PULSE PATHOLOGY SUB-PROGRAM (PIGEONPEA)

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PULSE PATHOLOGY SUB-PROGRAM (PIGEONPEA)

LIST OF APPROVED PROJECTS

(1978-1980)

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No.	Title	Project Scientist	Cooperators
PP-Path-1	Studies on pigeonpea wilt	J. Kannaiyan	K.B. Saxena L.J. Reddy S.C. Gupta
PP-Path-2	Studies on sterility mosaic of pigeonpea	M.V. Reddy	D.V.R. Reddy W. Reed R.Jambunathan K.B. Saxena L.J. Reddy S.C. Gupta
PP-Path-3	Studies on Phytophthora blight of pigeonpea	J. Kannaiyan	K.B. Saxena L.J. Reddy S.C. Gupta
PP-Path-4	International survey of pigeonpea diseases	Y.L. Nene	M.V. Reddy J. Kannaiyan J.M. Green D. Sharma

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PROJECT: PP-PATH-1(78) : STUDIES ON PIGEONPEA WILT

I. SUMMARY

1. The incidence of wilt in the susceptible check in sick plots was higher than in the last year. The level of "sickness"in Vertisol sick plots 'A' and 'B' and Alfisol sick plot 'A' as determined by wilt incidence in susceptible check line ICP-6997 was 93.5, 93.3 and 99.6 percent, respectively. The newly developing Alfisol sick plot 'B' had 72.2 percent wilt incidence.

2. Onset of wilt was noticed in July, a month earlier than observed last year. Marked increase in wilt incidence occurred in September in Alfisol sick plot 'A' and in November in Vertisol sick plot 'A' and 'B'.

3. The wilt fungus *Fusarium udum* could not be isolated from stubble buried three and half and four years ago in both Alfisol and Vertisol. The average loss in weight during the four years since burial of stubble in Vertisol and Alfisol was 99.8 and 93.3 percent, respectively.

4. A large number of breeding material was screened in the sick plots. This included F_2 bulks, F_3, F_4, F_5, and F_6 progenies, triple crosses, top crosses, germplasm selections, selective mating population selections, male sterile lines, parental and crossing block entries. Promising materials are being advanced for further study/ screening.

5. One hundred and fifty-three germplasm accessions were screened in a Vertisol sick plot and all were susceptible to wilt.

6. Out of 58 ACT (All India trial) entries screened, only one entry (BDN-1) showed low wilt incidence.

7. In the National Uniform Wilt Trial, out of 12 ICRISAT entries 6 showed low wilt in both Alfisol and Vertisol sick plots. Twenty-seven entries received from cooperators in National Uniform Wilt Trial were also screened in both the sick plots. Amongst the better ones were: AWR-74/15 and Purple-1.

8. Twelve ICRISAT pigeonpea entries were tested at nine locations (including two locations in ICRISAT Center, Vertisol and Alfisol sick plots) in National Uniform Wilt Trial in cooperation with All India Coordinated Pulse Improvement Programme. One entry, ICP-8863 (15-3-3-sel)showed less than 10% incidence at all locations. Other two entries; ICP-8859 and -8860 performed well at most locations.

9 Two hundred and sixty-four Phytophthora blight promising progenies were screened for wilt in sick plots. Out of these, only three progenies showed low wilt.

10. One hundred and six sterility mosaic resistant germplasm selections were screened in wilt sick plot. Of these only six progenies showed low wilt. Another set of four hundred and twelve sterility mosaic resistant progenies were screened for wilt. Of these twenty-seven progenies showed low wilt.

11. Seven hundred and fifteen progenies from wilt promising lines were screened. Of these 325 progenies recorded low wilt.

12. Only *Fusarium udum* was isolated from wilt specimens collected during the survey in Uttar Pradesh state of India.

13. A 'wilt sick pot' technique was developed for large screening of germplasm and other materials.

14. Over 700 germplasm accessions were screened for resistance by the 'sick pot' technique. Three accessions showed less than 10% wilt incidence, whereas the susceptible check line, ICP-6997, recorded more than 75% incidence.

II. INTRODUCTION

During this year we continued studies on survival, development of sick plots and screened a large number of breeding and other materials in sick plots. We developed 1000 wilt sick pots for screening large number of germplasm round the year.

III. FIELD STUDIES

A. Further development of sick plots

We now have four wilt sick plots at ICRISAT Center; i.e., two in Vertisol ('A' and 'B') and two in Alfisol ('A' and 'B'). The total area of these sick plots is 3.50 ha (3.00 ha in Vertisol and 0.50 ha in Alfisol). The following steps were taken to further increase and/or maintain the 'sickness' of these plots.

Vertisol sick plot 'A' (approx. 1.5 ha)

July 3, 1978 : The susceptible check line, ICP-6997, was planted after every four test rows Rest of field planted with breeding materials.

March 3, 1979 (observation) : The wilt incidence was 93.5% in ICP-6997

May 15, 1979 : All the stubble below the soil level were chopped and incorporated into soil.

Vertisol sick plot 'B' (approx 1.5 ha)

July 4, 1978 : The susceptible check line, ICP-6997, was planted after every four test rows. Rest of the field was planted with germplasm and breeding materials.

March 4, 1979 (observation) : The wilt incidence was 93.3% in ICP-6997

May 15, 1979 : All the stubble below the soil level were chopped and incorporated into soil.

Alfisol sick plot 'A' (0.1 ha)

June 22, 1978 : The wilt susceptible check line, ICP-6997 was planted after every four test rows. Rest of the plot was planted with breeding materials.

January 22, 1979 : The susceptible check, ICP-6997, showed 99.6% wilt.

May 10, 1979 : All the stubble below soil level were chopped and incorporated into soil.

Alfisol sick plot 'B' (0.4 ha)

July 14, 1978 : Two rows of susceptible check line, ICP-6997, were planted after every two test rows.

March 14, 1979 : The susceptible check, ICP-6997, showed 72.2% wilt

May 10, 1979 : All the stubble were chopped and incorporated into soil.

In the Alfisol sick plots 'A' and 'B', planting was done on June 22, and July 14, 1978, respectively. Planting in the two Vertisol sick plots 'A' and 'B' was done on July 3 and 4, 1978. Monthly counts of wilted plants were taken in susceptible check line, ICP-6997, in all plots except in Alfisol 'B' and the results have been summarised in Table 1 and Figure 1.

The results in Table 1 indicate that the wilt development was more in Alfisol 'A' than Vertisol sick plots in the early crop growth period. Alfisol 'A' showed more than 90% wilt incidence within four months after planting. Whereas the incidence was less than 50% in Vertisol sick plots for the same period. There was no marked difference in wilt incidence between Vertisol sick plots 'A' and 'B'.

Table 1 Monthly incidence (percent) of wilt in ICP-6997 in sick plots during 1978-79[a]

Month		Vertisol-'A'	Vertisol-'B'	Alfisol -A
August	1978	Not recorded	Not recorded	25.0
September		24.0	27.1	81.7
October		36.5	45.8	92.3
November		57.8	63.9	96.7
December		68.7	78.3	99.1
January	1979	79.4	85.8	99.6
February		85.2	89.0	Harvested
March		93.5	93.3	-

a/ Sowing was done on June 22nd, July 3rd and 4th, 1978 in Alfisol-'A', Vertisol - 'A' & 'B', respectively.

B. Survival of the pathogen

This 5-year study was initiated on November 18, 1974. On May 17 and November 17, 1978 the seventh and eighth sets of stubble, buried in Vertisol and Alfisol soils, were removed for detecting the presence of *Fusarium udum*. The isolations were made on modified Czapek's Dox agar[1] selective medium. The results are presented in Table 2 and 3.

The results indicate that the pigeonpea wilt pathogen could not be isolated either in seventh (42 months after burial of stubble) or in eighth (48 months after burial of stubble) sampling. The wilt pathogen survived up to 30 months and 36 months in stubble buried in Vertisol and in Alfisol, respectively. There was 99.8% loss in weight of stubble burried in vertisol at the end of 48 months. The temperature during these 4 years (November 1974 - November 1978) ranged from 5.4^{o} to 26.8^{o}C (minimum) and 25.8^{o} to 42.6^{o}C (maximum). The total rainfall has been 3,746 mm during these 4 years.

[1] Czapek's-Dox agar containing, in addition to normal ingredients, PCNB-500 mg, malachite green-25 mg, Dicrysticin-S (Streptopenicillin of Sarabhai Chemicals Ltd; Baroda, India) - 750 mg, and yeast extract-2 g per litre of medium.

FIGURE 1. MONTHLY PIGEONPEA (ICP-6997) WILT INCIDENCE IN SICK PLOTS (ALFISOL-'A', VERTISOL-'A' AND -'B') DURING 1978-79

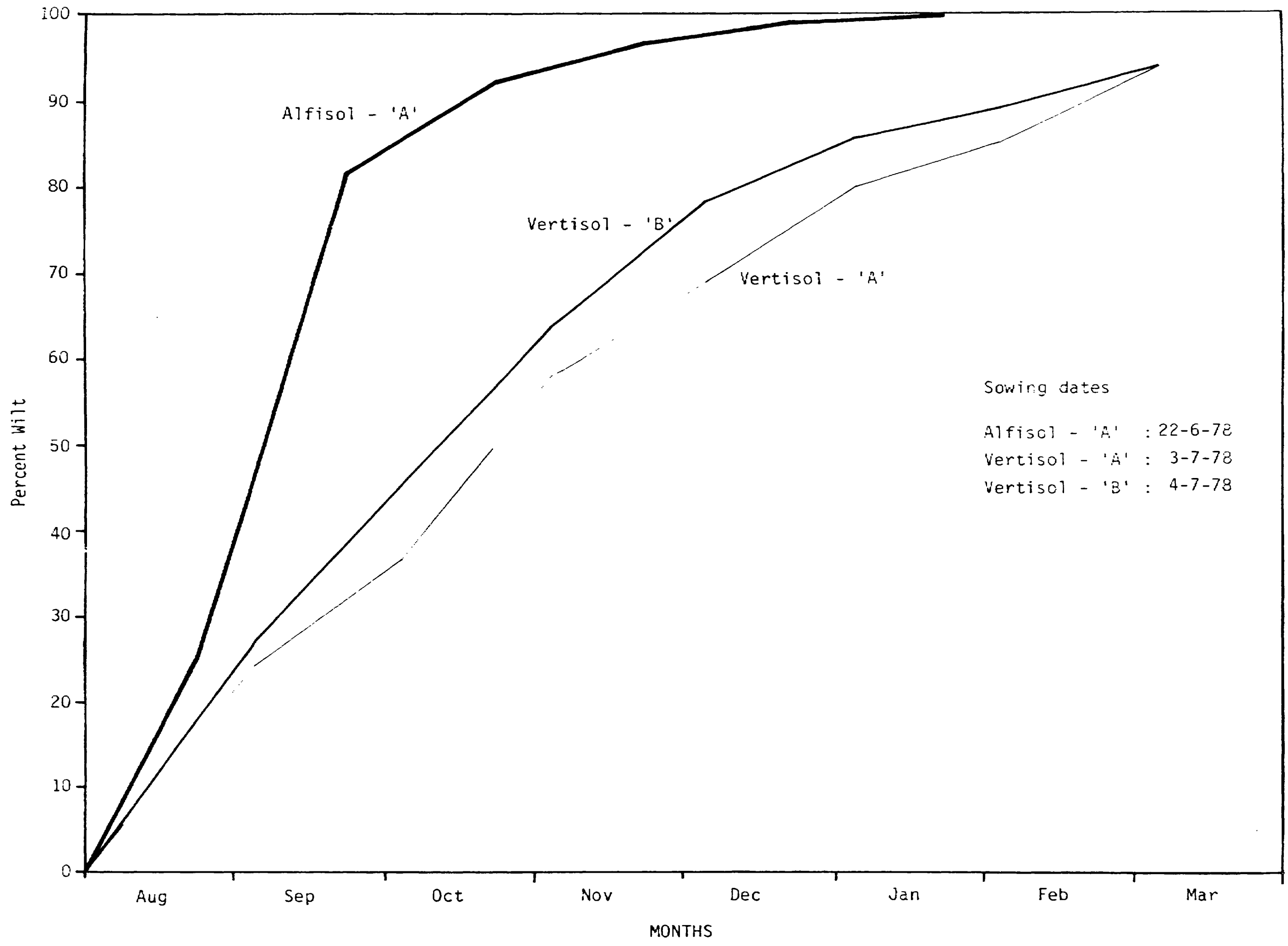

Table 2. Detection of *Fusarium udum* from stubble of wilted plants of pigeonpea 42 months after burial a/

Soil type	Replication	Weight of stubble (g) At the time of burial	Weight of stubble (g) After 42 months	Percent loss in weight	Average loss in weight (%)	No. of isolations made	No. of isolations which yielded *F. udum*
Alfisol (Red)	R_1	117.0	16.4	86.0		20	0
	R_2	81.0	6.6	91.9	88.2	20	0
	R_3	150.0	20.1	86.6		20	0
Vertisol (Black)	B_1	201.0	11.1	94.5		20	0
	B_2	39.0	0.1	99.7	96.1	20	0
	B_3	225.0	13.4	94.0		20	0

a/ The stubble were buried in Alfisol and Vertisol in large pots. See Pulse Pathology (Pigeonpea) Annual Reports 1974-75, 1975-76, 1976-77 and 1977-78.

Table 3. Detection of *Fusarium udum* from stubble of wilted plants of pigeonpea 48 months after burial a/

Soil type	Replication	Weight of stubble (g) At the time of burial	Weight of stubble (g) After 48 months	Percent loss in weight	Average loss in weight (%)	No. of isolations made	No. of isolations which yielded *F. udum*
Alfisol (Red)	R_1	85.0	8.5	90.0		20	0
	R_2	63.0	1.1	98.3	93.3	20	0
	R_3	225.0	18.6	91.7		20	0
Vertisol (Black)	B_1	64.0	0.2	99.7		20	0
	B_2	101.0	0.1	99.8	99.8	4	0
	B_3	390.0	0.2	99.9		15	0

a/ The stubble were buried in Alfisol and Vertisol in large pots. See Pulse Pathology (pigeonpea) Annual Reports 1974-75, 1975-76, 1976-77, and 1977-78.

C. Screening in sick plots

During the year under report, we planted pigeonpea materials to be screened for wilt in one Alfisol sick plot ('A') and in two Vertisol sick plots ('A' and 'B'). The Alfisol 'B' plot was not used for wilt screening because it is still being developed. In Kharif 1978, we have screened breeders' materials, germplasm, ACT (All India Trials) lines, materials received from National Uniform Trial for wilt, single plant selections from wilt promising lines, sterility mosaic resistant lines and Phytophthora blight resistant lines to identify resistant materials. The level of sickness as indicated by wilt in the susceptible line ICP-6997 during 1978-79 in the three sick plots is again given below for a ready reference.

Alfisol 'A'	:	99.6%
Vertisol 'A'	:	93.5%
Vertisol 'B'	:	93.3%

In all the screening tests, the criterion used for selecting promising lines/progenies was based on low wilt incidence (0.0 to 20.0%). In advancing the selected lines/progenies, agronomically desirable characters were also considered by breeders and such plants were selfed and the seeds collected for further studies.

1. Breeders' material

Materials received from the Breeding subprogram of ICRISAT were planted mainly in two Vertisol sick plots and the results are presented below. The selection of wilt-free plants for further testing was done by breeders.

(a) F_2 bulks

Three F_2 bulks involving the 'resistant' lines, either NP(WR)-15 or BDN-1 and other desirable but susceptible parents, were screened in Vertisol sick plot 'A'. The resistant and agronomically desirable plants were selfed and seeds were collected. The results of screening and also the number of plants selected in each cross are given in Table 4. The data have been passed on to breeders to draw conclusions, if any.

Table 4. Results of screening F_2 population for resistance to wilt in Vertisol sick plot 'A'

Cross No.	Pedigree	No. of plants	No. wilted	% wilt	No. selected
76088	ICP-7979 x BDN-1	1344	667	49.6	2
76094	ICP-7979 x NP(WR)-15	1481	871	58.8	1
76111	ICP-8504 x BDN-1	1456	1171	80.4	0

(b) F_3 progenies

Eight progenies (about 20 seeds each) from ICP-6997 (Susc.) x NP(WR)-15 (Resistant) cross were screened in Alfisol sick plot 'A'. The results of the screening and the number of plants selected have been given in Table 5. Of the eight progenies tested, only two showed low wilt incidence. Only from these two progenies, resistant and agronomically desirable plants were selfed and seeds were collected for further screening.

Table 5. Results of screening F_3 progenies of the Cross no.74342 for resistance to wilt in Alfisol sick plot 'A'

Pedigree	No. of plants	% wilt	No. of plants selected
74342-SW1⊗ (ICP-6997 x NP(WR)-15)	21	95.2	0
-SW2⊗	28	53.2	0
-SW3⊗	15	46.7	0
-SW4⊗	25	64.0	0
-SW5⊗	16	25.0	0
-SW6⊗	22	36.4	0
-SW7⊗	24	12.5	15
-SW8⊗	25	20.0	9

Another set of 475 progenies from ten crosses were screened in Vertisol sick plot 'A'. The F_2 bulks of these crosses were tested in same plot in 1977 K. The summarised results are given in Table 6 (see Appendix-I for details). The wilt incidence in these F_3 progenies ranged from 0 to 100%. Out of 475 progenies screened, 123 showed low wilt incidence. Only from these 123 progenies, the resistant and desired plants were selected for further testing.

Table 6. List of F_3 progenies which showed low wilt incidence in Vertisol sick plot 'A' a/

Cross No.	Pedigree	No. of progenies tested	No.of progenies with low wilt incidence	No. of plants selected
75216	ICP-7035 x -6902	59	12	27
75224	ICP-7035 x -6915	52	14	6
75236	ICP-7035 x -7183	18	10	33
75239	ICP-7035 x -7189	18	15	10
75456	ICP-3783 x -6909	47	6	3
75463	ICP-3783 x -6929	18	1	0
75470	ICP-3783 x -7183	52	2	0
75493	ICP-7118 x -6907	74	18	7
75513	ICP-7118 x -6897	76	14	13
75519	ICP-7118 x -7336	62	31	0

a/ Low wilt incidence = 0 to 20%.

(c) F_4 progenies

Nine progenies from ICP-6997 x ICP-102 cross and two progenies from 10 x 10 group diallel crosses were screened in Vertisol sick plot 'A'. The results of screening are presented in Table 7. The wilt incidence in these progenies was above 20% and therefore no selection was made.

Table 7. Results of screening F_4 progenies to wilt in Vertisol sick plot 'A'

Pedigree		No. of plants	% wilt
74246-31-W1@	(ICP-6997 x -102)	12	33.3
-W2@		10	70.0
-33-W1@		12	58.3
-W2@		31	87.5
-34-W1@		38	86.7
-W2@		12	91.7
-35-W1@		10	90.0
-W2@		11	63.6
-41-W1@		23	39.3
74456-2-10-W1@	(10 x 10 group diallel)	27	33.3
16-W1@		13	38.5

Another set of one hundred and thirty-five progenies from 5 crosses (both determinate and non-determinate) were planted for screening in Vertisol sick plot 'A'. The summarised results are given in Table 8 (see Appendix-II for details). The resistant plants were selfed and seeds were collected from the selected plants.

Table 8. Summary of the screening of single plant progenies of F_4 wilt-free progenies (BA-2) for resistance to wilt in Vertisol sick plot 'A' a/

Cross No.	Pedigree	No. of progenies tested	No.of progenies with low wilt incidence	No. of plants selected
74130-DT7	PAx ICP-4234	1	0	0
74131-DT8	ICP-7175x PA	20	0	0
74134-DT1	PAx ICP-4711	11	2	13
74137-DT7	PAx ICP-7105	31	0	0
74140-DT5	PAx ICP-4741	17	0	0
74130-NDT7	PAx ICP-4234	8	0	0
74131-NDT8	ICP-7175 x PA	9	0	0
74134-NDT1	PAx ICP-4711	18	0	0
74137-NDT7	PAx ICP-7105	14	2	4
74140-NDT5	PAx ICP-4741	6	0	0

a/ Low wilt incidence = 0 to 20%.

Four hundred and fifty-six progenies from five crosses were screened in Vertisol sick plot 'A'. The summarised results are presented in Table (see APPENDIX III for details). The wilt incidence in these progenies ranged from 0 to 100%. Out of 456 progenies screened,only 76 showed low wilt incidence. Only from these progenies the resistant and desired plants were selected for further testing.

(d) F_5 progenies

Forty-eight progenies from C-11 x ICP-6997 cross were screened in Vertisol sick plot 'A'. The summarised results are given in Table 9 (see APPENDIX IV for details). No selection could be made in these progenies.

Table 9. Results of screening of F_4 and F_5 progenies for wilt resistance in Vertisol sick plot 'A' a/

Cross No.	Pedigree	No. of progenies tested	No. of progenies with low wilt incidence	No. of plants selected
F_4 progenies				
74258	NP(WR)15 x ICP-1	76	11	7
74321	ICP-102 x -7035	99	27	21
74335	ICP-6997 x -7035	77	12	8
74209	Pant-A2 x NP(WR)15	78	14	7
74360	ICP-7065 x -7035	126	12	3
F_5 progenies				
74243	C-11 x ICP-6997	48	2	0

a/ Low wilt incidence = 0 to 20%.

(e) F_6 and F_7 progenies

Eleven progenies (3 F_6 + 8 F_7) involving a 'resistant' parent (JA-275) and two early maturing desirable parents (T-21 and Pusa Ageti) were screened in Vertisol sick plot 'A' and the detailed results of screening have been presented in Table 10. Since all progenies showed more than 20% wilt incidence, selection was not done.

Table 10. Results of screening F_6 and F_7 progenies to wilt in Vertisol sick plot 'A'

Pedigree	Generation	No. of plants	% wilt
73054-61-1-5-W1⊗	F_6	23	25.8
-W2⊗	F_6	12	50.0
-W3⊗	F_6	20	45.0
73047-14-6-B II-1-W1⊗	F_7	15	93.3
-2-W2⊗	F_7	15	60.0
73054-67-2-4-1-W1⊗	F_7	15	66.7
-W2⊗	F_7	5	60.0
-2-6-4-1-W1⊗	F_7	17	59.1
-5-5-5-W1⊗	F_7	18	27.8
-W2⊗	F_7	35	30.9
-W3⊗	F_7	13	38.5

(f) Triple and top cross progenies

Three triple cross progenies and nine top cross progenies were screened in Vertisol sick plot 'A' and the detailed results are presented in Table 11. Because of the poor plant types, very few plants were selected for further testing.

Table 11. Results of screening triple cross and top cross progenies to wilt in Vertisol sick plot 'A'

Pedigree	No. of plants	% wilt	No. selected
76073-W1⊗ (ICP-7118x-7336x JA-275)	16	12.5	2
76048-W1⊗ (ICP-7035x-7189x BDN-1)	24	0.0	3
76048-W2⊗ (ICP-7035x-7189x BDN-1)	8	75.0	0
75210-W1⊗ (ICP-7035x-6892)	10	10.0	0
75237-W1⊗ (ICP-7035x-7186)	22	22.7	0
75237-W2⊗ (ICP-7035x-7186)	16	25.0	0
75238-W1⊗ (ICP-7035x-7187)	17	11.8	0
75238-W2⊗ (ICP-7035x-7187)	10	50.0	0
75448-W1⊗ (ICP-3783x-6900)	5	0.0	0
75458-W1⊗ (ICP-3783x-6915)	11	36.4	0
75480-W1⊗ (ICP-3783x-7336)	34	17.4	5
75480-W2⊗ (ICP-3783x-7336)	26	33.9	0

(g) Germplasm selections

Eighty-nine progenies from germplasm selections were screened in Vertisol sick plot 'A'. Sixteen progenies from these germplasm selections were also screened in Alfisol sick plot 'A'. These progenies were previously screened in the wilt sick plots. The detailed results of screening have been given in Tables 12 and 13. Only progenies from ICP-5174 and ICP-7336 germplasm selections showed low wilt incidence in both Vertisol and Alfisol sick plots.

Table 12. Screening of germplasm progenies for wilt resistance in Vertisol sick plot - 'A'

Sl. No.	Pedigree	No. of plants	% wilt
1.	ICP-1-6-W2⊗-W3⊗	22	22.7
2.	-W4⊗	22	36.4
3.	-W5⊗	23	39.1
4.	-W6⊗	13	7.7
5.	-W3⊗-W5⊗	22	18.2
6.	-W6⊗	19	15.8
7.	-W7⊗	20	10.0
8.	-W8⊗	21	14 3
9.	-W5⊗-W2⊗	20	40.0
10.	-W3⊗	18	11.1
11.	-W4⊗	23	13.0
12.	-W5⊗	20	10.0
13.	ICP-4745-4-W4⊗-W1⊗	9	22.2
14.	-W2⊗	8	12.5
15.	-W3⊗	9	0.0
16.	-W4⊗	14	28.6
17.	-W5⊗-W1⊗	14	78.6
18.	-W2⊗	6	100.0
19.	-W3⊗	10	100.0
20.	-W4⊗	20	85.0
21.	ICP-6426-W4⊗-W3⊗	20	60.0
22.	-W4⊗	20	55.0
23.	-W5⊗	25	36.0
24.	-W6⊗	24	58.3
25.	HY-3C-12-W3⊗-W2⊗	20	20.0
26.	-W3⊗	20	5.0
27.	-W4⊗	12	25.0
28.	-W5⊗	4	25.0
29.	-W5⊗-W1⊗	15	0.0
30.	-W2⊗	18	16.7
31.	-W3⊗	19	21.1
32.	-W4⊗	17	11.8

Contd.

Sl. No.	Pedigree	No. of plants	%wilt
33.	ICP-2812-W1⊗	22	0.0
34.	-W2⊗	18	22.2
35.	-W3⊗	22	9.1
36.	-W4⊗	20	30.0
37.	ICP-4698-W1⊗	21	33.3
38.	-W2⊗	23	21.7
39.	-W3⊗	44	56.7
40.	ICP-5174-W1⊗	18	0.0
41.	-W2⊗	21	33.3
42.	-W3⊗	24	8.3
43.	-W4⊗	22	27.3
44.	ICP-5579-W2⊗	19	78.9
45.	-W3⊗	16	43.8
46.	-W4⊗	21	28.6
47.	-W5⊗	26	50.0
48.	NP(WR)-15-W1⊗	26	57.7
49.	-W2⊗	14	21.4
50.	-W3⊗	51	38.7
51.	ICP-6524-W2⊗	21	57.1
52.	-W3⊗	21	61.9
53.	-W4⊗	10	40.0
54.	-W5⊗	10	90.0
55.	ICP-6588-W2⊗	18	11.1
56.	-W3⊗	15	100.0
57.	-W4⊗	14	92.9
58.	-W5⊗	16	43.8
59.	ICP-6812-W2⊗	13	61.5
60.	-W3⊗	15	0.0
61.	-W4⊗	27	59.3
62.	-W5⊗	19	57.9
63.	ICP-6815-W1⊗	20	65.0
64.	-W2⊗	15	40.0
65.	-W3⊗	15	0.0
66.	-W4⊗	6	100.0
67.	ICP-6915-W1⊗	12	91.7
68.	-W2⊗	6	83.3
69.	-W3⊗	17	94.1
70.	-W4⊗	17	100.0
71.	ICP-6927-W1⊗	10	80.0
72.	-W3⊗	14	100.0
73.	-W4⊗	27	81.3
74.	ICP-7336-W2⊗	17	5.9
75.	-W3⊗	15	6.7
76.	-W4⊗	11	9.1
77.	-W5⊗	9	0.0

Contd.

Sl. No.	Pedigree	No. of plants	% wilt
78.	ICP-7424-W2⊗	23	8.7
79.	-W3⊗	21	23.8
80.	-W4⊗	21	19.1
81.	-W5⊗	18	33.3
82.	ICP-7549-W1⊗	11	0.0
83.	-W2⊗	18	83.3
84.	-W3⊗	27	81.5
85.	-W4⊗	21	80.9
86.	ICP-6897-W2⊗	7	0.0
87.	-W3⊗	17	0.0
88.	-W4⊗	17	23.5
89.	-W5⊗	14	28.6

Table 13. Results of screening germplasm selections for resistance to wilt in Alfisol sick plot - 'A'

Pedigree	No. of plants	% wilt	No. of plants selected
ICP-1-6-W3⊗-W1⊗	24	62.5	0
-W2⊗	24	54.2	0
ICP-4745-4-W4⊗-W1⊗	6	66.7	0
-W2⊗	9	77.8	0
HY-3C-12-W3⊗-W1⊗	13	69.2	0
-W2⊗	18	50.0	0
-W5⊗-W2⊗	24	37.5	0
-W4⊗	21	42.9	0
ICP-5174-W1⊗	20	10.0	7
-W2⊗	12	16.7	5
ICP-6812-W1⊗	24	91.7	0
-W2⊗	18	88.9	0
ICP-7336-W2⊗	20	5.0	9
-W4⊗	22	13.6	13
ICP-7424-W1⊗	21	85.7	0
-W4⊗	22	90.9	0

(h) Parental and crossing block entries

Thirty-nine parental lines and twenty-four crossing block entries obtained from the Breeding subprogram were planted in Vertisol sick plot 'A'. Wilt incidence was recorded and the results are presented in Tables 14 and 15. Except one crossing block entry, 73081-40D2-1⊗-1⊗ (13.6%), all were susceptible to wilt.

Table 14. Results of screening some parental lines to wilt in Vertisol sick plot - 'A'

Sl. No.	ICP No.	No. of plants	% wilt
1.	659	27	66.7
2.	885	29	75.9
3.	3783	38	89.5
4.	4109	19	84.2
5.	4234	18	88.9
6.	4711	34	64.7
7.	4741	21	85.7
8.	6523	29	55.2
9.	6524	33	45.5
10.	6525	24	79.2
11.	6892	24	70.8
12.	6897	29	89.7
13.	6902	32	50.0
14.	6907	39	82.1
15.	6915	26	61.5
16.	6929	30	100.0
17.	7029	31	80.6
18.	7065	12	100.0
19.	7105	35	65.7
20.	7175	19	57.9
21.	7183	43	44.2
22.	7186	22	54.5
23.	7187	31	64.5
24.	7189	32	59.4
25.	7201	32	53.1
26.	7887	19	84.2
27.	7889	34	64.7
28.	7894	23	82.6
29.	7950	21	66.7
30.	7952	4	100.0
31.	7956	18	83.3
32.	7962	34	94.1

Contd.

Sl. No.	ICP-No.	No. of plants	% wilt
33.	8021	15	93.3
34.	8023	17	88.2
35.	8257⊗	29	72.4
36.	8426	22	86.4
37.	8645⊗	29	79.3
38.	8646⊗	26	76.9
39.	8647⊗	27	74.1

Table 15. Results of screening crossing block entries to wilt in Vertisol sick plot - 'A'

Sl. No.	Pedigree	No. of plants	% wilt
1.	ICP-6973-69⊗-4⊗-7⊗-6⊗-B⊗-B⊗-B⊗	36	50.0
2.	-26-35⊗-6⊗-7⊗-2⊗-B⊗-B⊗-B⊗	32	93.8
3.	-28-24⊗-1⊗-3⊗-2⊗-B⊗-B⊗-B⊗	38	100.0
4.	-1-15⊗-5⊗-1⊗-2⊗	43	81.4
5.	-7120-91⊗-1⊗-1⊗-3⊗	40	50.0
6.	-7118-60⊗-1⊗-B⊗	40	42.5
7.	-102-36⊗-4⊗-1⊗-5⊗	50	86.0
8.	-7182-89⊗-2⊗-B⊗	44	43.2
9.	-7035-37⊗-5⊗-4⊗-B⊗	42	64.3
10.	-7119-13⊗-3⊗-14⊗-B⊗	29	24.1
11.	-7855 (AS-71-37-21⊗-4⊗)	29	20.7
12.	MS-3A (Sibs)	31	54.8
13.	MS-4A (Sibs)	18	27.8
14.	ICP-6344 (7-7⊗)	23	82.6
15.	ICP-1641 (T-17⊗)	31	80.7
16.	ICP-8518 (LRG-30⊗)	31	100.0
17.	-7979⊗	21	57.1
18.	73081-40D2-1⊗-1⊗	22	13.6
19.	-2⊗	7	71.4
20.	-3⊗	16	81.3
21.	-2⊗-1⊗	27	59.3
22.	-3⊗	23	47.8
23.	73081-11D2-2⊗-2⊗	20	45.0
24.	ICP-8504⊗	35	60.0

(i) Selective mating population selections

One hundred and ninety-one selective mating population (SMP) selections were screened in Vertisol sick plot 'B'. The detailed results of screening are given in APPENDIX V. The wilt incidence in these progenies ranged from 22.3% to 100.0% and hence no selections were made.

(j) Selections from M-1 field

Three hundred and sixty-two progenies from double cross F_3 - 'A' were planted in Vertisol sick plot 'B'. The detailed results of screening are presented in APPENDIX VI. The wilt incidence in these progenies ranged from 18 to 100%. The resistant and agronomically desirable plants were selfed and seed were collected for further tests.

Another set of three hundred and seventy-nine progenies from double cross F_3-'B' (DCF_3B) were screened for wilt in Vertisol sick plot 'B'. The detailed results are given in APPENDIX VII. The wilt incidence in these DC-F_3 'B' progenies ranged from 11.1% to 100.0%. Resistant and desirable plants were chosen, selfed and seeds collected from them for further tests.

Sixty-six F_4 progenies selected from M-1 were screened in Vertisol sick plot 'B'. The results of screening are presented in APPENDIX VIII. All progenies showed more than 20.0% wilt incidence and hence no selection was possible.

(k) Selections from RA-28 and wilt nursery

Ninety-four progenies (F_4 and F_3) selected from wilt nursery 1976 were planted in Vertisol sick plot 'B' again for wilt resistance screening. The results are given in APPENDIX IX. Except one progeny (74243-9-W30), all other showed more than 20.0% wilt incidence.

Seventy-six F_4 progenies selected from RA-28 were planted in Vertisol sick plot 'B'. The results of screening are presented in APPENDIX X. All progenies showed more than 20.0% wilt incidence.

Another set of ninety-two F_4 and F_5 progenies from RA-28 were also screened in Vertisol sick plot 'B'. The wilt incidence in these progenies ranged from 7.5% to 97.1% (APPENDIX XA). The resistant and agronomically desirable plants were selfed and seeds were collected for further studies.

(l) Male sterile lines

Six male sterile lines obtained from breeders were screened for wilt in Vertisol sick plot 'B'. The results of screening are given in Table 16. All six male sterile lines were highly susceptible to wilt.

Table 16. Results of screening of male sterile lines to wilt in Vertisol sick plot 'B'

Male sterile lines	No. of plants	% wilt
MS-3A	26	88.5
MS-3B	43	86.0
MS-3C	25	85.0
MS-3D	51	98.0
MS-3E	40	100.0
MS-4A	46	95.6

2. Germplasm

During 1978 kharif, 153 germplasm accessions were screened in Vertisol sick plot 'B'. The detailed results are presented in APPENDIX XI. All the accessions showed more than 20.0% wilt and hence no selection was made.

3. All India coordinated trial entries

Seeds of 58 entries included EACT, ACT-1, ACT-2, and ACT-3 trials were received from the All India Coordinated Pulses Improvement Programme (AICPIP) for wilt screening. All the four trials were planted in Vertisol sick plot 'B'. The detailed results of screening and grain yield data are given in APPENDIX XII. Only BDN-1 showed low wilt incidence. The range of wilt incidence in ACT lines varied from 7.6% (BDN-1) to 95.2% (GS-1).

4. National (All India) Uniform Wilt Trial

Thirty-nine lines including 12 ICRISAT lines were screened in Alfisol sick plot 'A' and Vertisol sick plot 'A'. The results of screening are given in Table 17 Among the 12 ICRISAT lines, 6 showed less than 20.0% wilt in Alfisol sick plot 'A'. Whereas in Vertisol sick plot 'A' eight lines came under this group. In the remaining 27 lines, only two (Purple-1 and AWR-74/15) recorded 'low' wilt in Alfisol sick plot 'A'. In Vertisol sick plot 'A' only AWR-74/15, NP(WR)-15 and Banda palera recorded low wilt. The screening seemed to be more severe in Alfisol sick plot 'A' since the wilt incidence in individual lines was greater in the former than in the latter with few exceptions.

Table 17. Results of screening of national uniform trial for wilt in Alfisol - 'A' and Vertisol - 'A'

Pedigree	Alfisol - 'A' No. of plants	Alfisol - 'A' % wilt	Vertisol - 'A' No. of plants	Vertisol - 'A' % wilt
ICP-8858	44	40.9	37	10.8
-8859	42	9.5	33	12.1
-8860	28	10.7	46	10.9
-8861	42	21.4	34	14.7
-8862	33	45.5	37	21.6
-8863	40	5.0	39	2.6
-8864	39	33.3	46	23.9
-8865	36	5.6	37	13.5
-8866	32	28.1	29	34.5
-8867	40	5.0	27	14.8
-8868	34	32.0	37	21.6
-8869	38	13.2	27	11.1
TS-136-1 (Kar)	16	93.8	44	68.2
Bori-1	24	70.8	16	68.8
MAU-W-1	21	90.5	36	83.3
MAU-E-175	19	78.9	39	56.4
KWR-1-1	21	90.5	17	70.6
AS-29 (KPR)	19	79.0	14	42.9
DL-74-1	18	100.0	18	94.4
15-3-3 (JBR)	9	66.7	10	80.0
15-3-3 (MAU)	18	83.3	48	35.4
AWR-74/15 (KPR)	19	15.8	19	5.3
NP(WR)-15	11	90.9	15	20.0
C-11	14	85.7	11	45.5
BDN-1 (MAU)	15	93.3	28	39.3
BDN-1 (KPR)	18	88.9	16	25.0
BDN-1 (JBR)	17	82.4	17	64.7
BDN-2 (MAU)	21	95.2	23	65.2
70 (KPR)	22	45.5	14	50.0
K-28	7	100.0	8	50.0
K-73	18	83.3	13	38.5
Beitul-1	6	100.0	2	100.0
Shivpuri-2	8	100.0	10	80.0
Indore-7	13	92.3	6	83.3
Banda Palera (KPR)	18	55.6	16	6.3
JA-3A	12	83.3	16	81.3
Ben-1	11	72.7	11	27.3
Purple-1 (134A)	16	0.0	19	26.3
Purple-2	18	100.0	12	75.0

5. Multilocation testing of ICRISAT entries

Twelve ICRISAT pigeonpea entries selected for wilt resistance from sick plots here were screened at nine locations (including two at ICRISAT, viz., Vertisol and Alfisol sick plots) in wilt sick plots during 1978 kharif in India (Table 18). Along with test entries, susceptible check lines were planted at regular intervals. The wilt incidence was recorded both in test entries and susceptible checks and the results are presented in Table 19. The results in Table 19 indicate that at all centres, the susceptible checks showed more than 50% wilt incidence except at Kanpur (36%). Out of 12 entries tested only ICP-8863 (15-3-3 selection) showed less than 10.0% wilt incidence at all the nine locations. The entry ICP-8863 did not show any wilt at 4 out of 9 locations tested. The entries ICP-8859 and ICP-8860 showed more than 20.0% wilt at one location each. Only at Parbhani all 12 entries showed less than 20.0% incidence. At the same location, the susceptible check line No. 1258 showed 82.1% wilt. At ICRISAT location, six entries showed less than 20.0% wilt incidence in both Vertisol and Alfisol sick plots.

Table 18. Locations and cooperators in the 1978 kharif National Uniform Wilt Trial from whom results were received

Locations a/		Cooperator
Andhra Pradesh	- Hyderabad - Rajendranagar	R. Baner Raj
	Patancheru - ICRISAT	Y.L. Nene & J. Kannaiya
Bihar	- Dholi	M. Mahmood
Karnataka	- Annigeri	R.V. Hiremath
Madhya Pradesh	- Jabalpur	S.R. Kotasthane
Maharashtra	- Parbhani	K.K. Zote
Uttar Pradesh	- Kanpur	P. Shukla
	- Varanasi	U.P. Singh

a/ Two sets were planted at ICRISAT and one each at all others.

6. Material collected in surveys

Eight materials collected during pigeonpea disease survey in Madhya Pradesh and three entries given by ICRISAT Pigeonpea Breeding unit were screened in Alfisol sick plot 'A'. The results are presented in Table 20. Except HY-3A all other materials were highly susceptible to wilt.

Table 19. Results of performance of ICRISAT pigeonpea entries in national uniform wilt trial 1978 K

Locations / ICP.No.	ICRISAT Alfisol sick plot		ICRISAT Vertisol sick plot		Karnataka Annigeri		Madhya Pradesh Jabalpur		Andhra Pradesh Rajendranagar		Maharashtra Parbhani		Uttar Pradesh Kanpur		Uttar Pradesh Varanasi		Bihar Dholi	
	TPT	%wilt	TPT	%wilt	TPT	%wilt	TPT	%wilt	TPT	%wilt	TPT	%wilt	TPT	%wilt	TPT	%wilt	TPT	%wilt
8858	44	40.9	37	10.8	55	25.5	42	7.1	27	7.4	85	1.2	22	45.4	37	78.4	-	23.5
8859	42	9.5	33	12.1	50	20.0	38	0.0	54	16.6	83	2.4	15	80.0	37	5.4	-	8.7
8860	28	10.7	46	10.9	63	28.6	50	0.0	48	4.1	87	2.3	22	9.9	42	4.7	-	18.8
8861	42	21.4	34	14.7	61	6.6	55	10.9	39	30.7	81	1.2	4	*	41	0.0	-	50.0
8862	33	45.5	37	21.6	60	15.0	49	22.5	42	28.5	79	2.5	1	*	41	65.0	-	50.0
8863	40	5.0	39	2.6	78	7.7	46	2.2	54	0.0	77	0.0	32	0.0	37	0.0	-	2.9
8864	39	33.3	46	23.9	68	42.6	58	0.0	45	15.5	78	12.8	39	25.5	34	2.9	-	20.0
8865	36	5.6	37	13.5	72	23.6	55	5.5	62	25.8	82	8.5	47	36.1	41	26.8	-	6.3
8866	32	28.1	29	34.5	56	35.7	51	23.5	38	60.5	78	15.4	19	73.6	36	30.8	-	20.0
8867	40	5.0	27	14.8	66	15.2	55	1.8	28	21.4	82	2,4	21	*	36	13.8	-	44.0
8868	34	32.0	37	21.6	71	32.4	51	0.0	34	32.3	82	2.4	24	*	37	5.4	-	13.8
8869	38	13.2	27	11.1	62	25.8	52	32.7	39	15.3	86	1.2	24	*	41	58.5	-	2.8
Susceptible checks																		
ICP-6997	-	99.6	-	93.5	-	-	-	-	-	93.0	-	-	-	36.0	-	-	-	53.0
No.1258	-	-	-	-	-	100.0	-	76.3	-	100.0	-	82.1	-	-	-	80.0	-	-
Others	-	-	-	-	-	-	-	-	-	100.0 (HY-2)	-	-	-	-	-	91.9 (T-21)	-	-

TPT - indicates total plants tested.
* These entries died in early stage either due to Phytophthora or excess water.

Table 20. Incidence of wilt in materials collected in Madhya Pradesh (MP) and given by ICRISAT Pigeonpea Breeding Unit (Alfisol sick plot 'A')

Particulars	Source	No. of plants	% wilt
Hoshangabad	M.P. coll.	21	100.0
Bairagarh	"	23	100.0
Bhaura	"	17	100.0
Akalpur	"	20	100.0
Pathrota	"	22	100.0
Ratanpur	"	15	100.0
Tanda	"	16	100.0
Deshgoan	"	4	100.0
ICP-7086	Breeding Unit	43	95.3
T-15-15 (Aujarat)	"	38	100.0
Hy-3A	"	36	8.3

7. Progenies promising against Phytophthora blight

Thirteen Phytophthora blight promising progenies screened for wilt reaction in Alfisol sick plot 'A'. The results are presented in Table 21. The wilt incidence in these progenies ranged from 50.0% to 100.0%.

Table 21. Results of screening some Phytophthora blight promising progenies to wilt in Alfisol sick plot 'A'

Pedigree	No. of plants	% wilt
Pusa Ageti-P10⊗	20	85.0
ICP-113-P5⊗	21	100.0
-231-P5⊗	17	100.0
-339-P5⊗	21	95.3
-758-P5⊗	19	100.0
-1209-P1⊗	22	100.0
-1522-P2⊗	23	100.0
-1529-P5⊗	24	95.8
-1643-P2⊗	23	100.0
-2376-P5⊗	20	100.0
-3753-P5⊗	20	50.0
Pant-A3-P5⊗	10	80.0
ICP-7065-P5⊗	17	100.0

Two hundred and fifty-one Phytophthora blight promising progenies from three crosses were screened for wilt in Vertisol sick plot 'B'. The detailed results of screening are presented in APPENDIX XIII, and the summarised results are given in Table 22. The wilt incidence in these F_3 progenies ranged from 13.6% to 100.0% and only three progenies showed 'low'wilt incidence.

Table 22. Summary of the screening of Phytophthora blight promising progenies in Vertisol sick plot 'B'

Cross No.	Pedigree	No. of progenies tested	No. of progenies with low wilt incidence a/	No. of plants selected
74290	C-11 x ICP-7065	100	1	43
74360	ICP-7035 x ICP-7065	69	1	0
74363	HY-3C x ICP-7065	82	1	26

a/ Low wilt incidence = 0 to 20%.

8. Progenies resistant to sterility mosaic

One hundred and six sterility mosaic resistant germplasm selections were screened for wilt in Vertisol sick plot 'B'. The summarised results are presented in Table 23 (see APPENDIX XIV). The wilt incidence in these progenies ranged from 11.5% to 100.0%. Only six progenies showed low wilt incidence. The resistant and agronomically desirable plants were selected for further study.

Another set of three hundred and sixty-two sterility mosaic resistant progenies (from 8 crosses) and three parents were planted in Vertisol sick plot 'B'. The summarised results are given in Table 24(see APPENDIX XV for details). The results in Table 24 indicate that only sixteen progenies from two crosses (ICP-6997 x C-11 and JA-275 x ICP-1) showed low wilt incidence. The resistant and agronomically desirable plants were selected from these sixteen progenies only.

Fifty progenies from three sterility mosaic resistant lines (ICP-3783, -7035 and HY-3C) were screened in Vertisol sick plot 'A'and the results ar given in APPENDIX XVI. The resistant and agonomically desirable plants were selected for further studies.

Table 23. List of sterility mosaic resistant germplasm selections which showed low wilt in Vertisol sick plot 'B' a/

Pedigree	No. of plants	% wilt	No. of plants selected
ICP-4769-3-S3⊗	22	13.6	5
-5097-1-S3⊗	26	11.5	7
-5701-1-S1⊗	20	15.0	4
-6831-1-S2⊗	34	11.8	9
-7194-1-S4⊗	35	20.0	1
-7217-1-S1⊗	21	19.0	0

a/ Low wilt = 0 to 20%.

Table 24. List of single plant progenies (SPP) of sterility mosaic resistant materials which showed low wilt incidence in Vertisol sick plot 'B' a/

Cross No.	Pedigree	No. of progenies tested	No. of progenies with low wilt incidence	No. of plants selected
74243	ICP-6997 x C-11	263	10	143
74254	ICP-1 x HY-3C	14	0	0
73070	JA-275 x ICP-1	12	6	68
73088	JA-275 x P-334	5	0	0
74240	ICP-6997 x ST-1	31	0	0
74245	ICP-3773 x ICP-6997	5	0	0
74024	(T-21 x JA-275)xICP-7035	8	0	0
73054	JA-275 x C-11	24	0	0

a/ Low wilt = 0 to 20%.

9. Progenies promising against wilt

One hundred and twenty-six progenies selected from Vertisol sick plot were screened for the first time in Alfisol sick plot 'A'. The summarised results are given in Table 25 (see APPENDIX XVII). Of the 126 progenies screened in Alfisol sick plot 'A', 57 showed low wilt incidence. Some progenies from ICP-6970, NP(WR)-15 and T-17 showed no wilt at all. The resistant and agronomically desirable plants were selfed and seeds were collected for further study.

These progenies were also screened for sterility mosaic by "leaf stapling" technique and the results are given in APPENDIX XVIII.

Another set of 332 progenies from 10 lines found less susceptible to wilt in Vertisol sick plots were further screened in Vertisol sick plot 'A'. The summarised results are given in Tables 26 and 27 (see APPENDIX XIX).

The wilt incidence in these progenies ranged from 0 to 100%. One hundred and fifty-six progenies showed low wilt incidence. Many progenies from ICP-6970 did not show any wilt. Selfed seeds were collected from resistant and desired plants for further study.

Table 25. Summary of screening of single plant progenies for resistance to wilt in Alfisol sick plot - 'A'

Pedigree	No. of plants	%wilt	No. of plants selected
T-17-W1⊗-W17⊗-W2⊗	19	15.8	5
-W2⊗-W1⊗-W2⊗	24	12.5	6
-W3⊗-W1⊗	23	17.4	12
-W2⊗	23	0.0	11
-W7⊗-W1⊗	26	19.2	3
-W3⊗-W9⊗-W2⊗	22	13.6	6
NP(WR)-15-W1⊗-W1⊗-W2⊗	16	18.8	5
-W7⊗-W1⊗	15	13.3	8
-W2⊗	20	15.0	10
-W12⊗-W1⊗	17	11.8	5
-W19⊗-W2⊗	22	13.6	5
-W21⊗-W1⊗	21	9.5	12
-W2⊗	25	16.0	6
-W2⊗-W3⊗-W1⊗	21	14.3	7
-W14⊗-W1⊗	18	5.6	9
-W2⊗	25	8.0	20
-W15⊗-W1⊗	20	20.0	4
-W2⊗	17	0.0	5
-W16⊗-W1⊗	26	15.4	8
-W2⊗	19	0.0	12
-W19⊗-W1⊗	20	10.0	5
-W2⊗	17	17.7	5
-W20⊗-W1⊗	20	0.0	10
-W2⊗	22	18.2	7
-W3⊗-W6⊗-W1⊗	20	0.0	12
-W7⊗-W1⊗	20	5.0	14
-W2⊗	19	5.3	13
-W8⊗-W1⊗	20	0.0	11
-W2⊗	20	15.0	8

Contd.

Pedigree	No. of plants	%wilt	No. of plants selected
ICP-6970-S1⊗-W1⊗	26	0.0	11
-W2⊗	26	0.0	19
-S2⊗-W1⊗	16	6.3	9
-W2⊗	17	5.9	10
-S3⊗-W5⊗	23	8.7	8
-S1 -W1⊗	20	10.0	12
-W2⊗	22	9.1	14
-S4-W2⊗	16	6.3	8
-S5-W1⊗	27	18.5	19
-W3⊗	23	4.4	18
-S6-W1⊗	23	17.4	19
-W2⊗	19	0.0	8
-S7-W1⊗	27	18.5	9
-W2⊗	20	5.0	17
-S8-W1⊗	24	4.2	12
-S9-W1⊗	23	0.0	13
-W2⊗	20	0.0	12
-S10-W1⊗	27	11.1	11
-W2⊗	20	0.0	15
15-3-3-W2⊗-W13⊗-W1⊗	20	20.0	2
-W2⊗	20	15.0	6
-W1⊗-W16⊗-W1⊗	21	9.5	2
-W3⊗	25	20.0	4
20-1-W1⊗-W1⊗	21	19.1	8
-W2⊗	18	11.1	9
73039-RbB-W4⊗-W1⊗-W1⊗	20	10.0	10
-W2⊗-W1⊗	20	20.0	3
Early x Early-RbB-W5⊗-W1⊗-W1⊗	12	16.7	5

Table 26. Summary of screening of single plant progenies (SPP) of promising lines in Vertisol sick plot 'A'

Pedigree	No. of SPP screened	No. of SPP showed low wilt incidence a/
T-17	72	12
NP(WR)-15	120	49
KWR-1	52	23
ICP-6970	56	48
C-11	4	3
No.1258	4	1
15-3-3	8	8
20-1	4	3
F_5 73039 (T-21 x NPWR-15)	8	7
F_6 Early x Early	4	2

a/ Low wilt = 0 to 20%.

Table 27. List of single plant progenies (SPP) of promising lines which showed 'low' wilt incidence in Vertisol 'A'.

Pedigree	No. of plants	%wilt	No. of plants selected
T-17-W1⊗-W2⊗-W5⊗	15	13.3	0
-W8⊗	13	0.0	2
-W5⊗-W2⊗	14	0.0	2
-W3⊗	15	0.0	2
-W4⊗	12	0.0	2
-W9⊗-W6⊗	32	12.5	0
-W12⊗-W4⊗	18	0.0	2
-W2⊗-W1⊗-W8⊗	15	6.7	4
-W9⊗-W4⊗	22	13.6	7
-W3⊗-W3⊗-W4⊗	18	16.7	2
-W6⊗-W5⊗	16	18.8	4
-W12⊗-W2⊗	19	15.8	2
NP(WR)-15-W1⊗-W1⊗-W5⊗	18	11.1	0
-W6⊗	20	10.0	0
-W7⊗	22	18.2	0
-W8⊗	15	13.3	0
-W3⊗-W4⊗	18	0.0	10
-W4⊗-W4⊗	16	18.8	5
-W7⊗-W4⊗	20	5.0	8
-W6⊗	21	14.3	6
-W7⊗	17	17.7	7
-W12⊗-W5⊗	15	0.0	2
-W7⊗	15	13.3	3
-W13⊗-W6⊗	22	13.6	0
-W14⊗-W5⊗	16	0.0	5
-W6⊗	21	9.5	3
-W17⊗-W2⊗	13	0.0	5
-W3⊗	17	5.9	5
-W4⊗	10	20.0	5
-W19⊗-W6⊗	22	13.6	5
-W21⊗-W5⊗	15	0.0	4
-W2⊗-W1⊗-W7⊗	18	0.0	3
-W3⊗-W5⊗	14	14.3	4
-W5⊗-W8⊗	15	0.0	6
-W12⊗-W5⊗	15	6.7	4
-W6⊗	18	0.0	4
-W8⊗	18	11.1	6
-W14⊗-W5⊗	16	12.5	4
-W6⊗	20	15.0	3
-W7⊗	18	16.7	4
-W8⊗	23	17.4	2

Contd.

Pedigree	No. of plants	%wilt	No. of plants selected
NP(WR)-15-W2⊗-W15⊗-W5⊗	10	0.0	5
-W8⊗	14	7.1	5
-W20⊗-W5⊗	16	0.0	5
-W6⊗	14	0.0	3
-W7⊗	19	15.8	2
-W3⊗-W6⊗-W8⊗	16	6.3	8
-W7⊗-W5⊗	22	0.0	11
-W7⊗	20	15.0	13
-W8⊗-W5⊗	20	5.0	9
-W6⊗	21	4.8	9
-W7⊗	21	4.8	8
-W8⊗	21	9.6	3
-W9⊗-W8⊗	21	19.1	4
-W15⊗-W6⊗	22	18.2	5
-W7⊗	23	17.4	2
-W8⊗	18	16.7	2
-W17⊗-W3⊗	22	13.6	5
-W6⊗	16	18.8	3
-W18⊗-W7⊗	19	15.8	13
-W8⊗	22	4.6	16
KWR-1-W1⊗-W2⊗-W5⊗	23	17.4	5
-W8⊗	18	16.7	4
-W3⊗-W5⊗	22	9.1	4
-W2⊗-W2⊗-W5⊗	13	15.4	4
-W6⊗	12	16.7	7
-W7⊗-W5⊗	16	12.5	3
-W6⊗	24	16.7	5
-W11⊗-W5⊗	18	0.0	5
-W7⊗	20	20.0	5
-W8⊗	21	14.3	4
-W13⊗-W5⊗	21	19.1	4
-W3⊗-W1⊗-W8⊗	16	6.3	4
-W5⊗-W3⊗	16	12.5	4
-W4⊗	14	7.1	4
-W5⊗	11	18.2	5
-W6⊗	22	18.2	8
-W11⊗-W5⊗	15	6.7	5
-W6⊗	12	16.7	5
-W7⊗	18	5.6	3
-W8⊗	13	0.0	5
-W13⊗-W1⊗	17	17.7	6
-W3⊗	23	8.7	7
-W5⊗	23	17.4	6

Contd.

Pedigree	No. of plants	%wilt	No. of plants selected
ICP·6970-S1⊗-W2⊗	16	6.3	3
-W3⊗	25	16.0	15
-W4⊗	20	5.0	7
-W5⊗	22	4.6	5
-S2⊗-W2⊗	15	0.0	5
-W4⊗	17	0.0	6
-S3⊗-W2⊗	18	0.0	18
-W3⊗	19	10.5	11
-W4⊗	16	12.5	10
-W5⊗	17	5.9	11
-S4⊗-W4⊗	20	15.0	0
-S1-W2⊗	23	4.4	2
-W3⊗	18	5.6	14
-W4⊗	17	0.0	12
-W5⊗	22	0.0	12
-S2-W2⊗	18	0.0	9
-W3⊗	21	0.0	17
-W5⊗	16	0.0	9
-S3-W3⊗	24	0.0	1
-W4⊗	16	12.5	0
-W5⊗	20	0.0	7
-S4-W1⊗	19	0.0	14
-W3⊗	18	11.1	9
-W4⊗	21	4.8	13
-W5⊗	18	0.0	13
-S5-W2⊗	19	15.8	12
-W3⊗	20	0.0	4
-W4⊗	16	0.0	5
-W5⊗	22	4.6	5
-S6-W2⊗	20	15.0	3
-W3⊗	23	4.4	4
-W4⊗	21	14.3	9
-W5⊗	19	5.3	10
-S7-W3⊗	17	5.9	4
-W4⊗	20	5.0	4
-W5⊗	16	12.5	3
-S8-W2⊗	20	10.0	6
-W3⊗	16	0.0	5
-W4⊗	15	0.0	5
-W5⊗	20	0.0	5
-S9-W2⊗	19	0.0	5
-W3⊗	20	0.0	5
-W4⊗	15	0.0	3
-W5⊗	21	4.8	4

Contd.

Pedigree	No. of plants	%wilt	No. of plants selected
ICP-6970-S10-W1⊗	20	0.0	11
-W3⊗	22	13.6	12
-W4⊗	24	0.0	9
-W5⊗	17	0.0	5
C-11-W2⊗-W10⊗-W2⊗	18	5.6	0
-W3⊗	18	11.2	2
-W4⊗	23	13.0	0
No.1258-W2⊗-W5⊗-W4⊗	12	16.7	2
15-3-3-W1⊗-W16⊗-W2⊗	18	16.7	9
-W3⊗	22	9.1	9
-W4⊗	18	5.6	11
-W5⊗	24	4.2	10
-W2⊗-W13⊗-W2⊗	19	0.0	9
-W3⊗	14	14.3	-
-W4⊗	15	6.7	4
-W5⊗	15	6.7	5
20-1-W1⊗-W3⊗	21	4.8	7
-W4⊗	15	6.7	5
-W5⊗	14	7.1	5
73039-RbB-W4⊗-W1⊗-W5⊗	18	0.0	2
-W6⊗	24	8.3	2
-W7⊗	21	4.8	2
-W8⊗	18	16.7	2
-W2⊗-W2⊗	17	17.7	2
-W3⊗	18	16.7	2
-W5⊗	30	13.3	2
E x E-RbB-W5⊗-W1⊗-W5⊗	17	5.9	2
-W6⊗	19	0.0	2

One hundred and eighty-nine progenies from six field tolerant lines against wilt were planted for the second time in Vertisol sick plot 'A'. The progenies which recorded low wilt incidence and also number of plants selected from each such progeny are indicated in Table 28 (see APPENDIX XX). Out of the 189 progenies screened, 65 showed low wilt incidence.

10. Progenies promising against wilt and resistant to sterility mosaic

Twenty progenies from sterility mosaic resistant and wilt promising lines were screened in Alfisol sick plot 'A'. The results of screening and the number of plants selected from each progeny are presented in Table 29. Seventeen progenies recorded low wilt of which two progenies (JA-275-S1⊗-S2⊗-SW11⊗ and NPWR-15- W2⊗-W14⊗-SW1⊗) were completely free of wilt incidence.

Another set of 44 progenies from sterility mosaic resistant and wilt promising lines were screened in Vertisol sick plot 'B'. The wilt incidence and number of plants selected are presented in APPENDIX XXI.

Table 28. Summary of the screening of single plant progenies of field tolerant lines in Vertisol sick plot 'A'

Pedigree	No. of SPP screened	No. of SPP showed low wilt incidence[a/]	No. of plants selected
NP(WR)-15	20	14	18
ICP-7035	37	8	0
HY-3C	4	2	0
C-11	6	5	11
No 148	88	22	25
BDN-1	34	14	27

SPP - Single plant progenies
Low wilt = 0 to 20%

Table 29. Screening of sterility mosaic resistant and wilt promising progenies for resistance to wilt in Alfisol sick plot 'A'

Pedigree	No. of plants	%wilt	No. of plants selected
ICP-2376-SW1⊗	20	10.0	9
-SW2⊗	17	23.5	0
JA-274-SW1⊗	16	6.3	4
-SW19⊗	18	16.7	3
JA-275-S1⊗-S2⊗-SW11⊗	20	0.0	6
-SW16⊗	19	5.3	9
NPWR-15-W2⊗-W14⊗-SW1⊗	12	0.0	2
-SW5⊗	15	6.7	4
ICP-6970-S2⊗-SW3⊗	21	9.5	11
-SW23⊗	20	5.0	15
ICP-7035-S34⊗-S29⊗-SW18⊗	15	26.7	0
-SW21⊗	20	20.0	7
HY-3C-S251⊗-S15⊗-SW1⊗	15	13.3	5
-SW2⊗	15	20.0	5
BDN-1-W1⊗-SW1⊗	27	100.0	0
-SW4⊗	27	92.6	
KWR-1-W3⊗-W1⊗-SW1⊗	22	63.6	0
-SW2⊗	17	17.7	6
15-3-3-W2⊗-W16⊗-SW2⊗	13	7.7	4
-SW17⊗	21	14.3	9
ICP-7867-SW1⊗	21	42.9	4
-SW3⊗	23	43.5	5
ICP-7942-SW1⊗	24	12.5	16
-SW6⊗	15	6.7	7

IV. LABORATORY/NET HOUSE STUDIES

A. Identification and grouping of *Fusarium udum* isolated from samples collected in surveys

We collected wilted plant specimens from 56 locations in Uttar Pradesh during the extensive roving surveys. Isolations were made from these specimens on potato-dextrose-agar medium. All cultures were identified as *F. udum* based on their 'hook shaped' macroconidia. All the pure cultures were sub-cultured at one time on potato-dextrose-agar medium and incubated at 28^{o} to 30^{o} C for 25 days. These cultures were then classified into different cultural groups [following the criteria described in Pulse Pathology (Pigeonpea) Annual Reports 1975-76 and 1976-77]. The groups thus obtained from Uttar Pradesh collections have been presented in Table 30. Groups 'B' and 'A' were most frequently encountered than others.

Table 30. Grouping of *Fusarium udum* isolated from the samples collected in Uttar Pradesh during 1978-79 survey trip

Group	Culture numbers[a/]	% frequency
A	UP-6, -7, -8, -10, -16, -22, -30 -33, -34, -38, -43, -45, -55, -56, -88, -91	28.5
B	UP-5, -12, -17, -19, -24, -26,-27, -28, -32, -57, -63, -64, -67, -71, -72, -86, -89, -99, and -105	33.9
C	UP-11 and -77	3.6
E	UP-20	1.8
G	UP-59 and -76	3.6
H	UP-65	1.8
J	UP-1, -13, -49, -73, -75, -78, -85, and 100	14.3
K	UP-29, -36, -54, -66, -69, -70	10.7
L	UP-90	1.8

a/ UP - Uttar Pradesh

B Pot screening technique

The need for a 'pot technique' was appreciated to enable handling large number of germplasm accessions round the year and for use in inheritance studies We plan to use the technique to supplement field screening Efforts were therefore made to develop such a technique for wilt resistance screening

1 Development of sick pots

The following steps were found suitable for a 'pot screening technique':

(a) Alfisol (non-autoclaved) is filled in large (35 cm) earthen pots.

(b) *Fusarium udum* is multiplied on sand:pigeonpea flour (9:1) medium (SPM) for 15 days

(c) Fungus on SPM (200 g) and autoclaved pigeonpea stem bits (200 g) are mixed with top 15 cm of soil in pots.

(d) A susceptible cultivar (ICP-6997) is raised (about 50 seeds) in each pot. All plants wilting withing 60 days are chopped and incorporated in the same pot.

(e) Step 'C' is repeated once

(f) Step 'D' is repeated twice

By these steps we get over 90 percent wilt in most of the pots. This way we have developed 1000 such pots

2 Germplasm screening

Seven hundred and twenty germplasm accessions were screened in sick pots About 30 seeds of each accession were planted in each pot. To monitor the sickness in each pot, about 10 seeds of wilt susceptible line ICP-6997 were planted in a row in the center of each pot The wilt incidence in susceptible check and also in the germplasm accession was recorded after 60 days The results are presented in APPENDIX XXII The wilt incidence in the susceptible check line ICP-6997 varied from 50 to 100%. In the germplasm accessions the wilt incidence ranged from 0 to 100% Only three germplasm accessions, ICP-974 (9 9%), ICP-976 (0 0%) and ICP-995 (0 0%) showed low wilt while the susceptible check ICP-6997 in the same pots showed 75.0% to 100 0% wilt

C. Adoption of 'Sand culture' technique

During 1975-76, we developed a 'water culture' technique (see Pulse Pathology (Pigeonpea) Annual Report, 1976-77) for use in laboratory screenings. However, this technique did not work satisfactorily. Therefore, attempts were made to evolve an efficient technique for use in green-house screening. The 'sand culture' technique was adapted by which we get above 95.0% wilt on wilt susceptible line, ICP-6997, within a month's period. Alfisol and Vertisol, instead of sand, gave 93.3% and 80.0% wilt, respectively (Table 31).

The steps involved in the 'sand culture' technique are given below:

1. *Fusarium udum* isolate 'A' is used.

2. Inoculum is multiplied in flasks containing potato-dextrose broth for 10 days in a shaker.

3. Inoculum from 4 flasks is filtered through Whatman No.42 filter paper and washed with sterilized distilled water twice.

4. The content (mycellium + conidia) from a filter paper is collected with 100 ml of sterilized distilled water and blended intermittently with Waring blendor for 1-2 minutes.

5. Roots of seven to 10-day old seedlings, raised in autoclaved riverbed sand in polythene bags, are dipped in the inoculum for 10 minutes and transplanted into a pot containing autoclaved sand.

6. Final observation is taken one month after inoculation.

Table 31. Influence of soil type on the incidence of *Fusarium* wilt[a/]

Soil type	No.of plants tested		%wilt		%wilt
	Test-1	Test-2	Test-1	Test-2	(avg. of 2 tests)
Vertisol	15	15	93.3	66.7	80.0
Alfisol	15	15	93.3	93.3	93.3
Sand	15	15	100.0	93.3	96.7

a/ Seedlings grown in autoclaved sand were inoculated by dipping roots in inoculum and then transplanted in autoclaved soil/sand.

PROJECT: PP-PATH 2(78) : STUDIES ON STERILITY MOSAIC OF PIGEONPEA

I. SUMMARY

1. Reports of severe occurrence of sterility mosaic from several pigeonpea producing areas were received.

2. Transmission through dodder and graft could not be relied because of the problem of contamination with the mite vector.

3. Hopes of transmission of the causal agent through sap inoculation have brightened. Addition of Polyclar AT at the time of extraction seems to help.

4. The efficiency of transmission of the causal agent of sterility mosaic increased with the increase in the number of mites. With 20 mites, 60% transmission was obtained. The mites were able to acquire the causal agent within 5 minutes.

5. The non-viruliferous mite colony isolated was found to transmit sterility mosaic indicating it is same as *Aceria cajani*.

6. Several collections of *Atylosia scarabaeoides* were found to be susceptible to sterility mosaic and also supported mite multiplication.

7. Considerable progress was made in isolation and characterisation of the causal agent of sterility mosaic.

8. In two months period, the sterility mosaic was found to spread up to a distance of 35 m during June to August months from the source of inoculum.

9. Inoculations in seedling and mid-vegetative stages resulted in 100% infection in susceptible BDN-1; in tolerant ICP-2376 it was 93.8 and 94.62%, respectively. In mild mosaic NPWR-15 the infection was very low even in seedling inoculation.

10. In BDN-1, inoculation in seedling stage resulted in 58.81% decrease in yield. Inoculation in mid-vegetative stage and later did not cause any decrease in yield; rather it increased slightly. In the tolerant ICP-2376, inoculation at all stages resulted in significant increase in yield. It was as high as 88.02% when inoculated in seedling stage. The results in mild mosaic NPWR-15 were not reliable as the percent infection was low.

11. The number of secondary and tertiary branches increased in inoculated plants.

12. No major morphological and anatomical differences between resistant and susceptible lines were observed. However, the tannin layer in the resistant line appears to be comparatively thicker than in the susceptible line. It appears that the changes brought out in the host as a result of sterility mosaic infection are playing major role in the multiplication of mites.

13. A large amount of breeding material and germplasm was screened in 6.0 ha plot under 'infector row' system.

14. In 4 generations of rigorous screening and selection, 29 out of 30 single plant progenies of 4 germplasm lines selected in 1975-76 showed uniform resistance.

15. A total of 2092 single plant progenies of resistant plants selected from germplasm during 1976-77 and 1977-78 were screened and 931 of them were found to show uniform resistance.

16. Several F_1 and F_2 materials involving resistant and susceptible parents were screened in order to help the breeders in understanding the nature of resistance.

17. A total of 781 F_3 progenies from 11 crosses were screened; 4 progenies were selected for yield trial and single plant selections were made from 52 promising progenies.

18. Out of a total of 346 F_4 progenies screened, two progenies were selected for yield trial and single plant selections were made from 39 promising progenies.

19. Out of 841 F_5 progenies screened, five were selected for yield trial and single plant selections were made from 66 promising progenies.

20. Out of 172 advanced germplasm and breeding materials screened, two germplasm lines were selected for yield trial and single plant selections were made from two more.

21. Out of 174 advanced triple cross progenies screened, four were selected for yield trial and single plant selections were made from 37 promising progenies.

22. Out of 227, F_3, F_4, and F_5 triple cross progenies screened, for the first time, 4 progenies showing low disease incidence were selected for yield trial and single plant selections were made from 13 progenies.

23. A total of 442 F_4 progenies from generation tests were screened for the first time and single plant selections were made from 17 promising progenies

24. A total of 331 F_4 triple cross progeny bulks were screened for the first time and single plant selections were made from 10 promising progenies.

25. All the six male steriles tested were found highly susceptible.

26. Of the 58 ACT materials tested only 1234 and NPWR-15 showed low infection. Hy-2 showed uniform ringspot symptom.

27. None of the six materials sent by Dr. B. Baldev of IARI, New Delhi was found promising.

28. All the 12 resistant lines included in the Sterility Mosaic National Uniform Trial developed severe infection at Dholi, Bihar.

29. Of the 13 Phytophthora blight promising lines tested ICP-6974-PQ and ICP-2376 showed promise against sterility mosaic.

30. Of the 39 lines in the Wilt National Uniform Trial, five lines were found resistant to sterility mosaic also.

II. INTRODUCTION

ICRISAT surveys and reports from other places revealed that sterility mosaic has become a serious problem in several pigeonpea producing areas. It has resulted in more requests for seed of resistant materials from ICRISAT. Starting of large scale screening and resistance breeding program at ICRISAT proved to be a right decision. The work started giving good materials when they are most needed. A wide variety of resistant materials is available.

The major activity during the year has been the large scale screening of germplasm and breeding materials and identification of the causal agent involved in sterility mosaic. Work on estimation of yield losses and multilocation testing of the resistant materials was continued.

III. ETIOLOGY AND EPIDEMIOLOGY

A. Transmission

Efforts to transmit the causal agent of sterility mosaic through means other than eriophyid mite continued. Anatomical studies conducted by Mr. S.S. Bissen of ICRISAT revealed presence of a layer of tannin on the leaf surface in pigeonpea. Since tannins are known to be the strong inhibitors of plant viruses, it was thought that the failure of mechanical transmission may be due to interference by tannins. Emphasis was placed on use of tannin binders in the extraction media.

1. Graft

In the earlier years transmission through wedge grafting failed probably because of the failure of graft itself. This year approach grafting was tried. The diseased plants before grafting were thoroughly sprayed with Karathane to eliminate the mites. After 30 days, 1 out of 10 plants grafted, showed symptoms.

The leaves from infected plants when observed showed no mites. The plants were kept for further observation. When observed three months later 2 more plants showed symptoms. But the leaves of all the three plants also showed mite colonisation leading to the suspicion that the mite contamination has occurred. Hence, the results can not be considered reliable.

2. Dodder

The usual procedure of colonising dodder on the diseased plants first and then connecting it with the healthy plants resulted in development of infection in 3 out of 10 plants colonised within 40 days. Even though the diseased plants were thoroughly drenched with Karathane before infestation, mites re-appeared on them, again leading to the suspicion of contamination. To avoid this problem, dodder from diseased plants were treated with 2% parafin oil with little liquid soap for 5 minutes. The dodder then was washed thoroughly in water with liquid soap to remove the excess parafin oil. It was colonised on susceptible pigeonpea to see whether if any causal agent present in the dodder get transmitted to them. The plants were kept under observation for 3 months. No symptoms could be seen even though the dodder colonised on them extensively.

3. Mechanical

Efforts to transmit the disease through sap inoculation were continued. Leaves from diseased plants and mites from the infected ones were used as inoculum source. Emphasis was placed on the use of tannin binders in the extraction medium.

(a) From host tissue

Young leaves from diseased plants with clear symptoms were ground in 0.1M KPO_4 buffer pH 7.0 with 0.02M, 2-mercaptoethanol and Polyclar AT using pestle and mortar in cold. The concentration of Polyclar AT used was 50% of the weight of leaf tissue. Inoculations were made by rubbing the juice on the carborundum dusted primary leaves and then the leaves were washed with tap water. Faint circular chlorotic lesions of about 2-3 mm in diameter appeared on the inoculated primary leaves within 7 days after inoculation. The trifoliate leaves also showed symptoms of stunting, malformation and faint mottle. The plants are being observed further and this needs to be confirmed.

(b) From mite vector

Several individual mites were picked from the infected leaves and placed in a drop of cold 0.1MKPO_4 buffer pH 7.0. They were ground thoroughly and the extract with Celite was used for inoculation. None of the inoculated plants developed infection.

B. Virus-vector relationship

The influence of acquisition access period and number of mites per plant on the transmission of the causal agent of sterility mosaic was studied.

1. Influence of number of mites

Mites from sterility mosaic infected BDN-1 plants were used. The test variety was also BDN-1 (19-day old seedlings). The number of mites per plant tried were 1, 5, 10 and 20. A batch of plants without inoculation were kept as control. The results are presented in Table 32.

Even with one mite per plant 40% transmission was obtained. With 5, 10 and 20 mites per plant the transmission was 60%. It shows that a higher number per plant is needed for obtaining 100% transmission.

Table 32. Influence on number of mites on the transmission of the causal agent of sterility mosaic

No. of mites per plant	No. of plants inoculated	No. of plants infected	Percent infection
1	5	2	40.00
5	5	3	60.00
10	5	3	60.00
20	5	3	60.00
Control (no mites)	5	0	0.00

2. Influence of acquisition access period

The minimum acquisition access period needed by the eriophyid mite to acquire the causal agent of sterility mosaic was studied using the healthy mite colony. Detatched young leaves from infected plant, thoroughly sprayed 15 days earlier with Karathane to completely eliminate the mites, were used for mite feeding. The leaves before use were examined under stereo binocular microscope to make sure that there were no mites. One cm^2 discs floated in water were used for feeding. The acquisition access periods tried were; 5 min., 30 min., 1 hr., 2 hr., 4 hr., and 6 hr. Test seedlings used were of BDN-1 (11-day old). The number mites used per seedling was 10. The results are presented in Table 33.

The results were erratic but it is interesting to note that transmission could be obtained with 5 min. acquisition access period. Lack of transmission with longer acquisition access periods could be due to residual Karathane left on the diseased leaf used for acquisition access. At the time of transfer it was observed that the mites became inactive in case of longer acquisition access periods.

Table 33. Influence of acquisition access period on transmission of pigeonpea sterility mosaic by *Aceria cajani*.

Acquisition access period	No. of seedlings inoculated	No. of seedlings infected	Percent infection
5 min.	10	4	40.00
30 min.	10	0	0.00
1 hr.	10	0	0.00
2 hr.	10	1	10.00
4 hr.	10	0	0.00
6 hr.	10	0	0.00

C. Maintenance of non-viruliferous mite colony

The mite colony isolated from healthy BDN-1 plant during 1977-78 and proved to be non-viruliferous is successfully maintained. The colony is maintained by repeated transfers on to young seedlings of BDN-1 in an Incubator, with flourescent lights, maintained at 30°C.

It was found essential to prove whether these mites are vectors of the causal agent or not before they are used in further studies. For this purpose individual mites were transferred on to 1 cm^2 diseased leaf discs, free from mites, and floated in water. The mites were allowed to feed for 6 hr. and then transferred on to healthy seedlings of BDN-1 in batches of 10 per plant. Within 3 weeks 4 out of 6 inoculated seedlings developed clear symptoms of sterility mosaic. This indicates the mite in the healthy colony being maintained is the vector of sterility mosaic.

Similar results were obtained in repeated experiments.

The successful and continuous maintenance of the non-viruliferous mite colony on the susceptible variety without symptoms of sterility mosaic conclusively negates the possibility of mite toxaemia being the cause of sterility mosaic.

D. Host range

The role of *Atylosia spp.* in the epiphytology of pigeonpea sterility mosaic was further investigated. In the host range study some of the *Atylosia spp.* were inoculated last year but the results were not clear because of severe iron deficiency symptoms in the plants. This year again seven of the *Atylosia spp.* and one species of *Rhyncosia* were inoculated with sterility mosaic to see their susceptibility to the virus and also vector. The results are presented in Table 34.

The collections of *A. scarabaeoides, A. platycarpa* and *A. cajanifolia* only were found susceptible. The collections of other species screened did not show symptoms. The three susceptible species were observed for mite colonisation. *A. scarabaeoides* and *A. cajanifolia* showed the presence of mites. The mite number was comparatively more on *A. cajanifolia.*

Since among the wild species, *A. scarabaeoides* is more commonly present in pigeonpea growing areas, it is expected to play a major role in harbouring the causal agent and the mite vector during the off-season. To get more information on this, all the collections of *A. scarabaeoides* available in the Genetics Resources Unit of ICRISAT were inoculated and observed for sterility mosaic reaction and mite colonisation. The results are presented in Table 35.

Table 34. Reaction of *Atylosia spp.* and *Rhyncosia minima* to sterility mosaic

Species	Total plants	Infected plants
A. albicans (JM-2337)	9	0
A. scarabaeoides (JM-1818; IC-7467)	8	3
A. platycarpa (LJR Coll.)	9	2
A. lineata (IC-7225)	3	0
A. cajanifolia (JM-2739)	8	8
A. volubilis (JM-1984)	6	0
A. sericea (IC-7470)	6	0
R. minima	4	0

The reaction to the collections to the disease varied. Most of the collections did not develop 100% infection indicating heterogeneity in the collections. The susceptible collections were checked for mite colonisation. Most of them showed presence of mite, but the number was very low.

Some of the collections *A. scarabaeoides* planted in the Pulse Entomology area, close to the sterility mosaic affected pigeonpeas, also showed symptoms of mottling and colonisation with eriophyid mites. Back inoculations from *A. scarabaeoides* to pigeonpea are in progress.

E. Purification

The work on the isolation and characterisation of the causal agent is in progress. We have got some positive leads during the year.

F. Disease spread

The extent of spread of sterility mosaic under field conditions was studied. On June 30, 1978, one pot containing sterility mosaic infected plants with mites was kept on western end of each of the 16 rows of BDN-1 planted in east-west direction on 23rd June 1978. After 38 days, the number of plants showing infection at different distances from the pots were counted in all the 16 rows. The results are presented in Table 36. Infected plants were observed only up to a distance of 35 m. The infected plants were more towards the source of inoculum and the number gradually decreased with the increase in the distance. The frequency of rows with infected plants also decreased with increase in the distance from inoculum source.

Table 35. Reaction of different collections of *A. scarabaeoides* to sterility mosaic

S.No.	Collection No.	Total plants	Infected plants
1.	LJR Coll.	7	0
2.	EC-1212341	2	2
3.	EC-1212344	8	3
4.	JM-2958	10	2
5.	RJW Coll.	7	0
6.	JM-1965	6	2
7.	JM-1967	6	1
8.	EC-1212342	4	1
9.	Hayatnagar Coll.	10	4
10.	EC-121206	6	-
11.	ICRISAT Site coll.	10	4
12.	JM-2323	8	0

Contd.

S.No.	Collection No.	Total plants	Infected plants
13.	JM-2289	5	0
14.	EC-12107	6	1
15.	JM-1988	7	-
16.	JM-2865	6	2
17.	JM-2939	8	7
18.	JM-2881	8	7
19.	ANM-557	6	2

Table 36. Spread of sterility mosaic of pigeonpea under field conditions

Row No.	No. of infected plants at distances from infection source a/							
	5 m.	10 m.	15 m.	20 m.	25 m.	30 m.	35 m.	40 m.
1	1	3	2	2	1	2	0	0
2	4	1	0	1	1	2	0	0
3	10	4	0	1	0	0	1	0
4	1	2	3	1	0	0	1	0
5	1	3	0	0	0	0	0	0
6	4	0	0	0	0	0	0	0
7	4	3	1	2	0	1	0	0
8	4	2	0	1	1	0	0	0
9	7	2	1	1	0	0	0	0
10	2	2	0	1	0	0	0	0
11	0	0	1	0	0	0	1	0
12	2	1	1	1	0	0	0	0
13	4	2	1	1	2	0	1	0
14	1	3	0	0	0	0	1	0
15	7	5	3	0	0	0	0	0
16	3	2	1	0	0	0	0	0
Rows with infected plants	15	14	9	10	4	3	5	0
Total infected plants	55	35	14	12	5	5	5	0

a/ The number of plants given in the table represent counts in 5 meter lengths.

G. Efffect of Bavistin on symptom expression

There are recent reports indicating that drenching with Bavistin has resulted in both symptom reduction and inhibition of RNA-synthesis in some plant viruses. The effect of Bavistin on sterility mosaic was studied mainly to get some information on the nature of the causal agent. The experiment was carried out in pots. The concentration of Bavistin used was 0.5%. The dose was 500 ml. per 8" pot with 5 seedlings. It was applied at 3 stages; 5 days before inoculation, at the time of inoculation and 5 days after inoculation. Surprisingly the treated plants showed more severe symptoms than the controls. The experiment needs to be repated before drawing conclusions.

IV. ESTIMATION OF LOSSES

Studies on the estimation of losses in pigeonpea due to sterility mosaic were continued. A field trial with 3 cultivars representing one each of susceptible (BDN-1), ring spot (tolerant - ICP-2376) and mild mosaic (less susceptible - NPWR-15) types was conducted. Inoculations were carried out at 4 different growth stages (i) seedling (35 days), (ii) mid-vegetative (62 days), (iii) pre-flowering (111 days), and (iv) post-flowering (148 days).

The experiment was laid out in such a way that the blocks to be inoculated at different stages were isolated from each other by at least 50 m. These plots were separated by a mixed crop of maize and resistant pigeonpea (HY-3C). Each block consisted of 12 plots of 75 m^2 (3 cultivars x 4 replications). Randomized block design was followed in each block. Pigeonpea was planted in broad beds at 150 x 30 cm spacing. In between two rows of pigeonpea there were 2 rows maize.

The four stages selected applied only to BDN-1 and ICP-2376 and not to NPWR-15 which is a late cultivar. Separate inoculations for it were not possible because of the contamination problem. Inoculations at each stage were carried out on the top five leaves of the central branch by leaf-stapling technique. Observations on incubation period, percent infection, yield, primary, secondary and tertiary branches, pods, 100-seed weight and harvest index were taken.

A. Incubation period

For each stage of inoculation, the time taken for symptom development was recorded. The results are presented in Table 37. It varied with the stage of inoculation but there was no particular trend. It appears that the weather conditions prevailing at the time of inoculation also played a role in it. But the incubation period at all the stages of inoculation was same for all the 3 cultivars.

B. Percent infection

The percent infection based on the observations made at the maturity stage of the crop was calculated. The results are presented in Table 38. The infection in BDN-1 and ICP-2376 was very high when inoculated before mid-vegetative stage. Infection in NPWR-15 was very low. Inoculation at pre-flowering stage resulted in low infection even in BDN-1 and ICP-2376 and it was negligible after post-flowering stage. The low infection in NPWR-15 appears to be due to use of a seed lot which had a high level of resistance.

Table 37. Effect of age of pigeonpea at inoculation on incubation period of sterility mosaic

Age at inoculation	Cultivar	Incubation period in days				
		R1	R2	R3	R4	Average
Seedling (35 days age)	BDN-1	11	11	11	11	11
	ICP-2376	11	11	11	11	11
	NPWR-15	11	11	11	11	11
Mid-vegetative (62 days age)	BDN-1	19	19	19	19	19
	ICP-2376	19	19	19	19	19
	NPWR-15	19	19	19	19	19
Pre-budding (111 days age)	BDN-1	15	15	15	15	15
	ICP-2376	15	15	15	15	15
	NPWR-15	15	15	15	15	15
Post-flowering (148 days age)	BDN-1	20	20	20	20	20
	ICP-2376	20	20	20	20	20
	NPWR-15	20	20	20	20	20
Control (No inoculation)	BDN-1	0	0	0	0	0
	ICP-2376	0	0	0	0	0
	NPWR-15	0	0	0	0	0

C. Effect on yield

The effect on yield was calculated on the basis of both total plants (plot yield) and 10 infected plants. The second observation was taken with the intention of having a better comparison since there was considerable variation in the plant population in different plots.

1. Yield based on total plants

The yield data based on the total plants (infected and healthy) is presented in Table 39. Because of low percent of infection in NPWR-15 even in the early stages of inoculation, the yield data may not be reliable. But the results of ICP-2376 and BDN-1 are very surprising. There was reduction in yield (58.81%) only in case of BDN-1 when inoculated in the seedling stage. The yields increased in ICP-2376 and BDN-1 when inoculations were made in mid-vegetative, pre-flowering and post-flowering stages. The increase in BDN-1 was marginal but in ICP-2376 the increase in yield was as high as 88.02% (seedling stage inoculation). The reasons for this unexpected increase in yield might become clear when the data on the various yield components are analysed.

2. Yield based on infected plants

The yield data based on 10 infected plants is presented in Table 40. As in the previous case, the data in case of NPWR-15 is not reliable as 10 infected plants were not available. So the percent yield loss was not calculated for this variety. In this case also the trend was same as in case of total plant yields except that the increase in yield in BDN-1, when inoculated at pre-flowering and post-flowering stages, was also considerable.

D. Effect on yield components

Data on the number of primary, secondary, and tertiary branches, number pods, 100 seed weight and harvest index were collected. These data were collected from the 10 infected plants of the cultivars except NPWR-15 (Table 41).

1. Primary branches

There was not much effect of inoculation at all the stages on the number of primary branches in BDN-1 and ICP-2376. In NPWR-15 there was an increase in the inoculated compared to control.

2. Secondary branches

There was a significant increase in the number of secondary branches in the inoculated plants of all the three cultivars. The extent of increase varied with cultivar. The increase in BDN-1 was more pronounced in seedling and mid-vegetative stage inoculations.

Table 38. Effect of age of pigeonpea at inoculation on the incidence of sterility mosaic

Age at inoculation	Cultivar	Total plants				Infected plants				Percent infection				Average
		R1	R2	R3	R4	R1	R2	R3	R4	R1	R2	R3	R4	
Seedling	BDN-1	189	183	188	178	189	183	188	178	100.00	100.00	100.00	100.00	100.00
	ICP-2376	214	195	237	228	202	194	224	198	94.39	99.48	94.51	86.84	93.80
	NPWR-15	224	221	265	228	24	24	38	16	10.71	10.85	14.33	7.01	10.72
Mid-vegetative	BDN-1	247	281	245	181	247	281	245	181	100.00	100.00	100.00	100.00	100.00
	ICP-2376	204	245	217	235	200	214	203	234	98.03	87.34	93.54	99.57	94.62
	NPWR-15	242	427	275	211	38	30	25	11	15.70	7.02	9.09	5.21	9.25
Pre-budding	BDN-1	360	308	285	329	113	102	56	51	31.38	33.11	19.64	15.50	24.90
	ICP-2376	331	344	355	270	13	1	20	10	3.92	0.29	5.97	3.70	3.47
	NPWR-15	342	410	390	274	24	24	7	21	7.01	5.85	1.79	7.66	5.57
Post- flowering	BDN-1	258	305	235	319	0	1	2	4	0.00	0.32	0.85	1.25	0.60
	ICP-2376	269	249	225	270	0	0	0	0	0.00	0.00	0.00	0.00	0.00
	NPWR-15	235	288	235	233	0	1	1	0	0.00	0.34	0.42	0.00	0.19
Control (No inoculation)	BDN-1	426	325	311	380	3	3	2	2	0.70	0.92	0.64	0.52	0.69
	ICP-2376	306	460	341	310	0	0	0	0	0.00	0.00	0.00	0.00	0.00
	NPWR-15	280	277	237	301	0	0	0	1	0.00	0.00	0.00	0.33	0.08

Table 39. Effect of sterility mosaic on yield in pigeonpea when inoculated at different ages[a/]

Age at inoculation	Cultivar	Total plants				Total yield (grams)					Yield/plant (grams)					% loss/increase	
		R1	R2	R3	R4	R1	R2	R3	R4	Average	R1	R2	R3	R4	Average	Yield/ plant	Yield/ plot
Seedling	BDN-1	189	183	188	178	1876.6	1427.2	1155.6	3916.1	3093.8	9.92	7.79	6.14	22.00	11.46	- 58.81	- 78.70
	ICP-2376	214	195	237	228	8301.6	9752.6	9465.7	9613.5	9283.3	38.79	50.01	39.93	42.16	42.72	+ 88.02	+ 18.22
	NPWR-15	224	221	265	228	5415.5	5212.2	5022.5	5292.1	5235.5	24.17	23.58	18.95	23.21	22.47	- 7.53	- 21.64
Mid-vegetative	BDN-1	247	281	245	181	6451.4	6015.7	7352.5	8797.2	7154.2	26.11	21.40	30.01	48.60	31.53	+ 13.37	- 27.24
	ICP-2376	204	245	217	235	6305.4	8639.2	8070.5	5717.0	7183.0	30.90	35.26	37.19	24.32	31.91	+ 40.44	- 8.88
	NPWR-15	242	427	275	211	6137.6	8182.4	7892.3	7452.6	7416.2	25.36	19.16	28.69	35.32	27.13	+ 11.64	+ 10.99
Pre-budding	BDN-1	360	308	285	329	9555.4	10024.7	7985.2	8033.1	8899.6	26.54	32.54	28.01	24.40	27.87	+ 0.21	- 9.42
	ICP-2376	331	344	335	270	4295.0	9627.1	10006.3	8039.1	8039.1	12.97	27.98	29.86	30.84	25.41	+ 11.83	+ 2.38
	NPWR-15	342	410	390	274	5633.1	5169.6	5000.0	5670.5	5368.3	16.47	12.60	12.82	20.69	15.64	- 35.63	- 19.08
Post-flowering	BDN-1	258	305	235	319	7916.1	8332.6	7923.4	8027.6	8049.0	30.68	27.32	33.71	25.16	29.21	+ 5.03	- 18.13
	ICP-2376	269	249	225	270	7239.9	7818.1	6043.9	7301.0	7100.7	26.91	31.59	26.86	27.04	28.10	+ 23.67	- 9.56
	NPWR-15	235	288	235	233	4752.8	4900.0	5454.6	5100.0	5051.8	20.22	17.01	23.21	21.88	20.58	- 15.72	- 24.39
Control (No inoculation)	BDN-1	426	325	311	380	9483.2	9062.5	10963.5	9825.8	9833.5	22.26	27.88	35.25	25.85	27.81	-	-
	ICP-2376	305	460	341	310	8265.3	8172.9	7327.8	7642.4	7852.1	27.01	17.76	21.48	24.65	22.72	-	-
	NPWR-15	280	277	237	301	7500.0	7057.3	5050.0	7119.7	6681.7	26.78	25.47	21.30	23.65	24.30	-	-

+ = Increase in yield. - = Loss in yield. a/ yields based on total plants.

Table 40. Effect of sterility mosaic on yield in pigeonpea when infected at different ages

Age at inoculation	Cultivar	Yield/10 plants (grams)				Yield/plant (grams)				Average	Percent loss/increase
		R1	R2	R3	R4	R1	R2	R3	R4		
Seedling	BDN-1	33.71	68.00	28.00	80.50	3.37	6.80	2.80	8.05	5.25	- 77.52
	ICP-2376	301.60	452.62	265.79	413.51	30.16	45.26	26.57	41.35	35.83	+ 46.48
	NPWR-15	165.50	212.20	272.50	192.10	16.55	21.22	27.25	19.21	21.05	-
Mid-vegetative	BDN-1	201.40	115.70	452.50	147.20	20.14	11.57	45.25	14.72	22.92	- 1.79
	ICP-2376	505.40	489.20	470.50	317.00	50.54	48.92	47.05	31.70	44.55	+ 82.13
	NPWR-15	137.60	132.40	142.30	202.60	13.76	13.24	14.23	20.26	15.37	-
Pre-budding	BDN-1	555.40	424.70	385.20	283.10	35.54	42.47	38.52	28.30	36.21	+ 55.00
	ICP-2376	295.00	427.10	406.30	428.30	29.50	42.71	40.63	42.83	38.91	+ 59.07
	NPWR-15	199.40	88.90	-	97.05	19.94	8.89	-	9.70	12.84	-
Post-flowering	BDN-1	416.10	332.60	373.40	277.60	41.60	33.20	37.30	27.70	34.95	+ 49.61
	ICP-2376	339.90	368.10	343.90	301.00	33.99	36.81	34.39	30.10	33.82	+ 38.26
	NPWR-15	28.00	0.00	546.50	-	28.00	-	54.65	-	28.72	-
Control (No inoculation)	BDN-1	233.20	262.50	213.00	225.80	23.32	26.25	21.30	22.58	23.36	-
	ICP-2376	265.30	222.90	253.10	237.30	26.53	22.29	25.31	23.73	24.46	-
	NPWR-15	-	57.30	0.00	69.70	-	5.73	-	6.97	6.35	-

+ = Increase in yield; - = Loss in yield.

3. Tertiary branches

There was tremendous increase in the number of tertiary branches in BDN-1 when inoculated in seedling and mid-vegetative stages. There was no effect in pre and post-flowering stage inoculations. In ICP-2376 also there was considerable increase in seedling and mid-vegetative stage inoculations. In NPWR-15 there was no marked effect.

4. Pod number

In BDN-1 the number decreased when inoculated in seedling and mid-vegetative stages and increased in pre and post-flowering stage inoculations. In ICP-2376 inoculations in all the stages resulted in about 2-fold increase in pod number. In NPWR-15 the pod number increased.

5. 100-seed weight

Data on 100-seed weight was also recorded to see if the inoculations were causing any effect (Table 42). There was a slight increase in BDN-1 and ICP-2376 in seedling and mid-vegetative stage inoculations.

6. Harvest index

The harvest index in BDN-1 reduced drastically in seedling and mid-vegetative stage inoculations (Table 43). But it increased in pre and post-flowering stage inoculations. In ICP-2376 it increased in all the stages of inoculation. In NPWR-15, it is not reliable as the plant number considered for this observation was low.

V. NATURE OF RESISTANCE

Investigations into the morphological and anatomical differences of the resistant and susceptible lines continued. The work was carried out in close collaboration with Mr. S S. Bissen of Pulse Physiology.

A. Methodology

The fresh, healthy leaf samples of different ages of the variety BDN-1 (susceptible) and ICP-7119 (resistant) were fixed in 4% glutaraldehyde prepared in phosphate buffer of 6.8 pH for 48 hrs. The leaf samples were then washed in phosphate buffer twice by giving the changes of 15-minute intervals. The samples were then post-fixed in 1% osmium tetraoxide prepared in phosphate buffer of 6.8 pH for 20 minutes.

The samples were then thoroughly washed in phosphate buffer of 6.8 pH and dehydrated by passing through the series of 100% methylcellosolve, 100% ethanol, 100% n-propanol, and 100% n-butanol. The

Table 41. Effect of sterility mosaic on yield components in pigeonpea when infected at different ages[a/]

Age at inoculation	Cultivar	Average no.of primary branches/plant				Average	Average no.of secondary branches/plant				Average	Average no.of tertiary branches/plant				Average	Average no. of pods/plant				Average
		R1	R2	R3	R4		R1	R2	R3	R4		R1	R2	R3	R4		R1	R2	R3	R4	
Seedling	BDN-1	5.5	7.3	6.0	9.3	7.02	35.3	36.1	31.2	46.1	37.17	91.5	54.4	51.2	53.7	62.70	7.1	35.9	9.2	43.2	23.85
	ICP-2376	6.6	7.7	8.2	5.8	7.07	21.7	27.9	27.2	29.1	26.47	2.4	11.2	8.6	7.6	7.45	102.9	196.9	186.3	151.6	159.42
	NPWR-15	3.1	5.5	3.2	3.9	3.92	31.1	29.0	28.5	45.3	33.47	51.7	49.9	58.6	44.7	51.22	90.1	99.0	146.6	165.2	125.22
Mid-vegetative	BDN-1	7.6	6.0	3.5	6.4	5.87	38.4	31.2	37.1	38.3	36.25	45.5	51.2	35.5	57.3	47.37	55.5	9.2	123.8	49.8	59.57
	ICP-2376	7.4	8.2	7.6	6.2	7.35	27.4	27.2	23.5	24.4	25.62	6.0	8.6	7.0	10.0	7.90	126.7	186.3	171.2	165.7	162.47
	NPWR-15	1.3	1.9	1.8	2.5	1.87	20.2	37.7	23.4	30.6	27.07	45.4	62.5	72.6	61.5	60.50	89.3	80.3	145.9	173.8	122.32
Pre-budding	BDN-1	5.3	9.2	11.6	12.3	9.60	15.1	30.7	18.8	11.3	18.97	1.7	0.0	0.0	0.2	0.47	110.3	127.6	133.1	94.7	116.42
	ICP-2376	8.6	6.4	8.5	7.9	7.85	20.6	37.1	27.8	26.1	27.90	4.0	2.1	0.9	3.0	2.50	142.0	150.6	122.4	158.2	143.30
	NPWR-15	1.1	1.8	2.7	1.5	1.77	36.8	21.8	26.7	20.5	26.45	19.0	39.3	20.7	59.1	34.52	129.5	131.8	111.5	128.5	125.32
Post-flowering	BDN-1	6.3	5.0	4.2	6.1	5.40	24.0	21.3	24.1	13.4	20.70	0.2	1.6	0.0	0.0	0.45	116.7	118.0	105.4	76.7	104.20
	ICP-2376	5.2	5.0	4.4	5.5	5.02	24.8	27.5	27.0	22.0	25.32	0.0	0.0	0.0	0.1	0.02	113.9	128.9	186.8	106.4	134.00
	NPWR-15	1.0	-	4.0	-	3.00	30.0	-	87.0	-	58.50	26.0	-	72.0	-	49.00	77.0	-	94.0	-	85.50
Control (No inoculation)	BDN-1	6.1	7.0	5.6	5.9	6.15	16.9	15.3	15.0	12.5	14.92	0.0	0.2	0.5	1.2	0.47	54.9	74.6	55.3	69.5	63.57
	ICP-2376	6.0	5.6	7.3	7.5	6.60	21.2	16.0	21.2	17.8	19.05	0.0	0.0	0.0	1.0	0.25	90.8	75.2	89.5	81.8	84.32
	NPWR-15	-	1.0	-	1.0	1.00	-	10.0	-	20.0	10.33	-	100.0	-	15.0	57.50	-	148.0	-	4.0	76.00

a/ Results based on 10 infected plants of each cultivar

Table 42. Effect of sterility mosaic on 100 seed weight of pigeonpea when infected at different ages

Age at inoculation	Cultivar	100 seed weight (grams)				
		R1	R2	R3	R4	Average
Seedling	BDN-1	10.0	10.30	10.0	10.00	10.75
	ICP-2376	11.7	11.70	9.9	11.40	11.17
	NPWR-15	12.0	8.33	12.0	12.00	11.08
Mid-vegetative	BDN-1	13.0	12.60	8.4	10.66	11.16
	ICP-2376	13.6	11.50	12.3	13.00	12.60
	NPWR-15	12.6	-	12.2	13.00	12.60
Pre-budding	BDN-1	10.1	9.10	9.9	9.40	9.62
	ICP-2376	8.8	8.60	10.0	9.10	9.12
	NPWR-15	-	11.00	-	11.60	11.30
Post-flowering	BDN-1	10.4	8.80	10.2	10.20	9.90
	ICP-2376	-	9.10	8.6	8.70	8.80
	NPWR-15	-	10.10	12.0	-	11.00
Control (No inoculation)	BDN-1	9.5	10.60	10.5	8.60	9.80
	ICP-2376	8.9	8.70	8.3	8.30	8.55
	NPWR-15	-	-	-	-	-

samples were then kept 12 hr in each solvent by giving two changes of 6 hr interval. The complete process of dehydration was carried out in cold at 10°C. The samples were then transferred into 1:1 mixture of n-Butanol and Glycol methacrylate monomer mixture (GMA). The percentage of GMA was increased gradually. Finally the sample were transferred into a pure GMA; for a week, changing the GMA at 24 hrs intervals.

After the infiltration, the samples were transferred into the gelatin capsules filled with the GMA mixture and were kept in the incubator at 60°C for the polymerisation. The temperature of the incubator was raised slowly from 50°C to 60°C, to avoid the formation of air bubble.

Table 43. Effect of sterility mosaic on harvest index of pigeonpea when infected at different ages (on the basis of 10 plants)

Age at inoculation	Cultivar	Total weight of 10 plants (gms)				Weight of 10 plant grain				Harvest index				
		R1	R2	R3	R4	R1	R2	R3	R4	R1	R2	R3	R4	Average
Seedling	BDN-1	1408.0	837.0	1020.0	1168.00	23.60	27.20	5.60	16.10	0.01	0.03	0.00	0.01	0.01
	ICP-2376	1176.8	1799.4	1375.0	1094.50	301.60	452.62	265.79	415.51	0.25	0.25	0.19	0.37	0.26
	NPWR-15	2552.0	2337.0	1033.4	1493.73	165.50	212.20	272.53	192.18	0.06	0.09	0.26	0.12	0.13
Mid-vegetative	BDN-1	1466.0	970.0	2090.0	1373.00	141.00	46.00	49.73	103.10	0.09	0.04	0.01	0.07	0.05
	ICP-2376	2433.0	2247.0	2561.6	2095.00	504.56	489.29	470.59	317.00	0.20	0.21	0.18	0.15	0.18
	NPWR-15	1081.0	1775.0	1514.3	1544.08	96.35	105.92	128.09	202.63	0.08	0.05	0.08	0.13	0.08
Pre-budding	BDN-1	1276.6	1731.6	1603.3	1057.30	355.49	424.79	385.23	283.15	0.27	0.24	0.24	0.26	0.25
	ICP-2376	1427.3	1878.8	1758.0	1608.30	295.15	427.16	406.39	428.32	0.20	0.22	0.23	0.26	0.22
	NPWR-15	593.74	-	-	1127.00	53.34	-	-	97.05	0.08	-	-	0.08	0.08
Post-flowering	BDN-1	1419.6	1235.4	1348.3	933.70	416.11	332.62	373.41	277.64	9.29	0.26	0.27	0.29	0.27
	ICP-2376	1320.0	1192.6	1360.2	1381.00	339.91	368.11	343.95	301.06	0.25	0.30	0.25	0.21	0.25
	NPWR-15	-	271.3	325.3	-	-	3.80	109.31	-	-	0.01	0.33	-	0.17
Control (No inoculation)	BDN-1	975.0	1416.0	1152.0	1084.00	233.26	862.53	213.04	225.81	0.23	0.18	0.18	0.20	0.19
	ICP-2376	1261.3	1332.2	1170.2	1032.50	265.30	222.90	227.80	142.40	0.21	0.16	0.19	0.13	0.17
	NPWR-15	-	320.0	-	-	-	6.97	-	-	-	0.02	-	-	0.02

The gelatin capsules containing the polymerised GMA were kept in water for 5-10 min, to dissolve the gelatin. The samples were then cut at 1.5 to 2 μ by glass knives. The individual sections were picked by a fine forcep and were arranged on a slide in a drop of water. The slides containing the sections were then kept on a hot plate at 45-50°C for spreading and drying.

The dried sections were stained with 0.05% Toluidine blue prepared in phosphate buffer of 6.8 pH for 1 min. The sections were stain differentiated by washing in water, and again dried on the hot plate. After drying, the sections were mounted in permount. Before putting the mountant it is desirable to breathe on the sections which helps in proper differentiation of the stain colour. The sections were then observed under the microscope, both in bright light and phase contrast.

B. Results and discussion

The anatomical study of the leaves of these susceptible and resistant varieties did not reveal any marked structural difference.

There was not much difference in the cuticle thickness, in the compactness of palisade tissue. There were no crystals in the epidermal cells. There were apparent differences in the density of hairs on the lower epidermis, but the scanning electron microscopic studies did not show any considerable difference in the hair density, and also in cuticle thickness, or pattern of wax on the surface of the leaf.

The only difference which can be concluded with anatomical study is the presence of continuous line of tannin on the epidermal layer of these varieties. It is more prominent in ICP-7119 than BDN-1. The quantitative estimation is not possible under the microscope. It will be worthwhile to assess the total tannin contents of the leaves of these varieties.

It appears that the changes brought out in the host as a result of sterility mosaic infection probably play a major role in the more multiplication of mites in the susceptible lines. This hypothesis is supported by the fact that even the healthy plants of highly susceptible pigeonpea do not generally support mite multiplication.

VI. INFLUENCE OF PLANTING DATE

The experiment on the effect of date of planting on the incidence of sterility mosaic under infector row system was repeated. The disease incidence and mite population in the infector rows was very low because the inoculations were done in summer months. The disease spread was also very much affected as the infector rows were planted in the direction of the wind. Because of these two drawbacks the experiment was discarded after 5 months. The results for the first five months are presented in Table 44.

The data show that both infection and mite number in the infector rows was low resulting in very low disease incidence in the test plantings. The experiment will be repeated next year.

Table 44. Sterility mosaic incidence in monthly plantings of BDN-1 under infector row system in relation to disease incidence and mite vector population in infector rows

Date of planting	Percent incidence after 4 weeks	Percent infection in infector rows	Average no. of mites/leaf
19-07-1978	0.26	47.05	0.00
18-08-1978	0.00	56.73	0.65
18-09-1978	6.74	85.58	0.40
18-10-1978	0.10	52.54	0.10
18-11-1978	0.00	24.00	0.00

VII. SCREENING FOR DISEASE RESISTANCE

A large amount of breeding materials and germplasm was screened in the field. The work was carried out in very close collaboration with the breeders. The materials found resistant to wilt and Phytophthora blight were also screened to identify lines with multiple disease resistance.

A. Screening nursery

The entire screening was done in 6.0 ha field (Vertisol) under "infector row" system. BDN-1, a highly susceptible cultivar to sterility mosaic but resistant to wilt and Phytophthora blight, was planted in paired rows on one ridge on April 10, 1978 after every 10 ridges. It was inoculated with sterility mosaic following "leaf stapling" technique when the seedlings were 10-20 days old. Because of very high temperatures prevailing at the time of inoculation (about 40^{o}C) both infection and mite population was low in the beginning of kharif season. But by July-August the infection developed to almost 100 percent. The mite population also increased resulting in high disease development in the nursery.

The test materials were planted on June 25, 1978. BDN-1 was planted as susceptible check (indicator row) after every 20 rows. The plants not showing symptoms after one month of planting were 'staple inoculated'. Final observations were taken when the crop was in flowering and podding; i.e., when the susceptible check showed near 100 percent infection. In each material the number infected plants showing severe mosaic, mild mosaic and ring spot symptoms were recorded separately. In the selected material/progeny, 2-10 resistant plants were selfed using muslin cloth bags and seed collected for further use/evaluation. In cases where selfed seed was not available, open pollinated seed was collected.

B. Screening

1. Germplasm

Additional 1083 germplasm accessions including mostly introductions and recent collections by Genetic Resources Unit were screened. For each accession 25 seeds were planted in a single 4 m row. Because of continuous water logging in the field immediately after germination the stand was adversely affected. Only in few accessions some plants survived. The results are presented in APPENDIX XXIII. Because of very low plant number the results are not reliable and the screening of these entire lines will be taken up next year.

2. Germplasm selections

The process of selecting the resistant plants from the segregating germplasm lines, selfing them and re-testing their progenies continued. The objective is to obtain as many pure resistant lines as possible. To avoid increase in the material to be handled, from each germplasm two progenies showing uniform resistance or those looking agronomically good were selected. From each progeny two resistant and agronomically good looking plants were selfed The seed of the plants was harvested individually. The seed of the plants from uniformly resistant progeny is stored in the cold room and will be made available for breeders/pathologists. The seed of the plants from still segregating progenies will be sown progeny-wise and re-selection carried out.

(a) 1975-76 selections

The results of screening of 30 single plant progenies of 4 germplasm lines selected during 1975-76 are presented in Table 45. Except one progeny, all others showed uniform resistance indicating that after 4 years, the lines are now fixed for resistance.

Table 45. Results of screening of pigeonpea germplasm selections made in 1975-76 to sterility mosaic during 1978-79

Particular	Total plants	Infected plants	Percent infection
ICP-85-1-1-S1@	23	0	0.00
-S2@	16	0	0.00
-S3@	10	0	0.00
-S4@	8	0	0.00
-S5@	34	0	0.00

Contd.

Particular	Total plants	Infected plants	Percent infection
ICP-85-1-2-S1⊗	7	0	0.00
-S2⊗	16	0	0.00
-3-S1⊗	7	0	0.00
-S2⊗	26	0	0.00
-S3⊗	14	0	0.00
-S4⊗	15	0	0.00
-S5⊗	11	0	0.00
BDN-1	17	17	100.00
ICP-85-1-3-S6⊗	6	6	0.00
ICP-95-1-2-S1⊗	6	0	0.00
-3-S1⊗	6	0	0.00
-S2⊗	11	0	0.00
-4-S1⊗	16	0	0.00
-S2⊗	13	1	3.03
-S3⊗	8	0	0.00
BDN-1	4	4	100.00
ICP-2828-1-1-S1⊗	8	0	0.00
-S2⊗	16	0	0.00
-S3⊗	8	0	0.00
-S4⊗	7	0	0.00
ICP-7942-1-2-S1⊗	7	0	0.00
-S2⊗	3	0	0.00
-S3⊗	5	0	0.00
-S4⊗	5	0	0.00
-S5⊗	10	0	0.00
-3-S1⊗	3	0	0.00
-S2⊗	-	-	-
BDN-1	17	17	100.00

BDN-1 = Susceptible check

(b) 1976-77 selections

A total of 1138 single plant progenies generated from germplasm selections made in 1976-77 were screened. The detailed results are presented in APPENDIX XXIV. The summarised results are presented in Table 46. About 50% of the progenies did not develop any infection. Only 0.56% of the progenies developed 100% infection. Other progenies segregated with more number of resistant plants than susceptibles. The method of selection in the segregating progenies was same as described earlier. The seed of the progenies which showed 100% resistance will be stored in cold room.

Selections were made by the breeders based on both disease reaction and other agronomic characters. Five lines; ICP-7197-43-S3Ø, ICP-8120-5-S1Ø, ICP-8120-5-S6Ø, ICP-4152-1-S2Ø and ICP-4395-3-S1Ø were selected for yield trial. Single plant selections were made from 34 lines for further evaluation.

Table 46. Summary of results of screening of pigeonpea germplasm selections made in 1976-77 to sterility mosaic during 1978-79.

Percent infection range	Total no. of entries	Percent of entries
0.00	541	47.53
0.01-10.00	155	14.47
10.01-20.00	121	11.29
20.01-30.00	49	4.57
30.01-40.00	41	3.82
40.01-50.00	33	3.08
50.01-60.00	21	1.96
60.01-70.00	22	2.05
70.01-80.00	10	0.93
80.01-90.00	5	0.46
90.01-99.99	0	0.00
100.00	6	0.56
No germination	67	5.88

(c) 1977-78 selections

A total of 954 progenies of single plants selected during 1977-78 were tested. The detailed results of screening are presented in APPENDIX XXV. The summarised results are presented in Table 47. No infection was observed on 40.88 percent of the progenies. The seed of the progenies with no infection was collected for storing in cold room. From the segregating prognies as usual two resistant plants from each of the two progenies per accession were selected for further evaluation.

Breeders made selections based on disease reaction and agronomic characters. Seven lines were selected for yield trial. These were ICP-1644-S5@, ICP-2812-S4@, ICP-7281-S2@, ICP-8022-S4@, ICP-8072-S6@, ICP-8105-S3@ and ICP-8221-S1@. Single plant selections were made from 52 lines for further evaluation.

Table 47. Results of screening of pigeonpea germplasm selections made in 1977-78 against sterility mosaic during 1978-79.

Percent infection range	Total no. of entries	Percent of entries
0.00	390	40.88
0.01-10.00	102	10.69
10.01-20.00	88	9.22
20.01-30.00	73	7.65
30.01-40.00	79	8.28
40.01-50.00	65	6.81
50.01-60.00	39	4.08
60.01-70.00	33	3.45
70.01-80.00	23	2.41
80.01-90.00	16	1.67
90.01-99.99	6	0.62
100.00	15	1.57
No germination	61	6.39

(d) Promising selections

A total of 469 single plant progenies of germplasm selections found promising for yield were also evaluated both for disease reaction and yield. The detailed results are presented in APPENDIX XXVI. The summarised results are presented in Table 48. Most of the progenies remained highly resistant to disease. Based on yield, the breeders made re-selection and two lines have been selected for yield trial (ICP-504-1-4-S33@ and ICP-2795-1-1-S1@). Single plant selections were made from 42 progenies for further evaluation.

Table 48. Summary of results of screening of promising selections of germplasm to sterility mosaic during 1978-79.

Percent infection range	No. of entries	Percent entries
0.00	368	78.46
0.01-10.00	53	11.30
10.01-20.00	17	3.62

Contd.

Percent infection	No. of entries	Percent entries
20.01-30.00	8	1.70
30.01-40.00	5	1.06
40.01-50.00	2	0.42
50.01-60.00	0	0.00
60.01-70.00	1	0.21
70.01-80.00	0	0.00
80.01-90.00	1	0.21
90.01-99.99	0	0.00
100.00	0	0.00
No germination	7	1.49

3. Breeding materials

Screening of the various breeding materials was carried out in close collaboration with the breeders. The materials screened involved F_1s and F_2s for understanding the nature of resistance and progenies in F_3 to F_7 generation. Most of the materials in F_3 to F_7 generations were planted in two 4-meter rows.

(a) F_1 and F_2 materials

The F_1 and F_2 material generated by the breeders was screened. In each material the number of plants showing no infection, ring spot, and severe mosaic symptoms were recorded separately. The infection was recorded twice;once in mid-vegetative stage and again in flowering and podding stage. The detailed results are presented in APPENDIX XXVII. The information is with the breeders and is being analysed.

(b) F_3 progenies

A total of 760 F_3 progenies selected from 11 F_2 bulks in the las year's screening nursery were screened (Table 49). The detailed results of screening are presented in APPENDIX XXVIII. The summarised results are presented in Table 50. The progenies showed very high degree of resistance. Few progenies showed a low level of susceptible plants. The results indicate the high level of disease pressure that they have been subjected to last year and efficiency of the selection. One screening has practically eliminated the susceptible plants. Rigorous selections were made by the breeders. Only four progenies were selected based on yield data for preliminary yield trial. These were:75248-F_2B-S470, 75268- F_2 B-S370, 75275-F_2B-S40 and 75275-F_2B-S60. Single plant selections were made from 52 promising progenies.

Table 49. Parentage of F_3 progenies screened against sterility mosaic during 1978-79

S No	Cross No.	Pedigree	No. of SPP screened
1	75209	7035 x 6891	56
2	75248	6997 x 6891	83
3.	75443	3783 x 6891	92
4	75229	7035 x 6929	71
5.	75268	6997 x 6929	61
6	75463	3783 x 6929	50
7.	75236	7035 x 7183	96
8	75275	6997 x 7183	67
9	75470	3783 x 7183	61
10.	75276	6997 x 7186	43
11.	75471	3783 x 7186	60

SPP · Single plant progenies.

Table 50. Summary of results of screening of F_3 progenies of pigeonpea to sterility mosaic during 1978-79

Percent infection range	No. of entries	Percent entries
0.00	692	89.98
0.01-10.00	25	3.28
10.01-20.00	16	2.10
20.01-30.00	6	0.78
30.01-40.00	9	1.18
40.01-50.00	3	0.39
50.01-60.00	2	0.26
60.01-70.00	0	0.00
70.01-80.00	2	0.26
80.01-90.00	0	0.00
90.01-99.99	1	0.13
100.00	1	0.13
No germination	2	0.26

(c) F_4 progenies

A total of 345 F_4 progenies selected from 2 F_3 bulks in the last year's screening nursery were screened. The parentage of the crosses involved is presented in Table 51. The detailed results of screening are presented in APPENDIX XXIX. The summary of results is presented in Table 52. The trend of the results was the same as in F_3 progenies. Rigorous selections were made by the breeders. Only two progenies; 74348-F_3B-S128@ and 74321-F_3B-S14@ were selected for yield trial. Single plant selections were made from 39 progenies.

Table 51. Parentage of F_4 progenies screened against sterility mosaic during 1978-79

S.No.	Cross No.	Pedigree	No. of SPP screened
1.	74348	7035 x 7086	170
2.	74321	7035 x 102	176

SPP - Single plant progenies

Table 52. Summary of results of screening of F_4 progenies of pigeonpea to sterility mosaic during 1978-79

Percent infection range	No. of entries	Percent entries
0.00	249	71.96
0.01-10.00	21	6.10
10.01-20.00	25	7.22
20.01-30.00	18	5.23
30.01-40.00	9	2.60
40.01-50.00	10	2.90
50.01-60.00	1	0.29
60.01-70.00	3	0.87
70.01-80.00	1	0.29
80.01-90.00	0	0.00
90.01-99.99	1	0.29
100.00	4	1.16
No germination	2	0.57

(d) F_5 progenies

A total of 859 F_5 progenies selected from 3 F_4 bulks in the last year's screening nursery were screened. The parentage of the crosses involved is given in Table 53. The detailed results of screening are presented in APPENDIX XXX. The summary of results is presented in

Table 54. More than 50% progenies showed uniform resistance. Five progenies; 73076-F_4B-S33Ø, 73076-F_4 B-S131Ø, 73076-F_4 B-S118Ø, 73070-F_4 B-S393Ø, and 74240-F_4 B-S77Ø were selected for yield trial. Single plant selections were made from another 66 promising progenies.

Table 53. Parentage of F_5 progenies screened against sterility mosaic during 1978-79

S.No.	Cross No.	Pedigree	No. of SPP screened
1.	74240	6997 x ST-1	192
2.	73076	JA-275 xGW-3-191-1	264
3.	73070	JA-275 x 1	393

Table 54. Summary of results of screening of F_5 progenies of pigeonpea to sterility mosaic during 1978-79

Percent infection range	No. of entries	Percent entries
0.00	452	53.74
0.01-10.00	62	7.37
10.01-20.00	90	10.70
20.01-30.00	37	4.39
30.01-40.00	37	4.39
40.01-50.00	21	2.49
50.01-60.00	15	1.78
60.01-70.00	8	0.95
70.01-80.00	10	1.18
80.01-90.00	1	0.11
90.01-99.99	1	0.11
100.00	11	1.30
No germination •	96	11.41

(e) Promising breeding and germplasm materials

Preliminary selections for yield were made last year by breeders in advanced breeding and germplasm materials. Single plant progenies of these were planted in four 4-meter row plots for further evaluation and selection. The detailed results of screening are presented in APPENDIX XXXI. The summary is presented in Table 55. Most of the progenies remained highly resistant to the disease. Further selections were made by the breeders and the selected lines are proposed for preliminary yield trials. The germplasm lines selected for yield trial are; ICP-7249-1-1-S3⊗ and ICP-7249-1-1-S8⊗. Single plant selections were made from ICP-6491-1-S9⊗ and 74041-11-4-S2B⊗ for further evaluation.

Table 55. Summary of results of screening of promising advanced germplasm and breeding materials to sterility mosaic during 1978-79

Percent infection range	Total No. of entries	Percent entries
0.00	104	60.46
0.01-10.00	29	17.15
10.01 20.00	18	10.65
20.01-30.00	6	3.55
30.01-40.00	5	2.95
40.01-50.00	2	1.18
50.01-60.00	2	1.18
60.01-70.00	0	0.00
70.01-80.00	2	1.18
80.01-90.00	1	0.59
90.01-99.99	0	0.00
100.00	0	0.00
No germination	3	1.74

(f) Advanced triple cross progenies

A total of 175 F_4 and F_5 triple cross progenies selected from last year's screening nursery were further evaluated. The detailed results of screening are presented in APPENDIX XXXII. The summary is presented in Table 56. Most of the progenies have attained uniform resistance. Four progenies; 74038-26-1-7-S5⊗, 74041-1-4-S8⊗, 74041-10-3S4⊗, and 74054-1-3-S5⊗ were selected for yield trial. Single plant selections were made from 37 promising progenies for further evaluation.

Table 56. Summary of results of screening of advanced F_4 and F_5 triple cross progenies of pigeonpea to sterility mosaic during 1978-79

Percent infection range	Total No. of entries	Percent entries
0.00	103	59.19
0.01-10.00	34	19.54
10.01-20.00	24	13.79
20.01-30.00	6	3.44
30.01-40.00	2	1.14

Contd.

Percent infection range	Total No. of entries	Percent entries
40.01-50.00	1	0.57
50.01-60.00	0	0.00
60.01-70.00	2	1.14
70.01-80.00	1	0.57
80.01-90.00	0	0.00
90.01-99.99	0	0.00
100.00	0	0.00
No germination	1	0.57

(g) Preliminary triple cross progenies

An additional 226 triple cross progenies in F_3, F_4 and F_5 generation were screened. The detailed results are presented in APPENDIX XXXIII. The summary is presented in Table 57. Most of the progenies segregated. Few progenies showed uniform resistance. Four progenies; 74038-74-4-5, 74038-74-6-4, 75093-14-2 and 75093-17-1 showing low disease incidence were selected for yield trial. Single plant selections were made from 13 promising progenies for further evaluation.

Table 57. Results of screening F_3, F_4 and F_5 triple cross progenies of pigeonpea to sterility mosaic during 1978-79

Percent infection range	Total No. of entries	Percent entries
0.00	20	8.81
0.01-10.00	44	19.38
10.01-20.00	42	18.50
20.01-30.00	34	14.97
30.01-40.00	19	8.37
40.01-50.00	11	4.84
50.01-60.00	14	6.16
60.01-70.00	15	6.60
70.01-80.00	8	3.52
80.01-90.00	10	4.40
90.01-99.99	3	1.32
100.00	3	1.32
No germination	2	0.88

(h) F_4 progenies from generation tests

A total of 432 F_4 progenies from generation tests were also screened. The detailed results are presented in APPENDIX XXXIV. The summary is presented in Table 58. Most of the progenies were found segregating. Single plant selections were made from 17 promising progenies for further evaluation (3-5 plants/progeny).

Table 58. Summary of results of screening of F_4 progenies of pigeonpea from generation tests to sterility mosaic during 1978-79

Percent infection range	Total No. of entries	Percent entries
0.00	4	0.90
0.01-10.00	19	4.29
10.01-20.00	28	6.33
20.01-30.00	29	6.56
30.01-40.00	40	9.04
40.01-50.00	38	8.59
50.01-60.00	37	8.37
60.01-70.00	63	14.25
70.01-80.00	56	12.66
80.01-90.00	64	14.47
90.01-99.99	43	9.72
100.00	21	4.75

(i) Triple cross progeny bulks

A total of 331 F_4 triple cross progeny bulks were screened. These were planted in late August. The detailed results are presented in APPENDIX XXXV. The summary is presented in Table 59. Single plant selections from 10 promising progenies were made for further evaluation.

Table 59. Summary of results of screening of F_4 triple cross progeny bulks of pigeonpea to sterility mosaic during 1978-79

Percent infection range	Total No. of entries	Percent entries
0.00	2	0.60
0.01-10.00	4	1.20
10.01-20.00	4	1.20
20.01-30.00	4	1.20
30.01-40.00	5	1.51
40.01-50.00	8	2.41

Contd.

Percent infection range	Total No. of entries	Percent entries
50.01-60.00	15	4.53
60.01-70.00	27	8.15
70.01-80.00	38	11.80
80.01-90.00	73	22.05
90.01-99.99	117	35.34
100.00	34	10.27

4. Male steriles

Six of the male steriles supplied by the breeders were screened. The results are presented in Table 60. All the male steriles were found 100% susceptible indicating the need to incorporate resistance in them.

Table 60. Results of screening of pigeonpea male steriles to sterility mosaic during 1978-79

Particulars	Total plants	Infected plants	Percent infected	Symptom severity
MS-3A	19	19	100.00	Severe mosaic
MS-3B	32	32	100.00	"
MS-3C	14	14	100.00	"
MS-3D	14	14	100.00	"
MS-3E	23	23	100.00	"
MS-4A	11	11	100.00	"

5. ACT (All India trials) materials

As in the earlier years, the entries in the All India Arhar Coordinated Trials were tested for their reaction against the sterility mosaic. For each line information on percent infection, symptom severity and yield/plant was recorded.

(a) EACT

The results are presented in Table 61. All were found highly susceptible and showed severe mosaic symptoms. The yield from them was negligible.

Table 61. Reaction of EACT materials to sterility mosaic at ICRISAT Hyderabad 1978-79

Entry	Total plants	Infected plants	Percent infection	Symptom severity	Total yield (grams)	Yield/ plant (grams)
ICPL-1	18	18	100.00	Severe mosaic	17.39	0.96
ICPL-2	45	45	100.00	"	0.00	0.00
ICPL-3	45	45	100.00	"	10.00	0.23
ICPL-4	4	8	100.00	"	0.00	0.00
H-73-20	58	58	100.00	"	6.79	0.11
H-76-19	70	70	100.00	"	2.50	0.03
H-76-20	27	27	100.00	"	3.10	0.11
H-76-35	20	20	100.00	"	0.00	0.00
H-76-53	36	36	100.00	"	3.00	0.08
HPA-2	10	10	100.00	"	0.00	0.00
Prabhat	7	7	100.00	"	1.12	0.16
UPAS-120	18	18	100.00	"	0.00	0.00

(b) ACT-1

The results are presented in Table 62. Except ICPL-5 and ICPL-6 all others showed 100% infection. All showed severe mosaic infection and the yield was negligible.

Table 62. Reaction of ACT-1 materials to sterility mosaic at ICRISAT Hyderabad 1978-79

Entry	Total plants	Infected. plants	Percent infection	Symptom severity	Total yield (grams)	Yield/ plant (grams)
ICPL-5	42	40	95.23	Severe mosaic	55.76	1.32
ICPL-6	13	11	84.61		25.12	1.93
ICPL-7	38	38	100.00	"	46.07	1.21
ICPL-8	47	47	100.00	"	78.70	1.67
HY-5	5	5	100.00	"	0.00	0.00

Contd.

Entry	Total plants	Infected plants	Percent infection	Symptom severity	Total yield (grams)	Yield/ plant (grams)
4-84	39	39	100.00	Severe mosaic	1 80	0 04
DL-74-1	46	46	100 00	"	5.78	0 12
TT-4	26	26	100 00	"	10.65	0.40
TT-5	31	31	100.00	"	7 81	0.25
TT-6	38	38	100.00	"	9.08	0.23
Sehore-68	12	12	100.00	"	0.00	0.00
Sehore-197	27	27	100.00	"	9 50	0 35
JA-9-19	30	30	100.00	"	6.11	0 20
T-21	16	16	100.00	"	0.00	0 00

(c) ACT-2

The results are presented in Table 63. All the lines showed near 100% infection. Except HY-2, which showed ring spot reaction all others showed severe mosaic symptoms

Table 63. Reaction of ACT-2 materials to sterility mosaic at ICRISAT Hyderabad 1978-79

Entry	Total plants	Infected plants	Percent infection	Symptom severity	Total yield (grams)	Yield/ plant (grams)
HY-2	38	38	100.00	Ring spot	338 88	8 91
HY-4	60	59	98.33	Severe mosaic	220.13	3 66
BDN-1	71	71	100.00	"	0.00	0 00
BDN-2	72	72	100 00	"	5 12	0.07
No 148	76	76	100 00	"	0 00	0 00
JA-3	61	61	100.00	"	0.00	0.00
JA-5	48	48	100 00	"	20 46	0.42
JA-15	59	59	100 00	"	9 27	0 15
GS-1	35	35	100.00	"	4.86	0 13
AS-71-37	62	62	100.00	"	32 91	0 53
Sehore-75-4	61	61	100.00	"	39.18	0.64
C-11	55	55	100.00	"	18 26	0 33
ICPL-42	44	44	100.00	"	50.50	1.14
ICPL-43	59	59	100.00	"	0 00	0 00
ICP-1	72	72	100.00	"	0 00	0 00
JA-8	46	46	100.00	"	8 18	0.17

(d) ACT-3

The results are presented in Table 64. Compared to lines in other trials, the lines in ACT-3 showed less susceptibility. Two lines; 1234 and NPWR-15 particularly showed low susceptibility. The infected plants in these two lines and in AS-29 showed mild mosaic symptoms. All others showed severe mosaic symptoms.

Table 64. Reaction of ACT-3 materials to sterility mosaic at ICRISAT Hyderabad 1978-79

Entry	Total plants	Infected plants	Percent infection	Symptom severity	Total yield (grams)	Yield/ plant (grams)
AS-29	41	40	97.56	Mild mosaic	2.98	0.07
PS-41	31	31	100.00	"	3.41	0.11
PS-43	13	13	100.00	Severe mosaic	27.18	2.09
PS-65	52	39	75.00	"	63.10	1.21
PS-66	47	39	82.97	"	69.45	1.47
Gwalior-3	34	32	94.11	"	67.81	1.99
1234	42	12	28.57	Mild mosaic	80.66	1.92
1258	9	7	77.77	"	0.00	0.00
T-7	36	31	86.11	"	83.50	2.31
K-16	114	96	84.21	Severe mosaic	326.87	2.86
K-23	74	73	98.64	"	147.39	1.99
K-28	42	42	100.00	"	28.65	0.68
NPWR-15	68	29	42.64	Mild mosaic	97.73	1.43
Composite-4	20	20	100.00	Severe mosaic	10.30	0.51
Group-8	69	64	92.75	"	80.08	1.16
Group-10	45	42	93.33	"	8.15	0.18

6. Materials from other research centres

Six lines sent by Dr. B. Baldev of IARI, New Delhi were tested for their reaction against sterility mosaic. The screening was done in the pots and inoculations were made by leaf stapling procedure. The results are presented in Table 65.

Table 65. Reaction of pigeonpea lines sent by Dr. B. Baldev of IARI, New Delhi to sterility mosaic at ICRISAT

Cultivar	Total plants	Infected plants	Percent infection
BS-1 (1977)	42	42	100.00
BS-5 "	73	71	97.26
BS-12 "	78	78	100.00
BS-15 "	85	83	97.64
BS-18 "	47	45	95.74
BS-20 "	64	64	100.00

All the lines showed very high infection and severe mosaic symptoms indicating none of them is promising. Most of them also showed wilt in the pot; BS-1 particularly showed more wilt.

7. Sterility Mosaic National Uniform Nursery

A set of twelve germplasm lines that were found resistant/tolerant for at least two seasons at ICRISAT were sent for testing at 6 different locations in India through sterility mosaic National Uniform Nursery. The nursery was jointly operated by All India Coordinated Pulse Improvement Project and ICRISAT. The locations to which the nurseries were sent are Pantnagar, Faizabad, Varanasi, Dholi (Bihar), Dharwar (Karnataka) and Hyderabad. Results were obtained only from Dholi and Faizabad (Table 66).

Table 66. Reaction of some pigeonpea sterility mosaic at different location in India (Kharif 1978)

ICP No.	Percent infection		
	Hyderabad	Faizabad	Dholi
8847	0.00	0.00	100.00
8848	0.00	0 00	90.88
8849	94.50	0.00	100.00
8850	6.55	0.00	100.00
8851	0.00	0 00	55.90
8852	0.00	0.00	100.00
8853	0.00	0.00	100.00
8854	1.23	0.00	100.00
8855	0.00	0.00	100.00
8856	12.32	0.00	100 00
8857	15.25	0.00	100 00
8501	1.00	0.00	100 00
BDN-1 (Check)	100.00	29 21	100 00

At ICRISAT, Hyderabad ICP-8849, ICP-8854 and ICP-8857 showed ring spot symptoms and ICP-8850 showed mild mosaic symptoms.

From the data it is clear that the lines resistant at Hyderabad and Faizabad are highly susceptible at Dholi. The problem is under investigation.

8. Phytophthora blight promising lines

Some of the germplasm lines found promising against the Phytophthora blight were screened against sterility mosaic to find out lines with promise for both the diseases. The lines were screened in the field by 'staple inoculation'. The results are presented in Table 67. Except ICP-6974-P5Ø, all developed very high infection. Except ICP-2376-P5Ø all showed severe mosaic symptoms. Since ICP-2376 does not suffer any yield loss, it can also be considered highly promising for both the diseases.

9. Wilt National Uniform Nursery

The lines in Wilt National Uniform Nursery were also tested for their reaction against the sterility mosaic. Screening was done in the field and inoculations were done through "leaf stapling". The results are presented in Table 68. Seven lines; ICP-8861, ICP-8862, ICP-8867, ICP-8869, Purple-1 (134 A), Purple-2 and K-28 did not show any infection. Purple-2 and K-28 need to be checked again because of the low plant number. AWR-74/15 (KPR) and 70 (KPR) showed low infection. Among others; ICP-8858 and ICP-8860 showed ring spot symptoms.

Table 67. Reaction of Phytophthora blight promising progenies of pigeonpea to sterility mosaic during 1978-79

S.No.	Particular	Total plants	Infected plants	Percent infection	Symptom severity
1.	ICP-28-P1Ø	10	10	100.00	SM
2.	-113-P5Ø	10	9	90.00	"
3.	-231-P5Ø	11	11	100.00	"
4.	-339-P5Ø	20	20	100.00	"
5.	-758-P5Ø	5	5	100.00	"
6.	-1209-P1Ø	14	14	100.00	"
7.	-1522-P2Ø	10	10	100.00	"
8.	-1529-P5Ø	10	10	100.00	"
9.	-1643-P2Ø	6	6	100.00	"
10.	-2376-P5Ø	5	4	90.00	RS
11.	-3753-P5Ø	15	14	93.33	SM
12.	-6974-P5Ø	6	0	0.00	-
13.	-7065-P5Ø	4	4	100.00	SM

RS = Ring spot; SM = Severe mosaic; - = No symptom.

Table 68. Reactions of pigeonpea lines in wilt national uniform nursery to sterility mosaic during 1978-79

S.No.	Particular	Total plants	Infected plants	Percent infection	Symptom severity
1.	ICP-8858	29	17	58.62	RS
2.	-8859	42	33	78.57	MM
3.	-8860	28	19	67.85	RS
4.	-8861	40	0	0.00	-
5.	-8862	33	0	0.00	-
6.	-8863	40	40	100.00	SM
7	-8864	34	29	85.29	"
8.	-8865	34	34	100.00	"
9.	-8866	28	28	100.00	"
10.	-8867	38	0	0.00	-
11.	-8868	33	33	100.00	MM
12.	-8869	38	0	0.00	-
13.	Purple-1 (134A)	18	0	0.00	-
14.	Purple-2	5	0	0.00	-
15.	TS-136-1 (Kar)	9	9	100.00	SM
16.	Bori-1	15	12	80.00	"
17.	MAU-W-1	8	8	100.00	"
18.	MAU-E-175	11	10	90.90	"
19.	KWR-1-1 (KPR)	13	12	92.30	"
20	AS-29 (KPR)	9	8	88.88	"
21	DL-74-1	2	1	50.00	"
22.	15-3-3 (JBR)	5	5	100.00	"
23.	15-3-3 (AAU)	11	11	100.00	"
24	AWR-74/15 (KPR)	18	2	11.11	MM
25.	NP(WR)-15	4	2	50.00	SM
26.	C-11	5	4	90.00	"
27	BDN-1 (AAU)	11	11	100.00	"
28	BDN-1 (KPR)	10	10	100.00	"
29	BDN-1 (JBR)	8	6	75.00	"
30	BDN-2 (MAUR)	11	11	100.00	"
31	70 (KPR)	18	1	5.55	"
32.	K-28	4	0	0.00	-
33	K-73	11	10	90.90	SM
34	Beitul-1	4	4	100.00	"
35	Shivpuri-2	5	4	90.00	"
36	Indore-7	8	8	100.00	"
37	Bandapalera (KPR)	13	10	76.92	"
38.	JA-3A	10	10	100.00	"
39	Ben-1	10	10	100.00	"

RS = Ring spot; MM = Mild mosaic; SM = Severe mosaic; - = No symptoms

PROJECT: PP-PATH-3(78): STUDIES ON PHYTOPHTHORA BLIGHT OF PIGEONPEA

I. SUMMARY

1. A large number of breeding material was screened by following a field screening technique. This included 1109 F_3 progenies, 91 F_4 progenies, 20 progenies of lines from West Indies, 6 male sterile lines and 26 crossing block entries. Promising materials are being advanced for further studies.

2. Over 160 blight promising progenies were screened in the field. Out of these 105 progenies showed low blight incidence (0 to 20%). Twenty-eight lines promising in 'pot culture' were tested in field and good correlation between the two tests was obtained.

3. Over 100 wilt promising progenies were tested for blight reaction. Fifty-eight progenies which showed low blight incidence were advanced for further testing.

4. One hundred and six sterility mosaic resistant germplasm selections and 174 sterility mosaic resistant progenies (F_4 to F_7) were screened for blight reaction in the field. Of them one hundred and twenty progenies showed low blight incidence.

5. Fifty-eight lines received from the All India Coordinated Pulse Improvement Project were tested for blight reaction. Out of these, nine lines showed low blight incidence.

6. Five *Phytophthora* isolates were collected from Hyderabad, Delhi, Kanpur, Kalyanpur and Deeg. A detailed study on these isolates revealed that the causal organism of pigeonpea blight is *Phytophthora drechsleri f. sp. cajani.*

7. More than 1400 germplasm accessions were screened for resistance to blight by 'pot culture' technique. Fifty-two accessions showed less than 10% blight.

8. One hundred and seven sterility mosaic resistant germplasm selections were screened for blight in 'pot culture' and 14 selections were found resistant in 'pot culture', of which 9 showed resistant reaction to blight in the field test also.

9. Thirty blight promising lines (against the Hyderabad isolate, P2) were tested against P3 (Delhi) and P4 (Kanpur) isolates. All the 30 lines showed susceptible reaction to both P3 and P4 isolates, indicating possibility of the existence of different races.

10. A seed treatment trial was conducted in 'pot culture' with Ridomil (25 WP) for controlling pigeonpea blight. Good control of blight was achieved with 0.5% Ridomil seed treatment.

11. *Phytophthora* isolate (P2) could be stored for a long period (105-133 days) at 15°C than at above or below this temperature.

II. INTRODUCTION

During 1978-79 season we carried out work mainly on screening of germplasm and breeding materials. The causal agent of blight was identified as *Phytophthora drechsleri f. sp. cajani*.

III. FIELD STUDIES

Field screening for Phytophthora blight resistance was carried out in RA-9. In this area about 300 cu ft of blight affected pigeonpea stubble were incorporated during the land preparation. Further steps in providing inoculum were described under method - II in the Pulse Pathology (Pigeonpea) Annual Report 1977-78. Isolate P2 was used instead of P1. The blight susceptible check cv. HY-3C was planted after every ten test rows. The average blight incidence on cv. HY-3C was 87.8%. All test and check materials were planted on the slope of the ridge. This type of planting enabled the plant collar region to be in touch with irrigation/rain water after inoculations.

The materials screened in the blight nursery were: F_3 and F_4 progenies, ACT (All India trials) materials, blight promising progenies, wilt promising progenies, sterility mosaic resistant progenies, male sterile lines, crossing block entires, and parental lines.

In all the screening tests, the criterion used for selecting less susceptible lines/progenies was based on low blight incidence (20.0% or less). In advancing the selected lines/progenies, agronomically desirable characters were also considered by the breeders and such plants were selfed and seeds were collected for further studies.

A. Breeders' material

1. F_3 and F_4 progenies

One thousand and fifty-eight progenies in F_3 and ninety-one progenies in F_4 generations from crosses involving a resistant parent (ICP-7065) were screened in the blight nursery. These progenies were advanced from 1977-78 blight nursery for further testing. In addition to these, 51 progenies from one F_3 selected from the wilt nursery were also screened in the blight nursery. The summarised results are given in Table 69 (see APPENDIX XXXVI). The blight incidence in these progenies varied from

0 to 100%. Of the 1058 progenies screened in 11 F_3s, 438 showed low blight. In F_4 only 10 progenies recorded low blight incidence out of 91 screened. Only four progenies showed low blight out of 51 progenies selected from wilt nursery. From all these, the breeders along with us selected blight resistant and agronomically desired plants for further test/ study.

2. Progenies from West Indies lines

Twenty progenies of lines from West Indies (vegetable type) which showed some tolerance to blight in 1977-78 field screening were again tested in 1978-79 blight nursery. The detailed results are given in APPENDIX XXXVII. The blight incidence in these progenies varied from 31 to 100%. Hence none of them was selected for further tests.

3. Male sterile lines

Six male sterile lines obtained from the Pigeonpea Breeding subprogram were tested for the blight reaction in RA-9 nursery and in 'pot culture'. The results are presented in Table 70. In field screening, all the six lines showed low blight. Whereas in 'pot culture' they were susceptible to blight. In both the tests, MS-4A showed the least blight incidence.

Table 69. Summary of the screening of F_3 and F_4 progenies for Phytophthora blight resistance [a/]

Cross No.	Pedigree	Generation	No. of SPP tested	No. of SPP showed 'low' blight	No. of plants selected
Progenies from Blight nursery					
74143	Prabhat x ICP-7065	F_3	100	34	3
74171	UPAS-120 x ICP-7065	F_3	87	41	0
74185	ICP-6 x ICP-7065	F_3	99	33	6
74248	ICP-1 x ICP-7065	F_3	100	43	132
74262	No.148 x ICP-7065	F_3	91	48	25
74290	C-11 x ICP-7065	F_3	100	53	222
74318	ICP-102 x ICP-7065	F_3	99	35	67
74332	ICP-6997 x ICP-7065	F_3	93	24	64
74332	ICP-6997 x ICP-7065	F_4	91	10	81
74360	ICP-7035 x ICP-7065	F_3	97	38	81
74363	HY-3C x ICP-7065	F_3	97	24	123
74369	NP-69 x ICP-7065	F_3	95	65	116
Progenies from Wilt nursery					
74332	ICP-6997 x ICP-7065	F_3	51	4	53

a/ The percent blight in susceptible check, HY-3C, was 85.7%.

Table 70. Incidence of Phytophthora blight in male sterile lines in field nursery and in 'pot culture'

Pedigree	Field nursery		Pot culture	
	No. of plants	% Blight	No. of plants	% Blight
MS-3A	46	10.9	18	61.1
-3B	50	12.0	20	90.0
-3C	13	7.7	17	100.0
-3D	23	16.3	21	95.2
-3E	40	12.5	20	95.0
-4A	24	4.2	16	56.3

4. Crossing block entries

Twenty-six crossing block entries were screened in RA-9 blight nursery and the results are given in Table 71. All ICP-231, ICP-6974 (Pant A-3), ICP-28 (Pusa Ageti), ICP-7182 (BDN-1) and ICP-7065 progenies showed uniformly low blight incidence, whereas all ICP-6915, ICP-7120 (No. 148), ICP-6971, ICP-6997, ICPL-1 and ICPL-2 progenies recorded more than 20% blight incidence. Only ICP- 4779 (NP-69) showed intermediate type of reaction. All resistant, intermediate and susceptible lines are being used in the breeding program to understand the pattern of inheritance and to evolve cultivars with blight resistance character.

Table 71. Incidence of Phytophthora blight in crossing block entries in the field nursery

Pedigree	No. of plants	% Blight
ICP-6915-P1⊗	19	73.7
-231 (2366-1-P5⊗)	22	0.0
-6974-28⊗-1⊗-B⊗-B⊗-B⊗	44	9.1
-36⊗-1⊗-B⊗-B⊗-B⊗	35	8.6
-99⊗-2⊗-B⊗-4B⊗-B⊗	34	8.8
28-24-⊗-1⊗-3⊗-2⊗-B⊗-B⊗-B⊗	47	8.5
-3⊗-B⊗-B⊗-B⊗	33	12.1
-8⊗-B⊗-B⊗-B⊗	22	0.0
-7120-(No.148-35⊗-1⊗-4⊗-B⊗)	45	95.6
-51⊗-4⊗-1⊗-B⊗	41	56.1
-84⊗-4⊗-B⊗	46	28.3

Contd.

Pedigree	No. of plants	% Blight
ICP-7182-89⊗-2⊗-B⊗	49	6.1
-9C⊗-2⊗-B⊗	47	8.5
-91⊗-1⊗-B⊗	45	0.0
-7065-22⊗-3⊗-5⊗-B⊗	34	8.8
-29⊗-3⊗-1⊗-B⊗	38	10.5
-33⊗-6⊗-1⊗-B⊗	51	0.0
-4779-(NP-69-73⊗-1⊗-3⊗-B⊗)	49	10.2
-73⊗-85⊗-6⊗-2⊗-B⊗	33	6.2
-92⊗-4⊗-3⊗-B⊗	28	32.1
-6971-32⊗-6⊗-7⊗-5⊗-B⊗	25	36.0
ICPL-1 (6971-32⊗-83⊗-3⊗-5⊗-3⊗-B⊗-B⊗-B⊗)	37	37.8
ICPL-2 (ICP-6971-83⊗-5⊗-9⊗-B⊗-B⊗-B⊗)	23	60.9
ICP-6997-5⊗-3⊗-3⊗-B⊗	44	100.0
-87⊗-2⊗-1⊗-B⊗	32	100.0
-108⊗-2⊗-1⊗-B⊗	38	97.4

B. Progenies from blight promising germplasm and parental lines

Thirty-three progenies from germplasm and parental lines selected in 1977-78 blight nursery were again tested for the blight reaction in 1978-79 season in RA-9 field. The list of progenies showed low blight and number of plants selected are given in Table 72 (see APPENDIX XXXVIII). Of the 33 progenies screened, 13 showed low blight. From these, individual resistant and agronomically desirable plants were selfed and seeds were collected for further tests.

Table 72. List of progenies of germplasm and parental lines which showed 'low' blight in field nursery a/

Sl. No.	Pedigree	No. of plants	% Blight	No. of plants selected
1.	ICP-3-P1⊗	23	4.3	10
2.	-31-P1⊗	22	18.2	0
3.	-102-P1⊗	24	0.0	0
4.	-301-P1⊗	26	0.0	10
5.	-309-P1⊗	14	0.0	10
6.	-1204-P1⊗	24	8.3	10
7.	-3868-P1⊗	27	3.7	4
8.	-4234-P1⊗	25	16.0	0
9.	-6526-P2⊗	19	15.8	0
10.	-6929-P1⊗	23	4.4	8
11.	-7175-P1⊗	31	0.0	7
12.	-7199-P1⊗	26	3.9	9
13.	-K-28-P1⊗	30	3.3	6

a/ The susceptible check, Hy-3C, showed 87.8% blight incidence.

C. Progenies from blight promising lines

One hundred and twenty-nine progenies from Phytophthora blight promising lines were screened in the blight nursery, RA-9. The progenies were selected either from field or from pot screenings conducted during 1977-78. The list of progenies which showed low blight and the number of plants selected are presented in the Table 73 (see APPENDIX XXXIX). Of the 129 progenies tested, 92 seemed promising against the blight.

Twenty-eight lines were selected as blight resistant through 'pot culture' screening and they were planted in the field. Confirmation of their resistance to Phytophthora blight was obtained in the field.

Table 73 List of progenies of promising lines which showed low blight in RA-9 nursery [a/]

Pedigree	No. of plants	% Blight	No. of plants selected
ICP-24-P1⊗	22	0.0	8
-P2⊗	23	4.4	10
-2376-P1⊗	16	6.3	9
-P2⊗	14	7.1	11
-3753-P1⊗	21	4.8	19
-P2⊗	21	0.0	15
-P3⊗	25	8.0	8
-P4⊗	18	0.0	5
Pant-A3-P1⊗	24	8.3	10
-P2⊗	13	7.3	8
-P3⊗	27	3.7	6
-P4⊗	25	4.0	4
ICP-7065-P1⊗	15	0.0	10
-P2⊗	24	8.3	12
-P3⊗	17	5.9	9
-P4⊗	21	9.5	11
BDN-1 -P1⊗	31	3.2	16
-P2⊗	26	7.7	20
-P3⊗	18	0.0	16
-P4⊗	19	5.3	6
Pusa Ageti-P1⊗	23	8.7	15
-P2⊗	27	7.4	18
-P3⊗	20	0.0	17
-P4⊗	24	8.3	0
-P6⊗	24	8.3	21
-P7⊗	22	4.6	20
-P8⊗	26	0.0	22
-P9⊗	24	0.0	12

Contd.

Pedigree	No. of plants	% Blight	No. of plants selected
ICP-113-P1⊗	19	0.0	19
-P2⊗	27	0.0	15
-P3⊗	17	0.0	12
-P4⊗	14	7.1	10
-231-P1⊗	26	3.8	9
-P2⊗	22	0.0	9
-P3⊗	23	8.7	8
-P4⊗	23	4.3	7
-339-P1⊗	28	3.6	13
-P2⊗	22	9.1	5
-P3⊗	29	3.5	0
-P4⊗	25	4.0	9
-758-P1⊗	15	0.0	1
-P2⊗	16	0.0	5
-P3⊗	21	9.5	4
-P4⊗	20	0.0	10
-1175-P2⊗	22	9.1	4
-P3⊗	24	8.3	10
-P4⊗	26	7.7	12
-1208-P1⊗	13	0.0	8
-P2⊗	8	0.0	6
-P3⊗	22	9.1	15
-1209-P3⊗	25	8.0	5
-P4⊗	21	0.0	13
-1510-P2⊗	17	0.0	7
-1522-P5⊗	19	0.0	16
-1529-P2⊗	17	5.9	3
-P3⊗	30	6.7	6
-P5⊗	20	5.0	9
-1531-P1⊗	20	0.0	11
-P3⊗	26	7.7	10
-P4⊗	22	9.1	17
-1535-P3⊗	28	3.6	5
-P4⊗	30	10.0	10
-P5⊗	21	9.5	8
-1587-P2⊗	25	0.0	16
-P3⊗	22	0.0	7
-1622-P2⊗	27	7.4	16
-P3⊗	22	9.1	9
-P4⊗	16	12.5	7
-1643-P1⊗	6	0.0	6
-P2⊗	13	7.7	10
-P3⊗	21	4.8	7
-1686-P3⊗	31	6.5	6

Contd.

Pedigree	No. of plants	% Blight	No. of plants selected
ICP-1708-P2⊗	26	3.9	7
-P4⊗	13	0.0	6
-214	33	9.1	15
-580	43	4.7	12
-752	40	5.0	12
-913	41	9.8	11
-934	46	8.7	12
-1088	47	8.5	12
-1090	51	9.8	12
-1120	46	0.0	10
-1123	51	9.8	12
-1149	49	8.2	11
-1150	50	10.0	12
-1151	48	8.3	10
-1258	50	10.0	12
-1321	47	8.5	12
-1529	48	6.3	10
-1535	46	8.7	12
-1570	42	7.1	12
-1586	49	8.2	7

a/ The susceptible check, Hy-3C, showed 87.8% blight incidence.

D. Wilt promising progenies

One hundred and four progenies selected from the wilt sick plot for wilt resistance were tested in the blight nursery to identify the progenies having wilt and blight resistance. The list of wilt promising progenies which showed low blight are given in Table 74 (see APPENDIX XL). Fifty-eight progenies showed low blight out of 104 tested. From these, resistant and agronomically desired plants were selfed and seeds were collected for further studies.

Table 74. List of wilt promising progenies which showed low Phytophthora blight in field nursery a/

Pedigree	No. of plants	% Blight	No. of plants selected
T-17-W1 ⊗-W2⊗-W1⊗	25	8.0	5
-W3⊗-W1⊗	24	0.0	4
-W5⊗-W1⊗	25	0.0	4
-W9⊗-W1⊗	24	4.2	3
-W12⊗-W1⊗	24	8.3	4

Contd

Pedigree	No. of plants	% Blight	No. of plants selected
T-17-W1⊗-W13⊗-W1⊗	23	4.3	5
-W17⊗-W1⊗	25	4.0	1
-W2⊗-W1⊗-W3⊗	27	0.0	4
-W7⊗-W1⊗	20	20.0	4
-W9⊗-W2⊗	27	0.0	3
-W3⊗-W3⊗-W2⊗	29	6.9	3
-W4⊗-W2⊗	22	9.1	5
-W6⊗-W1⊗	17	0.0	5
-W7⊗-W1⊗	27	3.7	5
-W9⊗-W1⊗	25	8.0	5
NP(WR)-15-W1⊗-W7⊗-W1⊗	23	8.7	0
-W12⊗-W2⊗	30	10.0	5
-W17⊗-W3⊗	25	8.0	6
-W20⊗-W7⊗	22	18.2	0
-W21⊗-W1⊗	27	18.5	5
-W2⊗-W3⊗-W1⊗	23	13.0	5
-W5⊗-W1⊗	23	4.5	3
-W12⊗-W1⊗	24	4.2	0
-W3⊗-W8⊗-W1⊗	25	16.0	5
-W9⊗-W1⊗	19	15.8	0
-W14⊗-W1⊗	27	3.7	5
-W15⊗-W1⊗	27	11.1	4
-W17⊗-W7⊗	24	4.2	0
-W18⊗-W1⊗	22	9.1	0
E x E-RbB-W5⊗-W1⊗-WA⊗	19	0.0	10
73039-RbB-W4⊗-W1⊗-W19⊗	28	10.7	10
-W2⊗-W3⊗	25	4.0	9
ICP-6970-S1⊗-W3⊗	24	8.3	4
-W4⊗	26	0.0	5
-S2⊗-W3⊗	26	3.9	4
-S7⊗-W1⊗	24	8.3	5
-S10⊗-W1⊗	26	3.8	4
No.1258-W2⊗-W5⊗-W3⊗	26	0.0	5
15-3-3-W2⊗-W13⊗-W4⊗	25	0.0	2
20-1-W1⊗-W4⊗	24	0.0	6
KWR-1-W1⊗-W5⊗-W3⊗	26	0.0	5
-W2⊗-W2⊗-W1⊗	26	7.7	0
-W7⊗-W8⊗	26	19.2	0
-W13⊗-W2⊗	25	20.0	5
-W3⊗-W1⊗-W3⊗	22	13.6	0
-W11⊗-W4⊗	27	14.8	5
ICP-1-6-W2⊗-W1⊗	16	12.5	0
-W3⊗-W1⊗	24	8.3	4
-W5⊗-W2⊗	26	3.9	5

Contd.

Pedigree	No. of plants	% Blight	No. of plants selected
ICP-4745-4-W5⊗-W3⊗	7	0.0	0
-W4⊗	22	0.0	4
-6426-4-W4⊗-W8⊗	23	0.0	5
-2812-W4⊗	26	7.7	5
-4698-W1⊗	26	7.7	4
-5174-W1⊗	30	0.0	5
-6927-W1⊗	22	9.1	0
-7424-W3⊗	23	8.7	3
-7549-W3⊗	25	20.0	5

a/ The susceptible check, Hy-3C, showed 87.8% blight incidence.

E. Sterility mosaic resistant progenies

1. Germplasm selections

One hundred and six germplasm selections resistant to sterility mosaic were screened for Phytophthora blight resistance in RA-9. The list of twenty-seven germplasm selections which showed low blight are presented in Table 75 (see APPENDIX XLI). From these, the resistant and agronomically desired plants were selfed and seeds were collected for further studies. These 106 selections were also screened in 'pot culture' and the results are presented elsewhere in this report.

2. Breeding material

One hundred and seventy-four sterility mosaic resistant progenies from F_4, F_5, F_6 and F_7 generations and one parent were screened in the blight nursery. The summary of the results and number of plants selected are given in Table 76 (see APPENDIX XLII). Ninety-three progenies showed low blight. The resistant and agronomically desired plants were selected and selfed seeds were collected for further testing.

Table 75. <u>List of sterility mosaic resistant progenies (germplasm selections) which showed low Phytophthora blight in field nursery</u>

Pedigree	No. of plants	% Blight	No. of plants selected
ICP-4866-1-S3⊗	26	0.0	5
-4885-1-S1⊗	39	7.7	5
-5097-1-S3⊗	31	9.7	2
-5436-1-S2⊗	22	9.1	4
-5651-1-S3⊗	27	7.4	5
-5656-1-S2⊗	31	3.2	5
-7185-1-S1⊗	37	5.4	5
-7194-1-S4⊗	28	0.0	5
-7246-2-S9⊗	10	10.0	0
-7414-1-S3⊗	26	0.0	5
-7445-4-S5⊗	28	7.1	0
-7864-1-S5⊗	23	9.6	0
-8075-2-S2⊗	24	8.3	2
-8094-1-S2⊗	34	8.8	2
-8101-2-S2⊗	21	9.5	5
-8102-5-S1⊗	24	0.0	4
-8103-3-S2⊗	30	0.0	4
-8106-2-S5⊗	32	0.0	5
-8111-2-S1⊗	30	0.0	4
-8121-2-S1⊗	30	3.3	2
-8130-5-S4⊗	20	5.0	2
-8132-2-S3⊗	25	4.0	4
-8137-4-S4⊗	28	7.1	2
-8144-3-S3⊗	29	3.5	4
-8147-1-S2⊗	34	0.0	2
-8151-7-S4⊗	24	0.0	2
-8161-1-S1⊗	42	4.8	2

Table 76. List of sterility mosaic resistant progenies (breeding material) which showed low Phytophthora blight in field nursery

Cross No.	Pedigree	Generation	No. of SPP tested	No. of SPP showed 20% and less blight	No. of plants selected
74360	ICP-7035 x ICP-7065	F_4	66	29	255
74363	HY-3C x ICP-7065	F_4	21	9	56
73047	Pusa Ageti x JA275	F_5	36	29	74
73047	"	F_6	15	15	92
73047	"	F_7	26	11	89
74236	ICP-6997 x No.148	F_5	10	0	0

F. Sterility mosaic resistant and wilt promising progenies

Eighteeen progenies which were identified as promising against sterility mosaic and wilt were screened for blight resistance in RA-9. The results are presented in Table 77. All 18 progenies from JA-275, ICP-7035 and HY-3C were highly susceptible to the blight. The blight incidence ranged from 81.8% to 100.0%.

Table 77. Results of the screening of sterility mosaic resistant and wilt promising progenies for Phytophthora blight in RA-9 nursery

Pedigree	No. of plants	% Blight
JA-275-S10-S270-W20	16	100.0
-S390-W20	13	92.3
-S420-W10	15	100.0
-S450-W30	22	81.8
-S460-W50	26	96.2
-S30-S120-W40	12	100.0
-S150-W30	11	100.0
-S160-W30	21	100.0
ICP-7035-S450-S60-W20	11	100.0
-S200-W20	23	100.0
-S230-W20	13	100.0

Contd.

Pedigree	No. of plants	% Blight
HY-3C-S5@-S1@-W2@	11	100.0
-S3@-W3@	25	100.0
-S4@-W1@	25	100.0
-S8@-W5@	21	100.0
-S9@-W2@	25	100.0
-S25@-S1@-W3@	25	100.0
-S11@-W2@	27	96.3

G. Materials collected from Madhya Pradesh

Seven pigeonpea materials collected from Madhya Pradesh during disease survey and two lines given by Pigeonpea Breeding unit were screened for blight resistance in RA-9 nursery and the results are presented in Table 78. The blight incidence in these materials varied from 5 to 80%. Of the 9 materials screened, seven showed low blight incidence.

Table 78. Results of screening materials collected in surveys in Madhya Pradesh and elsewhere to Phytophthora blight in the field nursery

Pedigree		No. of plants	% Blight
Hoshangabad	(M.P.)	25	4.0
Bairagarh	"	26	11.5
Bhaura	"	22	63.6
Akalpur	"	26	15.4
Pathrata	"	23	4.3
Ratanpur	"	14	21.4
Tanda	"	10	80.0
ICP-7086	(Breeding unit)	20	5.0
T-15-15	(Aujarat) M.S.	42	14.3

H. ACT (All India trials) materials

Fifty-eight lines received from the All India Coordinated Pulse Improvement Project (includes EACT, ACT-1, ACT-2 and ACT-3) were screened for blight reaction in the RA-9 nursery. The detailed results are presented in APPENDIX XLIII. In EACT out of 12 lines screened, only one H-73-20 showed least blight (8.9%) and recorded more grain yield/plant (22.1 g). All the ACT-1 lines were susceptible to blight. The grain yield/plant was more (24.88) in ICPL-6. Out of 16 ACT-2 lines screened, four lines showed low blight incidence. The least blight incidence (5.1%) coupled with higher grain yield/plant (41.0 g) was recorded in cv. BDN-1. Four ACT-3 lines out of 16 screened also showed less than 20% blight. AS-29 recorded higher grain yield/plant (61.3 g) and least blight incidence (11.3%).

I. Blight in the sterility mosaic screening nursery

During 1978-79 sterility mosaic screening work was carried out in M-4 (Vertisol) field. The rainfall was unusually more during the early crop growth period and there was water stagnation in that field for a longer period. These conditions being favourable for Phytophthora blight, caused considerable damage to many of test lines.

Observations were made on 2244 germplasm single plant progenies and 145 sterility mosaic promising lines for the blight incidence. The reaction of lines/progenies was classified into 10 groups based on percent blight. The results are given in Table 79.

Table 79. Grouping of sterility mosaic promising germplasm lines/progenies based on Phytophthora blight incidence in M-4 field

Blight	No. of SPP of germplasm	No. of promising lines from germplasm
0-10%	1443	104
11-20%	280	29
21-30%	185	9
31-40%	137	2
41-50%	85	1
51-60%	31	0
61-70%	25	0
71-80%	23	0
81-90%	5	0
91-100%	30	0

IV. LABORATORY/NET HOUSE STUDIES

A. Isolation and identification of Phytophthora from material collected in survey trips and at ICRISAT Center

During 1978 rainy season, a survey trip was made to Delhi and Kanpur in northern India to observe the Phytophthora blight incidence and to obtain fungus isolates. The details of the survey trip are presented elsewhere in this report. All the isolations were made either on PVP[a/] or PDA media and identified as species of *Phytophthora* based on mycelial swellings and sporangial characters. All isolates were maintained either on PDA or V-8 juice agar.

As regards the identification of the species of *Phytophthora* causing blight on pigeonpea, Pal et al (Indian Phytopath. 23:583-587, 1970) had identified the organism as *P. drechsleri* Tucker var. *Cajani* Pal, Grewal, and Sarbhoy. In a later investigation of the same disease in India by Amin et al (Mycologia 70: 171-176, 1978) the causal organism was reported as *P. cajani*, Amin, Baldev and Williams, a new species. When ICRISAT *Phytophthora* isolates were sent to Dr. D.J. Stamps, *Phytophthora* taxonomist at the Commonwealth Mycological Institute, Kew, England, she opined that the pigeonpea *Phytophthora sp.* was close to *P. vignae*. To proceed with the present breeding program for resistance in pigeonpea cultivars at ICRISAT it was important to resolve the confusion as to the identity of the causal organism of the blight of pigeonpea. We therefore undertook a detailed study of several isolates of *Phytophthora* from blighted pigeonpea collected from several locations in India to critically determine whether one or more species of the genus involved.

Most of this work was done by Dr. J. Kannaiyan during a brief visit with Dr. Donald C. Erwin and his colleagues at the Department of Plant Pathology, University of California, Riverside, California, where more than 1000 *Phytophthora* type culture collections are available for comparative studies.

The *Phytophthora* isolates used in this study were obtained from the following locations in India: P2 (ICRISAT - Hyderabad), P3 (Delhi), P4 (Kanpur), P5 (Kalyanpur), and P6 (Deeg). These cultures have been deposited in the culture collections of the Department of Plant Pathology, University of California, Riverside and of the Commonwealth Mycological Institute, Kew, England. Pal et al's type culture, *P. drechsleri* var. *cajani*, was also collected from the Indian Agricultural Research Institute, Delhi type culture collections. Various experiments were conducted with

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a/ PVP - Cornmeal (infusion from solids) - 2g; agar - 15 g; Pimaricin -10- ppm; Vancomycin - 200 ppm; and PCNB - 100 ppm. pH adjusted to 6.0.

these six isolates and four type cultures, viz., *P. cryptogea* (P-1088), *P. drechsleri* (P-1087), *P. megasperma* (P-1057) and *P. vignae* (P-606).

1. Growth rate

The growth rates of the six pigeonpea isolates and four type cultures were studied on clear V-8 juice agar (CV-8JA), at the following temperatures: 5, 9, 15, 21, 24, 27, 30, 33, 36 and 39°C. For this a plug (5 mm dia) of inoculum from each culture was placed in the center of 90 mm sterilized plastic petri dishes containing the solidified CV-8JA medium. The final data on the colony diameter (minus 5 mm initial plug) was recorded on 5th day and the results are presented in Table 80 and Figs. 2 and 3.

Table 80. Comparison of the effect of temperature on radial growth (mm) of several isolates of *Phytophthora* from *Cajanus cajan* with several known species on clarified V-8 juice agar a/

Isolates	Temperature (°C)									
	5	9	15	21	24	27	30	33	36	39
P2	0	1	30	56	72	79	80	80	56	0
P3	0	3	32	57	71	79	80	79	48	0
P4	0	1	31	58	71	76	76	64	35	0
P5	0	1	28	56	66	74	72	63	37	0
P6	0	2	32	60	67	76	77	67	50	0
Phytophthora drechsleri var. *cajani*	0	2	19	53	71	78	80	74	45	0
P. drechsleri	2	15	38	55	65	70	68	68	34	0
P. cryptogea	8	19	41	64	69	68	41	7	0	0
P. megasperma	6	19	42	61	72	78	75	3	0	0
P. vignae	0	0	21	38	41	44	37	25	0	0

a/ Average of 4 replications.

The optimum temperature for growth of all six pigeonpea isolates was 27-33°C, minimum 9°C and maximum 36°C. Comparative studies made with cultures of *P. cryptogea*, *P. drechsleri*, *P. megasperma*, and *P. vignae* indicated that the growth rate of pigeonpea isolates resembled that of the *P. drechsleri* culture.

FIGURE 2. COMPARATIVE CARDINAL TEMPERATURES FOR GROWTH OF THE PIGEONPEA PHYTOPHTHORA ISOLATES ON CV-8JA

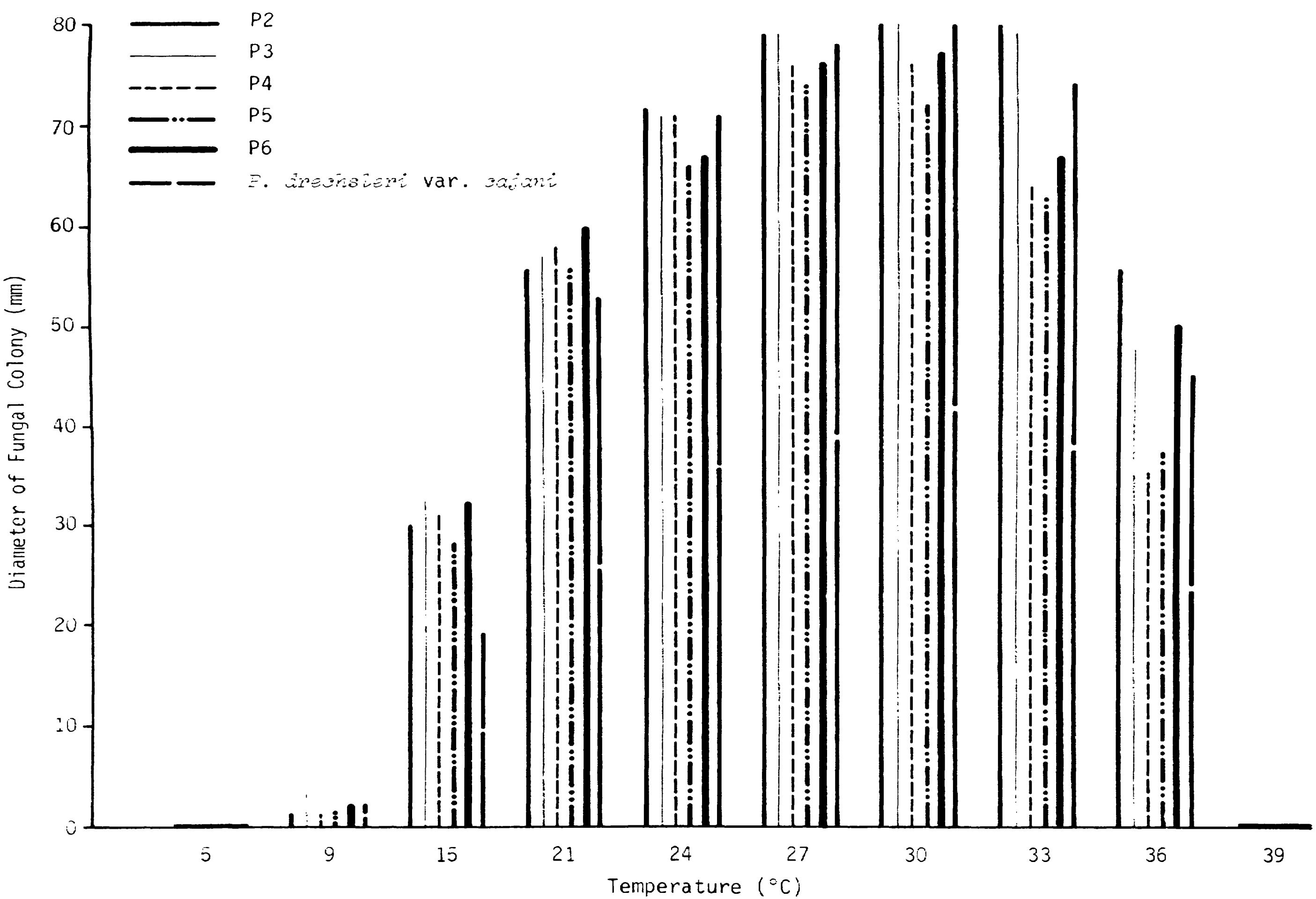
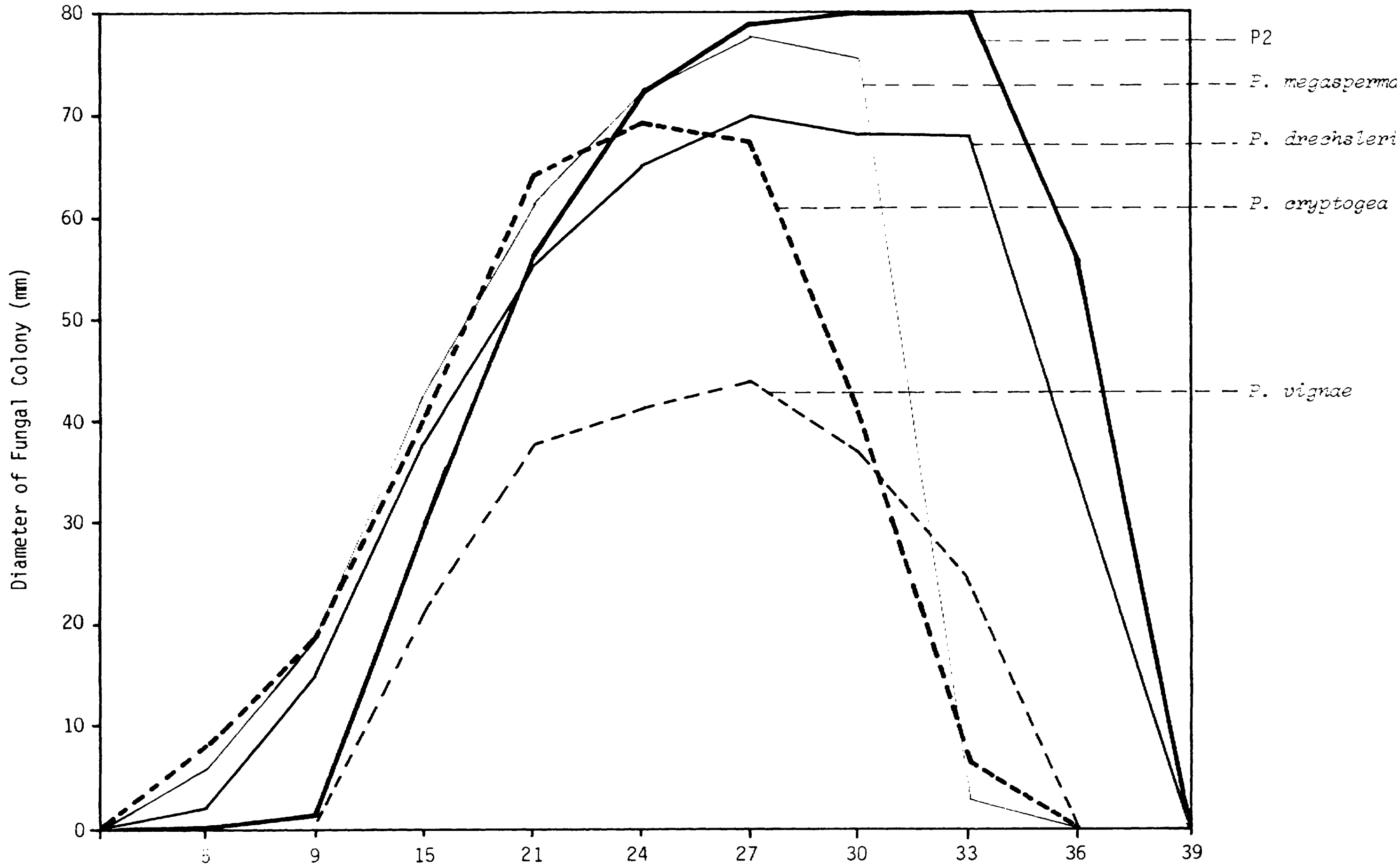


FIGURE 3. COMPARATIVE CARDINAL TEMPERATURES FOR GROWTH OF ONE PIGEONPEA ISOLATE (P2) AND FOUR TYPE CULTURES OF <u>PHYTOPHTHORA</u>



2. Morphological studies

The morphology of six pigeonpea isolates and four type cultures was studied on potato-dextrose-agar (PDA), cornmeal agar (CMA), CV-8JA and 2% malt agar. A 5-mm mycelial plug of each culture from CV-8JA was placed on the center of 90 mm petri dishes containing solidified medium and were incubated at 26°C. Observations were made 7 days after incubation and details are given in Table 81. The observations revealed that the colony morphology of pigeonpea isolates and four type cultures varied considerably on four media.

3. Sporangia

Sporangia were obtained by transferring 5 mm inoculum plugs from the outer edge of a growing colony on CV-8JA to petri dishes (50 mm in dia) containing 5 ml of diluted clarified V-8 juice broth (1:5). The plates were then incubated under Westinghouse 40 Watt fluorescent lamps at an intensity of 1300 μWcm^2 (12 hr light/12 hr dark cycle), after which the medium was removed and replaced by fresh distilled water. The cultures were then incubated for a further 24 hr period after which abundant sporangia were formed.

Proliferating sporangia were produced by all pigeonpea isolates. Size of sporangia in all isolates were similar, ranging from 42-83 x 29-48 µm (avg. 61.8 x 37.3 µm). The measurements are also comparable to published data on sizes of sporangia of *P. cryptogea, P. drechsleri* (Tucker, C.M. 1931. Taxonomy of the genus *Phytophthora* de Bary. Univ. Missouri Expt. Sta. Bull. 153: 208 pp; Waterhouse, G.M. 1963. Key to the species of *Phytophthora* de Bary. Mycol. Pap. 92: 1-22), and *P. cajani* (Amin et al. 1978. *Phytophthora cajani,* a new species causing stem blight on *Cajanus cajan.* Mycologia 70: 171-176)and *P. drechsleri* var. *cajani* (Table 82). The sporangial stalk of our isolates was either narrowly tapered or widened somewhat at the base of the sporangium.

All six pigeonpea isolates had sporangium morphology similar to that described by Waterhouse (1963) for both *P. cryptogea* and *P. drechsleri.* Although *P. cryptogea* and *P. drechsleri* are similar in general morphology, these two species have been separated by Waterhouse (1963) based on the following characteristics: *P. cryptogea* has smaller sporangia (avg. size 37-40 x 23 µm, max. 55 x 30 µm) than *P. drechsleri* (avg. size 36-50 x 26-30 µm, max. 70 x 40 µm). *P. cryptogea* produces sporangia sympodially and the sporangia have conspicuous vacoules. Also sporangia of *P. cryptogea* are less variable in shape than *P. drechsleri. P. drechsleri* sporangia have been described as broadly obpyriform to elongated obpyriform, some times asymmetrical and tapering at the base. Based on these criteria, our isolates resemble *P. drechsleri* more closely than *P. cryptogea.*

Table 81. Morphological characters of several isolates of *Phytophthora* from *Cajanus cajan* with several known species on four different media

Isolates	Morphological characters on			
	Cornmeal agar	2% Malt agar	CV-8JA	PDA
1	2	3	4	5
P2 (Hyderabad)	Colony amorphous, not finely radiate, margin entire, no pattern, colony fairly aerial throughout, hyphae very thick, very small irregular hyphal swellings, distance between branch irregular and no spores.	Colony amorphous, no pattern, moderately aerial throughout, margin entire, hyphae stout, thick, branching not all at right angles to the parent hyphae. No spores.	Colony densely aerial, amorphous , hyphae smooth.	Amorphous, dense aerial, hyphae irregular in width, generally smooth.
P3 (Delhi)	Colony appears finer than P2. No definite colony pattern, colony slightly fluffy at the centre, hyphae smoother at the margin of the colony than at the centres, hyphae at centres of colony very irregular with hyphal swellings adorned with small projections. Distance between branches irregular. No spores.	Colony pattern like a flower with small, pointed petals. Aerial hyphae slight to moderate. Hyphae generally smooth, some times slightly coraloid with small hyphal swellings. Branching not always at right angles to the parent hyphae. No spores.	Colony with dense aerial mycelium, a slightly stellate pattern faintly visible. Hyphal smooth and branching irregular.	Strong camellia. Definite flower pattern, small petals with points. Hyphae always coraloid but not botryoidal, small projections.
P4 (Kanpur)	Very similar or identical in morphology to P3.	Colony pattern like a flower, but with fewer points than P3. Growth slightly slower than P3, colony margin scalloped. Hyphae stout, generally smooth, some few small swellings. Branching not generally at right angles. No spores.	Colony not quite as densely aerial as above, slightly radial. Hyphae smooth. Branching irregular. Growth in a pattern of faint concentric rings.	Pattern as above
P5 (Kalyanpur)	Very similar to P3. Growth perhaps a little slower, colony slightly stellate or exhibiting a faint flame pattern. No spores.	Colony pattern more or less identical to that of P3. Hyphae slightly more coraloid than those of P4. Hyphae with small projections, not botryoidal. No spores.	Less aerial mycelium than P3. Colony somewhat radiate, but still very dense. Hyphae generally smooth, with some slightly coraloid. Branching irregular, concentric rings visible.	Pattern as above

Contd.

1	2	3	4	5
P6 (Deeg)	Growth slower than P3, P4, and P5. More amorphous, less fine. Aerial hyphae moderate to abundant in the centre of the colony, patchy elsewhere. Abundant small hyphal swellings. Branching very irregular. No spores.	Pattern more or less like that of P4, slightly less obvious flower pattern than P3 and P5. Hyphae stout, smooth. Hyphae some times slightly coraloid with irregular projections, but not botryoidal. Branchings somewhat irregular. No spores.	Aerial mycelium moderate. Colony somewhat radiate to very slightly stellate, generally amorphous. Hyphae stout, generally smooth. Some hyphae slightly coraloid. Branching not generally at right angles.	Pattern as above
F. [illegible] (P-1088)	--	--	Colony with no strong pattern. Growth rate much slower than others. Margin of colony slightly irregular. Macroscopic appearance of the colony coarse. More aerial than F. [illegible], but still much less aerial growth than any of pigeonpea isolates. Hyphae coraloid to botryoical with some swollen hyphae. Branching of hyphae often not at right angles to parent hypha.	Amorphous, margin slightly irregular, branching not at right angles. Hyphae rugose, but not really as coral as F. [illegible].
F. [illegible] (P-1087)	Finely stellate/petal, slightly fluffy at center, finely radiate. Hyphae fairly smooth, only slightly irregular. Branching distance slightly irregular not always in right angles.	Definite flower, many small petals (like Chrysanthemum). Mostly appressed, usually aerial at center. Hyphae slightly coral, small projections, angles variables.	Colony with a definite stellate pattern, like small petals with points slightly aerial in center of colony. Hyphae slightly coraloid, with small projections and uneven thickness. Branching of hyphae often at or near right angles to the parent hyphae.	Very definite flower, but not same as pigeonpea isolates, small, rounded petals. hyphae coraloid appearance similar to P3.

Contd.

1	2	3	4	5
P. megasperma (P-1057)	--	--	--	Very dense aerial. Margin entire, amorphous, slower than P2. Branches not generally in right angles, slightly rugose.
P. vignae (P-606)	--	--	--	Very slow growing, very dense aerial, amorphous, fine edge. Hyphae generally smooth, not branching at right angles. Very slightly coraloid.

Table 82. Comparison of the size of sporangia of several isolates of *Phytophthora* from *Cajanus cajan* with several known species

Isolates	Size (μm)[a]	Length:Breadth ratio
P2	42-83 (66) x 29-46 (37)	1.7:1
P3	50-76 (64) x 29-42 (36)	1.7:1
P4	46-74 (61) x 31-48 (40)	1.7:1
P5	48-64 (54) x 29-42 (35)	1.5:1
P6	50-73 (62) x 33-48 (38)	1.5:1
Phytophthora drechsleri var. *cajani*	56-73 (64) x 32-46 (38)	1.6:1
P. cajani [b]	49-82 (60) x 19-44 (32)	1.7:1
P. cryptogea[c]	Avg.37-40 x 23 (max. 55 x 30)	1.7:1
P. drechsleri [c]	Avg.36-50 x 26-30(max.70x 40)	1.7:1

[a] Data in parentheses is the mean based on 50 measurements for each value.

[b] Amin et al. (1978)

[c] Waterhouse (1963)

4. Mating studies

Observations on oogonial and antheridial formation were made on carrot agar medium and a modified CV-8JA which contained β-Sitosterol (30 mg/l), Tryptophan (20mg/l), $CaCl_2$, H_2O (100 mg/l) and Thiamine (1 mg/l) A plug (5 mm dia) of each pigeonpea *Phytophthora* isolate was placed in 90 mm petri dishes containing the solidified medium opposite (20 mm apart) to a 5 mm plug of the A^1 or A^2 mating type of either *P. drechsleri*(P-1087) *P. cinnamomi*(Pc-40 and Pc-140), *P. cryptogea* (P-1016) or *P. cambivora* (P-592). All cultures were incubated at 25°C in darkness for 3 weeks before observations were made. All media used are described in the review by Ribeiro (A sourcebook of the genus *Phytophthora*. J. Cramer, Lehre, W. Germany. 420 pp, 1978).

Mating experiments with A^1 and A^2 mating types of above species of *Phytophthora* indicated that all of ICRISAT pigeonpea isolates were of the A^1 mating type. The isolate designated as *P. drechsleri* var. *cajani* was also A^1 mating type. The greatest number of oogonia and oospores occurred in matings with the A^2 type of *P. cryptogea*. Antheridia and oogonia differed in these interspecific matings. Bicellular antheridia was noted in some interspecific crosses with *P. cinnamomi* (Table 83 and 84). Variation in oogonial sizes was noted when interspecific crosses were made with the A^2 mating type of *P. cinnamomi* on the modified CV-8JA and on carrot agar. Oospores sizes however varied little (Table 83, 84, 85, 86 and 87). A greater number of bicellular antheridia was observed on carrot agar medium than on the modified CV-8JA. Oospores were not formed in cross P5 x Pc-40 on carrot agar. Oospores were formed in the modified CV-8JA in the modified CV-8JA in cross P5 x Pc-140 (Table 84). Oogonia with a verrucose outer wall were observed only in certain crosses with A^2 mating type of *P. cambivora* (Table 85). The frequency of oogonia with verrucose walls varied in crosses with different pigeonpea isolates. A majority of the oogonia were verrucose in cross P5 x *P. cambivora* while there were none in the cross P3 x *P. cambivora* (Table 85).

A few deeply pigmented oospores were observed in single cultures of pigeonpea isolates, when incubated on oatmeal agar at 30°C for 3 weeks. No sexual structures were observed at any other temperature on any other medium.

The formation of oospores has also been used as a criterion for separating *P. cryptogea* and *P. drechsleri*. Waterhouse (1963) reported that *P. drechsleri* did not form oospores when crossed with *P. cinnamomi*. Our studies indicate that oogonia formed readily in crosses with *P. cinnamomi*, but the number produced varied with the isolate of *P. drechsleri* used. Shepherd[1] (1978) recently reported a detailed study of inter and intra-specific mating behaviour of several *Phytophthora* species. He found that A^1 isolates of *P. drechsleri/P. cryptogea* readily formed oogonia when mated with *P. cinnamomi*, but not crossed with the A^2 mating type of *P. drechsleri* or of *P. cryptogea*. Our mating tests agree in general with Shepherd's findings.

5. <u>Pathogenicity tests</u>

For these studies, 'pot culture' technique was used. Pathogenicity tests using 28 plant species indicated that representative pigeonpea isolates P2, P3 and P4 were specific to pigeonpea and some *Atylosia spp.*, a closely related wild species commonly found in India (Table 88).

In another test, 30 *Phytophthora* isolates (5 ICRISAT isolates + *P. drechsleri* var. *cajani* + *P. parasitica*, a Puerto Rico pigeonpea isolate) were tested on two pigeonpea lines; viz., ICP-7065 and HY-3C by following 'pot culture' technique. The results presented in Table 89 indicate that ICP-7065 showed resistant reaction (within 10% blight) to only two pigeonpea isolates (P2 and *P. drechsleri* var. *cajani*) and to all non-pigeonpea isolate. But HY-3C was susceptible to all seven pigeonpea isolates and to one pine isolate, *P. drechsleri* (this isolate was non-pathogenic in a repeat test). It remained free from all other non-pigeonpea isolates. This indicates the probability that races of *Phytophthora* exist within the collection of isolates from pigeonpea.

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[1] Shepherd, C.J. 1978. Mating behaviour of Australian isolates of *Phytophthora species*. I. Inter- and intra-specific mating. Aust.J.Bot. 26: 123-138.

Table 83. Formation of sexual organs in crosses between Phytophthora isolates from pigeonpea & an A2 mating type of *P. cinnamomi* (Pc40) on carrot agar medium

Matings	Sex organs[a/]	Oogonia (µm)	Antheridia[b/] (µm)	Oospores (µm)	Thickness of oospore wall (µm)
P2 x Pc40	++	37-48 (43)	17-37(24) x 15-20(17)	34-44(38)	3-5 (4)
P3 x Pc40	+++	29-48 (40)	15-29(18) x 12-21(16)	25-44(35)	2-5 (4)
P4 x Pc40	+	35-42 (39)	17-29(22) x 12-21(16)	29-40(34)	2-4 (3)
P5 x Pc40	0	--	--	--	--
P6 x Pc40	++	27-37 (32)	15-19(16) x 15-19(16)	23-31(27)	2-3 (2)
Pdc[c/] x Pc40	++	29-37 (32)	17-29(21) x 15-19(16)	25-32(28)	2-4 (3)

a/ Number of oogonia are indicated:+ = 1-10 ooginia; ++ = 11-20 oogonia, and +++ = above 20 ooginia per low power microscope field (100X).

b/ On crosses P3 x Pc40 and P4 x Pc40 a few bicellular antheridia were present; and in crosses P2 x Pc40 and Pdc x Pc40 about 50% of the antheridia were bicellular.

c/ Pdc = *P. drechsleri* var. *cajani*.

Table 84. Formation of sexual organs in crosses between *Phytophthora* isolates from pigeonpea and an A2 mating type of *P. cinnamomi* (Pc140) on a modified clarified V-8 juice agar medium

Matings	Sex organs [a/]	Oogonia (µm)	Antheridia [b/] (µm)	Oospores (µm)	Thickness of oospore wall (µm)
P2 x Pc140	+++	35-46 (40)	15-25 (19) x 15-21 (17)	31-40 (35)	2-5 (4)
P3 x Pc140	+++	25-35 (31)	10-19 (15) x 10-21 (15)	21-31 (26)	2-4 (3)
P4 x Pc140	++	29-46 (34)	12-23 (17) x 12-19 (16)	25-42 (31)	2-4 (3)
P5 x Pc140	++	27-35 (32)	12-19 (15) x 10-19 (15)	21-31 (27)	2-4 (3)
P6 x Pc140	++	33-42 (37)	15-25 (19) x 15-21 (18)	29-37 (34)	2-4 (3)
Pdc [c/] x Pc140	+++	29-44 (37)	15-31 (19) x 12-19 (16)	25-34 (31)	2-4 (3)

a/ Number of oogonia are indicated: ++ = 11-20 oogonia and +++ = above 20 oogonia per low power microscopic field (100X).

b/ On crosses P2 x Pc140, P4 x Pc140, and P6 x Pc140 a few bicellular antheridia were present; and in cross Pdc x Pc140 about 50% of the antheridia were bicellular.

c/ Pdc = *P. drechsleri* var. *cajani*.

Table 85. Formation of sexual organs in crosses between *Phytophthora* isolates from pigeonpea and an A^2 mating type of *P. cambivora* (P592) on a modified clarified V-8 juice agar medium

Matings	Sex organs[a/]	Oogonia[b/] (µm)	Antheridia (µm)	Oospores (µm)	Thickness of oospore wall (µm)
P2 x P592	0	--	--	--	--
P3 x P592	+++	27-44 (35)	12-21 (16) x 12-19 (16)	21-38 (30)	2-4 (3)
P4 x P592	+	33-42 (38)	17-40 (26) x 15-23 (19)	31-38 (34)	2-4 (3)
P5 x P592	+	33-42 (36)	12-21 (16) x 12-19 (16)	27-35 (31)	2-5 (3)
P6 x P592	0	--	--	--	--
Pdc[c/] x P592	+	37-40 (38)	12-19 (16) x 12-17 (15)	31-33 (32)	3-3 (3)

a/ Number of oogonia are indicated: + = 1-10 oogonia and +++ = above 20 oogonia per lower microscopic field (100X).

b/ On crosses P5 x P592 and Pdc x P592 about 50% of the oogonia were with verrucose walls.

c/ Pdc = *P. drechsleri* var. *cajani*.

Table 86. Formation of sexual organs in crosses between *Phytophthora* isolates from pigeonpea and an A2 mating type of *P. drechsleri* (P1087) on a modified clarified V-8 juice agar medium

Matings	Sex organs[a/]	Oogonia (µm)	Antheridia (µm)	Oospores[b/] (µm)	Thickness of oospore wall (µm)
P2 x P1087	+	29-40 (35)	12-17 (15) x 12-17 (15)	27-35 (31)	2-4 (3)
P3 x P1087	++	24-35 (31)	12-21 (17) x 15-19 (16)	20-29 (25)	2-3 (2)
P4 x P1087	+	27-40 (34)	10-17 (15) x 12-17 (14)	23-35 (39)	2-5 (3)
P5 x P1087	++	27-35 (30)	12-19 (15) x 12-19 (15)	21-29 (26)	2-5 (2)
P6 x P1087	++	29-37 (33)	12-19 (15) x 12-17 (15)	23-31 (27)	2-3 (2)
Pdc[c/] x P1087	+++	29-44 (35)	12-21 (15) x 12-15 (13)	23-35 (28)	2-4 (3)

a/ Number of oogonia are indiated: + = 1-10 oogonia, ++ = 11-20 oogonia and +++ = above 20 oogonia per low power microscopic field (100X).

b/ On crosses P3 x P1087 and P6 x P1087 oospores were aplerotic.

c/ Pdc = *P. drechsleri* var. *cajani*.

Table 87. Formation of sexual organs in crosses between *Phytophthora* isolates from pigeonpea and an A2 mating type of *P. cryptogea* (P1016) on a modified clarified V-8 juice agar medium

Matings	Sex[a/] organs	Oogonia (μm)	Antheridia (μm)	Oospores (μm)	Thickness of oospore wall (μm)
P2 x P1016	+++	26-41 (34)	10-17 (13) x 12-19 (15)	22-34 (28)	2-5 (3)
P3 x P1016	+++	29-41 (34)	12-19 (15) x 12-22 (17)	22-34 (27)	2-5 (3)
P4 x P1016	+++	31-41 (35)	12-17 (16) x 12-19 (16)	22-36 (27)	2-5 (3)
P5 x P1016	+++	31-38 (34)	12-19 (15) x 10-22 (16)	22-31 (26)	2-4 (3)
P6 x P1016	+++	26-36 (31)	12-17 (15) x 12-22 (17)	19-29 (23)	2-4 (3)
Pdc[b/] x P1016	+++	29-38 (32)	12-19 (16) x 12-24 (17)	19-30 (23)	2-4 (3)

a/ Number of oogonia are indicated: +++ = above 20 oogonia per low power microscopic field (100X).

b/ Pdc = *P. drechsleri* var. *cajani*.

Table 88. Pathogenicity of *Phytophthora* isolates from pigeonpea (*Cajanus cajan*) to various plant species

Plant species	*Phytophthora* isolates[a/] P2	P3	P4
Cajanus cajan (Cv. HY-3C) (pigeonpea)	+	+	+
Cajanus cajan (ICP-7065) (pigeonpea)	-	+	+
Osteospermum sp. (african daisy)	-	-	-
Medicago sativum cv. Moapa (alfalfa)	-	-	-
Persea indica (wild avocado)	-	-	-
Citrus sinensis cv. mv sweet (citrus)	-	-	-
Vigna sinensis L. (cowpea)	-	-	-
Cucumis sativus L. cv. Straight-8 (cucumber)	-	-	-
Solanum melongenum L. cv. Black Beauty (eggplant)	-	-	-
Capsicum annuum L. (pepper)	-	-	-
Vinca minor L. (periwinkle)	-	-	-
Solanum tuberosum L. cv. White Rose (potato)	-	-	-
Carthamus tinctorius L. cv. N-10 (safflower)	-	-	-
Glycine max. L. (soybean)	-	-	-
Helianthus annuus L. cv. Summer Beauty (sunflower)	-	-	-
Lycopersicum esculentum L. cv. Pearson (tomato)	-	-	-
Crotalaria juncea L. (sunn-hemp)	-	-	-
Phaseolus vulgaris L. (french bean)	-	-	-
Phaseolus sp. (valor bean)	-	-	-
Pisum sativum L. (pea)	-	-	-
Cicer arietinum L. cv. White panish (chickpea)	-	-	-
Atylosia sericea (wilt plants related to pigeonpea)	-	-	-
A. platycarpa "	-	-	-
A. volubilis "	+	+	+
A. scarabaeoides "	+	+	+
A. lineata "	+	+	+
A. cajanifolia "	+	+	+
A. albicans "	+	+	+

a/ The + sign indicates the plants were susceptible.
The - sign indicates the plants were resistant.

Table 89. Reaction of cultivars HY-3C and ICP-7065 of *Cajanus cajan* (pigeonpea) to different *Phytophthora* species

Phytophthora isolates tested and hosts		Pigeonpea lines[a/] HY-3C	ICP-7065
P2	(pigeonpea)	+	-
P3	"	+	+
P4	"	+	+
P5	"	+	+
P6	"	+	+
drechsleri var. *cajani*	"	+	-
cactorum (Blackwell's type) (P715)		-	-
colocasiae(P356)		-	-
cryptogea (P 187)		-	-
cryptogea (P637)		-	-
cryptogea (P1016)		-	-
cryptogea Pethybridge type (P1088)		-	-
capsici type (P1091)		-	-
citricola type (P716)		-	-
citrophthora (P479) (citrus)		-	-
cinnamomi (Pc40) (avocado)		-	-
cambivora (P592)		-	-
drechsleri (P568)		-	-
drechsleri (P852)		-	-
drechsleri (P1076)		+ [b/]	-
drechsleri (P1087)		-	-
megasperma (P1057) (alfalfa)		-	-
megasperma -- high temp. isolate (P238) (alfalfa)		-	-
megasperma var. *sojae* (P406)		-	-
megasperma -- high temp. isolate (p240) (alfalfa)		-	-
parasitica (P991)		-	-
parasitica (P1070)		-	-
parasitica (P968) [c/]	(pigeonpea)	+	+
palmivora (P550)		-	-
vignae (P606) (cowpea)		-	-

[a/] The + sign indicates the plants were susceptible.
The - sign indicates the plants were resistant.

[b/] Isolate was non-pathogenic in a repeated test.

[c/] Isolate from Puerto Rico.

6. Designation of the causal agent of blight of pigeonpea as *P. drechsleri* f. sp. *cajani*

We cannot state unequivocally that the isolates described as *P. cajani* by Amin et al. (1978) is the same as our isolates since the culture of this fungus have apparently been lost. However, the morphology and size of sporangia of this isolate designated as *P. cajani* as reported by Amin et al. (1978) was similar to our isolates. Homothallism as cited by Amin et al. (1978) does not differentiate *P. cajani* from *P. drechsleri* since homothallic isolates of *P. drechsleri* have previously been described by Tucker (1931). Our studies showed that the isolates P2, P3, P4, P5 and P6 were A^1 mating type when crossed with test A^2 isolates but at 30^oC on OMA these isolates were homothallic.

Pal et al (1970) described chlamydospores. Our close observation by light microscopy indicated that the hyphal swellings were not delimited by a septum. Therefore what we saw were not chlamydospores.

Our data support that the isolates P2, P3, P4, P5 and P6 should be classified as *P. drechsleri* since they closely resemble the comparative isolate of that species and with characteristics of sporangia described by Tucker (1931). Although the 'forma speciales' concept has not previously been used to classify host specific isolates of *Phytophthora*, it appears to be appropriate here. The data in tables 88 and 89 indicate that the isolate from pigeonpea are host specific. Therefore, *P. drechsleri* f. sp.*cajani* is presented as the name for the *Phytophthora* causing blight of pigeonpea. The designation is in conformity with the International Rules of Botanical Nomenclature, Article 4 (Stafleu et al. 1972. International Code of Botanical Nomenclature. Utrecht, Netherlands, 426 pp). The term "variety" (eg. var. *cajani)* has been used by Pal et al. (1970). The "variety" should be based on morphological differences and not on host specificity. The use of forma speciales was recently proposed by Kuan and Erwin[1] (1978) in designating host specific isolates of *P. megasperma*.

B. Screening

1. Germplasm

More than 1400 germplasm accessions were screened by 'pot culture' technique. Planting, screening and recording observations were done as described in Pulse Pathology (Pigeonpea) Annual Report, 1977-78. The results are presented in APPENDIX XLIV.

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[1] Kuan, Ta-Li., and D.C. Erwin. 1978. The use of formae speciales to subdivide *Phytophthora megasperma* Drechsler. Phytopathology News. 12: 147 (Abstr.).

The percentage of blight varied from 0.0 to 100.0%. A list of 52 lines that recorded less than 10% blight is given below:

ICP-1788, -1950, -2153, -2376, -2505, -2673, -2682, -2719, -2736, -2974, -3008, -3259, -3367, -3741, -3753, -3868, -3891, -3899, -3937,-4135, -4141, -4168, -4699, -4752, -4882, -5450, -5860, -6865,-6952,-6953,-6956,-6974, -7057, -7065, -7151, -7182, -7185, -7196, -7200, -7232, -7269, -7273,-7483, -7533, -7624, -7657, -7672, -7692, -7701, -7746, -7749, and -7754.

2. Sterility mosaic resistant lines

One hundred and seventeen sterility mosaic resistant germplasm selections were screened for blight resistance in 'pot culture' and the results are presented in APPENDIX XLV. The 15 selections which showed less than 10% blight incidence in the first test were screened again and the results are given in Table 90. Average of two tests results indicated that 14 germplasm selections (only ICP-7185-1-6S⊗ showed more blight in the second test) recorded less than 10% blight.

Most of these sterility mosaic resistant germplasm selections were screened in the blight nursery and the results are presented elsewhere in this report. Out of these 14 selections found resistant in the 'pot culture', 9 showed resistant reaction to the blight in field screening also.

Table 90. Summary of pot screening of sterility mosaic resistant germplasm selections for resistance to Phytophthora blight

Particular	1st Test		2nd Test		Total no.of plants tested	Total no. blighted	Average percent blight
	No. of plants tested	No. blighted	No. of plants tested	No. blighted			
ICP-4765-3-5S⊗	8	0	7	0	15	0	0.0
ICP-4866-1-6S⊗*	10	0	18	0	28	0	0.0
ICP-5656-1-2S⊗*	8	0	13	0	21	0	0.0
ICP-7185-1-6S⊗*	10	0	10	6	20	6	30.0
ICP-7197-3-S1⊗	11	0	5	1	16	1	6.2
ICP-7414-1-4S⊗*	11	0	9	0	20	0	0.0
ICP-8101-5-1S⊗*	16	0	8	0	24	0	0.0
ICP-8106-2-5S⊗*	10	0	10	1	20	1	5.0
ICP-8120-1-1S⊗	9	0	6	1	15	1	6.7
ICP-8127-8-1S⊗	10	0	17	0	27	0	0.0
ICP-8132-2-3S⊗*	10	0	12	0	22	0	0.0
ICP-8139-3-1S⊗	14	0	10	0	24	0	0.0
ICP-8144-3-3S⊗*	10	0	19	2	29	2	6.9
ICP-8147-1-2S⊗*	10	0	11	0	21	0	0.0
ICP-8151-7-3S⊗*	15	0	13	0	28	0	0.0
HY-3C (Susceptible)	15	13	12	10	27	23	85.2

* Also resistant in field screening.

3. Reaction of blight promising lines (against P2 isolate) to P3 (Delhi) and P4 (Kanpur) isolates

Thirty blight promising lines from 1977-78 screening were tested against P3 (Delhi) and P4 (Kanpur) isolates along with P2 in 'pot culture'. The test was repeated once and the results are presented in Table 91.

All the 30 lines showed susceptible reaction to both P3 and P4 isolates. Against P2 however, only 3 lines showed around 30% blight and the remaining were resistant. More than 90% blight was recorded in all the 30 lines against P4 whereas against P3 most of the lines showed less than 50% blight.

Table 91. Results of pot screening of Phytophthora blight promising lines (to P2 isolate) against P3 (Delhi) and P4 (Kanpur) isolates[a/]

ICP.No.	P2		Delhi		Kanpur	
	No. of plants	% Blight	No. of plants	% Blight	No. of plants	% Blight
ICP-28	129	3.9	132	55.3	123	100.0
-113	122	4.9	124	45.2	110	97.3
-214	145	27.6	112	87.5	132	100.0
-231	129	8.5	124	36.3	123	99.2
-339	141	8.5	145	42.8	129	100.0
-580	129	9.3	131	35.9	133	98.5
-752	135	8.9	133	29.3	123	99.2
-913	113	9.7	123	52.8	104	96.2
-914	123	29.3	111	52.3	126	100.0
-934	129	5.4	126	46.0	122	100.0
-1088	104	5.8	113	46.9	104	98.1
-1090	128	1.6	122	41.8	125	98.4
-1120	122	6.6	126	41.3	123	98.4
-1123	126	1.6	127	26.8	114	97.4
-1149	131	3.8	130	41.5	138	99.3
-1150	121	8.3	124	40.3	118	97.5
-1151	128	10.9	122	50.8	122	100.0
-1258	124	11.3	132	49.2	135	99.3
-1321	106	1.9	106	40.6	92	97.8
-1529	125	2.4	124	34.7	105	99.1
-1535	130	9.2	140	57.1	114	99.1
-1570	120	30.8	106	35.9	118	98.3
-1586	97	6.2	97	24.7	109	99.1
-1950	121	7.4	115	33.0	99	98.9
-2153	131	9.2	142	42.9	114	94.7
-2376	129	6.9	133	39.9	118	99.2
-3753	110	8.2	120	24.2	99	98.9
-6974	126	4.8	135	27.4	80	98.8
-7065	127	6.3	135	54.8	84	100.0
-7182	102	4.9	122	36.1	69	98.6
HY-3C (Susceptible check)	30	100.0	36	100.0	35	100.0

a/ Average of two tests.

C. Growth of five pigeonpea *Phytophthora* isolates on five media

The objective of this study was to find out suitable solid medium for the growth of 5 pigeonpea isolates. Five solid media used in this study were Corn meal agar (CMA)+Pimaricin - Vancomycin - PcNB (PVP), Potato-dextrose agar (PDA), V-8 juice agar (V-8JA), Pigeonpea stem extract dextrose agar (PPDA) and CMA. Five mm inoculum plugs of each of five isolates (P2 to P6) were placed on the center of solidified medium in petri dishes and incubated at 30^{o}C for 7 days. The colony diameter(minus initial 5 mm inoculum plug) was recorded and presented in Table 92. The results indicate that CMA is the best soild medium for all the five isolated followed by pigeonpea stem extract dextrose agar and V-8JA. The other two media (CMA + PVP and PDA) supported moderate growth for all the five isolates.

Table 92. Colony diameter (cm) of five pigeonpea *Phytophthora* isolates on five media [a/]

Isolate No.	Corn meal agar + Pimaricin - Vancomycin -PCNB	Potato dextrose agar	V-8 Juice agar	Pigeonpea stem extract dextrose agar	Corn meal agar
P2 (Hyderabad)	4.7	4.0	5.8	7.1	9.0
P3 (Delhi)	4.8	6.1	8.0	6.7	9.0
P4 (Kanpur)	4.6	5.7	7.4	8.7	9.0
P5 (Kalyanpur)	5.2	4.2	7.3	9.0	9.0
P6 (Deeg)	5.4	5.1	8.2	8.2	9.0

[a/] Average of 4 replications.

D. Fungicidal seed treatment studies

Recently a group of acylalanine derivatives, which systemically control various diseases caused by fungi of the Oomycetes, has become available from CIBA-GEIGY Corporation for experimentation. Diseases caused by species of *Phytophthora, Pythium, Bremia, Plasmopara, Pseudoperonospora* and *Sclerospora* are among those controlled by these compounds. One acylalanine analogue was inhibitory to *Phytophthora parasitica* var. *nicotianae* *in vitro* and gave good control of black shank of tobacco in preliminary field tests in 1976 (Mitchell and Kannwischer, unpublished). This compound, which has the systematic chemical name of N- (2, 6-dimethylphenyl) -N-(methoxyacetyl)- alanine methylester, was tested as CGA 48988 (=GA-1-82) and given the trade name, Ridomil.

A seed treatment trial was conducted in 'pot culture' with Ridomil (25 WP) to control the blight of pigeonpea. Seeds of HY-3C, a blight susceptible cultivar, were used in seed treatment studies. Seeds were dry dressed at five rates - 0.1%, 0.2%, 0.3%, 0.4% and 0.5% fungicide. Four replications were kept for each treatment. Proper checks were also maintained during the experimentation. About 25 seeds were sown in each pot (= replication). The first inoculation was done 6 days after sowing and the same treatments received second inoculation 15 days after the first inoculation to find out the persistence of the fungicidal effect in the treated seedlings. The percent blight incidence was recorded 15 days after 1st inoculation as well as 15 days after 2nd inoculation. The results are presented in Table 93.

With the first inoculation control of blight in 'pot culture' was accomplished (from 0.2% to 0.5% Ridomil seed treatment). When the same treatments were subjected to second inoculation, the control of blight (within 10% blight) was achieved only with higher rate (0.5%). There was no adverse effect on germination and seedlings. The experiment will be repeated in 'pot culture'.

In 1979 kharif, a field trial will be conducted in blight nursery to see the performance of this chemical.

Table 93. Effect of pigeonpea seed treatment with Ridomil on the *Phytophthora* blight incidence 15 days after 1st and 2nd inoculations a/

Treatment	R1			R2			R3			R4			Average	
	TPT	%Blight		TPT	%Blight		TPT	%Blight		TPT	%Blight		%Blight	
		A	B		A	B		A	B		A	B	A	B
0.1%	25	24.0	48.0	26	19.2	38.5	26	15.4	38.5	26	23.1	53.8	20.4	44.7
0.2%	26	0.0	15.4	26	0.0	26.9	28	25.0	35.7	26	7.7	11.5	8.2	22.4
0.3%	26	7.7	19.2	30	0.0	6.7	28	7.1	14.3	29	0.0	3.4	3.7	10.9
0.4%	24	0.0	8.3	28	0.0	17.8	26	0.0	7.7	26	0.0	7.7	0.0	10.4
0.5%	29	0.0	3.4	23	0.0	8.7	26	0.0	7.7	27	0.0	7.4	0.0	6.8
Non-treated (1st inoculation)	22	100.0	-	28	100.0	-	26	100.0	-	25	96.0	-	99.0	-
Non-treated (2nd inoculation) b/	25	-	36.0	26	-	11.5	23	-	8.7	25	-	18.7	-	18.7

a/ HY-3C, a blight susceptible cultivar was used. b/ Less blight is observed when old seedlings are inoculated. R1 to R4: Replications.
TPT: Total Plants Tested. A: % Blight 15 days after 1st inoculation.
B: % Blight 15 days after 2nd inoculation.

E. Longevity of Phytophthora culture *in vitro*

In initial stages we faced some difficulties in storing our *Phytophthora* cultures at lower temperatures. So, a simple experiment was conducted to find out optimum temperature and proper medium for storing *Phytophthora* cultures over long periods *in vitro*. The P2 isolate was sub-cultured on both V-8JA (V-8 juice agar) and PDA (potato-dextrose-agar) media and kept at four different temperature ranges; viz., 10°, 15°, 22°, and 28°C. The viability of the culture was tested at weekly intervals on V-8JA (a favourable medium for *Phytophthora*) and the results are presented in Table 94.

The results clearly indicate that the P2 isolate of pigeonpea *Phytophthora* survives for a longer period at 15°C. It survives only for a week (on PDA) or two (on V-8JA) at 10°C. Among the two media tested V-8JA is better than PDA, but the pattern on temperature effects remains the same.

The *Phytophthora* cultures could be stored at 15°C on V-8JA for a longer period.

Table 94. Influence of temperature on the survival of *Phytophthora drechsleri* f. sp. *cajani* on two growth media

Temperature (°C)	V-8JA Days	PDA Days
10	14	7
15	133	105
22	77	77
28	63	56

V-8JA - V8 Juice agar
PDA - Potato-dextrose-Agar

F. Growth of Phytophthora on media incorporating different tissues of pigeonpea

Since the pigeonpea *Phytophthora* does not attack the root system, we wondered if root tissues contains inhibitory substances. An experiment was conducted in which leaf, stem and root tissue extracts with dextrose were used for growing *Phytophthora*. V-8 juice broth and potato-dextrose broth served as checks. Mycelial weights were compared after three weeks. No marked difference in growth was noticed between the different pigeonpea tissue media. Thus the roots, under the conditions of this test, did not show any inhibitory effect on the fungus.

PROJECT: PP-PATH-4(78) : INTERNATIONAL SURVEY OF PIGEONPEA DISEASES

I. SUMMARY

1. Roving surveys in the Indian state of Uttar Pradesh were carried out. Total locations surveyed were 108 in 44 districts. The average incidence of wilt and sterility mosaic for the state was 8.2% and 15.4%, respectively. The ranges of incidence for the two diseases were 0 to 86% and 0 to 93%.

2. Macrophomina stem canker, Yellow mosaic and Phytophthora blight were important at certain locations.

3. During September 1978 Delhi, Kanpur, Kalyanpur and Deeg were surveyed for the incidence of Phytophthora blight. The disease was observed in all four locations surveyed. Higher incidence of blight was noticed in Deeg Farm on Cv. T-21 (50%). Isolates of *Phytophthora* were obtained from Delhi, Kanpur, Kalyanpur and Deeg.

4. More incidence of yellow mosaic was observed at ICRISAT in rabi pigeonpea plantings than in kharif plantings. The maximum incidence observed was only 5.87 percent.

5. Plants infected with sterility mosaic showed more susceptibility to powdery mildew than the healthy plants. Plants with ring spot or mild mosaic symptoms behaved similar to healthy or apparently immune plants.

6. Most of the ACT (All India trials) materials showed high susceptibility to powdery mildew. HY-2, 1238 and T-7 were comparatively less susceptible.

7. Plants infected with sterility mosaic also showed more susceptibility to spider mites.

II. INTRODUCTION

This year, in cooperation with the C.S. Azad University of Agriculture and Technology, Kanpur; N.D. University of Agriculture and Technology, Faizabad, and the Banaras Hindu University, Varanasi, we conducted roving surveys in major pigeonpea growing districts of the state of Uttar Pradesh in northern India. A short trip was also made to Delhi and Kanpur to study Phytophthora blight situation. The observations made during these surveys are presented in this report. We did not undertake any survey trip outside India.

III. SURVEYS

A. Uttar Pradesh

The survey trip was made by Dr. J. Kannaiyan. Mr. A.N. Mishra, Senior Research Assistant, C.S. Azad University of Agriculture and Technology, Kanpur (New Delhi to Kanpur); Dr. R.N. Singh, Junior Plant Pathologist, N.D. University of Agriculture and Technology, Faizabad (Faizabad to Sultanpur) and Dr. U.P. Singh, Pulse Pathologist, Banaras Hindu University, Varanasi (Varanasi to Jaunpur) cooperated and accompanied him.

Dr. Kannaiyan's schedule was as follows:

January 29 :	Travelled from Hyderabad to New Delhi New Delhi to Pantnagar via Moradabad and Rampur
January 30 :	Pantnagar to Shajahanpur via Bareilly and Pilibhit
January 31 :	Shajahanpur to Bahraich via Lakhimpur, Sitapur, Lucknow, and Barabanki
February 1 :	Bahraich to Deoria via Faizabad and Gorakpur
February 2 :	Deoria to Varanasi via Azamgarh and Ghazipur
February 3 :	Varanasi to Allahabad via Mirzapur and Jaunpur
February 4 :	Allahabad to Kanpur via Sultanpur and Raebareli
February 5 :	Kanpur to Mahoba via Banda
February 6 :	Mahoba to Agra via Etawah, Mainpur and Etah
February 7 :	Agra to New Delhi via Mathura and Aligarh
February 8 :	New Delhi to Hyderabad

In Uttar Pradesh (border to border) the distance covered was approximately 3100 Km by road with stops at 108 locations for the observations of pigeonpea diseases; i.e. an average of one stop for every 29 Km. In this trip 44 pigeonpea growing districts of Uttar Pradesh were covered.

The size of the fields observed varied from 0.20 to 3.00 ha. More than 90% of the fields observed had some inter- or mixed crop(s). The percentage of pigeonpea in inter - or mixed crop(s) varied from 10 to 90.

The overall incidence in the field and also the incidence based on 500 plants in random rows were recorded for wilt, sterility mosaic (SM), Macrophomina stem canker (MSC), yellow mosaic (YM) and Phytophthora blight (PB). Incidence of foliar diseases was recorded on 3-point scale (low, medium and severe). Samples of wilted plants were collected from each place for the purpose of isolation. In addition, G.B. Pant University of Agriculture and Technology, Pantnagar; N.D. University of Agriculture and Technology, Faizabad; Banaras Hindu University, Varanasi; and C.S. Azad University of Agriculture and Technology, Kanpur were visited and similar observations were recorded on the pigeonpea crop there. The results are presented in Tables 95 and 96 and Figs. 4 and 5.

District-wise summary

1. Ghaziabad

Pigeonpea was cultivated mostly in loamy soils along with pearl millet. The crop was in flowering and podding stage. The average incidence of wilt, SM, YM and PB was 3.0%, 20.0%, 2.1%, and 6.3%, respectively. Cercospora leaf spot was observed at one location.

2. Meerut

The crop was cultivated in loamy soil along with maize and was in flowering and podding stage. The incidence of SM and YM was 46.2% and 6.4%, respectively.

3. Moradabad

Pigeonpea was raised mainly in clayey loam and was intercropped with sorghum or pearl millet. The incidence of wilt, SM and YM was low.

4. Rampur

The crop was cultivated in clayey loam soils and was in flowering and podding stage. SM and YM incidence was low but more wilt was seen. Cercospora leaf spot was also observed.

5. Nainital

The crop was in flowering and podding stage. SM incidence was high (35.0%). Very low incidence of wilt, YM, PB and Cercospora leaf spot was observed in some fields. Pigeonpea experimental plots at the G.B. Pant University of Agriculture and Technology, Pantnagar were also visited.

6. Bareilly

The crop was cultivated in clayey loam soils and was in flowering and podding stage. Moderate incidence of SM was seen. The incidence of other diseases was low.

Table-95

Locationwise data on incidence of pigeonpea diseases in Uttar Pradesh (1978-79)

District and location	Soil type	Total area observed (ha)	Net PP area observed (ha)	Cropping pattern	Stage	% Wilt		% SM		%Macrophomina Stem canker		% YMV		% Blight		Cercospora sp.	Phyllosticta sp.	Grey mildew	Remark
						Overall	Within 500	Overall	Within 500	Overall	Within 500	Overall	Within 500	Overall	Within 500				
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
GHAZIABAD																			
1. Ghaziabad	L	1.50	1.12	1PP:1PM	P&F	1.00	2.40	10.00	12.00	0.00	0.00	1.00	0.60	15.00	12.60	0	0	0	
2. Gopalpur	L	0.50	0.25	1PP:3PM	F	5.00	3.60	30.00	28.00	0.00	0.00	3.00	3.60	0.00	0.00	+	0	0	
Average						3.00	3.00	20.00	20.00	0.00	0.00	2.00	2.10	7.50	6.30	0.50	0	0	
MEERUT																			
3. Garhmuktes-war	L	0.75	0.56	1PP:1M	P&F	0.00	0.00	50.00	46.20	0.00	0.00	5.00	6.40	0.00	0.00	+	0	0	
MORADABAD																			
4. Rajabpur	SL	0.25	0.12	1PP:1PM	F	0.00	0.00	5.00	5.60	0.00	0.00	1.00	0.60	0.00	0.00	0	0	0	
5. Baksar	CL	0.50	0.37	3PP:1S	F	0.00	0.00	1.00	0.60	0.00	0.00	5.00	7.20	0.00	0.00	+	0	0	
6. Ghat	CL	0.50	0.37	1PP:1S	P&F	2.00	1.60	4.00	5.60	0.00	0.00	2.00	2.60	0.00	0.00	+	0	0	
Average						0.67	0.53	3.33	3.93	0.00	0.00	2.67	3.47	0.00	0.00	0.67	0	0	
RAMPUR																			
7. Rampur	CL	0.75	0.56	1PP:1S	P&F	10.00	8.60	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	+	0	0	Black leaf spot at location.
8. Bilaspur	CL	1.00	0.75	1PP:1S	P&F	5.00	5.60	5.00	4.20	0.00	0.00	1.00	1.60	0.00	0.00	0	0	0	
Average						7.50	7.10	2.50	2.10	0.00	0.00	0.50	0.80	0.00	0.00	0.5	0	0	

Contd.

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
NAINITAL																			
9. Pantnagar GBPUAT Farm	CL	1.00	1.00	Sole	P	1.00	0.80	75.00	65.80	0.00	0.00	1.00	1.60	10.00	8.40	++	0	0	
10. Kichha	CL	0.50	0.37	2PP:1S	P&F	0.00	0.00	5.00	4.20	0.00	0.00	0.00	0.00	0.00	0.00	0	0	0	
Average						0.50	0.40	40.00	35.00	0.00	0.00	0.50	0.80	5.00	4.20	1	0	0	
BAREILLY																			
11. Baheri	CL	0.50	0.25	2PP:1S:1C	P&F	1.00	1.40	15.00	16.80	0.00	0.00	0.00	0.00	10.00	9.20	+	0	0	
12. Bhojipura	CL	0.50	0.12	Border crop in GN	P&F	2.00	2.60	5.00	3.60	2.00	2.80	0.00	0.00	5.00	3.20	+	0	0	
13. Nawabganj	CL	0.50	0.37	3PP:1S	P&F	2.00	1.20	5.00	3.80	1.00	0.60	1.00	0.40	0.00	0.00	+	0	0	
Average						1.67	1.73	8.33	8.07	1.00	1.13	0.33	0.13	5.00	4.13	1	0	0	
PILIBHIT																			
14. Pilibhit	CL	0.20	0.15	2PP:1S	P&F	5.00	6.80	5.00	5.80	0.00	0.00	0.00	0.00	1.00	0.60	0	0	0	
15. Bilaspur	CL	0.75	0.56	3PP:1PM	P&F	0.00	0.00	2.00	1.40	0.00	0.00	0.00	0.00	4.00	2.20	0	0	0	
Average						2.50	3.40	3.50	3.60	0.00	0.00	0.00	0.00	2.50	1.40	0	0	0	
SHAHJAHANPUR																			
16. Nigohi	CL	0.50	0.25	1PP:1S	P&F	0.00	0.00	5.00	6.00	0.00	0.00	0.00	0.00	10.00	7.60	+	0	0	
17. Shahjahanpur	CL	0.50	0.25	1PP:1S	P&F	5.00	3.60	5.00	5.80	0.00	0.00	0.00	0.00	0.00	0.00	+	0	0	
Average						2.50	1.80	5.00	5.90	0.00	0.00	0.00	0.00	5.00	3.80	1	0	0	
LAKHIMPUR																			
18. Muhamdi	SL	0.75	0.37	1PP:1S	P&F	0.00	0.00	2.00	2.80	1.00	1.20	0.00	0.00	0.00	0.00	+	0	0	
19. Gola	CL	0.50	0.37	1PP:1S	P&F	0.00	0.00	5.00	7.20	0.00	0.00	0.00	0.00	0.00	0.00	+	0	0	
20. Lakhimpur	CL	1.00	0.75	1PP:1S	P&F	15.00	13.60	10.00	7.40	0.00	0.00	0.00	0.00	0.00	0.00	0	0	0	
Average						5.00	4.53	5.67	5.80	0.33	0.40	0.00	0.00	0.00	0.00	0.67	0	0	

Contd.

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
SITAPUR																			
21. Hargaon	CL	0.25	0.22	3PP:1S	P&F	5.00	6.80	10.00	8.40	0.00	0.00	0.00	0.00	0.00	0.00	+	0	0	
22. Sitapur	CL	1.00	0.75	1PP:1S	P&F	0.00	0.00	2.00	2.80	10.00	7.80	0.00	0.00	0.00	0.00	0	0	0	
23. Naimisharanya	SL	1.00	0.50	1PP:1S	P&F	0.00	0.00	10.00	8.60	0.00	0.00	0.00	0.00	0.00	0.00	0	0	0	
Average						1.66	2.27	7.33	6.60	3.33	2.60	0.00	0.00	0.00	0.00	0.33	0	0	
HARDOI																			
24. Hemganj	SL	1.50	0.75	1PP:1S	P&F	5.00	4.20	1.00	1.40	0.00	0.00	1.00	0.60	0.00	0.00	+	0	0	
25. Sandila	SL	1.50	1.12	1PP:1S	P&F	0.00	0.00	10.00	9.20	2.00	1.60	1.00	0.60	0.00	0.00	0	0	0	
Average						2.50	2.10	5.50	5.30	1.00	0.80	1.00	0.60	0.00	0.00	0.50	0	0	
LUCKNOW																			
26. Malihabad	SL	2.00	1.50	1PP:1PM	P&F	1.00	1.60	3.00	2.80	0.00	0.00	1.00	1.20	0.00	0.00	+	0	0	
27. Lucknow	L	2.50	1.87	1PP:1S	P&F	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	+	0	0	
Average						0.50	0.80	1.50	1.40	0.00	0.00	0.50	0.60	0.00	0.00	1.00	0	0	
BARABANKI																			
28. Barabanki	SL	0.75	0.56	2PP:1PM	F	20.00	17.80	1.00	1.40	0.00	0.00	0.00	0.00	0.00	0.00	+	0	0	
29. Ramnagar	SL	1.50	1.12	1PP:1S	P&F	25.00	22.40	1.00	0.60	0.00	0.00	0.00	0.00	0.00	0.00	+	0	+	
Average						22.50	20.10	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0	0.50	
BAHRAICH																			
30. Kaiserganj	SL	0.50	0.37	1PP:1S	P&F	15.00	13.20	20.00	17.80	0.00	0.00	0.00	0.00	0.00	0.00	+	0	0	
31. Bahraich	SL	1.50	1.12	1PP:1S	P&F	15.00	12.60	0.00	0.00	2.00	1.40	0.00	0.00	0.00	0.00	+	0	0	
32. Payagpur	SL	2.00	1.50	1PP:1S	P	20.00	21.80	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	+	0	++	
Average						16.67	15.87	6.67	5.93	0.67	0.47	0.00	0.00	0.00	0.00	1	0	0.67	
GONDA																			
33. Bangain	SL	1.00	0.50	1PP:2S	P&F	0.00	0.00	2.00	2.40	0.00	0.00	0.00	0.00	0.00	0.00	+	0	+	
34. Gonda	SL	1.50	1.12	1PP:1S	P&F	10.00	8.60	2.00	1.40	0.00	0.00	0.00	0.00	2.00	2.40	+	0	+	
35. Nawabganj	SL	1.00	0.75	2PP:1S	P&F	5.00	4.60	0.00	0.00	0.00	0.00	0.00	0.00	2.00	1.60	+	0	0	
Average						5.00	4.40	1.33	1.27	0.00	0.00	0.00	0.00	1.33	1.33	1.00	0	0.67	

Contd.

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
FAIZABAD																			
36. Faizabad NDUAT Farm	SL	0.75	0.75	Sole	P&F	5.00	3.20	10.00	9.60	0.00	0.00	2.00	2.40	0.00	0.00	+	0	+	One plant infected with phyllody.
37. Faizabad	SL	0.75	0.56	1PP:1S	P&F	0.00	0.00	25.00	22.80	0.00	0.00	0.00	0.00	0.00	u.00	+	0	+	
Average						2.50	1.60	17.50	16.20	0.00	0.00	1.00	1.20	0.00	0.00	1.00	0	1.00	
BASTI																			
38. Kolepur	SL	0.75	0.56	1PP:1S	P&F	20.00	18.80	5.00	3.80	0.00	0.00	0.00	0.00	0.00	0.00	+	0	+	
39. Basti	SL	2,00	1.50	2PP:1S	P&F	0.00	0.00	50.00	46.20	0.00	0.00	0.00	0.00	0.00	0.00	+	0	++	
40. Khaliabad	SL	0.50	0.37	1PP:1S	P&F	40.00	37.20	5.00	3.40	0.00	0.00	0.00	0.00	0.00	0.00	+	0	+	
Average						20.00	18.67	20.00	17.80	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0	1.33	
GORAKPUR																			
41. Gorakpur	SL	1.00	0.75	2PP:1S	P&F	0.00	0.00	50.00	45.40	0.00	0.00	0.00	0.00	0.00	0.00	+	0	+	Observed wet leaf spot.
42. Jangalesikari	SL	2.00	1.50	1PP:1S	P&F	0.00	0.00	10.00	13.60	0.00	0.00	0.00	0.00	0.00	0.00	+	0	++	
Average						0.00	0.00	30.00	29.50	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0	1.5	
DEORIA																			
43. Gauribazar	SL	1.50	1.12	1PP:1S	P&F	0.00	0.00	60.00	57.20	0.00	0.00	0.00	0.00	0.00	0.00	+	0	0	
44. Deoria	SL	1.25	0.93	2PP:1S	P&F	0.00	0.00	50.00	46.80	0.00	0.00	0.00	0.00	0.00	0.00	+	+	0	
45. Bhagalpur	SL	2.00	1.50	2PP:1S	P&F	5.00	4.20	20.00	18.80	0.00	0.00	1.00	0.60	0.00	0.00	+	+	0	Observed wet leaf spot.
46. Pindi	SL	0.50	0.37	2PP:1S	F	0.00	0.00	10.00	10.60	5.00	4.20	0.00	0.00	5.00	4.20	+	+	+	Observed Bacterial canker.
Average						1.25	1.05	35.00	33.35	1.25	1.05	0.25	0.15	1.25	1.05	1.00	0.75	0.25	
BALLIA																			
47. Thurthipar	SL	1.50	1.50	Sole	P&F	1.00	0.60	75.00	72.60	0.00	0.00	0.00	0.00	0.00	0.00	+	+	+	
48. Narapathpur	SL	0.25	0.12	1PP:2P	P&F	0.00	0.00	20.00	18.80	0.00	0.00	0.00	0.00	10.00	8.20	+	0	+	
Average						0.50	0.30	47.50	45.70	0.00	0.00	0.00	0.00	5.00	4.10	1.00	0.50	1.00	

Contd.

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
AZAMGARH																			
49. Ghosi	CL	1.50	0.25	1PP:1S 1BG:1IM	P&F	0.00	0.00	75.00	75.60	0.00	0.00	0.00	0.00	2.00	1.60	+	0	+	Observed wet leaf spot.
50. Mau	CL	1.00	0.75	2PP:1S	P&F	0.00	0.00	90.00	87.60	0.00	0.00	0.00	0.00	2.00	1.80	+	+	0	
51. Azamgarh	SL	1.50	1.12	2PP:1S	P&F	5.00	3.80	60.00	56.60	0.00	0.00	0.00	0.00			+	+	0	
52. Chirayyakot	SL	0.50	0.37	1PP:1S	P&F	0.00	0.00	50.00	49.20	0.00	0.00	0.00	0.00	1.00	0.60	+	+	0	
Average						1.25	0.95	68.75	67.25	0.00	0.00	0.00	0.00	1.25	1.00	1.00	0.75	0.25	
GHAZIAPUR																			
53. Dullanpur	SL	0.25	0.19	2PP:1S	P&F	0.00	0.00	10.00	7.40	0.00	0.00	5.00	3.10	0.00	0.00	+	+	0	
54. Ghaziapur	SL	1.00	0.75	2PP:1S	P&F	0.00	0.00	20.00	18.80	0.00	0.00	5.00	3.60	0.00	0.00	+	0	+	
55. Saidpur	SL	1.50	1.12	1PP:1S	P&F	0.00	0.00	30.00	27.00	0.00	0.00	0.00	0.00	0.00	0.00	0	+	+	
Average						0.00	0.00	20.00	17.73	0.00	0.00	3.33	2.23	0.00	0.00	0.67	0.67	0.67	
VARANASI																			
56. Sarnath	SL	0.75	0.75	Sole	P&F	20.00	17.20	10.00	11.20	0.00	0.00	2.00	1.40	0.00	0.00	+		+	
57. Varanasi BHU Farm	SL	1.50	1.50	Sole	P	50.00	47.20	5.00	3.60	10.00	8.20	0.00	0.00	0.00	0.00	+		+	
58. Ramnagar	CL	1.50	1.12	1PP:1PM	F	25.00	24.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0		+	
59. Fatenpur	SL	2.00	1.50	1PP:1S	F	20.00	18.20	1.00	0.60	0.00	0.00	10.00	8.60	1.00	0.40	0		+	
Average						28.75	26.70	4.00	3.85	2.50	2.05	3.00	2.50	0.25	0.10	0.50		1.00	
MIRZAPUR																			
60. Parsoda	SL	0.50	0.25	2PP:3S	P&F	20.00	17.60	60.00	57.40	0.00	0.00	2.00	1.40	15.00	13.60	+	0	+	
61. Pandari	SL	2.00	1.00	1PP:1PM	F	0.00	0.00	5.00	4.20	0.00	0.00	5.00	3.40	10.00	9.00	0	0	0	
Average						10.00	8.80	32.50	30.80	0.00	0.00	3.50	2.40	12.50	11.30	0.50	0	0.50	

Contd.

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
JAUNPUR																			
62. Rampur	SL	1.00	0.50	1PP:1PM	P&F	0.00	0.00	1.00	0.60	0.00	0.00	2.00	1.60	0.00	0.00	0.00	0.00	0.00	Black leaf spot at one location.
63. Mayanagar	SL	0.25	0.18	2PP:1S	P	0.00	0.00	5.00	4.40	0.00	0.00	0.00	0.00	0.00	0.00	+	0.00	0.00	
64. Mungrabud-shalpur	SL	1.50	1.12	1PP:1S	P&F	0.00	0.00	5.00	3.60	0.00	0.00	25.00	22.20	20.00	18.00	0.00	0.00	0.00	
Average						0.00	0.00	3.67	2.87	0.00	0.00	9.00	7.93	6.67	6.00	0.33	0.00	0.00	
ALLAHABAD																			
65. Phulpur	SL	1.00	0.75	1PP:1PM	P&F	10.00	8.60	0.00	0.00	0.00	0.00	5.00	4.60	0.00	0.00	0.00	0.00	0.00	
66. Allahabad	SL	1.50	0.75	1PP:1PM	F	10.00	7.60	0.00	0.00	0.00	0.00	5.00	4.20	5.00	3.60	+	0.00	0.00	Die-back in one location.
67. Mauaimma	SL	1.00	0.50	1PP:1S	F	2.00	1.40	5.00	4.20	0.00	0.00	10.00	7.80	2.00	1.80	+	0.00	0.00	
Average						7.33	5.87	1.67	1.40	0.00	0.00	6.67	5.53	2.33	1.80	0.67	0.00	0.00	
PRATAPGARH																			
68. Chandpur	SL	0.50	0.25	2PP:3PM	F	90.00	86.20	5.00	3.40	2.00	1.60	10.00	8.80	0.00	0.00	0.00	0.00	+	
69. Bella	SL	1.00	0.75	1PP:1S:1G:1MR	P&F	10.00	8.60	5.00	3.80	0.00	0.00	5.00	3.20	5.00	4.00	0.00	0.00	++	
Average						50.00	47.40	5.00	3.60	1.00	0.80	7.50	6.00	2.50	2.00	0.00	0.00	1.50	
SULTANPUR																			
70. Bhada	SL	0.75	0.37	1PP:1S	P&F	0.00	0.00	50.00	48.20	2.00	1.40	5.00	4.60	0.00	0.00	+	0.00	+	
71. Sultanpur	SL	1.00	0.75	1PP:1S	P&F	25.00	21.40	5.00	3.60	0.00	0.00	5.00	4.40	5.00	4.60	0.00	0.00	+	
72. Gauriganj	SL	1.50	1.20	1PP:1S	P&F	20.00	19.00	5.00	4.60	0.00	0.00	2.00	1.80	0.00	0.00	0.00	0.00	0.00	
Average						15.00	13.47	20.00	18.80	0.67	0.47	4.00	3.60	1.67	1.53	0.33	0.00	0.67	

Contd.

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
RAEBARELI																			
73. Jais	SL	1.00	0.75	1PP:1S	P&F	25.00	23.80	2.00	1.40	0.00	0.00	0.00	0.00	0.00	0.00	+	0.00	0.00	
74. Raebareli	SL	0.50	0.25	2PP:3S	P&F	90.00	86.20	0.00	0.00	20.00	16.40	2.00	1.20	0.00	0.00	+	0.00	+	Observed wet leaf spot.
75. Lalganj	SL	1.00	0.75	1PP:1S	P&F	30.00	22.80	0.00	0.00	0.00	0.00	4.00	3.40	0.00	0.00	+	0.00	+	
Average						48.33	44.27	0.67	0.47	6.67	5.47	2.00	1.53	0.00	0.00	1.00	0.00	0.67	
UNNAO																			
76. Tabia	SL	0.75	0.56	2PP:1S	P&F	0.00	0.00	0.00	0.00	0.00	0.00	3.00	2.40	0.00	0.00	+	0.00	0.00	
77. Achalganj	SL	0.75	0.56	1PP:1S	P&F	80.00	77.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	+	0.00	+	
Average						40.00	38.60	0.00	0.00	0.00	0.00	1.50	1.20	0.00	0.00	1.00	0.00	0.50	
KANPUR																			
78. Kanpur CSAUAT Farm	SL	0.50	0.50	Sole	P&F	50.00	47.60	5.00	4.60	0.00	0.00	0.00	0.00	20.00	18.20	+	0.00	0.00	
79. Maharajpur	SL	0.25	0.18	1PP:1S	P	5.00	3.20	5.00	4.20	0.00	0.00	5.00	3.80	0.00	0.00	0.00	0.00	0.00	
80. Bhognipur	L	0.75	0.56	1PP:1S	P	20.00	18.40	90.00	87.40	0.00	0.00	3.00	2.00	0.00	0.00	+	0.00	+	
81. Sikandra	SL	0.50	0.37	1PP:1S	P&F	30.00	27.20	50.00	48.20	0.00	0.00	5.00	4.00	0.00	0.00	0.00	0.00	0.00	
Average						26.25	24.10	37.50	36.10	0.00	0.00	3.25	2.45	5.00	4.55	0.50	0.00	0.25	
FATEHPUR																			
82. Salapur	SL	1.00	0.50	2PP:3S	P&F	20.00	19.20	5.00	4.60	0.00	0.00	5.00	3.80	15.00	14.20	-	0.00	+	
83. Kuraua	SL	0.75	0.37	1PP:1S:1SH	P&F	0.00	0.00	20.00	18.60	0.00	0.00	5.00	4.40	0.00	0.00	0.00	0.00	+	
84. Lalauli	SL	1.50	0.75	2PP:2S:1Ca	P	0.00	0.00	0.00	0.00	25.00	23.60	3.00	2.00	0.00	0.00	0.00	0.00	+	
Average						6.67	6.40	8.33	7.73	8.33	7.87	3.25	3.40	5.00	4.73	0.33	0.00	1.00	
BANDA																			
85. Dohtara	SL	2.00	1.00	1PP:1S	P	0.00	0.00	5.00	3.60	25.00	22.60	3.00	2.40	0.00	0.00	0.00	0.00	0.00	Observed Bacterial canker.
86. Banda	SL	2.00	1.00	2PP:3PM	P	0.00	0.00	0.00	0.00	10.00	8.60	0.00	0.00	0.00	0.00	+	0.00	0.00	
Average						0.00	0.00	2.50	1.80	17.50	15.60	1.50	1.20	0.00	0.00	0.50	0.00	0.00	

Contd.

1		2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HAMIRPUR																				
87.	Kabrai	CL	0.50	0.12	1PP:AS	P&F	0.00	0.00	0.00	0.00	5.00	4.00	0.00	0.00	0.00	0.00	+	+	+	
88.	Kulpanar	CL	1.00	0.75	1PP:1G	P	0.00	0.00	0.00	0.00	20.00	16.80	0.00	0.00	0.00	0.00	+	0.00	0.00	
89.	Kalhanda	CL	2.00	1.50	2PP:1IM:1S	P	30.00	28.40	15.00	13.40	25.00	23.60	0.00	0.00	0.00	0.00	+	0.00	0.00	
90.	Gohand	SL	0.50	0.25	1PP:2G	P	10.00	7.80	0.00	0.00	20.00	18.20	0.00	0.00	0.00	0.00	+	0.00	0.00	
	Average						10.00	9.05	3.75	3.35	17.50	15.65	0.00	0.00	0.00	0.00	1.00	0.25	0.25	
JALAUN																				
91.	Dakur	SL	0.75	0.37	1PP:1S:1G	P	0.00	0.00	0.00	0.00	50.00	45.80	4.00	3.20	0.00	0.00	+	0.00	0.00	Die back in one location.
92.	Kalpi	SL	1.00	0.75	1PP:1S	P	5.00	3.40	0.00	0.00	10.00	8.60	5.00	3.80	0.00	0.00	+	0.00	+	
	Average						2.50	1.70	0.00	0.00	30.00	27.20	4.50	3.50	0.00	0.00	1.00	0.00	0.50	
ETAWAH																				
93.	Auraiya	L	1.00	0.75	1PP:1S	P&F	40.00	37.20	50.00	47.40	15.00	12.80	0.00	0.00	0.00	0.00	0.00	0.00	+	
94.	Bakewar	L	0.50	0.25	1PP:1S	P&F	0.00	0.00	25.00	23.40	0.00	0.00	4.00	3.40	0.00	0.00	+	0.00	0.00	
95.	Ravaiyapura	L	0.50	0.25	1PP:1PM:1G	P&F	0.00	0.00	2.00	1.40	0.00	0.00	5.00	3.60	0.00	0.00	+	0.00	0.00	
	Average						13.33	12.40	25.67	24.07	5.00	4.27	3.00	2.33	0.00	0.00	0.67	0.00	0.33	
MAINPURI																				
96.	Ladwanpur	SL	0.75	0.37	1PP:1S	P&F	0.00	0.00	5.00	4.40	5.00	4.00	2.00	1.60	0.00	0.00	+	0.00	0.00	
97.	Kurawali	SL	1.00	0.50	2PP:3PM	P&F	0.00	0.00	20.00	17.80	0.00	0.00	3.00	2.60	0.00	0.00	+	0.00	0.00	
	Average						0.00	0.00	12.50	11.10	2.50	2.00	2.50	2.10	0.00	0.00	1.00	0.00	0.00	
ETAH																				
98.	Malawan	SL	1.00	0.75	1PP:1PM	P&F	0.00	0.00	50.00	48.60	0.00	0.00	2.00	1.20	0.00	0.00	+	0.00	0.00	
99.	Awagash	SL	0.50	0.25	2PP:3PM	P&F	0.00	0.00	75.00	71.60	0.00	0.00	2.00	1.80	0.00	0.00	+	0.00	0.00	
	Average						0.00	0.00	62.50	60.10	0.00	0.00	2.00	1.50	0.00	0.00	1.00	0.00	0.00	

Contd.

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
AGRA																			
100. Sikandar	SL	1.00	0.75	1PP:2PM	P&F	0.00	0.00	0.00	0.00	0.00	0.00	20.00	19.00	0.00	0.00	0.00	0.00	0.00	
101. Sikandra	L	1.00	0.50	1PP:2PM	P&F	40.00	38.60	5.00	4.60	0.00	0.00	3.00	2.20	0.00	0.00	+	0.00	0.00	
Average						20.00	19.30	2.50	2.30	0.00	0.00	11.50	10.60	0.00	0.00	0.50	0.00	0.00	
MATHURA																			
102. Farah	CL	2.00	1.50	1PP:1PM	P	25.00	23.20	15.00	14.20	40.00	37.20	0.00	0.00	0.00	0.00	+	0.00	0.00	
103. Raya	CL	0.75	0.80	Border crop to wheat	P&F	0.00	0.00	20.00	17.20	0.00	0.00	2.00	1.20	0.00	0.00	+	0.00	0.00	
Average						12.50	11.60	17.50	15.70	20.00	18.60	1.00	0.60	0.00	0.00	1.00	0.00	0.00	
ALIGARH																			
104. Bhagadanganj	SL	3.00	1.50	1PP:3PM	P&F			30.00	27.60	5.00	3.80	5.00	4.20	0.00	0.00	+	0.00	+	
105. Aligarh	SL	0.50	0.25	1PP:3PM	P&F			95.00	93.20	10.00	8.80	5.00	4.20	0.00	0.00	+	0.00	+	
Average								62.50	60.40	7.50	6.30	5.00	4.20	0.30	0.00	1.00	0.00	1.00	
BULANDSHAHAR																			
106. Khurja	CL	0.50	0.37	1PP:2PM				15.00	13.80	0.00	0.00	2.00	1.60	0.00	0.00	0.00	0.00	0.00	
Average								15.00	13.80	0.00	0.00	2.00	1.60	0.00	0.00	0.00	0.00	0.00	

Contd.

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
JHANSI																			
107. Jhansi	C	0.25	0.12	1PP:1S:1Tom	P&F			0,00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	+	0.00	0.00	
LALITPUR																			
108. Umariya	C	2.00	0.20	1PP:10S	P&F			0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	+	0.00	0.00	

PP - Pigeonpea, S - Sorghum, PM - Pearl millet, GN - Groundnut, P - Paddy, G - Gingelly, IM - Italian Millet,
M - Maize, C - Cotton, BG - Black gram, Me - Mesta, SH - Sunn-hemp, Ca - Castor, Tom - Tomato.
L - Loamy, SL - Sandy loam, CL - Clayey loam.
F - Flowering, P&F - Podding & Flowering, P - Podding.
SM - Sterility mosaic, YMV - Yellow mosaic virus.
Net pigeonpea area was estimated on crop growth basis and is not related to cropping pattern.

Table-96. Districtwise Summary of data on PP disease incidence in Uttar Pradesh

District	No. of locations examined	Total area observed (ha)	Net PP area observed (ha)	% Wilt		% SM		%Microphomina stem canker		% YMV		% Blight		*Cercospora*	*Phyllosticta*	Grey mildew	Remarks
				Over-all	Within 500	Over-all	Within 500	Over-all	Within 500	Over-all	Within 500	Over-all	Within 500				
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Ghaziabad	2	2.00	1.37	3.00	3.00	20.00	20.00	0.00	0.00	2.00	2.10	7.50	6.30	0.50	0.00	0.00	
Meerut	1	0.75	0.56	0.00	0.00	50.00	46.20	0.00	0.00	5.00	6.40	0.00	0.00	1.00	0.00	0.00	
Moradabad	3	1.25	0.86	0.67	0.53	3.30	3.93	0.00	0.00	2.67	3.47	0.00	0.00	0.67	0.00	0.00	
Rampur	2	1.75	1.31	7.50	7.10	2.50	2.10	0.00	0.00	0.50	0.80	0.00	0.00	0.50	0.00	0.00	Observed black leaf spot (?) at one location.
Nainital	2	1.50	1.37	0.50	0.40	40.00	35.00	0.00	0.00	0.50	0.80	5.00	4.20	1.00	0.00	0.00	
Bareilly	3	1.50	0.74	1.67	1.73	8.33	8.07	1.00	1.13	0.33	0.13	5.00	4.13	1.00	0.00	0.00	
Pilibhit	2	0.95	0.71	2.50	3.40	3.50	3.60	0.00	0.00	0.00	0.00	2.50	1.40	0.00	0.00	0.00	
Shahjahanpur	2	1.00	0.50	2.50	1.80	5.00	5.90	0.00	0.00	0.00	0.00	5.00	3.80	1.00	0.00	0.00	
Lakhimpur	3	2.25	1.49	5.00	4.53	5.67	5.80	0.33	0.40	0.00	0.00	0.00	0.00	0.67	0.00	0.00	
Sitapur	3	2.25	1.47	1.66	2.27	7.33	6.60	3.33	2.60	0.00	0.00	0.00	0.00	0.33	0.00	0.00	
Hardoi	2	3.00	1.87	2.50	2.10	5.50	5.30	1.00	0.80	1.00	1.00	0.00	0.00	0.50	0.00	0.00	
Lucknow	2	4.50	3.37	0.50	0.80	1.50	1.40	0.00	0.00	0.50	0.60	0.00	0.00	1.00	0.00	0.00	
Barabanki	2	2.25	1.68	22.50	20.10	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.50	
Bahraich	3	4.00	2.99	16.67	15.87	6.67	5.93	0.67	0.47	0.00	0.00	0.00	0.00	1.00	0.00	0.67	

Contd.

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Gonda	3	3.50	2.37	5.00	4.40	1.33	1.27	0.00	0.00	0.00	0.00	1.33	1.33	1.00	0.00	0.67	
Faizabad	2	1.50	1.31	2.50	1.60	17.50	16.20	0.00	0.00	1.00	1.20	0.00	0.00	1.00	0.00	1.00	
Basti	3	3.25	2.43	20.00	18.67	20.00	17.80	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	1.33	
Gorakpur	2	3.00	2.25	0.00	0.00	30.00	29.50	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	1.50	Observed wet leaf spot (?) at one location.
Deoria	4	5.25	3.92	1.25	1.05	35.00	33.35	1.25	1.05	0.25	0.15	1.25	1.05	1.00	0.75	0.25	Observed wet leaf spot (?) and bacterial stem canker at 2 different locations.
Ballia	2	1.75	1.62	0.50	0.30	47.50	45.70	0.00	0.00	0.00	0.00	5.00	4.10	1.00	0.50	1.00	
Azamgarh	4	3.50	2.49	1.25	0.95	68.75	67.25	0.00	0.00	0.00	0.00	1.25	1.00	1.00	0.75	0.25	Observed wet leaf spot (?) at one location
Ghaziapur	3	2.75	2.06	0.00	0.00	20.00	17.73	0.00	0.00	3.33	2.23	0.00	0.00	0.67	0.67	0.67	
Varanasi	4	5.75	4.87	28.75	26.70	4.00	3.85	2.50	2.05	3.00	2.50	0.25	0.10	0.50	0.00	1.00	
Mirzapur	2	2.50	1.25	10.00	8.80	32.50	30.80	0.00	0.00	3.50	2.40	12.50	11.30	0.50	0.00	0.50	
Jaunpur	3	2.75	1.80	0.00	0.00	3.67	2.87	0.00	0.00	9.00	7.93	6.67	6.00	0.33	0.00	0.00	Observed black leaf spot (?) at one location

Contd.

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Allahabad	3	3.50	2.00	7.33	5.87	1.67	1.40	0.00	0.00	6.67	5.53	2.33	1.80	0.67	0.00	0.00	Observed Die-back at one location.
Pratapgarh	2	1.50	1.00	50.00	47.40	5.00	3.60	1.00	0.80	7.50	6.00	2.50	2.00	0.00	0.00	1.50	
Sultanpur	3	3.25	2.32	15.00	13.47	20.00	18.80	0.67	0.47	4.00	3.60	1.67	1.53	0.33	0.00	0.67	
Raibareli	3	2.50	1.75	48.33	44.27	0.67	0.47	6.67	5.47	2.00	1.53	0.00	0.00	1.00	0.00	0.67	Observed wet leaf spot (?) at one location.
Unnao	2	1.50	1.12	40.00	38.60	0.00	0.00	0.00	0.00	1.50	1.20	0.00	0.00	1.00	0.00	0.50	
Kanpur	4	2.00	1.61	26.25	24.10	37.50	36.10	0.00	0.00	3.25	2.45	5.00	4.55	0.50	0.00	0.25	
Fatehpur	3	3.25	1.62	6.67	6.40	8.33	7.73	8.33	7.87	3.25	3.40	5.00	4.73	0.33	0.00	1.00	
Banda	2	4.00	2.00	0.00	0.00	2.50	1.80	17.80	15.60	1.50	1.20	0.00	0.00	0.50	0.00	0.00	Observed bacterial stem canker at one location.
Hamirpur	4	4.00	2.62	10.00	3.75	3.75	3.35	17.50	15.65	0.00	0.00	0.00	0.00	1.00	0.25	0.25	
Jalaun	2	1.75	1.12	2.50	1.70	0.00	0.00	30.00	27.20	4.50	3.50	0.00	0.00	1.00	0.00	0.50	Observed Die-back at one location.
Etawah	3	2.00	1.25	13.33	12.40	25.67	24.07	5.00	4.27	3.00	2.33	0.00	0.00	0.67	0.00	0.33	
Mainpuri	2	1.75	0.87	0.00	0.00	12.50	11.10	2.50	2.00	2.50	2.10	0.00	0.00	1.00	0.00	0.00	
Etah	2	1.50	1.00	0.00	0.00	62.50	60.10	0.00	0.00	2.00	1.50	0.00	0.00	1.00	0.00	0.00	

Contd.

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Agra	2	2.00	1.25	20.00	19.30	2.50	2.30	0.00	0.00	11.50	10.60	0.00	0.00	0.50	0.00	0.00	
Mathura	2	2.75	1.58	12.50	11.60	17.50	15.70	20.00	18.60	1.00	0.60	0.00	0.00	1.00	0.00	0.00	
Aligarh	2	3.50	1.75	0.00	0.00	62.50	60.40	7.50	6.30	5.00	4.20	0.00	0.00	1.00	0.00	1.00	
Bulandshahar	1	0.50	0.37	0.00	0.00	15.00	13.80	0.00	0.00	2.00	1.60	0.00	0.00	0.00	0.00	0.00	
Jhansi	1	0.25	0.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	
Lalitpur	1	2.00	0.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	
Average				8.83	8.19	16.32	15.41	2.88	2.56	2.13	1.89	1.59	1.35	0.74	0.07	0.36	

PP - Pigeonpea

SM - Sterility mosaic

YMV - Yellow Mosaic Virus

<u>Range:</u>

Wilt - 0-86%

SM -- 0-93%

Macrophomina stem canker - 0-46%

YMV - 0-22%

Phytophthora blight - 0-18%

7. Pilibhit

Two locations were observed and the incidence of wilt, SM and PB was very low.

8. Shahajahanpur

Pigeonpea was mainly cultivated in clayey loam soils and was intercropped with sorghum. The crop was in flowering and podding stage. The incidence of wilt, SM, PB and Cercospora leaf spot was low.

9. Lakhimpur

The crop was cultivated either in clayey or sandy loam soils and was in flowering and podding stages. The average incidence of wilt and SM was 4.5% and 5.8%, respectively. The incidence of other diseases was very low.

10. Sitapur

The crop was grown in clayey and sandy loam soils intercropped with sorghum. The average incidence of SM was 6.6%.

11. Hardoi

Sampling involved two locations and the crop was cultivated mainly in sandy loam soils along with sorghum. It was in flowering and podding stage. The average SM incidence was 5.3%. Incidence of other diseases was low.

12. Lucknow

Pigeonpea crop was cultivated in loamy and sandy loam soils and was in flowering and podding stage. Incidence of diseases was very low.

13. Barabanki

Most of the crop was cultivated in sandy loam soils. Incidence of wilt averaged 20.1%. Incidence of other diseases was low.

14. Bahraich

Generally pigeonpea was observed in sandy loam soils, intercropped with sorghum. The average wilt incidence was 15.8%.

15. Gonda

The crop was in podding and flowering stage. The average wilt incidence was 4.4%. Very low incidence of SM and PB was observed.

16. Faizabad

The survey was made in only a part of this district. Crop was grown in sandy loam and was in podding and flowering stage. The average incidence of SM was 16.2%. Incidence of other diseases was low. Visited pigeonpea experimental plots at N.D. University of Agriculture and Technology, Faizabad.

17. Basti

The crop was grown in sandy loam and intercropped with sorghum. The average incidence of wilt and SM was 18.6% and 17.8%, respectively.

18. Gorakhpur

The tour was made in only a part of this district. The crop was intercropped with sorghum and was in podding and flowering stage. The average SM incidence was 29.5%.

19. Deoria

Most of the crop was cultivated in sandy loam along with sorghum. The incidence of SM alone was 33.3%. Low incidence of other diseases was recorded.

20. Ballia

Pigeonpea crop was cultivated in sandy loam soils and was in podding and flowering stage. The average incidence of SM was 45.7%.

21. Azamgarh

The crop was generally intercropped with sorghum and was in podding and flowering stage. The average incidence of SM was 67.2%. The incidence of other diseases was low.

22. Ghazipur

In this district, pigeonpea was in podding and flowering stage and was intercropped with sorghum. The average incidence of SM was17.7%.

23. Varanasi

The crop was cultivated either in sandy loam or in clayey loam soil. The average wilt incidence was 26.7%. The incidence of other diseases was low. Visited Banaras Hindu University pigeonpea experimental plots including National Uniform Wilt Trial where ICRISAT lines were also tested for wilt resistance.

FIGURE 4. PREVALENCE OF PIGEONPEA WILT (PERCENT) IN UTTAR PRADESH DURING THE YEAR 1978-1979.

FIGURE 5. PREVALENCE OF PIGEONPEA STERILITY MOSAIC (PERCENT) IN UTTAR PRADESH DURING THE YEAR 1978-1979.

24. Mirzapur

The crop was cultivated in sandy loam soils. The average incidence of wilt, SM and PB was 8.8%, 30.8% and 11.3%, respectively.

25. Jaunpur

The average incidence of YM and PB was 7.9% and 6.0%, respectively. The highest incidence of YM was observed at Mungrabudshalpur (22.2%). Incidence of SM was low (2.8%).

26. Allahabad

Pigeonpea was cultivated in sandy loam soils either with sorghum or pearl millet. The average incidence of wilt and YM was 5.8% and 5.5%, respectively. The incidence of other diseases was low.

27. Pratapgarh

The average wilt incidence was 47.4%. The highest incidence of wilt was observed at Chandpur (86.2%). Sterility mosaic, MSC, YM, PB and grey mildew were observed. However, their average incidence was low.

28. Sultanpur

The crop was grown in sandy loam soils along with sorghum and was in flowering and podding stage. The average incidence of wilt and SM was 13.4% and 18.8%, respectively. The incidence of other diseases was low.

29. Raebarelli

The crop was cultivated in sandy loam soils and was in flowering and podding stage. It was intercropped with sorghum. The average wilt incidence was 44.2%. Presence of SM, MSC, YM, PB, Cercospora leaf spot and grey mildew were also recorded.

30. Unnao

Stopped at two locations for observing the disease incidence. The average wilt incidence was 38.6%. At one location 77.2% wilt was noticed. Incidence of other diseases was low.

31. Kanpur

The crop was in flowering and podding stages. Generally it was intercropped with sorghum. The average incidence of wilt and SM was 24.1% and 36.1%, respectively. Pigeonpea experimental plots at C.S.Azad University of Agriculture and Technology farm, Kanpur were also visited.

32. Fatehpur

Pigeonpea was cultivated in sandy loam soils and was in flowering or podding stage. Incidence of diseases was low.

33. Banda

The pigeonpea crop was generally poor in this district. It was cultivated in sandy loam soils either with sorghum or pearl millet and was in podding stage. Macrophomina stem canker was the major problem.

34. Hamirpur

The crop cultivated mainly in clayey loam soils and was in flowering or podding stage. Here also the average incidence of MSC was high (15.6%). The average incidence of wilt was 9.0%. The incidence of other diseases was low.

35. Jalaun

In this district pigeonpea crop growth was poor. It was cultivated in sandy loam and was in podding stage. The average incidence of MSC was 27.2%. The highest incidence of MSC was observed at Dakur (45.8%).

36. Etawah

The crop was grown in loamy soils and was in flowering and podding stage. The average incidence of wilt and SM was 12.4% and 24.0%, respectively. The incidence of other diseases was low.

37. Mainpuri

The crop was in flowering and podding stage. The average SM incidence was 11.1%. Macrophomina stem canker, YM and Cercospora leaf spot were also recorded.

38. Etah

Pigeonpea crop was cultivated in sandy loam soils along with pearl millet and was in flowering and podding stage. The average SM incidence was 60.1%. The incidence of YM and Cercospora leaf spot was low.

39. Agra

The crop was intercropped with pearl millet and was in flowering and podding stage. The average wilt and YM incidence was 19.3% and 10.6%, respectively.

40. Mathura

The crop was cultivated in clayey loam soils. The average incidence of wilt, SM and MSC was 11.6%, 15.7% and 18.6%, respectively. The incidence of other diseases was low.

41. Aligarh

Pigeonpea was grown in sandy loamy soils along with pearl millet and was in flowering and podding stage. The average SM incidence was 60.4%. The highest incidence of SM was recorded at Aligarh (93.2%). The incidence of other diseases was low.

42. Bulandshahar

The area under pigeonpea crop was very low. The crop was cultivated in clayey loam along with pearl millet and was in flowering and podding stage. The average SM incidence was 13.8%.

43. Jhansi

Travel limited to only a part of this district. The crop was grown in clayey soil and was in flowering and podding stage. Only Cercospora leaf spot could be observed.

44. Lalitpur

The crop was cultivated in clayey soil along with sorghum and was in flowering and podding stage. Here also, only Cercospora leaf spot was noticed.

Isolations

Wilt disease was observed at 56 locations out of 108 surveyed. *Fusarium udum* was isolated on PDA medium from all the samples collected. Macrophomina stem canker samples yielded *Rhizoctonia bataticola*.

Conclusions

Roving surveys conducted in Uttar Pradesh revealed sterility mosaic, wilt, Macrophomina stem canker, yellow mosaic and Phytophthora blight as the important disease problems.

The incidence of wilt ranged from 0.0 to 86.2% with an overall average of 8.2%. Wilt was noticed in 33 out of 44 districts surveyed. Maximum incidence of wilt was in Pratapgarh district; i.e., an average of 47.4%. The wilt was 20.0% and more in Barabanki, Varanasi, Pratapgarh, Raebareli, Unnao, and Kanpur districts.

Sterility mosaic was observed in 40 out of 44 districts surveyed. The incidence of SM varied from 0.0 to 93.2% with an overall average of 15.4%. The highest overall incidence of SM (67.2%) was observed in Azamgarh district. Sterility mosaic incidence was 20% and more in Ghaziabad, Meerut, Nainital, Gorakhpur, Deoria, Ballia, Azamgarh, Mirzapur, Kanpur, Etawah, Etah and Aligarh districts.

The next important problem was Macrophomina stem canker (MSC). It was observed in 18 out of 44 districts surveyed. The incidence ranged from 0.0 to 45.8% with an overall average of 2.5%. Maximum incidence of MSC was noticed in Jalaun district (27.2%).

The Yellow mosaic (YM) was recorded in 30 out of 44 districts surveyed. The incidence ranged from 0.0 to 22.2% with an overall average of 1.8%. The highest overall incidence of YM was in Agra district (10.6%).

The Phytophthora blight was observed in 17 out of 44 districts surveyed. The Phytophthora blight incidence varied from 0.0 to 18.2% with an overall average of 1.3%. The highest overall incidence of blight was in Mirzapur district (11.3%).

Low incidence of Cercospora leaf spot, Phyllosticta leaf spot, and bacterial canker was observed.

This survey indicated that SM and wilt are the major problems of pigeonpea in Uttar Pradesh. Macrophomina stem canker, YM and Phytophthora blight are potentially important problems.

B. Phytophthora blight in Delhi and Kanpur

This survey trip was undertaken by Dr. J. Kannaiyan.

The objective of the survey was to study the relative incidence of the Phytophthora blight in Delhi and Kanpur and to obtain isolates of *Phytophthora* from those areas. The incidence was moderate in Delhi and high at Deeg. The trip report is in APPENDIX XLVI.

IV. YELLOW MOSAIC

A. Introduction

Yellow mosaic in pigeonpea is caused by Mungbean yellow mosaic transmitted by *Bemisia tabaci*. During the normal season (kharif), its incidence in pigeonpea is very low. However in the rabi pigeonpea experimental plots at ICRISAT, its incidence was more conspicuous. The reason for comparatively higher incidence in rabi plantings than the kharif plantings could be that in kharif the vector has several other crop and weed hosts that are more preferred by it than the pigeonpea. In rabi, the vector has not much choice and is forced to feed on pigeonpea and consequently more disease. At present cultivation of pigeonpea in rabi is very much limited. But it may become popular if the experimental results prove encouraging. In that case yellow mosaic is likely to become a problem.

B. Incidence at ICRISAT Center

Before taking up any resistance screening work, it is necessary to find out the extent of its incidence and effect on yield. This year the incidence of the disease in different experimental plots at ICRISAT was estimated. The results are presented in Table 97.

Table 97. Occurrrence of yellow mosaic in different experimental plots of rabi pigeonpea at ICRISAT during 1978-79

Field	Date of planting	Total plants	Infected plants	Percent infection
Campus-C	4.1.1979	1426	21	1.47
B-8	25.12.1978	4228	60	0.01
BA-25	October 1978	1025	3	0.29
Manmool Castle field	14.12.1978	783	46	5.87

The data indicate that the incidence was not high in any of the fields surveyed even though visually the incidence appeared high.

C. Incidence in monthly plantings

The disease incidence in BDN-1 planted at monthly intervals from July 1978 through January 1979 was also estimated. The results are presented in Table 98.

Table 98. Incidence of yellow mosaic in monthly plantings of pigeonpea (BDN-1)

Date of planting	Total plants	Infected plants	Percent infection
19.7.1978	580	0	0.00
18.8.1978	173	2	0.15
18.9.1978	631	5	0.79
18.10.1978	456	12	2.63
18.11.1978	679	5	0.73
18.12.1978	929	8	0.86
18.1.1979	1160	0	0.00

Incidence was higher in October planted pigeonpea. It may be related to the vector behaviour, and conditions which need to be investigated.

V. POWDERY MILDEW AND STERILITY MOSAIC

A. Introduction

During this season severe infestation of powdery mildew was seen in sterility mosaic screening nursery. Closer observations revealed sterility mosaic susceptible plants were more severely infested with powdery mildew (*Oidiopsis taurica*) than resistant ones. Experiments were carried out to find interaction between the two.

B. Materials and methods

Field observations were taken on 7-month old plants in sterility mosaic screening nursery planted in Vertisol during the last week of June 1978.

Powdery mildew severity was compared on ten germplasm selections for each of resistant, mild mosaic and susceptible reaction types. Mildew severity on healthy and infected branches in the same plant was scored in three germplasm selections. One germplasm line ICP-2376 which shows ring spot reaction was also scored. Powdery mildew severity was rated on a 4-point scale; 1-No visible symptoms; 2-Symptoms on the lower surface of the older leaves; 3-Symptoms common on upper and lower surfaces of older and younger leaves; 4-Symptoms on older and younger leaves, stems, flowers, and pods. Curling and defoliation of leaves was common. For each genotype, rating on five randomly selected plants and overall rating was recorded.

Conidial production was compared on four genotypes of each with resistant, mild mosaic, ring spot and susceptible reactions. Conidial production on healthy and infected branches of one genotype was also studied. For conidial count, one gram of fresh leaf material from each reaction type was washed in 100 ml of sterile distilled water by keeping on shaker for one hour. Counts were taken using haemocytometer and the number of conidia per gram of tissue was calculated. The experiment was repeated twice.

Size of 100 conidia was measured for each reaction type. Germination was determined using cavity slides placed in humidity chambers. Counts were taken 12 hr after incubation at room temperature (23^oC). For conidial germination test on detached leaves, one cm^2 leaf discs were cut from each of sterility mosaic reaction type. A drop of conidial suspension was placed on leaf disc and incubated for overnight. The experiment was repeated thrice. Spore suspension placed on plain glass surface served as control.

Leaf extracts were prepared by grinding 1 g of leaf material in 10 ml of sterile distilled water (SDW) using a pestle and mortar. The extract was centrifuged at 3000 RPM for five minutes and the supernatent was used. To a drop of extract, one drop of conidial suspension was added in cavity slides and incubated for 12 hr before taking the germination counts. The experiment was repeated thrice. Leaf washes were prepared by washing 1 g of fresh leaves in 10 ml of SDW by keeping on shaker for 1 hr. To each drop of leaf washing a drop of conidial suspension was added in cavity slides and incubated for 12 hr.

In artificial inoculations, BDN-1, a cultivar susceptible to sterility mosaic and to powdery mildew, was used. Seedlings were raised in 15 cm dia plastic pots filled with natural Alfisol. In each pot 5-8 seedlings were retained. When the seedlings were 14-day old, half of them were inoculated with sterility mosaic following leaf stapling procedure and the other half were left uninoculated. Fifteen days after sterility mosaic inoculation, one half of inoculated and the other half of uninoculated were dusted with powdery mildew conidia. Disease severity and conidial production were estimated.

C. RESULTS

Severe incidence of powdery mildew caused by *Oidiopsis taurica* was noticed on pigeonpea when the crop was in flowering and podding stage. Dry and warm weather prevailed during the months of January and February 1979 favoured mildew development. The severity of mildew infestation on different reaction types rated on 4-point scale is presented in Table 99. The rating in all the ten resistant, one ring spot and ten mild mosaic lines was 2. On the other hand the rating in the susceptible lines ranged from 3 to 4. In genotypes where plants showed partial sterility healthy and diseased branches showed a rating of 2 and 4, respectively.

To substantiate the visual scoring conidial production in genotypes with different sterility mosaic reaction types was calculated and the results are presented in Table 100. Conidial production in different reaction types varied. Highest production of conidia was found in susceptible genotype followed by partially sterile branch. The differences between these two and others were statistically significant. Conidial production in resistant, ring spot, mild mosaic and partial sterility healthy types was low and the differences among them were not significant.

The size of the conidia on different reaction types was measured. The results are presented in Table 101. It is clear that there are no differences in the size.

Table 99. Severity of powdery mildew on pigeonpea genotypes different sterility mosaic reaction types.

Genotype	Reaction type	Mean[a]
ICP-3208-3S⊗	Resistant	2
ICP-2732-2S⊗	"	2
ICP-4919-2S⊗	"	2
ICP-2210-2S⊗	"	2
ICP-5113-1S⊗	"	2
ICP-2003-2S⊗	"	2
ICP-2020-2S⊗	"	2
ICP-2050-1S⊗	"	2
ICP-2096-1S⊗	"	2
ICP-2376	Ring spot	2
ICP-5175-1S⊗	Mild mosaic	2
ICP-4727-2S⊗	"	2
ICP-1921-3S⊗	"	2
ICP-1977-1S⊗	"	3
ICP-1978-4S⊗	"	2
ICP-5641-3S⊗	"	2
ICP-7873-4-1S⊗	"	2
ICP-8090-1-5S⊗	"	2
R.No. 1648	"	2
R.No. 1654	"	2
BDN-1	Susceptible	4
ICP-2209-1S⊗	"	4
ICP-1802-1S⊗	"	4
ICP-1833-1S⊗	"	4
ICP-2020-3S⊗	"	4
ICP-2060-1S⊗	"	4
ICP-5629-1S⊗	"	4
ICP-2112-2S⊗	"	4
ICP-2121-1S⊗	"	3
ICP-2209-3S⊗	Partial sterility	
	Healthy	2
	Diseased	4
ICP-7984-1S⊗	Healthy	2
	Diseased	4
ICP-2209-5S⊗	Healthy	2
	Diseased	4

[a] Mean of five replications.

Table 100. Powdery mildew conidial production in different sterility mosaic reaction types

Reaction type	Mean[a/]
Ring spot	2826.0
Susceptible	25834.5*
Resistant	1668.5
Mild mosaic	3724.0
Partial sterility - Healthy	1223.5
- Diseased	17263.0

[a/]Mean of two replications.
* Means were significant at P = 0.05.

Table 101. Powdery mildew conidial size in pigeonpea genotypes different sterility mosaic reaction types

Reaction type	Conidial size[a/] (μ)	
	Length	Breadth
Susceptible	57 (41-72)	18 (14-24)
Resistant	55 (38-72)	18 (14-26)
Ring spot	51 (41-65)	17 (12-24)
Mild mosaic	54 (41-74)	18 (14-24)
Partial healthy	57 (43-70)	18 (14-24)
Partial diseased	56 (43-74)	18 (14-26)

[a/]100 Conidia measured for each group.

Table 102. Germination of conidia from pigeonpea genotypes with different sterility mosaic reaction types

Reaction type	% Conidial germination[a/]
Susceptible	45.0
Ring spot	32.0
Mild mosaic	53.0
Resistant	52.0
Partial healthy	36.0
Partial diseased	49.0

[a/]100 Conidia observed in each group.

Table 103. Germination of powdery mildew conidia on detached leaf discs of different sterility mosaic reaction types

Treatment	Mean[a/]
BDN-1 (Healthy)	6.0
BDN-1 (Diseased)	15.7*
ICP-7194-2-1S⊗ (Resistant)	5.0
Plain glass surface	6.3

[a/] Mean of three replications.

*Means were significant at P = 0.05.

Table 104. Effect of leaf washings from pigeonpea genotypes on conidial germination

Treatment	% Average germinated[a/]
BDN-1 (Healthy)	10.0
BDN-1 (Diseased)	23.0
ICP-7194-2-1S⊗ (Resistant)	7.0

[a/] 100 conidia counted.

Germination of the conidia from different reaction types was also compared (Table 102). Conidia from susceptible, mild mosaic and partial diseased plants showed higher percent germination than conidia from resistant, ring spot and partial healthy plants.

To get information on the factors responsible for increased susceptibility in sterility mosaic infected plants, the effect of the leaf extracts from different reaction types on conidial germination was tried. The germination in leaf extracts of healthy (BDN-1), sterility mosaic diseased (BDN-1) and resistant (ICP-7194-2-1S⊗) genotypes was 12.3, 18.0 and 2.0% respectively. Germination in distilled water was 5.0%. The differences were however not significant.

Germination of conidia on the detached leaf discs of different reaction types was compared. The results are presented in Table 103. Germination on the sterility mosaic diseased leaf discs was higher than the others and was statistically significant. No statistical differences in germination on healthy and resistant leaves and SDW were found.

The effect of leaf washings from the above reaction types on conidial germination was studied (Table 104). Germination in washings from sterility mosaic diseased leaves was more than in healthy and resistant leaves.

The interaction observed in the field was also tested in artificial inoculations in greenhouse. Sterility mosaic infected and healthy plants of BDN-1 were inoculated with powdery mildew conidia. Sterility mosaic infected and healthy plants without powdery mildew inoculation served as control. The average rating on sterility mosaic infected and healthy were 4 and 2, respectively.

D. Discussion

The severity of powdery mildew on lines with resistant, ring spot and mild mosaic reaction to sterility mosaic was consistently low when compared to the sterility mosaic susceptible lines. Even in the same plant, branches infected with sterility mosaic showed more severity than the healthy branches. These observations clearly indicate that infection by sterility mosaic causal agent increased susceptibility to powdery mildew pathogen. The visual reaction of the lines was in conformation with the results of fungus sporulation. Conidial morphology was not varied much but differences in viability were found.

Resistant, mild mosaic and ring spot types behaved similar to the healthy branches in partially infected susceptible plant indicating that the causal agent is possibly not directly involved in the phenomenon observed. It appears that the changes brought about by the causal agent in the physiology of infected plants are playing the role. The changes brought out in the infected plants appear to stimulate conidial germination by secreting some exudates as the conidial germination on the diseased leaf discs and in washings was found higher. The leaf extracts from different reaction types did not have significant differential effect on conidial germination pointing to the possibility of mainly the external factors in the infected plants playing the role in the phenomenon.

E. Powdery mildew in ACT materials

All the entries in the 4 ACT trials were susceptible. However, 2 rating was shown by HY-2, 1238, and T-7. All others showed 3 and 4 ratings.

VI. INTERACTION BETWEEN STERILITY MOSAIC AND SPIDER MITES

During summer (March-May) months severe infestation of spider mites was observed in the potted sterility mosaic infected plants (BDN-1) maintained in partial shade. A batch of resistant progenies were however found to show negligible amount of infestation. Studies in collaboration with pulse entomologists have been initiated on this aspect.

SPECIAL PROJECT: MULTIPLE DISEASE RESISTANCE IN PIGEONPEA

I. SUMMARY

1. A procedure to screen pigeonpea for identifying resistance to the three major diseases; wilt, blight, and sterility mosaic, has been worked out.

2. Field screening has been initiated.

II. INTRODUCTION

At present all the three diseases; wilt, sterility mosaic and Phytophthora blight are important in few areas. But even if some of them are not serious at present they are likely to become serious when the more adapted local land races are replaced by improved genotypes. The local land races are highly heterogeneous and do not allow the disease build up. Also the present agronomic practices followed for pigeonpea like intercropping and poor management do not favour disease epiphytotics. But once high yielding varieties are available, the present agronomic practices are bound to change and there is every likely-hood of the present day non-important diseases becoming important in future.

At ICRISAT the disease resistance program is based on the above hypothesis. To start with the germplasm is screened against individual diseases. The lines found resistant to one disease are checked against other diseases to identify lines with multiple disease resistance. At present lines having resistance at least to two of the three diseases have been identified. There is hope of getting lines with resistance to all the three diseases. Experience so far with pigeonpea indicates that it is possible to develop lines with resistance to all the three diseases.

III. DEVELOPMENT OF SCREENING NURSERY

For testing the materials against all the 3 diseases a multiple disease screening nursery is being developed. A 1.3 ha red soil plot was selected for this purpose as it favours both wilt and Phytophthora blight. Since water stagnation is essential for blight development, a low-lying plot has been chosen. The plot is made wilt sick by repeated incorporation of pigeonpea wilted material and growing of high proportion of susceptible lines. Two Phytophthora inoculations are carried out on one and 2-month old seedlings by rubbing the inoculum on the stems. The infected plants are again incorporated in the plot at the end of the season. For sterility mosaic a susceptible cultivar is grown in advance and 'staple' inoculated to serve as infector rows. Since irrigations are known to help in the perpetuation of Phytophthora, from this season onwards the plot is frequently irrigated till the time of planting.

It is better to plant the infector rows well in advance of the onset of summer to provide enough time for the mites to build up sufficiently. The mite population needs build up to a high level, as the high temperatures during summer months are likely to reduce their population, which may result in late development of disease in the screening nursery.

The design in which the infector rows, susceptible checks and test materials are proposed to be planted is given in fig. 6. It is important to plant the infector rows across the wind direction in June-July months to enable proper spreqad of the disease. The 'infector rows' can be 'detopped' now and then to keep their growth under control and to provide fresh growth regularly to mites for better multiplication.

FIG.6. LAYOUT OF THE DESIGN OF PLANTING INFECTOR ROWS, SUSCEPTIBLE CHECKS AND TEST LINES IN A BLOCK OF THE MULTIPLE DISEASE NURSERY

Test lines

Sterility mosaic infector row

xxxxxxxx Wilt susceptible check

++++++++ Sterility mosaic susceptible check

.... Phytophthora blight susceptible check

IV. PROPOSED SCREENING PROCEDURE

The test materials are planted in the last week of June. Immediately after germination the stand is recorded. It has been observed that the initial monsoon rains are generally heavy and cause water stagnation. It helps in development of sufficient Phytophthora blight in the infector rows and causes moderate seedling mortality in the test materials. Only the surviving seedlings are inoculated after one month. The final observations on Phytophthora blight and sterility mosaic are taken at the time of flowering and podding stage; i.e., before the onset of wilt. Wilt observations are taken at the time of maturity. Materials showing less than 20% wilt, sterility mosaic, and Phytophthora blight will be selected and selfed for further evaluation.

V. MATERIALS SCREENED DURING 1978-79

During 1978-79 season 866 F_4 and F_5 progenies from 4 crosses involving parents resistant to at least one disease were screened (Table-105). These progenies were selected from sterility mosaic nursery in 1977-78 and have resistance to it. 1258, BDN-1, and HY-3C were planted as susceptible checks to wilt, sterility mosaic, and Phytophthora blight, respectively. Because of some problem in the leveling of the field the sterility mosaic infector rows this year were planted in East-West direction. Since the wind direction during June-July months is also the same the spread of the disease was poor. But as the materials were already tested against sterility mosaic, it did not affect the screening. Incidence of both wilt and Phytophthora blight was very high. The incidence of wilt and Phytophthora blight in susceptible checks 1258 and HY-3C was 66.4 and 91.2%, respectively.

The detailed results of screening are presented in APPENDIX XLVII. Of all the 4 crosses tested only cross no. 74360 had parents with resistance to all the 3 diseases. As the materials were advanced as bulk up to F_4 without selfing, many progenies showed high disease incidence. But when compared to other crosses which have parents resistant to only one disease, progenies of the cross 74360 did well. The list of progenies selected for low disease incidence and agronomic characters are presented in Table-106. The work was done in close collaboration with the breeders.

In addition 367 (APPENDIX XLVIII) F_3 *Phytophthora* resistant progenies were screened in other plot against wilt and sterility mosaic. Since wilt incidence was very low only sterility mosaic observations were recorded. Progenies with no sterility mosaic and agronomically looking good were selected for further evaluation.

Table-105. <u>Pigeonpea materials screened in pigeonpea multiple disease nursery during kharif 1978-79</u>

Cross No.	Parents	Generation	No. of SPP
74360	7035 x 7065	F_5	269
74236	6997 x No. 148	F_5	109
74335	6997 x 7035	F_5	332
75237	7035 x 7186	F_4	156

Parent	Wilt	Sterility mosaic	Phytophthora blight
7035	Resistant	Resistant	Susceptible
7065	Susceptible	Susceptible	Resistant
6997	Susceptible	Resistant	Susceptible
No.148	Susceptible	Susceptible	Susceptible
7186	Susceptible	Susceptible	Susceptible

Table-106. <u>Summary of screening of single plant progenies of sterility mosaic (SM) resistant material for wilt, SM, and Phytophthora blight (PB) in multiple disease nursery</u>

S.No.	Pedigree		No. of plants	% Blight	% SM	No. of plants	% Wilt	No. of plants selected
1.	74360-F_4B-S53⊗	8NDT	57	10.5	0.0	51	37.3	4
2.	-S68⊗	7NDT	54	20.4	0.0	43	23.3	9
3.	-S74⊗	7NDT	65	56.9	0.0	31	51.6	3
4.	-S80⊗	7NDT	47	23.4	0.0	39	48.7	2
5.	-S111⊗	7NDT	35	40.0	0.0	22	4.6	4
6.	-S131⊗	7NDT	50	40.0	0.0	32	18.8	7
7.	-S150⊗	7NDT	39	25.6	0.0	33	33.3	3
8.	-S163⊗	7NDT	42	19.1	0.0	35	5.7	8
9.	-S174⊗	7NDT	51	29.4	0.0	37	8.1	7
10.	-S178⊗	7NDT	43	37.2	0.0	32	12.5	9

Contd.

S.No.	Pedigree	No. of plants	% Blight	% SM	No. of plants	% Wilt	No. of plants selected
11.	74360-F_4B-S195⊗ 7NDT	48	35.4	0.0	32	0.0	4
12.	-S218⊗ 7NDT	55	23.6	0.0	42	9.5	8
13.	-S219⊗ 7NDT	39	33.3	0.0	27	0.0	5
14.	-S229⊗ 7NDT	53	41.5	0.0	35	42.9	7
15.	-S233⊗ 7NDT	64	21.9	0.0	52	25.0	4
16.	-S235⊗ 7NDT	67	16.4	0.0	56	30.4	8
17.	-S251⊗ 7NDT	49	16.3	0.0	42	30.9	7
18.	-S263⊗ 7NDT	54	42.6	0.0	34	14.7	8
19.	74236-F_4B-S68⊗ 7NDT	55	38.2	0.0	35	17.1	7
20.	-S92⊗ 7NDT	39	38.5	0.0	25	4.0	7

APPENDIX-I

Screening of F3 progenies (10 crosses) for wilt resistance in Vertisol sick plot-A

Sl. No	Pedigree		No. of plants	Percent wilt
1	2		3	4
1.	75216 (ICP-7035x-6902)	-W1⊗	31	19.4
2.		-W2⊗	30	30.0
3.		-W3⊗	30	45.0
4.		-W4⊗	31	25.8
5.		-W5⊗	13	15.4
6.		-W6⊗	7	28.6
7		-W7⊗	38	65.8
8.		-W8⊗	30	60.0
9.		-W9⊗	29	44.8
10.		-W10⊗	24	25.0
11.		-W11⊗	11	45.5
12.		-W12⊗	37	51.4
13.		-W13⊗	6	50.0
14.		-W14⊗	28	50.0
15.		-W15⊗	15	46.7
16.		-W16⊗	40	22.5
17.		-W17⊗	19	21.1
18.		-W18⊗	30	66.7
19		-W19⊗	40	42.5
20		-W20⊗	19	36.8
21.		-W21⊗	34	20.6
22.		-W-22⊗	10	40.0
23.		-W23⊗	16	18.8
24.		-W24⊗	25	44.0
25.		-W25⊗	24	41.7
26		-W26⊗	6	33.3
27.		-W27⊗	26	34.6
28		-W28⊗	29	72.4
29		-W29⊗	29	24.1
30		-W30⊗	35	48.6
31.		-W31⊗	41	14.6
32		-W32⊗	21	47.6
33		-W33⊗	45	37.8
34.		-W34⊗	26	34.6
35.		-W35⊗	20	35.0
36		-W36⊗	36	33.3
37		-W37⊗	39	28.2

Contd.

1	2		3	4
38.	75216 (ICP-7035x-6902)	-W38⊗	34	38.2
39.		-W39⊗	44	59.1
40.		-W40⊗	29	31.0
41.		-W41⊗	36	38.9
42.		-W42⊗	12	25.0
43.		-W43⊗	41	43.9
44.		-W44⊗	5	0.0
45.		-W45⊗	32	15.6
46.		-W46⊗	36	13.9
47.		-W47⊗	46	15.2
48.		-W48⊗	47	29.8
49.		-W49⊗	16	0.0
50.		-W50⊗	39	46.2
51.		-W51⊗	49	8.2
52.		-W52⊗	40	72.5
53.		-W53⊗	No germination	
54.		-W54⊗	6	33.3
55.		-W55⊗	38	5.3
56.		-W56⊗	30	56.7
57.		-W57⊗	39	7.7
58.		-W58⊗	48	22.9
59.		-W59⊗	45	35.6
60.	75224 (ICP-7035x-6915)	-W1⊗	38	39.5
61.		-W2⊗	16	93.8
62.		-W3⊗	49	57.1
63.		-W4⊗	44	31.8
64.		-W5⊗	19	57.9
65.		-W6⊗	19	21.1
66.		-W7⊗	28	42.9
67.		-W8⊗	9	66.7
68.		-W9⊗	15	13.3
69.		-W10⊗	23	13.0
70.		-W11⊗	23	26.1
71.		-W12⊗	10	10.0
72.		-W13⊗	9	11.1
73.		-W14⊗	28	0.0
74.		-W15⊗	8	25.0
75.		-W16⊗	11	18.2
76.		-W17⊗	22	27.3
77.		-W18⊗	46	34.8
78.		-W20⊗	36	11.1
79.		-W21⊗	18	33.3
80.		-W22⊗	20	15.0

1	2		3	4
81.	75224 (ICP-7035x-6915)	-W23⊗	34	26.5
82.		-W24⊗	26	50.0
83.		-W25⊗	10	40.0
84.		-W26⊗	14	42.9
85.		-W27⊗	9	0.0
86.		-W28⊗	5	0.0
87.		-W29⊗	17	35.3
88.		-W30⊗	22	50.0
89.		-W31⊗	14	50.0
90.		-W32⊗	12	16.7
91.		-W33⊗	6	16.7
92.		-W34⊗	23	43.5
93.		-W35⊗	8	50.0
94.		-W36⊗	46	49.9
95.		-W37⊗	35	34.3
96.		-W38⊗	35	48.6
97.		-W39⊗	22	27.3
98.		-W40⊗	47	27.0
99.		-W41⊗	8	37.5
100.		-W42⊗	14	57.1
101.		-W43⊗	6	33.3
102.		-W44⊗	13	46.2
103.		-W45⊗	28	35.7
104.		-W46⊗	23	52.2
105.		-W47⊗	10	10.0
106.		-W48⊗	1	0.0
107.		-W49⊗	7	57.1
108.		-W50⊗	9	44.4
109.		-W51⊗	9	55.6
110.		-W52⊗	12	33.3
111.	75236 (ICP-7035x-7183)	-W1⊗	23	30.4
112.		-W2⊗	8	25.0
113.		-W3⊗	13	53.9
114.		-W4⊗	6	16.7
115.		-W5⊗	30	10.0
116.		-W6⊗	14	14.3
117.		-W7⊗	7	14.3
118.		-W8⊗	27	18.5
119.		-W9⊗	22	27.3
120.		-W10⊗	34	17.7
121.		-W11⊗	36	16.7
122.		-W12⊗	33	24.2
123.		-W13⊗	10	10.0
124.		-W14⊗	3	0.0

Contd.

1	2		3	4
125.	75236 (ICP-7035x-7183)	-W15♀	10	80.0
126.		-W16♀	13	46.2
127.		-W17♀	18	27.8
128.		-W18♀	6	0.0
129.	75239 (ICP-7035x-7189)	-W1♀	3	33.3
130.		-W2♀	8	0.0
131.		-W3♀	45	2.2
132.		-W4♀	14	7.1
133.		-W5♀	35	8.6
134.		-W6♀	12	16.7
135.		-W7♀	7	0.0
136.		-W8♀	21	4.8
137.		-W9♀	18	12.1
138.		-W10♀	15	0.0
139.		-W11♀	19	5.3
140.		-W12♀	25	20.0
141.		-W13♀	21	23.8
142.		-W14♀	16	12.5
143.		-W15♀	13	0.0
144.		-W16♀	12	23.8
145.		-W17♀	18	16.7
146.		-W18♀	10	0.0
147.	75456 (ICP-3783x-6909)	-W1♀	33	12.1
148.		-W2♀	23	43.5
149.		-W3♀	44	25.0
150.		-W4♀	30	40.0
151.		-W5♀	26	33.3
152.		-W6♀	33	33.3
153.		-W7♀	23	65.2
154.		-W8♀	23	30.3
155.		-W9♀	10	30.0
156.		-W10♀	34	52.9
157.		-W11♀	25	36.0
158.		-W12♀	13	46.2
159.		-W13♀	36	41.7
160.		-W14♀	42	14.3
161.		-W15♀	22	31.8
162.		-W16♀	44	16.3
163.		-W17♀	25	8.0
164.		-W18♀	32	65.6
165.		-W19♀	12	83.3

Contd.

1	2		3	4
166.	75456 (ICP-3783x-6909)	-W20⊗	35	40.0
167.		-W21⊗	36	27.8
168.		-W22⊗	40	35.0
169.		-W23⊗	12	16.7
170		-W24⊗	14	71.4
171.		-W25⊗	22	36.4
172.		-W26⊗	33	33.3
173		-W27⊗	18	0.0
174		-W28⊗	20	45.0
175.		-W29⊗	29	31.0
176.		-W30⊗	20	60.0
177		-W31⊗	14	42.9
178.		-W32⊗	36	33.3
179.		-W33⊗	21	80.9
180.		-W34⊗	38	23.7
181.		-W35⊗	15	46.7
182.		-W36⊗	41	48.8
183.		-W37⊗	31	32.3
184.		-W38⊗	33	48.5
185.		-W39⊗	9	66.7
186.		-W40⊗	14	57.1
187		-W41⊗	39	43.6
188.		-W42⊗	21	42.9
189.		-W43⊗	30	40.0
190		-W44⊗	21	90.5
191		-W45⊗	6	33.3
192.		-W46⊗	6	50.0
193		-W47⊗	18	94.4
194	75463 (ICP-3783x-6929)	-W1⊗	33	48.5
195		-W2⊗	10	60.0
196		-W3⊗	9	100.0
197		-W4⊗	24	70.8
198		-W5⊗	22	54.6
199		-W6⊗	23	39.1
200		-W7⊗	34	70.6
201		-W8⊗	40	42.5
202		-W9⊗	29	34.5
203		-W10⊗	14	57.1
204		-W11⊗	7	0.0
205.		-W12⊗	18	55.6
206		-W13⊗	9	55.6
207.		-W14⊗	6	66.7
208.		-W15⊗	10	70.0

Contd.

1	2	3	4
209.	75463 (ICP-3783x-6929) -W16⊗	9	44.4
210.	-W17⊗	13	76.9
211.	-W18⊗	15	100.0
212.	75470 (ICP-3783x-7183) -W1⊗	17	70.6
213.	-W2⊗	27	40.7
214.	-W3⊗	40	82.5
215.	-W4⊗	32	53.1
216.	-W5⊗	48	39.6
217.	-W6⊗	14	92.9
218.	-W7⊗	45	53.3
219.	-W8⊗	44	88.6
220.	-W9⊗	43	67.4
221.	-W10⊗	34	50.0
222.	-W11⊗	36	80.7
223.	-W12⊗	8	100.7
224.	-W13⊗	20	41.2
225.	-W14⊗	19	94.7
226.	-W15⊗	25	44.0
227.	-W16⊗	31	29.0
228.	-W17⊗	16	75.0
229.	-W18⊗	29	79.3
230.	-W19⊗	14	50.0
231.	-W20⊗	17	47.1
232.	-W21⊗	6	100.0
233.	-W22⊗	34	91.2
234.	-W23⊗	20	45.0
235.	-W24⊗	21	95.2
236.	-W25⊗	48	56.3
237.	-W26⊗	14	92.9
238.	-W27⊗	47	53.2
239.	-W28⊗	22	40.9
240.	-W29⊗	31	100.0
241.	-W30⊗	57	45.9
242.	-W31⊗	36	61.1
243.	-W32⊗	25	80.0
244.	-W33⊗	26	92.3
245.	-W34⊗	27	59.3
246.	-W35⊗	32	81.3
247.	-W36⊗	42	73.8
248.	-W37⊗	42	26.2
249.	-W38⊗	33	15.2
250.	-W39⊗	46	78.3

Contd.

1	2		3	4
251.	75470 (ICP-3783x-7183)	-W40⊗	39	58.9
252.		-W41⊗	44	56.8
253.		-W42⊗	39	76.9
254.		-W43⊗	41	65.9
255.		-W44⊗	47	74.5
256.		-W45⊗	43	51.2
257.		-W46⊗	42	57.1
258.		-W47⊗	44	88.6
259.		-W48⊗	25	80.0
260		-W49⊗	44	81.8
261		-W50⊗	46	54.3
262.		-W51⊗	42	28.6
263.		-W52⊗	41	12.2
264.	75493 (ICP-7118x-6907)	-W1⊗	44	11.4
265.		-W2⊗	48	50.0
266		-W3⊗	38	21.1
267.		-W4⊗	61	18.0
268.		-W5⊗	41	26.8
269		-W6⊗	45	20.0
270.		-W7⊗	29	62.1
271.		-W8⊗	31	12.9
272		-W9⊗	23	43.5
273.		-W10⊗	17	0.0
274		-W11⊗	21	14.3
275		-W12⊗	40	32.5
276.		-W13⊗	44	20.5
277		-W14⊗	16	31.3
278		-W15⊗	18	61.1
279		-W16⊗	32	88.2
280.		-W17⊗	21	66.7
281		-W18⊗	21	76.2
282.		-W19⊗	43	39.5
283.		-W20⊗	44	47.7
284.		-W21⊗	31	38.7
285		-W22⊗	40	37.5
286.		-W23⊗	23	21.7
287.		-W24⊗	24	61.8
288.		-W25⊗	43	55.8
289.		-W26⊗	55	52.7
290.		-W27⊗	42	47.6
291.		-W28⊗	39	25.6
292.		-W29⊗	37	32.4

Contd.

1	2		3	4
293.	75493 (ICP-7118x-6907)	-W30Q	43	79.1
294.		-W31Q	38	26.3
295.		-W32Q	38	2.6
296.		-W33Q	36	30.5
297.		-W34Q	44	18.2
298.		-W35Q	34	5.9
299.		-W36Q	36	11.1
300.		-W37Q	36	0.0
301.		-W38Q	38	15.8
302.		-W39Q	19	26.3
303.		-W40Q	36	11.1
304.		-W41Q	44	6.8
305.		-W42Q	39	7.7
306.		-W43Q	31	35.5
307.		-W44Q	45	46.7
308.		-W45Q	35	31.4
309.		-W46Q	26	38.5
310.		-W47Q	63	42.9
311.		-W48Q	38	31.6
312.		-W49Q	33	36.4
313.		-W50Q	17	64.7
314.		-W51Q	17	23.5
315.		-W52Q	39	41.0
316.		-W53Q	34	38.2
317.		-W54Q	41	53.7
318.		-W55Q	50	64.0
319.		-W56Q	35	25.7
320.		-W57Q	21	90.5
321.		-W58Q	39	53.8
322.		-W59Q	37	54.1
323.		-W60Q	54	79.6
324.		-W61Q	25	20.0
325.		-W62Q	33	75.8
326.		-W63Q	43	58.5
327.		-W64Q	35	68.6
328.		-W65Q	43	71.4
329.		-W66Q	28	32.1
330.		-W67Q	42	57.1
331.		-W68Q	27	22.2
332.		-W69Q	37	56.8
333.		-W70Q	38	44.7
334.		-W71Q	42	9.5
335.		-W72Q	41	58.5
336.		-W73Q	41	2.4

1	2		3	4
337	75493	-W74⊗	16	50.0
338	75513 (ICP-7118x-6897)	-W1⊗	43	44.1
339		-W2⊗	20	45.0
340		-W3⊗	35	57.1
341		-W4⊗	28	42.9
342		-W5⊗	48	54.2
343		-W6⊗	45	53.3
344		-W7⊗	38	39.5
345		-W8⊗	37	51.4
346		-W9⊗	45	75.6
347		-W10⊗	36	36.1
348		-W11⊗	48	68.8
349		-W12⊗	49	44.0
350		-W13⊗	25	28.0
351		-W14⊗	39	66.7
352		-W15⊗	44	40.9
353		-W16⊗	37	32.4
354		-W17⊗	41	60.9
355		-W18⊗	39	66.7
356		-W19⊗	45	20.0
357		-W20⊗	44	11.4
358		-W21⊗	19	66.7
359		-W22⊗	41	48.8
360		-W23⊗	1	100.0
361		-W24⊗	17	94.1
362		-W25⊗	36	58.3
363		-W26⊗	50	10.0
364		-W27⊗	44	52.3
365		-W28⊗	31	48.4
366		-W29⊗	39	43.6
367		-W30⊗	33	42.4
368		-W31⊗	44	47.7
369		-W32⊗	41	17.1
370		-W33⊗	37	37.8
371		-W34⊗	27	81.5
372		-W35⊗	19	36.8
373		-W36⊗	45	53.3
374		-W37⊗	44	63.6
375		-W38⊗	37	37.8
376		-W39⊗	42	35.7
377		-W40⊗	41	21.9
378		-W41⊗	48	14.6
379		-W42⊗	27	44.4
380		-W43⊗	12	41.7

Contd

1	2	3	4
381.	75513 (ICP-7118x-6897) -W44⊗	40	52.5
382.	-W45⊗	37	51.4
383.	-W46⊗	28	60.7
384.	-W47⊗	34	44.1
385.	-W48⊗	42	52.3
386.	-W49⊗	10	10.0
387.	-W50⊗	40	25.0
388.	-W51⊗	38	5.3
389.	-W52⊗	No germination.	
390.	-W53⊗	14	42.9
391.	-W54⊗	45	35.6
392.	-W55⊗	15	20.0
393.	-W56⊗	30	26.7
394.	-W57⊗	41	17.2
395.	-W58⊗	15	20.0
396.	-W59⊗	29	41.4
397.	-W60⊗	6	33.3
398.	-W61⊗	41	46.3
399.	-W62⊗	40	62.5
400.	-W63⊗	22	81.8
401.	-W64⊗	38	31.6
402.	-W65⊗	18	72.2
403.	-W66⊗	18	11.1
404.	-W67⊗	9	55.6
405.	-W68⊗	36	72.2
406.	-W69⊗	13	15.4
407.	-W70⊗	36	44.4
408.	-W71⊗	34	58.8
409.	-W72⊗	40	57.5
410.	-W73⊗	20	70.0
411.	-W74⊗	6	100.0
412.	-W75⊗	26	7.7
413.	-W76⊗	23	8.7
414.	75519 (ICP-7118x-7336) -W1⊗	15	6.7
415.	-W2⊗	19	36.8
416.	-W3⊗	38	7.9
417.	-W4⊗	18	0.0
418.	-W5⊗	41	7.3
419.	-W6⊗	15	26.7
420.	-W7⊗	12	16.7
421.	-W8⊗	17	5.9
422.	-W9⊗	35	17.1
423.	-W10⊗	12	25.0
424.	-W11⊗	16	18.8
425.	-W12⊗	15	20.0

Contd.

1	2		3	4
426.	75519 (ICP-7118x-7336)	-W13⊗	13	0.0
427.		-W14⊗	30	0.0
428.		-W15⊗	49	30.6
429.		-W16⊗	43	16.3
430		-W17⊗	48	8.3
431.		-W18⊗	23	0.0
432		-W19⊗	38	13.2
433		-W20⊗	22	4.6
434.		-W21⊗	21	4.8
435.		-W22⊗	21	4.8
436.		-W23⊗	20	0.0
437.		-W24⊗	8	25.0
438.		-W25⊗	23	4.3
439.		-W26⊗	18	11.1
440.		-W27⊗	36	11.1
441.		-W28⊗	16	18.8
442		-W29⊗	22	4.6
443.		-W30⊗	12	41.7
444.		-W31⊗	47	14.9
445		-W32⊗	22	13.6
446.		-W33⊗	4	0.0
447.		-W34⊗	35	22.9
448.		-W35⊗	17	64.7
449		-W36⊗	11	36.4
450.		-W37⊗	17	47.1
451		-W38⊗	13	61.5
452.		-W39⊗	10	70.0
453.		-W40⊗	19	52.6
454		-W41⊗	15	66.7
455.		-W42⊗	38	68.4
456.		-W43⊗	8	87.5
457		-W44⊗	47	82.9
458.		-W45⊗	35	54.3
459		-W46⊗	42	85.7
460		-W47⊗	35	45.7
461		-W48⊗	14	14.3
462.		-W49⊗	41	29.3
463		-W50⊗	11	18.2
464		-W51⊗	22	27.3
465		-W52⊗	29	20.7
466		-W53⊗	18	38.9
467.		-W54⊗	12	25.0

Contd.

1	2		3	4
468.	75519 (ICP-7118x-7336)	-W55⊗	36	36.1
469.		-W56⊗	2	0.0
470.		-W57⊗	16	50.0
471.		-W58⊗	16	6.3
472.		-W59⊗	23	38.5
473.		-W60⊗	26	34.6
474.		-W61⊗	20	25.0
475.		-W62⊗	15	40.0

APPENDIX- II

Screening of F_4 progenies (from BA-2) for wilt resistance in Vertisol sick plot-A

Sl No.	Pedigree	No of plants	Percent wilt
1	2	3	4
1.	74130-DT7-B-W1⊗	24	87.8
2.	74131-DT8-B-W1⊗	12	25.0
3.	74131-DT8-B-W2⊗	17	88.2
4.	74131-DT8-B-W3⊗	29	49.8
5.	74131-DT8-B-W4⊗	11	81.8
6.	74131-DT8-B-W5⊗	26	76.8
7.	74131-DT8-B-W6⊗	26	91.9
8.	74131-DT8-B-W7⊗	35	91.5
9.	74131-DT8-B-W8⊗	30	92.2
10.	74131-DT8-B-W9⊗	18	100.0
11.	74131-DT8-B-W10⊗	27	85.9
12.	74131-DT8-B-W11⊗	11	90.9
13.	74131-DT8-B-W12⊗	38	91.9
14.	74131-DT8-B-W13⊗	33	96.2
15.	74131-DT8-B-W14⊗	32	97.5
16	74131-DT8-B-W15⊗	22	100.0
17.	74131-DT8-B-W16⊗	39	100.0
18.	74131-DT8-B-W17⊗	12	100.0
19	74131-DT8-B-W18⊗	15	93.3
20	74131-DT8-B-W19⊗	10	80.0
21.	74131-DT8-B-W20⊗	26	100.0
22	74134-DT1-B-W1⊗	9	88.9
23.	74134-DT1-B-W2⊗	5	60.0
24.	74134-DT1-B-W3⊗	30	25.9
25.	74134-DT1-B-W4⊗	27	61.2
26.	74134-DT1-B-W5⊗	48	97.9
27.	74134-DT1-B-W6⊗	12	0.0
28.	74134-DT1-B-W7⊗	36	44.2
29.	74134-DT1-B-W8⊗	9	66.7
30.	74134-DT1-B-W9⊗	42	50.7
31	74134-DT1-B-W10⊗	11	45.5
32.	74134-DT1-B-W11⊗	35	14.7
33.	74137-DT7-B-W1⊗	33	60.8
34.	74137-DT7-B-W3⊗	34	96.9
35.	74137-DT7-B-W4⊗	23	65.2
36	74137-DT7-B-W5⊗	30	58.7
37.	74137-DT7-B-W6⊗	26	68.8
38.	74137-DT7-B-W7⊗	12	50.0

Contd.

1	2	3	4
39.	74137-DT7-B-W8Ø	14	42.9
40.	74137-DT7-B-W9Ø	38	59.3
41.	74137-DT7-B-W10Ø	12	66.7
42.	74137-DT7-B-W11Ø	35	97.1
43.	74137-DT7-B-W12Ø	26	96.2
44.	74137-DT7-B-W13Ø	34	91.1
45.	74137-DT7-B-W14Ø	32	28.1
46.	74137-DT7-B-W15Ø	32	68.8
47.	74137-DT7-B-W16Ø	10	100.0
48.	74137-DT7-B-W17Ø	27	77.8
49.	74137-DT7-B-W18Ø	24	70.8
50.	74137-DT7-B-W19Ø	35	94.3
51.	74137-DT7-B-W20Ø	43	81.4
52.	74137-DT7-B-W21Ø	7	85.7
53.	74137-DT7-B-W22Ø	41	56.1
54.	74137-DT7-B-W23Ø	37	89.2
55.	74137-DT7-B-W24Ø	29	68.9
56.	74137-DT7-B-W25Ø	28	71.4
57.	74137-DT7-B-W26Ø	7	85.7
58.	74137-DT7-B-W27Ø	37	86.5
59.	74137-DT7-B-W28Ø	44	63.6
60.	74137-DT7-B-W29Ø	40	35.0
61.	74137-DT7-B-W30Ø	37	86.5
62.	74137-DT7-B-W31Ø	29	96.6
63.	74137-DT7-B-W32Ø	50	84.0
64.	74140-DT5-B-W1Ø	2	100.0
65.	74140-DT5-B-W2Ø	8	100.0
66.	74140-DT5-B-W3Ø	21	95.2
67.	74140-DT5-B-W4Ø	45	84.4
68.	74140-DT5-B-W5Ø	22	77.3
69.	74140-DT5-B-W6Ø	34	79.4
70.	74140-DT5-B-W7Ø	38	65.5
71.	74140-DT5-B-W8Ø	42	78.6
72.	74140-DT5-B-W9Ø	24	54.2
73.	74140-DT5-B-W10Ø	19	89.5
74.	74140-DT5-B-W11Ø	45	97.8
75.	74140-DT5-B-W12Ø	34	50.0
76.	74140-DT5-B-W13Ø	45	73.3
77.	74140-DT5-B-W14Ø	39	79.5
78.	74140-DT5-B-W15Ø	21	85.7
79.	74140-DT5-B-W16Ø	7	71.4
80.	74140-DT5-B-W17Ø	10	90.0
81.	74130-NDT7-B-W1Ø	17	29.4
82.	74130-NDT7-B-W2Ø	9	88.9
83.	74130-NDT7-B-W3Ø	38	60.5
84.	74130-NDT7-B-W4Ø	23	69.6

Contd.

1	2	3	4
85	74130-NDT7-B-W5Ø	29	89.7
86	74130-NDT7-B-W6Ø	16	81.3
87	74130-NDT7-B-W7Ø	39	89.7
88	74130-NDT7-B-W8Ø	17	76.5
89	74131-NDT8-B-W1Ø	1	100.0
90	74131-NDT8-B-W2Ø	8	100.0
91	74131-NDT8-B-W3Ø	16	100.0
92	74131-NDT8-B-W4Ø	3	100.0
93	74131-NDT8-B-W5Ø	18	94.4
94	74131-NDT8-B-W6Ø	17	82.4
95	74131-NDT8-B-W7Ø	32	84.2
96	74131-NDT8-B-W8Ø	20	100.0
97	74131-NDT8-B-W9Ø	24	97.8
98	74134-NDT1-B-W1Ø	3	100.0
99	74134-NDT1-B-W2Ø	15	100.0
100	74134-NDT1-B-W3Ø	16	56.3
101	74134-NDT1-B-W4Ø	17	58.8
102	74134-NDT1-B-W5Ø	19	100.0
103	74134-NDT1-B-W6Ø	12	75.0
104	74134-NDT1-B-W7Ø	9	88.9
105	74134-NDT1-B-W8Ø	8	100.0
106	74134-NDT1-B-W9Ø	9	77.8
107	74134-NDT1-B-W10Ø	10	50.0
108	74134-NDT1-B-W11Ø	6	100.0
109	74134-NDT1-B-W12Ø	14	71.4
110	74134-NDT1-B-W13Ø	20	85.0
111	74134-NDT1-B-W14Ø	34	100.0
112	74134-NDT1-B-W15Ø	10	100.0
113	74134-NDT1-B-W16Ø	14	78.6
114	74134-NDT1-B-W17Ø	28	100.0
115	74134-NDT1-B-W18Ø	19	89.5
116	74137-NDT7-B-W1Ø	24	66.7
117	74137-NDT7-B-W2Ø	34	67.6
118	74137-NDT7-B-W3Ø	33	51.5
119	74137-NDT7-B-W4Ø	9	88.9
120	74137-NDT7-B-W5Ø	14	64.3
121	74137-NDT7-B-W6Ø	No germination	
122	74137-NDT7-B-W7Ø	22	59.1
123	74137-NDT7-B-W8Ø	29	79.3
124	74137-NDT7-B-W9Ø	30	46.7
125	74137-NDT7-B-W10Ø	30	20.0
126	74137-NDT7-B-W11Ø	14	57.1
127	74137-NDT7-B-W12Ø	21	14.3

1	2	3	4
128.	74137-NDT7-B-W13Ø	34	26.5
129.	74137-NDT7-B-W14Ø	28	71.4
130.	74140-NDT5-B-W1Ø	16	68.8
131.	74140-NDT5-B-W2Ø	30	73.3
132.	74140-NDT5-B-W3Ø	32	57.1
133.	74140-NDT5-B-W4Ø	23	56.5
134.	74140-NDT5-B-W5Ø	37	78.4
135.	74140-NDT5-B-W6Ø	39	69.2

APPENDIX-III

Screening of F_4 progenies (5 crosses) for wilt resistance in Vertisol sick plot- 'A'.

Sl. No.	Pedigree		No. of plants	Percent wilt
1	2		3	4
1.	74258 [NP(WR)15 x ICP-1]	-B-W1⊗	36	22.2
2.		-W2⊗	43	81.4
3.		-W3⊗	51	21.6
4.		-W4⊗	56	7.1
5.		-W5⊗	39	5.1
6.		-W6⊗	42	66.7
7.		-W7⊗	7	57.1
8.		-W8⊗	29	79.3
9.		-W9⊗	33	84.8
10.		-W10⊗	21	66.7
11.		-W11⊗	25	76.0
12.		-W12⊗	27	81.5
13.		-W13⊗	39	33.3
14.		-W14⊗	31	74.2
15.		-W15⊗	26	69.2
16.		-W16⊗	34	64.7
17.		-W17⊗	31	48.4
18.		-W18⊗	26	73.1
19.		-W19⊗	34	58.8
20		-W20⊗	58	35.9
21.		-W21⊗	35	34.5
22.		-W22⊗	33	51.2
23		-W23⊗	41	82.9
24.		-W24⊗	34	64.7
25.		-W25⊗	12	100.0
26.		-W26⊗	35	28.6
27		-W27⊗	50	30.0
28.		-W28⊗	35	25.7
29.		-W29⊗	39	46.2
30		-W30⊗	38	57.6
31.		-W31⊗	20	45.0
32.		-W32⊗	32	31.3
33.		-W33⊗	45	17.0
34.		-W34⊗	33	0.0
35.		-W35⊗	35	8.6

Contd.

1	2		3	4
36.	74258 [NP(WR) 15 x ICP-1]	-B-W36⊗	38	5.3
37.		-W37⊗	35	14.3
38.		-W38⊗	No germination	
39.		-W39⊗	17	76.5
40.		-W40⊗	9	33.3
41.		-W41⊗	15	86.7
42.		-W42⊗	32	75.0
43.		-W43⊗	22	54.6
44.		-W44⊗	26	42.3
45.		-W45⊗	33	45.5
46.		-W46⊗	12	91.7
47.		-W47⊗	21	0.0
48.		-W48⊗	38	39.5
49.		-W49⊗	21	80.9
50.		-W50⊗	54	64.8
51.		-W51⊗	31	35.5
52.		-W52⊗	19	84.2
53.		-W53⊗	13	90.6
54.		-W54⊗	18	77.8
55.		-W55⊗	22	86.4
56.		-W56⊗	19	47.4
57.		-W57⊗	35	65.7
58.		-W58⊗	27	59.3
59.		-W59⊗	45	51.1
60.		-W60⊗	16	18.8
61.		-W61⊗	23	69.6
62.		-W62⊗	26	88.5
63.		-W63⊗	33	84.5
64.		-W64⊗	15	93.3
65.		-W65⊗	31	58.1
66.		-W66⊗	44	95.5
67.		-W67⊗	44	45.5
68.		-W68⊗	37	45.9
69.		-W69⊗	2	100.0
70.		-W70⊗	37	64.9
71.		-W71⊗	21	28.6
72.		-W72⊗	16	37.5
73.		-W73⊗	19	21.1
74.		-W74⊗	23	69.6
75.		-W75⊗	13	0.0
76.		-W76⊗	45	15.6
77.	74321 (ICP-102 x -7035)	-B-W1⊗	25	24.0
78.		-W2⊗	44	81.8

Contd.

1	2		3	4
79.	74321 (ICP-102x-7035)	-B-W3Ø	41	56.1
80.		-W4Ø	42	42.9
81.		-W5Ø	43	76.7
82.		-W6Ø	45	40.0
83.		-W7Ø	45	33.3
84.		-W8Ø	45	55.6
85.		-W9Ø	44	20.5
86.		-W10Ø	33	45.5
87.		-W11Ø	39	28.2
88.		-W12Ø	41	48.8
89.		-W13Ø	21	33.3
90.		-W14Ø	44	34.1
91.		-W15Ø	33	66.7
92.		-W16Ø	49	67.3
93.		-W17Ø	38	60.5
94.		-W18Ø	48	75.0
95.		-W19Ø	42	33.0
96.		-W20Ø	9	66.7
97.		-W21Ø	37	45.9
98.		-W22Ø	39	30.8
99.		-W23Ø	38	31.6
100.		-W24Ø	34	2.9
101.		-W25Ø	29	20.7
102.		-W26Ø	40	15.0
103.		-W27Ø	29	31.0
104.		-W28Ø	34	14.7
105.		-W29Ø	22	72.7
106.		-W30Ø	24	54.2
107.		-W31Ø	35	20.0
108.		-W32Ø	28	14.3
109.		-W33Ø	5	20.0
110.		-W34Ø	37	37.8
111.		-W35Ø	10	40.0
112.		-W36Ø	30	23.3
113.		-W37Ø	17	41.2
114.		-W38Ø	26	26.9
115.		-W39Ø	5	40.0
116.		-W40Ø	34	0.0
117.		-W41Ø	6	16.7
118.		-W42Ø	34	11.8
119.		-W43Ø	33	12.1
120.		-W44Ø	11	36.4
121.		-W45Ø	32	31.3

1	2		3	4
122.	74321 (ICP-102x-7035)	-B-W46Ø	45	46.7
123.		-W47Ø	31	19.4
124.		-W48Ø	23	17.4
125.		-W49Ø	22	9.1
126.		-W50Ø	38	39.5
127.		-W51Ø	25	60.0
128.		-W52Ø	27	18.5
129.		-W53Ø	39	7.7
130.		-W54Ø	14	21.4
131.		-W55Ø	23	26.1
132.		-W56Ø	16	93.8
133.		-W57Ø	39	17.9
134.		-W58Ø	7	0.0
135.		-W59Ø	24	29.0
136.		-W60Ø	22	13.6
137.		-W61Ø	15	6.7
138.		-W62Ø	23	0.0
139.		-W63Ø	12	25.0
140.		-W64Ø	33	69.7
141.		-W65Ø	16	31.3
142.		-W66Ø	36	41.7
143.		-W67Ø	20	20.0
144.		-W68Ø	13	46.2
145.		-W69Ø	16	25.0
146.		-W70Ø	37	72.9
147.		-W71Ø	26	43.0
148.		-W72Ø	22	59.1
149.		-W73Ø	44	31.8
150.		-W74Ø	12	33.3
151.		-W75Ø	13	69.2
152.		-W76Ø	31	16.1
153.		-W77Ø	21	42.9
154.		-W78Ø	33	3.0
155.		-W79Ø	7	28.6
156.		-W80Ø	8	75.0
157.		-W81Ø	13	38.5
158.		-W82Ø	15	33.3
159.		-W83Ø	12	50.0
160.		-W84Ø	41	60.9
161.		-W85Ø	22	50.0
162.		-W86Ø	9	88.9
163.		-W87Ø	37	18.9
164.		-W88Ø	24	33.3
165.		-W89Ø	10	50.0

1	2		3	4
166.	74321 (ICP-102x-7035)	-B-W90⊗	17	0.0
167.		-W91⊗	19	0.0
168.		-W92⊗	10	30.0
169.		-W93⊗	10	50.0
170.		-W94⊗	9	22.2
171.		-W95⊗	No germination	
172.		-W96⊗	36	41.7
173.		-W97⊗	10	20.0
174.		-W98⊗	19	26.3
175.		-W99⊗	38	65.8
176.	74335 (ICP-6997x-7035)	-B-W1⊗	29	48.3
177.		-W2⊗	46	58.3
178.		-W3⊗	40	50.0
179.		-W4⊗	40	92.5
180.		-W5⊗	33	39.4
181.		-W6⊗	23	73.9
182.		-W7⊗	19	52.9
183.		-W8⊗	25	56.0
184.		-W9⊗	38	47.4
185.		-W10⊗	37	51.4
186.		-W11⊗	12	75.0
187.		-W12⊗	4	0.0
188.		-W13⊗	34	55.9
189.		-W14⊗	33	36.4
190.		-W15⊗	14	42.9
191.		-W16⊗	40	57.5
192.		-W17⊗	14	57.1
193.		-W18⊗	51	76.5
194.		-W19⊗	41	39.0
195.		-W20⊗	33	45.5
196.		-W21⊗	29	68.9
197.		-W22⊗	5	80.0
198.		-W23⊗	19	100.0
199.		-W24⊗	12	75.0
200.		-W25⊗	10	100.0
201.		-W26⊗	41	75.6
202.		-W27⊗	28	92.9
203.		-W28⊗	31	48.4
204.		-W29⊗	23	73.9
205.		-W30⊗	30	30.0
206.		-W31⊗	36	0.0
207.		-W32⊗	22	72.7
208.		-W33⊗	46	56.5

Contd.

1	2		3	4
209.	74335 (ICP-6997x-7035)	-B-W34⊗	41	48.8
210.		-W35⊗	36	80.6
211.		-W36⊗	40	42.5
212.		-W37⊗	41	68.3
213.		-W38⊗	35	62.9
214.		-W39⊗	41	82.9
215.		-W40⊗	31	61.3
216.		-W41⊗	5	80.0
217.		-W42⊗	27	70.3
218.		-W43⊗	19	57.9
219.		-W44⊗	47	76.6
220.		-W45⊗	18	16.7
221.		-W46⊗	27	37.0
222.		-W47⊗	12	41.7
223.		-W48⊗	40	47.5
224.		-W49⊗	46	39.1
225.		-W50⊗	41	53.7
226.		-W51⊗	37	51.4
227.		-W52⊗	21	33.3
228.		-W53⊗	40	47.5
229.		-W54⊗	51	33.3
230.		-W55⊗	38	28.9
231.		-W56⊗	54	50.0
232.		-W57⊗	55	64.4
233.		-W58⊗	48	47.9
234.		-W59⊗	38	34.2
235.		-W60⊗	17	11.8
236.		-W61⊗	35	5.7
237.		-W62⊗	15	20.0
238.		-W63⊗	12	18.5
239.		-W64⊗	9	11.1
240.		-W65⊗	26	26.9
241.		-W66⊗	12	41.7
242.		-W67⊗	23	43.5
243.		-W68⊗	19	10.5
244.		-W69⊗	20	35.0
245.		-W70⊗	20	35.0
246.		-W71⊗	25	24.0
247.		-W72⊗	9	44.4
248.		-W73⊗	27	25.9
249.		-W74⊗	19	10.5
250.		-W75⊗	7	14.3
251.		-W76⊗	30	3.3
252.		-W77⊗	13	30.8

Contd.

1	2		3	4
253.	74209 [Pant-A2 x NP(WR) 15]	-B-W1⊗	40	12.5
254.		-W2⊗	38	39.5
255.		-W3⊗	13	61.5
256.		-W4⊗	24	8.3
257.		-W5⊗	7	14.3
258.		-W6⊗	18	11.1
259.		-W7⊗	40	2.5
260.		-W8⊗	43	23.3
261.		-W9⊗	16	43.8
262.		-W10⊗	25	40.0
263.		-W11⊗	33	21.2
264.		-W12⊗	27	22.2
265.		-W13⊗	23	39.1
266.		-W14⊗	28	17.9
267.		-W15⊗	34	14.7
268.		-W16⊗	36	0.0
269.		-W17⊗	31	6.5
270.		-W18⊗	30	26.7
271.		-W19⊗	39	48.7
272.		-W20⊗	26	23.1
273.		-W21⊗	19	31.6
274.		-W22⊗	32	68.8
275.		-W23⊗	16	50.0
276.		-W24⊗	30	40.0
277.		-W25⊗	25	68.0
278.		-W26⊗	42	64.3
279.		-W27⊗	24	62.5
280.		-W28⊗	34	38.2
281.		-W29⊗	34	64.7
282.		-W30⊗	33	30.3
283.		-W31⊗	43	9.3
284.		-W32⊗	45	75.6
285.		-W33⊗	42	80.9
286.		-W34⊗	47	65.9
287.		-W35⊗	32	50.0
288.		-W36⊗	19	73.7
289.		-W37⊗	40	25.0
290.		-W38⊗	41	58.5
291.		-W39⊗	25	48.0
292.		-W40⊗	45	17.8
293.		-W41⊗	32	50.0
294.		-W42⊗	39	30.8
295.		-W43⊗	35	2.9

Contd.

1	2		3	4
296.	74209 [Pant-A2 x NP(WR)15]	-B-W44⊗	29	79.3
297.		-W45⊗	34	55.9
298.		-W46⊗	43	39.5
299.		-W47⊗	29	31.0
300.		-W48⊗	18	55.6
301.		-W49⊗	31	32.3
302.		-W50⊗	37	62.1
303.		-W51⊗	13	100.0
304.		-W52⊗	26	92.3
305.		-W53⊗	27	77.8
306.		-W54⊗	13	100.0
307.		-W55⊗	16	43.8
308.		-W56⊗	22	68.2
309.		-W57⊗	15	93.3
310.		-W58⊗	20	30.0
311.		-W59⊗	14	100.0
312.		-W60⊗	12	100.0
313.		-W61⊗	18	22.2
314.		-W62⊗	3	66.7
315.		-W63⊗	12	83.3
316.		-W64⊗	19	68.4
317.		-W65⊗	12	100.0
318.		-W66⊗	30	6.7
319.		-W67⊗	21	90.5
320.		-W68⊗	17	88.2
321.		-W69⊗	36	63.9
322.		-W70⊗	7	100.0
323.		-W71⊗	26	46.2
324.		-W72⊗	52	7.7
325.		-W73⊗	25	28.0
326.		-W74⊗	34	52.9
327.		-W75⊗	22	59.1
328.		-W76⊗	18	83.3
329.		-W77⊗	15	73.3
330.		-W78⊗	No germination	
331.	74360 (ICP-7065 x -7035)	-B-W1⊗	30	20.0
332.		-W2⊗	1	100.0
333.		-W3⊗	20	0.0
334.		-W4⊗	33	15.2
335.		-W5⊗	31	38.7
336.		-W6⊗	29	65.5

1	2		3	4
337.	74360 (ICP-7065 x -7035)	-B-W7⊗	37	18.9
338.		-W8⊗	31	6.5
339.		-W9⊗	14	8.3
340.		-W10⊗	38	52.6
341.		-W11⊗	20	95.0
342.		-W12⊗	34	38.2
343.		-W13⊗	20	10.0
344.		-W14⊗	36	97.2
345.		-W15⊗	18	77.8
346.		-W16⊗	32	53.1
347.		-W17⊗	33	30.3
348.		-W18⊗	30	50.0
349.		-W19⊗	36	27.8
350.		-W20⊗	25	18.5
351.		-W21⊗	27	34.6
352.		-W22⊗	44	25.9
353.		-W23⊗	13	92.3
354.		-W24⊗	42	90.5
355.		-W25⊗	30	80.0
356.		-W26⊗	28	96.4
357.		-W27⊗	28	71.4
358.		-W28⊗	21	66.7
359.		-W29⊗	13	92.3
360.		-W30⊗	18	83.3
361.		-W31⊗	35	65.7
362.		-W32⊗	45	51.1
363.		-W33⊗	25	52.0
364.		-W34⊗	45	73.3
365.		-W35⊗	8	62.5
366.		-W36⊗	37	45.9
367.		-W37⊗	39	38.5
368.		-W38⊗	31	58.1
369.		-W39⊗	20	60.0
370.		-W40⊗	48	56.3
371.		-W41⊗	31	64.5
372.		-W42⊗	38	34.2
373.		-W43⊗	45	51.1
374.		-W44⊗	45	60.0
375.		-W45⊗	41	68.3
376.		-W46⊗	44	79.5
377.		-W47⊗	38	63.1
378.		-W48⊗	49	65.3
379.		-W49⊗	47	61.7
380.		-W50⊗	44	56.8

Contd.

1	2		3	4
381.	74360 (ICP-7065 x -7035)	-B-W51⊗	46	86.9
382.		-W52⊗	43	69.8
383.		-W53⊗	45	82.2
384.		-W54⊗	44	54.5
385.		-W55⊗	44	72.7
386.		-W56⊗	37	48.6
387.		-W57⊗	47	76.6
388.		-W58⊗	14	71.4
389.		-W59⊗	51	96.1
390.		-W60⊗	31	38.7
391.		-W61⊗	20	55.0
392.		-W62⊗	45	75.6
393.		-W63⊗	11	81.8
394.		-W64⊗	38	84.2
395.		-W65⊗	34	67.6
396.		-W66⊗	33	63.6
397.		-W67⊗	32	15.6
398.		-W68⊗	40	47.5
399.		-W69⊗	29	82.8
400.		-W70⊗	33	51.5
401.		-W71⊗	18	33.3
402.		-W72⊗	27	88.9
403.		-W73⊗	49	46.9
404.		-W74⊗	31	19.4
405.		-W75⊗	16	25.0
406.		-W76⊗	39	36.6
407.		-W77⊗	29	6.9
408.		-W78⊗	36	47.2
409.		-W79⊗	28	39.3
410.		-W80⊗	30	30.0
411.		-W81⊗	36	27.8
412.		-W82⊗	12	41.7
413.		-W83⊗	24	58.3
414.		-W84⊗	21	28.6
415.		-W85⊗	9	66.7
416.		-W86⊗	21	54.5
417.		-W87⊗	35	60.0
418.		-W88⊗	40	60.0
419.		-W89⊗	36	91.7
420.		-W90⊗	36	58.3
421.		-W91⊗	39	76.9
422.		-W92⊗	27	66.7
423.		-W93⊗	14	71.4
424.		-W94⊗	22	59.1
425.		-W95⊗	35	68.6

Contd.

1	2		3	4
426.	74360 (ICP-7065 x -7035)	-B-W96⊗	16	50.0
427.		-W97⊗	33	66.7
428.		-W98⊗	3	33.3
429.		-W99⊗	18	55.6
430.		-W100⊗	29	72.4
431.		-W101⊗	18	44.4
432.		-W102⊗	34	32.4
433.		-W103⊗	41	78.1
434.		-W104⊗	31	51.6
435.		-W105⊗	36	77.8
436.		-W106⊗	33	42.4
437.		-W107⊗	39	35.9
438.		-W108⊗	39	41.0
439.		-W109⊗	44	43.2
440.		-W110⊗	39	69.2
441.		-W111⊗	28	75.0
442.		-W112⊗	20	90.0
443.		-W113⊗	43	74.4
444.		-W114⊗	32	62.5
445.		-W115⊗	35	74.3
446.		-W116⊗	41	75.6
447.		-W117⊗	23	73.9
448.		-W118⊗	38	55.3
449.		-W119⊗	30	63.3
450.		-W120⊗	33	78.8
451.		-W121⊗	44	63.6
452.		-W122⊗	38	42.1
453.		-W123⊗	19	15.8
454.		-W124⊗	13	76.9
455.		-W125⊗	33	84.8
456.		-W126⊗	26	76.9

APPENDIX- IV

Screening of F5 progenies for resistance to wilt in Vertisol sick plot- 'A'

Sl. No.	Pedigree	No. of plants	Percent wilt
1	2	3	4
1.	74243-B-B-W1⊗	15	100.0
2.	-W2⊗	45	73.3
3.	-W3⊗	35	80.0
4.	-W4⊗	10	100.0
5.	-W5⊗	15	60.0
6.	-W6⊗	43	93.0
7.	-W7⊗	57	89.5
8.	-W8⊗	12	41.7
9.	-W9⊗	24	41.7
10.	-W10⊗	44	56.8
11.	-W11⊗	31	51.6
12.	-W12⊗	5	60.0
13.	-W13⊗	11	100.0
14.	-W14⊗	12	75.0
15.	-W15⊗	23	13.0
16.	-W16⊗	24	29.2
17.	-W17⊗	10	50.0
18.	-W18⊗	32	78.1
19.	-W19⊗	17	52.9
20.	-W20⊗	11	27.3
21.	-W21⊗	7	71.4
22.	-W22⊗	10	50.0
23.	-W23⊗	22	86.4
24.	-W24⊗	4	75.0
25.	-W25⊗	32	78.1
26.	-W26⊗	22	68.2
27.	-W27⊗	10	80.0
28.	-W28⊗	7	71.4
29.	-W29⊗	32	46.9
30.	-W30⊗	7	28.6
31.	-W31⊗	31	32.3
32.	-W32⊗	3	66.7
33.	-W33⊗	15	53.3
34.	-W34⊗	45	48.6
35.	-W35⊗	22	40.6

Contd.

1	2	3	4
36.	74243-B-B-W36Ø	11	27.3
37	-W37Ø	32	53.1
38.	-W38Ø	12	91.7
39.	-W39Ø	11	54.5
40.	-W40Ø	12	66.7
41.	-W41Ø	28	60.7
42.	-W42Ø	5	80.0
43.	-W43Ø	10	100.0
44.	-W44Ø	9	11.1
45.	-W45Ø	21	44.9
46.	-W46Ø	17	100.0
47.	-W47Ø	7	42.9
48.	-W48Ø	15	100.0

APPENDIX-V

Results of screening selective mating population selections for wilt resistance in Vertisol sick plot -'B'.

Sl. No.	Pedigree	No. of plants	Percent wilt
1	2	3	4
1.	SMP-1-VI NDT-1	62	88.7
2.	-2	62	69.3
3.	-3	59	63.3
4.	-4	68	77.9
5.	-5	46	76.1
6.	-6	65	81.5
7.	-7	49	81.6
8.	-8	64	89.1
9.	-9	48	58.3
10.	SMP-3-VI NDT-1	57	47.4
11.	-2	57	93.0
12.	-3	55	74.5
13.	-4	63	77.8
14.	-5	60	61.7
15.	-6	49	85.7
16.	-7	46	79.2
17.	-8	54	90.7
18.	-9	57	68.4
19.	-10	54	72.2
20.	-11	61	65.6
21.	-12	59	74.6
22.	-13	62	90.3
23.	-14	54	83.3
24.	-15	68	77.9
25.	-16	68	58.6
26.	-17	52	59.6
27.	-18	63	90.5
28.	-19	42	63.4
29.	-20	64	76.6
30.	-21	61	73.8
31.	-22	55	59.2
32.	-23	68	44.1
33.	-24	66	90.9
34.	-25	51	88.1
35.	-26	62	87.1

Contd.

1	2	3	4
36.	SMP-4-VI NDT-1	50	66.0
37.	-2	41	80.5
38.	-3	66	50.0
39.	-4	34	82.3
40.	-5	73	78.1
41.	-7	64	92.2
42.	-8	65	92.3
43.	-9	54	88.8
44.	-10	89	96.6
45.	SMP-5-VI NDT-2	49	67.3
46.	-3	53	60.4
47.	SMP-6-VI NDT-1	56	48.0
48.	-2	57	49.1
49.	-3	67	59.7
50.	SMP-8-VI NDT-1	22	72.7
51.	SMP-9-VI NDT-1	59	94.9
52.	-2	59	74.6
53.	-3	57	73.7
54.	-4	46	47.8
55.	-5	50	80.0
56.	-6	53	67.9
57.	-7	53	98.1
58.	-8	63	71.4
59.	-9	67	80.6
60.	SMP-10-VI NDT-1	58	70.7
61.	-2	50	66.0
62.	-3	63	66.7
63.	-4	56	87.5
64.	-5	66	62.1
65.	-6	54	77.8
66.	-7	58	65.5
67.	-8	41	87.8
68.	-9	58	89.6
69.	-10	50	96.0
70.	-11	60	71.7
71.	-12	65	73.8
72.	-13	58	56.9
73.	-14	55	81.8
74.	-15	47	72.3
75.	-17	69	60.9
76.	-18	59	88.1
77.	-19	49	89.8
78.	-20	62	51.6
79.	-21	55	80.0
80.	SMP-11-VI NDT-2	61	75.4

Contd.

1	2	3	4
81.	SMP-11-VI NDT-3	68	67.6
82.	-4	50	60.0
83.	-5	62	30.6
84.	-6	60	43.3
85.	-7	55	74.1
86.	-8	66	71.2
87.	-9	58	50.0
88.	-10	44	27.3
89.	SMP-12-VI NDT-4	50	42.0
90.	-5	46	60.9
91.	-6	57	71.9
92.	-7	53	64.1
93.	-9	54	59.2
94.	-10	78	67.9
95.	-11	55	81.8
96.	-12	55	81.8
97.	-13	47	51.1
98.	-14	51	60.4
99.	-15	53	72.9
100.	-16	54	75.9
101.	SMP-13-VI NDT-3	51	60.8
102.	-4	42	52.4
103.	-5	44	65.9
104.	-6	54	40.7
105.	SMP-16-VI NDT-3	58	60.3
106.	-4	49	22.4
107.	-5	48	50.0
108.	-7	57	87.7
109.	SMP-17-VI NDT-1	50	64.0
110.	-2	67	86.6
111.	-3	73	79.4
112.	-4	67	76.1
113.	-5	78	76.9
114.	-6	49	65.3
115.	-7	66	50.0
116.	-8	61	59.0
117.	SMP-18-VI NDT-1	65	44.6
118.	-2	57	29.8
119.	-3	61	91.7
120.	SMP-20-VI NDT-1	50	60.0
121.	SMP-23-VI NDT-1	46	56.5
122.	-2	61	39.3
123.	-3	53	52.8
124.	-4	69	71.0

Contd.

1	2	3	4
125.	SMP-24-VI NDT-1	57	84.2
126.	-2	61	63.9
127.	-3	59	42.4
128	-4	51	54.3
129.	-5	57	71.9
130.	SMP-25-VI NDT-2	54	33.3
131.	-3	55	23.6
132.	-4	60	51.7
133.	-5	67	85.1
134.	-6	63	46.0
135.	-7	59	40.7
136.	SMP-26-VI NDT-3	57	91.2
137.	-4	62	79.0
138.	SMP-27-VI NDT-2	56	71.4
139.	SMP-28-VI NDT-2	65	76.9
140.	-3	65	38.5
141.	-6	57	80.7
142.	-7	62	37.1
143.	-8	72	68.0
144.	-9	70	60.0
145.	-10	71	91.5
146.	-11	74	100.0
147.	-12	55	74.5
148.	SMP-31-VI NDT-1	59	94.9
149.	-2	67	85.1
150.	-3	56	58.9
151	-4	56	62.5
152.	-5	58	44.8
153	-6	68	77.9
154	-7	61	62.3
155	SMP-32-VI NDT-1	75	88.0
156	-2	75	72.0
157.	-3	57	68.4
158	-4	65	47.7
159.	SMP-33-VI NDT-1	52	59.6
160.	SMP-35-VI NDT-1	72	69.4
161.	-2	65	75.0
162.	-3	69	73.9
163	-4	65	89.2
164.	SMP-36-VI NDT-2	56	67.8
165	-3	69	92.7
166.	-4	56	96.4
167.	-5	53	74.4
168.	-6	55	49.1
169.	-7	56	64.3
170.	-8	59	50.8

Contd.

1	2	3	4
171.	SMP-36-VI NDT-9	61	90.2
172.	-10	40	90.0
173.	-11	52	90.4
174.	-13	36	63.9
175.	-14	63	74.6
176.	SMP-37-VI NDT-2	48	75.0
177.	-3	58	81.0
178.	-4	47	53.2
179.	-5	47	72.3
180.	-6	41	80.5
181.	-7	63	82.5
182.	SMP-41-VI NDT-1	57	78.9
183.	-2	55	69.1
184.	-3	72	70.8
185.	-4	71	71.8
186.	-5	57	75.4
187.	SMP-42-VI NDT-1	57	45.4
188.	-2	62	53.2
189.	SMP-43-VI NDT-1	63	68.2
190.	-2	72	59.7

APPENDIX-VI

Results of screening selections from M-1 (DC-F_3) 'A' for wilt resistance in Vertisol sick plot-'B'.

Sl. No.	Pedigree	No. of plants	Percent wilt
1	2	3	4
1.	75004-79-VI NDT-1	68	56.1
2.	-2	61	42.6
3.	-3	71	84.5
4.	-4	58	56.9
5.	-5	63	41.3
6.	-6	55	78.2
7.	-7	74	27.8
8.	-8	63	50.8
9.	75004-81-VI NDT-2	63	27.0
10.	75004-84-VI NDT-1	55	38.2
11.	-2	64	73.4
12.	75004-85-VI NDT-2	74	41.9
13.	-3	78	69.2
14.	-4	67	68.6
15.	-5	64	78.1
16.	-6	77	42.8
17.	-7	57	68.4
18.	-8	79	73.4
19.	-9	69	81.1
20.	-10	75	76.0
21.	75004-88-VI NDT-1	65	43.1
22.	-2	75	89.3
23.	75004-91-VI NDT-1	76	88.1
24.	-2	55	80.0
25.	-3	73	86.3
26.	-4	87	76.6
27.	75004-92-VI NDT-1	67	82.1
28.	75004-94-VI NDT-1	72	58.3
29.	-2	66	80.3
30.	-3	68	58.8
31.	75004-95-VI NDT-1	69	86.9
32.	75004-96-VI NDT-1	66	65.1
33.	75004-97-VI NDT-1	61	94.8
34.	-2	73	75.3
35.	75004-98-VI NDT-1	61	65.6
36.	75004-100-VI NDT-1	65	73.8

Contd.

1	2	3	4
37.	75013-25-VI NDT-1	43	37.2
38.	-2	65	80.0
39.	75013-85-VI NDT-1	60	85.7
40.	-2	70	68.6
41.	-3	72	75.0
42.	75013-88-VI NDT-1	59	72.9
43.	-2	69	86.4
44.	-3	65	89.5
45.	75013-89-VI NDT-1	68	91.2
46.	75013-93-VI NDT-1	61	55.7
47.	75013-95-VI NDT-1	66	59.1
48.	-2	59	53.1
49.	75013-97-VI NDT-1	57	70.2
50.	-2	74	59.4
51.	75013-99-VI NDT-1	62	59.7
52.	75013-100-VI NDT-1	49	65.3
53.	75013-102-VI NDT-1	74	77.0
54.	75013-103-VI NDT-1	65	67.7
55.	-2	52	67.3
56.	75013-103-VI NDT-3	56	78.6
57.	-4	56	60.7
58.	-5	43	58.1
59.	-6	46	56.5
60.	75013-105-VI NDT-1	62	74.2
61.	75013-116-VI NDT-1	42	93.7
62.	-2	30	50.0
63.	75020-83-VI NDT-1	52	100.0
64.	-2	62	82.2
65.	-3	58	96.5
66.	-4	54	77.8
67.	-5	53	90.6
68.	75020-84-VI NDT-1	71	98.6
69.	-2	59	91.5
70.	-3	71	84.5
71.	75020-85-VI NDT-1	76	85.5
72.	75020-88-VI NDT-1	53	94.3
73.	75020-91-VI NDT-1	78	93.6
74.	75020-94-VI NDT-1	68	91.2
75.	75020-94-VI NDT-2	67	88.0
76.	75020-94-VI NDT-3	73	86.3
77.	75020-94-VI NDT-4	77	88.3
78.	75020-95-VI NDT-1	57	75.4
79.	75020-101-VI NDT-1	59	79.7
80.	-2	57	71.9

1	2	3	4
81.	75020-101-VI NDT-3	81	71.6
82.	-4	63	77.8
83.	-5	65	90.8
84.	-6	66	80.3
85.	-7	72	94.4
86.	-8	71	63.4
87.	-9	49	79.6
88.	-10	52	86.5
89.	-11	70	64.3
90.	-12	71	42.2
91.	75020-102-VI NDT-1	79	72.1
92.	-2	72	84.7
93.	-3	73	95.9
94.	75023-77-VI NDT-1	65	96.9
95.	75023-84-VI NDT-1	75	94.7
96.	-2	61	82.0
97.	-3	58	87.9
98.	75023-92-VI NDT-1	63	68.2
99.	75023-96-VI NDT-1	62	71.0
100.	-2	70	40.0
101.	-3	75	86.7
102.	75023-97-VI NDT-1	64	79.7
103.	-2	56	76.8
104.	75009-99-VI NDT-1	59	49.1
105.	-2	60	35.0
106.	75009-100-VI NDT-1	60	43.3
107.	75009-102-VI NDT-1	72	77.8
108.	-2	62	51.6
109.	-3	67	65.7
110.	75009-104-VI NDT-1	62	82.2
111.	-2	56	92.8
112.	-3	68	91.2
113.	-4	49	69.4
114.	75009-106-VI NDT-1	59	35.6
115.	-2	59	64.4
116.	75009-107-VI NDT-1	66	53.9
117.	-2	74	81.1
118.	75009-111-VI NDT-1	57	73.7
119.	-2	62	58.1
120.	-3	63	71.4
121	75009-112-VI NDT-1	65	35.4
122.	-2	61	78.7
123.	-3	60	61.7
124	-4	52	57.7
125.	-5	65	58.5

Contd.

1	2	3	4
126.	75009-114-VI NDT-1	65	38.5
127.	-2	59	66.1
128.	-3	72	51.4
129.	-4	70	42.8
130.	75009-116-VI NDT-1	64	40.6
131.	-2	57	77.2
132.	75009-121-VI NDT-1	61	54.1
133.	-2	60	75.0
134.	75009-124-VI NDT-1	67	83.6
135.	-2	68	77.9
136.	75028-76-VI NDT -1	59	78.0
137.	-2	57	75.4
138.	75028-78-VI NDT -1	64	60.9
139.	-2	60	86.7
140.	75028-81-VI NDT -1	76	89.5
141.	75028-82-VI NDT -1	63	84.1
142.	75028-83-VI NDT -1	57	77.2
143.	-2	62	90.3
144.	75028-84-VI NDT -1	60	75.0
145.	-2	62	85.5
146.	75028-85-VI NDT -1	80	78.7
147.	-2	60	73.7
148.	-3	54	77.8
149.	75028-87-VI NDT -1	61	60.6
150.	75028-88-VI NDT -1	62	61.3
151.	75028-92-VI NDT -1	46	76.1
152.	-2	47	42.5
153.	75028-93-VI NDT -1	52	57.7
154.	-2	54	57.4
155.	-3	59	30.0
156.	-4	46	30.4
157.	-5	62	45.2
158.	75028-96-VI NDT -1	42	50.0
159.	-2	50	66.0
160.	-3	51	45.1
161.	-4	55	67.3
162.	75028-97-VI NDT -1	52	48.1
163.	-2	64	67.2
164.	-3	53	77.3
165.	75028-100-VI NDT-1	55	85.4
166.	-2	59	88.1
167.	75028-102-VI NDT-1	54	75.9
168.	-2	58	50.0
169.	75028-104-VI NDT-1	64	62.5
170.	-2	66	62.1

Contd.

1	2	3	4
171.	75028-105-VI NDT-1	59	49.1
172.	-2	52	71.1
173.	-3	52	59.6
174.	75028-106-VI NDT-1	66	66.7
175.	75028-108-VI NDT-1	65	89.2
176.	75028-109-VI NDT-1	55	65.4
177.	-2	62	82.2
178.	75028-110-VI NDT-1	71	78.9
179.	75028-111-VI NDT-1	61	60.6
180.	-2	61	62.3
181.	75028-115-VI NDT-1	63	38.1
182.	-2	60	48.3
183.	75028-119-VI NDT-1	68	36.8
184.	-2	62	74.2
185.	-3	67	50.7
186.	75010-54-VI NDT -1	60	88.3
187.	-2	75	73.3
188.	75010-59-VI NDT -1	54	83.3
189.	75010-60-VI NDT -1	55	66.1
190.	75010-68-VI NDT -1	46	73.9
191.	-2	55	96.4
192.	75010-71-VI NDT -1	69	79.7
193.	75010-72-VI NDT -1	62	75.8
194.	-2	60	70.0
195.	75010-74-VI NDT -1	53	92.4
196.	-2	70	68.6
197.	75010-75-VI NDT -1	69	94.2
198.	75010-76-VI NDT -1	58	93.1
199.	75010-77-VI NDT -1	57	78.9
200.	-2	54	90.7
201	-3	55	88.9
202.	75010-78-VI NDT -1	60	90.0
203.	-2	59	91.5
204.	75010-79-VI NDT -1	67	76.1
205.	-2	44	93.2
206.	75010-87-VI NDT -1	73	86.3
207.	-2	64	70.3
208.	-3	64	90.6
209.	75010-88-VI NDT -1	58	81.0
210.	-2	70	78.6
211.	75010-91-VI NDT -1	62	95.2
212.	75010-92-VI NDT -1	75	85.3
213.	-2	73	87.7
214.	75059-34-VI NDT -1	61	57.4
215.	75059-35-VI NDT -1	65	61.5

Contd

1	2	3	4
216.	75059-35-VI NDT-2	71	40.8
217.	-3	74	43.2
218.	-4	47	46.8
219.	75059-39-VI NDT-1	67	82.1
220.	75059-43-VI NDT-1	72	62.5
221.	75059-45-VI NDT-1	58	74.1
222.	-2	66	57.6
223.	-3	71	78.9
224.	-4	66	66.7
225.	-5	67	91.0
226.	-6	60	81.4
227.	-7	71	32.4
228.	-8	91	81.5
229.	75059-50-VI NDT-1	73	76.7
230.	-2	70	85.7
231.	-3	58	53.4
232.	75059-56-VI NDT-1	48	79.2
233.	75059-58-VI NDT-1	12	25.0
234.	75059-62-VI NDT-1	63	65.1
235.	75059-69-VI NDT-1	63	77.8
236.	75059-70-VI NDT-1	59	88.1
237.	-2	60	78.3
238.	75033-15-VI NDT-1	52	82.7
239.	-2	69	89.8
240.	-3	66	93.9
241.	-4	59	91.5
242.	-5	48	89.6
243.	75033-16-VI NDT-1	64	71.9
244.	-2	57	91.2
245.	75033-17-VI NDT-1	62	77.4
246.	-2	49	71.4
247.	-3	58	84.5
248.	75033-20-VI NDT-1	59	32.2
249.	75033-21-VI NDT-1	66	30.3
250.	-2	60	60.0
251.	75033-22-VI NDT-1	54	59.2
252.	-2	75	77.3
253.	-3	64	84.3
254.	75033-32-VI NDT-1	58	84.5
255.	-2	54	85.2
256.	-3	64	98.4
257.	75033-43-VI NDT-1	55	69.1
258.	-2	64	92.2
259.	-3	68	66.2
260.	-4	70	80.0

Contd.

1	2	3	4
261.	75033-46-VI NDT-1	60	98.3
262.	-2	74	81.1
263.	-3	59	100.0
264.	-4	52	71.1
265.	75033-50-VI NDT-1	68	85.3
266.	75033-51-VI NDT-1	66	72.7
267.	-2	56	69.6
268.	-3	64	79.7
269.	-4	58	96.5
270.	-7	74	66.2
271.	-8	65	60.0
272.	-9	63	68.2
273.	-10	59	55.9
274.	-11	62	66.1
275.	-13	64	57.8
276.	-16	59	28.8
277.	-17	44	31.8
278.	-18	63	46.0
279.	-19	70	24.3
280.	-20	25	40.0
281.	-21	60	42.6
282.	-22	66	38.1
283.	-23	55	65.4
284.	-24	63	54.0
285.	-25	60	61.7
286.	-26	62	88.7
287.	-27	53	84.9
288.	75033-52-VI NDT-2	46	54.3
289.	-5	57	77.2
290.	-6	51	53.3
291.	-7	49	69.4
292.	-8	63	68.2
293.	-10	51	72.5
294.	-11	58	79.3
295.	-15	64	93.7
296.	-17	26	69.2
297.	-21	54	63.0
298.	-22	68	72.0
299.	-23	58	87.5
300.	-24	58	79.3
301.	-25	44	75.0
302.	-26	46	32.6
303.	75033-53-VI NDT-1	50	18.0
304.	75033-56-VI NDT-1	55	58.2
305.	-2	63	71.4

1	2	3	4
306.	75033-57-VI NDT-1	65	93.3
307.	-2	58	84.5
308.	75033-62-VI NDT-1	64	92.2
309.	75049-13-VI NDT-1	64	82.8
310.	-2	61	78.7
311.	75049-14-VI NDT-1	54	61.1
312.	-2	66	92.1
313.	-3	64	85.9
314.	-4	51	78.4
315.	-5	55	87.3
316.	-6	58	75.9
317.	75049-15-VI NDT-1	64	75.0
318.	-2	43	81.4
319.	-1	52	28.8
320.	-2	65	68.9
321.	75049-17-VI NDT-1	54	40.7
322.	-2	60	63.3
323.	75049-20-VI NDT-1	53	35.8
324.	75049-23-VI NDT-1	49	75.5
325.	75049-27-VI NDT-1	47	53.2
326.	-2	54	55.5
327.	-3	72	81.9
328.	75049-28-VI NDT-1	60	53.3
329.	75049-32-VI NDT-1	45	53.3
330.	-2	53	62.3
331.	-3	43	55.8
332.	75049-34-VI NDT-1	59	74.6
333.	-2	64	68.7
334.	75049-35-VI NDT-1	55	81.8
335.	-2	51	76.5
336.	-3	62	56.4
337.	75049-37-VI NDT-1	66	31.8
338.	-2	69	85.5
339.	75049-39-VI NDT-1	58	65.5
340.	75049-40-VI NDT-1	76	30.3
341.	75049-42-VI NDT-1	73	71.2
342.	-2	56	62.5
343.	75049-43-VI NDT-1	64	70.3
344.	-2	59	42.4
345.	-3	61	55.7
346.	75049-45-VI NDT-1	72	59.7
347.	-2	59	39.0
348.	75049-47-VI NDT-1	57	75.4

1	2	3	4
349	75049-47-VI NDT-2	61	59.0
350.	-3	57	71.9
351.	75049-50-VI NDT-1	58	37.9
352.	75049-52-VI NDT-1	52	46.1
353.	-2	55	43.6
354.	75049-53-VI NDT-1	54	33.3
355.	-2	56	44.6
356.	75049-55-VI NDT-1	60	50.0
357.	-2	69	68.8
358.	75049-56-VI NDT-1	61	75.4
359.	75049-58-VI NDT-1	68	82.3
360.	75049-59-VI NDT-1	75	86.7
361.	75049-64-VI NDT-1	72	98.6
362.	75049-80-VI NDT-1	61	95.1

APPENDIX- VII

Results of screening selections from M-1 ($DC-F_3$) -'B' for wilt resistance in Vertisol sick plot -'B'

Sl. No.	Pedigree	No. of plants	Percent wilt
1	2	3	4
1.	75023-56-VI NDT-1	68	64.7
2.	-2	62	66.1
3.	-3	79	83.9
4.	-4	71	48.6
5.	-5	61	54.1
6.	-6	66	84.8
7.	-7	70	82.8
8.	-8	57	82.4
9.	-9	66	84.8
10.	-10	56	76.8
11.	75023-102-VI NDT-1	71	59.1
12.	-2	61	86.9
13.	-3	52	51.9
14.	-4	71	91.5
15.	-5	75	82.7
16.	-6	66	39.4
17.	-7	74	98.6
18.	-8	51	58.8
19.	-9	69	75.4
20.	-10	75	46.7
21.	75009-39-VI NDT-1	59	98.3
22.	-2	64	57.8
23.	-3	70	85.7
24.	-4	60	85.0
25.	-5	56	91.1
26.	-6	50	74.0
27.	-7	64	96.9
28.	-8	66	69.7
29.	-9	57	91.2
30.	-10	78	87.2
31.	75009-119-VI NDT-1	50	82.0
32.	-2	51	68.6
33.	-4	84	95.2
34.	-5	68	79.4
35.	-6	64	89.1
36.	-7	67	76.1
37.	-8	63	93.6
38.	-9	55	67.3
39.	-10	81	98.8

Contd.

1	2	3	4
40.	75028-99-VI NDT-1	61	47.5
41.	-2	64	60.9
42.	-3	59	83.0
43.	-4	67	76.1
44.	-5	45	57.8
45.	-6	69	81.1
46.	-7	65	58.5
47.	-8	70	77.1
48.	-9	68	66.2
49.	-10	42	92.8
50.	75059-67-VI NDT-1	34	61.8
51.	-2	79	44.4
52.	-3	63	71.4
53.	-4	52	44.2
54.	-5	59	61.0
55.	-6	63	71.4
56.	-7	65	67.7
57.	-8	55	72.7
58.	-9	59	74.6
59.	-10	57	63.1
60.	75059-39-VI NDT-1	57	35.0
61.	-2	69	35.1
62.	-3	52	53.8
63.	-4	58	81.0
64.	-5	63	63.5
65.	-6	63	57.1
66.	-7	69	55.1
67.	-8	65	33.8
68.	-9	67	25.4
69.	-10	58	72.4
70.	75020-71-VI NDT-1	36	75.0
71.	-2	50	84.0
72.	-3	51	94.1
73.	-4	42	68.8
74.	-5	31	58.5
75.	-6	58	96.5
76.	-7	50	66.0
77.	-8	55	76.4
78.	-9	51	72.5
79.	-10	48	85.4
80.	75020-80-VI NDT-1	56	55.3
81.	-2	62	54.8
82.	-3	52	71.1
83.	-4	66	89.4

Contd.

1	2	3	4
84.	75020-80-VI NDT-5	35	57.1
85.	-6	67	98.5
86.	-7	55	81.8
87.	-8	51	88.2
88.	-9	66	74.2
89.	-10	53	84.9
90.	75020-82-VI NDT-1	60	83.3
91.	-2	53	83.0
92.	-3	54	81.5
93.	-4	60	90.0
94.	-5	64	87.5
95.	-6	53	94.3
96.	-7	62	72.6
97.	-8	61	90.2
98.	-9	54	70.4
99.	-10	60	93.3
100.	75023-68-VI NDT-1	61	100.0
101.	-2	55	90.9
102.	-3	70	95.7
103.	-4	54	88.9
104.	-5	58	67.2
105.	-6	43	81.4
106.	-7	52	48.1
107.	-8	55	80.0
108.	-9	57	66.7
109.	-10	57	59.6
110.	75023-71-VI NDT-1	56	53.6
111.	-2	58	70.7
112.	-3	59	47.4
113.	-4	68	79.4
114.	-5	63	66.7
115.	-6	68	70.7
116.	-7	65	87.7
117.	-8	72	83.3
118.	-9	61	93.4
119.	-10	66	86.4
120.	75023-100-VI NDT-1	64	78.1
121.	-2	48	95.8
122.	-3	74	75.7
123.	-4	57	96.5
124.	-5	61	88.5
125.	-6	53	83.0
126.	-7	58	91.4
127.	-8	42	57.1

1	2	3	4
128.	75023-100-VI NDT-9	64	48.4
129.	-10	50	78.0
130.	75023-101-VI NDT-1	48	77.1
131.	-2	65	69.2
132.	-3	57	86.0
133.	-4	58	55.2
134.	-5	59	91.5
135.	-6	44	77.3
136.	-7	51	52.9
137.	-8	49	73.5
138.	-9	54	55.5
139.	-10	57	56.0
140.	75009-72-VI NDT-1	46	50.0
141.	-2	50	38.0
142.	-3	62	56.4
143.	-4	56	73.2
144.	-5	39	58.9
145.	-6	41	78.0
146.	-7	51	62.7
147.	-8	51	17.6
148.	-9	51	21.6
149.	-10	62	69.3
150.	75009-113-VI NDT-1	47	55.3
151.	-2	59	74.6
152.	-3	49	78.3
153.	-4	51	58.8
154.	-5	52	61.5
155.	-6	61	55.7
156.	-7	63	77.8
157.	-8	68	51.5
158.	-9	57	54.4
159.	-10	63	88.9
160.	75009-118-VI NDT-1	64	75.0
161.	-2	48	50.0
162.	-3	46	52.2
163.	-4	27	74.1
164.	-5	42	80.9
165.	-6	62	56.4
166.	-7	72	75.0
167.	-8	52	78.8
168.	-9	60	83.3
169.	-10	50	74.0
170.	75009-120-VI NDT-1	51	64.7
171.	-2	33	81.8

1	2	3	4
172.	75009-120-VI NDT-3	52	42.3
173.	-4	57	82.4
174.	-5	42	78.6
175.	-6	52	67.3
176.	-7	48	35.4
177.	-8	58	74.1
178.	-9	44	54.5
179.	-10	47	61.7
180.	75009-126-VI NDT-1	39	87.2
181.	-2	43	81.4
182.	-3	33	60.6
183.	-4	66	71.2
184.	-5	57	71.9
185.	-6	41	70.7
186.	-7	49	69.4
187.	-8	52	90.4
188.	-9	45	75.5
189.	-10	32	93.7
190.	75009-128-VI NDT-1	65	11.1
191.	-2	58	75.9
192.	-3	68	50.0
193.	-4	73	84.9
194.	-5	37	81.1
195.	-6	77	90.9
196.	-7	63	76.2
197.	-8	56	96.4
198.	-9	70	84.3
199.	-10	55	60.0
200.	75009-129-VI NDT-1	52	84.6
201.	-2	59	83.0
202.	-3	46	71.7
203.	-4	41	74.5
204.	-5	62	58.1
205.	-6	30	76.7
206.	-7	52	61.5
207.	-8	54	81.5
208.	-9	44	52.3
209.	-10	51	82.3
210.	75028-70-VI NDT-1	44	63.6
211.	-2	49	69.4
212.	-3	36	69.4
213.	-4	54	87.0
214.	-5	35	65.7
215.	-6	44	84.1

1	2	3	4
216.	75028-70-VI NDT-7	48	70.8
217.	-8	53	73.6
218.	-9	60	81.7
219.	-10	57	85.9
220.	75028-72-VI NDT-1	57	84.2
221.	-2	44	81.8
222.	-3	41	82.9
223.	-4	60	91.7
224.	-5	40	70.0
225.	-6	37	89.2
226.	-7	38	84.2
227.	-8	59	72.9
228.	-9	44	61.4
229.	-10	60	70.0
230.	75028-89-VI NDT-1	47	87.2
231.	-2	36	75.0
232.	-3	49	89.8
233.	-4	47	63.8
234.	-5	43	73.5
235.	-6	43	65.1
236.	-7	43	69.8
237.	-8	40	60.0
238.	-9	35	80.0
239.	-10	53	84.9
240.	75028-98-VI NDT-1	53	50.9
241.	-2	38	65.8
242.	-3	47	70.2
243.	-4	34	79.4
244.	-5	42	61.9
245.	-6	37	86.5
246.	-7	67	67.2
247.	-8	57	77.2
248.	-9	54	61.1
249.	-10	43	83.7
250.	75028-103-VI NDT-1	65	90.8
251.	-2	55	96.4
252.	-3	54	96.3
253.	-4	37	91.9
254.	-5	60	91.7
255.	-6	53	88.4
256.	-7	49	95.9
257.	-8	41	97.6
258.	-9	48	100.0
259.	-10	68	95.6

Contd.

1	2	3	4
260.	75028-112-VI NDT-1	53	98.1
261.	-2	50	92.0
262.	-3	58	88.1
263.	-4	44	97.7
264.	-5	38	100.0
265.	-6	45	96.4
266.	-7	49	100.0
267.	-8	38	76.3
268.	-9	47	70.2
269.	-10	57	82.4
270.	75059-66-VINDT -1	57	43.8
271.	-2	57	77.2
272.	-3	52	69.2
273.	-4	60	61.7
274.	-5	58	82.7
275.	-6	59	74.6
276.	-7	64	81.2
277.	-8	51	94.1
278.	-9	56	80.3
279.	-10	55	74.5
280.	75059-27-VI NDT-1	58	63.8
281.	-2	59	78.0
282.	-3	47	78.7
283.	-4	72	87.5
284.	-5	54	59.2
285.	-6	48	47.9
286.	-7	62	51.6
287.	-8	58	79.3
288.	-9	47	46.8
289.	-10	41	90.2
290.	75059-33-VI NDT-1	62	77.4
291.	-2	42	80.9
292.	-3	59	84.7
293.	-4	53	75.5
294.	-5	59	55.9
295.	-6	46	71.7
296.	-7	55	81.8
297.	-8	47	74.5
298.	-9	52	80.8
299.	-10	56	76.8
300.	75059-36-VI NDT-1	60	21.7
301.	-2	59	69.5
302.	-3	59	29.8
303.	-4	52	46.1
304.	-5	50	80.0
305.	-6	56	62.5

306.	75059-36-VI NDT-7	54	85.2
307.	-8	61	62.3
308.	-9	54	85.7
309.	-10	67	83.6
310.	75059-37-VI NDT-1	62	41.9
311.	-2	46	23.9
312.	-3	61	34.4
313.	-4	48	39.6
314.	-5	55	60.0
315.	-6	49	100.0
316.	-7	58	39.6
317.	-8	57	75.4
318.	-9	56	83.9
319.	-10	54	74.1
320.	75059-40-VI NDT-1	73	78.1
321.	-2	36	83.3
322.	-3	41	87.8
323.	-4	43	76.7
324.	-5	46	80.4
325.	-6	69	78.3
326.	-7	52	36.5
327.	-8	55	60.0
328.	-9	47	70.2
329.	-10	60	71.7
330.	75059-44-VI NDT-1	47	95.7
331.	-2	52	82.7
332.	-3	51	88.2
333	-4	43	76.7
334.	-5	49	77.5
335.	-6	51	74.5
336.	-7	60	98.3
337.	-8	57	94.7
338.	-9	51	88.2
339	-10	48	91.7
340.	75033-54-VI NDT-1	57	78.9
341.	-2	53	92.4
342.	-3	49	83.7
343.	-4	58	89.6
344.	-5	53	86.8
345.	-6	38	76.3
346.	-7	35	68.6
347.	-8	53	88.7
348.	-9	51	98.0
349.	-10	51	100.0
350.	75033-55-VI NDT-1	54	100.0

Contd.

1	2	3	4
351.	75033-55-VI NDT-2	30	96.7
352.	-3	51	96.1
353.	-4	64	100.0
354.	-5	72	97.2
355.	-6	60	100.0
356.	-7	54	92.6
357.	-8	53	90.6
358.	-9	51	92.1
359.	-10	47	93.6
360.	75049-36-VI NDT-1	51	86.3
361.	-2	41	95.1
362.	-3	42	85.7
363.	-4	37	86.5
364.	-5	46	89.1
365.	-6	41	81.4
366.	-7	38	86.8
367.	-8	59	96.6
368.	-9	44	81.8
369.	-10	54	88.9
370.	75049-54-VI NDT-1	48	77.1
371.	-2	53	62.3
372.	-3	52	59.6
373.	-4	47	48.9
374.	-5	42	71.4
375.	-6	36	58.3
376.	-7	52	65.4
377.	-8	49	57.1
378.	-9	43	62.8
379.	-10	33	48.5

APPENDIX-VIII

Results of screening of F4 progenies selected from M-1 for wilt resistance in Vertisol sick plot -'B'

Sl. No.	Pedigree	No. of plants	Percent wilt
1	2	3	4
1.	74226-E-V NDT-1	57	49.1
2.	74240-3-V NDT-1	81	76.5
3.	74240-2-V NDT-1	44	77.3
4.	-3	59	72.9
5.	-4	88	89.8
6.	-5	61	80.3
7.	74240-1-V NDT-1	67	86.6
8.	-2	82	80.5
9.	-3	80	96.2
10.	-4	85	92.9
11.	-5	80	88.7
12.	74233-3-V NDT-1	76	65.8
13.	74233-4-V NDT-2	70	80.0
14.	-3	78	93.6
15.	-4	85	82.3
16.	74233-1-V NDT-5	60	88.3
17.	-6	73	79.4
18.	74233-2-V NDT-7	69	95.6
19.	-8	46	76.1
20.	-9	66	100.0
21.	-10	78	88.5
22.	-11	64	93.4
23.	74233-3-V NDT-12	47	48.9
24.	-13	71	57.7
25.	-14	56	41.1
26.	-15	66	21.2
27.	-16	77	66.2
28.	74233-1-V NDT-17	63	92.1
29.	-18	71	59.1
30.	74233-4-V NDT-19	52	55.7
31.	-20	69	79.7
32.	-21	55	69.1
33.	-22	52	73.1
34.	-23	59	47.4
35.	-24	75	72.0
36.	-25	58	51.7
37.	-26	61	52.4

Contd.

1	2	3	4
38.	74233-4-V NDT-27	57	63.1
39.	-28	72	86.1
40.	-29	41	65.8
41.	-30	56	73.2
42.	-31	55	55.4
43.	-32	50	60.0
44.	74233-4-VI NDT-11	59	81.3
45.	74233-3-VI NDT-33	62	74.2
46.	-34	64	57.8
47.	-35	55	50.9
48.	-36	52	42.3
49.	74233-1-VI NDT-37	57	38.6
50.	-38	66	62.1
51.	-39	69	53.6
52.	-40	40	65.0
53.	-41	60	53.3
54.	74240-4-VI NDT-12	57	87.7
55.	-13	36	66.7
56.	-14	60	70.0
57.	74233-2-V NDT-42	68	53.4
58.	-43	57	40.3
59.	-44	58	65.5
60.	-45	51	80.4
61.	74233-3-VI NDT-46	55	86.1
62.	-47	51	55.0
63.	-48	70	45.7
64.	-49	67	65.7
65.	-50	49	42.8
66.	-51	56	76.8

APPENDIX-IX

Results of screening of F4 & F3 progenies (selected from wilt nursery, 1976) for wilt in Vertisol sick plot -B

Sl. No.	Pedigree	No. of plants	Percent wilt
1	2	3	4
1.	F_4-74243-1-W1⊗	30	96.7
2.	-W2⊗	35	100.0
3.	-W3⊗	22	100.0
4.	-W4⊗	42	100.0
5.	F_4-74243-2-W1⊗	24	87.5
6.	-W2⊗	25	88.0
7.	-W3⊗	28	96.4
8.	-W4⊗	39	83.3
9.	-W5⊗	42	83.3
10.	-W6⊗	28	92.8
11.	-W7⊗	33	60.6
12.	-W8⊗	15	100.0
13.	F_4-74243-3-W1⊗	19	68.4
14.	-W2⊗	27	59.2
15.	-W3⊗	41	70.7
16.	-W4⊗	26	53.8
17.	F_4-74243-4-W1⊗	10	80.0
18.	-W2⊗	20	75.0
19.	-W3⊗	24	100.0
20.	-W4⊗	30	76.7
21.	-W5⊗	43	74.4
22.	F_4-74243-5-W1⊗	35	97.1
23.	-W2⊗	29	89.6
24.	-W3⊗	19	78.9
25.	-W4⊗	37	100.0
26.	-W5⊗	31	87.1
27.	-W6⊗	35	91.4
28.	-W7⊗	19	78.9
29.	-W8⊗	33	75.7
30.	-W9⊗	21	90.3
31.	-W10⊗	21	71.4
32.	-W11⊗	31	74.2
33.	F_4-74243-8-W1⊗	28	85.7
34.	-W2⊗	27	85.2
35.	-W3⊗	14	85.7
36.	-W4⊗	47	97.9
37.	F_4-74243-9-W1⊗	37	86.5

Contd.

1	2	3	4
38.	F_4-74243-9-W2♀	22	45.4
39.	-W3♀	17	17.6
40.	-W4♀	22	81.8
41.	-W5♀	40	35.0
42.	-W6♀	28	50.0
43.	-W7♀	14	28.6
44.	-W8♀	48	64.6
45.	-W9♀	33	78.8
46.	-W10♀	20	85.0
47.	-W11♀	24	54.2
48.	-W12♀	24	83.3
49.	-W13♀	29	86.2
50.	-W14♀	38	84.2
51.	-W15♀	20	85.0
52.	-W16♀	14	85.7
53.	F_4-74243-10-W1♀	46	93.5
54.	-W2♀	45	91.1
55.	-W3♀	30	76.7
56.	-W4♀	27	44.7
57.	-W5♀	31	83.9
58.	-W6♀	56	100.0
59.	-W7♀	36	100.0
60.	F_4-74167-1-W1♀	26	100.0
61.	-W2♀	36	85.0
62.	-W3♀	33	100.0
63.	-W4♀	25	84.0
64.	F_4-74167-2-W1♀	58	96.5
65.	-W2♀	21	90.5
66.	(Early x Early)-1-W1♀	32	93.7
67.	-W2♀	30	76.7
68.	-W3♀	50	90.0
69.	-W4♀	24	83.3
70.	-W5♀	30	73.3
71.	(Early x Early)-2-W1♀	27	92.6
72.	-W2♀	13	100.0
73.	-W3♀	25	96.0
74.	-W4♀	39	100.0
75.	-W5♀	41	95.1
76.	-W6♀	32	90.6
77.	-W7♀	52	51.9
78.	F_3-74277-W1♀	23	100.0
79.	-W2♀	37	86.5
80.	-W3♀	28	100.0

Contd.

1	2	3	4
81.	F_3-74277-W4Ø	36	83.3
82.	-W5Ø	42	57.1
83.	F_3-74423-W1Ø	38	73.7
84.	-W2Ø	27	33.3
85.	-W3Ø	43	79.1
86.	-W4Ø	24	48.1
87.	-W5Ø	26	73.1
88.	-W6Ø	18	94.4
89.	-W7Ø	22	81.8
90.	-W8Ø	25	88.0
91.	-W9Ø	31	74.2
92.	-W10Ø	40	67.5
93.	-W11Ø	23	52.2
94.	-W12Ø	20	90.0

APPENDIX-X

Results of screening of selections (F4) from RA-28 for wilt resistance in Vertisol sick plot -'B'

Sl. No.	Pedigree	No. of plants	Percent wilt
1	2	3	4
1.	F_4-74376-W2♀-VII NDT-1	35	80.0
2.	-2	47	63.8
3.	-3	35	54.3
4.	F_4-74376-W6♀-VII NDT-1	61	52.4
5.	F_4-74376-W17♀-VII NDT-1	53	77.3
6.	-2	63	90.5
7.	F_4-74376-W40♀-VII NDT-1	71	69.0
8.	-2	53	24.5
9.	-3	62	54.8
10.	-4	68	66.1
11.	F_4-74376-W41♀-VII NDT-1	38	92.1
12.	F_4-74376-W42♀-VII NDT-1	33	63.6
13.	-2	54	59.2
14.	-3	43	39.5
15.	F_4-74427-W9♀-VII NDT-1	53	52.8
16.	F_4-74427-W16♀-VII NDT-1	62	72.6
17.	-2	39	58.9
18.	-3	52	62.5
19.	F_4-74427-W23♀-VII NDT-1	59	50.8
20.	-2	56	57.1
21.	-3	55	63.6
22.	F_4-74427-W29♀-VII NDT-1	53	56.6
23.	-2	65	67.7
24.	F_4-74427-W36♀-VII NDT-1	54	74.1
25.	-2	44	77.3
26.	-3	47	83.0
27.	-4	48	60.4
28.	F_4-74427-W39♀-VII NDT-1	52	65.4
29.	-2	52	73.1
30.	F_4-74427-W42♀-VII NDT-1	48	85.4
31.	F_4-74428-W8♀-VII NDT-1	51	78.4
32.	-2	56	85.7
33.	-3	54	75.9
34.	-4	53	83.0
35.	F_4-74428-W13♀-VII NDT-1	34	79.4
36.	-2	53	83.7

Contd.

1	2	3	4
37.	F_4-74428-W27Ø-VII NDT-1	29	93.1
38.	-2	34	100.0
39.	F_4-74428-W30Ø-VII NDT-1	46	67.4
40.	F_4-74428-W42Ø-VII NDT-1	43	93.0
41.	-2	36	88.9
42.	-3	41	80.5
43.	F_4-74428-W43Ø-VII NDT-1	48	64.6
44.	-2	50	50.0
45.	-3	54	77.8
46.	F_4-74428-W44Ø-VII NDT-1	44	78.6
47.	F_4-74429-W1-VII NDT-1	49	67.3
48.	F_4-74429-W2-VII NDT-1	57	70.2
49.	F_4-74429-W6-VII NDT-1	47	42.5
50.	F_4-74429-W7-VII NDT-1	38	65.8
51.	-2	45	80.0
52.	F_4-74420-W10Ø-VII NDT-1	40	50.0
53.	F_4-74420-W12Ø-VII NDT-1	37	56.7
54.	F_4-74420-W14Ø-VII NDT-1	41	87.8
55.	F_4-74420-W20Ø-VII NDT-1	56	58.9
56.	F_4-74420-W24Ø-VII NDT-1	52	57.7
57.	-2	45	42.2
58.	F_4-74420-W25Ø-VII NDT-1	52	80.8
59.	F_4-74348-W1Ø-VII NDT-1	30	56.7
60.	-2	40	52.5
61.	F_4-74348-W4Ø-VII NDT-1	49	95.9
62.	F_4-74348-W14Ø-VII NDT-1	22	81.8
63.	F_4-74348-W17Ø-VII NDT-1	15	60.0
64.	-2	27	70.4
65.	F_4-74348-W24Ø-VII NDT-1	42	88.1
66.	-2	54	90.7
67.	F_4-74348-W25Ø-VII NDT-1	50	92.0
68.	F_4-74348-W29Ø-VII NDT-1	29	93.1
69.	-2	23	95.6
70.	F_4-74348-W37Ø-VII NDT-1	46	69.7
71.	F_4-74348-W39Ø-VII NDT-1	39	100.0

Contd.

1	2	3	4
72.	F_4-74348-W410-VII NDT-1	49	93.9
73.	-2	47	95.7
74.	F_4-74360-W10-VII NDT-1	55	90.9
75.	-2	65	92.3
76.	F_4-74334-W350-VII NDT-1	69	63.8

APPENDIX-XA

Results of screening of selections from RA-28 (F_4&F_5) for wilt resistance in Vertisol sick plot - 'B'

Sl. No.	Pedigree	No. of plants	Percent wilt
1	2	3	4
1.	F_4-74351-W4⊗-VI NDT-1	25	76.0
2.	-74351-W18⊗-VI NDT-1(source 12142)	46	47.8
3.	-74351-W18⊗-VI NDT-2	33	61.5
4.	-74363-W10⊗-VI NDT-1	23	82.6
5.	-74363-W12⊗-VI NDT-1	39	30.8
6.	-74363-W18⊗-VI NDT-1	39	43.6
7.	-2	44	52.3
8.	-74363-W34⊗-VI NDT-1	24	29.2
9.	-74363-W36⊗-VI NDT-1	53	60.4
10.	-74363-W37⊗-VI NDT-1	47	53.2
11.	-74363-W37⊗-VI NDT-2	45	48.9
12.	-74418-W3⊗-VI NDT-1	37	21.6
13.	-74418-W28⊗-VI NDT-1	2	50.0
14.	-74418-W33⊗-VI NDT-1	15	53.3
15.	-74418-W35⊗-VI NDT-1	39	69.2
16.	-74418-W44⊗-VI NDT-1	30	13.3
17.	-74418-W49⊗-VI NDT-1	40	7.5
18.	-74418-W51⊗-VI NDT-1	42	38.1
19.	-74418-W57⊗-VI NDT-1	38	71.0
20.	-74418-W57⊗-VI NDT-2	52	51.9
21.	-74376-W5⊗-VI NDT-2	36	91.7
22.	-74376-W7⊗-VI NDT-1	49	77.5
23.	-74376-W7⊗-VI NDT-2	51	66.7
24.	-74376-W9⊗-VI NDT-1	72	80.5
25.	-74427-W12⊗-VI NDT-1	54	96.3
26.	-74427-W13⊗-VI NDT-1	60	45.0
27.	-74427-W17⊗-VI NDT-1	53	81.1
28.	-74427-W34⊗-VI NDT-1	64	48.4
29.	-74427-W38⊗-VI NDT-1	65	69.2
30.	-74428-W3⊗-VI NDT-1	64	78.1
31.	-74428-W5⊗-VI NDT-1	64	50.0
32.	-74428-W21⊗-VI NDT-1	72	87.5
33.	-74428-W21⊗-VI NDT-2	62	90.3
34.	-74428-W34⊗-VI NDT-1	48	89.6
35.	-74428-W38⊗-VI NDT-1	26	38.5

Contd.

1	2	3	4
36.	F_4-74428-W450-VI NDT-1	62	98.4
37.	-2	33	45.4
38.	-74429-W110-VI NDT-1	49	75.5
39.	-74429-W340-VI NDT-1	16	75.0
40.	-74348-W50-VI NDT-1	20	45.0
41.	-74348-W100-VI NDT-1	37	62.2
42.	-74348-W110-VI NDT-1	50	58.0
43.	-74348-W150-VI NDT-1	45	82.2
44.	-74348-W150-VI NDT-2	49	75.5
45.	-3	56	76.8
46.	-4	44	77.3
47.	-5	49	83.7
48.	-74348-W270-VI NDT-1	66	83.3
49.	-2	46	86.9
50.	-74348-W340-VI NDT-1	42	66.7
51.	-74348-W360-VI NDT-1	69	97.1
52.	-2	53	88.7
53.	-74360-W40-VI NDT-1	42	80.9
54.	-74360-W120-VI NDT-1	56	87.5
55.	-74360-W250-VI NDT-1	57	78.9
56.	-74360-W260-VI NDT-1	69	84.0
57.	-74360-W270-VI NDT-1	62	96.1
58.	-2	64	70.3
59.	-74360-W440-VI NDT-1	38	52.6
60.	-74360-W450-VI NDT-1	48	58.3
61.	-74360-W530-VI NDT-1	25	48.0
62.	-74360-W560-VI NDT-1	61	85.2
63.	-74330-W80-VI NDT-1	20	75.0
64.	-74330-W90-VI NDT-1	45	68.9
65.	-2	41	75.6
66.	74330-W350-VI NDT-1	27	66.7
67.	-74434-W120-VI NDT-1	48	27.1
68.	-74434-W130-VI NDT-1	24	8.3
69.	-74434-W160-VI NDT-1	27	11.1
70.	-74434-W370-VI NDT-1	39	56.4
71.	-74289-W260-VI NDT-1	30	83.3
72.	-2	49	89.8
73.	-74289-W310-VI NDT-1	43	63.1
74.	-74290-W30-VI NDT-1	24	80.8
75.	-74290-W30-VI NDT-2	67	59.7
76.	-74290-W170-VI NDT-1	54	94.4
77.	-74290-W180-VI NDT-1	37	89.2
78.	-2	46	82.6
79.	-3	36	80.5
80.	-74290-W550-VI NDT-1	48	97.5

Contd.

1	2	3	4
81.	F_4-74430-W130-VI NDT-1	58	67.2
82.	-74430-W190-VI NDT-1	56	83.9
83.	-74430-W360-VI NDT-1	41	82.9
84.	-74367-W20-VI NDT-1	44	79.5
85.	-74367-W60-VI NDT-1	50	84.0
86.	-2	64	82.8
87.	-74367-W120-VI NDT-1	68	83.8
88.	-74367-W140-VI NDT-1	37	83.8
89.	-2	28	64.3
90.	F_5-73094-W10-VI NDT-1	59	20.3
91.	-2	35	37.1
92.	-73094-W50-VI NDT-1	45	60.0

APPENDIX-XI

Results of screening of germplasm lines for wilt resistance in Vertisol sick plot -'B'

Sl. No.	Pedigree	No. of plants	Percent wilt	Sl. No.	Pedigree	No. of plants	Percent wilt
1	2	3	4	1	2	3	4
1.	ICP-1	33	58.1	37.	ICP-43	38	81.6
2.	-2	40	61.5	38.	-45	28	75.0
3.	-3	32	83.9	39.	-46	32	93.7
4.	-4	41	95.1	40.	-48	36	75.0
5.	-5	40	90.0	41.	-49	36	88.9
6.	-6	22	72.7	42.	-50	29	89.6
7.	-7	28	100.0	43.	-51	35	94.3
8.	-8	35	82.8	44.	-52	40	52.5
9.	-9	36	91.7	45.	-54	30	90.0
10.	-10	36	77.8	46.	-56	31	67.7
11.	-11	35	82.8	47.	-57	39	94.9
12.	-12	24	85.7	48.	-58	47	87.2
13.	-13	43	93.5	49.	-59	40	100.0
14.	-14	36	88.9	50.	-60	33	72.7
15.	-15	42	85.7	51.	-62	43	88.4
16.	-16	36	94.4	52.	-63	39	89.7
17.	-17	36	88.2	53.	-64	37	94.6
18.	-18	48	79.2	54.	-65	28	89.3
19.	-19	32	75.0	55.	-66	29	89.6
20.	-22	31	87.1	56.	-67	51	100.0
21.	-24	48	91.7	57.	-68	48	95.8
22.	-25	44	88.6	58.	-69	38	84.2
23.	-26	48	100.0	59.	-70	33	81.8
24.	-27	35	100.0	60.	-71	30	93.3
25.	-28	55	94.5	61.	-72	37	91.9
26.	-29	28	100.0	62.	-75	34	70.6
27.	-31	25	88.0	63.	-76	33	84.8
28.	-32	43	53.5	64.	-77	45	82.2
29.	-33	25	88.0	65.	-78	58	81.0
30.	-34	31	61.3	66.	-79	36	83.3
31.	-35	33	87.9	67.	-81	46	82.6
32.	-36	35	85.7	68.	-82	39	82.0
33.	-37	25	72.0	69.	-83	39	84.6
34.	-38	30	86.7	70.	-84	42	90.5
35.	-40	45	88.9	71.	-86	42	95.2
36.	-41	36	80.5	72.	-87	38	94.7

Contd.

1	2	3	4
73.	ICP-88	36	94.4
74.	-91	42	57.1
75.	-92	41	92.7
76.	-94	32	100.0
77.	-95	39	61.5
78.	-98	40	72.5
79.	-99	46	82.6
80.	-100	39	74.3
81.	-102	44	81.8
82.	-103	36	80.5
83.	-104	35	91.4
84.	-106	39	84.6
85.	-107	39	66.7
86.	-108	38	76.3
87.	-109	38	97.4
88.	-110	29	82.7
89.	-111	33	75.7
90.	-112	39	33.3
91.	-113	43	81.4
92.	-115	38	78.9
93.	-116	38	44.7
94.	-119	44	88.6
95.	-121	41	92.6
96.	-122	26	92.3
97	-124	38	81.6
98.	-126	38	94.7
99.	-127	39	94.8
100.	-128	49	97.9
101.	-130	38	100.0
102.	-131	33	78.8
103.	-132	42	80.9
104.	-135	35	91.4
105.	-136	39	94.9
106.	-139	31	77.4
107.	-141	41	90.2
108.	-147	41	78.0
109.	-148	24	83.3
110.	-150	38	78.9
111.	-154	36	86.1
112.	-155	37	54.0
113.	-156	31	90.3
114.	-157	35	80.0
115.	-163	40	90.0
116.	-164	23	73.9
117.	ICP-165	35	100.0
118.	-167	36	86.1
119.	-168	43	93.0
120.	-170	44	93.2
121.	-171	34	88.2
122.	-173	39	69.2
123.	-175	43	95.3
124.	-175	36	91.7
125.	-180	41	97.8
126.	-182	35	88.6
127.	-184	26	96.1
128.	-185	42	97.6
129.	-187	42	100.0
130.	-189	28	96.4
131.	-193	46	100.0
132.	-194	20	80.0
133.	-195	35	94.3
134.	-198	38	94.7
135.	-199	31	93.5
136.	-202	25	84.0
137.	-206	36	94.4
138.	-208	16	93.7
139.	-210	38	94.7
140.	-212	28	89.3
141.	-213	34	50.0
142.	-214	34	88.2
143.	-216	33	72.7
144.	-218	35	77.1
145.	-219	34	85.3
146.	-220	35	71.4
147.	-222	35	80.0
148.	-224	33	81.8
149.	-227	24	87.5
150.	-228	30	93.3
151.	-230	27	96.3
152.	-231	29	100.0
153.	-232	33	90.9

APPENDIX-XII

Results of screening of ACT pigeonpea lines against wilt in sick plot 'B' during 1978 K

Sl. No.	Pedigree/ Cultivar	No. of plants	Number wilted	Percent wilt	Yield/plant (g)
1	2	3	4	5	6
EACT					
1.	ICPL-1	83	55	66.3	1.8
2.	HPA-2	77	57	74.0	1.5
3.	UPAS-120	52	40	76.9	1.0
4.	Prabhat	27	21	77.8	0.7
5.	H-76-53	78	62	79.5	0.2
6.	H-76-35	60	48	80.0	1.2
7.	ICPL-2	93	75	80.6	1.6
8.	H-76-19	92	76	82.6	0.3
9.	H-73-20	70	59	84.3	0.9
10.	H-76-20	78	67	85.9	0.4
11.	ICPL-4	82	76	92.7	0.2
12.	ICPL-3	72	67	93.1	0.1
ACT-1					
1.	JA-9-19	74	60	81.1	1.8
2.	ICPL-6	105	87	82.9	1.0
3.	DL-74-1	119	101	84.9	0.6
4.	TT-5	72	62	86.1	0.4
5.	4-84	69	60	87.0	0.5
6.	TT-6	80	70	87 5	1.1
7.	TT-4	91	80	87.9	0.4
8.	HY-5	73	65	89.0	0.4
9.	Sehore-68	65	58	89.2	2.5
10.	ICPL-8	78	70	89.7	0.4
11.	T-21	91	83	91.2	0.5
12.	ICPL-5	81	74	91.4	0.1
13.	ICPL-7	96	89	92.7	0.8
14.	Sehore-197	101	95	94.1	0.3
ACT-2					
1.	BDN-1	79	13	16.5	7.6
2.	C-11	130	56	43.1	9.0
3.	AS-71-37	136	60	44.1	7.1
4.	Sehore-75-4	129	67	51.9	1.4
5.	BDN-2	91	50	54.9	10.7

Contd.

1	2	3	4	5	6
ACT-2					
6.	JA-15	131	73	55.7	6.3
7.	HY-4	91	57	62.6	7.4
8.	ICP-1	129	84	65.1	1.4
9.	ICPL-42	105	71	67.6	5.3
10.	ICPL-43	55	39	70.9	1.3
11.	No. 148	87	65	74.7	10.5
12.	JA-3	62	49	79.0	9.0
13.	JA-8	71	60	84.5	1.7
14.	JA-5	87	79	90.8	1.5
15.	HY-2	78	73	93.6	0.4
16.	GS-1	83	79	95.2	11.4
ACT-3					
1.	NP(WR)15	114	23	20.2	0.8
2.	K-28	78	33	42.3	0.5
3.	K-16	99	58	58.6	1.3
4.	PS-65	83	49	59.0	1.5
5.	PS-66	58	35	60.3	0.8
6.	T-7	76	46	60.5	0.2
7.	PS-43	72	48	66.7	0.1
8.	Composite-4	64	44	68.8	1.7
9.	AS-29	72	56	77.8	0.8
10.	K-23	72	56	77.8	0.1
11.	Gwalior-3	83	67	80.7	0.7
12.	1258	74	60	81.1	0.2
13	Group-8	88	72	81.8	2.3
14	Group-10	68	56	82.4	0.9
15.	PS-41	109	95	87.2	0.9
16.	1234	50	47	94.0	0.2

APPENDIX-XIII

Results of screening of Phytophthora blight promising progenies against wilt in Vertisol sick plot -B

Sl. No.	Pedigree		No. of plants	Percent wilt
1	2		3	4
1.	74290-P1⊗	(3NDT)	2	100.0
2.	-P2⊗	(3NDT)	21	71.4
3.	-P3⊗	(5NDT)	22	77.3
4.	-P4⊗	(5NDT)	19	73.7
5.	-P5⊗	(6NDT)	15	80.0
6.	-P6⊗	(6NDT)	20	65.0
7.	-P7⊗	(6NDT)	16	93.7
8.	-P8⊗	(6NDT)	18	61.1
9.	-P9⊗	(6NDT)	31	80.6
10.	-P10⊗	(6NDT)	21	76.2
11.	-P11⊗	(6NDT)	25	80.0
12.	-P12⊗	(6NDT)	19	78.9
13.	-P13⊗	(6NDT)	24	83.3
14.	-P14⊗	(6NDT)	21	95.2
15.	-P15⊗	(6NDT)	24	91.7
16.	-P16⊗	(6NDT)	34	70.6
17.	-P17⊗	(6NDT)	23	60.9
18.	-P18⊗	(6NDT)	15	93.3
19.	-P19⊗	(6NDT)	18	83.3
20.	-P20⊗	(6NDT)	19	78.9
21.	-P21⊗	(6NDT)	25	84.0
22.	-P22⊗	(6NDT)	18	44.4
23.	-P23⊗	(6NDT)	17	47.0
24.	-P24⊗	(6NDT)	26	84.6
25.	-P25⊗	(6NDT)	2	100.0
26.	-P26⊗	(6NDT)	4	75.0
27.	-P27⊗	(6NDT)	18	72.2
28.	-P28⊗	(6NDT)	12	58.3
29.	-P29⊗	(6NDT)	16	81.2
30.	-P30⊗	(6NDT)	27	74.1
31.	-P31⊗	(6NDT)	25	52.0
32.	-P32⊗	(6NDT)	10	50.0
33.	-P33⊗	(6NDT)	9	55.5
34.	-P34⊗	(6NDT)	21	57.1
35.	-P35⊗	(6NDT)	18	27.8
36.	-P36⊗	(6NDT)	18	50.0
37.	-P37⊗	(6NDT)	22	63.6
38.	-P38⊗	(7NDT)	24	50.0

Contd.

1	2		3	4
39	74290-P39Ø	(7NDT)	21	47.6
40.	-P40Ø	(7NDT)	27	66.7
41.	-P41Ø	(7NDT)	26	46.1
42.	-P42Ø	(7NDT)	24	20.8
43.	-P43Ø	(7NDT)	18	55.5
44.	-P44Ø	(7NDT)	21	57.1
45.	-P45Ø	(7NDT)	24	62.5
46.	-P46Ø	(7NDT)	23	56.5
47	-P47Ø	(7NDT)	24	41.7
48.	-P48Ø	(7NDT)	20	45.0
49	-P49Ø	(7NDT)	22	13.6
50	-P50Ø	(7NDT)	24	41.7
51.	-P51Ø	(7NDT)	25	64.0
52.	-P52Ø	(7NDT)	19	42.1
53	-P53Ø	(7NDT)	27	48.1
54	-P54Ø	(7NDT)	27	55.5
55.	-P55Ø	(7NDT)	22	36.4
56.	-P56Ø	(7NDT)	21	52.4
57.	-P57Ø	(7NDT)	24	41.7
58.	-P58Ø	(7NDT)	21	57.1
59.	-P59Ø	(7NDT)	16	56.2
60.	-P60Ø	(7NDT)	26	46.1
61.	-P61Ø	(7NDT)	26	34.6
62.	-P62Ø	(7NDT)	20	55.0
63	-P63Ø	(7NDT)	27	63.0
64.	-P64Ø	(7NDT)	21	52.4
65.	-P65Ø	(7NDT)	28	71.4
66.	-P66Ø	(7NDT)	24	62.5
67.	-P67Ø	(7NDT)	22	72.7
68	-P68Ø	(7NDT)	24	50.0
69.	-P69Ø	(7NDT)	27	77.8
70.	-P70Ø	(7NDT)	29	51.7
71	-P71Ø	(7NDT)	25	56.0
72.	-P72Ø	(7NDT)	19	73.7
73	-P73Ø	(7NDT)	26	88.5
74.	-P74Ø	(7NDT)	19	73.7
75.	-P75Ø	(7NDT)	25	96.0
76.	-P76Ø	(7NDT)	24	62.5
77.	-P77Ø	(7NDT)	21	52.4
78.	-P78Ø	(7NDT)	24	62.5
79.	-P79Ø	(7NDT)	26	76.9
80.	-P80Ø	(7NDT)	19	68.4

Contd.

1	2		3	4
81.	74290-P81⊗	(8NDT)	23	91.3
82.	-P82⊗	(8NDT)	25	100.0
83.	-P83⊗	(8NDT)	28	60.7
84.	-P84⊗	(8NDT)	23	95.6
85.	-P85⊗	(8NDT)	22	86.4
86.	-P86⊗	(8NDT)	22	100.0
87.	-P87⊗	(8NDT)	28	96.4
88.	-P88⊗	(8NDT)	23	73.9
89.	-P89⊗	(8NDT)	25	96.0
90.	-P90⊗	(8NDT)	22	50.0
91.	-P91⊗	(8NDT)	22	50.0
92.	-P92⊗	(8NDT)	21	71.4
93.	-P93⊗	(8NDT)	24	100.0
94.	-P94⊗	(8NDT)	18	100.0
95.	-P95⊗	(8NDT)	26	84.6
96.	-P96⊗	(8NDT)	24	58.3
97.	-P97⊗	(8NDT)	24	75.0
98.	-P98⊗	(8NDT)	24	37.5
99.	-P99⊗	(8NDT)	25	28.0
100.	-P100⊗	(8NDT)	25	56.0
101.	74360-P1⊗	(6NDT)	23	21.7
102.	-P2⊗	(7NDT)	24	91.7
103.	-P3⊗	(7NDT)	19	84.2
104.	-P4⊗	(7NDT)	22	95.4
105.	-P5⊗	(7NDT)	20	45.0
106.	-P6⊗	(7NDT)	23	69.6
107.	-P7⊗	(7NDT)	21	66.7
108.	-P9⊗	(8NDT)	25	100.0
109.	-P10⊗	(8NDT)	23	91.3
110.	-P12⊗	(8NDT)	24	87.5
111.	-P14⊗	(8NDT)	22	90.9
112.	-P15⊗	(8NDT)	26	73.1
113.	-P16⊗	(8NDT)	23	65.2
114.	-P17⊗	(8NDT)	18	94.4
115.	-P18⊗	(8NDT)	21	66.7
116.	-P19⊗	(8NDT)	17	76.5
117.	-P20⊗	(8NDT)	23	82.6
118.	-P21⊗	(8NDT)	19	89.5
119.	-P22⊗	(8NDT)	24	95.8
120.	-P23⊗	(8NDT)	3	66.7
121.	-P24⊗	(8NDT)	24	87.5
122.	-P25⊗	(8NDT)	17	100.0
123.	-P26⊗	(8NDT)	25	92.0
124.	-P27⊗	(8NDT)	21	61.9
125.	-P28⊗	(8NDT)	23	78.3

Contd.

1	2		3	4
126.	74360-P29Ø	(8NDT)	23	82.6
127.	-P30Ø	(8NDT)	29	69.0
128.	-P34Ø	(8NDT)	19	68.4
129.	-P35Ø	(8NDT)	20	60.0
130.	-P36Ø	(8NDT)	23	39.1
131.	-P37Ø	(8NDT)	21	57.1
132.	-P38Ø	(8NDT)	29	48.3
133.	-P40Ø	(8NDT)	20	55.0
134.	-P44Ø	(8NDT)	18	77.8
135.	-P45Ø	(8NDT)	22	63.6
136.	-P46Ø	(8NDT)	26	53.8
137.	-P48Ø	(8NDT)	24	16.7
138.	-P49Ø	(8NDT)	9	33.3
139.	-P50Ø	(8NDT)	18	83.3
140.	-P51Ø	(8NDT)	18	72.2
141.	-P52Ø	(8NDT)	25	64.0
142.	-P53Ø	(8NDT)	15	33.3
143.	-P54Ø	(8NDT)	19	73.7
144.	-P56Ø	(8NDT)	20	80.0
145.	-P57Ø	(8NDT)	19	78.9
146.	-P59Ø	(8NDT)	22	54.5
147.	-P60Ø	(8NDT)	20	90.0
148.	-P61Ø	(8NDT)	7	57.1
149	-P62Ø	(8NDT)	14	57.1
150.	-P63Ø	(9NDT)	9	66.7
151.	-P64Ø	(9NDT)	12	66.7
152	-P65Ø	(9NDT)	12	91.7
153.	-P66Ø	(9NDT)	8	100.0
154.	-P67Ø	(9NDT)	16	75.0
155.	-P68Ø	(9NDT)	8	65.2
156.	-P69Ø	(9NDT)	3	100.0
157	-P70Ø	(9NDT)	1	100.0
158.	-P81Ø	(9NDT)	2	50.0
159.	-P82Ø	(9NDT)	10	90.0
160.	-P83Ø	(9NDT)	12	100.0
161.	-P84Ø	(9NDT)	26	76.9
162.	-P85Ø	(9NDT)	17	76.5
163	-P86Ø	(9NDT)	13	92.3
164	-P88Ø	(9NDT)	20	50.0
165	-P89Ø	(9NDT)	11	72.7
166.	-P90Ø	(9NDT)	16	100.0
167.	-P91Ø	(9NDT)	21	61.9
168	-P96Ø	(9NDT)	24	100.0

Contd

1	2		3	4
169.	74363-P1Ø	(8NDT)	12	58.3
170.	-P2Ø	(8NDT)	13	69.2
171.	-P3Ø	(8NDT)	12	91.7
172.	-P4Ø	(8NDT)	15	26.7
173.	-P6Ø	(8NDT)	18	77.8
174.	-P7Ø	(8NDT)	18	88.9
175.	-P8Ø	(8NDT)	24	95.8
176.	-P15Ø	(8NDT)	19	31.6
177.	-P17Ø	(8NDT)	12	83.3
178.	-P18Ø	(8NDT)	15	66.7
179.	-P21Ø	(8NDT)	10	50.0
180.	-P22Ø	(8NDT)	4	25.0
181.	-P23Ø	(8NDT)	24	66.7
182.	-P24Ø	(8NDT)	23	73.9
183.	-P27Ø	(8NDT)	20	55.0
184.	-P28Ø	(8NDT)	14	48.2
185.	-P29Ø	(8NDT)	28	39.3
186.	-P30Ø	(8NDT)	21	42.8
187.	-P31Ø	(8NDT)	25	72.0
188.	-P32Ø	(8NDT)	16	68.7
189.	-P33Ø	(8NDT)	27	51.8
190.	-P34Ø	(8NDT)	21	61.9
191.	-P35Ø	(8NDT)	14	45.8
192.	-P36Ø	(8NDT)	19	57.9
193.	-P37Ø	(8NDT)	23	73.9
194.	-P38Ø	(8NDT)	23	100.0
195.	-P39Ø	(8NDT)	24	87.5
196.	-P40Ø	(8NDT)	17	64.7
197.	-P41Ø	(8NDT)	19	73.7
198.	-P42Ø	(8NDT)	14	85.7
199.	-P43Ø	(8NDT)	24	62.5
200.	-P44Ø	(8NDT)	24	66.7
201.	-P45Ø	(8NDT)	19	78.9
202.	-P46Ø	(8NDT)	17	70.6
203.	-P47Ø	(8NDT)	16	75.0
204.	-P48Ø	(8NDT)	20	65.0
205.	-P49Ø	(8NDT)	22	40.9
206.	-P50Ø	(8NDT)	22	59.1
207.	-P51Ø	(8NDT)	23	73.9
208.	-P52Ø	(8NDT)	25	76.0
209.	-P53Ø	(8NDT)	26	46.1
210.	-P54Ø	(8NDT)	21	95.2
211.	-P55Ø	(8NDT)	25	84.0
212.	-P56Ø	(8NDT)	23	91.3
213.	-P57Ø	(8NDT)	25	60.0

Contd.

1	2		3	4
214.	74363-P580	(8NDT)	24	70.8
215.	-P590	(8NDT)	25	60.0
216.	-P600	(8NDT)	12	58.3
217.	-P610	(8NDT)	24	41.7
218.	-P620	(8NDT)	25	72.0
219.	-P630	(8NDT)	20	70.0
220.	-P640	(8NDT)	21	95.2
221.	-P650	(8NDT)	21	57.1
222.	-P660	(8NDT)	23	73.9
223.	-P670	(8NDT)	26	92.3
224.	-P680	(8NDT)	25	36.0
225.	-P690	(8NDT)	21	52.4
226.	-P700	(8NDT)	23	78.3
227.	-P710	(8NDT)	24	66.7
228.	-P720	(8NDT)	No germination	
229.	-P730	(8NDT)	26	42.3
230.	-P740	(8NDT)	18	50.0
231.	-P750	(8NDT)	20	80.0
232.	-P760	(8NDT)	18	50.0
233.	-P770	(8NDT)	19	78.9
234.	-P780	(8NDT)	23	21.7
235.	-P790	(8NDT)	21	76.2
236.	-P800	(8NDT)	22	18.2
237	-P810	(8NDT)	17	100.0
238.	-P820	(8NDT)	24	100.0
239.	-P830	(8NDT)	23	86.9
240.	-P840	(8NDT)	23	100.0
241	-P850	(8NDT)	27	44.4
242	-P860	(8NDT)	22	54.5
243	-P870	(8NDT)	24	58.3
244.	-P880	(8NDT)	23	78.3
245	-P900	(8NDT)	26	84.6
246	-P910	(8NDT)	9	88.9
247.	-P930	(8NDT)	13	76.9
248	-P940	(8NDT)	16	68.7
249	-P960	(8NDT)	20	80.0
250	-P970	(8NDT)	26	53.8

APPENDIX-XIV

Results of screening of sterility mosaic resistant germplasm selections against wilt in Vertisol sick plot - 'B'

Sl. No.	Pedigree	No. of plants	Percent wilt
1	2	3	4
1.	ICP-3782-S1⊗	24	70.8
2.	-4769-3-S3⊗	22	13.6
3.	-4866-1-S3⊗	32	25.0
4.	-4885-1-S1⊗	21	42.8
5.	-5051-2-S4⊗	22	54.5
6.	-5097-1-S3⊗	26	11.5
7.	-5463-1-S2⊗	20	85.0
8.	-5467-1-S1⊗	29	100.0
9.	-5651-1-3⊗	33	30.3
10.	-5656-1-S2⊗	21	71.4
11.	-5701-1-S1⊗	20	15.0
12.	-6748-3-S2⊗	22	95.4
13.	-6831-1-S2⊗	34	11.8
14.	-6975-1-S3⊗	28	100.0
15.	-7185-1-S1⊗	16	37.5
16.	-7187-2-S5⊗	23	56.5
17.	-7194-1-S4⊗	35	20.0
18.	-7201-2-S1⊗	18	100.0
19.	-7217-1-S1⊗	21	19.0
20.	-7232-2-S4⊗	23	73.9
21.	-7233-2-S1⊗	10	60.0
22.	-7234-2-S1⊗	29	93.1
23.	-7237-1-S3⊗	16	68.7
24.	-7238-1-S5⊗	21	85.7
25.	-7239-1-S1⊗	29	89.6
26.	-7240-3-S1⊗	32	96.9
27.	-7243-7-S1⊗	23	95.6
28.	-7246-2-S9⊗	7	42.8
29.	-7248-7-S4⊗	No germination	
30.	-7250-1-S1⊗	23	86.9
31.	-7258-1-S4⊗	13	100.0
32.	-7273-1-S3⊗	25	56.0
33.	-7306-2-S2⊗	23	91.3
34.	-7336-1-S3⊗	20	25.0
35.	-7337-2-S4⊗	17	100.0

Contd.

1	2	3	4
36	ICP-7345-3-S20	19	68.4
37	-7346-1-S30	19	100.0
38	-7349-1-S10	31	64.5
39	-7353-1-S40	12	100.0
40	-7372-3-S30	19	94.7
41	-7378-2-S20	19	68.4
42	-7387-5-S50	24	95.8
43	-7403-2-S20	20	95.0
44	-7407-1-S20	19	78.9
45	-7411-1-S10	16	68.7
46	-7414-1-S30	8	75.0
47	-7445-4-S50	20	40.0
48	-7501-2-S20	21	100.0
49	-7864-1-S50	22	81.8
50	-7867-1-S40	22	72.7
51	-7870-1-S10	21	90.5
52	-7873-5-S10	26	100.0
53	-7874-6-S40	17	100.0
54	-7875-3-S40	10	100.0
55	-7898-3-S30	20	100.0
56	-7904-5-S50	15	100.0
57	-7906-1-S50	23	100.0
58	-7942-1-S40	26	69.2
59	-7983-1-S20	25	100.0
60	-7998-4-S50	23	100.0
61	-8014-3-S40	19	68.4
62	-8021-3-S50	24	91.7
63	-8029-1-S40	30	66.7
64	-8032-1-S40	28	64.3
65	-8033-2-S10	27	66.7
66	-8035-1-S30	22	95.4
67	-8036-13-S10	25	96.0
68	-8038-2-S10	29	96.5
69	-8057-3-S10	24	91.7
70	-8058-3-S40	10	100.0
71	-8061-3-S10	23	100.0
72	-8063-5-S10	17	100.0
73	-8067-2-S20	22	90.9
74	-8075-2-S20	18	83.3
75	-8084-7-S50	23	52.2
76	-8093-2-S10	26	65.4
77	-8094-1-S20	25	56.0
78	-8101-2-S20	16	87.5
79	-8102-5-S10	23	26.1
80	-8103-3-S20	29	55.2

Contd.

1	2	3	4
81.	ICP-8106-2-S50	30	83.3
82.	-8111-2-S10	21	90.5
83.	-8113-1-S50	24	33.3
84.	-8120-2-S50	34	61.8
85.	-8121-2-S10	28	57.1
86.	-8123-1-S50	24	95.8
87.	-8127-2-S40	23	43.5
88.	-8128-1-S10	23	73.9
89.	-8130-5-S40	21	76.2
90.	-8132-2-S30	27	66.7
91.	-8133-1-S40	25	80.0
92.	-8134-1-S10	13	53.8
93.	-8136-1-S10	17	70.6
94.	-8137-2-S40	25	100.0
95.	-8138-2-S40	22	72.7
96.	-8139-3-S10	13	30.8
97.	-8140-1-S40	41	65.8
98.	-8141-2-S20	14	85.7
99.	-8144-3-S30	28	92.8
100.	-8146-1-S50	32	56.2
101.	-8147-1-S20	27	66.7
102.	-8151-7-S40	17	58.8
103.	-8160-1-S30	34	26.5
104.	-8161-1-S10	26	42.3
105.	-8167-1-S30	30	53.3
106.	-8501-2-S20	16	87.5

APPENDIX-XV

Results of screening of single plant progenies of sterility mosaic resistant materials for wilt resistance in Vertisol sick plot -'B'

Sl No.	Pedigree		No. of plants	Percent wilt
1	Pant-B-76-5-S1⊗		14	100.0
2.	ICP-6997-137-16Br-P1		42	100.0
3.	74243-8-B-S1⊗	(6NDT)	39	87.2
4.	-S2⊗	(7NDT)	42	100.0
5.	-S3⊗	(6NDT)	47	93.7
6.	-S4⊗	(6NDT)	34	70.5
7.	-S5⊗	(6NDT)	56	89.8
8.	-S6⊗	(7NDT)	49	93.9
9	-S7⊗	(7NDT)	34	94.1
10	-S8⊗	(6NDT)	57	66.7
11.	-S9⊗	(6NDT)	35	77.8
12	-S10⊗	(7NDT)	53	73.6
13	-S11⊗	(7NDT)	29	82.7
14.	-S12⊗	(6NDT)	52	44.2
15.	-S13⊗	(6NDT)	66	57.6
16.	-S14⊗	(6NDT)	19	84.2
17.	-S15⊗	(6NDT)	42	92.8
18.	-S16⊗	(5NDT)	15	73.3
19	-S17⊗	(5NDT)	18	100.0
20	-S18⊗	(5NDT)	18	16.7
21	-S19⊗	(5NDT)	50	100.0
22	-S20⊗	(7NDT)	47	17.0
23	-S21⊗	(7NDT)	51	58.8
24	-S22⊗	(6NDT)	51	13.9
25.	-S23⊗	(6NDT)	55	74.5
26.	-S24⊗	(6NDT)	42	73.8
27	-S25⊗	(7NDT)	48	18.7
28.	-S26⊗	(6NDT)	41	95.1
29.	-S27⊗	(6NDT)	43	65.1
30.	-S28⊗	(6NDT)	45	66.7
31.	-S29⊗	(6NDT)	45	95.5
32.	-S30⊗	(5NDT)	48	0.0
33.	-S31⊗	(7NDT)	52	94.2
34.	-S32⊗	(6NDT)	42	88.1
35.	-S33⊗	(6NDT)	37	94.6
36.	-S34⊗	(6NDT)	37	100.0
37.	-S35⊗	(6NDT)	21	95.2
38.	-S36⊗	(4NDT)	21	61.9

Sl. No.	Pedigree		No. of plants	Percent wilt
39.	74243-B-B-S37⊗	(6NDT)	41	46.3
40.	-S38⊗	(7NDT)	34	76.5
41.	-S39⊗	(6NDT)	48	83.3
42.	-S40⊗	(7NDT)	22	31.8
43.	-S41⊗	(7NDT)	48	62.5
44.	-S42⊗	(5NDT)	25	100.0
45.	-S43⊗	(5NDT)	56	83.9
46.	-S44⊗	(5NDT)	46	67.4
47.	-S45⊗	(5NDT)	48	79.2
48.	-S46⊗	(7NDT)	52	71.1
49.	-S47⊗	(6NDT)	43	60.5
50.	-S48⊗	(6NDT)	43	83.7
51.	-S49⊗	(4NDT)	45	26.7
52.	-S50⊗	(6NDT)	60	8.3
53.	-S51⊗	(6NDT)	50	42.0
54.	-S52⊗	(6NDT)	60	65.1
55.	-S53⊗	(5NDT)	63	77.8
56.	-S54⊗	(6NDT)	32	65.6
57.	-S55⊗	(7NDT)	41	90.2
58.	-S56⊗	(6NDT)	29	69.0
59.	-S57⊗	(6NDT)	41	95.7
60.	-S58⊗	(7NDT)	43	79.1
61.	-S59⊗	(6NDT)	50	56.0
62.	-S60⊗	(6NDT)	43	72.1
63.	-S61⊗	(7NDT)	36	97.2
64.	-S62⊗	(3NDT)	43	72.1
65.	-S63⊗	(3NDT)	22	63.6
66.	-S64⊗	(6NDT)	36	100.0
67.	-S65⊗	(5NDT)	39	100.0
68.	-S66⊗	(6NDT)	40	50.0
69.	-S67⊗	(6NDT)	30	93.3
70.	-S68⊗	(6NDT)	49	100.0
71.	-S69⊗	(6NDT)	49	91.8
72.	-S70⊗	(6NDT)	43	100.0
73.	-S71⊗	(5NDT)	53	77.8
74.	-S72⊗	(6NDT)	51	92.1
75.	-S73⊗	(6NDT)	35	91.4
76.	-S74⊗	(5NDT)	33	72.7
77.	-S75⊗	(5NDT)	44	72.3
78.	-S76⊗	(5NDT)	31	45.2
79.	-S77⊗	(5NDT)	18	66.7
80.	-S78⊗	(5NDT)	29	17.2

Contd.

Sl No.	Pedigree	No. of plants	Percent wilt
81.	74243-B-B-S79⊗	17	82.3
82.	-S80⊗	44	65.9
83	-S81⊗	36	61.1
84	-S82⊗	37	48.6
85.	-S83⊗	36	83.3
86.	-S84⊗	51	98.0
87.	-S85⊗	28	78.6
88.	-S86⊗	49	63.3
89.	-S87⊗	50	50.0
90.	-S88⊗	36	100.0
91.	-S89⊗	55	58.9
92.	-S90⊗	6	100.0
93.	-S91⊗	30	100.0
94.	-S92⊗	34	100.0
95.	-S93⊗	40	62.5
96	-S94⊗	15	26.7
97.	-S95⊗	27	33.3
98.	-S96⊗	49	79.6
99.	-S97⊗	45	33.3
100.	-S98⊗	42	97.6
101.	-S99⊗	37	94.6
102.	-S100⊗	59	72.9
103.	-S101⊗	23	30.4
104.	-S102⊗	56	100.0
105.	-S103⊗	41	95.1
106.	-S104⊗	32	96.9
107.	-S105⊗	28	100.0
108	-S106⊗	36	100.0
109.	-S107⊗	41	98.0
110.	-S108⊗	43	100.0
111.	-S109⊗	62	74.2
112.	-S110⊗	11	81.8
113.	-S111⊗	46	100.0
114.	-S112⊗	50	74.0
115.	-S113⊗	22	4.5
116.	-S114⊗	16	87.5
117.	-S115⊗	62	85.5
118.	-S116⊗	62	58.1
119.	-S117⊗	11	63.6
120.	-S118⊗	37	21.6
121.	-S119⊗	47	42.2
122.	-S120⊗	16	100.0
123.	-S121⊗	47	85.1

Contd..

Sl. No.	Pedigree	No. of plants	Percent wilt
124.	74243-B-B-S122⊗	38	76.3
125.	-S123⊗	No germination	
126.	-S124⊗	39	43.6
127.	-S125⊗	49	93.9
128.	-S126⊗	16	62.5
129.	-S127⊗	39	66.7
130.	-S128⊗	42	45.2
131.	-S129⊗	32	93.7
132.	-S130⊗	36	94.4
133.	-S131⊗	38	97.2
134.	-S132⊗	28	71.4
135.	-S133⊗	55	47.3
136.	-S134⊗	42	85.7
137.	-S135⊗	44	86.4
138.	-S136⊗	37	91.9
139.	-S137⊗	14	96.4
140.	-S138⊗	30	30.0
141.	-S139⊗	34	85.5
142.	-S140⊗	35	85.3
143.	-S141⊗	42	90.5
144.	-S142⊗	39	53.8
145.	-S143⊗	45	73.3
146.	-S144⊗	20	15.0
147.	-S145⊗	55	76.4
148.	-S146⊗	38	81.6
149.	-S147⊗	39	87.2
150.	-S148⊗	49	51.0
151.	-S149⊗	47	100.0
152.	-S150⊗	46	65.2
153.	-S151⊗	41	82.9
154.	-S152⊗	29	89.6
155.	-S153⊗	19	100.0
156.	-S154⊗	45	51.1
157.	-S155⊗	45	84.4
158.	-S156⊗	17	76.5
159.	-S157⊗	30	63.3
160.	-S158⊗	31	51.6
161.	-S159⊗	47	89.4
162.	-S160⊗	24	58.3
163.	-S161⊗	29	72.4
164.	-S162⊗	33	57.6
165.	-S163⊗	46	91.3
166.	-S164⊗	44	88.6
167.	-S165⊗	48	72.9
168.	-S166⊗	39	33.3

Contd.

Sl. No	Pedigree	No. of plants	Percent wilt
169.	74243-B-B-S167⊗	38	84.2
170.	-S168⊗	35	82.8
171.	-S169⊗	64	17.2
172	-S170⊗	39	84.6
173.	-S171⊗	45	53.3
174.	-S172⊗	36	88.9
175.	-S173⊗	51	25.5
176.	-S174⊗	54	90.7
177.	-S175⊗	3	66.7
178.	-S176⊗	49	83.7
179.	-S177⊗	21	85.7
180.	-S178⊗	51	58.8
181	-S179⊗	19	84.2
182	-S180⊗	58	91.4
183.	-S181⊗	22	68.2
184.	-S182⊗	55	61.8
185.	-S183⊗	22	27.3
186.	-S184⊗	26	96.1
187.	-S185⊗	27	96.3
188.	-S186⊗	56	55.3
189	-S187⊗	56	60.7
190.	-S188⊗	51	51.0
191	-S189⊗	49	71.4
192.	-S190⊗	57	75.4
193	-S191⊗	44	95.4
194.	-S192⊗	46	97.8
195.	-S193⊗	39	23.1
196.	-S194⊗	16	93.7
197.	-S195⊗	40	90.0
198	-S196⊗	15	100.0
199.	-S197⊗	50	88.0
200.	-S198⊗	42	71.4
201.	-S199⊗	50	70.0
202.	-S200⊗	30	43.3
203	-S201⊗	23	63.6
204.	-S202⊗	32	100.0
205.	-S203⊗	29	84.6
206.	-S204⊗	59	81.3
207.	-S205⊗	54	44.4
208.	-S206⊗	34	94.1
209	-S207⊗	44	100.0
210.	-S208⊗	34	58.8
211.	-S209⊗	41	92.7
212	-S210⊗	40	92.5

Contd.

Sl. No.	Pedigree	No. of plants	Percent wilt
213.	74243-B-B-S211⊗	24	100.0
214.	-S212⊗	42	73.8
215.	-S213⊗	30	46.7
216.	-S214⊗	52	59.6
217.	-S215⊗	49	95.9
218.	-S216⊗	48	25.0
219.	-S217⊗	14	64.3
220.	-S218⊗	44	97.7
221.	-S219⊗	58	84.5
222.	-S220⊗	26	92.3
223.	-S221⊗	39	94.9
224.	-S222⊗	11	90.9
225.	-S223⊗	12	75.0
226.	-S224⊗	51	78.4
227.	-S225⊗	43	90.7
228.	-S226⊗	41	56.1
229.	-S227⊗	16	32.2
230.	-S228⊗	40	100.0
231.	-S229⊗	42	80.9
232.	-S230⊗	39	92.3
233.	-S231⊗	37	91.9
234.	-S232⊗	48	85.4
235.	-S233⊗	41	100.0
236.	-S234⊗	33	75.7
237.	-S235⊗	37	100.0
238.	-S236⊗	39	76.9
239.	-S237⊗	31	54.8
240.	-S238⊗	38	65.8
241.	-S239⊗	38	94.7
242.	-S240⊗	59	88.1
243.	-S241⊗	49	79.6
244.	-S242⊗	45	75.5
245.	-S243⊗	47	91.5
246.	-S244⊗	44	93.2
247.	-S245⊗	29	93.1
248.	-S246⊗	60	40.0
249.	-S247⊗	44	97.7
250.	-S248⊗	38	86.8
251.	-S249⊗	37	91.9
252.	-S250⊗	41	87.8
253.	-S251⊗	60	63.3
254.	-S252⊗	18	88.9
255.	-S253⊗	41	95.1

Contd.

Sl. No.	Pedigree		No. of plants	Percent wilt
256	74243-B-B-S254⊗		37	81.1
257.	-S255⊗		47	93.6
258.	-S256⊗		39	97.4
259.	-S257⊗		39	84.6
260.	-S258⊗		36	94.4
261.	-S259⊗		53	100.0
262.	-S260⊗		42	95.2
263.	-S261⊗		31	32.2
264.	-S262⊗		51	92.1
265.	-S263⊗		51	84.3
266.	C-11-21-2-P2		85	38.8
267.	74254-S4⊗-S1⊗		49	69.4
268.	-S2⊗		37	87.2
269.	-S3⊗	(7NDT)	18	77.8
270.	-S4⊗		51	80.4
271.	-S5⊗		42	80.9
272.	-S6⊗		40	82.5
273.	-S7⊗		40	67.5
274.	-S8⊗		44	70.4
275.	-S9⊗		54	92.6
276.	-S10⊗	(7NDT)	35	80.0
277.	-S11⊗		50	86.0
278.	-S12⊗		53	77.3
279.	-S13⊗		49	63.3
280	-S14⊗		42	69.2
281.	73070-S2⊗-S1⊗	(8NDT)	47	53.2
282.	-S2⊗		43	51.2
283.	73070-30-S1⊗-S1⊗	(7NDT)	49	20.4
284.	-S2⊗	(7NDT)	46	23.9
285.	-S1⊗-S3⊗	(7NDT)	53	24.5
286	-S4⊗	(7NDT)	53	15.1
287.	-S5⊗	(7NDT)	53	11.3
288.	-S6⊗	(7NDT)	No germination	
289.	-S2⊗-S1⊗	(7NDT)	48	16.8
290.	-S2⊗	(7NDT)	44	6.8
291	-S3⊗	(7NDT)	51	17.6
292.	-S4⊗	(7NDT)	52	15.4
293.	73088-13-S1⊗-S1⊗	(8NDT)	35	82.8
294.	-S2⊗	(8NDT)	43	81.4
295.	-S3⊗	(8NDT)	23	95.6
296.	-S4⊗	(8NDT)	60	90.0
297.	-S5⊗	(8NDT)	36	83.3
298.	74240-7-S1⊗-S1⊗		46	86.9
299.	-S2⊗	(7NDT)	57	86.0
300.	-S3⊗	(7NDT)	51	76.5

Contd.

Sl. No.	Pedigree		No. of plants	Percent wilt
301.	74240-7-S1⊗-S4⊗	(7NDT)	51	60.8
302.	-S5⊗	(7NDT)	51	88.2
303.	-S2⊗-S1⊗	(8NDT)	47	83.0
304.	-S2⊗	(6NDT)	48	89.6
305.	-S3⊗	(6NDT)	46	84.8
306.	-S4⊗	(5NDT)	46	97.8
307.	-S5⊗	(5NDT)	54	90.7
308.	74240-33-S1⊗-S1⊗	(6NDT)	58	94.8
309.	-S2⊗	(7NDT)	46	71.7
310.	-S3⊗	(6NDT)	42	69.0
311.	-S4⊗	(6NDT)	45	53.3
312.	-S5⊗	(6NDT)	51	88.2
313.	74240-46-S1⊗-S1⊗	(8NDT)	13	76.9
314.	-S2⊗	(8NDT)	29	86.2
315.	-S3⊗	(6NDT)	12	58.3
316.	-S4⊗	(8NDT)	35	80.0
317.	74240-60-S1⊗-S1⊗	(6NDT)	47	93.6
318.	-S2⊗	(6NDT)	44	100.0
319.	-S3⊗	(6NDT)	27	100.0
320.	-S4⊗	(6NDT)	42	85.7
321.	-S5⊗	(5NDT)	55	92.7
322.	-S6⊗	(6NDT)	49	95.9
323.	-S7⊗	(6NDT)	42	95.2
324.	-S8⊗	(5NDT)	49	91.8
325.	-S9⊗		43	93.0
326.	-S10⊗		44	81.8
327.	-S11⊗		33	90.9
328.	-S12⊗		31	90.3
329.	74245-15-S1⊗-S1⊗		13	92.3
330.	-S2⊗		45	100.0
331.	-S3⊗		48	85.4
332.	-S4⊗		46	97.8
333.	-S5⊗		41	100.0
334.	74024-8-S2⊗-S1⊗	(7NDT)	40	85.0
335.	-S2⊗		40	70.0
336.	-S3⊗		44	68.2
337.	-S4⊗		26	84.6
338.	-S5⊗		17	88.2
339.	-S6⊗		27	59.2
340.	-S7⊗		40	70.0
341.	-S8⊗		33	63.6

Contd.

Sl. No.	Pedigree	No. of plants	Percent wilt
342.	73054-17-1-Bulk.II S1⊗-S1⊗	24	54.2
343.	-S2⊗	41	80.5
344.	-S3⊗	15	100.0
345.	-S4⊗	20	100.0
346.	73054-2-5-5-S1⊗-S1⊗-2NDT	33	75.7
347.	-S2⊗-3NDT	43	39.5
348.	-S3⊗-3NDT	28	71.4
349.	-S4⊗-2NDT	28	78.6
350.	-S5⊗-6NDT	46	91.3
351.	73054-2-6-3-S5⊗-S1⊗-5NDT	45	80.0
352.	-S2⊗-5NDT	13	92.3
353.	-S3⊗-6NDT	38	94.7
354.	-S4⊗-5NDT	44	59.1
355.	-S5⊗-5NDT	36	86.1
356.	73054-58-1-2-S3⊗-S1⊗-5NDT	20	55.0
357.	-S2⊗-4NDT	40	77.5
358.	-S3⊗-5NDT	32	66.7
359.	-S4⊗-3NDT	41	75.6
360.	-S5⊗-5NDT	18	100.0
361.	73054-58-1-2-S4⊗-S1⊗-5NDT	43	76.2
362.	-S2⊗-5NDT	42	59.5
363.	-S3⊗-5NDT	42	64.3
364.	-S4⊗-3NDT	49	97.9
365.	-S5⊗-2NDT	30	50.0

APPENDIX- XVI

Results of screening of progenies resistant to sterility mosaic against wilt in Vertisol sick plot -'A'

Sl. No.	Pedigree	No. of plants	Percent wilt	No. of plants selected
1.	ICP-3783-S1@-S27@-W1@	8	37.5	0
2.	-W3@	14	28.6	0
3.	-S39@-W1@	15	40.0	0
4.	-W2@	15	53.3	0
5.	-S42@-W3@	4	75.0	0
6.	-W4@	9	33.3	0
7.	-S45@-W3@	19	36.8	0
8.	-W4@	12	16.7	0
9.	-S46@-W3@	10	30.0	0
10.	-W4@	12	16.7	3
11.	-3783-S3@-S11@-W1@	13	15.4	1
12.	-W3@	22	27.3	0
13.	-S12@-W4@	20	15.0	2
14.	-W5@	16	18.8	1
15.	-S15@-W3@	10	70.0	0
16.	-W4@	9	11.1	2
17.	-S16@-W1@	13	38.5	0
18.	-W3@	16	31.3	0
19.	-S43@-W3@	14	28.6	1
20.	-W4@	12	16.7	1
21.	ICP-7035-S45@-S1@-W1@	8	12.5	2
22.	-W3@	5	40.0	0
23.	-S6@--W1@	18	22.2	0
24.	-W3@	17	29.4	0
25.	-S20@-W3@	6	50.0	0
26.	-W4@	12	33.3	0
27.	-S23@-W4@	11	18.2	1
28.	-W5@	19	36.8	0
29.	HY-3-C-S5@-S1@-W2@	27	44.4	0
30.	-W3@	13	30.8	0
31.	-S2@-W1@	15	60.0	0
32.	-S3@-W2@	19	52.6	0
33.	-W3@	16	43.8	0
34.	-S4@-W3@	20	35.0	0
35.	-W4@	18	38.9	0
36.	-S5@-W2@	8	25.0	0
37.	-W3@	7	71.4	0

Contd

Sl. No.	Pedigree	No. of plants	Percent wilt	No. of plants selected
38	HY-3-C-S5⊗-S8⊗-W3⊗	19	15.8	1
39.	-W4⊗	20	35.0	0
40.	-S9⊗-W3⊗	21	47.6	0
41.	-W4⊗	10	20.0	0
42.	-S251⊗-S10⊗-W3⊗	14	21.4	0
43.	-W4⊗	18	61.1	0
44	-S11⊗-W1⊗	18	77.8	0
45.	-W3⊗	23	39.1	0
46.	-W5⊗	14	35.7	0
47.	-S14⊗-W1⊗	11	54.6	0
48.	-W2⊗	12	58.3	0
49.	-S15⊗-W1⊗	11	81.8	0
50.	-W2⊗	20	35.0	0

APPENDIX-XVII & XVIII

Screening of single plant progenies for resistance to wilt in Alfisol sick plot - A

Sl. No.	Pedigree	No. of plants	Percent wilt	Percent SMV infection	Symptom severity (SMV)
1	2	3	4	5	6
1.	T-17-W1⊗-W2⊗-W1⊗	15	53.3	75.00	MM
2.	-W2⊗	22	27.3	95.00	MM
3.	-W3⊗-W1⊗	25	100.0	88.23	MM
4.	-W2⊗	25	100.0	80.00	MM
5.	-W5⊗-W1⊗	23	30.4	85.00	MM
6.	-W2⊗	30	26.7	82.75	MM
7.	-W9⊗-W1⊗	21	100.0	9.09	MM
8.	-W2⊗	22	100.0	0.00	-
9.	-W17⊗-W1⊗	23	26.1	33.33	MM
10.	-W2⊗	19	15.8	84.21	MM
11.	T-17-W2⊗-W1⊗-W1⊗	25	28.0	78.26	MM
12.	-W2⊗	24	12.5	91.66	MM
13.	-W3⊗-W1⊗	23	17.4	90.90	MM
14.	-W2⊗	23	0.0	69.56	MM
15.	-W7⊗-W1⊗	26	19.2	88.00	MM
16.	-W2⊗	24	25.0	85.00	MM
17.	T-17-W3⊗-W6⊗-W1⊗	22	59.1	84.21	MM
18.	-W2⊗	21	38.1	100.00	MM
19.	-W7⊗-W1⊗	20	45.0	100.00	MM
20.	-W2⊗	21	52.4	94.11	MM
21.	-W9⊗-W1⊗	24	20.8	81.81	MM
22.	-W2⊗	22	13.6	100.00	SM
23.	-W12⊗-W1⊗	20	60.0	100.00	SM
24.	-W2⊗	21	71.4	3.03	MM
25.	NP(WR)15-W1⊗-W1⊗-W1⊗	20	30.0	0.00	-
26.	-W2⊗	16	18.8	0.00	-
27.	NP(WR)15-W1⊗-W7⊗-W1⊗	15	13.3	43.75	MM
28.	-W2⊗	20	15.0	80.95	MM
29.	-W12⊗-W1⊗	17	11.8	0.00	-
30.	-W2⊗	21	23.8	0.00	-
31.	-W14⊗-W1⊗	16	56.3	85.71	MM
32.	-W2⊗	15	40.0	93.33	MM
33.	-W16⊗-W1⊗	17	70.6	0.00	-
34.	-W2⊗	18	27.8	0.00	-
35.	-W19⊗-W1⊗	23	30.4	0.00	-

Contd.

1	2	3	4	5	6
36	NP(WR)-15-W10-W190-W20	22	13.6	22.22	MM
37.	-W210-W10	21	9.5	10.00	MM
38.	-W20	25	16.0	0.00	-
39.	NP(WR)-15-W20-W10-W10	19	68.4	0.00	-
40	-W20	25	72.0	0.00	-
41	-W30-W10	21	14.3	71.42	MM
42	-W20	18	33.3	88.23	MM
43.	-W50-W10	23	39.1	0.00	-
44	-W20	22	36.4	0.00	-
45	-W120-W10	20	30.0	61.11	MM
46.	-W20	27	44.4	20.83	MM
47	-W140-W10	18	5.6	17.64	MM
48.	-W20	25	8.0	15.78	MM
49	-W150-W10	20	20.0	18.18	MM
50	-W20	17	0.0	31.57	MM
51	-W160-W10	26	15.4	55.55	MM
52	-W20	19	0.0	43.75	MM
53.	-W190-W10	20	10.0	0.00	-
54.	-W20	17	17.7	5.26	MM
55.	-W200-W10	20	0.0	23.80	MM
56.	NP(WR)-15-W20-W200-W20	22	18.2	41.76	MM
57	-W30-W60-W10	20	0.0	0.00	-
58.	-W20	20	35.0	0.00	-
59.	-W70-W10	20	5.0	66.66	MM
60	-W20	19	5.3	65.00	MM
61	-W80-W10	20	0.0	0.00	-
62	-W20	20	15.0	6.66	MM
63.	-W90-W10	17	29.4	0.00	-
64	-W20	18	27.8	0.00	-
65	-W140-W10	24	62.5	0.00	-
66	-W20	22	90.9	10.00	MM
67	-W150-W10	24	66.7	0.00	-
68	-W20	22	22.7	0.00	-
69	-W180-W10	28	32.1	7.69	RS
70.	-W20	25	28.0	15.38	RS
71.	ICP-6970-S10-W10	26	0.0	26.66	RS
72.	-W20	26	0.0	5.88	RS
73.	-S20-W10	16	6.3	0.00	-
74	-W20	17	5.9	4.76	RS
75	-S30-W10	23	21.7	0.00	-
76	-W50	23	8.7	100.00	SM
77	-S40-W10	17	35.7	9.52	RS
78	-W20	17	100.0	30.00	RS
79.	-S10-W10	20	10.0	70.58	SM
80.	-W20	22	9.1	10.00	RS

Contd

1	2	3	4	5	6
81.	ICP-6970-S2-W1⊗	22	31.8	0.00	-
82.	-W2⊗	22	22.7	0.00	-
83.	-S3-W1⊗	21	95.2	5.88	RS
84.	-W2⊗	22	68.2	20.00	RS
85.	-S4-W1⊗	22	31.8	3.57	RS
86.	-W2⊗	16	6.3	18.18	RS
87.	-S5-W1⊗	27	18.5	5.26	RS
88.	-W3⊗	23	4.4	15.78	RS
89.	-S6-W1⊗	23	17.4	5.66	RS
90.	-W2⊗	19	0.0	30.00	RS
91.	-S7-W1⊗	27	18.5	17.39	RS
92.	-W2⊗	20	5.0	16.66	RS
93.	-S8-W1⊗	24	4.2	4.37	RS
94.	-W2⊗	21	47.6	10.00	RS
95.	-S9-W1⊗	23	0.0	16.00	RS
96.	-W2⊗	20	0.0	14.28	RS
97.	-S10⊗-W1⊗	27	11.1	0.00	-
98.	-W2⊗	20	0.0	0.00	-
99.	KWR-1-W1⊗-W2⊗-W1⊗	24	62.5	100.00	SM
100.	-W2⊗	25	76.0	100.00	SM
101.	-W3⊗-W1⊗	24	87.5	0.00	-
102.	-W5⊗	20	50.0	0.00	-
103.	-W5⊗-W1⊗	19	78.9	0.00	-
104.	-W2⊗	24	70.8	0.00	-
105.	-W2⊗-W2⊗-W1⊗	22	77.3	0.00	-
106.	-W2⊗	16	62.5	0.00	-
107.	-W11⊗-W1⊗	21	42.9	0.00	-
108.	--W2⊗	21	33.3	0.00	-
109.	-W13⊗-W1⊗	19	78.9	0.00	-
110.	-W2⊗	24	87.5	0.00	-
111.	-W3⊗-W1⊗-W1⊗	22	27.3	85.00	MM
112.	-W2⊗	24	66.7	33.33	MM
113.	-W3⊗-W11⊗-W1⊗	21	47.6	30.76	MM
114.	-W2⊗	23	60.9	0.00	-
115.	15-3-3-W2⊗-W13⊗-W1⊗	20	20.0	100.00	SM
116.	-W2⊗	20	15.0	94.44	SM
117.	-W1⊗-W16⊗-W1⊗	21	9.5	100.00	SM
118.	-W3⊗	25	20.0	100.00	SM
119.	20-1-W1⊗-W1⊗	21	19.1	38.09	MM
120.	-W2⊗	18	11.1	24.52	MM

Contd.

1	2	3	4	5	6
121.	73039-RbB-W4⊗-W1⊗-W1⊗	20	10.0	95.00	SM
122.	-W2⊗	15	46.7	100.00	SM
123.	-W2⊗-W1⊗	20	20.0	100.00	SM
124.	-W3⊗	22	50.0	100.00	SM
125.	Early x Early-RbB-W5⊗-W1⊗-W1⊗	12	16.7	90.00	SM
126.	-W2⊗	23	43.4	94.11	SM

SMV - Sterility mosaic virus
SM - Severe mosaic
RS - Ring spot
MM - Mild mosaic

APPENDIX-XIX

Screening of single plant progenies for resistance to wilt in Vertisol sick plot - 'A'

Sl. No.	Pedigree	No. of plants	Percent wilt
1	2	3	4
1.	T-17-W1⊗-W2⊗-W5⊗	15	13.3
2.	-W6⊗	19	52.6
3.	-W7⊗	16	56.3
4.	-W8⊗	13	0.0
5.	-W3⊗-W5⊗	13	69.2
6.	-W6⊗	22	54.6
7.	-W7⊗	16	50.0
8.	-W8⊗	20	75.0
9.	-W5⊗-W2⊗	14	0.0
10.	-W3⊗	15	0.0
11.	-W4⊗	12	0.0
12.	-W6⊗	21	57.1
13.	-W9⊗-W5⊗	21	42.9
14.	-W6⊗	32	12.5
15.	-W7⊗	17	64.7
16.	-W8⊗	33	81.8
17.	-W12⊗-W3⊗	24	58.3
18.	-W4⊗	18	0.0
19.	-W5⊗	14	42.9
20.	-W6⊗	18	88.9
21.	-W13⊗-W3⊗	17	58.8
22.	-W4⊗	18	55.6
23.	-W5⊗	16	50.0
24.	-W6⊗	19	47.4
25.	-W17⊗-W5⊗	18	44.4
26.	-W6⊗	16	50.0
27.	-W7⊗	21	38.1
28.	-W8⊗	16	62.5
29.	T-17-W2⊗-W1⊗-W5⊗	18	55.6
30.	-W6⊗	20	45.0
31.	-W7⊗	18	44.4
32.	-W8⊗	15	6.7
33.	-W3⊗-W5⊗	16	62.5
34.	-W6⊗	29	27.6
35.	-W7⊗	19	42.1
36.	-W8⊗	15	40.0

Contd.

1	2	3	4
37.	T-17-W20-W70-W50	14	71.4
38.	-W60	26	53.9
39.	-W70	17	35.3
40.	-W80	20	30.0
41.	-W90-W30	24	50.0
42.	-W40	22	13.6
43.	-W50	13	46.2
44.	-W60	18	33.3
45.	-W30-W20-W20	20	25.0
46.	-W30	22	45.5
47.	-W40	19	26.3
48.	-W50	15	53.3
49.	-W30-W20	16	50.0
50.	-W30	11	63.6
51.	-W40	18	16.7
52.	-W50	16	56.3
53.	-W40-W20	12	50.0
54.	-W30	16	50.0
55.	-W40	15	53.3
56.	-W50	22	22.7
57.	-W60-W10	19	36.8
58.	-W30	19	47.4
59.	-W40	18	61.1
60.	-W50	16	18.8
61.	-W70-W10	21	28.6
62.	-W20	21	47.6
63.	-W30	16	31.3
64.	-W40	20	25.0
65.	-W90-W20	22	31.8
66.	-W30	17	23.5
67.	-W40	22	22.7
68.	-W50	20	35.0
69.	-W120-W20	19	15.8
70.	-W30	22	45.5
71.	-W40	23	52.2
72.	-W50	14	28.6
73.	NP(WR)-15-W10-W10-W50	18	11.1
74.	-W60	20	10.0
75.	-W70	22	18.2
76.	-W80	15	13.3
77.	-W20-W10	20	55.0
78.	-W30	17	41.2
79.	-W40	19	47.4
80.	-W50	14	64.3

Contd

1	2	3	4
81.	NP(WR)-15-W10-W30-W30	18	33.3
82.	-W40	18	0.0
83.	-W50	16	31.3
84.	-W60	15	40.0
85.	-W40-W30	16	50.0
86.	-W40	16	18.8
87.	-W50	18	27.8
88.	-W60	19	36.8
89.	-W70-W40	20	5.0
90.	-W50	21	23.8
91.	-W60	21	14.3
92.	-W70	17	17.7
93.	-W120-W50	15	0.0
94.	-W60	18	44.4
95.	-W70	15	13.3
96.	-W80	14	21.4
97.	NP(WR)-15-W10-W130-W30	17	35.3
98.	-W40	23	26.1
99.	-W50	17	41.2
100.	-W60	22	13.6
101.	-W140-W50	16	0.0
102.	-W60	21	9.5
103.	-W70	20	35.0
104.	-W80	22	31.8
105.	-W160-W50	19	36.8
106.	-W60	18	55.6
107.	-W70	18	50.0
108.	-W80	17	52.9
109.	-W170-W10	23	21.7
110.	-W20	13	0.0
111.	-W30	17	5.9
112.	-W40	10	20.0
113.	-W190-W50	19	57.9
114.	-W60	22	13.6
115.	-W70	18	22.2
116.	-W80	14	35.7
117.	-W200-W30	19	84.2
118.	-W40	22	45.5
119.	-W50	15	73.3
120.	-W60	16	56.3
121.	-W210-W50	15	0.0
122.	-W60	22	45.5
123.	-W70	15	33.3
124.	-W80	20	55.0

Contd.

1	2	3	4
125.	NP(WR)-15-W20-W10-W50	21	38.1
126.	-W60	12	41.7
127.	-W70	18	0.0
128.	-W80	18	27.8
129.	-W30-W50	14	14.3
130.	-W60	16	31.3
131.	-W70	18	33.3
132.	-W80	15	26.7
133.	-W50-W50	18	27.8
134.	-W60	14	50.0
135.	-W70	19	21.1
136.	-W80	15	0.0
137.	-W120-W50	15	6.7
138.	-W60	18	0.0
139.	-W70	19	21.1
140.	-W80	18	11.1
141.	-W140-W50	16	12.5
142.	-W60	20	15.0
143.	-W70	18	16.7
144.	-W80	23	17.4
145.	-W150-W50	10	0.0
146.	-W60	25	40.0
147.	-W70	21	28.6
148.	-W80	14	7.1
149.	-W160-W50	18	38.9
150.	-W60	16	25.0
151.	-W70	12	33.3
152.	-W80	13	38.5
153.	-W190-W50	19	26.3
154.	-W60	22	31.8
155.	-W70	12	50.0
156.	-W80	20	60.0
157.	-W200-W50	16	0.0
158.	-W60	14	0.0
159	-W70	19	15.8
160.	-W80	14	42.9
161.	NP(WR)-15-W30-W60-W50	19	21.1
162.	-W60	18	27.8
163.	-W70	11	45.5
164.	-W80	16	6.3
165.	-W70-W50	22	0.0
166.	-W60	19	26.3
167.	-W70	20	15.0
168.	-W80	15	33.3

Contd

1	2	3	4
169.	NP(WR)-15-W3⊗-W8⊗-W5⊗	20	5.0
170.	-W6⊗	21	4.8
171.	-W7⊗	21	4.8
172.	-W8⊗	21	9.6
173.	-W9⊗-W5⊗	23	43.5
174.	-W6⊗	23	26.1
175.	-W7⊗	22	22.7
176.	-W8⊗	21	19.1
177.	-W14⊗-W5⊗	20	35.0
178.	-W6⊗	21	57.1
179.	-W7⊗	18	38.9
180.	-W8⊗	27	33.3
181.	-W15⊗-W5⊗	22	40.9
182.	-W6⊗	22	18.2
183.	-W7⊗	23	17.4
184.	-W8⊗	18	16.7
185.	-W17⊗-W3⊗	22	13.6
186.	-W4⊗	27	37.0
187.	-W5⊗	19	21.1
188.	-W6⊗	16	18.8
189.	-W18⊗-W5⊗	26	23.1
190.	-W6⊗	23	30.4
191.	-W7⊗	19	15.8
192.	-W8⊗	22	4.6
193.	KWR-1-W1⊗-W2⊗-W5⊗	23	17.4
194.	-W6⊗	21	23.8
195.	-W7⊗	18	55.6
196.	-W8⊗	18	16.7
197.	-W3⊗-W2⊗	18	27.8
198.	-W3⊗	22	22.7
199.	-W4⊗	19	36.8
200.	-W5⊗	22	9.1
201.	-W5⊗-W5⊗	22	40.9
202.	-W6⊗	21	28.6
203.	-W7⊗	17	35.3
204.	-W8⊗	22	40.9
205.	KWR-1-W2⊗-W2⊗-W5⊗	13	15.4
206.	-W6⊗	12	16.7
207.	-W7⊗	20	25.0
208.	-W8⊗	24	50.0
209.	-W3⊗-W3⊗	23	26.1
210.	-W4⊗	24	33.3
211.	-W5⊗	23	47.8
212.	-W6⊗	18	33.3

Contd.

1	2	3	4
213	KWR-1-W2⊗-W7⊗-W3⊗	14	28.6
214.	-W4⊗	15	40 0
215.	-W5⊗	16	12.5
216	-W6⊗	24	16 7
217.	-W10⊗-W3⊗	21	42 9
218.	-W4⊗	22	36.4
219	-W5⊗	21	28.6
220.	-W6⊗	21	33.3
221.	-W11⊗-W5⊗	18	0.0
222.	-W6⊗	21	28.6
223.	-W7⊗	20	20.0
224.	-W8⊗	21	14.3
225.	-W13⊗-W5⊗	21	19.1
226.	-W6⊗	17	41.2
227.	-W7⊗	22	45.5
228.	-W8⊗	15	66 7
229.	KWR-1-W3⊗-W1⊗-W5⊗	22	22.7
230.	-W6⊗	22	31.8
231	·W7⊗	18	33.3
232.	-W8⊗	16	6.3
233	-W5⊗-W3⊗	16	12.5
234.	-W4⊗	14	7.1
235.	-W5⊗	11	18.2
236.	-W6⊗	22	18.2
237.	-W11⊗-W5⊗	15	6.7
238.	-W6⊗	12	16.7
239	-W7⊗	18	5 6
240.	-W8⊗	13	0 0
241.	-W13⊗-W1⊗	17	17.7
242.	-W3⊗	23	8.7
243.	-W4⊗	24	20.8
244.	-W5⊗	23	17.4
245.	ICP-6970-S1⊗-W2⊗	16	6.3
246.	-W3⊗	25	16.0
247	-W4⊗	20	5.0
248.	-W5⊗	22	4.6
249.	-S2⊗-W2⊗	15	0.0
250.	-W3⊗	18	22 2
251	-W4⊗	17	0.0
252.	-W5⊗	20	25.0
253.	-S3⊗-W2⊗	18	0.0
254.	-W3⊗	19	10 5
255.	-W4⊗	16	12.5
256.	-W5⊗	17	5.9

Contd.

1	2	3	4
257.	ICP-6970-S40-W20	12	100.0
258.	-W30	21	23.8
259.	-W40	20	15.0
260.	-W50	18	22.2
261.	-S10-W20	23	4.4
262.	-W30	18	5.6
263.	-W40	17	0.0
264.	-W50	22	0.0
265.	-S20-W20	18	0.0
266.	-W30	21	0.0
267.	-W40	19	36.8
268.	-W50	16	0.0
269.	-S30-W20	16	31.3
270.	-W30	24	0.0
271.	-W40	16	12.5
272.	-W50	20	0.0
273.	-S40-W10	19	0.0
274.	-W30	18	11.1
275.	-W40	21	4.8
276.	-W50	18	0.0
277.	-S50-W20	19	15.8
278.	-W30	20	0.0
279.	-W40	16	0.0
280.	-W50	22	4.6
281.	-S60-W20	20	15.0
282.	-W30	23	4.4
283.	-W40	21	14.3
284.	-W50	19	5.3
285.	-S70-W20	18	27.8
286.	-W30	17	5.9
287.	-W40	20	5.0
288.	-W50	16	12.5
289.	-S80-W20	20	10.0
290.	-W30	16	0.0
291.	-W40	15	0.0
292.	-W50	20	0.0
293.	-S90-W20	19	0.0
294.	-W30	20	0.0
295.	-W40	15	0.0
296.	-W50	21	4.8
297.	-S100-W10	20	0.0
298.	-W30	22	13.6
299.	-W40	24	0.0
300.	-W50	17	0.0

Contd.

1	2	3	4
301.	C-11-W20-W100-W10	25	28.0
302.	-W20	18	5.6
303.	-W30	18	11.2
304.	-W40	23	13.0
305.	NO-1258-W20-W50-W10	16	43.8
306.	-W30	20	45.0
307.	-W40	12	16.7
308.	-W50	22	45.5
309.	15-3-3-W10-W160-W20	18	16.7
310.	-W30	22	9.1
311.	-W40	18	5.6
312	-W50	24	4.2
313.	-W20-W130-W20	19	0.0
314.	-W30	14	14.3
315	-W40	15	6.7
316.	-W50	15	6.7
317.	20-1-W10-W20	19	21.1
318.	-W30	21	4.8
319.	-W40	15	6.7
320	-W50	14	7.1
321.	F_5-73039-RbB-W40-W10-W50	18	0.0
322.	-W60	24	8.3
323.	-W70	21	4.8
324.	-W80	18	16.7
325.	-W20-W20	17	17.7
326	-W30	18	16.7
327	-W40	14	28.6
328	-W50	30	13.3
329.	F_6-EXE-RbB-W50-W10-W50	17	5.9
330.	-W60	19	0.0
331.	-W70	22	31.8
332	-W80	15	33.3

APPENDIX - XX

Screening of single plant progenies from six field wilt tolerant lines for resistance to wilt in Vertisol sick plot - 'A'

Sl. No.	Pedigree	No. of plants	Percent wilt
1	2	3	4
1.	NP(WR)-15-W1⊗-W1⊗	20	10.0
2.	-W2⊗	20	15.0
3.	-W3⊗-W1⊗	20	0.0
4.	-W2⊗	21	14.3
5.	-W12⊗-W1⊗	22	9.1
6.	-W2⊗	20	0.0
7.	-W13⊗-W1⊗	23	30.4
8.	-W2⊗	21	19.0
9.	-W14⊗-W1⊗	23	17.4
10.	-W2⊗	20	50.0
11.	-W21⊗-W1⊗	25	24.0
12.	-W2⊗	20	20.0
13.	-W29⊗-W1⊗	20	10.0
14.	-W2⊗	24	16.7
15.	-W44⊗-W1⊗	22	63.6
16.	-W2⊗	17	11.8
17.	-W73⊗-W1⊗	20	5.0
18.	-W2⊗	22	9.1
19.	-W79⊗-W1⊗	21	54.6
20.	-W2⊗	22	50.0
21.	ICP-7035-W16⊗-W2⊗	23	52.2
22.	-W3⊗	21	19.1
23.	-W21⊗-W2⊗	12	33.3
24.	-W33⊗-W1⊗	32	65.6
25.	-W2⊗	17	64.7
26.	-W49⊗-W1⊗	10	10.0
27.	-W2⊗	23	82.6
28.	-W50⊗-W1⊗	23	65.2
29.	-W2⊗	25	28.0
30.	-W60⊗-W1⊗	21	61.9
31.	-W2⊗	17	58.8
32.	-W64⊗-W1⊗	23	73.9
33.	-W2⊗	23	47.8
34.	-W73⊗-W1⊗	17	76.5
35.	-W2⊗	18	44.4
36.	-W77⊗-W1⊗	15	40.0
37.	-W2⊗	18	72.2

Contd.

1	2	3	4
38.	ICP-7035-W79⊗-W1⊗	22	54.6
39	-W2⊗	25	56.0
40.	-W80⊗-W1⊗	21	52.4
41	-W2⊗	12	41.7
42.	-W89⊗-W1⊗	17	58.8
43	-W2⊗	10	80.0
44.	-W99⊗-W1⊗	19	84.2
45.	-W2⊗	11	100.0
46.	-W103⊗-W1⊗	14	0.0
47.	-W2⊗	17	17.7
48	-W142⊗-W1⊗	13	23.1
49	--W2⊗	11	100.0
50.	-W144⊗-W1⊗	22	86.4
51.	-W2⊗	16	18.8
52.	-W151⊗-W1⊗	17	0.0
53.	-W2⊗	10	0.0
54.	-W161⊗-W1⊗	22	0.0
55.	-W2⊗	14	100.0
56.	-W165⊗-W1⊗	15	80.0
57.	-W2⊗	20	60.0
58.	HY-3C-W1⊗-W1⊗	19	10.5
59.	-W2⊗	2	0.0
60.	-W3⊗-W1⊗	17	35.3
61.	-W2⊗	22	68.2
62.	C-11-W11⊗-W1⊗	29	0.0
63.	-W2⊗	20	0.0
64.	-W13⊗-W1⊗	21	0.0
65.	-W2⊗	32	0.0
66.	-W22⊗-W1⊗	18	5.6
67.	-W2⊗	18	33.3
68.	NO-148-W26⊗-W1⊗	16	0.0
69.	-W2⊗	20	35.0
70.	-W32⊗-W1⊗	18	5.6
71.	-W2⊗	17	35.3
72	-W53⊗-W1⊗	24	62.5
73.	-W2⊗	24	100.0
74.	-W63⊗-W1⊗	16	6.3
75.	-W2⊗	16	0.0
76.	-W69⊗-W1⊗	18	66.7
77.	-W2⊗	42	0.0
78.	-W70⊗-W1⊗	26	69.0
79	-W2⊗	21	19.1
80.	-W80⊗-W3⊗	22	86.4
81.	-W4⊗	23	82.6
82.	-W83⊗-W2⊗	18	38.9

Contd.

1	2	3	4
83.	NO-148-W83⊗-W3⊗	19	42.1
84.	-W86⊗-W1⊗	27	81.5
85.	-W2⊗	25	88.0
86.	-W88⊗-W1⊗	19	15.8
87.	-W2⊗	22	50.0
88.	-W111⊗-W1⊗	20	85.0
89.	-W2⊗	24	8.3
90.	-W112⊗-W1⊗	24	41.7
91.	-W2⊗	26	30.8
92.	-W114⊗-W1⊗	20	15.0
93.	-W2⊗	24	29.2
94.	-W118⊗-W1⊗	22	54.5
95.	-W2⊗	18	39.9
96.	-W120⊗-W1⊗	21	9.5
97.	-W2⊗	19	47.4
98.	-W122⊗-W2⊗	24	62.5
99.	-W5⊗	25	36.0
100.	-W126⊗-W1⊗	20	50.0
101.	-W2⊗	22	27.3
102.	-W127⊗-W1⊗	23	86.9
103.	-W2⊗	22	50.0
104.	-W128⊗-W1⊗	20	30.0
105.	-W2⊗	23	13.0
106.	-W130⊗-W1⊗	19	10.5
107.	-W2⊗	18	16.7
108.	-W131⊗-W1⊗	26	19.2
109.	-W2⊗	26	30.8
110.	-W133⊗-W1⊗	20	5.0
111.	-W3⊗	27	14.8
112.	-W136⊗-W1⊗	21	23.8
113.	-W2⊗	22	18.2
114.	-W137⊗-W1⊗	19	36.8
115.	-W2⊗	24	29.2
116.	-W141⊗-W1⊗	25	44.0
117.	-W2⊗	25	36.0
118.	-W143⊗-W1⊗	21	66.7
119.	-W2⊗	25	28.0
120.	-W145⊗-W1⊗	23	30.4
121.	-W149⊗-W1⊗	22	22.7
122.	-W2⊗	20	35.0
123.	-W150⊗-W4⊗	24	75.0
124.	-W5⊗	28	46.4
125.	-W165⊗-W1⊗	19	21.1
126.	-W2⊗	28	35.7

1	2	3	4
127.	NO-148-W167⊗-W1⊗	22	50.0
128	-W2⊗	21	47.6
129	-W169⊗-W1⊗	16	62.5
130.	-W2⊗	20	55.0
131.	-W170⊗-W1⊗	24	16.7
132.	-W2⊗	24	50.0
133.	-W174⊗-W3⊗	25	24.0
134.	-W4⊗	21	28.6
135.	-W175⊗-W1⊗	24	25.0
136.	-W3⊗	23	8.7
137.	-W176⊗-W1⊗	20	15.0
138.	-W181⊗-W2⊗	26	23.1
139.	-W3⊗	21	66.7
140.	-W182⊗-W3⊗	26	46.2
141.	-W5⊗	20	40.0
142.	-W190⊗-W1⊗	19	15.8
143.	-W2⊗	26	26.9
144.	-W204⊗-W1⊗	20	60.0
145.	-W4⊗	20	55.0
146.	-W209⊗-W1⊗	21	23.8
147.	-W2⊗	21	23.8
148.	-W212⊗-W1⊗	25	36.0
149.	-W3⊗	21	4.8
150.	-W229⊗-W1⊗	22	27.3
151.	-W2⊗	26	34.6
152.	-W232⊗-W1⊗	23	47.8
153.	-W3⊗	20	25.0
154	-W242⊗-W1⊗	21	52.4
155	-W3⊗	22	27.3
156.	BDN-1-W39⊗-W1⊗	22	18.2
157.	-W2⊗	30	20.0
158.	-W174⊗-W2⊗	23	82.6
159.	-W3⊗	27	37.0
160.	-W191⊗-W3⊗	22	50.0
161.	-W4⊗	29	37.9
162.	-W192⊗-W2⊗	27	40.7
163.	-W3⊗	24	16.7
164.	-W202⊗-W2⊗	24	50.0
165.	-W3⊗	20	20.0
166.	-W209⊗-W3⊗	22	9.1
167.	-W4⊗	23	52.1
168.	-W214⊗-W2⊗	27	33.3
169.	-W3⊗	26	19.2
170.	BDN-1-W216⊗-W4⊗	22	13.6
171.	-W5⊗	30	23.3

Contd.

1	2	3	4
172.	BDN-1-W2190-W10	21	76.2
173.	-W20	18	61.2
174.	-W2360-W10	23	0.0
175.	-W20	15	20.0
176.	-W2370-W10	26	65.4
177.	-W30	22	54.5
178.	-W2390-W30	19	31.6
179.	-W40	21	14.3
180.	-W2420-W10	26	34.6
181.	-W20	27	51.9
182.	-W2430-W10	28	14.3
183.	-W20	20	10.0
184.	-W2450-W20	20	55.0
185.	-W30	25	40.0
186.	-W2500-W10	27	25.9
187.	-W50	20	25.0
188.	-W2630-W30	29	10.3
189.	-W40	12	8.3

APPENDIX-XXI

Screening of sterility mosaic resistant and/wilt promising progenies for resistance to wilt in Vertisol sick plot-A

Sl. No.	Pedigree	No. of plants	% Wilt	No of plants selected
1	2	3	4	5
1.	ICP-2376-SW1⊗	9	44.4	0
2.	-SW2⊗	12	0.0	1
3.	-SW3⊗	18	0.0	1
4.	-SW4⊗	8	37.5	0
5.	ICP-3782-SW8⊗	11	9.1	0
6.	-SW10⊗	8	0.0	0
7.	-SW11⊗	10	10.0	0
8.	-SW12⊗	9	11.1	0
9.	ICP-3783-S1⊗-S2⊗-SW10⊗	16	6.3	0
10.	-SW11⊗	16	6.3	0
11.	-SW12⊗	23	8.7	0
12.	-SW16⊗	18	5.6	0
13.	NP(WR)-15-W2⊗-W14⊗-SW7⊗	20	5.0	0
14.	-SW9⊗	17	0.0	4
15.	-SW11⊗	12	0.0	5
16.	-SW13⊗	20	10.0	8
17.	ICP-6970-S2⊗-SW9⊗	24	4.2	5
18.	-SW10⊗	21	9.5	5
19.	-SW11⊗	16	6.3	6
20.	-SW12⊗	18	11.1	5
21.	ICP-7035-S34⊗-S29⊗-SW9⊗	17	76.5	0
22.	-SW10⊗	17	88.2	0
23.	-SW11⊗	16	37.5	0
24.	-SW12⊗	15	13.3	0
25.	HY-3C-S251⊗-S15⊗-SW7⊗	12	16.7	0
26.	-SW8⊗	21	38.1	0
27.	-SW10⊗	20	30.0	0
28.	-SW11⊗	16	31.3	0
29.	KWR-1-W3⊗-W1⊗-SW7⊗	16	6.3	5
30.	-SW8⊗	18	16.7	5
31.	-SW9⊗	27	18.5	3
32.	-SW10⊗	12	0.0	2
33.	BDN-1-W1⊗-SW10⊗	8	25.0	0
34.	-SW13⊗	26	53.9	0
35.	-SW14⊗	20	10.0	0

contd.

1	2	3	4	5
36.	BDN-1-W1⊗-SW16⊗	26	11.5	0
37.	15-3-3-W2⊗-W16⊗-SW10⊗	23	4.3	4
38.	-SW11⊗	20	0.0	5
39.	-SW13⊗	14	0.0	7
40.	-SW14⊗	22	4.6	6
41.	ICP-7867-SW6⊗	20	25.0	0
42.	-SW7⊗	20	40.0	0
43.	-SW8⊗	13	23.1	0
44.	-SW9⊗	11	36.4	0

APPENDIX - XXII

Results of screening germplasm against pigeonpea wilt in pots

Sl. No	ICP No.	No. of plants tested	Percent wilt	Sl. No	ICP No.	No. of plants tested	Percent wilt
1	2	3	4	1	2	3	4
1.	1	26	61.5	38.	45	21	80.9
2.	2	17	70.6	39.	46	31	67.7
3.	3	29	55.2	40.	48	27	85.2
4.	4	27	85.2	41.	49	32	81.3
5.	5	25	72.0	42.	50	26	76.9
6.	6	26	57.7	43.	51	32	87.5
7.	7	26	84.6	44.	52	17	52.9
8.	8	24	70.8	45.	54	26	92.3
9.	9	26	76.9	46.	56	22	77.3
10.	10	27	85.2	47.	57	29	78.3
11.	11	29	93.1	48.	58	31	93.5
12.	12	26	88.5	49.	59	24	66.7
13.	13	28	85.7	50.	60	29	96.5
14.	14	27	55.5	51.	62	28	64.3
15.	15	30	66.7	52.	63	25	68.0
16.	16	28	71.4	53.	64	17	88.2
17.	17	19	84.2	54.	65	20	90.0
18.	18	22	72.7	55	66	24	91.7
19.	19	21	71.4	56	67	18	94.4
20.	22	26	65.4	57.	68	28	75.0
21	24	20	85.0	58.	69	23	69.6
22.	25	28	82.1	59.	70	23	78.3
23.	26	29	82.8	60.	71	25	92.0
24.	27	33	81.8	61.	72	26	46.1
25.	28	26	34.6	62.	75	28	60.7
26.	29	23	95.6	63.	76	33	84.8
27.	31	28	71.4	64.	77	18	61.1
28	32	32	40.6	65	78	30	86.7
29.	33	28	78.6	66.	81	20	100.0
30	34	32	56.2	67.	82	26	73.1
31	35	28	50.0	68.	83	24	83.3
32	36	31	83.9	69.	84	28	67.9
33.	37	27	66.7	70.	86	22	86.4
34	38	24	75.0	71.	87	16	100.0
35.	40	30	83.3	72.	88	28	92.9
36.	41	28	64.3	73.	91	30	90.0
37	43	21	80.9	74.	92	4	100.0

Contd

1	2	3	4	1	2	3	4
75.	94	25	100.0	121.	173	25	52.0
76.	95	22	95.4	122.	175	22	95.4
77.	98	24	95.8	123.	178	25	76.0
78.	99	25	92.0	124.	180	24	79.2
79.	100	32	87.5	125.	182	23	78.3
80.	102	9	77.8	126.	184	31	87.1
81.	103	10	20.0	127.	185	22	95.4
82.	104	24	95.8	128.	187	31	54.8
83.	106	22	72.7	129.	189	26	69.2
84.	108	16	75.0	130.	193	27	15.0
85.	109	8	50.0	131.	194	14	71.4
86.	110	17	52.9	132.	195	24	79.2
87.	111	10	90.0	133.	198	28	82.1
88.	112	23	69.6	134.	199	25	72.0
89.	113	22	90.9	135.	202	30	90.0
90.	115	9	55.6	136.	204	22	86.4
91.	117	25	80.0	137.	206	28	71.4
92.	119	17	82.3	138.	208	33	81.8
93.	121	22	90.9	139.	210	27	81.5
94.	122	25	92.0	140.	212	27	85.2
95.	124	26	34.6	141.	213	26	80.8
96.	126	22	41.0	142.	214	24	33.3
97.	127	17	100.0	143.	216	23	8.7
98.	128	18	88.9	144.	218	22	81.8
99.	130	31	83.9	145.	219	25	68.0
100.	131	31	64.5	146.	220	20	95.0
101.	132	28	82.1	147.	222	28	82.1
102.	135	23	43.5	148.	224	25	64.0
103.	136	26	61.5	149.	227	31	61.3
104.	139	23	56.5	150.	228	29	79.3
105.	141	21	76.1	151.	230	23	73.9
106.	147	18	55.5	152.	231	29	79.3
107.	148	26	61.5	153.	232	28	82.1
108.	150	23	87.0	154.	233	24	79.2
109.	151	18	50.0	155.	234	28	85.7
110.	154	13	76.9	156.	235	29	79.3
111.	155	33	84.8	157.	238	30	90.0
112.	156	22	81.8	158.	240	26	96.1
113.	157	23	60.9	159.	242	23	100.0
114.	163	25	80.0	160.	246	21	95.2
115.	164	23	87.0	161.	247	26	76.9
116.	165	21	95.2	162.	248	26	26.9
117.	167	25	88.0	163.	250	23	82.6
118.	168	28	53.6	164.	251	27	77.8
119.	170	26	84.6	165.	252	23	91.3
120.	171	28	89.3	166.	255	24	83.3

Contd.

			4	1	2	3	4
167	257	31	83.9	214	357	27	70.4
168	261	23	82.6	215	359	24	41.7
169	264	26	88.5	216	361	31	90.3
170	266	17	100.0	217	363	28	87.9
171	267	20	90.0	218	366	30	66.7
172	268	27	77.8	219	369	28	96.4
173	270	23	78.3	220	373	22	72.7
174	274	29	86.2	221	375	33	72.7
175	275	33	84.8	222	377	30	73.3
176	279	24	70.8	223	379	25	88.0
177	281	23	73.9	224	380	29	89.6
178	283	25	56.0	225	382	23	95.6
179	285	34	70.6	226	383	29	89.6
180	288	23	69.6	227	385	29	62.1
181	290	28	71.4	228	387	34	85.3
182	292	20	75.0	229	388	29	72.4
183	294	25	68.0	230	389	13	61.5
184	296	26	92.3	231	390	21	80.9
185	297	31	90.3	232	391	19	79.0
186	299	22	31.8	233	393	28	64.3
187	301	22	81.8	234	395	26	92.3
188	305	29	65.5	235	397	25	88.0
189	306	20	41.7	236	400	26	76.9
190	308	26	61.5	237	402	25	92.0
191	309	28	50.0	238	406	25	84.0
192	312	24	75.0	239	408	14	100.0
193	314	26	26.9	240	410	17	100.0
194	315	26	61.5	241	412	25	88.9
195	321	28	71.4	242	416	22	72.7
196	323	31	77.4	243	418	20	85.0
197	325	26	23.1	244	420	20	70.0
198	327	32	53.2	245	423	13	76.9
199	330	19	57.9	246	424	36	66.7
200	332	19	63.2	247	426	32	18.7
201	334	30	66.7	248	427	22	40.9
202	335	21	100.0	249	428	29	51.7
203	338	2	100.0	250	431	13	38.5
204	339	22	81.8	251	432	31	48.4
205	341	31	48.4	252	433	22	72.3
206	342	22	45.4	253	434	18	83.3
207	344	22	86.4	254	438	13	61.5
208	348	26	80.8	255	439	22	68.2
209	349	26	80.8	256	440	23	26.1
210	350	32	34.4	257	441	17	11.8
211	352	27	48.1	258	442	25	56.0
212	353	11	72.7	259	444	22	86.4
213	355	17	82.3	260	445	18	83.3

Contd

1	2	3	4	1	2	3	4
261.	446	22	54.5	306.	539	21	100.0
262.	447	28	60.7	307.	542	25	88.0
263.	450	30	56.7	308.	547	21	66.7
264.	451	19	57.9	309.	551	28	100.0
265.	452	21	52.4	310.	552	25	88.0
266.	453	19	84.2	311.	553	28	92.9
267.	455	17	100.0	312.	554	23	73.9
268.	457	20	40.0	313.	555	28	78.6
269.	460	22	54.5	314.	558	27	88.9
270.	464	16	75.0	315.	559	29	79.3
271.	466	29	37.9	316.	561	24	75.0
272.	468	24	95.8	317.	562	31	64.5
273.	472	26	80.7	318.	565	30	56.7
274.	474	36	5.5	319.	567	29	65.5
275.	475	20	35.0	320.	569	25	64.0
276.	476	27	25.9	321.	570	29	72.4
277.	478	19	42.1	322.	576	27	55.5
278.	479	26	76.9	323.	580	24	75.0
279.	483	33	54.5	324.	582	29	86.2
280.	487	23	60.9	325.	583	25	92.0
281.	489	28	53.6	326.	587	29	89.6
282.	491	20	100.0	327.	589	23	87.0
283.	494	26	53.8	328.	590	31	90.3
284.	496	25	52.0	329.	592	15	100.0
285.	497	30	83.3	330.	594	28	82.1
286.	498	30	63.3	331.	595	17	94.1
287.	499	18	33.3	332	596	29	82.8
288.	500	19	84.2	333.	597	30	83.3
289.	501	21	76.2	334.	598	33	78.8
290.	503	28	50.0	335.	599	34	82.3
291.	504	21	80.9	336.	605	24	62.5
292.	505	24	83.3	337.	607	28	89.3
293.	508	29	44.8	338.	608	23	69.6
294.	509	25	84.0	339.	613	38	81.6
295.	511	20	75.0	340.	615	33	84.8
296.	512	22	90.9	341.	616	29	69.0
297.	513	26	100.0	342.	617	21	71.4
298.	514	21	90.5	343.	618	27	88.9
299.	517	21	85.7	344.	619	20	90.0
300.	522	18	88.9	345.	620	22	77.3
301.	525	26	76.9	346.	621	22	95.4
302.	528	25	76.0	347.	624	30	76.7
303.	534	21	80.9	348.	625	24	83.3
304.	535	17	82.3	349.	628	33	69.7
305.	538	25	32.0	350.	629	25	64.0

Contd.

1	2	3	4	1	2	3	4
351	633	34	52.9	396	744	27	85.2
352	635	34	70.6	397	747	26	88.5
353	637	33	78.8	398	752	24	95.8
354	638	30	70.0	399	755	28	100.0
355	648	29	62.1	400	756	20	90.0
356	649	13	30.8	401	758	9	66.7
357	652	35	65.7	402	760	17	100.0
358	653	22	27.7	403	767	27	96.3
359	654	34	14.7	404	769	27	88.9
360	655	38	84.2	405	774	24	70.8
361	656	34	50.0	406	776	6	66.7
362	657	34	72.2	407	778	20	65.0
363	659	45	73.3	408	779	3	100.0
364	663	46	54.3	409	780	21	66.7
365	664	29	65.5	410	781	20	85.0
366	665	42	73.8	411	783	24	41.6
367	666	26	57.7	412	785	10	50.0
368	667	42	61.9	413	786	20	80.0
369	668	33	87.9	414	788	24	87.5
370	670	35	68.6	415	791	27	92.6
371	672	34	41.2	416	792	20	95.0
372	673	37	70.3	417	794	32	68.7
373	676	33	48.5	418	795	19	100.0
374	677	17	58.8	419	796	26	80.8
375	679	12	75.0	420	797	22	81.8
376	681	20	20.0	421	798	10	80.0
377	684	23	82.6	422	800	24	91.7
378	688	35	74.3	423	801	14	57.1
379	691	16	87.5	424	802	20	90.0
380	694	23	78.3	425	803	24	87.5
381	698	19	84.2	426	804	17	76.5
382	702	23	78.3	427	805	31	19.3
383	704	28	60.7	428	806	21	85.7
384	705	28	96.4	429	807	35	71.4
385	707	28	42.9	430	808	22	72.7
386	709	19	100.0	431	809	36	61.1
387	711	23	73.9	432	810	26	88.5
388	715	26	84.6	433	811	25	56.0
389	719	28	75.0	434	813	10	90.0
390	722	29	65.5	435	814	35	94.3
391	725	28	78.6	436	816	35	88.6
392	728	28	57.1	437	818	32	78.1
393	730	29	82.8	438	820	39	38.5
394	731	32	87.5	439	821	25	20.0
395	735	16	43.7	440	822	31	45.2

Contd.

1	2	3	4	1	2	3	4
441.	823	28	75.0	486.	888	27	29.6
442.	826	33	78.8	487.	890	32	75.0
443.	827	26	76.9	488.	891	28	53.6
444.	828	14	71.4	489.	893	31	74.2
445.	829	32	78.1	490.	896	28	53.6
446.	830	29	75.9	491.	898	28	75.0
447.	832	26	61.5	492.	900	25	88.0
448.	836	31	41.9	493.	902	18	83.3
449.	838	28	75.0	494.	905	10	80.0
450.	839	29	82.7	495.	907	32	65.6
451.	840	23	60.9	496.	908	35	77.1
452.	841	27	77.8	497.	909	36	97.2
453.	842	32	75.0	498.	910	34	52.9
454.	843	34	70.6	499.	913	17	64.7
455.	844	33	69.7	500.	914	13	76.9
456.	845	21	76.2	501.	916	28	92.9
457.	846	35	48.6	502.	918	25	84.0
458.	848	36	88.9	503.	919	24	50.0
459.	849	28	67.8	504.	921	33	51.5
460.	850	42	73.8	505.	923	13	76.9
461.	852	36	77.8	506.	926	27	88.9
462.	853	35	80.0	507.	929	33	93.9
463.	854	29	75.9	508.	930	41	51.2
464.	855	38	73.7	509.	932	45	88.9
465.	856	30	93.3	510.	933	30	46.7
466.	857	27	85.2	511.	934	25	84.0
467.	858	22	86.4	512.	937	30	83.3
468.	860	24	91.7	513.	938	32	87.5
469.	861	21	100.0	514.	939	18	66.7
470.	863	27	25.2	515.	941	25	68.0
471.	865	24	87.5	516.	943	36	75.0
472.	867	38	24.2	517.	945	32	75.0
473.	868	29	62.1	518.	947	30	66.7
474.	869	34	79.4	519.	948	30	76.7
475.	870	26	73.1	520.	949	29	79.3
476.	872	29	75.9	521.	951	29	37.9
477.	874	30	80.0	522.	952	29	82.8
478.	875	30	56.7	523.	954	27	14.8
479.	876	31	74.2	524.	956	26	76.9
480.	877	24	87.5	525.	958	29	69.0
481.	878	16	56.2	526.	960	36	61.1
482.	882	25	72.0	527.	962	31	71.0
483.	885	8	75.0	528.	964	45	55.5
484.	886	19	52.6	529.	967	37	48.6
485.	887	28	42.8	530.	969	33	51.5

Contd.

1	2	3	4	1	2	3	4
531.	970	20	60.0	576.	1035	22	86.4
532.	972	29	13.8	577.	1036	28	89.3
533.	974*	22	9.9	578.	1038	22	68.2
534	976*	3	0.0	579.	1039	20	75.0
535.	978	26	30.8	580.	1040	25	80.0
536.	980	27	81.5	581.	1041	22	63.6
537	984	2	100.0	582.	1042	31	77.4
538.	987	31	45.2	583.	1043	25	56.0
539.	988	17	64.7	584.	1044	22	68.2
540.	989	18	94.4	585.	1045	26	26.9
541.	990	17	88.2	586.	1046	25	20.0
542.	991	17	100.0	587.	1047	26	26.9
543.	992	33	57.6	588.	1049	26	57.7
544.	993	21	52.4	589.	1050	29	24.1
545.	994	35	71.4	590.	1053	20	60.0
546.	995*	6	0.0	591.	1054	32	90.6
547.	997	10	70.0	592.	1055	27	48.1
548.	998	24	41.7	593.	1056	27	74.1
549.	999	33	48.5	594.	1057	32	90.1
550.	1000	30	56.7	595.	1058	30	80.0
551.	1002	29	55.2	596.	1059	33	75.7
552	1003	32	75.0	597.	1060	29	72.4
553.	1004	26	65.4	598.	1061	30	90.0
554.	1005	35	34.3	599.	1062	28	64.3
555.	1007	42	47.7	600.	1063	36	63.9
556.	1008	28	28.6	601.	1064	29	75.9
557.	1011	22	27.3	602.	1065	23	86.9
558.	1013	32	71.9	603.	1066	25	88.0
559.	1014	26	57.7	604.	1067	32	90.6
560.	1015	26	53.8	605.	1068	33	54.5
561.	1016	31	87.1	606.	1069	32	50.0
562	1017	26	73.1	607.	1070	51	78.4
563.	1018	25	52.0	608.	1071	36	69.4
564.	1020	24	50.0	609.	1072	32	68.7
565	1021	23	56.5	610.	1075	23	86.9
566.	1022	23	82.6	611.	1076	26	84.6
567.	1024	22	86.4	612.	1078	20	85.0
568.	1025	24	45.8	613.	1081	28	75.0
569.	1026	25	56.0	614.	1083	26	92.3
570.	1027	24	70.8	615.	1084	18	88.9
571.	1029	24	95.8	616.	1086	31	90.3
572.	1030	27	55.5	617.	1087	24	95.8
573.	1031	19	26.3	618.	1088	30	80.0
574.	1033	19	94.7	619.	1090	3	66.7
575.	1034	22	90.9	620.	1092	26	88.5

Contd.

1	2	3	4	1	2	3	4
621.	1094	21	80.9	666.	1151	23	91.3
622.	1095	20	50.0	667.	1152	22	77.3
623.	1097	21	52.4	668.	1154	26	76.9
624.	1098	24	83.3	669.	1156	26	26.9
625.	1100	9	33.3	670.	1157	16	68.7
626.	1101	3	100.0	671.	1158	33	45.4
627.	1102	26	76.9	672.	1159	23	60.9
628.	1103	19	68.4	673.	1160	43	90.7
629.	1105	32	78.1	674.	1161	23	78.3
630.	1106	30	60.0	675.	1162	20	100.0
631.	1107	29	75.9	676.	1163	33	69.7
632.	1108	27	59.2	677.	1164	10	80.0
633.	1110	2	100.0	678.	1165	27	22.2
634.	1112	32	65.6	679.	1168	30	60.0
635.	1115	25	80.0	680.	1173	36	69.4
636.	1116	32	87.5	681.	1174	29	79.3
637.	1117	6	66.7	682.	1175	25	52.0
638.	1119	24	79.2	683.	1176	16	100.0
639.	1120	30	80.0	684.	1177	33	72.7
640.	1121	26	57.7	685.	1178	44	40.9
641.	1123	26	57.7	686.	1179	33	78.8
642.	1124	28	71.4	687.	1180	44	25.0
643.	1125	29	65.5	688.	1182	42	19.0
644.	1126	25	84.0	689.	1183	26	19.2
645.	1127	33	39.4	690.	1184	39	46.1
646.	1128	26	76.9	691.	1185	38	50.0
647.	1131	26	73.1	692.	1186	26	23.1
648.	1132	18	55.5	693.	1187	35	40.0
649.	1133	12	33.3	694.	1188	35	40.0
650.	1134	23	26.1	695.	1189	29	48.3
651.	1135	34	50.0	696.	1190	35	48.6
652.	1136	31	35.5	697.	1191	22	63.6
653.	1137	30	40.0	698.	1192	32	68.7
654.	1139	22	45.4	699.	1193	18	83.3
655.	1140	26	80.8	700.	1194	33	84.8
656.	1141	31	80.6	701.	1196	22	68.2
657.	1142	23	30.4	702.	1199	32	56.2
658.	1143	26	73.1	703.	1200	21	19.0
659.	1144	3	100.0	704.	1202	23	30.4
660.	1145	26	23.1	705.	1203	32	31.2
661.	1146	22	72.7	706.	1204	37	75.7
662.	1147	32	65.6	707.	1205	36	86.1
663.	1148	14	92.8	708.	1206	25	4.0
664.	1149	20	85.0	709.	1207	37	29.7
665.	1150	14	71.4	710.	1208	22	13.6

Contd.

1	2	3	4
711.	1209	30	70.0
712.	1210	28	53.6
713.	1211	33	12.1
714.	1212	34	20.6
715.	1213	44	31.8
716.	1214	29	27.6
717.	1216	26	61.5
718.	1217	35	77.1
719.	1218	28	35.7
720.	1219	32	78.1

The wilt susceptible check, ICP-6997 showed 50 to 100% wilt incidence.

*The wilt incidence in these cases was ranging from 75-100% in susceptible check, ICP-6997.

APPENDIX-XXIII

Result of screening of pigeonpea germplasm accessions for sterility mosaic resistance during 1978-79

Sl. No.	PI/ICP No.	Total plants	Infected plants	Percent infection
1.	PI-394792	1	0	0.00
2.	-394833	1	0	0.00
3.	-394834	1	1	100.00
4.	-394837	4	2	50.00
5.	-394842	2	1	50.00
6.	-394845	6	6	100.00
7.	-394848	1	0	0.00
8.	-394866	1	1	100.00
9.	-394869 A	1	1	100.00
10.	-394875	1	0	0.00
11.	-394886	1	0	0.00
12.	-394887	1	0	0.00
13.	-394888	1	0	0.00
14.	-394890	2	0	0.00
15.	-394891	2	2	100.00
16.	-395067	2	1	50.00
17.	-395071	1	1	100.00
18.	-395089	1	0	0.00
19.	-395091	1	1	100.00
20.	-395107	1	1	100.00
21.	-395132	1	0	0.00
22.	-395143	1	1	100.00
23.	-395147	1	1	100.00
24.	-395171	1	1	100.00
25.	-395174	1	1	100.00
26.	-395185	1	1	100.00
27.	-395187	1	1	100.00
28.	-395188	3	2	66.66
29.	-395189	2	2	100.00
30.	-395190	2	0	0.00
31.	-395193	2	2	100.00
32.	-395194	1	1	100.00
33.	-395195	1	1	100.00
34.	-395196	2	2	100.00
35.	-395198	1	1	100.00
36.	-395203	2	2	100.00
37.	-395204	1	1	100.00
38.	-395206	6	6	100.00
39.	-395207	3	3	100.00
40.	-395209	5	5	100.00

contd.

1	2	3	4	5
41	PI-395210	2	2	100.00
42.	-395213	5	4	80.00
43	-395214	2	1	50.00
44.	-395217	3	2	66.66
45.	-395219	6	6	100.00
46.	-395220	2	2	100.00
47	-395223	6	4	66.66
48.	-395224	3	2	66.66
49.	-395227	1	1	100.00
50.	-395229	3	3	100.00
51.	-395230	4	2	50.00
52.	-395235	4	4	100.00
53.	-395236	1	1	100.00
54.	-395238	1	1	100.00
55.	-395240	3	3	100.00
56.	-395243	6	6	100.00
57.	-395246	3	2	66.66
58.	-395253	1	1	100.00
59.	-395257	1	1	100.00
60.	-395259	2	2	100.00
61.	-395266	1	0	0.00
62.	-395269	3	3	100.00
63.	-395273	2	2	100.00
64.	-395275	2	2	100.00
65.	-395277	3	3	100.00
66.	-395281	4	3	75.00
67.	-395282	1	1	100.00
68.	-395284	2	2	100.00
69.	-395289	1	1	100.00
70.	-395301	5	2	40.00
71.	-395302	2	1	50.00
72	-395303	3	1	33.33
73.	-395305	2	1	50.00
74.	-395306	6	2	33.33
75	-395307	8	0	0.00
76.	-395308	8	3	37.50
77.	-395309	5	1	20.00
78.	-395311	4	1	25.00
79	-395312	2	0	0.00
80.	-395313	5	1	20.00
81	-395315	3	3	100.00
82.	-395316	2	2	100.00
83	-395317	3	2	66.66
84.	-395319	1	0	0.00
85.	-395320	11	11	100.00

1	2	3	4	5
86.	PI-395324	2	2	100.00
87.	-395325	12	9	75.00
88.	-395327	3	2	66.66
89.	-395328	3	0	0.00
90.	-395329	2	1	50.00
91.	-395333	6	5	83.33
92.	-395334	2	1	50.00
93.	-395335	7	6	85.71
94.	-395338	4	0	0.00
95.	-395339	5	2	40.00
96.	-395340	3	1	33.33
97.	-395780	5	2	40.00
98.	-395954	7	4	57.14
99.	-395956	2	2	100.00
100.	-395961	3	1	33.33
101.	-395962	4	3	75.00
102.	-395967	5	2	40.00
103.	-395969	6	2	33.33
104.	-395971	3	2	66.66
105.	-395972	3	2	66.66
106.	-395973	6	0	0.00
107.	-395976	1	1	100.00
108.	-395977	7	4	57.14
109.	-395979	2	2	100.00
110.	-395980	3	2	66.66
111.	-395982	4	2	50.00
112.	-395984	13	0	0.00
113.	-395986	9	5	55.55
114.	-395987	3	2	66.66
115.	-395989	7	6	85.71
116.	-395990	8	7	87.50
117.	-395991	4	3	75.00
118.	-395992	7	7	100.00
119.	-395994	4	1	25.00
120.	-395995	6	5	83.33
121.	-395996	1	0	0.00
122.	-396002	1	0	0.00
123.	-396003	2	2	100.00
124.	-396004	2	1	50.00
125.	-396005	1	1	100.00
126.	-396009	1	0	0.00
127.	-396018	5	5	100.00
128.	-396032	1	1	100.00
129.	-396050	2	2	100.00
130.	-396063	1	1	100.00

contd.

1	2	3	4	5
131.	PI-396065	1	0	0.00
132.	-396069	1	1	100.00
133.	-396074	1	1	100.00
134.	-396078	1	0	0.00
135.	-396079	2	0	0.00
136.	-396085	1	1	100.00
137.	-396094	1	1	100.00
138.	-396096	1	0	0.00
139.	-396097	2	2	100.00
140.	-396099	3	2	66.66
141.	-396111	1	1	100.00
142.	-396142	3	1	33.33
143.	-396182	1	0	0.00
144.	-396202	1	0	0.00
145.	-396204	1	1	100.00
146.	-396733	1	1	100.00
147.	-396744	1	0	0.00
148.	-396749	2	0	0.00
149.	-396757	1	0	0.00
150.	-396792	3	2	66.66
151.	-396798	1	1	100.00
152.	-396799	3	2	66.66
153.	-396803	1	1	100.00
154.	-396834	1	1	100.00
155.	-396841	3	3	100.00
156.	-396862	1	0	0.00
157.	-396966	2	1	50.00
158.	-397008	1	1	100.00
159.	-397013	1	0	0.00
160.	-397085	1	1	100.00
161.	-397100	1	0	0.00
162.	-397101	1	0	0.00
163.	-397105	1	0	0.00
164.	-397322	3	1	33.33
165.	-397727	1	1	100.00
166.	-397754	5	5	100.00
167.	-397756	2	2	100.00
168.	-397769	1	0	0.00
169.	-397777	2	1	50.00
170.	-397786	3	2	66.66
171.	-397788	1	1	100.00
172.	-397789	1	1	100.00
173.	-394791	2	2	100.00
174.	-394792	1	1	100.00
175.	-394794	2	2	100.00

contd.

1	2	3	4	5
76.	PI-394798	1	1	100.00
77.	-394799	2	2	100.00
78.	-397802	5	5	100.00
79.	-397812	1	1	100.00
80.	-397817	2	2	100.00
81.	-397818	7	7	100.00
82.	-397821	2	2	100.00
83.	-397825	3	3	100.00
84.	-397826	6	6	100.00
85.	-397835	2	2	100.00
86.	-397836	3	3	100.00
87.	-397841	5	2	40.00
88.	-397855	3	3	100.00
89.	-397857	2	1	50.00
90.	-397861	5	3	60.00
91.	-397865	5	0	0.00
192.	-397868	3	2	66.66
193.	-397872	2	2	100.00
194.	-397880	8	7	87.50
195.	-397883	4	3	75.00
196.	-397892	3	2	66.66
197.	-397900	7	1	14.28
198.	-397911	6	4	66.66
199.	-397912	1	0	0.00
200.	-397931	1	0	0.00
201.	-397937	5	2	40.00
202.	-397939	11	9	81.81
203.	-397941	6	1	16.66
204.	-397955	5	3	60.00
205.	-397957	9	4	44.44
206.	-397958	2	0	0.00
207.	-397969	6	3	50.00
208.	-398000	2	1	50.00
209.	-398002	4	4	100.00
210.	-398012	1	1	100.00
211.	-398018	4	1	25.00
212.	-398019	1	1	100.00
213.	-398026	1	1	100.00
214.	-398028	2	2	100.00
215.	-398029	4	4	100.00
216.	-398032	8	8	100.00
217.	-398034	4	3	75.00
218.	-398036	1	1	100.00
219.	-398037	8	8	100.00
220.	-398038	1	1	100.00

contd.

1	2	3	4	5
221.	PI-398039	2	2	100.00
222.	-398040	10	9	90.00
223.	-398041	3	2	66.66
224.	-398042	3	3	100.00
225.	-398043	4	3	75.00
226.	-398044	3	1	33.33
227.	-398045	3	2	66.66
228.	-398049	3	3	100.00
229.	-398050	3	3	100.00
230.	-398051	4	1	25.00
231.	-398052	1	1	100.00
232.	-398055	4	3	75.00
233.	-398056	6	5	83.33
234.	-398058	3	2	66.66
235.	-398059	2	0	0.00
236.	-398060	3	3	100.00
237.	-398063	1	1	100.00
238.	-398064	1	1	100.00
239.	-398065	6	5	83.33
240.	-398066	2	1	50.00
241.	-398068	2	2	100.00
242.	-398069	2	2	100.00
243.	-398071	3	3	100.00
244.	-398074	3	0	0.00
245.	-398080	8	8	100.00
246.	-398081	1	0	0.00
247	-398082	1	0	0.00
248.	-398085	2	2	100.00
249.	-398090	1	0	0.00
250.	-398092	3	1	33.33
251.	-398098	1	0	0.00
252	-398108	1	1	100.00
253.	-398114	1	1	100.00
254.	-398118	1	1	100.00
255.	-398119	1	1	100.00
256.	-398130	1	1	100.00
257.	ICP-8872	1	1	100.00
258	-8873	2	1	50.00
259	-8874	4	3	75.00
260.	-8875	3	3	100.00
261	-8878	6	5	83.33
262.	-8879	2	2	100.00
263.	-8880	5	4	80.00
264	-8881	4	3	75.00
265.	-8884	3	3	100.00

contd.

1	2	3	4	5
266.	ICP-8885	3	2	66.66
267.	-8886	1	1	100.00
268.	-8887	3	2	66.66
269.	-8890	1	1	100.00
270.	-8895	1	1	100.00
271.	-8897	1	1	100.00
272.	-8888	1	1	100.00
273.	-8900	1	0	0.00
274.	-8894	1	0	0.00
275.	-8898	2	2	100.00
276.	-8899	2	2	100.00
277.	-8901	1	1	100.00
278.	-8902	1	1	100.00
279.	-8903	1	1	100.00
280.	-8904	2	2	100.00
281.	-8905	4	4	100.00
282.	-8906	5	5	100.00
283.	-8907	1	1	100.00
284.	-8911	1	1	100.00
285.	-8912	1	1	100.00
286.	-8914	2	2	100.00
287.	-8915	1	1	100.00
288.	-8916	3	3	100.00
289.	-8918	1	1	100.00
290.	-8919	2	2	100.00
291.	-8921	3	3	100.00
292.	-8922	1	1	100.00
293.	-8923	1	1	100.00
294.	-8924	1	1	100.00
295.	-8926	5	5	100.00
296.	-8922	4	3	75.00
297.	-8929	3	3	100.00
298.	-8930	5	5	100.00
299.	-8931	2	2	100.00
300.	-8932	1	1	100.00
301.	-8933	3	3	100.00
302.	-8934	2	2	100.00
303.	-8936	1	1	100.00
304.	-8937	1	1	100.00
305.	-8939	3	3	100.00
306.	-8941	1	1	100.00
307.	-8942	1	1	100.00
308.	-8943	3	3	100.00
309.	-8944	2	2	100.00
310.	-8945	1	1	100.00

contd.

1	2	3	4	5
311.	ICP-8947	1	1	100.00
312.	-8949	1	1	100.00
313.	-8950	1	1	100.00
314.	-8951	1	1	100.00
315.	-8952	2	2	100.00
316.	-8953	1	1	100.00
317.	-8967	2	2	100.00
318.	-8968	2	1	50.00
319.	-8975	1	1	100.00
320.	-8978	3	3	100.00
321.	-8982	1	0	0.00
322.	-8984	4	3	75.00
323.	-8986	1	1	100.00
324.	-8987	6	5	83.33
325.	-8988	7	2	28.57
326.	-8989	3	1	33.33
327.	-8990	6	5	83.33
328.	-8991	4	4	100.00
329.	-8993	4	4	100.00
330.	-8996	4	4	100.00
331.	-8998	3	3	100.00
332.	-9002	2	2	100.00
333.	-9003	1	1	100.00
334.	-9004	1	0	0.00
335.	-9006	3	2	66.66
336.	-9012	1	0	0.00
337.	-9054	2	0	0.00
338.	-9055	3	0	0.00
339.	-9056	1	0	0.00
340.	-9057	10	4	40.00
341.	-9058	4	1	25.00
342.	-9059	2	1	50.00
343.	-9063	2	0	0.00
344	-9064	7	0	0.00
345.	-9065	7	1	14.28
346.	-9066	4	2	50.00
347.	-9067	2	0	0.00
348.	-9068	7	3	42.85
349.	-9069	5	2	40.00
350.	-9070	2	2	100.00
351.	-9072	1	0	0.00
352.	-9074	7	2	28.57
353.	-9075	3	0	0.00
354.	-9076	5	1	20.00
355.	-9077	2	0	0.00

contd.

1	2	3	4	5
356.	ICP-9080	6	0	0.00
357.	-9081	3	0	0.00
358.	-9084	2	0	0.00
359.	-9085	1	0	0.00
360.	-9087	3	0	0.00
361.	-9088	4	2	50.00
362.	-9090	2	1	50.00
363.	-9091	1	0	0.00
364.	-9092	1	1	100.00
365.	-9093	1	0	0.00
366.	-9094	4	2	50.00
367.	-9095	4	1	25.00
368.	-9097	2	1	50.00
369.	-9100	1	0	0.00
370.	-9103	1	0	0.00
371.	-9104	3	0	0.00

APPENDIX-XXIV

Results of screening of pigeonpea germplasm selections made in 1976-77 for sterility mosaic resistance during 1978-79

Sl. No.	ICP No.	Total plants	Infected plants: Ring spot	Infected plants: Severe mosaic	Infected plants: Total	Percent infection
1	2	3	4	5	6	7
		27	13	0	13	48.14
2.	-2S⊗	11	0	0	0	0.00
3.	-3S⊗	10	0	0	0	0.00
4.	-4S⊗	15	7	1	8	53.33
5.	ICP-6630-1-1S⊗	14	2	0	2	14.28
6.	-2-1S⊗	5	3	0	3	60.00
7.	-2S⊗	19	3	0	3	15.78
8.	-3S⊗	18	0	0	0	0.00
9	-4S⊗	21	0	0	0	0.00
10.	-3-1S⊗	24	2	0	2	8.33
11.	-2S⊗	9	0	0	0	0.00
12.	-3S⊗	13	0	0	0	0.00
13.	ICP-7196-1-1S⊗	25	0	0	0	0.00
14.	-2S⊗	37	0	1	1	2.70
15	-3S⊗	47	0	0	0	0.00
16.	-4S⊗	24	0	0	0	0.00
17.	-5S⊗	31	0	2	2	6.45
18.	-6S⊗	14	0	1	1	7.14
19.	-7S⊗	43	0	0	0	0.00
20.	-8S⊗	43	0	12	12	27.90
21.	-9S⊗	19	0	0	0	0.00
22.	ICP-7197-5-1S⊗	14	0	0	0	0.00
23.	-2S⊗	24	0	0	0	0.00
24.	-3S⊗	33	0	0	0	0.00
25.	-4S⊗	23	0	0	0	0.00
26.	-5S⊗	20	0	0	0	0.00
27.	-16-1S⊗	37	2	1	3	8.10
28.	-19-1S⊗	39	0	2	2	5.12
29.	-2S⊗	20	0	0	0	0.00
30.	-3S⊗	27	0	3	3	11.11
31.	-4S⊗	30	0	0	0	0.00
32.	-5S⊗	30	0	0	0	0.00
33.	-25-1S⊗	27	8	0	8	29.62
34.	-40-1S⊗	49	4	0	4	8.16
35.	-2S⊗	25	0	2	2	8.00
36.	-43-1S⊗	42	0	0	0	0.00
37.	-2S⊗	25	0	0	0	0.00
38.	-3S⊗	50	0	0	0	0.00
39.	-4S⊗	50	9	0	9	18.00
40.	ICP-7201-3-1S⊗	36	1	2	3	8.33

contd.

1	2	3	4	5	6	7
41.	ICP-7201-6-1S⊗	56	0	0	0	0.00
42..	-7240-1-1S⊗	31	0	1	1	3.22
43.	-2-1S⊗	30	1	0	1	3.33
44.	-6-1S⊗	25	1	0	1	4.00
45.	-6-2S⊗	46	0	0	0	0.00
46.	ICP-7372-4-1S⊗	44	7	0	7	15.90
47.	-2S⊗	46	6	1	7	15.21
48.	-3S⊗	41	1	0	1	2.43
49.	-4S⊗	34	3	0	3	8.82
50.	-5S⊗	45	2	0	0	0.00
51.	-6S⊗	5	0	0	0	0.00
52.	-7S⊗	6	0	0	0	0.00
53.	-8S⊗	43	0	0	0	0.00
54.	ICP-7407-3-1S⊗	-	-	-	-	-
55.	-2S⊗	15	3	0	3	20.00
56.	-3S⊗	-	-	-	-	-
57.	-4-1S⊗	26	0	0	0	0.00
58.	-2S⊗	-	-	-	-	-
59.	-3S⊗	-	-	-	-	-
60.	-4S⊗	-	-	-	-	-
61.	-5S⊗	15	0	6	6	40.00
62.	-6S⊗	13	0	0	0	0.00
63.	-7S⊗	57	16	0	16	28.07
64.	-8S⊗	-	-	-	-	-
65.	-9S⊗	1	0	0	0	0.00
66.	-10S⊗	12	0	0	0	0.00
67.	-11S⊗	41	2	0	2	4.87
68.	ICP-7407-5-1S⊗	-	-	-	-	-
69.	-2S⊗	-	-	-	-	-
70.	-3S⊗	-	-	-	-	-
71.	-4S⊗	13	3	2	5	38.46
72.	-5S⊗	14	0	3	3	21.42
73.	-6S⊗	31	0	4	4	12.90
74.	-7S⊗	57	8	3	11	19.29
75.	ICP-7407-6-1S⊗	30	6	0	6	20.00
76.	-2S⊗	-	-	-	-	-
77.	-3S⊗	-	-	-	-	-
78.	-4S⊗	8	2	0	2	25.00
79.	-5S⊗	1	0	0	0	0.00
80.	-6S⊗	-	-	-	-	-
81.	-7S⊗	11	7	0	7	63.63
82.	-8S⊗	-	-	-	-	-
83.	ICP-7407-7-1S⊗	-	-	-	-	-
84.	-2S⊗	1	0	0	0	0.00
85.	-3S⊗	3	0	0	0	0.00

contd.

1	2	3	4	5	6	7
86.	ICP-7407-7-4S⊗	6	2	0	2	33.33
87.	-8-1S⊗	8	1	0	1	12.50
88.	-2S⊗	4	0	0	0	0.00
89.	-3S⊗	10	2	0	2	20.00
90.	-9-1S⊗	3	0	0	0	0.00
91.	-2S⊗	1	0	0	0	0.00
92.	ICP-7436-1-1S⊗	20	3	0	3	15.00
93.	-2S⊗	15	0	0	0	0.00
94.	-3S⊗	7	0	0	0	0.00
95.	-4S⊗	10	0	0	0	0.00
96.	-5S⊗	18	0	0	0	0.00
97.	-6S⊗	7	0	0	0	0.00
98.	-2-1S⊗	18	0	0	0	0.00
99	-2S⊗	28	5	0	5	17.85
100.	-3S⊗	25	3	0	3	12.00
101.	-4S⊗	34	10	0	10	29.41
102.	-3-1S⊗	30	6	0	6	20.00
103.	-2S⊗	16	3	0	3	18.75
104.	-3S⊗	42	5	1	6	14.28
105.	-4-1S⊗	39	10	0	0	0.00
106.	-2S⊗	34	6	0	6	17.64
107.	-3S⊗	46	6	0	6	13.04
108.	-4S⊗	37	6	0	6	16.21
109.	ICP-7445-1-1S⊗	25	0	0	0	0.00
110.	-2S⊗	19	0	0	0	0.00
111.	-3S⊗	21	0	0	0	0.00
112.	-4S⊗	13	0	0	0	0.00
113.	-5S⊗	21	0	0	0	0.00
114.	ICP-7445-3-1S⊗	1	0	0	0	0.00
115.	-2S⊗	-	-	-	-	-
116.	-3S⊗	16	0	0	0	0.00
117.	-4S⊗	22	0	0	0	0.00
118.	-5-1S⊗	8	0	0	0	0.00
119.	-2S⊗	14	0	0	0	0.00
120.	-3S⊗	16	0	0	0	0.00
121.	-4S⊗	17	11	0	11	64.70
122.	-5S⊗	17	5	0	5	29.41
123.	-6S⊗	7	0	0	0	0.00
124.	-6-1S⊗	52	3	0	3	5.76
125.	-2S⊗	45	0	0	0	0.00
126.	-3S⊗	24	0	0	0	0.00
127.	-4S⊗	45	0	0	0	0.00
128.	-5S⊗	6	0	0	0	0.00
129.	-6S⊗	13	0	1	1	7.69
130.	-7S⊗	28	0	0	0	0.00

contd.

1	2	3	4	5	6	7
131.	ICP-7445-6-8S⊗	32	4	0	4	12.50
132.	-9S⊗	9	0	0	0	0.00
133.	-10S⊗	10	2	0	2	20.00
134.	-11S⊗	3	0	0	0	0.00
135.	-12S⊗	28	2	0	2	7.14
136.	-13S⊗	9	0	0	0	0.00
137.	-14S⊗	-	-	-	-	-
138.	-7-1S⊗	2	0	0	0	0.00
139.	-2S⊗	2	0	0	0	0.00
140.	-3S⊗	1	0	0	0	0.00
141.	-4S⊗	2	0	0	0	0.00
142.	-5S⊗	-	-	-	-	-
143.	-6S⊗	4	0	0	0	0.00
144.	-7S⊗	56	5	0	5	8.92
145.	-8S⊗	8	0	0	0	0.00
146.	-9S⊗	8	0	0	0	0.00
147.	-10S⊗	1	0	0	0	0.00
148.	-11S⊗	3	0	0	0	0.00
149.	-8-1S⊗	-	-	-	-	-
150.	-2S⊗	-	-	-	-	-
151.	-3S⊗	9	1	0	1	11.11
152.	-10-1S⊗	21	0	0	0	0.00
153.	-2S⊗	18	0	4	4	22.22
154.	-3S⊗	4	0	0	0	0.00
155.	-4S⊗	9	0	0	0	0.00
156.	-11-1S⊗	1	0	0	0	0.00
157.	-2S⊗	42	2	0	2	4.76
158.	-3S⊗	21	1	0	1	4.76
159.	-12-1S⊗	12	0	0	0	0.00
160.	-2S⊗	7	0	0	0	0.00
161.	-3S⊗	8	0	0	0	0.00
162.	-4S⊗	18	0	0	0	0.00
163.	ICP-7873-2-1S⊗	51	2	0	2	3.92
164.	-3-1S⊗	24	2	10	12	50.00
165.	-2S⊗	25	0	0	8	32.00
166.	-3S⊗	58	0	0	3	5.17
167.	-4S⊗	12	1	1	2	16.66
168.	-5S⊗	32	0	2	2	6.25
169.	-6S⊗	7	0	0	0	0.00
170.	-7S⊗	5	0	0	0	0.00
171.	-8S⊗	47	0	0	0	0.00
172.	-9S⊗	-	-	-	-	-
173.	ICP-7873-4-1S⊗	43	0	27	27	62.79
174.	-7898-5-2S⊗	1	0	0	0	0.00
175.	-3S⊗	12	0	6	6	50.00

contd.

1	2	3	4	5	6	7
176.	ICP-7898-5-4S⊗	12	4	0	4	33.33
177.	-5S⊗	30	0	0	0	0.00
178.	-9-1S⊗	21	0	0	0	0.00
179.	-2S⊗	4	3	1	4	100.00
180.	-3S⊗	22	3	0	3	13.63
181.	-4S⊗	9	0	0	0	0.00
182.	-13-1S⊗	12	0	0	0	0.00
183.	-2S⊗	11	3	0	3	27.27
184.	-3S⊗	28	0	0	0	0.00
185.	-4S⊗	-	-	-	-	-
186.	-5S⊗	2	0	0	0	0.00
187.	-6S⊗	14	4	0	4	28.57
188.	-14-1S⊗	46	4	0	4	8.69
189.	-2S⊗	23	0	0	0	0.00
190.	-3S⊗	7	0	0	0	0.00
191.	-4S⊗	25	1	0	1	4.00
192.	-5S⊗	-	-	-	-	-
193.	-6S⊗	4	0	0	0	0.00
194.	-7S⊗	11	0	0	0	0.00
195.	ICP-6748-5-1S⊗	-	-	-	-	-
196.	-9-1S⊗	1	0	0	0	0.00
197.	-2S⊗	-	-	-	-	-
198.	-10-1S⊗	2	0	0	0	0.00
199.	-15-1S⊗	9	3	0	3	33.33
200.	-16-1S⊗	-	-	-	-	-
201.	-18-1S⊗	9	1	0	1	11.11
202.	ICP-7904-1-1S⊗	17	4	0	4	23.52
203.	-2S⊗	5	2	0	2	40.00
204.	-3S⊗	10	2	1	3	30.00
205.	ICP-7873-4-2S⊗	2	0	0	0	0.00
206.	-3S⊗	-	-	-	-	-
207.	-4S⊗	1	0	0	0	0.00
208.	-5S⊗	-	-	-	-	-
209.	ICP-7875-5-1S⊗	-	-	-	-	-
210.	-2S⊗	-	-	-	-	-
211.	-3S⊗	6	1	0	1	16.66
212.	-4S⊗	12	0	0	0	0.00
213.	-5S⊗	-	-	-	-	-
214.	ICP-7898-5-1S⊗	24	3	0	3	12.50
215.	-7904-1-3S⊗	26	3	0	3	11.53
216.	-4S⊗	32	3	0	3	9.37
217.	-5S⊗	30	5	0	5	16.66
218.	-3-1S⊗	4	0	0	0	0.00
219.	-2S⊗	33	4	0	4	12.12
220.	-3S⊗	18	0	0	0	0.00

contd.

1	2	3	4	5	6	7
221.	ICP-7904-3-4S⊗	12	0	0	0	0.00
222.	-6-1S⊗	1	0	0	0	0.00
223.	-2S⊗	14	0	0	0	0.00
224.	-3S⊗	32	2	0	2	6.25
225.	-4S⊗	16	0	0	0	0.00
226.	-5S⊗	5	1	0	1	20.00
227.	-7-1S⊗	20	2	0	2	10.00
228.	-2S⊗	-	-	-	-	-
229.	-3S⊗	4	0	0	0	0.00
230.	-4S⊗	-	-	-	-	-
231.	-5S⊗	1	0	0	0	0.00
232.	ICP-7906-2-1S⊗	9	0	0	0	0.00
233.	-2S⊗	8	0	0	0	0.00
234.	-3S⊗	20	0	0	0	0.00
235.	-4S⊗	-	-	-	-	-
236.	-5S⊗	7	0	0	0	0.00
237.	-6S⊗	25	0	0	0	0.00
238.	-4-1S⊗	28	0	0	0	0.00
239.	-2S⊗	2	0	0	0	0.00
240.	-3S⊗	9	0	0	0	0.00
241.	-4S⊗	13	0	0	0	0.00
242.	-7-1S⊗	20	0	0	0	0.00
243.	-2S⊗	30	0	0	0	0.00
244.	-3S⊗	20	0	0	0	0.00
245.	-4S⊗	32	0	0	0	0.00
246.	-5S⊗	21	0	0	0	0.00
247.	ICP-7997-1-1S⊗	13	0	0	0	0.00
248.	-10-1S⊗	31	0	0	0	0.00
249.	-2S⊗	36	0	0	0	0.00
250.	-3S⊗	23	0	0	0	0.00
251.	-4S⊗	33	0	0	0	0.00
252.	-5S⊗	37	0	0	0	0.00
253.	ICP-8051-1-1S⊗	33	0	0	0	0.00
254.	-2S⊗	35	0	0	0	0.00
255.	-3S⊗	15	0	0	0	0.00
256.	-4S⊗	27	0	0	0	0.00
257.	-5S⊗	26	0	0	0	0.00
258.	-6S⊗	36	0	0	0	0.00
259.	-7S⊗	32	0	0	0	0.00
260.	-8S⊗	17	0	0	0	0.00
261.	-9S⊗	24	0	0	0	0.00
262.	-10S⊗	12	0	0	0	0.00
263.	ICP-8084-3-1S⊗	31	1	0	1	3.22
264.	-2S⊗	17	2	0	2	11.76
265.	-3S⊗	9	0	0	0	0.00

contd.

1	2	3	4	5	6	7
266.	ICP-8084-3-4S⊗	32	4	0	4	12.50
267.	-5S⊗	1	0	0	0	0.00
268.	-6S⊗	51	1	0	1	1.96
269.	-7S⊗	13	2	0	2	15.38
270.	-8S⊗	1	0	0	0	0.00
271	-9S⊗	1	0	0	0	0.00
272.	-10S⊗	35	2	0	2	5.71
273.	-11S⊗	2	0	0	0	0.00
274.	-5-1S⊗	-	-	-	-	-
275.	-2S⊗	7	0	0	0	0.00
276.	-3S⊗	3	0	0	0	0.00
277.	-4S⊗	-	-	-	-	-
278.	-5S⊗	6	0	0	0	0.00
279.	-6-1S⊗	27	3	0	3	11.11
280.	-2S⊗	4	0	0	0	0.00
281.	-3S⊗	1	0	0	0	0.00
282.	-4S⊗	19	0	0	0	0.00
283.	-5S⊗	8	0	0	0	0.00
284.	ICP-8120-3-1S⊗	21	1	0	1	4.76
285.	-2S⊗	73	0	0	0	0.00
286.	-3S⊗	23	0	0	0	0.00
287.	-4S⊗	32	0	0	0	0.00
288.	-5S⊗	30	0	0	0	0.00
289.	-5-1S⊗	38	0	0	0	0.00
290.	-2S⊗	28	0	0	0	0.00
291.	-3S⊗	27	0	0	0	0.00
292.	-4S⊗	-	-	-	-	-
293.	-5S⊗	25	0	0	0	0.00
294.	-6S⊗	28	0	0	0	0.00
295.	-7S⊗	30	0	0	0	0.00
296.	-8S⊗	36	0	0	0	0.00
297	-9S⊗	45	0	0	0	0.00
298.	-10S⊗	39	0	0	0	0.00
299.	-11S⊗	40	0	0	0	0.00
300.	-12S⊗	22	0	0	0	0.00
301.	ICP-8121-4-1S⊗	46	1	0	1	2.17
302.	-2S⊗	43	0	0	0	0.00
303.	-3S⊗	27	0	0	0	0.00
304.	-4S⊗	39	0	0	0	0.00
305	-5S⊗	25	0	0	0	0.00
306.	-6S⊗	36	0	0	0	0.00
307.	-7S⊗	25	0	0	0	0.00
308.	-8S⊗	19	0	0	0	0.00
309.	-9S⊗	14	0	0	0	0.00
310.	-5-13S⊗	13	0	0	0	0.00

contd.

1	2	3	4	5	6	7
311.	ICP-8121-5-14SØ	13	0	0	0	0.00
312.	-15SØ	29	7	0	7	24.13
313.	-16SØ	58	7	3	10	17.24
314.	ICP-8120-6-1SØ	17	0	0	0	0.00
315.	-2SØ	50	7	0	7	14.00
316.	-3SØ	41	8	0	8	19.51
317.	-4SØ	72	18	4	22	30.55
318.	-5SØ	32	2	1	3	9.37
319.	-6SØ	5	2	1	3	60.00
320.	ICP-8121-4-9SØ	-	-	-	-	-
321.	-10SØ	8	0	0	0	0.00
322.	-11SØ	31	0	0	0	0.00
323.	ICP-8136-1-1SØ	39	0	0	0	0.00
324.	-3227-2-1SØ	6	1	2	3	50.00
325.	-2SØ	14	2	0	2	14.28
326.	ICP-3426-1-1SØ	17	0	0	0	0.00
327.	-2SØ	4	0	0	0	0.00
328.	ICP-3486-1-1SØ	18	0	0	0	0.00
329.	-2SØ	29	0	0	0	0.00
330.	-3SØ	26	0	0	0	0.00
331.	-4SØ	28	0	0	0	0.00
332.	ICP-3727-1-1SØ	15	1	0	1	6.66
333.	-2SØ	35	0	0	0	0.00
334.	-3SØ	15	0	0	0	0.00
335.	-4SØ	23	0	0	0	0.00
336.	ICP-4043-1-1SØ	31	0	0	0	0.00
337.	-4152-1-1SØ	28	0	0	0	0.00
338.	-2SØ	38	0	0	0	0.00
339.	-3SØ	24	0	0	0	0.00
340.	ICP-4157-1-1SØ	6	0	0	0	0.00
341.	-2SØ	35	3	0	3	8.57
342.	-3SØ	15	2	0	2	13.33
343.	ICP-4395-3-1SØ	34	0	0	0	0.00
344.	-4439-1-1SØ	37	0	0	0	0.00
345.	-2SØ	33	0	0	0	0.00
346.	-3SØ	17	0	0	0	0.00
347.	ICP-4601-1-1SØ	46	7	2	9	19.56
348.	-2SØ	23	0	0	0	0.00
349.	ICP-4609-1-1SØ	26	0	0	0	0.00
350.	-2SØ	26	0	0	0	0.00
351.	-3SØ	28	2	0	2	7.14
352.	-4SØ	33	3	0	3	9.09
353.	-5SØ	17	0	0	0	0.00
354.	ICP-4731-2-1SØ	32	0	0	0	0.00
355.	-2SØ	28	9	0	9	32.14

1	2	3	4	5	6	7
356.	ICP-4731-2-3SØ	37	8	0	8	21.62
357.	-4SØ	45	11	0	11	24.44
358.	-5SØ	23	1	0	1	4.34
359.	ICP-4765-1-1SØ	20	2	0	2	10.00
360.	-4769-1-1SØ	12	0	0	0	0.00
361	-2SØ	23	0	0	0	0.00
362	ICP-4785-1-1SØ	21	0	0	0	0.00
363.	-2SØ	14	1	0	1	7.14
364.	-3SØ	42	1	0	1	2.38
365.	-4SØ	25	0	0	0	0.00
366.	-5SØ	41	1	0	1	2.43
367.	ICP-4788-2-1SØ	42	8	0	8	19.04
368.	-2SØ	52	9	1	10	19.23
369.	-3SØ	23	0	0	0	0.00
370.	-4SØ	23	0	0	0	0.00
371.	-5SØ	15	0	0	0	0.00
372.	ICP-4794-2-1SØ	17	1	0	1	5.88
373.	-2SØ	14	0	0	0	0.00
374.	-3SØ	19	3	6	9	47.36
375.	-4SØ	54	6	19	25	46.29
376.	-5SØ	29	2	0	2	6.89
377.	ICP-5098-1-1SØ	35	3	0	3	8.57
378.	-2SØ	30	8	0	8	26.66
379.	-3SØ	49	18	1	19	38.77
380.	ICP-5124-1-1SØ	39	13	0	13	33.33
381.	-2SØ	43	7	0	7	16.27
382.	-3SØ	14	0	0	0	0.00
383.	-4SØ	45	10	0	10	22.22
384	-5SØ	17	3	0	3	17.64
385.	ICP-5142-2-1SØ	5	1	0	1	20.00
386	-2SØ	22	3	0	3	13.63
387	-3SØ	16	0	0	0	0.00
388	-4SØ	6	0	0	0	0.00
389.	ICP-5151-1-1SØ	26	0	0	0	0.00
390.	-2SØ	13	0	0	0	0.00
391	-3SØ	24	2	0	2	8.33
392.	-4SØ	10	0	0	0	0.00
393.	-5SØ	25	17	0	17	68.00
394	ICP-5157-1-1SØ	8	4	0	4	50.00
395	-2SØ	43	5	1	6	13.95
396	ICP-5172-1-1SØ	48	15	16	31	64.58
397.	-2SØ	37	23	0	23	62.16
398.	-3SØ	54	16	20	36	66.66
399.	-4SØ	60	28	7	35	58.33
400.	-5SØ	43	24	9	33	76.74

contd.

1	2	3	4	5	6	7
401.	ICP-5172-1-6SØ	65	23	8	31	47.69
402.	-7SØ	33	15	2	17	51.51
403.	-8SØ	22	9	0	9	40.90
404.	-9SØ	1	0	0	0	0.00
405.	ICP-5291-2-1SØ	22	4	4	8	36.36
406.	-3-1SØ	17	0	0	0	0.00
407.	-2SØ	26	0	0	0	0.00
408.	-3SØ	29	0	0	0	0.00
409.	-4SØ	18	0	0	0	0.00
410.	ICP-5337-1-1SØ	33	0	0	0	0.00
411.	-2SØ	13	0	0	0	0.00
412.	-3SØ	27	0	0	0	0.00
413.	ICP-5350-2-1SØ	16	0	0	0	0.00
414.	-2SØ	24	0	0	0	0.00
415.	-3SØ	24	0	0	0	0.00
416.	-3-1SØ	16	0	0	0	0.00
417.	-2SØ	10	0	0	0	0.00
418.	ICP-5370-1-1SØ	14	2	0	2	14.28
419.	-2SØ	18	1	0	1	5.55
420.	-3SØ	5	0	0	0	0.00
421.	ICP-5444-2-1SØ	25	0	0	0	0.00
422.	-2SØ	29	1	0	1	3.44
423.	-3SØ	25	0	0	0	0.00
424.	-4SØ	17	1	0	1	5.88
425.	-5SØ	31	14	0	14	45.16
426.	-6SØ	1	0	0	0	0.00
427.	ICP-5446-1-1SØ	41	20	3	23	56.09
428.	-2SØ	48	29	0	29	60.41
429.	-3SØ	44	18	1	19	43.18
430.	-4SØ	29	17	0	17	58.62
431.	ICP-5465-1-1SØ	18	10	3	13	72.22
432.	-2SØ	36	3	3	6	16.66
433.	-3SØ	35	2	5	7	20.00
434.	ICP-5535-2-1SØ	8	0	0	0	0.00
435.	-2SØ	18	1	0	1	5.55
436.	-3SØ	19	0	3	3	15.78
437.	-4SØ	32	0	2	2	6.25
438.	ICP-5733-1-1SØ	15	0	1	1	6.66
439.	-2SØ	17	0	2	2	11.76
440.	-2-1SØ	23	0	2	2	8.69
441.	-2SØ	17	0	0	0	0.00
442.	ICP-5834-1-1SØ	27	1	2	3	11.11
443.	-2SØ	32	0	12	12	37.50
444.	-3SØ	1	0	1	1	100.00
445.	-4SØ	50	0	0	0	0.00

1	2	3	4	5	6	7
446.	ICP-5834-1-5SØ	31	0	0	0	0.00
447	-5950-1-1SØ	27	0	0	0	0.00
448.	-2SØ	32	0	0	0	0.00
449.	-3SØ	33	0	0	0	0.00
450.	-4SØ	24	0	0	0	0.00
451.	-6SØ	26	0	0	0	0.00
452.	ICP-5950-2-1SØ	35	4	0	4	11.42
453	-2SØ	22	3	0	3	13.63
454.	-3SØ	33	4	0	4	12.12
455.	-4SØ	25	0	0	0	0.00
456.	-5SØ	13	0	0	0	0.00
457.	ICP-5999-1-1SØ	7	0	0	0	0.00
458.	-2SØ	48	0	0	0	0.00
459.	-3SØ	37	3	0	3	8.10
460.	-4SØ	31	13	0	13	41.93
461.	-5SØ	41	5	0	5	12.19
462	ICP-6029-1-1SØ	53	20	0	20	37.73
463.	-2SØ	44	22	0	22	50.00
464.	-3SØ	35	4	3	7	20.00
465.	ICP-6929-1-1SØ	36	3	0	3	8.33
466.	-2SØ	27	0	0	0	0.00
467.	-2-1SØ	4	0	0	0	0.00
468.	-2SØ	18	0	0	0	0.00
469.	-3SØ	29	0	0	0	0.00
470.	-4SØ	18	1	8	9	50.00
471	ICP-6223-3-1SØ	11	0	0	0	0.00
472.	-2SØ	16	0	0	0	0.00
473.	-3SØ	18	0	0	0	0.00
474.	ICP-6241-1-1SØ	17	0	0	0	0.00
475.	-2SØ	58	18	16	34	58.62
476.	-3SØ	50	15	9	24	48.00
477	ICP-6267-1-1SØ	28	0	0	0	0.00
478.	-2SØ	21	9	0	9	42.85
479	-3SØ	41	0	0	0	0.00
480	ICP-6694-1-1SØ	35	1	0	1	2.85
481.	-2SØ	29	0	0	0	0.00
482	-3SØ	38	0	1	1	2.63
483.	-4SØ	31	0	0	0	0.00
484.	-5SØ	23	2	0	2	8.69
485	ICP-6707-1-1SØ	21	0	0	0	0.00
486.	-2SØ	27	0	0	0	0.00
487	-3SØ	11	0	0	0	0.00
488.	-4SØ	26	0	0	0	0.00
489	-5SØ	23	0	0	0	0.00
490.	ICP-6710-1-1SØ	26	1	0	1	3.84

contd.

1	2	3	4	5	6	7
491.	ICP-6710-1-2SB	38	1	0	1	2.63
492.	-3SB	25	0	0	0	0.00
493.	-4SB	21	0	0	0	0.00
494.	-5SB	21	1	0	1	4.76
495.	ICP-6742-1-1SB	29	0	0	0	0.00
496.	-2SB	25	0	0	0	0.00
497.	-3SB	27	0	0	0	0.00
498.	ICP-7125-1-1SB	5	0	5	5	100.00
499.	-2SB	3	0	0	0	0.00
500.	-3SB	3	0	0	0	0.00
501.	ICP-7169-1-1SB	30	0	0	0	0.00
502.	-2SB	44	0	0	0	0.00
503.	-3SB	32	12	0	12	37.50
504.	-4SB	29	0	0	0	0.00
505.	ICP-7169-2-1SB	61	22	0	22	36.06
506.	-2SB	67	31	0	31	46.26
507.	-3SB	46	24	0	24	52.17
508.	-4SB	55	13	0	13	23.63
509.	ICP-7169-3-1SB	8	0	0	0	0.00
510.	-2SB	9	0	0	0	0.00
511.	-3SB	16	0	0	0	0.00
512.	ICP-7173-1-1SB	18	0	0	0	0.00
513.	-2SB	15	6	0	6	40.00
514.	-3SB	14	0	0	0	0.00
515.	ICP-7183-1-1SB	47	0	0	0	0.00
516.	-7187-1-1SB	15	0	0	0	0.00
517.	-2SB	9	1	0	1	11.11
518.	-3SB	10	0	0	0	0.00
519.	-4SB	19	0	0	0	0.00
520.	-5SB	18	0	0	0	0.00
521.	-6SB	19	3	0	3	15.78
522.	ICP-7193-1-1SB	34	1	0	1	2.94
523.	-2SB	30	0	0	0	0.00
524.	-3SB	38	2	0	2	5.26
525.	ICP-7198-1-1SB	46	0	0	0	0.00
526.	-2SB	48	0	0	0	0.00
527.	-3SB	63	0	0	0	0.00
528.	-4SB	28	0	0	0	0.00
529.	-5SB	35	1	0	1	2.85
530.	ICP-7198-2-1SB	9	0	0	0	0.00
531.	-2SB	39	1	0	1	2.56
532.	-3SB	49	5	0	5	10.20
533.	-4SB	47	0	0	0	0.00
534.	-5SB	53	0	0	0	0.00
535.	ICP-7198-3-1SB	49	0	0	0	0.00

contd.

1	2	3	4	5	6	7
536.	ICP-7198-3-2SØ	37	0	0	0	0.00
537.	-3SØ	28	0	0	0	0.00
538.	-4SØ	37	0	0	0	0.00
539.	-5SØ	9	0	0	0	0.00
540.	-6SØ	44	0	0	0	0.00
541.	ICP-7198-4-1SØ	31	0	0	0	0.00
542.	-2SØ	39	0	0	0	0.00
543.	-3SØ	32	0	0	0	0.00
544.	-4SØ	42	0	0	0	0.00
545.	-5SØ	46	0	0	0	0.00
546.	ICP-7200-1-1SØ	50	0	0	0	0.00
547.	-2SØ	38	0	0	0	0.00
548.	-3SØ	32	1	0	1	3.12
549.	-4SØ	18	0	0	0	0.00
550.	ICP-7200-2-1SØ	37	0	0	0	0.00
551.	-2SØ	43	0	0	0	0.00
552.	-3SØ	19	0	0	0	0.00
553.	-4SØ	34	0	0	0	0.00
554	ICP-7200-3-1SØ	30	0	0	0	0.00
555.	-2SØ	23	0	0	0	0.00
556.	-3SØ	43	0	0	0	0.00
557.	-4SØ	41	0	0	0	0.00
558.	-5SØ	38	0	0	0	0.00
559.	ICP-7213-1-1SØ	24	0	8	8	33.33
560.	-2SØ	37	0	21	21	56.75
561.	ICP-7221-3-1SØ	20	0	0	0	0.00
562.	-2SØ	14	0	0	0	0.00
563.	-3SØ	34	0	0	0	0.00
564.	-4SØ	33	0	0	0	0.00
565.	-5SØ	14	0	0	0	0.00
566.	ICP-7221-4-1SØ	21	0	0	0	0.00
567.	-2SØ	26	0	0	0	0.00
568.	ICP-7222-4-1SØ	33	0	0	0	0.00
569.	-7232-3-1SØ	17	0	0	0	0.00
570.	-2SØ	22	0	0	0	0.00
571.	-3SØ	21	0	0	0	0.00
572.	-4SØ	18	0	0	0	0.00
573.	ICP-7232-6-1SØ	21	0	0	0	0.00
574.	-2SØ	17	1	0	1	5.88
575.	-3SØ	26	0	0	0	0.00
576.	ICP-7232-10-1SØ	3	0	0	0	0.00
577.	-2SØ	23	0	0	0	0.00
578.	-3SØ	24	0	0	0	0.00
579.	-4SØ	11	0	0	0	0.00
580.	ICP-7233-5-1SØ	36	0	0	0	0.00

contd.

1	2	3	4	5	6	7
581.	ICP-7233-5-2SB	8	0	0	0	0.00
582.	-3SB	24	1	0	1	41.67
583.	-4SB	28	3	0	3	10.71
584.	-5SB	33	3	2	5	15.15
585.	-6SB	31	2	0	2	6.45
586.	ICP-7234-1-1SB	12	1	0	1	8.33
587.	-2SB	4	0	0	0	0.00
588.	ICP-7234-4-1SB	10	0	0	0	0.00
589.	-2SB	10	0	0	0	0.00
590.	ICP-7238-3-3SB	26	2	0	2	7.69
591.	-4SB	21	1	0	1	4.76
592.	-5SB	20	0	0	0	0.00
593.	-6SB	14	1	0	1	7.14
594.	-7SB	24	0	0	0	0.00
595.	-8SB	16	0	0	0	0.00
596.	-9SB	10	0	0	0	0.00
597.	-10SB	23	0	0	0	0.00
598.	ICP-7238-4-1SB	21	0	4	4	19.04
599.	-2SB	32	2	0	2	6.25
600.	-3SB	14	6	0	6	42.85
601.	ICP-7243-1-1SB	28	4	4	8	28.57
602.	-7246-3-1SB	-	-	-	-	-
603.	-2SB	-	-	-	-	-
604.	ICP-7248-1-1SB	38	2	0	2	5.26
605.	-2SB	35	0	0	0	0.00
606.	-3SB	60	0	0	0	0.00
607.	-4SB	6	0	3	3	50.00
608.	-5SB	41	0	0	0	0.00
609.	ICP-7234-4-2SB	7	1	0	1	14.28
610.	-3SB	11	1	0	1	9.09
611.	ICP-7234-5-1SB	9	0	0	0	0.00
612.	-2SB	7	0	0	0	0.00
613.	-3SB	14	0	0	0	0.00
614.	-4SB	7	0	0	0	0.00
615.	ICP-7234-8-1SB	20	1	0	1	5.00
616.	-2SB	35	1	0	1	2.85
617.	-3SB	14	1	0	1	7.14
618.	ICP-7238-3-1SB	7	2	0	2	28.57
619.	-2SB	4	0	0	0	0.00
620.	ICP-7248-3-1SB	28	0	0	0	0.00
621.	-2SB	9	0	0	0	0.00
622.	-3SB	28	0	2	2	7.14
623.	-4SB	35	1	0	1	2.85
624.	-5SB	62	1	0	1	1.61
625.	ICP-7248-5-1SB	25	0	1	1	4.00

1	2	3	4	5	6	7
626.	ICP-7248-5-2S@	32	0	3	3	9.37
627.	-3S@	-	-	-	-	-
628.	-4S@	11	0	0	0	0.00
629.	-5S@	-	-	-	-	-
630.	-6S@	2	0	0	0	0.00
631.	ICP-7248-6-1S@	27	0	2	2	7.40
632.	-2S@	15	0	0	0	0.00
633.	ICP-7248-8-1S@	33	1	1	2	6.06
634.	-2S@	23	4	5	9	39.13
635.	-3S@	53	3	11	14	26.41
636.	-4S@	50	4	5	9	18.00
637.	-5S@	16	0	0	0	0.00
638.	ICP-7251-2-1S@	30	11	1	12	40.00
639.	-2S@	31	20	1	21	67.74
640	-3S@	22	15	0	15	68.18
641.	ICP-7251-3-1S@	3	0	0	0	0.00
642.	-2S@	19	0	1	1	11.11
643	-3S@	4	0	0	0	0.00
644.	-4S@	25	2	2	4	16.00
645.	-5S@	10	0	3	3	30.00
646.	ICP-7256-1-1S@	15	4	0	4	26.66
647.	-2S@	15	1	2	3	20.00
648.	-3S@	19	12	1	13	68.42
649.	-4S@	11	3	1	4	36.36
650.	-5S@	30	21	0	21	70.00
651.	ICP-7258-2-1S@	12	1	4	5	41.66
652.	-2S@	3	0	0	0	0.00
653	ICP-7258-3-1S@	12	2	0	2	16.66
654	-2S@	20	2	0	2	10.00
655.	-3S@	20	3	0	3	15.00
656	-4S@	8	1	0	1	12.50
657.	-5S@	29	6	0	6	20.69
658.	ICP-7258-4-1S@	6	3	0	3	50.00
659	-2S@	41	27	0	27	65.85
660	-3S@	24	17	0	17	70.83
661.	-4S@	5	0	0	0	0.00
662.	-5S@	27	14	1	15	55.55
663.	ICP-7273-2-1S@	52	35	0	35	67.30
664	-2S@	45	10	0	10	22.22
665.	-3S@	42	14	0	14	33.33
666.	-4S@	45	4	0	4	8.88
667.	-5S@	24	8	0	8	33.33
668.	ICP-7281-1-1S@	25	0	0	0	0.00
669.	-2S@	26	0	0	0	0.00
670.	-3S@	-	-	-	-	-

contd.

1	2	3	4	5	6	7
671.	ICP-7281-1-4S⊗	25	1	0	1	4.00
672.	-5S⊗	27	0	0	0	0.00
673.	ICP-7281-9-1S⊗	24	0	0	0	0.00
674.	-2S⊗	19	0	0	0	0.00
675.	-3S⊗	41	0	0	0	0.00
676.	-4S⊗	39	13	0	13	33.33
677.	-5S⊗	40	10	0	10	25.00
678.	ICP-7286-1-1S⊗	22	0	0	0	0.00
679.	-2S⊗	22	0	0	0	0.00
680.	-3S⊗	14	0	0	0	0.00
681.	-4S⊗	23	0	0	0	0.00
682.	-5S⊗	24	0	0	0	0.00
683.	ICP-7286-2-1S⊗	21	0	0	0	0.00
684.	-2S⊗	38	0	0	0	0.00
685.	-3S⊗	30	0	0	0	0.00
686.	-4S⊗	27	0	0	0	0.00
687.	-5S⊗	17	0	0	0	0.00
688.	ICP-7337-4-1S⊗	52	5	23	28	53.84
689.	-2S⊗	32	5	7	12	37.50
690.	-3S⊗	37	5	8	13	35.13
691.	-4S⊗	51	8	20	28	54.90
692.	-5S⊗	44	6	19	25	56.81
693.	ICP-7337-5-1S⊗	44	13	8	21	47.72
694.	-2S⊗	34	2	9	11	32.35
695.	ICP-7337-6-1S⊗	22	7	11	18	81.81
696.	-2S⊗	45	12	9	21	46.66
697.	-3S⊗	40	18	13	31	77.50
698.	-4S⊗	15	11	1	12	80.00
699.	ICP-7371-2-1S⊗	18	11	0	11	61.11
700.	-2S⊗	22	15	0	15	68.18
701.	ICP-7375-1-1S⊗	40	31	0	31	77.50
702.	-2S⊗	54	24	0	24	44.44
703.	-3S⊗	25	17	0	17	68.00
704.	-4S⊗	59	31	0	31	52.54
705.	-5S⊗	29	10	0	10	34.48
706.	ICP-7386-1-1S⊗	29	0	0	0	0.00
707.	-2S⊗	29	0	0	0	0.00
708.	-3S⊗	25	0	0	0	0.00
709.	-4S⊗	19	0	0	0	0.00
710.	-5S⊗	31	0	0	0	0.00
711.	ICP-7444-1-1S⊗	8	0	0	0	0.00
712.	-2S⊗	13	1	0	1	7.69
713.	ICP-7447-1-1S⊗	23	1	0	1	4.34
714.	-2S⊗	29	0	0	0	0.00
715.	ICP-7472-1-1S⊗	22	2	0	2	18.18

contd.

1	2	3	4	5	6	7
716.	ICP-7472-1-2S⊗	16	0	0	0	0.00
717.	-7491-1-1S⊗	41	3	0	3	14.63
718	-2S⊗	28	4	0	4	28.57
719	-3S⊗	32	2	0	2	12.50
720.	-4S⊗	37	5	0	5	27.02
721.	-5S⊗	42	6	0	6	28.57
722	ICP-7874-1-1S⊗	23	1	0	1	8.69
723.	-2S⊗	12	0	0	0	0.00
724.	-3S⊗	16	0	0	0	0.00
725	-4S⊗	8	0	0	0	0.00
726.	ICP-7874-13-1S⊗	31	0	0	0	0.00
727.	-2S⊗	11	0	0	0	0.00
728.	-3S⊗	20	0	0	0	0.00
729.	-4S⊗	21	2	0	2	9.52
730.	-5S⊗	15	0	0	0	0.00
731.	ICP-7874-16-1S⊗	-	-	-	-	-
732.	-2S⊗	12	4	0	4	33.33
733.	-3S⊗	26	8	0	8	30.76
734.	-4S⊗	2	0	0	0	0.00
735.	-5S⊗	26	10	0	10	38.46
736	ICP-7874-18-1S⊗	8	0	0	0	0.00
737.	-2S⊗	7	0	0	0	0.00
738.	ICP-7889-1-1S⊗	28	13	1	14	50.00
739.	-2S⊗	31	6	0	6	19.35
740.	-3S⊗	68	21	0	21	30.88
741	-4S⊗	11	4	0	4	36.36
742.	-5S⊗	1	1	0	1	100.00
743	ICP-7893-2-1S⊗	3	1	0	1	33.33
744	-2S⊗	38	6	10	16	42.10
745.	-3S⊗	39	1	0	1	2.56
746.	-4S⊗	2	0	0	0	0.00
747.	-5S⊗	1	0	0	0	0.00
748.	ICP-7983-3-1S⊗	22	0	0	0	0.00
749	-2S⊗	52	0	0	0	0.00
750	-3S⊗	31	3	2	5	16.12
751.	-4S⊗	18	15	1	16	88.99
752.	ICP-7993-3-1S⊗	2	0	0	0	0.00
753.	-7991-1-1S⊗	3	0	0	0	0.00
754.	-2S⊗	5	0	0	0	0.00
755.	-3S⊗	6	0	0	0	0.00
756	ICP-7997-2-1S⊗	36	5	4	9	25.00
757	-2S⊗	9	0	1	1	11.11
758.	-3S⊗	14	0	0	0	0.00
759	-4S⊗	27	0	0	0	0.00
760.	ICP-8021-5-1S⊗	27	5	0	5	18.50

contd.

1	2	3	4	5	6	7
761.	ICP-8021-5-2SØ	37	2	0	2	5.40
762.	-3SØ	18	0	0	0	0.00
763.	-4SØ	20	1	0	1	5.00
764.	-5SØ	24	0	0	0	0.00
765.	-6SØ	24	2	0	2	8.33
766.	ICP-8025-1-1SØ	30	0	0	0	0.00
767.	-2SØ	44	4	0	4	9.09
768.	-3SØ	25	4	3	7	28.00
769.	ICP-8027-1-1SØ	9	4	0	4	44.44
770.	-2SØ	24	2	0	2	8.33
771.	-3SØ	12	0	0	0	0.00
772.	ICP-8030-1-1SØ	17	0	0	0	0.00
773.	-2SØ	16	0	0	0	0.00
774.	-3SØ	29	0	0	0	0.00
775.	-4SØ	16	0	0	0	0.00
776.	-5SØ	6	1	0	1	16.66
777.	-6SØ	16	0	0	0	0.00
778.	-7SØ	25	0	0	0	0.00
779.	-8SØ	43	0	0	0	0.00
780.	ICP-8033-8-1SØ	9	2	0	2	22.22
781.	-2SØ	13	4	0	4	30.76
782.	-3SØ	14	1	0	1	7.14
783.	ICP-8035-1-1SØ	-	-	-	-	-
784.	-2SØ	15	0	1	1	6.66
785.	-3SØ	46	2	23	25	54.34
786.	-4SØ	42	0	1	1	2.38
787.	-5SØ	51	2	1	3	5.88
788.	-6SØ	30	5	4	9	30.00
789.	-7SØ	7	0	0	0	0.00
790.	ICP-8035-2-1SØ	44	2	4	6	13.63
791.	-2SØ	28	2	1	3	10.71
792.	-3SØ	24	0	6	6	25.00
793.	ICP-8035-3-1SØ	68	0	8	8	11.76
794.	-2SØ	49	2	8	10	20.40
795.	-3SØ	70	5	10	15	21.42
796.	-4SØ	44	2	9	11	25.00
797.	ICP-8035-4-1SØ	20	0	1	1	5.00
798.	-2SØ	35	2	5	7	20.00
799.	-3SØ	42	1	2	3	7.14
800.	-4SØ	21	2	0	2	9.52
801.	-5SØ	25	0	1	1	4.00
802.	ICP-8035-5-1SØ	11	0	0	0	0.00
803.	-2SØ	6	0	0	0	0.00
804.	-3SØ	18	1	0	1	5.55
805.	-4SØ	61	3	20	23	37.70

contd.

1	2	3	4	5	6	7
806	ICP-8035-5-5SØ	9	0	0	0	0.00
807	-6SØ	20	1	2	3	15.00
808.	-7SØ	7	1	0	1	14.28
809	ICP-8035-6-1SØ	10	2	0	2	20.00
810.	-8036-8-1SØ	25	0	0	0	0.00
811.	-9-1SØ	26	0	0	0	0.00
812	-2SØ	9	0	0	0	0.00
813	-3SØ	4	1	0	1	25.00
814.	-4SØ	36	0	0	0	0.00
815.	-5SØ	15	0	0	0	0.00
816	ICP-8036-10-1SØ	25	0	4	4	16.00
817	-2SØ	5	0	0	0	0.00
818	-3SØ	15	0	0	0	0.00
819.	-4SØ	15	0	0	0	0.00
820	-5SØ	9	0	0	0	0.00
821.	ICP-8036-14-1SØ	6	0	0	0	0.00
822.	-2SØ	7	0	0	0	0.00
823.	-3SØ	5	0	0	0	0.00
824.	ICP-8052-1-1SØ	26	0	0	0	0.00
825.	-2SØ	37	2	0	2	5.40
826.	-3SØ	69	11	5	16	23.18
827.	-4SØ	44	1	2	3	6.31
828	-5SØ	37	0	0	0	0.00
829.	ICP-8054-1-1SØ	28	4	0	4	14.28
830.	-2SØ	20	2	0	2	10.00
831.	-3SØ	29	1	0	1	3.44
832	-4SØ	21	0	0	0	0.00
833	ICP-8057-1-1SØ	34	0	4	4	11.76
834.	-2SØ	49	9	0	9	18.36
835.	-3SØ	33	1	0	1	3.03
836.	-4SØ	16	3	0	3	18.75
837	ICP-8057-4-1SØ	15	0	0	0	0.00
838.	-2SØ	52	0	2	2	3.84
839.	-3SØ	39	1	0	1	2.56
840	-4SØ	24	0	0	0	0.00
841.	-5SØ	33	4	0	4	12.12
842.	ICP-8057-6-1SØ	28	1	0	1	3.57
843.	-2SØ	14	0	0	0	0.00
844.	-3SØ	12	1	0	1	8.33
845.	-4SØ	8	1	0	1	12.50
846.	ICP-8058-2-1SØ	35	4	0	4	11.42
847.	-2SØ	47	0	0	0	0.00
848.	-3SØ	37	2	1	3	8.10
849.	-4SØ	20	0	5	5	25.00
850.	ICP-8058-5-1SØ	2	0	0	0	0.00

contd.

1	2	3	4	5	6	7
851.	ICP-8058-5-2S⊗	10	1	0	1	10.00
852.	-3S⊗	56	6	0	6	10.71
853.	-4S⊗	28	3	0	3	10.71
854.	ICP-8058-7-1S⊗	23	0	0	0	0.00
855.	-2S⊗	-	-	-	-	-
856.	ICP-8058-9-1S⊗	19	4	2	6	31.57
857.	-2S⊗	6	0	1	1	16.66
858.	-3S⊗	9	0	2	2	22.22
859.	ICP-8058-10-1S⊗	2	0	1	1	50.00
860.	-2S⊗	40	0	2	2	5.00
861.	ICP-8061-5-1S⊗	11	0	0	0	0.00
862.	-2S⊗	21	0	0	0	0.00
863.	-3S⊗	24	0	0	0	0.00
864.	-4S⊗	1	0	0	0	0.00
865.	-5S⊗	-	-	-	-	-
866.	ICP-8063-3-1S⊗	-	-	-	-	-
867.	-9-1S⊗	-	-	-	-	-
868.	-2S⊗	-	-	-	-	-
869.	-3S⊗	-	-	-	-	-
870.	-4S⊗	-	-	-	-	-
871.	ICP-8067-4-1S⊗	-	-	-	-	-
872.	-2S⊗	-	-	-	-	-
873.	-3S⊗	-	-	-	-	-
874.	-4S⊗	-	-	-	-	-
875.	-5S⊗	1	0	0	0	0.00
876.	-6S⊗	30	0	0	0	0.00
877.	-7S⊗	23	0	0	0	0.00
878.	-8S⊗	1	0	0	0	0.00
879.	ICP-8067-9-1S⊗	39	1	0	1	2.56
880.	-2S⊗	-	-	-	-	-
881.	-3S⊗	-	-	-	-	-
882.	-4S⊗	1	0	1	1	100.00
883.	ICP-8085-1-1S⊗	47	9	0	9	19.14
884.	-2S⊗	57	39	0	39	68.42
885.	-3S⊗	16	1	0	1	6.25
886.	-4S⊗	53	40	0	40	75.47
887.	ICP-8090-1-1S⊗	36	11	15	26	72.22
888.	-2S⊗	8	0	0	0	0.00
889.	-3S⊗	50	9	0	9	18.00
890.	-4S⊗	17	8	6	14	82.35
891.	-5S⊗	51	13	18	31	60.78
892.	ICP-8093-1-S1⊗	45	16	20	36	80.00
893.	-S2⊗	31	-	-	16	51.61
894.	-S3⊗	32	-	-	17	53.12
895.	-S4⊗	11	-	-	5	45.45

contd.

1	2	3	4	5	6	7
896.	ICP-8093-3-S1B	13	-	-	1	7.69
897	-S2B	8	-	-	6	75.00
898.	-S3B	13	-	-	0	0.00
899.	-S4B	15	-	-	9	60.00
900.	-S5B	10	-	-	0	0.00
901.	ICP-8094-2-S1B	8	-	-	1	12.50
902.	-S2B	7	-	-	0	0.00
903.	-S3B	10	-	-	0	0.00
904.	ICP-8095-1-S1B	21	-	-	9	42.85
905	-S2B	23	-	-	1	4.34
906.	-S3B	25	-	-	10	40.00
907.	-S4B	16	-	-	0	0.00
908.	-S5B	10	-	-	0	0.00
909.	ICP-8095-2-S1B	11	-	-	1	9.09
910.	-S2B	11	-	-	1	9.09
911.	-S3B	23	-	-	10	43.47
912.	-S4B	16	-	-	2	12.50
913.	-S5B	11	-	-	0	0.00
914.	ICP-8095-3-S1B	6	-	-	1	16.66
915	-S2B	4	-	-	0	0.00
916.	-S3B	11	-	-	0	0.00
917	-S4B	7	-	-	0	0.00
918.	-S5B	11	-	-	1	5.00
919.	ICP-8095-4-S1B	20	-	-	14	31.11
920.	-S2B	54	-	-	45	83.33
921.	-S3B	29	-	-	17	58.62
922.	-S4B	33	-	-	21	63.63
923	-S5B	12	-	-	0	0.00
924	ICP-8101-1-S1B	19	-	-	1	5.26
925.	-S2B	18	-	-	5	27.77
926	-S3B	24	-	-	0	0.00
927	-S4B	14	-	-	0	0.00
928.	-S5B	18	-	-	0	0.00
929.	ICP-8102-1-S1B	16	-	-	0	0.00
930	-S2B	27	-	-	7	25.92
931.	-S3B	10	-	-	1	10.00
932.	-S4B	42	-	-	16	38.09
933.	-S5B	28	-	-	18	64.28
934.	ICP-8102-2-S1B	3	-	-	0	0.00
935	-S2B	17	-	-	9	52.94
936.	-S3B	8	-	-	0	0.00
937.	-S4B	6	-	-	0	0.00
938.	-S5B	10	-	-	0	0.00
939.	ICP-8102-3-S1B	10	-	-	0	0.00
940.	-S2B	7	-	-	0	0.00

contd.

1	2	3	4	5	6	7
941.	ICP-8102-3-S30	11	-	-	2	18.18
942.	-S40	7	-	-	0	0.00
943.	-S50	15	-	-	0	0.00
944.	ICP-8102-6-S10	35	-	-	10	28.57
945.	-S20	9	-	-	0	0.00
946.	-S30	15	-	-	0	0.00
947.	-S40	9	-	-	0	0.00
948.	-S50	31	-	-	19	61.29
949.	ICP-8102-8-S10	2	-	-	0	0.00
950.	-S20	9	-	-	1	11.11
951.	-S30	17	-	-	1	5.88
952.	-s40	12	-	-	0	0.00
953.	-S50	18	-	-	3	16.66
954.	ICP-8103-1-S10	23	-	-	0	0.00
955.	-S20	22	-	-	0	0.00
956.	-S30	19	-	-	0	0.00
957.	-S40	29	-	-	0	0.00
958.	-S50	8	-	-	0	0.00
959.	ICP-8103-2-S10	13	-	-	1	7.62
960.	-S20	19	-	-	1	5.26
961.	-S30	17	-	-	1	5.88
962.	-S40	15	-	-	5	33.33
963.	-S50	17	-	-	3	17.64
964.	-S60	20	-	-	2	10.00
965.	ICP-8104-1-S10	5	-	-	1	20.00
966.	-S20	22	-	-	2	9.09
967.	-S30	15	-	-	2	13.33
968.	-S40	7	-	-	2	28.57
969.	-S50	-	-	-	-	-
970.	ICP-8104-2-S10	24	-	-	20	83.33
971.	-S20	10	-	-	0	0.00
972.	ICP-8107-1-S10	18	-	-	0	0.00
973.	-S20	18	-	-	0	0.00
974.	-S30	26	-	-	0	0.00
975.	-S40	24	-	-	0	0.00
976.	-S50	8	-	-	0	0.00
977.	ICP-8111-1-S10	8	-	-	0	0.00
978.	-S20	53	-	-	26	49.05
979.	-S30	3	-	-	0	0.00
980.	-S40	10	-	-	0	0.00
981.	-S50	45	-	-	9	20.00
982.	ICP-8112-1-S10	19	-	-	9	47.36
983.	-S20	13	-	-	0	0.00
984.	-S30	5	-	-	0	0.00
985.	-S40	26	-	-	0	0.00

contd.

1	2	3	4	5	6	7
986	ICP-8112-1-S50	16	-	-	2	12.50
987	-2-S10	22	-	-	13	59.09
988	-S20	8	-	-	0	0.00
989	-S30	13	-	-	1	7.69
990	-S40	9	-	-	0	0.00
991	-S50	23	-	-	8	34.78
992	ICP-8122-1-S10	4	-	-	0	0.00
993	-S20	5	-	-	0	0.00
994	-S30	6	-	-	0	0.00
995	-S40	9	-	-	0	0.00
996	-S50	18	-	-	0	0.00
997	ICP-8128-2-S10	14	-	-	0	0.00
998	-S20	24	-	-	0	0.00
999	-S30	9	-	-	0	0.00
1000	-S40	28	-	-	0	0.00
1001	-S50	19	-	-	0	0.00
1002	ICP-8128-3-S10	19	-	-	1	5.26
1003	-S20	19	-	-	0	0.00
1004	-S30	30	-	-	1	3.33
1005	-S40	34	-	-	1	2.94
1006	-S50	19	-	-	2	10.52
1007	ICP-8130-1-S10	14	-	-	0	0.00
1008	-S20	7	-	-	0	0.00
1009	-S30	27	-	-	0	0.00
1010	-S40	24	-	-	0	0.00
1011	-S50	10	-	-	0	0.00
1012	ICP-8130-2-S10	7	-	-	0	0.00
1013	-S20	33	-	-	0	0.00
1014	-S30	14	-	-	0	0.00
1015	-S40	18	-	-	0	0.00
1016	ICP-8130-6-S10	9	-	-	0	0.00
1017	-S20	24	-	-	0	0.00
1018	-S30	29	-	-	0	0.00
1019	-S40	36	-	-	0	0.00
1020	-S50	13	-	-	0	0.00
1021	ICP-8130-7-S10	15	-	-	0	0.00
1022	-S20	32	-	-	0	0.00
1023	-S30	31	-	-	0	0.00
1024	-S40	19	-	-	0	0.00
1025	-S50	19	-	-	4	21.05
1026	ICP-8130-8-S10	9	-	-	0	0.00
1027	-S20	23	-	-	0	0.00
1028	-S30	24	-	-	0	0.00
1029	-S40	19	-	-	0	0.00
1030	-S50	24	-	-	0	0.00

contd

1	2	3	4	5	6	7
1031.	ICP-8130-9-S1B	8	-	-	0	0.00
1032.	-S2B	10	-	-	2	20.00
1033.	-S3B	13	-	-	0	0.00
1034.	-S4B	16	-	-	0	0.00
1035.	-S5B	45	-	-	21	46.66
1036.	ICP-8132-7-S1B	29	-	-	8	27.58
1037.	-S2B	5	-	-	0	0.00
1038.	-S3B	9	-	-	0	0.00
1039.	-S4B	2	-	-	0	0.00
1040.	-S5B	13	-	-	0	0.00
1041.	ICP-8133-2-S1B	19	-	-	0	0.00
1042.	-S2B	19	-	-	0	0.00
1043.	-S3B	19	-	-	1	5.26
1044.	-S4B	24	-	-	0	0.00
1045.	-S5B	14	-	-	0	0.00
1046.	ICP-8133-3-S1B	31	-	-	0	0.00
1047.	-S2B	27	-	-	0	0.00
1048.	-S3B	34	-	-	0	0.00
1049.	-S4B	19	-	-	0	0.00
1050.	-S5B	18	-	-	0	0.00
1051.	ICP-8137-2-S1B	14	-	-	2	14.38
1052.	-4-S1B	12	-	-	0	0.00
1053.	-S2B	17	-	-	0	0.00
1054.	-S3B	14	-	-	0	0.00
1055.	-S4B	12	-	-	0	0.00
1056.	-S5B	30	-	-	2	6.66
1057.	-S6B	24	-	-	1	4.16
1058.	ICP-8138-1-S1B	33	-	-	1	3.03
1059.	-S2B	22	-	-	0	0.00
1060.	-S3B	28	-	-	0	0.00
1061.	-S4B	38	-	-	0	0.00
1062.	-S5B	38	-	-	4	10.52
1063.	ICP-8138-6-S1B	21	-	-	3	14.28
1064.	-S2B	32	-	-	0	0.00
1065.	-S3B	29	-	-	1	3.44
1066.	-S4B	27	-	-	0	0.00
1067.	-S5B	32	-	-	0	0.00
1068.	ICP-8139-6-S1B	25	-	-	0	0.00
1069.	-S2B	16	-	-	2	12.50
1070.	-S3B	10	-	-	4	40.00
1071.	-S4B	15	-	-	1	6.66
1072.	-S5B	21	-	-	2	9.52
1073.	ICP-8139-7-S1B	37	-	-	0	0.00
1074.	-S2B	20	-	-	0	0.00
1075.	-S3B	14	-	-	0	0.00

contd.

1	2	3	4	5	6	7
1076	ICP-8139-7-S40	14	-	-	0	0.00
1077	-S50	5	-	-	0	0.00
1078	ICP-8140-4-S10	15	-	-	0	0.00
1079	-S20	22	-	-	0	0.00
1080	-S30	18	-	-	1	5.55
1081	-S40	10	-	-	0	0.00
1082	-S50	50	-	-	7	14.00
1083	ICP-8161-2-S10	8	-	-	0	0.00
1084	-S20	21	-	-	0	0.00
1085	-S30	29	-	-	4	13.79
1086	-S40	22	-	-	0	0.00
1087	-S50	23	-	-	0	0.00
1088	ICP-8161-3-S10	24	-	-	0	0.00
1089	-S20	28	-	-	0	0.00
1090	-S30	29	-	-	0	0.00
1091	-S40	24	-	-	2	8.33
1092	-S50	36	-	-	2	55.55
1093	ICP-8163-1-S10	24	-	-	0	0.00
1094	-S20	17	-	-	0	0.00
1095	-S30	12	-	-	0	0.00
1096	-S40	16	-	-	0	0.00
1097	-S50	6	-	-	0	0.00
1098	ICP-8164-1-S10	11	-	-	1	9.09
1099	-S20	9	-	-	0	0.00
1100	ICP-7349-6-S10	-	-	-	-	-
1101	-S20	2	-	-	0	0.00
1102	-S30	1	-	-	0	0.00
1103	-S40	2	-	-	0	0.00
1104	-S50	1	-	-	0	0.00
1105	-S60	2	-	-	0	0.00
1106	-S70	-	-	-	-	-
1107	-S80	-	-	-	-	-
1108	-S90	-	-	-	-	-
1109	-S100	-	-	-	-	-
1110	-S110	1	-	-	0	0.00
1111	ICP-7942-13-S10	2	-	-	0	0.00
1112	-8084-1-S10	2	-	-	0	0.00
1113	-S20	1	-	-	0	0.00
1114	-S30	-	-	-	-	-
1115	-S40	5	-	-	0	0.00
1116	-S50	3	-	-	0	0.00
1117	-S60	10	-	-	0	0.00
1118	-S70	11	-	-	0	0.00
1119	-S80	6	-	-	0	0.00
1120	-S90	7	-	-	0	0.00

contd.

1	2	3	4	5	6	7
1121.	ICP-8084-1-S10Ø	8	-	-	0	0.00
1122.	-8021-6-S1Ø	10	-	-	0	0.00
1123.	-S2Ø	6	-	-	0	0.00
1124.	-S3Ø	15	-	-	0	0.00
1125.	-S4Ø	11	-	-	0	0.00
1126.	-S5Ø	4	-	-	0	0.00
1127.	ICP-8121-8-S1Ø	4	-	-	0	0.00
1128.	-2630-1-S1Ø	-	-	-	-	-
1129.	-S2Ø	-	-	-	-	-
1130.	-S3Ø	-	-	-	-	-
1131.	-S4Ø	-	-	-	-	-
1132.	-S5Ø	-	-	-	-	-
1133.	-S6Ø	1	-	-	0	0.00
1134.	-S7Ø	2	-	-	0	0.00

APPENDIX-XXV

Results of screening of pigeonpea germplasm selections made in 1977-78 for sterility mosaic resistance during 1978-79

Sl. No.	ICP No.	Total plants	Infected plants: Ring spot	Severe mosaic	Total	Percent infection
1	2	3	4	5	6	7
1.	ICP- 19-1S⊗	25	17	2	19	76.00
2.	-2S⊗	49	35	0	35	71.42
3.	-3S⊗	13	8	0	8	61.53
4.	-4S⊗	1	0	1	1	100.00
5	-5S⊗	38	17	2	19	50.00
6	ICP- 45-1S⊗	4	2	0	2	50.00
7.	-2S⊗	14	14	0	14	100.00
8	ICP- 70-1S⊗	7	0	0	0	0.00
9.	-2S⊗	31	13	0	13	41.93
10.	-3S⊗	21	8	0	8	38.09
11.	-4S⊗	18	3	2	5	27.77
12.	ICP- 95-1S⊗	58	7	0	7	12.06
13.	-2S⊗	36	21	2	28	63.88
14.	-3S⊗	10	3	2	7	70.00
15.	ICP-187-1S⊗	3	0	0	0	0.00
16	-2S⊗	14	1	1	2	14.28
17.	ICP-210-1S⊗	51	13	0	13	25.49
18.	-2S⊗	34	30	0	30	88.23
19.	ICP-238-1S⊗	47	26	0	26	55.31
20.	-2S⊗	17	8	0	8	47.08
21.	ICP-306-1S⊗	36	5	15	20	55.55
22	-314-1S⊗	42	16	14	30	71.42
23	-2S⊗	22	9	4	13	59.09
24.	-390-1S⊗	3	0	3	3	100.00
25.	-410-1S⊗	23	7	0	7	30.43
26	-416-1S⊗	2	2	0	2	100.00
27.	-457-1S⊗	36	2	0	2	5.55
28.	-2S⊗	18	7	0	7	38.88
29.	-3S⊗	35	4	0	4	11.42
30.	-4S⊗	7	0	0	0	0.00
31	-5S⊗	63	9	0	9	14.28
32	-6S⊗	35	4	0	4	11.42
33.	-7S⊗	24	9	0	9	37.50
34.	-8S⊗	15	0	0	0	0.00
35.	-595-1S⊗	23	5	0	5	21.73
36.	-2S⊗	49	11	0	11	22.44
37	-3S⊗	17	0	0	0	0.00
38	-260-1S⊗	46	18	5	23	50.00
39.	-2S⊗	48	24	0	24	50.00
40.	-3S⊗	12	0	0	0	0.00

contd.

1	2	3	4	5	6	7
41.	ICP-638-1Sℓ	22	20	0	20	90.90
42.	-2Sℓ	21	9	0	9	42.85
43.	-3Sℓ	40	18	0	18	45.00
44.	-778-1Sℓ	45	0	0	0	0.00
45.	-2Sℓ	32	3	2	5	15.62
46.	-3Sℓ	9	0	0	0	0.00
47.	-4Sℓ	40	4	2	6	15.00
48.	-5Sℓ	35	2	0	2	5.71
49.	-6Sℓ	16	0	0	0	0.00
50.	-934-1Sℓ	22	0	0	0	0.00
51.	-2Sℓ	27	0	0	0	0.00
52.	-3Sℓ	42	2	0	2	4.76
53.	-4Sℓ	26	0	0	0	0.00
54.	-5Sℓ	24	5	0	5	20.83
55.	-6Sℓ	40	6	0	6	15.00
56.	-7Sℓ	26	3	0	3	11.53
57.	-8Sℓ	43	10	0	10	23.25
58.	-999-1Sℓ	38	12	0	12	31.57
59.	-2Sℓ	19	18	0	18	94.73
60.	-3Sℓ	27	20	0	20	74.07
61.	-4Sℓ	-	-	-	-	-
62.	-5Sℓ	26	6	0	6	23.07
63.	ICP-1214-1Sℓ	32	1	0	1	3.12
64.	-2Sℓ	29	1	0	1	3.44
65.	-3Sℓ	28	2	0	2	7.14
66.	ICP-1220-1Sℓ	57	0	0	0	0.00
67.	-2Sℓ	25	0	0	0	0.00
68.	-3Sℓ	14	0	0	0	0.00
69.	ICP-1283-1Sℓ	1	0	0	0	0.00
70.	-2Sℓ	12	4	0	4	33.33
71.	-3Sℓ	18	1	0	1	5.55
72.	-4Sℓ	43	0	4	4	9.30
73.	-5Sℓ	27	0	26	26	96.29
74.	ICP-1644-1Sℓ	42	26	2	28	66.66
75.	-2Sℓ	36	13	0	13	36.11
76.	-3Sℓ	18	2	0	2	11.11
77.	-4Sℓ	20	20	0	20	100.00
78.	-5Sℓ	37	8	0	8	21.62
79.	-6Sℓ	33	13	0	13	39.39
80.	ICP-1680-1Sℓ	41	0	0	0	0.00
81.	-2Sℓ	50	15	0	15	30.00
82.	-3Sℓ	1	1	0	1	100.00
83.	-4Sℓ	16	1	0	1	6.25
84.	ICP-1736-1Sℓ	7	7	0	7	100.00
85.	-1802-1Sℓ	33	7	0	7	21.21

contd.

1	2	3	4	5	6	7
86.	ICP-1814-1S⊗	-	-	-	-	-
87	-1833-1S⊗	40	6	17	23	57.50
88.	-1896-1S⊗	37	28	2	30	81.08
89.	-1908-1S⊗	29	11	0	11	37.93
90.	-1908-1S⊗	46	9	0	9	19.56
91.	-1921-1S⊗	56	25	9	34	60.71
92.	-2S⊗	43	15	4	19	44.18
93.	-3S⊗	31	12	7	19	61.29
94	-4S⊗	65	21	9	30	46.15
95.	-5S⊗	41	6	15	21	51.21
96.	-6S⊗	49	4	16	20	40.81
97.	ICP-1923-1S⊗	55	11	0	11	20.00
98	-2S⊗	32	25	4	29	90.62
99.	-3S⊗	12	7	1	8	66.66
100.	-4S⊗	39	25	1	26	66.66
101	ICP-1926-1S⊗	26	3	11	14	53.84
102.	-1929-1S⊗	41	4	12	16	39.02
103.	-2S⊗	9	3	0	3	33.33
104.	ICP-1941-1S⊗	25	2	12	14	56.00
105.	-1944-1S⊗	54	9	25	34	62.96
106.	-1946-1S⊗	57	15	3	18	31.57
107.	-2S⊗	50	13	0	13	26.00
108.	-3S⊗	27	14	0	14	51.85
109.	-4S⊗	41	5	7	12	29.26
110.	-5S⊗	58	12	2	14	24.13
111.	ICP-1963-1S⊗	48	10	3	13	27.08
112.	-2S⊗	45	13	3	16	35.55
113.	ICP-1976-1S⊗	36	12	8	20	55.55
114.	-1979-1S⊗	29	4	20	24	82.75
115.	-2S⊗	63	5	47	52	82.53
116.	-3S⊗	28	0	27	27	96.42
117.	-4S⊗	20	2	16	18	90.00
118.	-5S⊗	30	3	20	23	76.66
119.	ICP-1983-1S⊗	22	3	5	8	36.36
120.	-2S⊗	16	0	2	2	12.50
121.	-3S⊗	33	0	0	0	0.00
122.	ICP-1987-1S⊗	34	10	0	10	29.41
123.	-2S⊗	15	13	0	13	86.66
124.	ICP-2003-1S⊗	36	15	7	22	61.11
125.	-2S⊗	33	2	0	2	6.06
126.	-3S⊗	-	-	-	-	-
127.	-4S⊗	19	8	4	12	63.15
128.	-5S⊗	25	4	17	21	84.00
129.	ICP-2009-1S⊗	30	4	19	23	76.66
130.	-2S⊗	26	0	17	17	65.38

contd.

1	2	3	4	5	6	7
131.	ICP-2010-1S⊗	32	8	2	10	31.25
132.	-2S⊗	44	16	7	23	52.27
133.	ICP-2013-1S⊗	35	3	11	14	40.00
134.	-2S⊗	14	4	3	7	50.00
135.	-3S⊗	24	7	0	7	29.16
136.	ICP-2017-1S⊗	3	0	0	3	100.00
137.	-2S⊗	13	3	2	5	38.46
138.	-3S⊗	26	9	6	15	57.69
139.	-4S⊗	21	8	0	8	38.09
140.	ICP-2020-1S⊗	-	-	-	-	-
141.	-2S⊗	31	1	0	1	3.22
142.	-3S⊗	50	5	13	18	36.00
143.	-4S⊗	39	4	11	15	38.46
144.	ICP-2045-1S⊗	43	2	12	14	32.55
145.	-2S⊗	44	6	12	18	40.90
146.	ICP-2050-1S⊗	37	0	0	0	0.00
147.	-2S⊗	45	7	0	7	15.55
148.	-3S⊗	3	0	0	0	0.00
149.	-4S⊗	50	8	4	12	24.00
150.	-5S⊗	52	1	2	3	5.76
151.	-6S⊗	52	2	4	6	11.53
152.	-7S⊗	42	0	1	1	2.38
153.	-8S⊗	54	0	6	6	11.11
154.	-9S⊗	48	3	6	9	18.75
155.	ICP-2060-1S⊗	36	3	21	24	66.66
156.	-2S⊗	31	4	5	9	29.03
157.	-3S⊗	43	10	12	22	51.16
158.	-4S⊗	56	10	27	37	66.07
159.	-5S⊗	42	12	6	18	42.85
160.	ICP-2067-1S⊗	49	15	17	32	65.30
161.	-2S⊗	30	5	6	11	36.66
162.	-3S⊗	33	9	17	26	78.78
163.	ICP-2096-1S⊗	43	8	3	11	25.58
164.	-2098-1S⊗	36	6	6	12	33.33
165.	-2101-1S⊗	53	9	12	21	39.62
166.	-2106-1S⊗	20	3	4	7	35.00
167.	-2110-1S⊗	67	12	19	31	46.26
168.	-2S⊗	42	19	16	35	83.33
169.	-3S⊗	37	8	18	26	70.27
170.	ICP-2112-1S⊗	-	-	-	-	-
171.	-2S⊗	50	23	20	43	86.00
172.	ICP-2121-1S⊗	36	9	17	26	72.22
173.	-2150-1S⊗	4	0	0	0	0.00
174.	-2S⊗	23	5	4	9	39.13
175.	-2155-1S⊗	20	7	1	8	40.00

contd.

1	2	3	4	5	6	7
176	ICP-2155-2SØ	17	8	2	10	58.82
177.	-2158-1SØ	29	6	3	9	31.03
178.	-2SØ	13	3	0	3	23.07
179.	-3SØ	37	0	10	10	27.02
180	-4SØ	-	-	-	-	-
181.	ICP-2170-1SØ	-	-	-	-	-
182.	-2SØ	1	0	0	0	0.00
183.	ICP-2184-1SØ	32	3	7	10	31.25
184.	-2SØ	13	1	7	8	61.53
185.	ICP-2209-1SØ	17	2	6	8	47.05
186.	-2SØ	-	-	-	-	-
187.	-3SØ	23	3	5	8	34.78
188.	-4SØ	9	0	3	3	33.33
189.	-5SØ	22	3	6	9	40.90
190.	ICP-2210-1SØ	27	0	7	7	25.92
191.	-2SØ	25	6	3	9	36.00
192.	ICP-2216-1SØ	-	-	-	-	-
193.	-2SØ	28	8	3	11	39.28
194.	ICP-2235-1SØ	27	3	6	9	33.33
195.	-2238-1SØ	26	7	15	22	84.61
196.	-2SØ	24	7	17	24	70.58
197.	ICP-2241-1SØ	25	7	3	10	40.00
198	-2246-1SØ	8	4	1	5	62.50
199.	-2SØ	1	1	0	1	100.00
200.	-3SØ	18	11	2	13	72.22
201.	ICP-2351-1SØ	21	3	15	18	85.71
202.	-2SØ	21	3	12	15	71.42
203.	-3SØ	26	5	6	11	42.30
204.	ICP-2380-1SØ	14	3	0	3	21.42
205.	-2SØ	7	1	0	1	14.28
206	-3SØ	1	0	0	0	0.00
207.	ICP-2621-1SØ	16	1	6	7	43.75
208	-2262-1SØ	29	14	0	14	48.27
209.	-2SØ	23	10	0	10	43.47
210.	-3SØ	20	13	2	15	75.00
211.	-4SØ	5	3	0	4	80.00
212.	ICP-2732-1SØ	12	0	4	4	33.33
213.	-2SØ	20	0	16	16	80.00
214.	ICP-2812-1SØ	29	0	0	0	0.00
215.	-2SØ	35	1	1	2	5.71
216.	-3SØ	12	0	0	0	0.00
217	-4SØ	19	0	0	0	0.00
218.	-5SØ	22	2	0	2	9.09
219.	ICP-2928-1SØ	17	1	2	3	17.64
220.	-3208-1SØ	20	1	1	2	10.00

contd.

1	2	3	4	5	6	7
221.	ICP-3208-2S⊗	16	1	0	1	6.25
222.	-3S⊗	20	5	1	6	30.00
223.	ICP-3259-1S⊗	33	5	3	8	24.24
224.	-3412-1S⊗	18	2	0	2	11.11
225.	-2S⊗	24	1	1	2	8.33
226.	ICP-3421-1S⊗	10	0	0	0	0.00
227.	-2S⊗	21	4	0	4	19.04
228.	-3S⊗	1	1	0	1	100.00
229.	ICP-3521-1S⊗	11	3	1	4	36.36
230.	-3566-1S⊗	26	13	3	16	61.53
231.	-3576-1S⊗	11	4	0	4	36.36
232.	-2S⊗	-	-	-	-	-
233.	-3S⊗	8	2	0	2	25.00
234.	ICP-3666-1S⊗	15	3	1	4	26.66
235.	-3678-1S⊗	19	14	3	17	89.47
236.	-2S⊗	15	8	0	8	53.33
237	-3S⊗	10	7	0	7	70.00
238.	ICP-3689-1S⊗	14	0	0	0	0.00
239.	-2S⊗	14	0	0	0	0.00
240.	ICP-3693-1S⊗	30	6	4	10	33.33
241.	-2S⊗	36	4	6	10	27.77
242.	ICP-3694-1S⊗	18	5	0	5	27.77
243.	-2S⊗	14	3	5	8	57.14
244.	ICP-3696-1S⊗	35	1	11	12	34.28
245.	-2S⊗	26	7	11	18	69.23
246.	-3S⊗	-	-	-	-	-
247.	ICP-3697-1S⊗	5	1	0	1	20.00
248.	-3755-1S⊗	29	2	0	2	6.89
249.	-2S⊗	29	8	0	8	27.58
250.	-3S⊗	19	11	0	11	57.89
251.	ICP-3756-1S⊗	17	5	0	5	29.41
252.	-2S⊗	18	8	0	8	44.44
253.	-3S⊗	18	9	0	9	50.00
254.	-4S⊗	28	9	0	9	32.14
255.	ICP-3761-1S⊗	38	8	0	8	21.05
256.	-3781-1S⊗	21	3	0	3	14.28
257.	-2S⊗	19	2	0	2	10.52
258.	ICP-3801-1S⊗	28	0	0	0	0.00
259.	-2S⊗	25	0	0	0	0.00
260.	-3S⊗	16	3	0	3	18.75
261.	-4S⊗	22	2	0	2	9.09
262.	-5S⊗	27	1	0	1	3.70
263.	ICP-3838-1S⊗	37	8	0	8	21.62
264.	-3920-1S⊗	29	1	0	1	3.44
265.	-2S⊗	8	0	0	0	0.00

1	2	3	4	5	6	7
266.	ICP-3923-1SØ	28	0	0	0	0.00
267	-2SØ	30	0	0	0	0.00
268.	-3SØ	34	0	0	0	0.00
269.	ICP-3979-1SØ	42	6	0	6	14.28
270.	-2SØ	11	0	0	0	0.00
271.	ICP-4125-1SØ	36	4	4	8	22.22
272.	-2SØ	17	4	1	5	0.00
273.	ICP-4126-1SØ	15	0	0	0	0.00
274.	-4142-1SØ	26	7	4	11	42.30
275.	-2SØ	43	0	0	0	0.00
276.	-3SØ	21	0	0	0	0.00
277.	-4SØ	31	0	0	0	0.00
278.	-5SØ	46	1	0	1	2.17
279.	-6SØ	48	0	0	0	0.00
280.	ICP-4200-1SØ	9	1	0	1	11.11
281.	-4290-1SØ	22	0	0	0	0.00
282.	-2SØ	21	2	0	2	9.52
283.	-3SØ	21	0	0	0	0.00
284.	ICP-4325-1SØ	19	0	0	0	0.00
285.	-2SØ	22	6	0	6	22.27
286.	ICP-4352-1SØ	18	2	5	7	38.88
287.	-4358-1SØ	34	10	1	11	32.35
288.	-2SØ	38	0	0	0	0.00
289.	-3SØ	48	5	0	5	10.41
290.	-4SØ	32	3	1	4	12.50
291.	-5SØ	6	0	0	0	0.00
292.	ICP-4367-1SØ	37	6	0	6	16.21
293.	-2SØ	18	13	0	13	72.22
294.	-3SØ	25	10	0	10	40.00
295.	-4SØ	16	1	0	1	6.25
296.	ICP-4375-1SØ	21	6	8	14	66.66
297.	-4380-1SØ	38	7	0	7	18.42
298.	-2SØ	38	6	0	6	15.78
299.	-3SØ	38	4	2	6	15.78
300.	ICP-4396-1SØ	31	2	0	2	6.45
301.	-2SØ	17	4	0	4	32.52
302.	-3SØ	5	0	0	0	0.00
303.	ICP-4423-1SØ	22	3	0	3	13.63
304.	-2SØ	36	17	2	19	52.77
305.	-3SØ	41	20	7	27	65.85
306.	ICP-4533-1SØ	38	9	1	10	26.31
307.	-2SØ	46	3	1	4	8.69
308.	-3SØ	42	15	2	17	40.47
309.	-4SØ	48	2	1	3	6.25
310.	-5SØ	28	7	2	9	32.14

contd.

1	2	3	4	5	6	7
311.	ICP-4602-1S⊗	2	0	0	0	0.00
312.	-4654-1S⊗	31	7	3	10	32.25
313.	-4668-1S⊗	41	10	0	10	24.39
314.	-2S⊗	3	0	0	0	0.00
315.	-3S⊗	12	0	0	0	0.00
316.	-4S⊗	6	0	0	0	0.00
317.	ICP-4678-1S⊗	50	7	0	7	14.00
318.	-2S⊗	45	6	7	13	28.88
319.	-3S⊗	44	6	1	7	15.90
320.	ICP-4701-1S⊗	17	7	0	7	41.17
321.	-4725-1S⊗	-	-	-	-	-
322.	-4726-1S⊗	15	3	0	3	20.00
323.	-2S⊗	15	3	0	3	20.00
324.	ICP-4727-1S⊗	3	0	0	0	0.00
325.	-2S⊗	7	0	0	0	0.00
326.	-3S⊗	1	0	0	0	0.00
327.	-4S⊗	1	0	0	0	0.00
328.	-5S⊗	33	3	2	5	15.15
329.	ICP-4777-1S⊗	13	13	0	13	100.00
330.	-4782-1S⊗	44	0	0	0	0.00
331.	-2S⊗	14	1	0	1	7.14
332.	ICP-4783-1S⊗	41	6	0	6	14.63
333.	-2S⊗	45	12	3	15	33.33
334.	-3S⊗	1	0	0	0	0.00
335.	-4S⊗	33	12	4	16	48.48
336.	-5S⊗	40	10	0	10	25.00
337.	-6S⊗	6	0	0	0	0.00
338.	ICP-4796-1S⊗	42	15	3	18	42.85
339.	-2S⊗	19	10	0	10	52.63
340.	-3S⊗	34	6	0	6	17.64
341.	ICP-4796-4S⊗	24	1	0	1	4.16
342.	-5S⊗	40	16	7	23	57.50
343.	ICP-4856-1S⊗	31	11	0	11	35.48
344.	-2S⊗	43	3	2	5	11.62
345.	ICP-4919-1S⊗	48	7	0	7	14.58
346.	-2S⊗	36	12	0	12	33.33
347.	ICP-4929-1S⊗	3	2	0	2	66.66
348.	-5001-1S⊗	29	10	0	10	34.48
349.	-5020-1S⊗	21	1	5	6	28.57
350.	-5125-1S⊗	42	3	4	7	16.66
351.	-2S⊗	59	2	6	8	13.55
352.	-3S⊗	62	1	11	2	3.22
353.	-4S⊗	49	2	9	11	22.44
354.	-5S⊗	26	0	7	7	26.92
355.	-6S⊗	55	1	5	6	10.90

contd.

1	2	3	4	5	6	7
356.	ICP-5174-1Sℓ	17	0	9	9	52.94
357.	-2Sℓ	-	-	-	-	-
358.	ICP-5175-1Sℓ	41	3	9	12	29.26
359.	-2Sℓ	-	-	-	-	-
360.	ICP-5213-1Sℓ	31	5	20	25	80.64
361.	-5312-1Sℓ	-	-	-	-	-
362.	-5435-1Sℓ	41	9	21	30	73.17
363.	-5476-1Sℓ	38	2	4	6	15.78
364.	-2Sℓ	48	4	0	4	8.33
365.	-5529-1Sℓ	42	11	8	19	45.23
366.	-2Sℓ	-	-	-	-	-
367.	-5542-1Sℓ	18	8	0	8	44.44
368.	-5641-6Sℓ	26	2	0	2	7.69
369.	-7Sℓ	46	5	3	8	17.39
370.	-5838-1Sℓ	26	12	0	12	46.15
371.	-2Sℓ	30	14	0	14	46.66
372.	-3Sℓ	1	0	0	0	0.00
373.	-4Sℓ	56	24	0	24	42.85
374.	-5Sℓ	31	11	3	14	45.16
375.	-5916-1Sℓ	46	20	4	24	52.17
376.	-5970-1Sℓ	53	8	2	10	18.86
377.	-2Sℓ	42	17	7	24	57.14
378.	-5551-1Sℓ	2	0	0	0	0.00
379.	-2Sℓ	4	0	0	0	0.00
380.	-5622-1Sℓ	55	13	0	13	23.63
381.	-5629-1Sℓ	36	0	22	22	61.11
382.	-5641-1Sℓ	33	7	0	7	21.21
383.	-2Sℓ	13	4	0	4	30.76
384.	-3Sℓ	22	5	0	5	22.72
385.	-4Sℓ	4	2	0	2	50.00
386.	-5Sℓ	47	2	0	2	4.25
387.	-6Sℓ	21	4	0	4	19.04
388.	-5970-3Sℓ	41	17	3	20	48.78
389.	-4Sℓ	13	1	1	2	15.38
390.	-5Sℓ	43	9	0	9	20.93
391.	-6Sℓ	17	3	0	3	17.64
392.	-7Sℓ	18	0	0	0	0.00
393.	-8Sℓ	20	0	0	0	0.00
394.	-6088-1Sℓ	11	0	0	0	0.00
395.	-2Sℓ	20	0	0	0	0.00
396.	-3Sℓ	37	2	0	2	5.40
397.	-4Sℓ	19	0	0	0	0.00
398.	-6102-1Sℓ	41	18	7	25	60.97
399.	-2Sℓ	30	12	6	18	60.00
400.	-6128-1Sℓ	45	6	3	9	20.00

contd.

1	2	3	4	5	6	7
401.	ICP-6228-1SØ	52	0	0	44	84.61
402.	-2SØ	28	0	14	14	50.00
403.	-3SØ	37	0	19	19	51.35
404.	-4SØ	55	0	22	22	40.00
405.	ICP-6088-2SØ	4	0	0	0	0.00
406.	-6344-1SØ	1	0	0	0	0.00
407.	-2SØ	2	0	0	0	0.00
408.	-3SØ	1	0	0	0	0.00
409.	-4SØ	1	0	0	0	0.00
410.	-5SØ	3	0	0	0	0.00
411.	-6SØ	18	0	0	0	0.00
412.	-7SØ	43	4	17	21	48.83
413.	-8SØ	29	0	0	0	0.00
414.	-9SØ	35	1	0	1	2.85
415.	ICP-6367-1SØ	46	0	35	35	76.08
416.	-6369-1SØ	42	3	20	23	54.76
417.	-2SØ	28	1	0	1	3.57
418.	-3SØ	32	3	4	7	21.87
419.	ICP-6394-1SØ	61	6	1	7	11.47
420.	-6410-1SØ	28	5	1	6	21.42
421.	-2SØ	34	0	0	0	0.00
422.	ICP-6427-1SØ	33	10	4	14	42.42
423.	-2SØ	20	17	0	17	85.00
424.	ICP-6431-1SØ	27	5	0	5	18.51
425.	-2SØ	1	0	0	0	0.00
426.	ICP-6447-1SØ	34	3	11	14	41.17
427.	-2SØ	38	0	0	0	0.00
428.	-3SØ	-	-	-	-	-
429.	ICP-6970-1SØ	42	1	2	3	7.14
430.	-6640-1SØ	37	0	1	1	2.70
431.	-2SØ	19	1	10	11	57.89
432.	ICP-6667-1SØ	10	0	0	0	0.00
433.	-2SØ	11	0	0	0	0.00
434.	-3SØ	28	3	2	5	17.85
435.	-4SØ	16	7	0	7	43.75
436.	-5SØ	3	0	0	0	0.00
437.	-6SØ	7	0	0	0	0.00
438.	-7SØ	28	3	4	7	25.00
439.	-8SØ	3	0	0	0	0.00
440.	ICP-6683-1SØ	44	4	12	16	36.36
441.	-2SØ	8	0	0	0	0.00
442.	-3SØ	9	0	0	0	0.00
443.	-4SØ	26	0	0	0	0.00
444.	ICP-6771-1SØ	-	-	-	-	-
445.	-2SØ	20	0	9	9	45.00

contd.

1	2	3	4	5	6	7
446.	ICP-6771-3SØ	5	0	2	2	40.00
447.	-4SØ	21	0	11	11	52.38
448.	ICP-6900-1SØ	7	2	2	4	57.14
449.	-7217-1SØ	6	0	0	0	0.00
450.	-2SØ	1	0	0	0	0.00
451.	ICP-7226-1SØ	28	4	6	10	35.71
452.	-2SØ	25	7	8	15	60.00
453.	-3SØ	24	5	5	10	41.66
454.	ICP-7227-1SØ	21	1	4	5	28.80
455.	-2SØ	39	4	0	4	10.25
456.	-3SØ	16	1	0	1	6.25
457.	-4SØ	21	3	5	8	38.09
458.	ICP-7227-5SØ	10	2	2	4	40.00
459.	•7228-1SØ	29	0	0	0	0.00
460.	-7236-1SØ	9	0	0	0	0.00
461.	-2SØ	-	-	-	-	-
462.	-3SØ	16	0	0	0	0.00
463.	-4SØ	6	0	0	0	0.00
464.	-5SØ	5	0	0	0	0.00
465.	-6SØ	4	0	0	0	0.00
466.	-7SØ	12	0	0	0	0.00
467.	-8SØ	3	0	0	0	0.00
468.	-9SØ	-	-	-	-	-
469.	ICP-7236-10SØ	11	0	0	0	0.00
470.	-7257-1SØ	2	0	0	0	0.00
471.	-2SØ	10	4	0	4	40.00
472.	ICP-7260-1SØ	5	2	0	2	40.00
473.	-2SØ	0	0	0	0	0.00
474.	ICP-7261-1SØ	24	0	0	0	0.00
475.	-2SØ	1	0	0	0	0.00
476.	ICP-7265-1SØ	2	0	0	0	0.00
477.	-2SØ	-	-	-	-	-
478.	-3SØ	10	0	0	0	0.00
479.	ICP-7267-1SØ	42	1	0	1	2.38
480.	-7281-1SØ	53	1	0	1	1.88
481.	-2SØ	16	1	0	1	6.25
482.	-3SØ	42	0	0	0	0.00
483.	-4SØ	27	0	0	0	0.00
484.	-5SØ	43	0	0	0	0.00
485.	-6SØ	34	0	1	1	2.94
486.	ICP-7621-1SØ	19	0	1	1	5.26
487.	-2SØ	53	1	3	4	7.54
488.	-3SØ	14	0	1	1	7.14
489.	-4SØ	37	12	0	12	32.43
490.	ICP-7667-1SØ	10	4	1	5	50.00

contd.

1	2	3	4	5	6	7
491.	ICP-7670-1SØ	31	0	5	5	16.12
492.	-7714-1SØ	6	0	3	3	50.00
493.	-2SØ	25	0	3	3	12.00
494.	ICP-7718-1SØ	22	1	4	5	22.72
495.	-7726-1SØ	21	0	11	11	52.38
496.	-7730-1SØ	19	0	2	2	10.52
497.	-7731-1SØ	16	0	4	4	25.00
498.	-7772-1SØ	56	13	3	16	28.57
499.	-2SØ	31	6	7	13	41.93
500.	-7775-1SØ	17	0	3	3	17.64
501.	-7799-1SØ	27	0	1	1	3.70
502.	-7802-1SØ	28	0	1	1	3.57
503.	-2SØ	14	0	3	3	21.42
504.	-7817-1SØ	2	0	0	0	0.00
505.	-7823-1SØ	19	0	7	7	36.84
506.	-7830-1SØ	48	0	1	1	2.08
507.	-7859-1SØ	23	0	0	0	0.00
508.	-2SØ	2	0	0	0	0.00
509.	-7860-1SØ	34	0	2	2	5.88
510.	-2SØ	30	0	0	0	0.00
511.	-3SØ	25	0	0	0	0.00
512.	-4SØ	19	0	0	0	0.00
513.	-5SØ	5	0	0	0	0.00
514.	-6SØ	18	1	0	1	5.55
515.	-7SØ	20	0	0	0	0.00
516.	-8SØ	21	0	0	0	0.00
517.	ICP-7861-1SØ	37	0	0	0	0.00
518.	-7862-1SØ	1	0	0	0	0.00
519.	-7862-2SØ	20	0	0	0	0.00
520.	-7863-1SØ	27	0	0	0	0.00
521.	-7866-1SØ	2	0	0	0	0.00
522.	-2SØ	16	0	0	0	0.00
523.	-3SØ	47	0	0	0	0.00
524.	-7869-1SØ	2	0	0	0	0.00
525.	-2SØ	20	0	0	0	0.00
526.	-3SØ	17	0	1	1	5.88
527.	-4SØ	2	0	0	0	0.00
528.	-5SØ	38	0	0	0	0.00
529.	-6SØ	39	0	0	0	0.00
530.	ICP-7882-1SØ	-	-	-	-	-
531.	-2SØ	-	-	-	-	-
532.	-3SØ	-	-	-	-	-
533.	ICP-7883-1SØ	4	0	2	2	50.00
534.	-7884-1SØ	3	0	0	0	0.00
535.	-2SØ	2	0	0	0	0.00

contd.

1	2	3	4	5	6	7
536.	ICP-7905-1S⊗	1	0	0	0	0.00
537.	-7907-1S⊗	9	1	2	3	33.33
538.	-7921-1S⊗	2	0	1	1	50.00
539.	-7938-1S⊗	45	4	0	4	8.88
540.	-7969-1S⊗	-	-	-	-	-
541.	-7973-1S⊗	79	2	0	2	2.53
542.	-2S⊗	56	1	0	1	1.78
543.	-7974-1S⊗	20	1	0	1	5.00
544.	-2S⊗	36	0	0	0	0.00
545.	-3S⊗	20	0	0	0	0.00
546.	-4S⊗	16	1	0	1	6.25
547.	-5S⊗	13	0	0	0	0.00
548.	ICP-7979-1S⊗	-	-	-	-	-
549.	-2S⊗	29	0	0	0	0.00
550.	-3S⊗	28	0	0	0	0.00
551.	ICP-7979-4S⊗	34	0	2	2	5.88
552.	-5S⊗	9	0	0	0	0.00
553.	ICP-7980-1S⊗	1	0	0	0	0.00
554.	-2S⊗	30	0	6	6	20.00
555.	-3S⊗	23	0	0	0	0.00
556.	-4S⊗	78	0	0	0	0.00
557.	-5S⊗	38	0	0	0	0.00
558.	-6S⊗	33	0	1	1	3.03
559.	ICP-7981-1S⊗	12	0	1	1	8.33
560.	-2S⊗	21	0	0	0	0.00
561.	-3S⊗	32	0	0	0	0.00
562.	-4S⊗	20	0	0	0	0.00
563.	-5S⊗	-	-	-	-	-
564.	ICP-7982-1S⊗	30	0	0	0	0.00
565.	-2S⊗	70	0	0	0	0.00
566.	-3S⊗	2	0	0	0	0.00
567.	-4S⊗	-	-	-	-	-
568.	-5S⊗	20	0	0	0	0.00
569.	-6S⊗	-	-	-	-	-
570.	-7S⊗	38	0	0	0	0.00
571.	-8S⊗	1	0	0	0	0.00
572.	ICP-7984-1S⊗	35	0	0	0	0.00
573.	-2S⊗	20	0	0	0	0.00
574.	-3S⊗	6	0	0	0	0.00
575.	-4S⊗	45	1	0	1	2.22
576.	-5S⊗	35	0	0	0	0.00
577.	-6S⊗	32	0	0	0	0.00
578.	-7S⊗	-	-	-	-	-
579.	-8S⊗	43	0	0	0	0.00
580.	ICP-7987-1S⊗	25	0	0	0	0.00

contd.

1	2	3	4	5	6	7
581.	ICP-7987-2S⊗	22	0	0	0	0.00
582.	-3S⊗	20	0	0	0	0.00
583.	-4S⊗	-	-	-	-	-
584.	ICP-7988-1S⊗	29	0	0	0	0.00
585.	-2S⊗	13	0	0	0	0.00
586.	-3S⊗	13	0	0	0	0.00
587.	ICP-7989-1S⊗	3	0	0	0	0.00
588.	-2S⊗	6	0	0	0	0.00
589.	-3S⊗	40	0	0	0	0.00
590.	ICP-7991-1S⊗	15	0	0	0	0.00
591.	-2S⊗	35	0	0	0	0.00
592.	-3S⊗	50	0	0	0	0.00
593.	-4S⊗	37	2	0	2	5.40
594.	ICP-7992-1S⊗	48	0	0	0	0.00
595.	-2S⊗	-	-	-	-	-
596.	-3S⊗	19	0	0	0	0.00
597.	ICP-7993-1S⊗	30	0	0	0	0.00
598.	-2S⊗	35	0	0	0	0.00
599.	-3S⊗	27	0	0	0	0.00
600.	ICP-7995-1S⊗	-	-	-	-	-
601.	-2S⊗	-	-	-	-	-
602.	-3S⊗	24	0	0	0	0.00
603.	-4S⊗	-	-	-	-	-
604.	ICP-8001-1S⊗	-	-	-	-	-
605.	-2S⊗	20	0	0	0	0.00
606.	-3S⊗	-	-	-	-	-
607.	-4S⊗	7	0	0	0	0.00
608.	ICP-8002-1S⊗	5	0	0	0	0.00
609.	-2S⊗	16	0	0	0	0.00
610.	-3S⊗	13	0	0	0	0.00
611.	-4S⊗	-	-	-	-	-
612.	-5S⊗	-	-	-	-	-
613.	-6S⊗	-	-	-	-	-
614.	-7S⊗	-	-	-	-	-
615.	ICP-8003-1S⊗	36	0	0	0	0.00
616.	-2S⊗	-	-	-	-	-
617.	-3S⊗	32	0	0	0	0.00
618.	-4S⊗	50	0	0	0	0.00
619.	-5S⊗	9	0	0	0	0.00
620.	-6S⊗	37	0	0	0	0.00
621.	-7S⊗	32	0	0	0	0.00
622.	-8S⊗	43	0	0	0	0.00
623.	-9S⊗	40	0	0	0	0.00
624.	-10S⊗	26	0	0	0	0.00
625.	ICP-8004-1S⊗	29	0	0	0	0.00

contd.

1	2	3	4	5	6	7
626	ICP-8004-2SØ	-	-	-	-	-
627	-3SØ	34	0	0	0	0.00
628	-4SØ	36	0	0	0	0.00
629	-5SØ	22	0	0	0	0.00
630	-6SØ	34	0	0	0	0.00
631	ICP-8005-1SØ	26	0	0	0	0.00
632	-2SØ	23	0	0	0	0.00
633	-3SØ	27	0	0	0	0.00
634	-4SØ	31	0	0	0	0.00
635	-5SØ	5	0	0	0	0.00
636	-6SØ	10	0	0	0	0.00
637	-7SØ	1	0	0	0	0.00
638	-8SØ	-	-	-	-	-
639	-9SØ	-	-	-	-	-
640	ICP-8006-1SØ	-	-	-	-	-
641	-2SØ	-	-	-	-	-
642	-3SØ	1	0	0	0	0.00
643	-4SØ	11	0	0	0	0.00
644	-5SØ	30	0	0	0	0.00
645	-6SØ	24	0	0	0	0.00
646	ICP-8008-1SØ	13	0	0	0	0.00
647	-2SØ	-	-	-	-	-
648	-3SØ	27	0	0	0	0.00
649	-4SØ	37	0	0	0	0.00
650	-5SØ	38	0	0	0	0.00
651	-6SØ	61	0	0	0	0.00
652	-7SØ	71	0	0	0	0.00
653	-8SØ	42	0	0	0	0.00
654	-9SØ	-	-	-	-	-
655	ICP-8011-1SØ	28	2	0	2	7.14
656	-3SØ	40	0	1	1	2.50
657	ICP-8012-1SØ	83	0	0	0	0.00
658	-2SØ	57	0	0	0	0.00
659	ICP-8015-1SØ	-	-	-	-	-
660	-2SØ	-	-	-	-	-
661	-3SØ	-	-	-	-	-
662	ICP-8026-1SØ	53	0	2	2	3.77
663	-2SØ	41	0	0	0	0.00
664	ICP-8028-1SØ	14	0	0	0	0.00
665	-2SØ	2	0	0	0	0.00
666	-3SØ	3	0	0	0	0.00
667	-4SØ	1	0	0	0	0.00
668	ICP-8031-1SØ	42	0	0	0	0.00
669	-2SØ	19	0	0	0	0.00
670	-3SØ	22	0	0	0	0.00

contd

1	2	3	4	5	6	7
671.	ICP-8031-4S0	76	0	1	1	1.31
672.	-8040-1S0	-	-	-	-	-
673.	-2S0	-	-	-	-	-
674.	-3S0	7	0	1	1	14.28
675.	-4S0	56	0	0	0	0.00
676.	-5S0	58	0	0	0	0.00
677.	ICP-8043-1S0	41	0	1	1	2.43
678.	-8044-1S0	12	0	0	0	0.00
679.	-2S0	11	0	0	0	0.00
680.	-3S0	33	0	0	0	0.00
681.	-4S0	43	0	0	0	0.00
682.	-5S0	34	0	0	0	0.00
683.	-6S0	47	0	0	0	0.00
684.	ICP-8048-1S0	-	-	-	-	-
685.	-2S0	13	0	0	0	0.00
686.	-3S0	-	-	-	-	-
687.	ICP-8062-1S0	26	0	0	0	0.00
688.	-2S0	47	0	0	0	0.00
689.	-3S0	21	0	0	0	0.00
690.	-4S0	1	0	0	0	0.00
691.	ICP-8064-1S0	2	1	0	1	50.00
692.	-2S0	2	0	0	0	0.00
693.	-3S0	50	0	0	0	0.00
694.	-4S0	8	0	0	0	0.00
695.	-5S0	37	0	0	0	0.00
396.	-6S0	34	0	0	0	0.00
697.	-7S0	29	0	0	0	0.00
698.	ICP-8070-1S0	-	-	-	-	-
699.	-2S0	18	0	0	0	0.00
700.	-3S0	23	0	0	0	0.00
701.	-4S0	14	0	0	0	0.00
702.	ICP-8070-5S0	48	0	0	0	0.00
703.	-6S0	66	0	0	0	0.00
704.	-7S0	55	0	0	0	0.00
705.	ICP-8071-1S0	49	0	0	0	0.00
706.	-2S0	52	0	0	0	0.00
707.	-3S0	-	-	-	-	-
708.	ICP-8072-1S0	-	-	-	-	-
709.	-2S0	-	-	-	-	-
710.	-3S0	15	0	0	0	0.00
711.	-4S0	63	0	0	0	0.00
712.	-5S0	4	0	0	0	0.00
713.	ICP-8073-1S0	5	0	0	0	0.00
714.	-2S0	1	0	0	0	0.00
715.	-3S0	9	0	0	0	0.00

contd.

1	2	3	4	5	6	7
716	ICP-8073-4SØ	25	0	0	0	0.00
717.	-8074-1SØ	11	0	1	1	9.09
718.	-2SØ	17	0	0	0	0.00
719	-3SØ	13	0	1	1	7.69
720.	ICP-8077-1SØ	26	0	0	0	0.00
721	-2SØ	18	0	0	0	0.00
722	-3SØ	18	0	0	0	0.00
723	-4SØ	12	0	0	0	0.00
724	-5SØ	14	0	0	0	0.00
725.	-6SØ	50	0	0	0	0.00
726	-7SØ	48	0	0	0	0.00
727.	-8SØ	12	0	0	0	0.00
728.	ICP-8080-1SØ	31	7	6	13	41.93
729.	-2SØ	39	13	3	16	41.02
730.	ICP-8081-1SØ	12	0	11	11	91.66
731.	-2SØ	43	1	18	19	44.18
732.	ICP-8082-1SØ	1	1	0	1	100.00
733.	-2SØ	13	5	5	10	76.92
734.	ICP-8083-1SØ	13	2	0	2	15.38
735.	-2SØ	4	4	0	4	100.00
736.	ICP-8088-1SØ	-	-	-	-	-
737.	-2SØ	43	1	0	1	2.32
738.	ICP-8091-1SØ	36	0	0	0	0.00
739.	-2SØ	49	9	3	12	24.48
740.	-3SØ	11	0	0	0	0.00
741.	-4SØ	41	0	0	0	0.00
742.	-5SØ	5	2	0	2	40.00
743.	ICP-8096-5SØ	50	9	10	19	38.00
744.	-8097-1SØ	64	14	13	27	42.18
745	-2SØ	40	13	4	17	42.50
746	-3SØ	41	8	14	22	53.65
747	-4SØ	49	3	11	14	28.57
748.	-5SØ	50	7	0	7	14.00
749.	ICP-8100-1SØ	31	0	0	0	0.00
750	-2SØ	26	0	2	2	7.69
751.	-3SØ	41	0	0	0	0.00
752.	-4SØ	22	0	0	0	0.00
753.	ICP-8091-1SØ	19	0	0	0	0.00
754.	-8092-1SØ	41	1	0	1	2.43
755.	-2SØ	23	0	0	0	0.00
756.	-3SØ	20	2	1	3	15.00
757.	-4SØ	21	0	0	0	0.00
758.	-5SØ	45	0	4	4	8.88
759.	ICP-8096-1SØ	51	1	0	1	1.96
760.	-2SØ	35	1	0	1	2.85

contd.

1	2	3	4	5	6	7
761.	ICP-8096-3SØ	22	4	0	4	18.18
762.	-4SØ	21	3	0	3	14.28
763.	ICP-8100-4SØ	15	0	0	0	0.00
764.	-5SØ	31	0	0	0	0.00
765.	ICP-8105-1SØ	27	2	0	2	7.40
766.	-2SØ	28	0	0	0	0.00
767.	-3SØ	36	0	0	0	0.00
768.	-4SØ	37	1	0	1	2.70
769.	-5SØ	14	0	0	0	0.00
770.	ICP-8107-1SØ	18	0	0	0	0.00
771.	-2SØ	20	0	0	0	0.00
772.	-3SØ	29	0	0	0	0.00
773.	-4SØ	25	0	0	0	0.00
774.	-5SØ	7	0	0	0	0.00
775.	ICP-8109-1SØ	10	4	0	4	40.00
776.	-2SØ	24	4	0	4	16.66
777.	-3SØ	24	0	0	0	0.00
778.	-4SØ	26	0	0	0	0.00
779.	-5SØ	22	4	0	4	18.18
780.	ICP-8110-1SØ	33	0	0	0	0.00
781.	-2SØ	35	2	0	2	5.71
782.	-3SØ	20	2	0	2	10.00
783.	-4SØ	23	4	0	4	17.39
784.	-5SØ	16	2	0	2	12.50
785.	ICP-8114-1SØ	13	2	0	2	15.38
786.	-2SØ	12	0	0	0	0.00
787.	-3SØ	10	0	0	0	0.00
788.	-4SØ	36	1	0	1	2.77
789.	-5SØ	18	0	0	0	0.00
790.	ICP-8116-1SØ	8	0	0	0	0.00
791.	-2SØ	32	0	0	0	0.00
792.	-3SØ	41	2	0	0	0.00
793.	-4SØ	15	0	0	0	0.00
794.	-5SØ	13	0	0	0	0.00
795.	ICP-8117-1SØ	7	0	0	0	0.00
796.	-2SØ	10	0	0	0	0.00
797.	-3SØ	15	0	0	0	0.00
798.	-4SØ	9	0	0	0	0.00
799.	-5SØ	25	1	0	1	4.00
800.	ICP-8118-1SØ	10	0	0	0	0.00
801.	-2SØ	14	0	0	0	0.00
802.	-3SØ	19	0	0	0	0.00
803.	-4SØ	32	0	0	0	0.00
804.	-5SØ	9	0	0	0	0.00
805.	ICP-8119-1SØ	28	0	0	0	0.00

1	2	3	4	5	6	7
806	ICP-8119-2SØ	37	0	0	0	0.00
807	-3SØ	22	5	0	5	22.72
808	-4SØ	32	3	0	3	9.37
809	-5SØ	22	1	0	1	4.54
810	ICP-8123-1SØ	46	1	0	1	2.17
811	-2SØ	29	0	0	0	0.00
812	-3SØ	15	0	0	0	0.00
813	-4SØ	15	6	0	6	40.00
814	-5SØ	17	0	0	0	0.00
815	ICP-8124-1SØ	16	0	0	0	0.00
816	-2SØ	1	0	0	0	0.00
817	-3SØ	4	0	0	0	0.00
818	-4SØ	19	0	0	0	0.00
819	-5SØ	7	0	0	0	0.00
820	ICP-8125-1SØ	27	5	0	5	18.51
821	-2SØ	30	3	0	3	10.00
822	-3SØ	51	2	11	13	25.49
823	-4SØ	33	7	0	7	21.21
824	-5SØ	14	1	0	1	7.14
825	ICP-8126-1SØ	21	5	0	5	23.80
826	-2SØ	39	3	24	27	69.23
827	-3SØ	58	7	2	9	17.30
828	-4SØ	31	3	12	15	48.38
829	-5SØ	34	0	13	13	38.23
830	ICP-8129-1SØ	26	0	0	0	0.00
831	-2SØ	35	4	0	4	11.42
832	-3SØ	27	0	0	0	0.00
833	-4SØ	26	0	0	0	0.00
834	-5SØ	50	6	1	7	14.00
835	ICP-8131-1SØ	16	2	0	2	12.50
836	-2SØ	16	1	0	1	6.25
837	ICP-8132-3SØ	34	2	0	2	5.88
838	-4SØ	21	2	2	4	19.04
839	-5SØ	6	2	0	2	33.33
840	ICP-8135-1SØ	34	0	0	0	0.00
841	-2SØ	27	0	0	0	0.00
842	-3SØ	44	0	0	0	0.00
843	-4SØ	19	0	0	0	0.00
844	-5SØ	50	9	2	11	22.00
845	-6SØ	32	8	1	9	28.12
846	ICP-8153-1SØ	30	0	0	0	0.00
847	-2SØ	18	0	0	0	0.00
848	-3SØ	28	0	0	0	0.00
849	-4SØ	49	7	0	7	14.28
850	-5SØ	48	13	0	13	27.08

contd.

1	2	3	4	5	6	7
851.	ICP-8156-1S0	38	8	14	22	57.89
852.	-2S0	57	4	17	21	36.84
853.	-3S0	49	4	2	6	12.24
854.	-4S0	29	3	8	11	37.93
855.	-5S0	34	10	3	13	38.23
856.	ICP-8158-1S0	43	0	0	0	0.00
857.	-2S0	35	6	5	11	31.42
858.	-3S0	31	0	0	0	0.00
859.	-4S0	49	0	2	2	4.08
860.	ICP-8166-1S0	23	2	10	12	52.17
861.	-2S0	26	0	11	11	42.30
862.	-3S0	34	2	16	18	52.94
863.	-4S0	47	19	23	42	89.36
864.	-5S0	35	8	16	24	68.57
865.	ICP-8168-1S0	45	11	25	36	80.00
866.	-8205-1S0	39	4	12	16	41.02
867.	-8212-1S0	83	11	39	50	60.24
868.	-2S0	51	7	18	25	49.01
869.	-3S0	7	2	0	2	28.57
870.	ICP-8215-1S0	34	1	3	4	11.76
871.	-8216-1S0	14	0	0	0	0.00
872.	-2S0	36	0	0	0	0.00
873.	-3S0	43	24	5	29	67.44
874.	-4S0	14	0	0	0	0.00
875.	-5S0	31	0	0	0	0.00
876.	ICP-8221-1S0	17	0	0	0	0.00
877.	-2S0	25	0	0	0	0.00
878.	-3S0	20	1	0	1	5.00
879.	ICP-8229-1S0	15	0	0	0	0.00
880.	-2S0	34	0	0	0	0.00
881.	ICP-8230-1S0	22	4	0	4	18.18
882.	-2S0	36	4	0	4	11.11
883.	ICP-8231-1S0	33	12	2	14	42.42
884.	-2S0	34	25	0	25	73.52
885.	-3S0	39	15	0	15	38.46
886.	-4S0	37	18	0	18	48.64
887.	-5S0	22	9	0	9	40.90
888.	ICP-8240-1S0	18	3	0	3	16.66
889.	-8247-1S0	9	1	0	1	11.11
890.	-2S0	23	4	7	11	47.82
891.	-3S0	48	3	13	16	33.33
892.	ICP-8257-1S0	6	0	0	0	0.00
893.	-2S0	43	11	1	12	27.00
894.	-3S0	35	10	0	10	28.57
895.	-4S0	6	2	4	6	100.00

contd

1	2	3	4	5	6	7
896	ICP-8258-1S0	11	4	1	5	45.45
897	-2S0	18	0	0	0	0.00
898	-3S0	34	12	6	18	52.94
899	ICP-8262-1S0	15	1	14	15	100.00
900	-2S0	24	2	0	2	8.33
901	ICP-8263-1S0	44	5	4	9	22.45
902	ICP-8266-1S0	34	12	0	12	35.29
903	-2S0	15	10	4	14	93.33
904	-3S0	6	2	2	4	66.66
905	-4S0	11	0	0	0	0.00
906	-5S0	40	2	1	3	7.50
907	ICP-8268-1S0	35	10	4	14	40.00
908	-8273-1S0	29	1	20	21	72.41
909	-8276-1S0	36	1	0	1	2.77
910	-2S0	21	0	0	0	0.00
911	-3S0	31	2	0	2	6.45
912	ICP-8277-1S0	9	1	0	1	11.11
913	-2S0	5	3	0	3	60.00
914	ICP-8282-1S0	31	7	11	18	58.06
915	-8285-1S0	53	0	0	0	0.00
916	-2S0	38	0	0	0	0.00
917	ICP-8286-1S0	14	3	0	3	21.42
918	-8289-1S0	19	5	0	5	26.31
919	-2S0	20	5	0	5	25.00
920	-3S0	28	0	0	0	0.00
921	ICP-8299-1S0	17	5	0	5	29.41
922	-2S0	16	4	7	11	68.75
923	-3S0	35	8	12	20	57.14
924	-4S0	18	2	0	2	11.11
925	ICP-8301-1S0	41	0	0	0	0.00
926	-2S0	19	3	10	13	68.42
927	-3S0	28	2	0	2	7.14
928	ICP-8304-1S0	27	15	3	18	66.66
929	-2S0	30	12	2	14	46.66
930	-3S0	25	7	1	8	32.00
931	-4S0	19	4	0	4	21.05
932	ICP-8308-1S0	51	22	0	22	43.13
933	-2S0	29	6	15	21	72.41
934	ICP-8316-1S0	29	0	0	0	0.00
935	-2S0	10	1	0	1	10.00
936	-3S0	37	0	12	12	32.43
937	-4S0	17	0	0	0	0.00
938	ICP-8317-1S0	37	0	0	0	0.00
939	-2S0	32	2	0	2	6.25
940	-3S0	27	0	0	0	0.00

contd.

1	2	3	4	5	6	7
941.	ICP-8317-4SØ	36	16	0	16	44.44
942.	-8318-1SØ	32	8	11	19	59.37
943.	-8319-1SØ	24	0	0	0	0.00
944.	ICP-8319-2SØ	55	0	0	0	0.00
945.	-8325-1SØ	30	0	0	0	0.00
946.	-2SØ	33	0	0	0	0.00
947.	ICP-8326-1SØ	38	0	0	0	0.00
948.	-2SØ	43	2	0	2	4.65
949.	-3SØ	52	0	0	0	0.00
950.	-4SØ	30	0	0	0	0.00
951.	-5SØ	20	0	0	0	0.00
952.	-6SØ	27	0	0	0	0.00
953.	-7SØ	28	0	0	0	0.00
954.	ICP-8330-1SØ	25	11	0	11	44.00

APPENDIX-XXVI

Results of screening of advanced selections of germplasm for sterility mosaic resistance during 1978-79

Sl No.	ICP No.	No. of plants	Infected plants	Percent infection
1	2	3	4	5
1.	ICP-85-1-4-1SØ	10	0	0.00
2.	-2SØ			
3.	-3SØ			
4.	-4SØ	21	0	0.00
5.	-5SØ	32	0	0.00
6.	-6SØ	32	0	0.00
7	-7SØ	27	0	0.00
8.	-8SØ	12	0	0.00
9.	-9SØ	19	0	0.00
10.	-10SØ	38	2	5.26
11.	-11SØ	34	0	0.00
12.	-12SØ	31	0	0.00
13.	-13SØ	21	0	0.00
14	ICP-504-1-4-S1Ø	31	1	33.00
15	-S2Ø	33	1	3.03
16.	-S3Ø	36	0	0.00
17.	-S4Ø	36	0	0.00
18.	-S5Ø	14	0	0.00
19	-S6Ø	26	0	0.00
20.	-S7Ø	41	0	0.00
21	-S8Ø	38	0	0.00
22.	-S9Ø	30	0	0.00
23.	-S10Ø	28	0	0.00
24	-S11Ø	51	0	0.00
25	-S12Ø	40	0	0.00
26	-S13Ø	38	0	0.00
27	-S14Ø	42	0	0.00
28.	-S15Ø	29	0	0.00
29.	-S16Ø	45	0	0.00
30.	-S17Ø	42	0	0.00
31	-S18Ø	32	0	0.00
32	-S19Ø	34	0	0.00
33.	-S20Ø	36	0	0.00
34	-S21Ø	38	0	0.00
35.	-S22Ø	37	0	0.00
36	ICP-2795-1-1-S1Ø	41	2	4.87
37.	-S2Ø	-	-	-
38.	-S3Ø	22	1	4.54
39.	-S4Ø	37	1	2.70
40.	-S5Ø	19	2	10.52

contd.

1	2	3	4	5
41.	ICP-2795-1-1-S6⊗	15	1	6.66
42.	-S7⊗	20	2	10.00
43.	-S8⊗	19	5	26.31
44.	-S9⊗	30	3	10.00
45.	-S10⊗	25	2	8.00
46.	-S11⊗	12	0	0.00
47.	-S12⊗	30	3	10.00
48.	-S13⊗	16	1	6.25
49.	-S14⊗	28	1	3.57
50.	-S15⊗	12	0	0.00
51.	-S16⊗	29	0	0.00
52.	-S17⊗	38	0	0.00
53.	ICP-2795-1-5-S1⊗	4	0	0.00
54.	-S1⊗	2	0	0.00
55.	-S2⊗	10	2	20.00
56.	-S3⊗	3	1	33.33
57.	-S4⊗	14	2	14.28
58.	-S5⊗	12	3	25.00
59.	-S6⊗	13	0	0.00
60.	-S7⊗	49	1	2.04
61.	-S8⊗	36	0	0.00
62.	-S9⊗	18	0	0.00
63.	-S10⊗	34	0	0.00
64.	-S11⊗	27	0	0.00
65.	-S12⊗	30	3	10.00
66.	-S13⊗	39	2	5.12
67.	-S14⊗	30	0	0.00
68.	-S15⊗	16	0	0.00
69.	-S16⊗	16	0	0.00
70.	-S17⊗	21	0	0.00
71.	-S18⊗	37	0	0.00
72.	ICP-2828-1-1-S1⊗	15	0	0.00
73.	-S2⊗	26	0	0.00
74.	-S3⊗	36	0	0.00
75.	-S4⊗	19	0	0.00
76.	-S5⊗	31	0	0.00
77.	-S6⊗	23	0	0.00
78.	-S7⊗	26	0	0.00
79.	-S8⊗	21	1	4.76
80.	-S9⊗	36	0	0.00
81.	ICP-7249-1-4-S1⊗	35	0	0.00
82.	-S2⊗	21	0	0.00
83.	-S3⊗	18	4	22.22
84.	-S4⊗	18	3	16.66
85.	-S5⊗	32	4	12.50

contd.

1	2	3	4	5
86	ICP-7249-1-4-S6Ø	16	0	0.00
87	-S7Ø	-	-	-
88.	-S8Ø	21	1	4.76
89	-S9Ø	23	0	0.00
90.	-S10Ø	31	5	16.12
91.	-S11Ø	10	2	20.00
92.	-S12Ø	18	12	66.66
93.	-S13Ø	12	0	0.00
94.	-S14Ø	19	0	0.00
95.	-S15Ø	19	2	10.52
96.	-S16Ø	10	0	0.00
97.	ICP-7249-1-7-S1Ø	18	2	11.11
98	-S2Ø	8	0	0.00
99	-S3Ø	10	1	10.00
100.	-S4Ø	13	1	7.69
101.	-S5Ø	10	2	20.00
102.	-S6Ø	10	0	0.00
103.	-S7Ø	21	0	0.00
104.	-S8Ø	11	0	0.00
105	-S9Ø	13	0	0.00
106.	-S10Ø	27	0	0.00
107.	ICP-7197-3-S1Ø	32	0	0.00
108.	-S2Ø	15	0	0.00
109.	-S3Ø	11	9	81.81
110	-S4Ø	39	12	30.76
111.	-S5Ø	40	7	17.50
112	-S6Ø	34	1	2.94
113.	-S7Ø	17	0	0.00
114.	-S7Ø	10	0	0.00
115.	-S8Ø	33	0	0.00
116.	-S9Ø	19	5	26.31
117.	-S10Ø	44	15	34.09
118.	-S11Ø	46	0	0.00
119.	-S12Ø	36	2	5.55
120.	-S13Ø	24	0	0.00
121.	-S14Ø	21	5	23.80
122.	-S15Ø	28	0	0.00
123.	-S16Ø	29	2	6.89
124	-S17Ø	17	7	41.17
125.	-S18Ø	14	1	7.14
126	-S19Ø	26	2	7.69
127.	ICP-7197-7-S1Ø	12	0	0.00
128.	-S2Ø	4	0	0.00
129.	-S3Ø	4	0	0.00
130	-S4Ø	12	0	0.00

contd.

1	2	3	4	5
131.	ICP-7197-7-S50	22	0	0 00
132	-8-S10	30	0	0 00
133.	-S20	15	0	0 00
134.	-S30	22	1	4 54
135.	-S40	8	0	0 00
136.	-S50	23	0	0 00
137.	-S60	13	0	0 00
138.	-S70	13	0	0 00
139.	-S80	17	0	0 00
140.	-S90	36	0	0 00
141.	-S100	25	0	0 00
142.	-S110	12	0	0 00
143.	-S120	31	0	0 00
144.	-S130	32	0	0 00
145.	-S140	16	0	0 00
146.	-S150	43	0	0 00
147.	-S160	12	0	0 00
148.	-S170	19	0	0 00
149.	-S180	22	0	0 00
150.	ICP-7197-11-S10	44	0	0 00
151	-S20	25	1	4 00
152	-S30	19	0	0 00
153.	-S40	21	0	0 00
154.	-S50	21	0	0 00
155	ICP-7197-16-S10	35	0	0 00
156.	-S20	15	0	0 00
157.	-S30	20	0	0 00
158	-S40	34	0	0 00
159.	-S50	36	0	0 00
160	-S60	45	0	0 00
161.	-S70	33	0	0 00
162.	-S80	13	0	0 00
163	-S90	30	0	0 00
164	-S100	36	0	0 00
165	-S110	39	0	0 00
166	ICP-7197-33-S10	25	0	0 00
167.	-S20	29	0	0 00
168.	-S30	31	0	0 00
169	-S40	35	0	0 00
170.	-S50	36	0	0 00
171	ICP-7197-36-S10	11	0	0 00
172.	-S20	38	0	0 00
173	-S30	32	0	0 00
174	-S40	31	0	0 00
175	-S50	33	0	0 00

contd

1	2	3	4	5
76	ICP-7197-36-S60	3	0	0.00
77	-S70	28	0	0.00
178	-S80	33	0	0.00
179	-S90	26	0	0.00
180	-S100	19	0	0.00
181	ICP-7197-37-S10	8	0	0.00
182	-S20	26	1	3.84
183	-S50	37	0	0.00
184	-S60	38	0	0.00
185	-S70	24	0	0.00
186	-S80	21	0	0.00
187	-S90	49	0	0.00
188	ICP-7197-42-S10	39	0	0.00
189	-S20	51	0	0.00
190	-S30	36	0	0.00
191	-S40	45	0	0.00
192	-S50	35	0	0.00
193	ICP-7197-52-S10	29	0	0.00
194	-S20	42	0	0.00
195	-S30	27	0	0.00
196	-S40	30	0	0.00
197	-S50	27	0	0.00
198	-S60	29	0	0.00
199	-S70	16	0	0.00
200	-S80	24	0	0.00
201	-S90	49	0	0.00
202	-S100	37	0	0.00
203	-S110	31	0	0.00
204	-S120	10	0	0.00
205	-S130	4	0	0.00
206	-S140	16	0	0.00
207	-S150	25	0	0.00
208	-S160	15	0	0.00
209	-S170	14	0	0.00
210	-S180	5	0	0.00
211	-S190	14	0	0.00
212	-S200	14	0	0.00
213	-S210	15	0	0.00
214	ICP-7249-1-S10	13	0	0.00
215	-S20	31	0	0.00
216	-S30	16	0	0.00
217	-S40	36	1	2.77
218	-S50	14	0	0.00
219	ICP-7353-2-S10	8	0	0.00
220	-S10	27	0	0.00

contd.

1	2	3	4	5
221	ICP-7353-2-S20	48	0	0.00
222	-S30	37	0	0.00
223	-S40	37	0	0.00
224	-S50	10	0	0.00
225	-S60	34	0	0.00
226	-S70	50	0	0.00
227	-S80	41	0	0.00
228	-S90	33	0	0.00
229	ICP-7353-5-S10	11	0	0.00
230	-S20	27	0	0.00
231	-S30	3	0	0.00
232	ICP-7403-10-S10	11	0	0.00
233	-S20	16	0	0.00
234	-S30	5	0	0.00
235	ICP-7445-5-S10	35	6	17.14
236	-S20	29	0	0.00
237	-S30	41	0	0.00
238	-S40	8	0	0.00
239	-S50	12	0	0.00
240	ICP-7445-13-S10	3	0	0.00
241	-S20	33	0	0.00
242	ICP-7873-8-S10	47	0	0.00
243	-S20	34	0	0.00
244	-S30	12	0	0.00
245	-S40	23	0	0.00
246	ICP-8043-8-S10	34	0	0.00
247	-S20	43	0	0.00
248	-S30	29	0	0.00
249	-S40	2	0	0.00
250	-S50	34	0	0.00
251	-S60	39	0	0.00
252	ICP-8042-10-S10	30	0	0.00
253	-S20	25	0	0.00
254	-S30	7	0	0.00
255	-S40	23	0	0.00
256	-S50	36	0	0.00
257	ICP-8051-2-S10	11	1	9.09
258	-S20	6	0	0.00
259	-S30	1	0	0.00
260	-S40	4	0	0.00
261	-S50	13	0	0.00
262	-S60	10	0	0.00
263	-S70	17	1	5.88
264	-S80	6	0	0.00
265	-S90	4	0	0.00
266	-S100	4	1	25.00
267	-S110	7	0	0.00

contd

1	2	3	4	5
268	ICP-8051-2-S12⊗	1	0	0.00
269	-3-S1⊗	1	0	0.00
270	-S2⊗	10	0	0.00
271	-S3⊗	10	0	0.00
272	-S4⊗	11	0	0.00
273	-S5⊗	23	4	17.39
274	-S6⊗	19	4	21.05
275	-S7⊗	-	-	-
276	-S8⊗	10	0	0.00
277	-S9⊗	5	0	0.00
278	-S10⊗	13	3	23.07
279	-S11⊗	14	1	7.14
280	-S12⊗	9	0	0.00
281	-S13⊗	21	0	0.00
282	-S14⊗	15	0	0.00
283	ICP-8120-1-S1⊗	46	1	2.17
284	-S2⊗	43	0	0.00
285	-S3⊗	38	0	0.00
286	-S4⊗	34	0	0.00
287	-S5⊗	60	0	0.00
288	-S6⊗	61	0	0.00
289	-S7⊗	44	0	0.00
290	-S8⊗	33	0	0.00
291	-S9⊗	34	0	0.00
292	-S10⊗	34	0	0.00
293	-S11⊗	57	0	0.00
294	-S12⊗	47	0	0.00
295	-S13⊗	31	0	0.00
296	-S14⊗	19	0	0.00
297	-S15⊗	33	0	0.00
298	-S16⊗	45	0	0.00
299	ICP-8121-1-S1⊗	47	0	0.00
300	-S2⊗	18	0	0.00
301	-S3⊗	20	1	5.00
302	-S4⊗	47	1	2.12
303	-S5⊗	26	0	0.00
304	-S6⊗	33	0	0.00
305	-S7⊗	16	0	0.00
306	-S8⊗	47	2	4.25
307	-S9⊗	20	0	0.00
308	ICP-3940-1-S1⊗	35	0	0.00
309	-S2⊗	39	0	0.00
310	-S3⊗	25	0	0.00
311	-S4⊗	16	0	0.00
312	-S5⊗	46	0	0.00

contd.

1	2	3	4	5
313	ICP-3940-1-S60	20	0	0 00
314	-S70	25	0	0 00
315	-S80	31	0	0 00
316	-S90	12	0	0 00
317	ICP-4537-1-S10	11	0	0 00
318	ICP-4765-2-S10	17	0	0 00
319	-S20	16	0	0 00
320	-S30	15	0	0.00
321	-S40	34	0	0 00
322	-S50	46	0	0 00
323	-S60	20	0	0 00
324	-S70	25	0	0 00
325	-S80	31	0	0 00
326	-S90	44	0	0 00
327	-S100	32	0	0 00
328	ICP-4765-3-S10	18	0	0 00
329	-S20	15	1	6 66
330	-S30	7	0	0 00
331	-S40	9	0	0 00
332	-S50	25	0	0 00
333	-S60	36	0	0 00
334	-S70	18	1	5 55
335	-S80	24	0	0 00
336	-S90	38	3	7 89
337	-S100	26	0	0 00
338	ICP-5436-2-S10	16	1	6 25
339	-S20	19	0	0 00
340	ICP-5444-1-S10	60	7	11 66
341	-S20	26	2	7 69
342	-S30	25	0	0 00
343	-S40	33	0	0 00
344	-S50	43	1	44 00
345	ICP-5444-2-S10	8	0	0 00
346	-S20	30	0	0 00
347	-S30	36	6	16 66
348	-S40	19	3	15 78
349	-S50	23	0	0 00
350	-S60	28	0	0 00
351	-S70	59	0	0 00
352	-S80	33	0	0 00
353	-S90	32	0	0 00
354	-S100	42	0	0 00
355	-S110	37	0	0 00
356	-S120	25	2	8 00

contd

1	2	3	4	5
357	ICP-5445-1-S1⊗	42	0	0.00
358	-S2⊗	26	2	7.69
359.	-S3⊗	1	0	0.00
360	-S4⊗	21	0	0.00
361.	-S5⊗	38	2	5.26
362	-S6⊗	36	0	0.00
363.	-S7⊗	21	0	0.00
364	-S8⊗	44	1	2.27
365.	-S9⊗	18	0	0.00
366.	ICP-5729-1-S1⊗	28	1	3.57
367.	-S2⊗	15	0	0.00
368.	-S3⊗	7	0	0.00
369	-S4⊗	28	1	3.57
370.	-S5⊗	14	0	0.00
371.	-S6⊗	30	0	0.00
372.	-S7⊗	31	1	3.22
373.	-S8⊗	14	0	0.00
374.	-S9⊗	20	0	0.00
375.	-S10⊗	50	0	0.00
376	-S11⊗	12	0	0.00
377.	ICP-5729-2-S1⊗	13	1	7.69
378.	-S2⊗	17	1	5.88
379.	-S3⊗	4	0	0.00
380.	-S4⊗	4	0	0.00
381.	-S5⊗	13	0	0.00
382.	-S6⊗	25	3	12.00
383	-S7⊗	14	1	7.14
384.	-S8⊗	20	3	15.00
385.	-S9⊗	15	0	0.00
386.	-S10⊗	17	0	0.00
387.	-S11⊗	46	2	4.87
388.	-S12⊗	10	1	10.00
389.	-S13⊗	8	0	0.00
390.	ICP-6559-1-S1⊗	24	0	0.00
391.	-S2⊗	3	0	0.00
392.	-S3⊗	11	0	0.00
393.	-S4⊗	24	0	0.00
394.	-S5⊗	20	1	5.00
395	ICP-6806-1-S1⊗	28	0	0.00
396.	-S2⊗	14	0	0.00
397.	-S3⊗	17	0	0.00
298	-S4⊗	27	0	0.00
299.	-S5⊗	29	0	0.00
400.	-S6⊗	27	0	0.00

contd.

1	2	3	4	5
401	ICP-6806-1-S70	26	0	0 00
402	-S80	23	0	0 00
403	ICP-7185-1-S10	22	0	0 00
404	-S20	12	0	0 00
405	-S30	26	0	0 00
406	-S40	6	0	0 00
407	-S50	2	0	0 00
408	-S60	5	0	0 00
409	-S70	14	0	0 00
410	-S80	6	0	0 00
411	-S90	13	0	0 00
412	-S90	6	0	0 00
413	ICP-7185-2-S10	39	0	0.00
414	-S20	28	0	0 00
415	-S30	28	0	0.00
416	-S40	19	0	0 00
417	-S50	6	0	0 00
418	-S60	15	0	0 00
419	ICP-7185-5-S10	13	0	0 00
420	-S20	22	0	0 00
421	-S30	12	0	0 00
422	-S40	21	0	0 00
423	-S50	22	0	0 00
424	-S60	25	0	0 00
425	ICP-7187-2-S10	6	0	0 00
426	-S20	6	0	0 00
427	-S30	15	0	0 00
428	-S40	12	0	0 00
429	-S50	19	0	0 00
430	-S60	6	0	0 00
431	-S70	10	0	0 00
432	-S80	4	0	0 00
433	-S90	3	0	0 00
434	-S100	13	0	0 00
435	-S110	14	0	0 00
436	-S120	16	0	0.00
437	ICP-7217-2-S10	13	0	0 00
438	-S20	26	0	0 00
439	-S30	13	0	0 00
440	-S40	1	0	0 00
441	-S50	2	0	0 00
442	-S60	5	0	0 00
443	-S70	4	0	0 00
444	-S80	-	-	-
445	-S90	7	0	0 00
446	-S100	6	0	0.00

contd

	2	3	4	5
447	ICP-7217-3-S10	25	4	16.00
448	-S20	19	0	0.00
449	-S30	2	0	0.00
450	-S40	11	0	0.00
451	-S50	7	0	0.00
452	-S60	8	0	0.00
453	-S70	10	0	0.00
454	ICP-7221-1-S10	3	0	0.00
455	-S20	3	0	0.00
456	-S30	11	0	0.00
457.	-S40	13	0	0.00
458.	-S50	8	0	0.00
459	-S60	9	0	0.00
460.	-S70	5	0	0.00
461	-S80	10	0	0.00
462	ICP-7221-2-S10	29	0	0.00
463	-S20	14	0	0.00
464	-S30	16	0	0.00
465.	-S40	18	0	0.00
466	ICP-8021-2-S10	10	0	0.00
467	-S20	14	0	0.00
468	-S30	1	0	0.00
469.	-S40	7	0	0.00

APPENDIX-XXVII

Results of screening of pigeonpea material for inheritance of resistance to sterility mosaic during 1978-79

Sl. No.	Particular	Total plants	Infected plants		
			Immune	Ring spot	Severe mosaic
1	2	3	4	5	6
1.	ICP-2376	18	0	18	0
2.	-6986-4	8	8	0	0
3.	C.NO-75102(2376 x 6986)RS-1(F_2)	17	14	3	0
	BDN-1	5	0	0	5
4.	C.NO-75102(2376 x 6986)RS-2	33	31	2	0
5.	-3	33	31	2	0
6.	-4	3	3	0	0
7.	-5	34	27	4	3
8.	-6	19	14	5	0
9.	-7	14	11	3	0
10.	-8	3	3	0	0
11.	-9	3	2	1	0
12.	-10	1	1	0	0
13.	-11	2	2	0	0
	BDN-1	11	0	0	11
14	-12	5	4	1	0
15.	-13	2	2	0	0
16.	-14	1	1	0	0
17.	-15	1	1	0	0
18.	-16		No germination		
19	-17	1	0	1	0
20	-18	1	1	0	0
21.	-19		No germination		
22.	-20	1	0	0	1
23.	-21	2	2	0	0
	BDN-1	4	0	0	4
24.	-22		No germination		
25.	-23		No germination		
26	-24	2	2	0	0
27	-25	16	15	1	0
28.	-26	3	2	1	0
29.	-27	2	1	0	1
30	-28	8	6	2	0
31.	-29	14	10	4	0
32	-30	1	0	1	0
	BDN-1	29	0	0	29
33.	-31	5	4	0	1

Contd.

1	2	3	4	5	6
34	C NO-75102(2376 x 6986)RS-32	2	2	0	0
35	-33	1	1	0	0
36	-34	15	7	6	2
37	-35	5	4	1	0
38	-36		No germination		
39	-37	17	14	3	0
40	-38	18	10	8	0
41	-39	12	9	1	2
	BDN-1	7	0	0	7
42	-40	9	8	1	0
43	-41	4	3	1	0
44	-42	10	8	2	0
45	-43	16	14	0	2
46	-44	13	11	2	0
47	-45	31	30	1	0
48	-46	4	4	0	0
49	-47	8	6	2	0
50.	-48	4	3	1	0
51	-49	9	7	2	0
	BDN-1	10	0	0	10
52	-50	15	9	5	1
53	C.NO-77022(2376 x 6986)x2376)B_1^1-1	2	1	1	0
54	B_1^1-2		No germination		
55	C.NO-77054(2376x(2376 x 6986)B_1^1-R1	1	1	0	0
56	B_1^1-R2	2	1	1	0
57	3		No germination		
58	4		No germination		
59	5	4	0	4	0
	BDN-1	9	0	0	9
60	C.NO-77021[(2376 x 6986)x 6986-4] B_1^1-1	3	2	1	0
61	-2	3	1	2	0
62	-3		No germination		
63	-4		No germination		
64	C.NO-77055[6986-6 x (2376x6986)] B_1^2- R1	2	2	0	0
65	- 2	5	4	1	0

Contd.

1	2	3	4	5	6
66	ICP-3782	7	7	0	0
67	ICP-2376	4	0	4	0
68	76078 [3782 x 2376]R-1	4	4	0	0
	BDN-1	30	0	0	30
69	76078 [3782 x 2376]R-2	8	8	0	0
70	77023[(3782 x 2376) x 3782] B_1^1-1		No germination		
71	-2	1	1	0	0
72	77056 [3782 x (3782 x 2376)] B_1^1-R1		No germination		
73	-R2		No germination		
	BDN-1	19	0	0	19
74	C NO-77056 [3782 x (3782 x 2376)]B_1^1-R3		No germination		
75	-R4		No germination		
76	C NO-77024[(3782 x 2376) x 2376]B_1^2-1	1	1	0	0
77	-2	1	1	0	0
78	77057 [2376 x (3782 x 2376)] B_1^2-R1	1	0	1	0
79	-R2		No germination		
80	ICP-8113	4	4	0	0
81	ICP 2376	2	0	2	0
82	76074 [8113 x 2376] R-1	19	15	4	0
	BDN-1	12	0	0	12
83	77025 [(8113 x 2376) x 8113] B_1^1-1	4	4	0	0
84	-2	2	2	0	0
85	77058[8113 x (8113 x 2376)] B_1^1-R1	19	18	1	0
86	-R2	6	6	0	0
87	77026 [(8113 x 2376) x 2376] B_1^2-1	3	2	1	0
88	-2	3	2	1	0
89	77059 [2376 x (8113 x 2376)] B_1^2-R1	5	4	1	0
90	-R2	9	6	3	0
	BDN-1	15	0	0	15

Contd

1	2	3	4	5	6
91	ICP-2376	6	8	0	0
92	ICP-8113	11	11	0	0
93	76083 [2376 x 8113] RS-1	19	13	6	0
94	-2	14	3	10	1
95	-3	35	28	7	0
96	-4	32	20	12	0
97	-5	47	24	17	0
98	-6	27	24	3	0
99	-7	15	10	5	0
100	-8	18	14	4	0
	BDN-1	18	0	0	18
101	-9	26	18	8	0
102.	-10	11	9	0	2
103	-11	31	26	5	0
104	-12	18	12	6	0
105	-13	24	20	4	0
106	-14	28	22	6	0
107.	-15	31	17	14	0
108.	-16	18	11	7	0
109	-17	36	21	15	0
110	-18	6	2	3	1
111	C.NO-75102 (2376 x 6986)RS-4	1	1	0	0
112	C.NO-75102 (2376 x 6986)RS-10		No germination		
	BDN-1		No germination		
113	C.NO-76083 [2376 x 8113]RS-18		No germination		
114	-19	19	13	6	0
115	-20	15	10	5	0
116	-21	23	9	14	0
117	-22	35	19	16	0
118	-23	44	16	28	0
119	-24	40	25	10	5
120.	-25	51	27	24	0
121	-26	24	14	10	0
122	-27	32	16	16	0
	BDN-1	45	0	0	45
123	-28	27	14	13	0
124	-29	15	15	0	0
125	-30	75	39	35	1
126	-31	62	25	36	1
127	-32	54	31	23	0
128	-33	43	28	15	0
129.	-34	135	99	32	4
130	-35	57	19	37	1

Contd.

1	2		3	4	5	6
131	C.NO-76083 [2376 x 8113]	RS-36	86	41	45	0
132		-37	59	25	32	2
	BDN-1		39	0	0	39
133	C.NO-76083 [2376 x 8113]	RS-38	40	12	27	1
134.		-39	14	4	10	0
135		-40	18	3	15	0
136		-41	18	6	11	1
137.		-42	32	7	22	3
138		43	89	33	51	5
139.		-44	39	14	25	0
140.		-45	43	17	25	1
141		46	46	21	25	0
	BDN-1		17	0	0	17
142	76083 [2376 x 8113]	-47	9	1	4	4
143		48	8	0	8	0
144		-49	8	3	5	0
145		-50	5	2	3	0
146	77027 [2376 x 8113] x 2376 -	B_1^1-1	10	3	7	0
147.		-2	9	1	8	0
148.		-3	7	1	6	0
149.		-4	1	0	1	0
150.	77060 [2376 x (2376 x 8113)]-	B_1^1-QM	5	0	5	0
	BDN-1		8	0	0	8
151	77028 [(2376 x 8113) x 8113]	B_2^1-1	16	10	6	0
152		-2	16	16	0	0
153.		-3	7	5	2	0
154		-4	10	10	0	0
155.	77061 [8113 x (2376 x 8113)]-	B_2^1-R1	22	22	0	0
156		-R2	20	20	0	0
157		-R3	10	8	2	0
158.	TTB 7		1	1	0	0
159	7035			No germination		
160	77062 (TTB - 7 x 7035)		3	3	0	0
	BDN-1		9	0	0	9

Contd

1	2	3	4	5	6
161	77063 (7035 x TTB-7)	4	4	0	0
162.	7197-9	4	4	0	0
163	7035	4	4	0	0
164	77070 (7197-9 x 7035)	20	19	0	1
165	77071 (7035 x 7197-9)	28	28	0	0
	BDN-1	25	0	0	25
166	7445-12	4	4	0	0
167	7035	3	3	0	0
168	77078 (7445-12 x 7035)	20	18	2	0
169	77079 (7035 x 7445-12)	22	22	0	0
170	7353-2		No germination		
171	7035	2	2	0	0
172.	77086 (7353-2 x 7035)	16	16	0	0
	BDN-1	6	0	0	6
173.	77087 (7035 x 7353-2)	16	16	0	0
174.	7088-2	2	0	2	0
175.	7035	15	15	0	0
176.	77094 (7088-2 x 7035)	14	0	14	0
177.	77095 (7035 x 7088-2)	36	32	4	0
178	999	3	3	0	0
179	7035	5	5	0	0
	BDN-1	10	0	0	10
180	77107 (999 x 7035)	29	25	4	0
181.	77103 (7035 x 999)	17	17	0	0
182	7173-1	1	0	1	0
183	7035	1	1	0	0
184	77110 (7173-1 x 7035)	11	11	0	0
185	77111 (7035 x 7173-1)	11	11	0	0
	BDN-1	34	0	0	34
186	TTB-7	1	1	0	0
187	2376	1	1	0	0
188	77064 (TTB-7 x 2376)	5	5	0	0
189	77065 (2376 x TTB-7)	16	16	0	0
190	7197-9	2	2	0	0
191.	2376	1	1	0	0
192	77072 (7197-9 x 2376)	10	1	9	0
	BDN-1	10	0	0	10
193	77073 (2376 x 7197-9)	15	0	15	0
194	7445-12	6	2	4	0
195.	2376	17	0	17	0
196	77080 (7445-12 x 2376)	44	41	3	0
197	77081 (2376 x 7445-12)	49	45	4	0

Contd.

1	2	3	4	5	6
198	7353-2	5	5	0	0
199	2376	4	0	4	0
	BDN 1	17	0	0	17
200	77088(7353- 2 x 2376)	26	26	0	0
201	77089 (2376 x 7353-2)	24	24	0	0
202	7088-2	5	0	5	0
203	2376	4	0	4	0
204	77096 (7088 2 x 2376)	27	0	27	0
205	77096 (2376 x 7088-2)	10	0	10	0
	BDN-1	15	0	0	15
206	999	6	6	0	0
207	2376	1	0	1	0
208	77104 (999 x 2376)	73	0	70	3
209	77105 (2376 x 999)	67	0	66	1
210	7173-1	1	0	1	0
211	2376	14	0	14	0
212	77112 (7173-1 x 2376)	36	3	33	0
	BDN-1	15	0	0	15
213	77113 (2376 x 7173 1)	18	0	18	0
214	TTB-7	20	20	0	0
215	3783 (Ia-275)	2	2	0	0
216	77066 (TTB-7 x 3783)	1	1	0	0
217	77067 (3783 x TTB-7)	8	8	0	0
	BDN-1	13	0	0	13
218	7197-9	5	5	0	0
219	3783		No germination		
220	77074 (7197-9 x 3783)	20	20	0	0
221	77075 (3783 x 7197 9)	11	11	0	0
222	7445-12	15	15	0	0
223	3783	3	3	0	0
224	77062(7445-12 x 3783)	55	55	0	0
	BDN-1	17	0	0	17
225	77083 (3783 x 7445) 12	18	18	0	0
226	7353-2	4	4	0	0
227	3783	2	2	0	0
228	77090(7353 2 x3783)	54	54	0	0
229	77091 (3783 x 7353-2)	17	17	0	0
230	7088 2	1	0	1	0
	BDN-1	23	0	0	23
231	3783	3	3	0	0
232	77098 (7088-2 x 3783)	44	28	14	2

Contd

1	2	3	4	5	6
233	77099 (3783 x 7088-2)	39	39	0	0
234	999		No germination		
235	3783	1	1	0	0
236	77106 (999 x 3783)	25	24	1	0
237	77107 (3783 x 999)	23	23	0	0
	BDN-1	4	0	0	4
238	7173-1	3	0	3	0
239	3783		No germination		
240	77114(7173-1 x 3783)	11	11	0	0
241	77115 (2783 x 717301)	2	2	0	0
242	TTB-7	1	1	0	0
243	Hy-3C	11	9	1	1
244	77068 (TTB-7 x Hy-3C)	2	2	0	0
	BDN-1	13	0	0	13
245	77069 (Hy-3C x TTB-7)	10	10	0	0
246	7197-9	3	3	0	0
247	Hy-3C	6	6	0	0
248.	77076 (7197-9 x Hy-3C)	15	15	0	0
249.	77077 (Hy-3C x 7197-9)	14	14	0	0
	BDN-1	26	0	0	26
250	7445-12	3	2	1	0
251	Hy-3C	1	1	0	0
252	77084 (7445-12 x Hy-3C)	26	26	0	0
253	77085 (Hy-3C x 7445-12)	67	67	0	0
254	7353-2	3	3	0	0
255	Hy-3C		No germination		
256	77092 (7353-2 x Hy-3C)	14	14	0	0
	BDN-1	15	0	0	15
257	77093 (Hy-3C x 7353-2)	8	8	0	0
258	7088-2	8	0	8	0
259	Hy-3C	1	1	0	0
260	77100 (7088-2 x Hy-3C)	9	9	0	0
261	77101 (Hy-3C x 7088-2)	12	12	0	0
	BDN-1	7	0	0	7
262	999	44	0	42	2
263	Hy-3C	2	2	0	0
264	77108 (999 x Hy-3C)	35	32	3	0
265	77109 (Hy-3C x 999)	73	72	0	1
266	7173-1	2	0	2	0
267	Hy-3C	6	6	0	0
268	77116 (7173-1 x Hy-3C)	23	19	4	0
269	77117 (Hy-3C x 7173-1)	56	54	2	0

Contd.

1	2	3	4	5	6
	BDN-1	32	0	0	32
270	2376	8	0	8	0
271	8113	10	10	0	0
272.	77037 (2376 X 8113)	157	150	7	0
273	77038 (8113 X 2376)	60	60	0	0
274.	2376	10	0	10	0
275.	BDN-1	13	0	0	13
	BDN-1	40	0	0	40
276.	77039 (2376 X BDN-1)	55	0	0	55
277.	77033 (BDN-1 X 2376)	88	0	0	88
278.	3783-Ja-275	6	6	0	0
279.	BDN-1	40	0	0	40
280	77040 (3783 X BDN-1)	19	15	0	4
281	77034 (BDN-1 X 3783)	10	7	0	3
	BDN-1	23	0	0	23
282.	7035	7	7	0	0
283.	BDN-1	40	0	0	40
284.	77041 (7035 X BDN-1	13	11	0	2
285	77035 (BDN-1 X 7035)	26	23	0	3
286	6997	6	6	0	0
287	BDN-1	5	0	0	5
288.	77118 (6997 X BDN-1)	33	15	0	18
	BDN-1	19	0	0	19
289	77036 (BDN-1 X 6997)	43	0	0	43
290	2376	12	0	12	0
291	2836-1-ØB (8798-77K)	6	0	0	6
292.	77136 (2376 X 2836-1-ØB)	2	0	0	2
293	6997	12	12	0	0
294	TTB-7	3	3	0	0
295	77137 (6997 X TTB-7)	59	59	0	0
	BDN-1	31	0	0	31
296	2376	5	0	5	0
297	7173-2	33	25	8	0
298	77135 (2376 X 7173-2)	15	0	15	0
299.	76080 (2376 X 3782) RS-1	10	1	7	2
300	-2	17	0	17	0
301	-3	28	27	1	0
302	-4	5	0	5	0
303	-5	1	1	0	0
304.	-6	9	5	3	1
305.	-7	8	7	1	0
306.	-8	29	29	0	0

contd

1	2	3	4	5	6
	BDN-1	33	0	0	33
307.	76082 (2376 X 7942) R-1	16	16	0	0
308.	-2	33	29	3	1
309.	-3	20	19	1	0
310.	-4	16	13	1	2
311.	-5	31	29	2	0
312.	-6	19	13	5	1
313.	-7	42	39	2	1
314.	-8	16	12	4	0
315.	-9	10	9	1	0
316.	-10	6	4	2	0
	BDN-1	16	0	0	16

APPENDIX-XXVIII

Results of screening of F_3 progenies of pigeonpea from 1977-78 sterility mosaic nursery for sterility mosaic resistance during 1978-79

Sl No	Particular	No of plants	Infected plants	Percent incidence
1	2	3	4	5
	ICP-102-P1	27	13	48 14
1	C No 75209-F_2B-S10	14	0	0 00
2	-S20	-	-	-
3	-S30	13	0	0 00
4	-S40	4	0	0 00
5	-S50	-	-	-
6	-S60	1	0	0 00
7	-S70	3	0	0 00
8	-S80	3	0	0 00
	BDN-1	3	3	100 00
9	C No 75209-F_2B-S90	1	0	0 00
10	-S100			
11	-S110			
12	-S120	6	1	16 66
13	-S130	2	0	0 00
14	-S140	2	0	0 00
15	-S150	7	0	0 00
16	-S160	3	0	0 00
17	-S170	4	0	0 00
18	-S180	9	0	0 00
19	-S190	21	11	52 38
	BDN-1	11	11	100 00
20	C No 75209-F_2B-S200	19	0	0 00
21	-S210	2	0	0 00
22	-S220	2	0	0 00
23	-S230	9	0	0 00
24	-S240	44	0	0 00
25	-S250	8	0	0 00
26	-S260	13	0	0 00
27	-S270	21	0	0 00
28	-S280	5	0	0 00
29	-S290	17	0	0 00
30	-S300	8	0	0 00
	BDN-1	5	5	100 00
31	C No 75209-F_2B-S310	3	0	0 00
32	-S320	3	0	0 00
33	-S330	6	0	0 00
34	-S340	11	0	0 00
35	-S350	1	0	0 00

contd

1	2	3	4	5
36.	C.No.75209-F_2B-S36⊠	1	0	0.00
37.	-S37⊠	11	0	0.00
38.	-S38⊠	9	0	0.00
39	-S39⊠	3	0	0.00
40.	-S40⊠	1	0	0.00
41.	-S41⊠	4	0	0.00
42	-S42⊠	4	0	0.00
	BDN-1	7	7	100.00
43.	C.No.75209-F_2B-S43⊠	17	2	11.76
44.	-S44⊠	19	0	0.00
45.	-S45⊠	14	0	0.00
46.	-S46⊠	16	0	0.00
47.	-S47⊠	31	0	0.00
48.	-S48⊠	15	0	0.00
49.	-S49⊠	16	0	0.00
50.	-S50⊠	5	0	0.00
51.	-S51⊠	6	0	0.00
	BDN-1	9	8	88.88
52.	C.No.75209-F_2B-S52⊠	3	0	0.00
53.	-S53⊠	13	1	7.69
54.	-S54⊠	1	0	0.00
55	-S55⊠	14	0	0.00
56.	-S56⊠	1	0	0.00
57.	ICP-6891-P2	20	7	35.00
58.	C.No.75248-F_2B-S1⊠	9	0	0.00
59	-S2⊠	4	0	0.00
60	-S3⊠	9	0	0.00
61	-S4⊠	10	0	0.00
62	-S5⊠	1	0	0.00
63.	-S6⊠	11	0	0.00
	BDN-1	2	2	100.00
64.	C.No.75248-F_2B-S7⊠	1	0	0.00
65.	-S8⊠	5	0	0.00
66.	-S9⊠	7	0	0.00
67	-S10⊠	-	-	-
68.	-S11⊠	-	-	-
69.	-S12⊠	1	0	0.00
70.	-S13⊠	1	0	0.00
71.	-S14⊠	1	0	0.00
72.	-S15⊠	1	0	0.00
73	-S16⊠	21	0	0.00
74	-S17⊠	16	0	0.00
	BDN-1	8	8	100.00
75	C.No.75248-F_2B-S18⊠	2	0	0.00

contd.

1	2	3	4	5
76	C.No.75248-F_2B-S190	10	0	0.00
77	-S200	2	0	0.00
78	-S210	14	0	0.00
79	-S220	5	0	0.00
80	-S230	6	0	0.00
81	-S240	0	0	0.00
82	-S250	8	0	0.00
83	-S260	1	0	0.00
	BDN-1	1	1	100.00
84	C.No.75248-F_2B-S270	5	0	0.00
85	-S280	7	0	0.00
86	-S290	4	0	0.00
87	-S300	9	0	0.00
88	-S310	13	0	0.00
89	-S320	1	0	0.00
90	-S330	7	0	0.00
91	-S340	11	0	0.00
92	-S350	1	0	0.00
93	-S360	4	0	0.00
	BDN-1	1	1	100.00
94	C.No.75248-F_2B-S370	2	0	0.00
95	-S380	-	-	-
96	-S390	6	0	0.00
97	-S400	-	-	-
98	-S410	7	0	0.00
99	-S420	2	0	0.00
100	-S430	4	0	0.00
101	-S440	21	0	0.00
102	-S450	6	0	0.00
	BDN-1	9	9	100.00
103	C.No.75248-F_2B-S460	14	0	0.00
104	-S470	19	0	0.00
105	-S480	19	0	0.00
106	-S490	21	0	0.00
107	-S500	15	0	0.00
108	-S510	5	0	0.00
109	-S520	18	0	0.00
110	-S530	18	0	0.00
111	-S540	17	0	0.00
112	-S550	26	0	0.00
	BDN-1	8	8	100.00
113	C.No.75248-F_2B-S560	10	0	0.00
114	-S570	13	0	0.00
115	-S580	13	0	0.00
116	-S590	11	0	0.00
117	-S600	-	-	-

contd

1	2	3	4	5
118	C.No.75248-F_2B-S61⊗	15	0	0.00
119	-S62⊗	44	0	0.00
120	-S63⊗	9	0	0.00
121	-S64⊗	7	0	0.00
122	-S65⊗	21	0	0.00
	BDN-1	6	6	100.00
123	C.No.75248-F_2B-S66⊗	8	0	0.00
124	-S67⊗	9	0	0.00
125	-S68⊗	23	0	0.00
126	-S69⊗	7	0	0.00
127	-S70⊗	13	0	0.00
128	-S71⊗	5	0	0.00
129	-S72⊗	5	0	0.00
130	-S73⊗	12	0	0.00
131	-S74⊗	9	0	0.00
	BDN-1	3	3	100.00
132	C.No.75248-F_2B-S75⊗	12	0	0.00
133	-S76⊗	32	0	0.00
134	-S77⊗	17	0	0.00
135	-S78⊗	11	1	9.09
136	-S79⊗	13	0	0.00
137	-S80⊗	3	0	0.00
138	-S81⊗	5	0	0.00
139	-S82⊗	6	0	0.00
140	-S83⊗	5	0	0.00
141	ICP-6891-P2	32	20	62.50
	BDN-1	4	4	100.00
142	ICP-3783-3-20P1	2	0	0.00
143	C.No.75443-F_2B-S1⊗	6	0	0.00
144	-S2⊗	-	-	-
145	-S3⊗	2	0	0.00
146	-S4⊗	-	-	-
147	-S5⊗	3	0	0.00
148	-S6⊗	17	0	0.00
149	-S7⊗	14	0	0.00
150	-S8⊗	15	0	0.00
151	-S9⊗	1	0	0.00
152	-S10⊗	6	0	0.00
153	-S11⊗	1	0	0.00
	BDN-1	4	4	100.00
154	C.No.75443-F_2B-S12⊗	17	0	0.00
155	-S13⊗	28	0	0.00
156	-S14⊗	1	0	0.00
157	-S15⊗	2	0	0.00
158	-S16⊗	11	0	0.00

contd.

1	2	3	4	5
159	C.No.75443-F_2B-S170	-	-	-
160	-S180	-	-	-
161	-S190	15	0	0.00
162	-S200	5	0	0.00
163	-S210	1	0	0.00
	BDN-1	3	3	100.00
164	C.No.75443-F_2B-S220	12	0	0.00
165	-S230	5	0	0.00
166	-S240	10	1	10.00
167	-S250	-	-	-
168	-S260	2	0	0.00
169	-S270	8	0	0.00
170	-S280	3	0	0.00
171	-S290	6	0	0.00
172	-S300	11	0	0.00
173	-S310	12	0	0.00
	BDN-1	7	7	100.00
174	C.No.75443-F_2B-S320	10	0	0.00
175	-S330	6	0	0.00
176	-S340	15	1	6.66
177	-S350	21	0	0.00
178	-S360	23	0	0.00
179	-S370	23	0	0.00
180	-S380	6	0	0.00
181	-S390	6	0	0.00
182	-S400	32	0	0.00
	BDN-1	10	10	100.00
183	C.No.75443-F_2B-S410	25	0	0.00
184	-S420	22	0	0.00
185	-S430	12	0	0.00
186	-S440	6	0	0.00
187	-S450	13	0	0.00
188	-S460	6	0	0.00
189	-S470	18	0	0.00
190	-S480	5	0	0.00
191	-S490	2	0	0.00
192	-S500	16	0	0.00
	BDN-1	2	2	100.00
193	C.No.75443-F_2B-S510	8	0	0.00
194	-S520	9	0	0.00
195	-S530	20	0	0.00
196	-S540	11	0	0.00
197	-S550	12	0	0.00
198	-S560	5	0	0.00
199	-S570	25	2	8.00
200	-S580	5	0	0.00

1	2	3	4	5
201	C.No.75443-F_2B-S59⊗	8	0	0.00
202.	-S60⊗	12	0	0.00
203	-S61⊗	20	0	0.00
	BDN-1	16	16	100.00
204.	C.No.75443-F_2B-S62⊗	21	0	0.00
205	-S63⊗	20	0	0.00
206.	-S64⊗	7	0	0.00
207.	-S65⊗	24	0	0.00
208.	-S66⊗	28	0	0.00
209	-S67⊗	3	0	0.00
210	-S68⊗	23	3	13.04
211.	-S69⊗	21	0	0.00
212.	-S70⊗	25	3	12.00
213	-S71⊗	7	0	0.00
	BDN-1	16	16	100.00
214.	C.No.75443-F_2B-S72⊗	16	4	25.00
215.	-S73⊗	12	0	0.00
216.	-S74⊗	11	0	0.00
217.	-S75⊗	10	0	0.00
218.	-S76⊗	14	0	0.00
219.	-S77⊗	6	1	16.66
220.	-S78⊗	12	0	0.00
221.	-S79⊗	3	1	33.33
222.	-S80⊗	-	-	-
223.	-S81⊗	5	4	80.00
	BDN-1	3	3	100.00
224.	C.No.75443-F_2B-S82⊗	5	0	0.00
225.	-S83⊗	7	0	0.00
226.	-S84⊗	4	0	0.00
227.	-S85⊗	4	0	0.00
228.	-S86⊗	15	0	0.00
229.	-S87⊗	12	1	6.66
230.	-S88⊗	2	0	0.00
231.	-S89⊗	4	0	0.00
232.	-S90⊗	12	0	0.00
233.	-S91⊗	6	0	0.00
	BDN-1	5	5	100.00
234.	C.No.75443-F_2B-S92⊗	13	2	15.38
235.	ICP-6891-P2	20	16	80.00
236.	ICP-7035-45-27-S20⊗P1	3	1	33.33
237.	C.No.75229-F_2B-S1⊗	6	0	0.00
238.	-S2⊗	8	0	0.00
239.	-S3⊗	1	0	0.00
240.	-S4⊗	2	0	0.00

contd.

1	2	3	4	5
241	C.No 75229-F_2B-S50	4	0	0 00
242.	-S60	2	0	0 00
243.	-S70	13	0	0.00
244	-S80	2	0	0.00
245.	-S90	9	0	0 00
246.	-S100	17	0	0 00
	BDN-1	4	4	100 00
247.	C.No 75229-F_2B-S110	13	0	0 00
248	-S120	8	3	37 50
249.	-S130	1	0	0 00
250.	-S140	9	0	0 00
251.	-S150	9	0	0 00
252.	-S160	1	0	0 00
253	-S170	1	0	0 00
254	-S180	3	0	0 00
255.	-S190	-	-	-
256.	-S200	8	0	0 00
	BDN-1	2	2	100 00
257	C.No 75229-F_2B-S210	6	0	0 00
258.	-S220	2	0	0 00
259.	-S230	10	0	0 00
260.	-S240	4	0	0 00
261.	-S250	3	0	0 00
262.	-S260	13	4	30 76
263.	-S270	6	0	0 00
264.	-S280	15	1	6 66
265.	-S290	-	-	-
266.	-S300	24	0	0 00
	BDN-1	8	8	100 00
267	C.No 75229-F_2B-S310	12	0	0 00
268.	-S320	3	0	0 00
269	-S330	12	0	0 00
270	-S340	9	0	0.00
271.	-S350	19	0	0 00
272.	-S360	9	0	0 00
273	-S370	18	1	5 55
274.	-S380	12	0	0 00
275.	-S390	18	0	0 00
276.	-S400	5	0	0 00
	BDN-1	10	10	100 00
277.	C No 75229-F_2B-S410	6	0	0 00
278	-S420	3	0	0 00
279.	-S430	1	0	0 00
280.	-S440	13	4	30 76

1	2	3	4	5
281	C.No.75229-F_2B-S45⊗	17	5	29.41
282.	-S46⊗	11	0	0.00
283.	-S47⊗	5	0	0.00
284.	-S48⊗	8	0	0.00
285.	-S49⊗	12	0	0.00
286.	-S50⊗	14	0	0.00
287.	-S51⊗	16	0	0.00
	BDN-1	8	8	100.00
288.	C.No.75229-F_2B-S52⊗	5	0	0.00
289.	-S53⊗	31	0	0.00
290	-S54⊗	4	0	0.00
291.	-S55⊗	14	0	0.00
292.	-S56⊗	22	0	0.00
293.	-S57⊗	21	0	0.00
294.	-S58⊗	6	0	0.00
295.	-S59⊗	23	0	0.00
296.	-S60⊗	31	0	0.00
	BDN-1	6	6	100.00
397.	C.No.75229-F_2B-S61⊗	22	0	0.00
298.	-S62⊗	-	-	-
299.	-S63⊗	12	0	0.00
300.	-S64⊗	1	0	0.00
301.	-S65⊗	10	0	0.00
302.	-S66⊗	3	0	0.00
303.	-S67⊗	15	0	0.00
304.	-S68⊗	19	0	0.00
305.	-S69⊗	3	0	0.00
306.	-S70⊗	6	0	0.00
	BDN-1	1	1	100.00
307.	C.No.75229-F_2B-S71⊗	7	0	0.00
308.	ICP-6929-P2	1	1	100.00
309.	ICP-6997-139-12-P1	21	0	0.00
310.	C.No.75268-F_2B-S1⊗	25	0	0.00
311.	-S2⊗	26	0	0.00
312.	-S3⊗	5	0	0.00
313.	-S4⊗	27	0	0.00
314.	-S5⊗	23	0	0.00
315.	-S6⊗	23	0	0.00
316.	-S7⊗	23	0	0.00
	BDN-1	1	1	100.00
317.	C.No.75268-F_2B-S8⊗	15	0	0.00
318.	-S9⊗	19	0	0.00
319.	-S10⊗	19	0	0.00
320.	-S11⊗	21	0	0.00
321.	-S12⊗	27	0	0.00
322.	-S13⊗	16	0	0.00
323.	-S14⊗	25	2	8.00

contd.

1	2	3	4	5
324	C No 75268-F_2B-S150	23	0	0.00
325	-S160	38	0	0.00
326	-S170	14	0	0.00
	BDN-1	22	22	100.00
327	C No 75268-F_2B-S180	13	0	0.00
328	-S190	22	0	0.00
329	-S200	19	0	0.00
330	-S210	23	1	4.34
331	-S220	21	0	0.00
332	-S230	7	0	0.00
333	-S240	24	0	0.00
334	-S250	20	0	0.00
335	-S260	3	0	0.00
336	-S270	12	0	0.00
	BDN-1	3	3	100.00
337	C No 75268-F_2B-S280	14	0	0.00
338	-S290	22	0	0.00
339	-S300	27	0	0.00
340	-S310	4	1	25.00
341	-S320	11	0	0.00
342	-S330	21	0	0.00
343	-S340	13	0	0.00
344	-S350	2	0	0.00
345	-S360	47	0	0.00
	BDN-1	19	17	89.47
346	C No 75268-F_2B-S370	38	0	0.00
347	-S380	13	0	0.00
348	-S390	20	0	0.00
349	-S400	20	2	10.00
350	-S410	19	1	5.26
351	-S420	11	0	0.00
352	-S430	28	0	0.00
353	-S440	25	0	0.00
354	-S450	16	0	0.00
355	-S460	22	2	9.09
	BDN-1	18	18	100.00
356	C No 75268-F_2B-S470	40	0	0.00
357	-S480	37	0	0.00
358	-S490	49	0	0.00
359	-S500	39	0	0.00
360	-S510	24	0	0.00
361	-S520	36	3	8.33
362	-S530	12	0	0.00
363	-S540	26	0	0.00
364	-S550	19	4	21.05
365	-S560	14	0	0.00

contd

1	2	3	4	5
366.	C.No.75268-F_2B-S57⊗	37	0	0.00
	BDN-1	16	16	100.00
367.	C.No.75268-F_2B-S58⊗	21	6	28.57
368.	-S59⊗	18	0	0.00
369.	-S60⊗	16	0	0.00
370.	-S61⊗	23	0	0.00
371.	ICP-6929-P2	26	25	96.15
372.	ICP-3783-3-20-P1	1	0	0.00
373.	C.No.75463-F_2B-S1⊗	13	0	0.00
374.	-S2⊗	5	0	0.00
375.	-S3⊗	10	2	20.00
376.	-S4⊗	11	1	9.09
	BDN-1	14	14	100.00
377.	C.No.75463-F_2B-S5⊗	28	2	7.14
378.	-S6⊗	18	0	0.00
379.	-S7⊗	5	0	0.00
380.	-S8⊗	8	0	0.00
381.	-S9⊗	8	0	0.00
382.	-S10⊗	18	0	0.00
383.	-S11⊗	16	2	12.50
384.	-S12⊗	31	0	0.00
385.	-S13⊗	2	0	0.00
386.	-S14⊗	27	0	0.00
387.	-S15⊗	22	0	0.00
	BDN-1	19	19	100.00
388.	C.No.75463-F_2B-S16⊗	9	0	0.00
389.	-S17⊗	3	1	33.33
390.	-S18⊗	5	0	0.00
391.	-S19⊗	8	0	0.00
392.	-S20⊗	16	0	0.00
393.	-S21⊗	25	0	0.00
394.	-S22⊗	3	0	0.00
395.	-S23⊗	22	0	0.00
396.	-S24⊗	5	0	0.00
397.	-S25⊗	8	0	0.00
398.	-S26⊗	9	0	0.00
399.	-S27⊗	3	0	0.00
	BDN-1	10	10	100.00
400.	C.No.75463-F_2B-S28⊗	3	0	0.00
401.	-S29⊗	3	0	0.00
402.	-S30⊗	3	0	0.00
403.	-S31⊗	29	0	0.00
404.	-S32⊗	29	4	13.79
405.	-S33⊗	8	0	0.00

contd.

1	2	3	4	5
406	C.No.75463-F$_2$B-S340	15	2	13.33
407	-S350	1	0	0.00
408	-S360	3	0	0.00
409	-S370	-	-	-
	BDN-1	8	8	100.00
410	C.No.75463-F$_2$B-S380	11	0	0.00
411	-S390	4	0	0.00
412	-S400	-	-	-
413	-S410	2	0	0.00
414	-S420	7	1	14.29
415	-S430	2	0	0.00
416	-S440	11	0	0.00
417	-S450	8	0	0.00
418	-S460	12	0	0.00
419	-S470	18	0	0.00
420	-S480	18	0	0.00
	BDN-1	5	5	100.00
421	C.No.75463-F$_2$B-S490	22	0	0.00
422	-S500	11	0	0.00
423	ICP-6929-P$_2$	17	17	100.00
424	ICP-7035-45-27-P1	2	0	0.00
425	C.No.75236-F$_2$B-S10	2	0	0.00
426	-S20	5	0	0.00
427	-S30	5	0	0.00
428	-S40	1	0	0.00
429	-S50	3	0	0.00
430	-S60	11	0	0.00
431	-S70	1	0	0.00
	BDN-1	6	6	100.00
432	C.No.75236-F$_2$B-S80	4	0	0.00
433	-S90	6	0	0.00
434	-S100	1	0	0.00
435	-S110	-	-	-
436	-S120	5	0	0.00
437	-S130	23	0	0.00
438	-S140	5	0	0.00
439	-S150	-	-	-
440	-S160	2	0	0.00
441	-S170	-	-	-
442	-S180	5	0	0.00
	BDN-1	13	13	100.00
443	C.No.75236-F$_2$B-S190	5	0	0.00
444	-S200	2	0	0.00
445	-S210	-	-	-

1	2	3	4	5
446.	C.No.75236-F_2B-S220	-	-	-
447.	-S230	-	-	-
448.	-S240	-	-	-
449.	-S250	-	-	-
450.	-S260	2	0	0.00
451.	-S270	3	0	0.00
452.	-S280	7	0	0.00
	BDN-1	8	8	100.00
453.	C.No.75236-F_2B-S290	3	0	0.00
454.	-S300	7	0	0.00
455.	-S310	8	0	0.00
456.	-S320	24	0	0.00
457.	-S330	32	0	0.00
458.	-S340	16	0	0.00
459.	-S350	16	0	0.00
460.	-S360	38	3	7.89
461.	-S370	27	0	0.00
	BDN-1	17	17	100.00
462.	C.No.75236-F_2B-S380	25	1	4.00
463.	-S390	1	0	0.00
464.	-S400	6	0	0.00
465.	-S410	15	0	0.00
466.	-S420	7	0	0.00
467.	-S430	5	0	0.00
468.	-S440	3	0	0.00
469.	-S450	7	0	0.00
470.	-S460	9	1	11.11
471.	-S470	9	1	11.11
	BDN-1	16	16	100.00
472.	C.No.75236-F_2B-S480	7	0	0.00
473.	-S490	2	0	0.00
474.	-S500	1	0	0.00
475.	-S510	1	0	0.00
476.	-S520	1	0	0.00
477.	-S530	2	0	0.00
478.	-S540	1	0	0.00
479.	-S550	3	0	0.00
480.	-S560	2	0	0.00
481.	-S570	4	0	0.00
	BDN-1	12	12	100.00
482.	C.No.75236-F_2B-S580	3	0	0.00
483.	-S590	1	0	0.00
484.	-S600	-	-	-
485.	-S610	3	0	0.00
486.	-S620	-	-	-
487.	-S630	5	0	0.00

contd.

1	2	3	4	5
488.	C.No 75236-F_2B-S640	-	-	-
489.	-S650	5	0	0 00
490.	-S660	1	0	0 00
	BDN-1	5	5	100 00
491.	C No.75236-F_2B-S670	-	-	-
492.	-S680	6	0	0 00
493.	-S690	5	0	0 00
494.	-S700	1	0	0 00
495.	-S710	3	0	0 00
496.	-S720	6	1	16 66
497.	-S730	-	-	-
498.	-S740	1	0	0.00
499.	-S750	4	0	0 00
500.	-S760	1	0	0 00
	BDN-1	6	6	100 00
501.	C No 75236-F_2B-S770	4	0	0 00
502.	-S780	1	0	0 00
503	-S790	3	0	0 00
504.	-S800	5	0	0 00
505.	-S810	1	0	0 00
506	-S820	-	-	-
508.	-S830	-	-	-
509.	-S840	3	0	0 00
509	-S850	2	0	0 00
510.	-S860	5	0	0 00
	BDN-1	7	7	100 00
511	C No 75236-F_2B-S870	-	-	-
512	-S880	1	0	0 00
513.	-S890	5	0	0 00
514	-S900	-	-	-
515.	-S910	3	0	0 00
516	-S920	2	0	0 00
517	-S930	4	0	0 00
518.	-S940	-	-	-
519.	-S950	3	0	0 00
520.	-S960	3	0	0 00
	BDN-1	3	3	100 00
521	ICP-7183-P2	11	0	0 00
522.	ICP-6997-139-12-P1	6	0	0 00
523.	C No. 75275-F_2B-S10	7	0	0 00
524	-S20	23	1	4 34
525.	-S30	15	0	0 00
526	-S40	32	0	0 00
527	-S50	9	0	0 00
528.	-S60	32	0	0 00
529.	-S70	19	0	0 00
	BDN-1	10	10	100 00

contd

1	2	3	4	5
530.	C.No.75275-F_2B-S80	20	0	0.00
531.	-S90	11	0	0.00
532.	-S100	7	0	0.00
533.	-S110	1	0	0.00
534.	-S120	14	0	0.00
535.	-S130	34	0	0.00
536.	-S140	13	0	0.00
537.	-S150	12	0	0.00
538.	-S160	5	0	0.00
539.	-S170	17	0	0.00
	BDN-1	7	7	100.00
540.	C.No.75275-F_2B-S180	29	0	0.00
541.	-S190	22	0	0.00
542.	-S200	11	0	0.00
543.	-S210	4	0	0.00
544.	-S220	21	0	0.00
545.	-S230	10	0	0.00
546.	-S240	6	0	0.00
547.	-S250	2	0	0.00
548.	-S260	13	0	0.00
549.	-S270	8	0	0.00
	BDN-1	10	8	80.00
550.	C.No.75275-F_2B-S280	3	0	0.00
551.	-S290	18	0	0.00
552.	-S300	3	0	0.00
553	-S310	7	0	0.00
554.	-S320	9	0	0.00
555.	-S330	17	0	0.00
556.	-S340	4	0	0.00
557.	-S350	19	0	0.00
558.	-S360	2	0	0.00
559.	-S370	53	0	0.00
	BDN-1	12	11	91.66
560.	C.No.75275-F_2B-S380	10	0	0.00
561.	-S390	7	0	0.00
562.	-S400	21	0	0.00
563.	-S410	2	0	0.00
564.	-S420	10	0	0.00
565.	-S430	5	0	0.00
566.	-S440	10	0	0.00
567.	-S450	8	0	0.00
568.	-S460	12	0	0.00
569.	-S470	17	0	0.00
	BDN-1	12	12	100.00
570.	C.No.75275-F_2B-S480	7	0	0.00

contd.

1	2	3	4	5
571.	C No. 75275-F$_2$B-S490	17	0	0.00
572.	-S500	6	0	0.00
573.	-S510	23	0	0.00
574.	-S520	2	0	0.00
575.	-S530	16	0	0.00
576.	-S540	1	0	0.00
577.	-S550	-	-	-
578.	-S560	7	0	0.00
579.	-S570	25	0	0.00
	BDN-1	13	13	100.00
580.	C.No.75275-F$_2$B-S580	19	0	0.00
581.	-S590	8	0	0.00
582.	-S600	19	0	0.00
583.	-S610	10	0	0.00
584.	-S620	27	0	0.00
585.	-S630	21	0	0.00
586.	-S640	-	-	-
587.	-S650	6	0	0.00
588.	-S660	12	0	0.00
	BDN-1	15	15	100.00
589.	C.No.75275-F$_2$B-S670	-	-	-
590.	ICP-7183-P2	-	-	-
591.	ICP-3783-3-20-P1	7	0	0.00
592.	C.No. 75470-F$_2$B-S10	1	0	0.00
593.	-S20	12	0	0.00
594.	-S30	6	0	0.00
595.	-S40	2	0	0.00
596	-S50	-	-	-
597.	-S60	1	0	0.00
598.	-S70	5	0	0.00
599	-S80	14	0	0.00
	BDN-1	10	10	100.00
600	C No. 75470-F$_2$B-S90	19	0	0.00
601	-S100	9	0	0.00
602	-S110	2	0	0.00
603.	-S120	4	0	0.00
604.	-S130	9	1	11.11
605	-S140	8	0	0.00
606.	-S150	38	0	0.00
607.	-S160	21	1	4.76
608.	-S170	8	0	0.00
609.	-S180	15	0	0.00
610.	-S190	28	1	3.57
611	-S200	17	0	0.00
	BDN-1	13	13	100.00

1	2	3	4	5
612.	C.No.75470-F_2B-S21⊗	6	0	0.00
613.	-S22⊗	11	0	0.00
614.	-S23⊗	23	0	0.00
615.	-S24⊗	27	1	3.70
616.	-S25⊗	17	0	0.00
617.	-S26⊗	6	0	0.00
618.	-S27⊗	8	0	0.00
619.	-S28⊗	5	0	0.00
620.	-S29⊗	4	0	0.00
621.	-S30⊗	2	0	0.00
622.	-S31⊗	5	2	40.00
	BDN-1	10	10	100.00
623.	C.No.75470-F_2B-S32⊗	3	0	0.00
624.	-S33⊗	8	3	37.50
625.	-S34⊗	-	-	-
626.	-S35⊗	1	0	0.00
627.	-S36⊗	3	0	0.00
628.	-S37⊗	2	0	0.00
629.	-S38⊗	2	0	0.00
630.	-S39⊗	2	0	0.00
631.	-S40⊗	2	0	0.00
632.	-S41⊗	1	0	0.00
	BDN-1	10	10	100.00
633.	C.No.75470-F_2B-S42⊗	-	-	-
634.	-S43⊗	3	0	0.00
635.	-S44⊗	20	0	0.00
636.	-S45⊗	2	0	0.00
637.	-S46⊗	1	0	0.00
638.	-S47⊗	-	-	-
639.	-S48⊗	4	0	0.00
640.	-S49⊗	3	0	0.00
641.	-S50⊗	-	-	-
642.	-S51⊗	1	0	0.00
643.	-S52⊗	-	-	-
644.	-S53⊗	5	0	0.00
645.	-S54⊗	-	-	-
646.	-S55⊗	2	0	0.00
	BDN-1	12	12	100.00
647.	C.No.75470-F_2B-S56⊗	1	0	0.00
648.	-S57⊗	6	0	0.00
649.	-S58⊗	9	0	0.00
650.	-S59⊗	-	-	-
651.	-S60⊗	-	-	-
652.	-S61⊗	5	0	0.00
653.	ICP-7183-P2	15	7	46.66
654.	ICP-6997-139-12-P1	11	0	0.00
655.	C.No.75276-F_1B-S1⊗	9	0	0.00

contd.

658	-S400	9	0	0.00
	BDN-1	2	2	100.00
659.	C.No.75276-F_2B-S500	5	0	0.00
660.	-S600	16	0	0.00
661.	-S700	16	2	12.50
662.	-S800	20	0	0.00
663.	-S900	6	0	0.00
664.	-S1000	5	0	0.00
665.	-S1100	7	0	0.00
666.	-S1200	5	0	0.00
667.	-S1300	13	0	0.00
668.	-S1400	7	0	0.00
	BDN-1	6	6	100.00
669.	C.No.75276-F_2B-S1500	15	0	0.00
670.	-S1600	8	0	0.00
671.	-S1700	6	0	0.00
672.	-S1800	5	0	0.00
673	-S1900	12	1	8.33
674.	-S2000	18	0	0.00
675.	-S2100	14	0	0.00
676.	-S2200	24	0	0.00
677	-S2300	12	0	0.00
678.	-S2400	8	0	0.00
	BDN-1	3	3	100.00
679.	C.No.75276-F_2B-S2500	29	0	0.00
680.	-S2600	15	0	0.00
681.	-S2700	6	0	0.00
682.	-S2800	-	.	-
683	-S2900	20	0	0.00
684.	-S3000	10	0	0.00
685.	-S3100	3	0	0.00
686.	-S3200	7	0	0.00
687.	-S3300	9	0	0.00
688.	-S3400	19	0	0.00
	BDN-1	8	8	100.00
689.	C.No.75276-F_2B-S3500	17	0	0.00
690.	-S3600	18	0	0.00
691.	-S3700	3	0	0.00
692	-S3800	1	0	0.00
693.	-S3900	32	0	0.00
694.	-S4000	27	0	0.00
695.	-S4100	22	0	0.00
696.	-S4200	33	0	0.00

contd

1	2	3	4	5
697.	C.No.75276-F_2B-S43⊗	14	0	0.00
698.	ICP-7186-P2	6	0	0.00
699.	ICP-3783-3-20P1	-	-	-
	BDN-1	9	9	100.00
700.	C.No.75471-F_2B-S1⊗	14	1	7.14
701.	-S2⊗	6	0	0.00
702.	-S3⊗	7	0	0.00
703.	-S4⊗	7	0	0.00
704.	-S5⊗	8	0	0.00
705.	-S6⊗	-	-	-
706.	-S7⊗	3	0	0.00
707.	-S8⊗	7	0	0.00
708.	-S9⊗	-	-	-
709.	-S10⊗	4	0	0.00
710.	-S11⊗	2	0	0.00
	BDN-1	6	6	100.00
711.	C.No.75471-F_2B-S12⊗	11	0	0.00
712.	-S13⊗	4	0	0.00
713.	-S14⊗	7	0	0.00
714.	-S15⊗	5	0	0.00
715.	-S16⊗	2	0	0.00
716.	-S17⊗	23	0	0.00
717.	-S18⊗	8	0	0.00
718.	-S19⊗	1	0	0.00
719.	-S20⊗	21	1	4.76
720.	-S21⊗	5	0	0.00
721.	-S22⊗	14	0	0.00
	BDN-1	16	16	100.00
722.	C.No.75471-F_2B-S23⊗	18	0	0.00
723.	-S24⊗	-	-	-
724.	-S25⊗	22	0	0.00
725.	-S26⊗	14	0	0.00
726.	-S27⊗	3	0	0.00
727.	-S28⊗	5	0	0.00
728.	-S29⊗	21	0	0.00
729.	-S30⊗	10	0	0.00
730.	-S31⊗	26	0	0.00
731.	-S32⊗	15	0	0.00
	BDN-1	5	5	100.00
732.	C.No.75471-F_2B-S33⊗	9	0	0.00
733.	-S34⊗	21	0	0.00
734.	-S35⊗	2	0	0.00
735.	-S36⊗	5	0	0.00
736.	-S37⊗	10	1	10.00
737.	-S38⊗	15	0	0.00

contd.

1	2	3	4	5
738	C No. 75471-F_2B-S390	10	0	0.00
739	-S400	3	1	33.33
740	-S410	4	0	0.00
741	-S420	1	0	0.00
742	-S430	4	0	0.00
743	-S440	16	0	0.00
	BDN-1	9	9	100.00
744	C.No.75471-F_2B-S450	8	0	0.00
745	-S460	2	0	0.00
746	-S470	9	1	11.11
747	-S480	2	0	0.00
748	-S490	5	0	0.00
749	-S500	-	-	-
750	-S510	2	0	0.00
751	-S520	-	-	-
752	-S530	2	0	0.00
753	-S540	18	0	0.00
754	-S550	7	0	0.00
	BDN-1	14	14	100.00
755	C.No.75471-F_2B-S560	1	0	0.00
756	-S570	17	0	0.00
757	-S580	18	0	0.00
758	-S590	6	0	0.00
759	-S600	10	0	0.00
760	ICP-7186-P2	13	7	53.84

APPENDIX-XXIX

Results of screening of F_4 progenies of pigeonpea from 1977-78 sterility mosaic nursery for sterility mosaic resistance during 1978-79

Sl. No.	Particular	No. of plants	Infected plants	Percent infection
1	2	3	4	5
1.	ICP-2624-P_2-ST-1	6	6	100.00
2.	C.No.74348-F_3B-S1⊠	9	6	66.00
3.	-S2⊠	11	3	27.27
4.	-S3⊠	6	0	0.00
	BDN-1	11	10	90.90
5.	C.No.74348-F_3B-S4⊠	14	0	0.00
6.	-S5⊠	1	0	0.00
7.	-S6⊠	5	0	0.00
8.	-S7⊠	1	0	0.00
9.	-S8⊠	6	0	0.00
10.	-S9⊠	9	0	0.00
11.	-S10⊠	2	2	100.00
12.	-S11⊠	7	0	0.00
13.	-S12⊠	10	0	0.00
14.	-S13⊠	5	0	0.00
	BDN-1	12	11	91.66
15.	C.No.74348-F_3B-S14⊠	19	0	0.00
16.	-S15⊠	11	0	0.00
17.	-S16⊠	17	7	41.17
18.	-S17⊠	14	4	28.57
19.	-S18⊠	22	2	9.09
20.	-S19⊠	27	0	0.00
21.	-S20⊠	6	0	0.00
22.	-S21⊠	23	2	8.69
23.	-S22⊠	15	0	0.00
24.	-S23⊠	2	0	0.00
	BDN-1	4	4	100.00
25.	C.No.74348-F_3B-S24⊠	25	0	0.00
26.	-S25⊠	9	2	22.22
27.	-S26⊠	8	1	12.50
28.	-S27⊠	2	0	0.00
29.	-S28⊠	7	0	0.00
30.	-S29⊠	27	3	11.11
31.	-S30⊠	13	6	46.15
32.	-S31⊠	12	0	0.00
33.	-S32⊠	23	0	0.00
34	BDN-1	7	7	100.00
35	C.No.74348-F_3B-S33⊠	17	0	0.00

contd.

1	2	3	4	5
36.	C.No.74348-F_3B-S35⊗	21	0	0.00
37.	-S36⊗	6	0	0.00
38.	-S37⊗	16	0	0.00
39.	-S38⊗	27	0	0.00
40.	-S39⊗	29	0	0.00
41.	-S40⊗	10	0	0.00
42.	-S41⊗	27	0	0.00
43.	-S42⊗	11	0	0.00
44.	-S43⊗	9	0	0.00
	BDN-1	17	17	100.00
45.	C.No.74348-F_3B-S44⊗	5	0	0.00
46.	-S45⊗	34	0	0.00
47.	-S46⊗	39	0	0.00
48.	-S47⊗	13	2	15.38
49.	-S48⊗	5	0	0.00
50.	-S49⊗	17	8	47.05
51.	-S50⊗	21	4	19.04
52.	-S51⊗	6	0	0.00
53.	-S52⊗	6	2	33.33
	BDN-1	-	-	-
54.	C.No.74348-F_3B-S53⊗	-	-	-
55.	-S54⊗	2	0	0.00
56.	-S55⊗	-	-	-
57.	-S56⊗	2	0	0.00
58.	-S57⊗	4	0	0.00
59.	-S58⊗	2	0	0.00
60.	-S59⊗	2	0	0.00
61.	-S60⊗	4	0	0.00
62.	-S61⊗	3	0	0.00
63.	-S62⊗	5	0	0.00
	BDN-1	-	-	-
64.	C.No.74348-F_3B-S63⊗	10	3	30.00
65.	-S64⊗	-	-	-
66.	-S65⊗	1	0	0.00
67.	-S66⊗	13	0	0.00
68.	-S67⊗	12	0	0.00
69.	-S68⊗	8	0	0.00
70.	-S69⊗	15	2	13.33
71.	C.No.74348-F_3B-S70⊗	22	1	4.54
72.	-S71⊗	8	0	0.00
73.	-S72⊗	17	0	0.00
	BDN-1	17	17	100.00
74.	C.No.74348-F_3B-S73⊗	24	0	0.00
75	-S74⊗	11	0	0.00

contd

1	2	3	4	5
76.	C.No.74348-F_3B-S75⊗	15	3	20.00
77.	-S76⊗	14	0	0.00
78.	-S77⊗	3	0	0.00
79.	-S78⊗	20	4	20.00
80.	-S79⊗	15	0	0.00
81.	-S80⊗	-	-	-
82.	-S81⊗	27	0	0.00
	BDN-1	12	12	100.00
83.	C No.74348-F_3B-S82⊗	11	0	0.00
84.	-S83⊗	3	0	0.00
85.	-S84⊗	6	0	0.00
86.	-S85⊗	7	1	14.28
87.	-S86⊗	5	0	0.00
88.	-S87⊗	4	0	0.00
89.	-S88⊗	2	0	0.00
90.	-S89⊗	1	0	0.00
91.	-S90⊗	7	0	0.00
92.	-S91⊗	2	0	0.00
93.	-S92⊗	11	0	0.00
	BDN-1	6	6	100.00
94.	C.No.74348-F_3B-S93⊗	-	-	-
95.	-S94⊗	2	0	0.00
96.	-S95⊗	3	0	0.00
97.	-S96⊗	1	0	0.00
98.	-S97⊗	14	0	0.00
99.	-S98⊗	5	1	20.00
100.	-S99⊗	7	0	0.00
101.	-S100⊗	22	0	0.00
102.	-S101⊗	2	0	0.00
103.	-S102⊗	19	0	0.00
	BDN-1	12	12	100.00
104	C.No.74348-F_3B-S103⊗	-	-	-
105.	-S104⊗	23	0	0.00
106.	-S105⊗	26	2	7.69
107.	-S106⊗	21	0	0.00
108.	-S107⊗	21	0	0.00
109.	-S108⊗	-	-	-
110.	-S109⊗	10	2	20.00
111.	-S110⊗	11	0	0.00
112.	-S111⊗	23	3	13.04
113.	-S112⊗	40	0	0.00
	BDN-1	12	12	100.00
114.	C.No.74348-F_3B-S113⊗	10	0	0.00
115.	-S114⊗	9	0	0.00

contd.

1	2	3	4	5
116.	C.No.74348-F_3B-S115Ø	12	0	0.00
117.	-S116Ø	6	0	0.00
118.	-S117Ø	10	0	0.00
119.	-S118Ø	20	0	0.00
120.	-S119Ø	17	0	0.00
121.	-S120Ø	2	0	0.00
122.	-S121Ø	2	0	0.00
123.	-S122Ø	13	0	0.00
	BDN-1	9	9	100.00
124.	C.No.74348-F_3B-S123Ø	8	0	0.00
125.	-S124Ø	1	0	0.00
126.	-S125Ø	12	0	0.00
127.	-S126Ø	7	1	14.28
128.	-S127Ø	2	0	0.00
129.	-S128Ø	41	0	0.00
130.	-S129Ø	4	0	0.00
131.	-S130Ø	6	0	0.00
132.	-S131Ø	1	0	0.00
133	-S132Ø	12	0	0.00
	BDN-1	3	3	100.00
134	C.No.74348-F_3B-S133Ø	7	0	0.00
135	-S134Ø	5	0	0.00
136.	-S135Ø	20	3	15.00
137.	-S136Ø	15	0	0.00
138.	-S137Ø	-	-	-
139.	-S138Ø	14	0	0.00
140.	-S139Ø	-	-	-
141	-S140Ø	11	0	0.00
142.	-S141Ø	9	2	22.22
143.	-S142Ø	19	6	31.57
	BDN-1	1	1	100.00
144	C.No.74348-F_3B-S143Ø	13	1	7.69
145.	-S144Ø	11	4	36.36
146	-S145Ø	25	0	0.00
147.	-S146Ø	13	0	0.00
148.	-S147Ø	14	0	0.00
149.	-S148Ø	27	0	0.00
150.	-S149Ø	16	0	0.00
151.	-S150Ø	22	0	0.00
152.	-S151Ø	4	2	50.00
	BDN-1	12	12	100.00
153.	C.No.74348-F_3B-S152Ø	26	0	0.00
154.	-S153Ø	13	0	0.00
155.	-S154Ø	6	0	0.00

1	2	3	4	5
156	C.No.74348-F_3B-S155⊗	2	0	0.00
57	-S156⊗	3	0	0.00
58.	-S157⊗	3	0	0.00
159.	-S158⊗	-	-	-
160.	-S159⊗	1	0	0.00
161	-S160⊗	8	0	0.00
162.	-S161⊗	9	0	0.00
	BDN-1	7	7	100.00
163.	C.No.74348-F_3B-S162⊗	-	-	-
164.	-S163⊗	-	-	-
165	-S164⊗	14	0	0.00
166.	-S165⊗	26	2	7.69
167.	-S166⊗	4	0	0.00
168.	-S167⊗	2	0	0.00
169.	-S168⊗	2	0	0.00
170.	-S169⊗	13	0	0.00
171.	-S170⊗	7	0	0.00
172	ICP-7086-P_2	-	-	-
173.	ICP-7035-45-27-S2⊗B-P_1	-	-	-
	BDN-1	2	2	100.00
174.	C.No.74321-F_3B-S1⊗	-	-	-
175.	-S2⊗	30	0	0.00
176.	-S3⊗	18	0	0.00
177.	-S4⊗	15	2	13.33
178.	-S5⊗	7	0	0.00
179.	-S6⊗	5	0	0.00
180.	-S7⊗	12	2	16.66
181.	-S8⊗	5	0	0.00
182	-S9⊗	15	1	6.66
183.	-S10⊗	9	0	0.00
184.	-S11⊗	15	1	6.66
185.	-S12⊗	34	17	50.00
	BDN-1	18	18	100.00
186.	C.No.74321-F_3B-S13⊗	20	6	30.00
187.	-S14⊗	34	0	0.00
188.	-S15⊗	13	0	0.00
189.	-S16⊗	26	1	3.84
190.	-S17⊗	30	2	6.66
191	-S18⊗	9	0	0.00
192.	-S19⊗	10	0	0.00
193	-S20⊗	14	7	50.00
194	-S21⊗	4	0	0.00
195	-S22⊗	33	7	21.21
196.	-S23⊗	22	3	13.63
	BDN-1	7	7	100.00

contd.

1	2	3	4	5
197.	C.No.74321-F_3B-S240	7	0	0.00
198.	-S250	1	0	0.00
199.	-S260	13	1	7.69
200	-S270	5	1	20.00
201.	-S280	4	2	50.00
202.	-S290	1	0	0.00
203.	-S300	5	1	20.00
204.	-S310	24	0	0.00
205.	-S320	2	0	0.00
206.	-S330	11	3	27.27
207.	-S340	15	0	0.00
	BDN-1	3	3	100.00
208.	C.No.74321-F_3B-S350	18	2	11.11
209.	-S360	14	2	14.28
210.	-S370	13	0	0.00
211.	-S380	14	11	78.57
212.	-S390	22	1	4.54
213.	-S400	4	1	25.00
214.	-S410	-	-	-
215.	-S420	12	0	0.00
216.	-S430	20	13	65.00
217.	-S440	11	3	27.27
	BDN-1	15	15	100.00
218.	C.No.74321-F_3B-S450	3	1	33.33
219.	-S460	14	3	21.42
220.	-S470	1	0	0.00
221.	-S480	40	0	0.00
222.	-S490	14	1	7.14
223	-S500	6	0	0.00
224.	-S510	12	6	50.00
225.	-S520	20	0	0.00
226.	-S530	-	-	-
227.	-S540	5	0	0.00
228.	-S550	-	-	-
	BDN-1	10	10	100.00
229.	C.No.74321-F_3B-S560	18	9	50.00
230	-S570	13	0	0.00
231.	-S580	17	5	29.41
232	-S590	15	3	20.00
233	-S600	8	2	25.00
234.	-S610	1	0	0.00
235	-S620	4	0	0.00
236.	-S630	13	0	0.00
237.	-S640	1	0	0.00
238.	-S650	3	1	33.33
	BDN-1	-	-	-

contd

1	2	3	4	5
239	C No 74321-F_3B-S66Ø	11	0	0.00
240	-S67Ø	2	0	0.00
241.	-S68Ø	-	-	-
242.	-S69Ø	1	0	0.00
243.	-S70Ø	16	0	0.00
244	-S71Ø	-	-	-
245	-S72Ø	30	0	0.00
246	-S73Ø	23	1	4.34
247.	-S74Ø	9	0	0.00
248	-S75Ø	-	-	-
249	-S76Ø	4	2	50.00
	BDN-1	4	4	100.00
250.	C No. 74321-F_3B-S77Ø	6	0	0.00
251.	-S78Ø	8	0	0.00
252.	-S79Ø	5	0	0.00
253.	-S80Ø	8	0	0.00
254.	-S81Ø	3	0	0.00
255.	-S82Ø	1	0	0.00
256.	-S83Ø	22	0	0.00
257.	-S84Ø	1	0	0.00
258.	-S85Ø	8	0	0.00
259.	-S86Ø	6	0	0.00
260.	-S87Ø	8	0	0.00
261	-S88Ø	-	-	-
262.	-S89Ø	1	0	0.00
	BDN-1	4	4	100.00
263.	C.No.74321-F_3B-S90Ø	5	0	0.00
264	-S91Ø	18	17	94.44
265	-S92Ø	-	-	-
266	-S93Ø	4	0	0.00
267.	-S94Ø	7	0	0.00
268	-S95Ø	12	0	0.00
269.	-S96Ø	9	2	22.22
270.	-S97Ø	10	10	100.00
271.	-S98Ø	3	0	0.00
272	-S99Ø	16	1	6.25
273	-S100Ø	25	2	8.00
274.	-S101Ø	10	0	0.00
275	-S102Ø	23	7	30.43
	BDN-1	17	17	100.00
276	C.No.74321-F_3B-S103Ø	9	0	0.00
277.	-S104Ø	7	2	28.57
278	-S105Ø	10	0	0.00
279.	-S106Ø	11	0	0.00
280	-S107Ø	25	0	0.00

contd..

1	2	3	4	5
281.	C No.74321-F_3B-S1080	9	0	0.00
282	-S1090	6	1	16 66
283.	-S1100	8	0	0 00
284	-S1110	2	0	0 00
285	-S1120	-	-	-
286	-S1130	10	1	10.00
	BDN-1	14	14	100 00
287	C.No.74321-F_3B-S1140	14	1	7 14
288.	-S1150	5	3	60 00
289.	-S1160	20	0	0 00
290.	-S1170	3	2	66.66
291.	-S1180	8	0	0 00
292.	-S1190	4	0	0 00
293.	-S1200	4	0	0.00
294.	-S1210	1	0	0 00
295.	-S1220	13	0	0 00
296.	-S1230	18	0	0 00
297.	-S1240	5	0	0.00
298.	-S1250	4	0	0.00
299.	-S1260	10	0	0.00
	BDN-1	16	16	100.00
300.	C.No.74321-F_3B-S1270	26	0	0 00
301.	-S1280	27	0	0 00
302	-S1290	11	1	9.09
303.	-S1300	9	0	0.00
304	-S1310	5	0	0.00
305.	-S1320	21	3	14 28
306	-S1330	3	0	0.00
307	-S1340	14	0	0 00
308	-S1350	22	0	0 00
309	-S1360	22	0	0.00
310.	-S1370	44	23	52 27
311	S1380	2	0	0 00
	BDN-1	17	17	100.00
312.	C No.74321-F_3B-S1390	29	8	27.58
313.	-S1400	18	3	16.66
314	-S1410	20	6	30 00
315.	-S1420	12	0	0.00
316.	S1430	-	-	-
317	-S1440	1	0	0 00
318	-S1450	-	-	-
319	-S1460	3	0	0.00
320.	-S1470	2	0	0 00
321	-S1480	6	0	0 00
322	-S1490	7	0	0 00
	BDN-1	7	7	100 00

contd

1	2	3	4	5
323.	C.No.74321-F_3B-S150Ø	3	0	0.00
324.	-S151Ø	5	0	0.00
325.	-S152Ø	-	-	-
326.	-S153Ø	1	0	0.00
327.	-S154Ø	1	0	0.00
328.	-S155Ø	1	1	100.00
329.	-S156Ø	2	1	50.00
330.	-S157Ø	5	0	0.00
331.	-S158Ø	4	0	0.00
332	-S159Ø	7	0	0.00
333.	-S160Ø	-	-	-
334.	-S161Ø	15	3	20.00
	BDN-1	3	3	100.00
335.	C.No.74321-F_3B-S162Ø	-	-	-
336.	-S163Ø	8	1	12.50
337	-S164Ø	2	0	0.00
338.	-S165Ø	26	2	7.69
339.	-S166Ø	7	0	0.00
340.	-S167Ø	12	5	41.66
341	-S168Ø	2	0	0.00
342.	-S169Ø	13	6	46.15
343.	-S170Ø	35	3	8.57
344.	-S171Ø	18	0	0.00
	BDN-1	3	3	100.00
345.	C.No.74321-F_3B-S172Ø	6	0	0.00
346.	-S173Ø	3	3	100.00

APPENDIX-XXX

Results of screening of F_5 progenies of pigeonpea from 1977-78 sterility mosaic nursery for sterility mosaic resistance during 1978-79

Sl No	Particular	No. of plants	Infected plants	Percent infection
1	2	3	4	5
1.	ICP-7404-10-1-S10	25	0	0.00
2.	-S20	13	1	7.69
3.	-S30	17	0	0.00
4.	-S40	22	0	0.00
5.	-S50	17	0	0.00
6.	ICP-3783-3-2-Br	-	-	-
7.	C.No.73076-F_4B-S10	8	0	0.00
8.	-S20	17	0	0.00
9.	-S30	17	0	0.00
10.	-S40	16	0	0.00
	BDN-1	7	5	71.42
11.	C.No.73076-F_4B-S50	19	12	63.15
12.	-S60	20	10	50.00
13.	-S70	7	1	14.28
14.	-S80	32	10	31.25
15.	-S90	-	-	-
16.	-S100	27	12	44.44
17.	-S110	3	0	0.00
18.	-S120	25	15	60.00
19.	-S130	41	13	31.70
20.	-S140	35	3	8.57
	BDN-1	19	18	94.73
21.	C.No.73076-F_4B-S150	16	7	43.75
22.	-S160	16	8	50.00
23.	-S170	25	0	0.00
24.	-S180	22	10	45.45
25.	-S190	47	1	2.12
26.	-S200	11	0	0.00
27.	-S210	4	1	25.00
28.	-S220	4	0	0.00
29.	-S230	30	0	0.00
	BDN-1	10	9	90.00
30.	C.No.73076-F_4B-S240	16	0	0.00
31.	-S250	16	1	6.25
32.	-S260	12	0	0.00
33.	-S270	21	14	66.66
34.	-S280	7	0	0.00
35.	-S290	7	0	0.00

contd.

1	2	3	4	5
36.	C.No.73076-F_4B-S30Ø	6	0	0.00
37.	-S31Ø	7	1	14.28
38.	-S32Ø	15	0	0.00
39.	-S33Ø	27	1	3.70
40.	-S34Ø	9	0	0.00
41.	-S35Ø	17	13	76.47
	BDN-1	22	22	100.00
42.	C.No 73076-F_4B-S36Ø	16	5	31.25
43.	-S37Ø	9	0	0.00
44.	-S38Ø	17	6	35.29
45.	-S39Ø	1	0	0.00
46.	-S40Ø	19	0	0.00
47.	-S41Ø	14	6	42.85
48.	-S42Ø	18	4	22.22
49.	-S43Ø	4	0	0.00
50.	-S44Ø	23	5	21.73
51.	-S45Ø	7	0	0.00
	BDN-1	9	9	100.00
52.	C.No.73076-F_4B-S46Ø	9	0	0.00
53.	-S47Ø	6	1	16.66
54.	-S48Ø	9	9	100.00
55.	-S49Ø	10	0	0.00
56.	-S50Ø	15	1	6.66
57.	-S51Ø	1	0	0.00
58.	-S52Ø	7	0	0.00
59.	-S53Ø	19	3	15.78
60.	-S54Ø	16	0	0.00
61.	-S55Ø	40	5	12.50
	BDN-1	22	22	100.00
62.	C.No.73076-F_4B-S56Ø	14	0	0.00
63	-S57Ø	1	0	0.00
64.	-S58Ø	7	0	0.00
65	-S59Ø	7	0	0.00
66.	-S60Ø	14	5	35.71
67.	-S61Ø	22	0	0.00
68.	-S62Ø	14	1	7.14
69.	-S63Ø	1	0	0.00
70.	-S64Ø	6	0	0.00
71.	-S65Ø	5	0	0.00
	BDN-1	9	9	100.00
72.	C.No.73076-F_4B-S66Ø	16	1	6.25
73	-S67Ø	9	0	0.00
74.	-S68Ø	3	0	0.00
75.	-S69Ø	11	0	0.00
76.	-S70Ø	20	0	0.00

1	2	3	4	5
77.	C.No 73076-F_4B-S710	20	0	0.00
78.	-S720	-	-	-
79.	-S730	5	0	0.00
80.	-S740	27	10	3.70
81.	-S750	11	0	0.00
	BDN-1	22	22	100.00
82.	C.No 73076-F_4B-S760	5	0	0.00
83.	-S770	24	0	0.00
84.	-S780	23	4	17.39
85.	-S790	7	3	42.85
86.	-S800	48	6	12.50
87.	-S810	7	0	0.00
88.	-S820	42	13	30.95
89.	-S830	12	1	8.33
90.	-S840	2	0	0.00
91.	-S850	-	-	-
	BDN-1	41	41	100.00
92.	C.No 73076-F_4B-S860	3	0	0.00
93.	-S870	13	2	15.38
94.	-S880	12	0	0.00
95.	-S890	-	-	-
96.	-S900	9	0	0.00
97.	-S910	3	0	0.00
98.	-S920	27	8	29.62
99.	-S930	4	1	25.00
100.	-S940	3	0	0.00
101.	-S950	23	0	0.00
102.	-S960	1	0	0.00
103.	-S970	11	0	0.00
	BDN-1	10	10	100.00
104.	C.No 73076-F_4B-S980	11	0	0.00
105.	-S990	15	0	0.00
106.	-S1000	3	1	33.33
107.	-S1010	12	3	25.00
108.	-S1020	9	0	0.00
109.	-S1030	21	0	0.00
110.	-S1040	5	0	0.00
111.	-S1050	7	0	0.00
112.	-S1060	20	0	0.00
113.	-S1070	11	0	0.00
114.	-S1080	10	0	0.00
	BDN-1	8	8	100.00
115.	C.No 73076-F_4B-S1090	12	0	0.00
116.	-S1100	10	0	0.00
117.	-S1110	20	0	0.00

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1	2	3	4	5
8.	C.No.73076-F_4B-S1120	9	0	0.00
9.	-S1130	3	1	33.33
120.	-S1140	18	0	0.00
121.	-S1150	9	0	0.00
122.	-S1160	10	0	0.00
123.	-S1170	13	0	0.00
124.	-S1180	19	3	15.78
	BDN-1	11	11	100.00
125	C.No.73076-F_4B-S1190	7	1	14.28
126	-S1200	6	1	16.66
127.	-S1210	8	0	0.00
128	-S1220	3	0	0.00
129.	-S1230	10	0	0.00
130.	-S1240	22	0	0.00
131.	-S1250	8	0	0.00
132	-S1260	35	8	22.85
133	-S1270	3	0	0.00
134.	-S1280	10	9	90.00
135.	-S1290	37	21	56.75
	BDN-1	15	15	100.00
136	C No.73076-F_4B-S1300	14	2	14.28
137.	-S1310	32	0	0.00
138.	-S1320	6	0	0.00
139.	-S1330	21	0	0.00
140.	-S1340	13	0	0.00
141.	-S1350	37	0	0.00
142.	-S1360	26	0	0.00
143.	-S1370	4	0	0.00
144.	-S1380	4	0	0.00
145	-S1390	22	0	0.00
	BDN-1	17	17	100.00
146.	C No.73076-F_4B-S1400	24	1	4.16
147.	-S1410	13	1	7.69
148.	-S1420	25	1	4.00
149.	-S1430	3	0	0.00
150.	-S1440	1	0	0.00
151.	-S1450	4	0	0.00
152.	-S1460	12	0	0.00
153.	-S1470	-	-	-
154.	-S1480	-	-	-
	BDN-1	47	47	100.00
155.	C.No 73076-F_4B-S1490	-	-	-
156.	-S1500	-	-	-
157.	-S1510	4	0	0.00
158.	-S1520	31	2	6.45

contd.

1	2	3	4	5
159	C No 73076-F_4B-S1530	10	0	0 00
160	-S1540	35	6	17 14
161	-S1550	28	22	78 57
162	-S1560	-	-	-
163	-S1570	-	-	-
164	-S1580	12	2	16 66
165	-S1590	11	0	0 00
	BDN-1	13	13	100 00
166	C No 73076-F_4B-S1600	13	1	7 69
167	-S1610	9	0	0 00
168	-S1620	15	0	0 00
169	-S1630	22	2	9 09
170	-S1640	12	0	0 00
171	-S1650	32	11	34 37
172	-S1660	12	1	8 33
173	-S1670	18	0	0 00
174	-S1680	10	0	0 00
	BDN-1	15	15	100 00
175	C No 73076-F_4B-S1690	30	16	53 33
176	-S1700	6	0	0 00
177	-S1710	10	0	0 00
178	-S1720	11	0	0 00
179	-S1730	11	0	0 00
180	-S1740	42	0	0 00
181	-S1750	22	0	0 00
182	-S1760	13	0	0 00
183	-S1770	8	1	12 50
184	-S1780	8	1	12 50
	BDN-1	5	5	100 00
185	C No 73076-F_4B-S1790	1	0	0 00
186	-S1800	4	0	0 00
187	-S1810	3	0	0 00
188	-S1820	10	0	0 00
189	-S1830	-	-	-
190	-S1840	12	1	8 33
191	-S1850	8	0	0 00
192	-S1860	13	1	7 69
193	-S1870	7	4	57 14
194	-S1880	42	15	35 71
	BDN-1	22	22	100 00
195	C No 73076-F_4B-S1890	10	3	30 00
196	-S1900	20	3	15 00
197	-S1910	3	0	0 00
198	-S1920	16	3	18 75
199	-S1930	11	0	0.00
200	-S1940	-	-	-

1	2	3	4	5
201	C.No.73076-F_4B-S195⊗	9	0	0.00
202	-S196⊗	19	7	36.84
203.	-S197⊗	31	5	16.12
204.	-S198⊗	19	14	73.68
	BDN-1	17	17	100.00
205.	C.No.73076-F_4B-S199⊗	31	7	22.58
206.	-S200⊗	8	0	0.00
207	-S201⊗	10	1	10.00
208.	-S202⊗	6	0	0.00
209	-S203⊗	24	23	95.83
210.	-S204⊗	8	0	0.00
211.	-S205⊗	12	5	41.66
212.	-S206⊗	16	0	0.00
213.	-S207⊗	1	0	0.00
214.	-S208⊗	20	1	5.00
	BDN-1	14	14	100.00
215.	C.No.73076-F_4B-S209⊗	-	-	-
216.	-S210⊗	11	0	0.00
217.	-S211⊗	-	-	-
218.	-S212⊗	31	10	32.25
219.	-S213⊗	27	3	11.11
220.	-S214⊗	25	2	8.00
221.	-S215⊗	-	-	-
222.	-S216⊗	3	0	0.00
223.	-S217⊗	34	5	14.70
224.	-S218⊗	3	2	66.66
	BDN-1	26	26	100.00
225	C.No.73076-F_4B-S219⊗	9	5	55.55
226.	-S220⊗	37	0	0.00
227.	-S221⊗	38	7	18.42
228	-S222⊗	22	4	18.18
229.	-S223⊗	3	0	0.00
230	-S224⊗	-	-	-
231	-S225⊗	20	7	35.00
232.	-S226⊗	8	5	62.50
233.	-S227⊗	40	5	12.50
	BDN-1	16	16	100.00
234	C.No.73076-F_4B-S228⊗	26	1	3.84
235.	-S229⊗	16	6	37.50
236.	-S230⊗	16	2	12.50
237.	-S231⊗	13	3	23.07
238.	-S232⊗	1	0	0.00
239.	-S233⊗	22	1	4.54
240.	-S234⊗	1	0	0.00

contd.

1	2	3	4	5
241	C No 73076-F_4B-S2350	9	5	55 55
242	-S2360	15	5	33 33
243	-S2370	38	2	5 26
244	-S2380	33	4	12 12
	BDN-1	34	34	100 00
245	C No 73076-F_4B-S2390	66	7	10 60
246	-S2400	31	11	35 48
247	-S2410	2	1	50 00
248	-S2420	6	0	0 00
249	-S2430	2	0	0 00
250	-S2440	3	0	0 00
251	-S2450	54	18	33 33
252	-S2460	7	0	0 00
253	-S2470	2	0	0 00
254	-S2480	7	4	57 14
	BDN-1	2	2	100 00
255	C No 73076-F_4B-S2490	16	1	6 25
256	-S2500	22	1	4 54
257	-S2510	21	3	14 28
258	-S2520	12	0	0 00
259	-S2530	6	0	0 00
260	-S2540	10	0	0 00
261	-S2550	6	0	0 00
262	-S2560	1	0	0 00
263	-S2570	3	1	33 33
264	-S2580	26	0	0 00
265	-S2590	1	0	0 00
	BDN-1	23	23	100 00
266	C No 73076-F_4B-S2600	8	0	0 00
267	-S2610	20	3	15 00
268	-S2620	2	0	0 00
269	-S2630	4	0	0 00
270	-S2640	14	1	7 14
271	ICP-4704-GW-3-91-S10	21	21	100 00
272	ICP-3783	2	0	0 00
273	C No 73070-F_4B-S10	33	2	6 06
274	-S20	16	0	0 00
275	-S30	-	-	-
276	-S40	19	0	0 00
	BDN-1	12	12	100 00
277	C No 73076-F_4B-S50	3	0	0 00
278	-S60	22	0	0 00
279	-S70	23	1	4 34
280	-S80	5	0	0 00

contd

1	2	3	4	5
281.	C.No.73070-F_4B-S9Ø	1	0	0.00
282.	-S10Ø	8	0	0.00
283.	-S11Ø	5	0	0.00
284.	-S12Ø	35	0	0.00
285.	-S13Ø	7	1	14.28
286.	-S14Ø	20	0	0.00
287.	-S15Ø	17	1	5.88
288.	-S16Ø	16	0	0.00
	BDN-1	11	11	100.00
289.	C.No.73070-F_4B-S17Ø	11	0	0.00
290.	-S18Ø	19	0	0.00
291.	-S19Ø	3	0	0.00
292.	-S20Ø	29	0	0.00
293.	-S21Ø	2	0	0.00
294.	-S22Ø	8	0	0.00
295.	-S23Ø	26	3	11.53
296.	-S24Ø	9	2	22.22
297.	-S25Ø	14	1	7.14
298.	-S26Ø	6	0	0.00
299.	-S27Ø	15	0	0.00
	BDN-1	15	15	100.00
300.	C.No.73070-F_4B-S28Ø	1	0	0.00
301.	-S29Ø	29	0	0.00
302.	-S30Ø	-	-	-
303.	-S31Ø	-	-	-
304.	-S32Ø	-	-	-
305.	-S33Ø	9	3	33.33
306.	-S34Ø	12	4	33.33
307.	-S35Ø	2	0	0.00
308.	-S36Ø	14	0	0.00
309.	-S37Ø	9	5	55.55
310.	-S38Ø	10	3	30.00
	BDN-1	9	9	100.00
311.	C.No.73070-F_4B-S39Ø	6	1	16.66
312.	-S40Ø	21	0	0.00
313.	-S41Ø	-	-	-
314.	-S42Ø	21	21	100.00
315.	-S43Ø	14	0	0.00
316.	-S44Ø	10	1	10.00
317.	-S45Ø	23	1	4.34
318.	-S46Ø	26	1	3.84
319.	-S47Ø	16	3	18.75
	BDN-1	3	3	100.00
320.	C.No.73070-F_4B-S48Ø	6	0	0.00

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1	2	3	4	5
321	C No 73070-F_4B-S490	6	0	0.00
322	-S500	3	0	0.00
323	-S510	19	0	0.00
324	-S520	9	1	11.11
325	-S530	11	0	0.00
326	-S540	3	0	0.00
327	-S550	9	0	0.00
328	-S560	6	0	0.00
329	-S570	11	2	18.18
	BDN-1	15	15	100.00
330	C No. 73070-F_4B-S580	13	0	0.00
331	-S590	5	0	0.00
332	-S600	6	0	0.00
333	-S610	46	22	47.82
334	-S620	15	0	0.00
335	-S630	34	9	26.47
336	-S640	27	2	7.40
337	-S650	3	0	0.00
338	-S660	17	2	11.76
	BDN-1	23	23	100.00
339	C.No 73070-F_4B-S670	36	5	13.88
340	-S680	16	0	0.00
341	-S690	8	0	0.00
342	-S700	9	0	0.00
343	-S710	21	0	0.00
344	-S720	13	0	0.00
345	-S730	17	0	0.00
346	-S740	-	-	-
347	-S750	15	0	0.00
348	-S760	12	0	0.00
349	-S770	20	3	15.00
	BDN-1	14	11	75.57
350	C No 73070-F_4B-S780	16	0	0.00
351	-S790	5	0	0.00
352	-S800	17	0	0.00
353	-S810	-	-	-
354	-S820	3	0	0.00
355	-S830	17	0	0.00
356	-S840	19	0	0.00
357	-S850	21	0	0.00
358	-S860	8	0	0.00
	BDN-1	10	8	80.00
359	C No. 73070-F_4B-S870	29	1	3.44
360	-S880	3	0	0.00
361	-S890	8	0	0.00
362	-S900	1	0	0.00

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1	2	3	4	5
363	C.No.73070-F_4B-S910	30	18	60.00
364	-S920	2	0	0.00
365.	-S930	6	1	16.66
366	-S940	6	0	0.00
367.	-S950	16	0	0.00
368.	-S960	14	6	42.85
	BDN-1	12	10	83.33
369.	C.No.73070-F_4B-S970	10	2	20.00
370	-S980	9	1	11.11
371.	-S990	29	10	34.48
372	-S1000	5	1	20.00
373.	-S1010	7	5	71.42
374	-S1020	2	0	0.00
375.	-S1030	27	0	0.00
376.	-S1040	5	0	0.00
377.	-S1050	4	0	0.00
378.	-S1060	7	0	0.00
379.	-S1070	3	0	0.00
380.	-S1080	19	0	0.00
	BDN-1	26	26	100.00
381.	C.No.73070-F_4B-S1090	-	-	-
382.	-S1100	7	0	0.00
383.	-S1110	14	1	7.14
384.	-S1120	14	2	14.28
385.	-S1130	18	0	0.00
386.	-S1140	18	1	5.55
387.	-S1150	17	10	58.82
388.	-S1160	15	0	0.00
389	-S1170	6	0	0.00
390.	-S1180	33	0	0.00
	BDN-1	12	12	100.00
391.	C.No.73070-F_4B-S1190	19	1	5.26
392.	-S1200	13	0	0.00
393.	-S1210	25	0	0.00
394	-S1220	26	0	0.00
395.	-S1230	18	0	0.00
396.	-S1240	15	1	6.66
397.	-S1250	12	0	0.00
398.	-S1260	12	0	0.00
399.	-S1270	14	0	0.00
400	-S1280	26	2	7.69
	BDN-1	12	10	83.33
401	C.No.73070-F_4B-S1290	7	0	0.00
402.	-S1300	20	0	0.00
403.	-S1310	27	6	22.22
404.	-S1320	46	20	43.47

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1	2	3	4	5
405	C No.73070-F_4B-S1330	53	8	15 09
406	-S1340	-	-	-
407	-S1350	-	-	-
408	-S1360	27	0	0 00
409	-S1370	7	0	0 00
410	-S1380	-	-	-
411	-S1390	2	0	0 00
412	-S1400	7	1	14 28
	BDN-1	8	8	100 00
413	C No.73070-F_4B-S1410	8	0	0 00
414	-S1420	-	-	-
415	-S1430	2	0	0 00
416	-S1440	-	-	-
417	-S1450	-	-	-
418	-S1460	3	0	0 00
419	-S1470	8	0	0 00
420	-S1480	-	-	-
421	-S1490	-	-	-
422	-S1500	19	4	21 05
	BDN-1	18	18	100 00
423	C No 73070-F_4B-S1510	-	-	-
424	-S1520	-	-	-
425	-S1530	5	0	0 00
426	-S1540	18	2	11 11
427	-S1550	5	0	0 00
428	-S1560	14	0	0 00
429	-S1570	6	0	0 00
430	-S1580	16	1	6 25
431	-S1590	10	1	10 00
432	-S1600	-	-	-
433	-S1610	[illegible]	0	0 00
	BDN-1	16	16	100 00
434	C No 73070-F_4B-S1620	18	1	5 55
435	-S1630	41	7	17 00
436	-S1640	3	0	0 00
437	-S1650	2	0	0 00
438	-S1660	15	0	0 00
439	-S1670	15	5	33 33
440	-S1680	-	-	-
441	-S1690	4	1	25 00
442	-S1700	10	2	20 00
443	-S1710	2	0	0 00
444	-S1720	5	2	40 00
445	-S1730	19	14	73 68
	BDN-1	22	22	100 00

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1	2	3	4	5
446.	C.No.73070-F_4B-S1740	7	0	0.00
447.	-S1750	18	5	27.77
448.	-S1760	28	3	10.71
449.	-S1770	16	7	43.75
450.	-S1780	-	-	-
451.	-S1790	1	0	0.00
452.	-S1800	31	0	0.00
453	-S1810	8	0	0.00
454	-S1820	-	-	-
455.	-S1830	24	15	62.50
	BDN-1	14	13	92.85
456.	C.No.73070-F_4B-S1840	22	2	9.09
457.	-S1850	9	0	0.00
458.	-S1860	1	1	100.00
459.	-S1870	3	0	0.00
460.	-S1880	16	4	25.00
461.	-S1890	10	3	30.00
462.	-S1900	26	0	0.00
463.	-S1910	16	1	6.25
464	-S1920	2	0	0.00
465.	-S1930	10	3	30.00
466.	-S1940	12	1	8.33
	BDN-1	10	9	90.00
467.	C No.73070-F_4B-S1950	5	1	20.00
468.	-S1960	2	0	0.00
469.	-S1970	5	0	0.00
470.	-S1980	-	-	-
471.	-S1990	4	0	0.00
472.	-S2000	40	30	75.00
473	-S2010	5	0	0.00
474	-S2020	3	0	0.00
475.	-S2030	20	3	15.00
476.	-S2040	19	2	10.52
477	-S2050	13	0	0.00
	BDN-1	10	10	100.00
478	C.No.73070-F_4B-S2060	-	-	-
479	-S2070	14	0	0.00
480	-S2080	13	0	0.00
481.	-S2090	18	0	0.00
482	-S2100	5	1	20.00
483.	-S2110	1	1	100.00
484	-S2120	2	0	0.00
485	-S2130	1	0	0.00
486.	-S2140	-	-	-
487.	-S2150	-	-	-
	BDN-1	1	1	100.00

contd.

1	2	3	4	5
488	C No 73070-F_4B-S2160	1	0	0 00
489	-S2170	2	0	0 00
490	-S2180	7	0	0 00
491	-S2190	3	1	33 33
492	-S2200	14	4	28 57
493	-S2210	-	-	-
494	-S2220	9	0	0 00
495	-S2230	16	0	0 00
496	-S2240	-	-	-
497	-S2250	6	0	0 00
	BDN-1	5	5	100 00
498	C No 73070-F_4B-S2260	3	0	0 00
499	-S2270	1	1	100 00
500	-S2280	-	-	-
501	-S2290	4	0	0 00
502	-S2300	3	0	0 00
503	-S2310	7	0	0 00
504	-S2320	10	0	0 00
505	-S2330	1	0	0 00
506	-S2340	2	0	0 00
507	-S2350	8	2	25 00
508	-S2360	13	0	0 00
	BDN-1	6	6	100 00
509	C No 73070-F_4B-S2370	10	0	0 00
510	-S2380	9	1	11 11
511	-S2390	10	0	0 00
512	-S2400	21	4	19 04
513	-S2410	8	0	0 00
514	-S2420	4	0	0 00
515	-S2430	21	0	0 00
516	-S2440	3	0	0 00
517	-S2450	-	-	-
518	-S2460	-	-	-
519	-S2470	1	1	100 00
	BDN-1	-	-	-
520	C No 73070-F_4B-S2480	4	0	0 00
521	-S2490	4	0	0 00
522	-S2500	-	-	-
523	-S2510	2	1	50 00
524	-S2520	7	2	28 57
525	-S2530	6	6	100 00
526	-S2540	-	-	-
527	-S2550	2	1	50 00
528	-S2560	-	-	-
529	-S2570	2	0	0 00
	BDN-1	-	-	-

contd

1	2	3	4	5
530.	C.No.73070-F_4B-S258Ø	-	-	-
531.	-S259Ø	-	-	-
532.	-S260Ø	15	0	0.00
533.	-S261Ø	6	0	0.00
534.	-S262Ø	7	0	0.00
535.	-S263Ø	10	0	0.00
536.	-S264Ø	9	0	0.00
537.	-S265Ø	5	0	0.00
538.	-S266Ø	8	0	0.00
539.	-S267Ø	26	1	3.84
540.	-S268Ø	6	0	0.00
541.	-S269Ø	13	0	0.00
	BDN-1	10	10	100.00
542.	C.No.73070-F_4B-S270Ø	13	2	15.38
543.	-S271Ø	20	9	45.00
544.	-S272Ø	28	9	32.14
545.	-S273Ø	6	1	16.66
546.	-S274Ø	20	3	15.00
547.	-S275Ø	8	0	0.00
548.	-S276Ø	12	0	0.00
549.	-S277Ø	21	0	0.00
550.	-S278Ø	13	5	38.46
	BDN-1	10	10	100.00
551.	C.No.73070-F_4B-S279Ø	10	0	0.00
552.	-S280Ø	16	4	25.00
553.	-S281Ø	2	0	0.00
554.	-S282Ø	7	1	14.28
555.	-S283Ø	9	0	0.00
556.	-S284Ø	15	2	13.33
557.	-S285Ø	9	0	0.00
558.	-S286Ø	11	0	0.00
559	-S287Ø	9	1	11.11
560.	-S288Ø	5	0	0.00
	BDN-1	4	4	100.00
561.	C.No.73070-F_4B-S289Ø	3	0	0.00
562.	-S290Ø	2	1	50.00
563.	-S291Ø	3	0	0.00
564.	-S292Ø	3	0	0.00
565.	-S293Ø	1	0	0.00
566.	-S294Ø	5	0	0.00
567.	-S295Ø	3	0	0.00
568.	-S296Ø	1	0	0.00
569.	-S297Ø	-	-	-
570.	-S298Ø	15	2	13.33

contd.

1	2	3	4	5
571	C No 73070-F_4B-S2990	20	0	0 00
572	-S3000	10	0	0 00
	BDN-1	15	15	100 00
573	C No 73070-F_4B-S3010	1	0	0 00
574	-S3020	2	1	50 00
575	-S3030	10	0	0 00
576	-S3040	7	0	0 00
577	-S3050	7	1	14 28
578	-S3060	-	-	-
579	-S3070	6	0	0 00
580	-S3080	6	0	0 00
581	-S3090	2	0	0 00
582	-S3100	-	-	-
583	-S3110	-	-	-
584	-S3120	-	-	-
585	-S3130	5	0	0 00
586	-S3140	11	0	0 00
	BDN-1	4	3	75 00
587	C No 73070-F_4B-S3150	7	5	71 42
588	-S3160	15	0	0 00
589	-S3170	9	0	0 00
590	-S3180	7	0	0 00
591	-S3190	15	0	0 00
592	-S3200	7	1	14 28
593	-S3210	13	2	15 38
594	-S3220	1	0	0 00
595	-S3230	-	-	-
596	-S3240	-	-	-
597	-S3250	-	-	-
	BDN-1	1	1	100 00
598	C No 73070-F_4B-S3260	-	-	-
599	-S3270	2	0	0 00
600	-S3280	3	0	0 00
601	-S3290	3	0	0 00
602	-S3300	12	0	0 00
603	-S3310	-	-	-
604	-S3320	-	-	-
605	-S3330	-	-	-
606	-S3340	-	-	-
	BDN-1	3	3	100 00
607	C No 73070-F_4B-S3350	-	-	-
608	-S3360	6	1	16 66
609	-S3370	-	-	-
610	-S3380	6	2	33 33

contd

1	2	3	4	5
611.	C.No.73070-F_4B-S339Ø	3	0	0.00
612.	-S340Ø	7	1	14.28
613.	-S341Ø	19	0	0.00
614.	-S342Ø	2	0	0.00
615.	-S343Ø	12	5	41.66
616.	-S344Ø	-	-	-
	BDN-1	6	6	100.00
617.	-S345Ø	3	0	0.00
618.	-S346Ø	10	0	0.00
619.	-S347Ø	-	-	-
620.	-S348Ø	9	1	11.11
621.	-S349Ø	7	5	71.42
622.	-S350Ø	4	0	0.00
623.	-S351Ø	5	0	0.00
624	-S352Ø	13	0	0.00
625.	-S353Ø	10	0	0.00
626.	-S354Ø	7	0	0.00
627.	-S355Ø	4	3	75.00
	BDN-1	7	7	100.00
628.	C.No.73070-F_4B-S356Ø	2	0	0.00
629.	-S357Ø	4	0	0.00
630.	-S358Ø	7	2	28.57
631.	-S359Ø	7	2	28.57
632.	-S360Ø	5	3	60.00
633.	-S361Ø	6	0	0.00
634.	-S362Ø	3	0	0.00
635.	-S363Ø	7	0	0.00
636.	-S364Ø	5	0	0.00
637.	-S365Ø	2	0	0.00
638.	-S366Ø	10	2	20.00
639.	-S367Ø	2	0	0.00
	BDN-1	8	8	100.00
640.	C.No.73070-F_4B-S368Ø	9	0	0.00
641.	-S369Ø	7	0	0.00
642	-S370Ø	21	4	19.04
643.	-S371Ø	7	2	28.57
644.	-S372Ø	15	8	53.33
645.	-S373Ø	3	0	0.00
646.	-S374Ø	4	0	0.00
647.	-S375Ø	3	0	0.00
648.	-S376Ø	13	0	0.00
649.	-S377Ø	38	24	63.15
650.	-S378Ø	12	0	0.00
	BDN-1	9	8	88.88

contd.

1	2	3	4	5
651	C No. 73070-F_4B-S3790	21	0	0 00
652	-S3800	26	1	3 84
653.	-S3810	34	1	2 94
654.	-S3820	19	0	0 00
655.	-S3830	18	0	0 00
656.	-S3840	18	4	22 22
657.	-S3850	37	0	0 00
658.	-S3860	16	1	6 25
659.	-S3870	13	1	7 69
660.	-S3880	27	1	3 70
	BDN-1	7	7	100 00
661.	C No. 73070-F_4B-S3890	2	0	0 00
662.	-S3900	26	0	0 00
663	-S3910	5	0	0 00
664.	-S3920	20	0	0 00
665.	-S3930	26	0	0 00
666	ICP-6997-137-16Br-P1	1	0	0 00
667	C No. 74240-F_4B-S10	-	-	-
668.	-S20	-	-	-
669.	-S30	-	-	-
	BDN-1	8	8	100 00
670.	C.No. 74240-F_4B-S40	5	3	60 00
671.	-S50	-	-	-
672.	-S60	3	0	0 00
673.	-S70	9	2	22 22
674.	-S80	-	-	-
675.	-S90	6	0	0 00
676	-S100	10	0	0 00
677.	-S110	6	2	33 33
678	-S120	8	0	0 00
679.	-S130	2	0	0 00
	BDN-1	8	8	100 00
680.	C No. 74240-F_4B-S140	2	0	0 00
681.	-S150	18	0	0 00
682.	-S160	12	1	8 33
683.	-S170	14	0	0 00
684.	-S180	4	0	0 00
685	-S190	8	3	37 50
686	-S200	8	0	0 00
687	-S210	4	0	0 00
688.	-S220	32	0	0 00
	BDN-1	13	13	100 00
689.	C.No 74240-F_4B-S230	8	0	0 00
690	-S240	5	0	0 00
691.	-S250	6	0	0 00

contd

1	2	3	4	5
692.	C.No.74240-F_4B-S260	18	5	27.77
693.	-S270	2	0	0.00
694.	-S280	1	0	0.00
695.	-S290	7	1	14.28
696.	-S300	7	3	42.85
697.	-S310	3	2	66.66
698.	-S320	-	-	-
699.	-S330	9	0	0.00
700.	-S340	2	0	0.00
	BDN-1	4	4	100.00
701.	C.No.74240-F_4B-S340	5	0	0.00
702.	-S350	9	3	33.33
703.	-S360	11	0	0.00
704.	-S370	12	1	8.33
705.	-S380	4	1	25.00
706.	-S390	23	2	8.69
707.	-S400	4	0	0.00
708.	-S410	7	2	28.57
709.	-S420	35	0	0.00
710.	-S430	6	0	0.00
	BDN-1	6	6	100.00
711.	C.No.74240-F_4B-S440	7	1	14.28
712.	-S450	3	0	0.00
713.	-S460	29	0	0.00
714.	-S470	-	-	-
715.	-S480	1	0	0.00
716.	-S490	19	0	0.00
717.	-S500	10	0	0.00
718.	-S510	18	3	16.66
719.	-S520	4	0	0.00
720.	-S530	10	1	10.00
721.	-S540	17	10	58.82
	BDN-1	10	10	100.00
722.	C.No.74240-F_4B-S550	9	2	22.22
723.	-S560	3	1	33.33
724.	-S570	13	5	38.46
725.	-S580	8	1	12.50
726.	-S590	10	2	20.00
727.	-S600	16	0	0.00
728.	-S610	7	0	0.00
729.	-S620	2	0	0.00
730.	-S630	-	-	-
731.	-S640	-	-	-
	BDN-1	7	7	100.00
732.	C.No.74240-F_4B-S650	15	2	13.33
733.	-S660	6	1	16.66

1	2	3	4	5
734	C No. $74240\text{-}F_4B$-S670	29	0	0.00
735	-S680	8	1	12.50
736.	-S690	9	2	22.22
737.	-S700	15	2	13.33
738.	-S710	2	0	0.00
739.	-S720	-	-	-
740.	-S730	4	0	0.00
741.	-S740	15	0	0.00
	BDN-1	5	5	100.00
742.	C.No. $74240\text{-}F_4B$-S750	15	3	20.00
743.	-S760	3	0	0.00
744.	-S770	15	0	0.00
745.	-S780	-	-	-
746.	-S790	5	0	0.00
747.	-S800	5	0	0.00
748.	-S810	6	0	0.00
749.	-S820	16	3	18.75
750.	-S830	2	0	0.00
751.	-S840	3	0	0.00
	BDN-1	-	-	-
752.	C.No. $74240\text{-}F_4B$-S850	2	0	0.00
753.	-S860	7	1	14.28
754.	-S870	3	3	100.00
755.	-S880	6	0	0.00
756.	-S890	4	0	0.00
757.	-S900	-	-	-
758.	-S910	8	0	0.00
759.	-S920	7	0	0.00
760.	-S930	-	-	-
761.	-S940	2	1	50.00
	BDN-1	5	4	80.00
762.	C.No. $74240\text{-}F_4B$-S950	11	1	9.09
763	-S960	1	0	0.00
764	-S970	14	2	14.28
765	-S980	10	0	0.00
766.	-S990	5	2	40.00
767.	-S1000	13	3	23.07
768.	-S1010	13	1	7.69
769	-S1020	21	3	14.28
770	-S1030	15	2	13.33
771.	-S1040	4	1	25.00
772.	-S1050	-	-	-
	BDN-1	3	3	100.00
773.	C.No. $74240\text{-}F_4B$-S1060	17	3	17.64
774.	-S1070	3	0	0.00
775.	-S1080	5	5	100.00

contd.

1	2	3	4	5
776	C.No.74240-F_4B-S1090	-	-	-
777.	-S1100	1	0	0.00
778.	-S1110	16	0	0.00
779.	-S1120	2	0	0.00
780.	-S1130	5	4	80.00
781.	-S1140	13	8	61.53
782.	-S1150	-	-	-
	BDN-1	2	2	100.00
783.	C.No.74240-F_4B-S1160	2	0	0.00
784.	-S1170	2	0	0.00
785.	-S1180	-	-	-
786.	-S1190	-	-	-
787.	-S1200	-	-	-
788	-S1210	-	-	-
789	-S1220	6	2	33.33
790.	-S1230	5	2	40.00
791.	-S1240	-	-	-
792	-S1250	4	0	0.00
	BDN-1	5	5	100.00
793	C.No.74240-F_4B-S1260	24	0	0.00
794.	-S1270	16	2	12.50
795.	-S1280	-	-	-
796.	-S1290	1	1	100.00
797	-S1300	7	1	14.28
798	-S1310	28	15	53.57
799.	-S1320	12	1	8.33
800.	-S1330	-	-	-
801	-S1340	20	0	0.00
802	-S1350	30	2	6.66
803.	-S1360	7	0	0.00
	BDN-1	10	10	100.00
804	C.No.74240-F_4B-S1370	4	0	0.00
805	-S1380	11	3	27.27
806	-S1390	10	0	0.00
807	-S1400	6	2	33.33
808.	-S1410	14	9	64.28
809	-S1420	9	0	0.00
810.	-S1430	9	0	0.00

contd.

1	2	3	4	5
811	C.No 74240-F_4B-S1440	5	0	0.00
812.	-S1450	2	0	0.00
	BDN-1	13	13	100.00
813.	C.No.74240-F_4B-S1460	19	0	0.00
814.	-S1470	6	1	16.66
815.	-S1480	10	1	10.00
816.	-S1490	9	0	0.00
817.	-S1500	4	1	25.00
818.	-S1510	4	0	0.00
819.	-S1520	-	-	-
820.	-S1530	-	-	-
821	-S1540	7	0	0.00
822.	-S1550	-	-	-
	BDN-1	15	15	100.00
823.	C.No.74240-F_4B-S1560	10	1	10.00
824.	-S1570	9	4	44.44
825	-S1580	20	0	0.00
826.	-S1590	15	4	26.66
827.	-S1600	4	0	0.00
828.	-S1610	4	0	0.00
829.	-S1620	8	1	12.50
830.	-S1630	2	0	0.00
831.	-S1640	-	-	-
832.	-S1650	2	0	0.00
	BDN-1	-	-	-
833	C.No.74240-F_4B-S1660	-	-	-
834	-S1670	-	-	-
835.	-S1680	6	1	16.66
836.	-S1690	2	0	0.00
837	-S1700	1	0	0.00
838	-S1710	10	3	30.00
839	-S1720	6	0	0.00
840	-S1730	11	0	0.00
841.	-S1740	3	0	0.00
842.	-S1750	26	0	0.00
	BDN-1	6	6	100.00
843.	C.No.74240-F_4B-S1760	1	0	0.00
844.	-S1770	6	0	0.00
845.	-S1780	6	0	0.00
846.	-S1790	10	1	10.00
847.	-S1800	-	-	-
848.	-S1810	-	-	-
849.	-S1820	1	0	0.00
850.	-S1830	-	-	-

contd

1	2	3	4	5
851	C.No.74240-F_4B-S1840	-	-	-
852.	-S1850	-	-	-
	BDN-1	-	-	-
853.	C.No.74240-F_4B-S1860	4	1	25.00
854.	-S1870	10	4	40.00
855.	-S1880	1	0	0.00
856.	-S1890	3	0	0.00
857.	-S1900	8	0	0.00
858.	-S1910	-	-	-
859.	-S1920	3	0	0.00

APPENDIX-XXXI

Results of screening of advanced selected germplasm and breeding materials for sterility mosaic resistance during 1978-79.

Sl No.	Particular	Total plants	Infected plants	Percent infection
1	2	3	4	5
1	ICP-7249-1-1-S1 VI NDT-B⊗	18	0	0.00
2	-S2 VI NDT-B⊗	18	1	5.55
3.	-S3 VI NDT-B⊗	33	1	3.03
4.	-S4 VI NDT-B⊗	22	2	9.09
5.	-S5 VI NDT-B⊗	14	0	0.00
6	-S6 VI NDT-B⊗	11	1	9.09
7	-S7 VI NDT-B⊗	29	0	0.00
	BDN-1	26	26	100.00
8	-S8 VI NDT-B⊗	28	1	3.57
9.	-S9 VI NDT-B⊗	17	1	5.88
10	-S10 VI NDT-B⊗	15	2	13.33
11	-S11 VI NDT-B⊗	32	6	18.75
	BDN-1	40	40	100.00
12.	-S13 VI NDT-B⊗	5	0	0.00
13.	-S14 VI NDT-B⊗	15	0	0.00
14	-S17 VI NDT-B⊗	35	1	2.85
15	-S18 VI NDT-B⊗	13	0	0.00
16.	-S19 VI NDT-B⊗	6	2	33.33
17	ICP-5157-1 S2 VI NDT-B⊗	4	0	0.00
18	-S3 VI NDT-B⊗	10	0	0.00
	BDN-1	4	4	100.00
19	-S4 VI NDT-B⊗	10	1	10.00
20.	-S5 VI NDT-B⊗	13	1	7.69
21	-S6 VI NDT-B⊗	6	1	16.66
22	-S7 VI NDT-B⊗	6	0	0.00
23.	-S8 VI NDT-B⊗	6	0	0.00
	BDN-1	8	8	100.00
24	-S9 VI NDT-B⊗	3	0	0.00
25	-S10 VI NDT-B⊗	11	0	0.00
26	-S11 VI NDT-B⊗	10	0	0.00
27	-S12 VI NDT-B⊗	14	0	0.00

Contd

1	2	3	4	5
28.	ICP-6491-1-S1 VI NDT-BØ	18	0	0.00
29	-S2 VI NDT-BØ	4	0	0.00
	BDN-1	12	12	100.00
30.	-S2 VI NDT-BØ	6	1	16.66
31	-S3 VI NDT-BØ	25	1	4.00
32	-S4 VI NDT-BØ	12	1	8.33
33.	-S5 VI NDT-BØ	14	0	0.00
34.	-S6 VI NDT-BØ	21	6	28.57
	BDN-1	8	8	100.00
35.	-S7 VI NDT-BØ	23	0	0.00
36.	-S8 VI NDT-BØ	12	1	8.33
37.	-S9 VI NDT-BØ	19	1	5.26
38.	-S10 VI NDT-BØ	29	1	4.44
39	-S11 VI NDT-BØ	21	1	4.76
	BDN-1	18	18	100.00
40.	-S12 VI NDT-BØ	23	7	30.43
41.	-S13 VI NDT-BØ	12	0	0.00
42.	-S14 VI NDT-BØ	7	1	14.28
43.	-S15 VI NDT-BØ	12	1	8.33
44.	-S16 VI NDT-BØ	8	3	37.50
	BDN-1	6	6	100.00
45.	ICP-6559-1-S1 VI NDT-BØ	5	1	20.00
46	-S2 VI NDT-BØ	6	5	83.33
47	-S3 VI NDT-BØ	7	0	0.00
48	-S5 VI NDT-BØ	9	0	0.00
49	-S12 VI NDT-BØ	15	0	0.00
50.	-S13 VI NDT-BØ	19	2	10.52
51	-S14 VI NDT-BØ	20	4	20.00
	BDN-1	6	6	100.00
52	-S15 VI NDT-BØ	27	0	0.00
53	-S16 VI NDT-BØ	5	1	20.00
54	-S17 VI NDT-BØ	10	0	0.00
55	-S18 VI NDT-BØ	6	0	0.00
56.	74041-11-4-S1 VI NDT-BØ (F_5)	20	15	75.00
	BDN-1	8	8	100.00
57.	-S2 VI NDT-BØ	18	7	38.88
58.	-S3 VI NDT-BØ	16	3	18.75
59.	-S4 VI NDT-BØ	10	0	0.00
60.	-S5 VI NDT-BØ	4	0	0.00

Contd.

1	2	3	4	5
61	74041-11-4-S6 VI NDT-B⊗	1	0	0 00
	BDN-1	6	6	100 00
62.	-S7 VI NDT-B⊗	2	0	0 00
63	-S8 VI NDT-B⊗	12	6	50 00
64	-S9 VI NDT-B⊗	12	4	33 33
65	-S10 NDT-B⊗	33	7	21 20
66.	S11 NDT-B⊗	20	2	10 00
	BDN 1	16	16	100.00
67.	-S12 NDT-B⊗	8	2	25 00
68.	-S13 NDT B⊗	21	16	76.19
69.	S14 NDT-B⊗	12	0	0 00
70	-S15 NDT-B⊗	21	2	9 52
71	-S16 NDT-B⊗	24	4	16 66
	BDN-1	7	7	100 00
72.	S17 NDT-B⊗	32	1	3 12
73.	-S18 NDT B⊗	18	0	0 00
74.	-S19 NDT-B⊗	16	2	12 50
75.	-S20 NDT-B⊗	16	0	0 00
	BDN-1	7	7	100 00
76.	73047.24-8-2-1-S2 IV DT-B⊗ (F8)		No germination	
77.	-S3 IV DT B⊗	2	0	0 00
78.	-S4 IV DT-B⊗	6	0	0.00
79.	-S5 IV DT B⊗	25	15	60 00
80.	73047-24-1-5-3-S1 V DT-B⊗	12	0	0 00
	BDN-1	14	14	100 00
81	-S2 V DT-B⊗	11	0	0 00
82.	-S3 V DT-B⊗	11	0	0 00
83.	-S4 V DT-B⊗	9	0	0 00
84	-S5 V DT-B⊗	2	1	50 00
85	-S6 V DT-B⊗	23	0	0 00
86	-S7 V DT-B⊗	7	4	57 14
87	S9 V DT B⊗	2	0	0 00
88	-S10 V DT-B⊗	10	0	0 00
89.	-S12 V DT-B⊗	7	0	0.00
90.	S13 V DT-B⊗	33	0	0 00
91.	73047 24-1-5-4-S1 V DT-B⊗	34	0	0 00
	BDN-1	19	19	100 00

Contd

1	2	3	4	5
92	73047-24-1-5-4-S2 V DT-B0	20	0	0.00
93	-S3 V DT-B0	16	2	12.50
94	-S4 V DT-B0	8	1	12.50
95	-S5 V DT-B0	12	1	8.33
	BDN-1	10	10	100.00
96.	-S6 V DT-B0	16	0	0.00
97.	-S7 V DT-B0	15	0	0.00
98.	-S8 V DT-B0	2	0	0.00
99.	-S9 V DT-B0	23	0	0.00
100	-S10 V DT-B0	19	0	0.00
	BDN-1	13	13	100.00
101	73047-24-8-2-1-S1 IV NDT-B0	19	0	0.00
102.	73054-3-4-1-S1 IV NDT-B0	12	0	0.00
103.	-S2 IV NDT-B0	5	0	0.00
104	-S3 IV NDT-B0	9	0	0.00
105.	-S4 IV NDT-B0	8	0	0.00
106.	-S5 IV NDT-B0	9	2	22.22
	BDN-1	28	28	100.00
107.	73047-21-2-4-S1 IV NDT-B0 (F7)	23	2	8.69
108	-S2 IV NDT-B0	25	0	0.00
109	-S3 IV NDT-B0	7	0	0.00
110	-S4 IV NDT-B0		No germination	
111	-S5 IV NDT-B0	9	1	11.11
	BDN-1	3	3	100.00
112	-S6 IV NDT-B0	28	8	28.57
113	-S7 IV NDT-B0	13	0	0.00
114	-S8 IV NDT-B0	24	0	0.00
115.	73047-24-BII-1-S6 V DT-B0	6	0	0.00
	BDN-1	8	8	100.00
116.	-S8 V DT-B0	14	0	0.00
117.	-S1 V NDT-B0	5	0	0.00
118.	-S2 V NDT-B0	1	0	0.00
119.	-S3 V NDT-B0	16	0	0.00
120	-S4 V NDT-B0	8	0	0.00
	BDN-1	6	6	100.00
121.	73047-24-BII-1-S5 V NDT-B0	19	0	0.00
122	-S7 V NDT-B0	18	0	0.00

Contd.

1	2	3	4	5
123	73047-22-5-S1 IV NDT-B0 (F6)	12	2	16 66
124	74236-35-2 S2 IV NDT-B0	5	0	0.00
125	74236-35-4-S1 IV NDT-B0	34	0	0 00
	BDN 1	15	15	100 00
126	-S2 IV NDT-B0	11	0	0 00
127.	-S3 IV NDT-B0	34	3	8.82
128.	-S4 IV NDT-B0	34	1	2 94
129.	74236-35-5-S1 IV NDT-B0	25	0	0 00
	BDN-1	14	14	100.00
130	-S3 IV NDT-B0	13	0	0 00
131	-S5 IV NDT-B0	27	0	0 00
132	74236-35-6-S1 IV NDT-B0	25	0	0.00
133	-S2 IV NDT B0	14	0	0 00
	BDN-1	22	22	100.00
134	-S3 IV NDT-B0	34	0	0 00
135.	-S4 IV NDT-B0	29	0	0 00
136	-S5 IV NDT-B0	33	2	6 06
137.	74236-35-7-S1 IV NDT-B0	23	0	0 00
138.	-S2 IV NDT-B0	14	0	0 00
	BDN-1	7	7	100 00
139.	-S3 IV NDT-B0	10	0	0 00
140	-S4 IV NDT-B0	11	0	0 00
141.	-S5 IV NDT B0	19	0	0 00
142	74236 35-9-S3 IV NDT-B0	7	0	0 00
143.	-S4 IV NDT-B0	15	0	0 00
	BDN-1	9	0	0 00
144	-S5 IV NDT B0	23	0	0 00
145	73047-42-S10-SV DT0-B0	7	1	14 28
146	73047-27-S10-SV NDT0-B0	2	0	0 00
147	73070-10-S10-SV NDT0-B0	12	0	0 00
148	74236-21-8-S1 V NDT-B0	16	0	0.00
149	-S2 V NDT-B0	11	0	0 00
150	-S3 V NDT-B0	10	0	0 00
151	-S4 V NDT B0	1	0	0 00
152	-S5 V NDT-B0	9	0	0 00
153	73054 55-1-S1 VI NDT-B0	10	1	10 00
154	-S2 VI NDT-B0	9	0	0 00
	BDN-1	3	3	100 00

Contd

1	2	3	4	5
155.	73054-55-1-S3 VI NDT-B⊗	10	1	10.00
156	-S4 VI NDT-B⊗	6	1	16.66
157.	-S5 VI NDT-B⊗		No germination	
158.	73054-55-3-S2 VI NDT-B⊗	1	0	0.00
159.	-S3 VI NDT-B⊗	4	0	0.00
160.	-S4 VI NDT-B⊗	7	0	0.00
	BDN-1	7	7	100.00
161.	74240-7-S1⊗-S VI NDT⊗-B⊗	4	1	25.00
162	-S2⊗-S VI NDT⊗-B⊗	12	1	8.33
163	73047-8-S2⊗-S V DT⊗-B⊗	8	0	0.00
164.	73047-19-S2⊗-S V DT1⊗-B⊗	2	0	0.00
165	73070-S1⊗-SV NDT⊗-B⊗ (F5)	1	0	0.00
166	73088-S1⊗-SV NDT⊗-B⊗	17	0	0.00
	BDN-1	4	2	50.00
167	74245-S1⊗-S V NDT⊗-B⊗	11	1	9.09
168	74240-S1⊗-S V NDT⊗-B⊗	16	0	0.00
169	74236-S1⊗-S VI NDT⊗-B⊗	5	0	0.00
170	74236-S2⊗-S VI NDT⊗-B⊗	14	1	7.14
171	74363-S3⊗-S VI NDT⊗-B⊗	13	0	0.00
	BDN-1	16	16	100.00
172	74363-S4⊗-S VI NDT⊗-B⊗	6	0	0.00

APPENDIX-XXXII

Results of screening of advanced F_4 and F_5 triple cross progenies of pigeonpea for sterility mosaic resistance during 1978-79

Sl No.	Particular	Total plants	Infected plants	Percent infection
1	2	3	4	5
1	74038-12-1-1-S1⊗ III DT (TCF5)	15	0	0.00
2.	74023-7-3-3-S5⊗ III NDT	37	2	5.40
3.	74020-9-1-2 S6⊗ V DT	13	0	0.00
4.	74020-8-2-7-S2⊗ V DT	25	0	0.00
5.	-S4 V DT⊗	4	0	0.00
6	-S5 V DT⊗	6	0	0.00
7.	-S6 V DT⊗	2	0	0.00
	BDN-1	10	10	100.00
8.	74020-31 2-3-S1 V DT⊗	5	0	0.00
9.	-S2 V DT⊗	2	0	0.00
10.	-S5 V DT⊗	3	0	0.00
11.	74008-5-1-5-S2 V NDT⊗	13	0	0.00
12.	-S3 V NDT⊗	26	2	7.69
13	74019-18-1-3-S2 V NDT⊗	19	0	0.00
14.	S3 V NDT⊗	10	0	0.00
15	-S4 V NDT⊗	11	0	0.00
16.	S5 V NDT⊗	5	0	0.00
17.	74019-28-1 6-S1 V NDT⊗	17	4	23.52
	BDN-1	8	8	100.00
18	-S3 V NDT⊗	12	1	8.33
19.	-S4 V NDT⊗	26	0	0.00
20.	74020 9-1-2 S1 V NDT⊗	19	0	0.00
21	-S2 V NDT⊗	11	0	0.00
22	74020-8-2-7-S3 V NDT⊗	32	0	0.00
23	74023-7-3-3-S2 V NDT⊗	26	0	0.00
24	-S3 V NDT⊗	36	0	0.00
25	-S4 V NDT⊗	3	0	0.00
26	-S6 V NDT⊗	14	2	14.28
	BDN-1	11	11	100.00

Contd

1	2	3	4	5
27.	74024-2-1-3-S1 V NDTQ	3	0	0.00
28.	-S2 V NDTQ	19	0	0.00
29.	-S3 V NDTQ	13	0	0.00
30.	-S5 V NDTQ	1	0	0.00
31.	74038-12-1-1-S4 V NDTQ	15	0	0.00
32.	74038-49-1-3-S1 V NDTQ	15	0	0.00
33.	-S2 V NDTQ	4	0	0.00
34.	-S3 V NDTQ	11	0	0.00
35.	-S5 V NDTQ	11	2	18.18
36.	74038-3-1-1-S2 V NDTQ	3	0	0.00
	BDN-1	19	19	100.00
37.	74030-1-2-S1 V NDTQ (TCF4)	29	0	0.00
38.	-S2 V NDTQ	48	1	2.08
39.	-S3 V NDTQ	15	0	0.00
40.	-S4 V NDTQ	18	0	0.00
41.	-S5 V NDTQ (TCF3)	18	1	5.55
42.	74034-4-4-S3 V NDTQ	22	5	22.72
43.	-S4 V NDTQ	40	0	0.00
44.	74020-9-1-2-S5 VI DTQ	14	0	0.00
45.	74020-8-2-7-S1 VI DTQ	37	0	0.00
	BDN-1	2	2	100.00
46.	74004-47-1-3-S1 VI NDTQ	9	0	0.00
47.	-S2 VI NDTQ	15	0	0.00
48.	-S3 VI NDTQ	19	0	0.00
49.	74004-47-1-4-S1 VI NDTQ	25	1	4.00
50.	-S2 VI NDTQ	23	1	4.34
51.	-S3 VI NDTQ	7	0	0.00
52.	-S4 VI NDTQ	13	0	0.00
53.	74007-54-1-4-S2 VI NDTQ	13	5	38.46
54.	-S3 VI NDTQ	20	3	15.00
55.	-S4 VI NDTQ	25	16	64.00
	BDN-1	12	12	100.00
56.	-S5 VI NDTQ	67	7	10.44
57.	74008-5-1-3-S1 VI NDTQ	42	0	0.00
58.	-S2 VI NDTQ	46	2	4.34
59.	-S3 VI NDTQ	32	0	0.00
60.	-S4 VI NDTQ	33	2	6.06
61.	74008-5-1-4-S1 VI NDTQ	26	1	3.84
62.	-S2 VI NDTQ	40	2	5.00
63.	-S3 VI NDTQ	68	0	0.00
64.	-S4 VI NDTQ	21	3	14.28
	BDN-1	15	15	100.00

Contd.

1	2	3	4	5
65	74008-5-1-5-S5 VI NDT⊗	28	1	3.57
66	74019-18-1 5-S1 VI NDT⊗	9	2	22 22
67	S2 VI NDT⊗	18	11	61 11
68	-S3 VI NDT⊗	13	2	15 38
69	-S4 VI NDT⊗	18	2	11 11
70	S5 VI NDT⊗	15	0	0 00
71	74019-28-1 6-S2 VI NDT⊗	29	1	3 44
72	-S5 VI NDT⊗	3	0	0 00
73	74023 6-1-5-S1 VI NDT⊗	14	0	0 00
74	-S2 VI NDT⊗	26	0	0 00
	BDN-1	7	7	100 00
75	-S3 VI NDT⊗	19	0	0 00
76	-S4 VI NDT⊗	34	0	0 00
77	-S5 VI NDT⊗	56	11	19 64
78	-S6 VI NDT⊗	40	32	80 00
79	74023-6 2-1 S1 VI NDT⊗	48	3	6 25
80	-S2 VI NDT⊗	12	0	0 00
81	-S3 VI NDT⊗	1	0	0 00
82	-S4 VI NDT⊗	9	0	0 00
83	-S5 VI NDT⊗	27	0	0 00
	BDN-1	17	17	100 00
84	74023-2-1-S6 VI NDT⊗	9	0	0 00
85	74038-20-1 3-S1 VI NDT⊗	2	0	0 00
86	-S2 VI NDT⊗	6	0	0 00
87	-S3 VI NDT⊗	32	0	0 00
88	-S4 VI NDT⊗	10	0	0 00
89	-S5 VI NDT⊗	32	7	21 87
90	74038-26-1-6-S1 VI NDT⊗	49	0	0 00
91	-S2 VI NDT⊗	15	3	20 00
92	-S3 VI NDT⊗	39	0	0 00
93	-S4 VI NDT⊗	38	1	2 63
	BDN-1	18	18	100 00
94	74038-26-1-7-S1 VI NDT⊗	64	0	0.00
95	-S3 VI NDT⊗	47	1	2 12
96	-S5 VI NDT⊗	36	0	0 00
97	74044-4-1-9-S1 VI NDT⊗	53	9	16 98
98	74034-6-1-S1 VI NDT⊗ (TCF4)	25	0	0 00
99	-S3 VI NDT⊗	41	5	12 19
100	-S4 VI NDT⊗	43	5	11 62
101	S5 VI NDT⊗	28	0	0 00
102	74041 1-1-S1 VI NDT⊗	46	4	8 69
	BDN 1	16	16	100 00

Contd

1	2	3	4	5
103.	74041-1-1-S2 VI NDTØ	48	0	0.00
104.	-S3 VI NDTØ	69	0	0.00
105.	-S4 VI NDTØ	60	1	1.66
106.	-S5 VI NDTØ	66	0	0.00
107.	74041-1-4-S1 VI NDTØ	10	0	0.00
108.	-S2 VI NDTØ	26	0	0.00
109.	-S3 VI NDTØ	52	8	15.38
110.	-S4 VI NDTØ	21	0	0.00
111.	-S5 VI NDTØ	36	0	0.00
112.	74041-74041-1-5-S1Ø VI NDT	22	0	0.00
	BDN-1	18	18	100.00
113.	-S2Ø VI NDT	24	0	0.00
114.	-S3Ø VI NDT	34	0	0.00
115.	-S4Ø VI NDT	56	0	0.00
116.	-S5Ø VI NDT	21	0	0.00
117.	74041-1-5-S6Ø VI NDT	60	0	0.00
118.	-S7Ø VI NDT	42	0	0.00
119.	-S8Ø VI NDT	60	0	0.00
120.	-S9Ø VI NDT	28	0	0.00
121.	74041-6-5-S2Ø	37	0	0.00
	BDN-1	20	20	100.00
122.	-S3Ø VI NDT	58	0	0.00
123.	-S4Ø VI NDT	48	3	6.25
124.	-S5Ø VI NDT	36	0	0.00
125.	-S6Ø VI NDT	23	0	0.00
126.	74041-8-2-S1Ø VI NDT	31	1	3.22
127.	-S2Ø VI NDT	60	1	1.66
128.	-S3Ø VI NDT	56	0	0.00
129.	74041-10-3-S1Ø VI NDT	45	1	2.22
130.	-S2Ø VI NDT	56	2	3.57
131.	-S3Ø VI NDT	66	0	0.00
	BDN-1	17	17	100.00
132.	-S4Ø	69	0	0.00
133.	74041-11-4-S1Ø VI NDT	57	0	0.00
134.	-S2Ø VI NDT	62	0	0.00
135.	74041-15-1-S2Ø VI NDT	19	2	10.52
136.	74043-1-4-S1Ø VI NDT	53	2	3.77
137.	-S3Ø VI NDT	89	14	15.73
138.	-S4Ø VI NDT	56	6	10.71
139.	74043-4-3-S1Ø VI NDT	47	5	10.63
140.	-S2Ø VI NDT	28	6	21.42
	BDN-1	16	16	100.00

Contd.

1	2	3	4	5
141	74043-4-3-S3⊗ VI NDT	14	2	14.28
142	-S4⊗ VI NDT	4	0	0.00
143	-S5⊗ VI NDT	10	0	0.00
144	74043-7-4-S1⊗ VI NDT	51	5	9.80
145	-S2⊗ VI NDT	51	0	0.00
146	-S4⊗ VI NDT	15	1	6.66
147	-S5⊗ VI NDT	52	0	0.00
148	74043-10-1-S1⊗ VI NDT	32	0	0.00
149	-S2⊗ VI NDT	29	0	0.00
150	-S3⊗ VI NDT	21	3	14.28
	BDN-1	15	15	100.00
151	-S4⊗ VI NDT	14	2	14.28
152	-S5⊗ VI NDT	10	1	10.00
153	74054-5-2-S1⊗ VI NDT	5	0	0.00
154	-S2⊗ VI NDT	8	0	0.00
155	-S3⊗ VI NDT	24	1	4.16
156	-S4⊗ VI NDT	16	1	6.25
157	-S5⊗ VI NDT	15	0	0.00
158	74054-7-3-S2 VI NDT	31	0	0.00
159	74023-7-3-3-S1⊗ VII NDT (TCF5)	38	18	47.36
	BDN-1	14	14	100.00
160	74038-12-1-1-S2⊗ VII NDT	32	4	12.50
161	74038-3-1-1-S1⊗ VII NDT	48	14	19.16
162	74041-15-1-S1⊗ VII NDT (TCF4)	38	5	13.15
163	74054-4-2-S4⊗ VIII NDT	39	4	10.25
164	74044-4-1-9-S2 VIII NDT (TCF5)	37	8	21.62
165	74041-16-2-S1⊗ VIII NDT (TCF4)	64	3	4.68
166	-S2⊗ VIII NDT	67	1	1.49
167	-S3⊗ VIII NDT	70	0	0.00
168	74054-1-3-S1⊗ VIII NDT	33	0	0.00
169	-S2⊗ VIII NDT	29	1	3.44
	BDN-1	22	22	100.00
170	-S3⊗ VIII NDT	23	1	4.34
171	-S5⊗ VIII NDT	44	1	2.27
172	74054-4-2-S1⊗ VIII NDT	3	1	33.33
173	-S2⊗ VIII NDT	1	0	0.00
174	-S3⊗ VIII NDT		No germination	
175	-S5⊗ VIII NDT	1	0	0.00

APPENDIX- XXXIII

Results of screening of F_3, F_4 & F_5 triple cross progenies of pigeonpea for sterility mosaic resistance during 1978-79.

Sl. No.	Particular	Total plants	Infected plants	Percent infection
1	2	3	4	5
1.	74014-5-1-3-1 VI NDT (TCF5)	49	30	61.22
2.	-4 VI NDT	81	47	58.02
	BDN-1	21	21	100.00
3.	-5 VI NDT	92	76	82.60
4.	74019-18-1-6-2 VI NDT	72	33	45.83
5.	-3 VI NDT	75	49	65.33
6.	74020-3-1-3-1- VI NDT	48	1	2.08
7.	-4 VI NDT	58	7	12.06
	BDN-1	13	13	100.00
8.	-5 VI NDT	42	9	21.42
9.	74042-9-1-4-2 VI NDT	55	40	72.72
10.	-4 VI NDT	26	15	57.69
11.	-5 VI NDT	19	9	47.36
	BDN-1	16	16	100.00
12.	74038-49-1-6-2 VI NDT	69	37	53.62
13.	-3 VI NDT	81	35	43.20
14.	-4 VI NDT	45	10	22.22
15.	74038-50-1-2-1 VI NDT	49	39	79.59
16.	-2 VI NDT	57	43	75.43
	BDN-1	14	14	100.00
17.	-3 VI NDT	41	41	100.00
18.	74038-50-1-4-2 VI NDT	57	45	78.94
19.	-3 VI NDT	50	13	26.00
20.	-4 VI NDT	24	7	29.16
21.	74003-48-B-5-1 VI NDT	39	39	100.00
	BDN-1	10	10	100.00
22.	74003-48-B-S-2 VI NDT	53	44	83.01
23.	-5 VI NDT	27	23	85.18
24.	74004-11-B-4-1 VI NDT	40	33	82.50
25.	-2 VI NDT	53	24	45.28

Contd.

1	2	3	4	5
26.	74004-11-B-4-5 VI NDT	72	25	34 72
	BDN-1	21	21	100 00
27	74004 53-B-4-3-2 VI NDT	69	18	26 08
28	-3 VI NDT	69	21	30 43
29	74004 53-B-4-2 VI NDT	72	68	94 44
30	-3 VI NDT	24	20	83 33
	BDN-1	16	16	100 00
31	74004-53-B 4-5 VI NDT	44	44	100 00
32	74004-44-B-1-1 VI NDT	69	22	31 88
33	-2 VI NDT	29	6	20 68
34	-3 VI NDT	79	6	7 59
35	74004-9-3-1 VI NDT (TCF4)	79	72	91 13
	BDN-1	19	19	100 00
36	-2 VI NDT	69	65	94 20
37.	-5 VI NDT	24	7	29 16
38	74004-18-4-1 VI NDT	53	17	32 07
39	-2 VI NDT	43	25	58 13
40	-5 VI NDT	65	42	64.61
	BDN-1	17	17	100 00
41	74004-25-2-1 VI NDT	61	21	34 42
42	-3 VI NDT	53	8	15 09
43	-5 VI NDT	26	7	26 92
44	74004-26-3-1 VI NDT	13	5	38 46
45	-3 VI NDT	36	18	50 00
	BDN-1	17	17	100 00
46	-4 VI NDT	80	40	50 00
47	74004-48-2-1 VI NDT	69	17	24 63
48	-3 VI NDT	73	17	23 28
49	-5 VI NDT	36	7	19 44
	BDN-1	18	18	100 00
50	74004-48-3-1 VI NDT	58	10	1 72
51	74004-48-2-3 VI NDT	61	9	14 75
52	-4 VI NDT	81	4	4 93
53	74004-48-4-3 VI NDT	73	59	80 82
54	-5 VI NDT	26	4	15 38
	BDN-1	16	16	100 00

Contd

1	2	3	4	5
55.	74004-48-4-6 VI NDT	5	0	0.00
56.	74004-49-5-3 VI NDT	56	16	28.57
57.	-4 VI NDT	78	28	35.89
58.	-5 VI NDT	61	32	52.45
59.	74007-61-3-1 VI NDT	96	65	67.70
	BDN-1	23	23	100.00
60.	-3 VI NDT	98	67	68.36
61.	-4 VI NDT	100	89	89.00
62.	74008-6-7-1VI NDT	96	71	73.95
63.	-4VI NDT	42	6	14.28
64	-5VI NDT	51	16	31.37
	BDN-1	15	15	100.00
65.	74008-29-2-3 VI NDT	64	4	6.25
66.	-5 VI NDT	44	10	22.72
67.	-6 VI NDT	96	14	14.58
68.	74019-15-2-1 VI NDT	95	0	0.00
	BDN-1	24	24	100.00
69.	-2 VI NDT	41	0	0.00
70.	-4 VI NDT	84	3	3.57
71.	74019-15-7-2 VI NDT	21	0	0.00
72.	-3 VI NDT	74	12	16.21
73.	-5 VI NDT	77	2	2.59
	BDN-1	26	26	100.00
74.	74034-14-2-1 VI NDT	99	48	48.48
75.	-2 VI NDT	9	3	33.33
76.	-6 VI NDT	59	48	81.35
77.	74034-14-3-3 VI NDT	69	47	68.11
78.	-4 VI NDT	53	36	67.92
	BDN-1	24	24	100.00
79.	74038-2-2-1 VI NDT	93	22	23.65
80.	-5 VI NDT	70	47	67.14
81.	-6 VI NDT	79	48	60.75
82	74038-5-1-1 VI NDT	62	35	56.45
83.	-3 VI NDT	113	10	8.84
	BDN-1	17	17	100.00
84.	-6 VI NDT	112	59	52.67

Contd.

1	2	3	4	5
85	74038-13-6-1 VI NDT	89	8	8 98
86	-2 VI NDT	80	4	5 00
87	-3 VI NDT	91	16	17 58
	BDN-1	17	17	100 00
88	74038-18-1 2 VI NDT	86	42	48 83
89	-3 VI NDT	84	44	52 38
90	-4 VI NDT	119	73	61 34
91	74038-22-4-4 VI NDT	58	6	10 34
92	-6 VI NDT	84	0	0 00
	BDN-1	17	17	100 00
93	74038-74-4-1 VI NDT	70	47	67.14
94	-4 VI NDT	120	103	85.83
95	-5 VI NDT	114	13	11 40
96	74038-74-6-1 VI NDT	94	26	27 65
97	-2 VI NDT	89	8	81 98
	BDN-1	18	18	100 00
98.	-4 VI NDT	94	19	20.21
99	75077-162-1 VI NDT (TCF3)	85	3	3 52
100	75077-165-1 VI NDT	76	12	15 78
101	-2 VI NDT	82	26	31 70
102	75069 15-1 VI NDT	20	0	0 00
	BDN 1	15	15	100 00
103	75069-16-1 VI NDT	26	1	3 84
104	75069-20-1 VI NDT	39	2	5 12
105	75069 21-1 VI NDT	41	5	12 19
106	75069-29-1 VI NDT	33	1	3 03
	BDN-1	7	7	100 00
107	75069-34-1 VI NDT	25	1	4 00
108	75069-38-1 VI NDT	7	0	0 00
109	75069-41-1 VI NDT	51	5	9 80
110	75069-41 2 VI NDT	14	0	0 00
111	75069-43-1 VI NDT	75	3	4 00
	BDN-1	14	14	100 00
112	75069 44-1 VI NDT	26	0	0 00
113	75069 47-1 VI NDT	45	9	20 00
114	75069-48-1 VI NDT	69	5	7 24
115	75069-51-1 VI NDT	21	2	9 52
116	-2 VI NDT		No germination	
	BDN-1	7	7	100 00

Contd

1	2	3	4	5
117.	75069-53-1 VI NDT	39	2	5.12
118.	75069-57-2 VI NDT	38	11	28.94
119.	75069-59-1 VI NDT	14	2	14.28
120.	75069-60-1 VI NDT	32	1	3.12
121.	75069-68-1 VI NDT	42	2	4.76
	BDN-1	17	17	100.00
122.	75069-72-1 VI NDT	57	16	28.07
123.	75069-72-2 VI NDT	87	6	6.89
124.	75069-74-1 VI NDT	82	3	3.65
125.	75069-75-1 VI NDT	20	2	10.00
	BDN-1	21	21	100.00
126.	75069-75-2 VI NDT	15	3	20.00
127.	-3 VI NDT	43	16	37.20
128.	75069-77-1 VI NDT	57	17	29.82
129.	75069-78-1 VI NDT	52	3	5.76
130.	75069-82-1 VI NDT	21	5	23.80
	BDN-1	16	16	100.00
131.	75069-82-2 VI NDT	19	2	10.52
132.	-3 VI NDT	74	11	14.86
133.	75069-86-1 VI NDT	88	23	26.13
134.	75069-87-1 VI NDT	50	12	24.00
135.	75073-14-1 VI NDT	62	15	24.19
	BDN-1	12	12	100.00
136.	75073-16-1 VI NDT	33	3	9.09
137.	75073-21-1 VI NDT	70	23	32.85
138.	75073-22-1 VI NDT	63	36	57.14
139.	75073-23-1 VI NDT	72	28	38.88
140.	75073-27-1 VI NDT	36	2	5.55
	BDN-1	10	0	0.00
141.	75073-29-1 VI NDT	54	21	38.88
142.	75073-30-1 VI NDT	90	6	6.66
143.	75073-30-2 VI NDT	46	1	2.16
144.	75073-39-1 VI NDT	65	15	23.07
	BDN-1	15	15	100.00
145.	-2 VI NDT	40	6	15.00
146.	75073-41-1 VI NDT	23	0	0.00
147.	75073-43-1 VI NDT	79	16	20.25
148.	75073-46-1 VI NDT	24	4	16.66
149.	75073-48-1 VI NDT	75	8	10.66
	BDN-1	14	14	100.00

Contd.

1	2	3	4	5
150	75073-51-1 VI NDT	48	19	39 58
151	75073-63-1 VI NDT	41	26	63 41
152	75073-65-1 VI NDT	57	29	50 87
153	75073-66-1 VI NDT	39	21	53 84
154	75073-70-1 VI NDT	30	12	40.00
	BDN-1	10	10	100 00
155	-2 VI NDT	62	15	24 19
156	75073-71-1 VI NDT	56	13	23 21
157	75073-74-1 VI NDT	29	1	3 44
158	75073-75-1 VI NDT	32	7	21 87
159	75073-77-1 VI NDT	23	4	17 39
	BDN-1	17	17	100 00
160	75077-76-1 VI NDT	3	0	0 00
161	75077-79-1 VI NDT	11	2	18 18
162	75077-83-1 VI NDT	12	4	33 33
163	75077-84-1 VI NDT	63	35	55 55
	BDN-1	14	14	100.00
164	75077-85-1 VI NDT	48	3	6 25
165	75077-86-1 VI NDT		No germination	
166	75077-87-1 VI NDT	23	3	13 04
167	75077-88-1 VI NDT	33	0	0.00
168	75077-89-1 VI NDT	5	0	0 00
	BDN-1	10	10	100 00
169	75077-91-1 VI NDT	29	0	0 00
170	75077-94-1 VI NDT	2	0	0 00
171	75077-169-1 VI NDT	15	2	13 33
172	75077-170-1 VI NDT	19	3	15 78
173	-2 VI NDT	45	4	88 88
	BDN-1	18	18	100 00
174	75077-171-1 VI NDT	44	9	20 45
175	75077-174-1 VI NDT	21	4	19 04
176	75077-174-2 VI NDT	22	10	8 19
177	75077-175-1 VI NDT	63	9	14 28
178	75093-4-1 VI NDT	29	2	6 89
	BDN-1	18	18	100 00
179	-2 VI NDT	101	15	14 85
180	75093-5-1 VI NDT	63	14	22.22
181	75093-6-1 VI NDT	55	32	58 18

Contd

1	2	3	4	5
182.	75093-9-1 VI NDT	55	14	25.45
	BDN-1	21	21	100.00
183.	-2 VI NDT	85	0	0.00
184.	75093-10-1 VI NDT	67	3	4.47
185.	75093-17-1 VI NDT	44	17	38.63
186.	75093-17-2 VI NDT	48	16	33.33
187.	75093-11-2 VI NDT	83	50	60.24
	BDN-1	21	21	100.00
188.	75093-14-1 VI NDT	147	34	23.12
189.	-2 VI NDT	137	4	2.91
190.	-3 VI NDT	62	7	11.29
191.	75093-18-1 VI NDT	100	0	0.00
192.	75093-19-1 VI NDT	72	8	11.11
	BDN-1	90	32	35.55
193.	75093-22-1 VI NDT	117	6	5.12
194.	-2 VI NDT	86	9	10.46
195.	-3 VI NDT	103	12	11.65
196.	-4 VI NDT	95	68	71.57
197.	-5 VI NDT	77	52	67.53
	BDN-1	18	18	100.00
198.	75093-23-1 VI NDT	97	26	26.80
199.	75093-28-1 VI NDT	73	0	0.00
200.	-2 VI NDT	82	0	0.00
201.	75093-29-1 VI NDT	78	10	12.82
	BDN-1	19	12	63.15
202.	-2 VI NDT	69	2	2.89
203.	75093-30-1 VI NDT	66	9	13.63
204.	-2 VI NDT	71	24	33.80
205.	75093-31-1 VI NDT	59	0	0.00
206.	-2 VI NDT	111	8	7.20
	BDN-1	10	10	100.00
207.	75093-33-1 VI NDT	86	2	2.32
208.	75093-35-1 VI NDT	56	9	16.07
209.	-2 VI NDT	80	12	15.00
210.	75093-36-1 VI NDT	81	11	13.58
211.	75093-37-1 VI NDT	65	4	6.15
	BDN-1	15	15	100.00

Contd.

1	2	3	4	5
212	75093-38-1 VI NDT	107	80	74 76
213	-2 VI NDT	113	70	61 94
214	-3 VI NDT	53	40	75 45
215	75093-39-1 VI NDT	62	10	16 12
216	-2 VI NDT	115	68	59 13
217	-3 VI NDT	104	47	45 19
218	-4 VI NDT	30	2	6 66
219	75093-44-1-VI NDT	75	52	69 33
220	75093-48-1 VI NDT	60	3	5.00
	BDN-1	15	15	100.00
221	-2 VI NDT	40	0	0.00
222	-3 VI NDT	55	9	16 36
223	-4 VI NDT	55	10	18 18
224	75093-49-1 VII NDT	78	22	28 20
225	75093-50-1 VII NDT	25	0	0 00
	BDN-1	6	6	100 00
226	75093-51-1 VII NDT	140	29	20.71

APPENDIX- XXXIV

Results of screening of F_4 progenies of pigeonpea from generation tests for sterility mosaic resistance during 1978-79.

Sl. No.	Particular	Total plants	Infected plants	Percent infection
1	2	3	4	5
1.	74236-1-V NDT1 (F4)	36	26	72.22
2.	1-V NDT2	40	27	67.50
3.	1-V NDT3	10	6	60.00
4.	1-V NDT4	116	5	4.31
5.	1-V NDT5	9	5	55.55
6.	1-V NDT6	32	11	34.37
7.	1-V NDT7	53	48	96.00
	BDN-1	13	13	100.00
8.	1-V NDT8	29	2	6.89
9.	1-V NDT9	10	1	10.00
10.	1-V NDT10	32	12	37.50
11.	1-V NDT11	12	7	58.33
12.	1-V NDT12	8	6	75.00
13.	1-V NDT13	7	3	42.85
14.	1-V NDT14	21	12	57.14
15.	1-V NDT15	39	31	79.48
16.	1-V NDT16	24	6	25.00
17.	1-V NDT17	41	29	70.73
	BDN-1	15	15	100.00
18.	1-V NDT18	18	9	50.00
19.	1-V NDT19	15	10	66.66
20.	1-V NDT20	46	38	82.60
21.	74236-4-V NDT21	57	22	38.59
22.	V NDT22	39	33	84.61
23.	V NDT23	39	1	2.56
24.	V NDT24	14	6	42.85
25.	V NDT25	36	22	61.11
26.	V NDT26	62	2	3.22
	BDN-1	15	15	100.00
27.	V NDT27	36	4	11.11
28.	V NDT28	19	12	63.15

Contd.

1	2	3	4	5
29.	74236-4-V NDT29	20	2	10.00
30.	V NDT30	42	27	64.28
31.	74236-1-V NDT31	42	30	71 42
32.	1-V NDT32	43	37	86 04
33	1-V NDT33	27	7	25 92
34.	1-V NDT34	45	19	42 22
35.	1-V NDT35	43	34	79 06
36.	1-V NDT36	23	14	60 86
	BDN-1	6	6	100 00
37.	1-V NDT37	35	10	28 57
38.	1-V NDT38	28	28	100 00
39	1-V NDT39	39	28	71 79
40.	1-V NDT40	49	28	57 14
41.	1-V NDT41	16	14	87 50
42.	1-V NDT42	9	4	44 44
43.	1-V NDT43	9	6	66.66
44.	1-V NDT44	7	5	71 42
45	1-V NDT45	13	13	100.00
	BDN-1	6	6	100.00
46.	1-V NDT46	5	4	80 00
47	1-V NDT47	4	2	50 00
48.	74236-3-V NDT48	64	34	53 12
49	3-V NDT49	35	5	14 28
50.	3-V NDT50	39	22	56 41
51.	3-V NDT51	46	26	56 52
52.	3-V NDT52	23	9	39 13
53.	3-V NDT53	43	14	32 55
54.	3-V NDT54	43	14	32.55
55.	3-V NDT55	32	21	65 62
	BDN-1	8	8	100 00
56.	3-V NDT56	42	34	80 95
57.	3-V NDT57	44	13	29 54
58.	3-V NDT58	22	10	45 45
59.	3-V NDT59	29	28	96 55
60.	3-V NDT60	35	28	80 00
61	3-V NDT61	23	14	60 86
62	3-V NDT62	11	6	54 54
63.	3-V NDT63	28	4	14 28
64.	3-V NDT64	22	15	68 18
	BDN-1	19	19	100 00

Contd

1	2	3	4	5
65.	74236-3-V NDT65	36	5	13.88
66.	3-V NDT66	24	2	8.33
67.	3-V NDT67	35	4	11.42
68.	74236-4-VI NDT68	35	35	100.00
69.	4-VI NDT69	39	38	97.43
70.	4-VI NDT70	35	33	94.28
71.	4-VI NDT71	39	35	89.74
72.	4-VI NDT72	48	45	93.75
73.	C.NO-74236-4-VI NDT73	22	21	95.45
74.	4-VI NDT74	11	11	100.00
	BDN-1	20	20	100.00
75.	4-VI NDT74	26	25	95.00
76.	4-VI NDT75	53	50	94.33
77.	4-VI NDT76	47	45	95.74
78	4-VI NDT77	29	27	93.10
79.	4-V NDT78	54	47	87.03
80.	4-V NDT79	45	41	91.11
81.	4-V NDT80	16	16	100.00
82.	4-V NDT81	37	27	72.97
83.	4-V NDT82	50	30	60.00
84.	4-V NDT83	35	28	80.00
	BDN-1	10	10	100.00
85.	4-V NDT84	40	39	97.50
86.	4-V NDT85	21	12	57.14
87.	4-V NDT86	36	18	50.00
88.	4-V NDT87	18	18	100.00
89.	74236-2-V NDT88	13	10	76.92
90.	-2 V NDT89	39	16	41.02
91.	-2 V NDT90	27	22	81.48
92.	-2 V NDT91	35	15	42.85
93.	-2 V NDT92	33	19	57.57
94.	-2 V NDT93	24	18	75.00
	BDN-1	8	8	100.00
95.	-2 V NDT93	25	12	48.00
96.	-2 V NDT94	35	22	62.85
97.	-2 V NDT95	15	8	53.33
98.	-2 V NDT96	43	26	60.46
99.	-2 V NDT97	30	23	76.66
100.	74236-3 V NDT98	69	34	49.27
101.	3 V NDT99	52	15	28.84
102.	3 V NDT100	30	4	13.33
103.	3 V NDT101	53	36	67.92
104.	3 V NDT102	40	6	15.00
	BDN-1	11	11	100.00

Contd.

1	2	3	4	5
105	74236-3 V NDT103	50	12	24 00
106	3 V NDT104	39	18	46 15
107	3 V NDT105	45	12	26 66
108	3 V NDT106	35	5	14 28
109	3 V NDT107	52	24	46 15
100	3 V NDT108	48	31	64 58
101	3 V NDT109	27	5	18 51
102	3 V NDT110	47	31	65 95
103	3 V NDT111	50	36	72 00
104	3 V NDT112	33	16	48 48
	BDN-1	17	16	95 00
105	74236-1 V NDT112	33	19	57 57
106	1 V NDT113	18	12	66 66
107	1 V NDT114	55	19	34 54
108	1 V NDT115	54	23	42.59
109	1 V NDT116	55	22	40 00
110	1 V NDT117	64	27	42 18
111	74243-1 V NDT1	23	5	21 73
112	1 V NDT2	23	13	56 52
113	1 V NDT3	28	27	96 42
114	1 V NDT4	18	7	38 88
	BDN-1	20	10	50 00
115	1 V NDT5	12	10	83 33
116	1 V NDT6	9	7	77 77
117	1 V NDT7	54	30	55 55
118	1 V NDT8	27	9	33 33
119	1 V NDT9	32	20	62 50
120	1 V NDT10	39	8	20 51
121	74243-3 VI NDT11	19	7	36 84
122	3 VI NDT12	41	29	70 73
123	3 VI NDT13	21	16	76 19
124	3 VI NDT14	28	20	71 42
	BDN-1	16	16	100 00
125	3 VI NDT14	33	20	60 60
126	3 VI NDT15	43	32	74 41
127	3 VI NDT16	32	11	34.37
128	3 VI NDT17	20	13	65 00
129	3 VI NDT18	37	30	81 08
130	3 VI NDT19	28	11	39 28
131	3 VI NDT20	25	8	32 00
132	74243-4 VI NDT21	45	35	77 77

Contd

1	2	3	4	5
133.	74243-4 VI NDT22	42	26	61.90
134.	4 VI NDT23	45	42	93.33
	BDN-1	20	20	100.00
135.	4 VI NDT24	53	52	98.11
136.	4 VI NDT25	42	28	66.66
137.	4 VI NDT26	38	37	97.36
138.	4 VI NDT27	35	33	94.28
139.	4 VI NDT28	63	59	93.65
140.	4 VI NDT29	38	35	92.10
141.	4 VI NDT30	28	25	89.28
142.	74243-3 VI NDT31	65	4	6.15
143.	3 VI NDT32	61	24	39.34
144.	3 VI NDT33	18	12	66.66
	BDN-1	17	17	100.00
145.	3 VI NDT33	32	13	40.62
146.	3 VI NDT34	43	3	6.97
147.	3 VI NDT35	54	21	38.88
148.	3 VI NDT36	46	7	15.21
149.	3 VI NDT37	60	6	10.00
150.	3 VI NDT38	73	4	5.47
151.	3 VI NDT39	29	9	31.03
152.	3 VI NDT40	45	2	4.44
153.	3 VI NDT41	60	35	58.33
154.	3 VI NDT42	75	73	97.33
	BDN-1	17	17	100.00
155.	3 VI NDT43	58	37	63.79
156.	3 VI NDT44	33	33	100.00
157.	3 VI NDT45	55	37	67.27
158.	3 VI NDT46	45	45	100.00
159.	3 VI NDT47	43	43	100.00
160.	3 VI NDT48	39	38	97.43
161.	3 VI NDT49	41	40	97.56
162.	3 VI NDT50	46	45	97.82
163.	74243-1 VI NDT51	56	49	87.50
164.	1 VI NDT52	28	19	67.85
	BDN-1	19	19	100.00
165.	1 VI NDT52	27	14	51.85
	BDN-1	19	19	100.00

Contd.

1	2	3	4	5
166.	C.NO-74243-1 VI NDT52	27	14	51.85
167	1 VI NDT53	14	0	0.00
168	1 VI NDT54	35	8	22.85
169	1 VI NDT55	36	11	30.55
170.	1 VI NDT56	57	42	73.68
171.	1 VI NDT57	18	7	38.88
172.	1 VI NDT58	31	28	90.32
173.	1 VI NDT59	36	8	22.22
174.	1 VI NDT60	37	28	75.67
175	1 VI NDT61	40	31	77.50
	BDN-1	20	20	100.00
176.	74243-3 VI NDT62	28	24	85.71
177.	3 VI NDT63	16	13	81.25
178.	3 VI NDT64	17	7	41.17
179.	3 VI NDT65	34	19	55.88
180.	3 VI NDT66	65	65	100.00
181.	3 VI NDT67	58	48	82.75
182	3 VI NDT68	32	28	87.50
183.	3 VI NDT69	47	40	85.10
184.	3 VI NDT70	37	28	75.67
185.	74243-4 VI NDT71	32	25	78.12
	BDN-1	15	15	100.00
186	4 VI NDT71	39	11	28.20
187	4 VI NDT72	54	48	88.88
188	4 VI NDT73	59	26	44.06
189	4 VI NDT74	59	46	77.96
190	4 VI NDT75	65	51	78.46
191	4 VI NDT76	44	37	84.09
192.	4 VI NDT77	40	35	87.50
193	4 VI NDT78	78	12	15.38
194.	4 VI NDT79	71	60	84.50
195.	4 VI NDT80	68	41	60.29
	BDN-1	15	15	100.00
196.	74243-3 V NDT81	35	34	97.14
197.	3 V NDT82	70	69	98.57
198	3 V NDT83	59	47	79.66
199	3 V NDT84	36	35	97.22
200	3 V NDT85	56	33	58.92
201.	3 V NDT86	26	26	100.00
202.	3 V NDT87	48	48	100.00
203	3 V NDT88	41	36	87.80
204.	3 V NDT89	49	48	97.95
205.	3 V NDT90	29	28	96.55
	BDN-1	16	16	100.00

Contd

1	2	3	4	5
206.	74243-3 V NDT90	16	14	87.50
207.	3 V NDT91	39	27	69.23
208.	3 V NDT92	43	22	51.16
209.	74243-1 V NDT93	69	14	20.28
210.	1 V NDT94	32	16	50.00
211.	1 V NDT95	31	26	83.87
212.	1 V NDT96	46	43	93.47
213.	1 V NDT97	55	27	49.09
214.	1 V NDT98	57	42	73.68
215.	1 V NDT99	31	24	77.41
	BDN-1	14	14	100.00
216.	1 V NDT100	37	11	29.72
217.	74243-3 VI NDT101	74	20	27.02
218.	3 NDT102	48	23	47.91
219.	3 NDT103	32	11	34.37
220.	3 NDT104	37	31	83.78
221.	3 NDT105	34	30	88.23
222.	3 NDT106	52	43	82.69
223.	3 NDT107	42	41	97.61
224.	74243-1 VI NDT108	32	29	90.62
225.	1 VI NDT109	16	2	12.50
	BDN-1	18	18	100.00
226.	1 VI NDT109	21	3	14.28
227.	1 VI NDT110	33	6	18.18
228.	1 VI NDT111	50	32	64.00
229.	1 VI NDT112	35	11	31.42
230.	1 VI NDT113	5	2	40.00
231.	1 VI NDT114	9	1	11.11
232.	1 VI NDT115	54	28	51.85
233.	1 VI NDT116	60	54	90.00
234.	1 VI NDT117	42	34	80.95
235.	1 VI NDT118	50	15	30.00
	BDN-1	20	20	100.00
236.	74243-2 V NDT119	28	6	21.42
237.	2 V NDT120	67	41	61.19
238.	2 V NDT121	48	6	12.50
239.	2 V NDT122	58	6	10.34
240.	2 V NDT123	75	50	66.66
241.	2 V NDT124	22	3	13.63
242.	2 V NDT125	15	3	20.00
243.	2 V NDT126	13	0	0.00
244.	2 V NDT127	20	16	80.00

Contd.

1	2	3	4	5
245	74243-4VNDT128	25	19	76 00
	BDN-1	5	5	100.00
246	4 V NDT128	17	14	82 35
247	4 V NDT129	7	7	100 00
248	4 V NDT130	25	25	100 00
249	4 V NDT131	25	22	88 00
250	4 V NDT132	20	20	100 00
251	4 V NDT133	7	7	100 00
252	4 V NDT134	6	4	66 66
253	4 V NDT135	14	14	100.00
254	4 V NDT136	46	44	95 65
255	4 V NDT137	15	15	100 00
	BDN-1	19	19	100 00
256	74245-4 VI NDT1	33	13	39 39
257	4 VI NDT2	72	50	69 44
258	4 VI NDT3	59	52	88 13
259	4 VI NDT4	40	26	65 00
260	4 VI NDT5	58	50	86 20
261	4 VI NDT6	41	26	63 41
262	4 VI NDT7	57	53	92 98
263	4 VI NDT8	39	27	69 23
264	4 VI NDT9	62	36	58 06
265	4 VI NDT10	25	23	92 00
	BDN-1	16	16	100.00
266	4 VI NDT10	16	14	87 50
267	4 V NDT11	35	24	68 57
268	4 V NDT12	39	32	82 05
269	4 V NDT13	42	22	52 38
270	4 V NDT14	19	17	89 47
271	4 V NDT15	22	11	50 00
272	4 V NDT16	34	30	88 23
273	4 V NDT17	20	18	90 00
274	4 V NDT18	53	47	88 67
275	4 V NDT19	13	11	84 61
	BDN-1	15	14	93 33
276	4 V NDT20	41	35	85 36
277	4 VI NDT21	59	30	50 84
278	4 VI NDT22	20	16	80.00
279	4 VI NDT23	26	13	50 00
280	4 VI NDT24	38	13	34 21
281	4 VI NDT25	17	7	41 17

Contd

1	2	3	4	5
282.	74245-4 VI NDT26	32	7	21.87
283.	4 VI NDT27	42	18	42.85
284.	4 VI NDT28	27	11	40.74
285.	4 VI NDT29	18	6	33.33
	BDN-1	12	12	100.00
286.	4 VI NDT29	6	6	100.00
287.	4 VI NDT30	39	1	2.56
288.	74245-3 VI NDT31	35	29	82.85
289.	3 VI NDT32	46	30	65.21
290.	3 VI NDT33	25	20	80.00
291.	3 VI NDT34	46	20	43.47
292.	3 VI NDT35	41	34	82.92
293.	3 VI NDT36	32	27	84.37
294.	3 VI NDT37	28	23	82.14
295.	3 VI NDT38	22	18	81.81
	BDN-1	11	11	100.00
296.	74245-4 VI NDT39	49	15	30.61
297.	4 VI NDT40	32	15	46.87
298.	4 VI NDT41	70	60	85.71
299.	4 VI NDT42	34	27	79.41
300.	4 VI NDT43	37	15	40.54
301.	4 VI NDT44	21	14	66.66
302.	4 VI NDT45	25	17	68.00
303.	4 VI NDT46	48	42	87.50
304.	4 VI NDT47	46	38	82.60
305.	4 VI NDT48	19	16	84.21
	BDN-1	14	14	100.00
306.	4 VI NDT48	7	5	71.42
307.	4 VI NDT49	18	11	61.11
308.	4 VI NDT50	43	9	20.93
309.	4 VI NDT51	37	5	13.51
310.	4 VI NDT52	47	40	57.14
311.	4 VI NDT53	50	13	26.00
312.	4 VI NDT54	38	36	94.73
313.	4 VI NDT55	31	30	96.77
314.	4 VI NDT56	38	28	73.68
315.	4 VI NDT57	45	38	84.44
	BDN-1	7	7	100.00
316.	4 VI NDT58	27	22	81.48
317.	74245-1 VI NDT59	22	22	100.00

Contd.

1	2	3	4	5
318	74245-1 VI NDT60	47	9	19 14
319	1 VI NDT61	45	33	73 33
320	1 VI NDT62	24	21	87 50
321	1 VI NDT63	37	28	75 67
322	1 VI NDT64	48	18	37 50
323	1 NDT65	30	14	46 66
324	1 NDT66	38	20	52 63
325	1 NDT67	29	18	62 06
	BDN-1	18	18	100 00
326	1 VI NDT67	13	5	38 46
327	1 VI NDT68	51	15	29 41
328	74245-3 VI NDT69	30	19	63 33
329	3 VI NDT70	57	44	77 19
330	3 VI NDT71	45	10	22 22
331	3 VI NDT72	45	15	33 33
332	3 VI NDT73	46	12	26 08
333	3 VI NDT74	47	9	19 14
334	3 VI NDT75	39	24	61 53
335	3 VI NDT76	55	33	60 00
	BDN-1	16	16	100 00
336	3 VI NDT77	25	14	56 00
337	3 VI NDT78	50	15	30 00
338	74245-2 V NDT79	22	14	63 63
339	2 V NDT80	37	17	45 94
340	2 V NDT81	19	17	17 00
341	2 V NDT82	32	20	53 12
342	2 V NDT83	71	46	64 78
343	2 V NDT84	59	49	83 05
344	2 V NDT85	38	28	73 68
345	2 V NDT86	20	13	65 00
	BDN-1	18	18	100 00
346	2 V NDT86	10	2	20 00
347	2 V NDT87	55	34	61 81
348	2 V NDT88	52	45	86 53
349	74245-1 V NDT89	54	34	62 96
350	1 V NDT90	63	41	65 07
351	1 V NDT91	32	22	68 75
352	1 V NDT92	32	24	75 00
353	1 V NDT93	38	25	65 78
354	1 V NDT94	58	37	63 79
355	1 V NDT95	49	19	38 77

Contd.

1	2	3	4	5
	BDN-1	15	15	100.00
356.	74245- 1 V NDT96	12	8	66.66
357.	1 V NDT97	8	2	25.00
358.	1 V NDT98	30	12	40.00
359.	74245- 3 V NDT99	24	19	79.16
360.	3 V NDT100	43	8	18.60
361.	3 V NDT101	31	12	38.70
362.	3 V NDT102	65	55	84.61
363.	3 V NDT103	52	40	64.51
364.	3 V NDT104	56	27	48.21
365.	3 V NDT105	28	19	67.85
	BDN-1	12	12	100.00
366.	3 V NDT105	16	5	31.25
367.	3 V NDT106	43	19	44.18
368.	3 V NDT107	49	24	48.97
369.	3 V NDT108	66	29	43.93
370.	3 V NDT109	63	32	50.79
371.	3 V NDT110	37	33	89.18
372.	3 V NDT111	11	7	63.63
373.	74245- 2 V NDT112	29	4	13.79
374.	2 V NDT113	55	43	78.18
375.	2 V NDT114	47	16	34.04
	BDN-1	17	17	100.00
376.	2 V NDT115	41	16	39.62
377.	2 V NDT116	37	13	35.13
378.	2 V NDT117	58	55	94.82
379.	2 V NDT118	51	36	70.58
380.	74245- 4 VI NDT119	63	35	55.55
381.	4 VI NDT120	41	23	56.09
382.	4 VI NDT121	40	9	22.50
383.	4 VI NDT122	13	8	61.53
384.	4 VI NDT123	34	11	32.35
385.	4 VI NDT124	33	19	57.57
	BDN-1	24	24	100.00
386.	4 VI NDT124	27	13	48.14
387.	4 VI NDT125	44	14	31.81
388.	4 VI NDT126	41	7	17.07
389.	4 VI NDT127	65	56	86.15
390.	4 VI NDT128	20	17	85.00
391.	74245- 2 VI NDT129	24	7	29.16
392.	2 VI NDT130	35	3	8.57
393.	2 VI NDT131	15	2	13.33

Contd.

1	2	3	4	5
394	74245-2 VI NDT132	44	3	6 81
395	2 VI NDT133	31	23	74 19
	BDN 1	14	14	100 00
396	2 VI NDT134	21	6	28 57
397	2 VI NDT135	51	30	58 82
398	2 VI NDT136	54	41	75 92
399	2 VI NDT137	27	7	25 92
400	2 VI NDT138	43	14	32 55
401	74245-6 VI NDT139	41	3	7 31
402	6 VI NDT140	45	29	64 44
403	6 VI NDT141	49	26	53 06
404	6 VI NDT142	52	4	7 69
405	6 VI NDT143	29	2	6 89
	BDN-1	20	20	100 00
406	6 VI NDT143	22	0	0 00
407	6 VI NDT144	14	1	7 10
408	74245 3 VI NDT145	38	24	63 15
409	3 VI NDT146	53	18	33 96
410	3 VI NDT147	44	32	72 72
411	3 VI NDT148	39	27	69 23
412	3 VI NDT149	43	38	88 37
413	3 VI NDT150	53	46	86 79
414	3 VI NDT151	63	52	82 53
415	3 VI NDT152	59	45	76 27
	BDN-1	8	8	100 00
416	3 VI NDT153	31	23	74 19
417	3 VI NDT154	37	30	81 08
418	74240 3 V NDT1	47	43	91 48
419	3 V NDT2	40	25	62 50
420	3 V NDT3	37	36	97 29
421	3 V NDT4	31	22	70 96
422	3 V NDT5	52	44	84 61
423	74240 1 V NDT1	9	0	0 00
424	1 V NDT2	18	13	72 22
425	1 V NDT3	20	19	95 00
	BDN-1	16	16	100 00
426	1 V NDT3	20	15	75 00
427	1 V NDT4	41	41	100 00
428	1 V NDT5	61	47	77 04
429	74240-4 VI NDT11	48	46	95 83
430	4 VI NDT12	39	24	61 53
431	4 VI NDT13	15	10	66 66
432	4 VI NDT14	43	41	95 34

APPENDIX-XXXV

Results of screening of F_4 triple cross progeny bulks of pigeonpea for sterility mosaic resistance during 1978-79

Sl. No.	Particular	No. of plants	Infected plants	Percent infection
1	2	3	4	5
1.	74003-49-4-B	7	7	100.00
2.	-50-3-B	51	51	100.00
	BDN-1	29	29	100.00
3.	74003-53-2-B	40	38	95.00
4.	-58-2-B	45	41	91.11
5.	-58-3-B	25	24	96.00
6.	-60-1-B	107	105	98.13
7.	-60-2-B	52	50	96.15
8.	-60-3-B	33	32	96.96
9.	-60-4-B	29	24	82.75
10.	-61-2-B	42	40	95.23
11.	-61-3-B	48	44	91.66
12.	-64-1-B	42	40	95.23
	BDN-1	34	34	100.00
13.	74003-64-2-B	40	38	95.00
14.	-65-1-B	77	74	96.10
15.	-66-10B	53	47	88.67
16.	-69-1-B	37	36	97.29
17.	-75-1-B	52	36	69.23
18.	-75-2-B	36	33	91.66
19.	74004-8-1-B	22	16	72.72
20.	-16-1-B	38	23	60.52
21.	-29-1-B	31	19	61.29
	BDN-1	32	32	100.00
22.	74007-1-1-B	55	23	41.81
23.	-2-3-B	42	28	66.66
24.	-3-1-B	21	19	90.47
25.	-4-2-B	85	59	69.41
26.	-13-1-B	109	87	79.81
27.	-13-2-B	53	48	90.56
28.	-17-1-B	36	26	72.22
29.	-18-1-B	15	11	73.33
30.	-20-2-B	37	27	72.97
31.	-23-1-B	42	34	80.95
	BDN-1	32	32	100.00
32.	74007-24-1-B	45	29	64.44
33.	-33-1-B	28	23	82.14
34.	-34-2-B	69	49	71.01
35.	-45-1-B	48	45	92.75

contd.

1	2	3	4	5
36	74007-55-1-B	65	50	76 92
37	-56-1-B	81	66	81 48
38	-56-3-B	48	32	66 66
39	74008-10-1-B	83	32	38 55
40	-36-1-B	34	20	54 00
	BDN-1	23	11	47 82
41	74022-25-4-B	18	15	83 33
42	-30-2-B	25	0	0 00
43	-30-3-B	54	50	92 59
44	-37-2-B	92	86	93 47
45	-38-2-B	107	70	65 42
46	74023-17-1-B	61	55	90 16
47	74024-1-1-B	44	35	79 54
48	-4-1-B	4	0	0 00
49	-4-2-B	43	36	83 72
50	-4-3-B	43	29	67 44
	BDN-1	29	29	100 00
51	74024-5-1-B	17	10	58 82
52	-5-2-B	20	13	65 00
53	74044-1-1-B	88	80	90 90
54	-2-1-B	54	45	83 33
55	-4-1-B	66	41	62 12
56	-5-1-B	50	45	90 00
57	74008-15-B-B-1-B	107	91	85 04
58	-17-B-B-1-B	85	45	52 94
59	-21-B-B-1-B	57	27	47 36
	BDN-1	27	27	100 00
60	74004-52-1-B	19	15	78 94
61	-55-1-B	39	31	81 57
62	74003-8-1-B	60	54	90 00
63	-14-4-B	57	51	89 47
64	-16-2-B	42	40	95 23
65	-17-3-B	41	34	92 92
66	-17-4-B	30	30	100 00
67	-18-2-B	15	11	73 33
68	-20-3-B	31	22	70 96
69	-20-4-B	44	35	79 54
	BDN-1	39	39	100 00
70	74003-24-4-B	44	42	95 45
71	-31-2-B	21	17	90 95
72	-35-2-B	11	8	72 72
73	-35-3-B	18	16	88 88
74	-35-4-B	28	26	92 85
75	-35-1-B	70	64	91 42

contd

1	2	3	4	5
76.	74003-38-1-B	9	6	66.66
77.	-41-3-B	51	42	82.35
78.	-42-2-B	37	34	91.89
	BDN-1	41	41	100.00
79.	74003-42-4-B	21	18	85.71
80.	-43-5-B	45	42	93.33
81.	-44-1-B	83	80	96.38
82.	-44-2-B	126	99	78.57
83.	-47-2-B	75	68	90.66
84.	-48-3-B	58	55	94.82
85.	-48-4-B	38	36	94.73
86.	-50-4-B	61	55	90.16
87.	-55-1-B	51	46	90.19
88.	-69-2-B	62	62	100.00
	BDN-1	41	41	100.00
89.	74003-72-1-B	82	70	85.36
90.	-74-1-B	48	43	89.58
91.	-75-3-B	27	25	92.59
92.	74004-1-1-B	31	23	74.19
93.	-1-2-B	53	51	96.22
94.	-9-1-B	52	46	88.46
95.	-15-1-B	18	18	100.00
96.	-17-1-B	28	25	89.28
97.	-17-2-B	23	20	86.95
	BDN-1	29	29	100.00
98.	74004-17-3-B	33	26	78.78
99.	-18-2-B	28	24	85.71
100.	-18-3-B	37	35	94.59
101.	-19-1-B	39	28	71.79
102.	-19-2-B	24	21	87.50
102.	-26-1-B	29	26	89.65
104.	-27-1-B	15	13	86.66
105.	-32-1-B	16	15	93.75
106.	-32-2-B	57	43	75.43
107.	-34-1-B	87	60	68.96
	BDN-1	48	48	100.00
108.	74004-34-2-B	25	22	88.00
109.	-34-3-B	26	26	100.00
110.	-36-1-B	52	51	98.07
111.	-38-1-B	35	31	88.57
112.	-39-1-B	53	50	94.33
113.	-45-1-B	41	26	63.41
114.	-46-1-B	12	10	95.00
115.	-48-1-B	20	15	75.00

contd.

1	2	3	4	5
116	74004-52-3-B	15	15	100 00
	BDN-1	18	18	100 00
117	74004-53-1-B	33	30	90 90
118	-54-1-B	30	25	83 33
119	74007-11-2-B	61	57	93 44
120	-21-1-B	39	35	89 74
121	-22-2-B	26	26	100 00
122	-24-2-B	19	18	94 75
123	-31-2-B	13	10	76 92
124	-32-1-B	25	22	88 00
	BDN-1	25	25	100 00
125	74007-32-2-B	43	41	95 34
126	-37-2-B	49	45	91 83
127	-38-1-B	30	27	90 00
128	-39-1-B	25	25	100 00
129	-39-2-B	21	20	95 25
130	-44-3-B	33	29	87 87
131	-44-4-B	36	30	83 33
132	-45-2-B	45	45	100 00
133	-46-2-B	34	27	79 41
	-47-2-B	44	38	86 36
	BDN-1	27	27	100 00
134	74007-47-4-B	23	22	95 65
136	-48-1-B	40	38	95 00
137	-49-3-B	40	35	87 50
138	-50-1-B	44	43	97 72
139	-51-1-B	34	34	100 00
140	-51-3-B	32	30	93 75
141	-51-5-B	31	28	90 32
142	-52-1-B	59	55	93 22
143	-52-2-B	48	46	95 83
	BDN-1	22	22	100 00
144	74007-53-1-B	50	49	98 00
145	-53-3-B	40	38	95 00
146	-54-1-B	45	37	82 22
147	-54-2-B	53	29	54 71
148	-55-2-B	39	27	69 23
149	-55-3-B	54	33	61 11
150	-57-1-B	31	26	83 87
151	-57-2-B	54	41	75 92
152	-58-1-B	50	48	96 00
153	-59-2-B	54	47	87 03
	BDN-1	38	38	100 00
154	74007-60-2-B	45	37	82 22
155	-61-2-B	45	42	93 33

contd

1	2	3	4	5
156.	74008-1-1-B	41	21	51.21
157.	-2-1-B	76	43	56.57
158.	-2-2-B	75	35	46.66
159.	-2-3-B	56	38	67.85
160.	-6-1-B	51	37	72.54
161.	-10-4-B	45	37	82.22
162.	-11-2-B	25	23	92.00
	BDN-1	41	40	97.56
163.	74007-12-3-B	71	60	84.50
164.	-12-4-B	25	19	76.00
165.	-12-6-B	68	46	67.64
166.	-13-1-B	66	55	83.33
167.	-15-1-B	65	53	81.53
168.	-15-6-B	59	58	98.30
169.	-15-7-B	42	38	90.47
170.	-16-2-B	60	59	98.33
171.	-17-1-B	60	38	63.33
172.	-17-2-B	58	46	79.31
	BDN-1	33	32	96.96
173.	74008-19-2-B	53	31	58.49
174.	-23-1-B	51	37	72.54
175.	-23-2-B	62	5	8.06
176.	-23-4-B	70	9	12.85
177.	-24-1-B	45	4	8.88
178.	-26-2-B	50	11	22.00
179.	-28-1-B	47	42	89.36
180.	-30-2-B	78	21	26.92
181.	-32-1-B	45	15	33.33
	BDN-1	23	23	100.00
182.	74008-34-1-B	59	39	66.10
183.	-38-1-B	50	6	12.00
184.	-38-2-B	55	19	34.54
185.	-38-3-B	62	3	4.83
186.	-32-2-B	47	6	12.76
187.	-40-1-B	61	13	21.31
188.	-41-2-B	56	23	41.07
189.	-41-3-B	49	47	95.91
190.	-43-1-B	55	36	65.45
191.	-43-2-B	69	6	8.69
	BDN-1	31	31	100.00
192.	74008-43-3-B	39	5	12.82
193.	-43-4-B	35	32	91.42
194.	-45-1-B	23	13	56.52
195.	-45-2-B	52	50	96.15

contd.

1	2	3	4	5
196	74008-45-3-B	67	59	88 05
197	-45-4-B	33	9	27 27
198	-45-5-B	16	9	56 25
199	-46-1-B	47	38	80 85
200	74022-1-2-B	53	53	100 00
	BDN-1	31	31	100 00
201	74022-4-2-B	48	47	97 91
202	-5-2-B	3	3	100 00
203	-6-1-B	86	86	100 00
204	-6-3-B	104	104	100 00
205	-8-1-B	95	94	98 94
206	-9-1-B	106	106	100 00
207	-11-1-B	25	25	100 00
208	-12-1-B	109	109	100 00
209	-12-2-B	124	121	97 58
210	-12-4-B	53	46	86 79
	BDN-1	27	27	100 00
211	74022-12-7-B	27	27	100 00
212	-13-1-B	69	69	100 00
213	-14-2-B	60	59	98 33
214	-15-2-B	50	50	100 00
215	-15-3-B	60	59	98 33
216	-16-1-B	72	70	97 22
217	-16-2-B	32	31	96 87
218	-20-3-B	21	20	95 23
219.	-20-4-B	60	60	100 00
	BDN-1	46	46	100 00
220	74022-20-5-B	71	71	100 00
221	-22-1-B	47	44	93 62
222	-22-2-B	43	43	100 00
223	-22-3-B	72	67	93 05
224	-23-2-B	79	74	93 67
225	-23-3-B	42	35	83 33
226	-24-1-B	42	40	95 23
227	-27-2-B	63	53	84 12
228	-28-1-B	39	32	82 05
229	-28-2-B	84	70	83 33
	BDN-1	53	53	100 00
230	74022-28-3-B	65	59	90 76
231	-29-2-B	83	81	97 59
232	-33-1-B	67	57	85 07
233	-34-1-B	87	85	97 70
234	-36-2-B	66	64	96 96
235	-36-3-B	62	60	96 76
236	-44-2-B	67	64	95 52

contd

1	2	3	4	5
237.	74022-45-1-B	79	79	100.00
238.	-45-2-B	15	9	60.00
	BDN-1	45	45	100.00
239.	74022-49-1-B	56	54	96.42
240.	-50-1-B	48	47	97.91
241.	-52-1-B	101	97	96.03
242.	-52-2-B	97	92	94.84
243.	-53-1-B	96	96	100.00
244.	-55-3-B	78	69	88.46
245.	-56-2-B	60	57	95.00
246.	-57-1-B	71	62	87.32
247.	-57-3-B	76	76	100.00
248.	-58-1-B	48	38	79.16
	BDN-1	54	54	100.00
249.	74023-1-1-B	57	31	54.38
250.	-7-1-B	65	52	80.00
251.	-7-2-B	74	69	93.24
252.	-8-1-B	72	66	93.95
253.	-8-2-B	68	61	89.70
254.	-9-1-B	34	24	70.58
255.	-9-2-B	64	57	89.06
256.	-9-3-B	30	29	96.66
257.	-12-1-B	71	68	95.77
	BDN-1	86	86	100.00
258.	74023-14-1-B	60	54	90.00
259.	-15-1-B	44	34	77.27
260.	-15-2-B	47	39	82.97
261.	-16-1-B	28	27	96.42
262.	-16-2-B	64	62	96.87
263.	-16-3-B	23	16	69.56
264.	-17-2-B	69	63	91.30
265.	-18-1-B	64	28	43.75
266.	-18-2-B	28	14	50.00
267.	-25-2-B	38	26	68.42
	BDN-1	31	31	100.00
268.	74023-25-3-B	17	9	52.94
269.	-27-1-B	14	12	85.71
270.	-27-2-B	44	33	75.00
271.	-27-3-B	40	40	100.00
272.	-28-1-B	23	13	50.52
273.	74024-1-2-B	29	26	89.65
274.	-1-3-B	58	57	98.27
275.	-1-4-B	19	19	100.00
276.	-6-1-B	42	28	66.66
	BDN-1	48	48	100.00

1	2	3	4	5
277	74024-11-1-B	51	41	80 39
278	-11-2-B	32	26	81 25
279	-11-3-B	59	52	88 13
280	-11-4-B	43	40	93 02
281	-12-1-B	51	38	74 50
282	-12-2-B	34	30	88 23
283	-12-3-B	17	11	64 70
284	-14-1-B	20	17	85 00
285.	74034-2-1-B	84	59	70 23
286	-4-1-B	78	71	91 02
	BDN-1	36	36	100 00
287	74034-11-1-B	102	84	82 35
288	-14-1-B	27	16	59 25
289	-16-1-B	74	73	98 64
290	74038-15-2-B	44	33	75 00
291	-16-1-B	65	64	98 46
	BDN-1	36	36	100 00
292	74038-16-2-B	46	42	91 30
293	-21-1-B	73	52	71 23
294	-22-1-B	43	21	48 83
295	-23-1-B	82	68	82 92
296	-24-1-B	84	84	100 00
297.	-25-1-B	81	75	92 59
298	-29-1-B	71	67	94 43
299	-29-2-B	77	71	92 20
300	-29-3-B	51	47	92 15
301	-29-4-B	48	47	97 91
	BDN-1	16	16	100 00
302	74038-30-1-B	33	31	93 93
303	-33-1-B	44	36	81 81
304	-48-2-B	48	46	95 83
305	-59-1-B	44	15	34 09
306	-61-1-B	39	29	74 35
307	-61-2-B	33	22	66 66
308	-76-1-B	28	21	75 00
309	74039-9-1-B	40	23	57 50
310	-28-1-B	40	23	57 50
	BDN-1	29	29	100 00
311	74039-28-2-B	30	27	90 00

contd

1	2	3	4	5
312.	74039-29-1-B	28	25	89.28
313.	74044-1-2-B	46	42	91.30
314.	-1-2-B	56	46	82.14
315.	-1-4-B	42	38	90.47
316.	-2-2-B	25	23	92.00
317.	-2-3-B	45	44	97.77
318.	-3-1-B	41	37	90.24
319.	-3-2-B	37	27	72.97
320.	-3-3-B	42	34	80.95
	BDN-1	20	20	100.00
321.	74044-3-4-B	15	15	100.00
322.	-4-2-B	30	30	100.00
323.	-5-2-B	48	48	100.00
324.	-5-3-B	25	25	100.00
325.	-6-1-B	39	38	97.43
326.	-9-1-B	52	51	98.07
327.	-9-2-B	44	39	88.63
328.	-12-1-B	57	53	92.98
329.	-12-2-B	72	69	95.83
	BDN-1	39	39	100.00
330.	74044-13-1-B	41	27	65.85
331.	-13-2-B	10	4	40.00

APPENDIX-XXXVI

Results of screening of F3 and F4 progenies for Phytophthora blight resistance in RA-9 nursery

Sl No	Pedigree	No of plants	Percent blight	Sl No	Pedigree	No of plants	Percent blight
1	2	3	4	1	2	3	4
1	74143-P1	24	16 6	41	74143-P41	22	22 7
2	-P2	31	9 7	42	-P42	26	57 7
3	-P3	18	5 6	43	-P43	13	0.0
4	-P4	19	0 0	44	-P44	23	13 0
5	-P5	26	3 9	45	-P45	23	30 4
6	-P6	21	9 5	46	-P46	18	5 6
7	-P7	22	13 6	47	-P47	19	31.6
8	-P8	24	33 3	48	-P48	17	0 0
9	-P9	24	37 5	49	-P49	24	75 0
10	-P10	22	40 9	50	-P50	13	53 8
11	-P11	24	12 5	51	-P51	21	4 8
12	-P12	21	4 8	52	-P52	16	25 0
13	-P13	22	31 8	53	-P53	24	66 7
14	-P14	17	29 4	54	-P54	25	64 0
15	-P15	24	12 5	55	-P55	20	50 0
16	-P16	24	37 5	56	-P56	16	25 0
17	-P17	21	28 6	57	-P57	19	5 3
18	-P18	25	24 0	58	-P58	22	31 8
19	-P19	24	33 3	59	-P59	25	36 0
20	-P20	29	20 7	60	-P60	21	80 9
21	-P21	27	92 6	61	-P61	22	18 2
22	-P22	23	30 4	62	-P62	27	51 9
23	-P23	28	50 0	63	-P63	23	56 5
24	-P24	16	6 3	64	-P64	12	75 0
25	-P25	27	11 1	65	-P65	24	70 8
26	-P26	21	4 8	66	-P66	22	36 4
27	-P27	15	40 0	67	-P67	20	30 0
28	-P28	24	25 0	68	-P68	23	39 1
29	-P29	21	23 8	69	-P69	21	19 0
30	-P30	28	64 3	70	-P70	21	61 9
31	-P31	28	7 1	71	-P71	24	70 8
32	-P32	29	51 7	72	-P72	21	66 7
33	-P33	25	12 0	73	-P73	26	0 0
34	-P34	28	7 1	74	-P74	24	29 2
35	-P35	28	32 1	75	-P75	15	53 3
36	-P36	24	75 0	76	-P76	19	15 8
37	-P37	22	30 7	77	-P77	13	0 0
38	-P38	19	10 5	78	-P78	25	16 0
39	-P39	29	51 7	79	-P79	20	25 0
40	-P40	17	47 1	80	-P80	24	41 7

Contd

1	2	3	4	1	2	3	4
81.	74143-P81	14	21.4	126.	74171-P26Ø	26	36.4
82.	-P82	10	10.0	127.	-P27Ø	16	12.5
83.	-P83	18	38.9	128.	-P28Ø	26	61.5
84.	-P84	16	31.3	129.	-P29Ø	27	11.1
85.	-P85	23	73.9	130.	-P30Ø	19	68.4
86.	-P86	18	33.3	131.	-P31Ø	21	4.8
87.	-P87	25	52.0	132.	-P32Ø	22	27.2
88.	-P88	15	66.7	133.	-P33Ø	18	61.1
89.	-P89	11	63.6	134.	-P34Ø	20	55.0
90.	-P90	16	56.3	135.	-P35Ø	28	32.1
91.	-P91	23	86.9	136.	-P36Ø	24	16.7
92.	-P92	21	38.1	137.	-P37Ø	16	12.5
93.	-P93	12	41.7	138.	-P38Ø	19	26.3
94.	-P94	23	21.7	139.	-P39Ø	17	5.9
95.	-P95	24	0.0	140.	-P40Ø	(5NDT)31	41.9
96.	-P96	18	5.6	141.	-P41Ø	(5NDT)23	13.0
97.	-P97	21	19.0	142.	-P42Ø	23	9.3
98.	-P98	17	82.4	143.	-P43Ø	24	16.7
99.	-P99	19	15.8	144.	-P44Ø	20	50.0
100.	-P100	23	26.1	145.	-P45Ø	21	38.1
101.	74171-P1Ø (2NDT)	20	25.0	146.	-P46Ø	(5NDT)23	13.0
102.	-P2Ø (3NDT)	17	29.4	147.	-P47Ø	(6NDT)19	68.4
103.	-P3Ø (3NDT)	12	50.0	148.	-P48Ø	24	25.0
104.	-P4Ø (3NDT)	15	26.7	149.	-P49Ø	22	27.3
105.	-P5Ø (3NDT)	12	0.0	150.	-P50Ø	19	57.9
106.	-P6Ø (4NDT)	16	25.0	151.	-P51Ø	25	20.0
107.	-P7Ø (4NDT)	12	0.0	152.	-P52Ø	22	40.9
108.	-P8Ø (4NDT)	11	9.1	153.	-P53Ø	24	4.2
109.	-P9Ø (4NDT)	12	25.0	154.	-P54Ø	23	4.3
110.	-P10Ø (4NDT)	21	14.3	155.	-P55Ø	24	0.0
111.	-P11Ø (4NDT)	32	21.9	156.	-P56Ø	32	18.8
112.	-P12Ø (4NDT)	27	14.8	157.	-P57Ø	23	30.4
113.	-P13Ø (4NDT)	11	18.2	158.	-P58Ø	(6NDT)24	0.0
114.	-P14Ø (4NDT)	13	46.2	159.	-P59Ø	(7NDT)21	47.6
115.	-P15Ø (4NDT)	18	66.7	160.	-P60Ø	(7NDT)22	31.8
116.	-P16Ø (4NDT)	21	76.2	161.	-P61Ø	(7NDT)18	100.0
117.	-P17Ø (5NDT)	21	33.3	162.	-P62Ø	25	0.0
118.	-P18Ø (5NDT)	19	26.3	163.	-P63Ø	24	20.8
119.	-P19Ø (5NDT)	15	100.0	164.	-P64Ø	26	26.9
120.	-P20Ø (5NDT)	22	22.7	165.	-P65Ø	21	4.8
121.	-P21Ø (5NDT)	25	16.0	166.	-P66Ø	23	8.7
122.	-P22Ø	23	86.9	167.	-P67Ø	21	33.3
123.	-P23Ø	24	29.2	168.	-P68Ø	22	4.6
124.	-P24Ø	23	17.4	169.	-P69Ø	20	20.0
125.	-P25Ø	21	9.0	170.	-P70Ø	27	40.7

Contd.

1	2	3	4	1	2	3	4
171.	74171-P710	17	23.5	216.	74185-P29	23	30.4
172.	-P720	18	44.4	217.	-P30	24	37.5
173.	-P730 (7NDT)	22	59.1	218.	-P31	20	90.0
174	-P740 (8NDT)	19	47.4	219.	-P32	31	38.7
175.	-P750	15	0.0	220.	-P33 (7NDT)	19	57.9
176	-P760	17	17.6	221.	-P34 (6NDT)	24	29.2
177.	-P770	22	9.1	222.	-P35	20	30.0
178.	-P780	22	9.1	223.	-P36	22	22.7
179	-P790	20	0.0	224.	-P37	24	74.1
180	-P800 (8NDT)	1	100.0	225.	-P38	23	47.8
181.	-P810 (8NDT)	25	8.0	226.	-P39	22	50.0
182.	-P820 (8NDT)	21	14.3	227.	-P40	23	17.4
183.	-P830	15	13.3	228.	-P41	22	4.6
184	-P840	23	17.4	229.	-P42	23	34.8
185.	-P850	27	7.4	230.	-P43	22	22.7
186	-P860 (9NDT)	23	4.3	231.	-P44	21	61.9
187.	-P870	15	46.7	232.	-P45	24	4.2
188	74185-P1 (2NDT)	22	77.3	233.	-P46	17	11.8
189.	-P2 (4NDT)	26	65.4	234.	-P47	16	43.8
190	-P3	16	12.5	235.	-P48	22	54.5
191	-P4	23	65.2	236.	-P49	22	9.2
192.	-P5	19	10.5	237.	-P50	22	54.5
193.	-P6	23	69.6	238.	-P51	23	47.8
194.	-P7	26	23.1	239.	-P52	24	70.8
195.	-P8	21	19.1	240	-P53 (6NDT)	23	0.0
196.	-P9 (4NDT)	23	26.1	241	-P54 (6NDT)	21	19.0
197	-P10 (5NDT)	20	60.0	242	-P55	10	60.0
198	-P11	28	78.6	243.	-P56	18	72.2
199	-P12	23	78.3	244	-P57	25	0.0
200	-P13	25	16.0	245.	-P58	12	58.3
201	-P14 (5NDT)	24	20.8	246.	-P59	19	26.3
202.	-P15	28	14.3	247.	-P60	22	22.7
203	-P16	24	16.7	248	-P61	16	37.5
204.	-P17	18	16.7	249	-P62	12	0.0
205	-P18 (5NDT)	27	18.5	250	-P63	21	14.3
206.	-P19 (6NDT)	24	29.2	251	-P64 (6NDT)	20	30.0
207	-P20	22	9.1	252	-P65	19	42.1
208	-P21	23	17.4	253	-P66	18	33.3
209	-P22	27	22.2	254	-P67	13	15.4
210.	-P23	24	16.7	255.	-P68	22	0.0
211	-P24	29	75.9	256	-P69	15	0.0
212.	-P25	22	100.0	257.	-P70	10	80.0
213	-P26	26	57.7	258	-P71	13	0.0
214.	-P27 (6NDT)	27	51.9	259.	-P72	13	38.5
215.	-P28	24	41.7	260.	-P73 (7NDT)	25	60.0

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1	2		3	4	1	2	3	4
261.	74185-P74	(7NDT)	18	16.7	306.	74248-P20	22	81.8
262.	-P75		21	80.9	307.	-P21	29	24.1
263.	-P76		20	20.0	308.	-P22	25	24.0
264.	-P77		19	31.6	309.	-P23	22	9.1
265.	-P78		12	75.0	310.	-P24	22	59.0
266.	-P79	(7NDT)	20	5.0	311.	-P25	21	19.1
267.	-P80	(8NDT)	23	17.4	312.	-P26	25	36.0
268.	-P81		13	61.5	313.	-P27	21	23.3
269.	-P82		26	26.9	314.	-P28	25	52.0
270.	-P83	(8NDT)	13	46.2	315.	-P29(6NDT)	26	26.9
271.	-P84		18	44.4	316.	-P30(7NDT)	20	10.0
272.	-P85		24	54.2	317.	-P31	20	40.0
273.	-P86		16	25.0	318.	-P32	20	55.0
274.	-P87		22	36.4	319.	-P33	23	8.7
275.	-P88		18	33.3	320.	-P34(7NDT)	25	20.0
276.	-P89		23	78.3	321.	-P35(7NDT)	24	16.7
277.	-P90		23	91.3	322.	-P36	25	8.0
278.	-P91		17	0.0	323.	-P37	25	4.0
279.	-P92		13	38.5	324.	-P38	23	4.5
280.	-P93		10	0.0	325.	-P39	26	30.8
281.	-P94		18	0.0	326.	-P40	26	76.9
282.	-P95		19	0.0	327.	-P41	25	72.0
283.	-P96		25	28.0	328.	-P42	23	47.8
284.	-P97		25	60.0	329.	-P43	25	56.0
285.	-P98		25	3.9	330.	-P44	25	58.0
286.	-P99		21	71.4	331.	-P45	29	41.4
287.	74248-P1	(6NDT)	20	40.0	332.	-P46	25	76.0
288.	-P2		21	23.8	333.	-P47	25	0.0
289.	-P3		18	66.7	334.	-P48	19	10.5
290.	-P4		16	0.0	335.	-P49	20	30.0
291.	-P5		23	4.3	336.	-P50	24	12.5
292.	-P6		19	15.7	337.	-P51	27	40.7
293.	-P7		20	0.0	338.	-P52	21	14.3
294.	-P8		12	25.0	339.	-P53	25	44.0
295.	-P9		19	42.1	340.	-P54(7NDT)	20	30.0
296.	-P10		11	72.7	341.	-P55(7NDT)	29	3.5
297.	-P11		21	38.1	342.	-P56	24	33.3
298.	-P12		13	23.1	343.	-P57	27	22.2
299.	-P13		13	23.1	344.	-P58	17	35.3
300.	-P14	(6NDT)	16	31.3	345.	-P59	25	20.0
301.	-P15	(6NDT)	20	80.0	346.	-P60	25	12.0
302.	-P16		12	91.7	347.	-P61	23	13.0
303.	-P17		20	25.0	348.	-P62	23	8.7
304.	-P18		19	89.5	349.	-P63	19	47.4
305.	-P19		22	18.2	350.	-P64	24	37.5

1	2	3	4
351	74248-P65	21	42.9
352.	-P66	26	15.4
353.	-P67	20	20.0
354	-P68	22	22.7
355.	-P69	24	8.3
356.	-P70 (7NDT)	22	18.2
357.	-P71 (8NDT)	25	16.0
358.	-P72	12	25.0
359.	-P73	26	3.9
360.	-P74 (8NDT)	23	34.8
361.	-P75 (8NDT)	22	9.1
362.	-P76	23	30.4
363.	-P77	23	30.4
364	-P78	23	43.4
365	-P79	24	8.3
366	-P80	21	38.1
367.	-P81	23	13.0
368.	-P82	23	8.7
369.	-P83	25	12.0
370	-P84	22	27.3
371.	-P85	26	23.1
372	-P86	25	32.0
373	-P87	24	87.5
374	-P88	23	21.7
375	-P89	22	18.2
376	-P90	25	8.0
377	-P91	26	11.5
378.	-P92	23	13.0
379.	-P93	21	23.8
380	-P94 (8NDT)	23	13.0
381	-P95 (8NDT)	24	33.3
382	-P96	18	5.6
383	-P97	26	11.5
384	-P98	28	57.1
385	-P99	27	14.8
386.	-P100 (8NDT)	25	16.0
387	74262-P10 (6NDT)	23	21.7
388	-P20	21	71.4
389	-P30	24	4.2
390.	-P40	28	39.3
391	-P50	21	85.7
392	-P60 (6NDT)	25	100.0
393.	-P70 (7NDT)	23	60.9
394.	-P80	28	67.9
395.	-P90	23	86.9
396.	74262-P100	21	42.9
397.	-P110	20	50.0
398.	-P120	24	16.7
399.	-P130	25	4.0
400.	-P140 (7NDT)	21	57.1
401.	-P150 (7NDT)	20	15.0
402.	-P160	16	68.8
403.	-P170	23	60.9
404.	-P180	18	11.1
405.	-P190	23	60.9
406.	-P200	19	15.8
407.	-P210	23	13.0
408.	-P220	23	95.6
409.	-P230	24	12.5
410.	-P240	26	80.8
411.	-P250	26	38.5
412.	-P260	25	20.0
413.	-P270	20	10.0
414.	-P280	21	57.1
415.	-P290	26	34.6
416.	-P300 (7NDT)	23	17.4
417.	-P310 (8NDT)	2	0.0
418.	-P320	19	10.5
419.	-P330	22	36.4
420.	-P340 (8NDT)	19	0.0
421.	-P350 (8NDT)	11	72.7
422.	-P360	28	3.6
423.	-P370	15	26.7
424.	-P380	24	41.7
425.	-P390	11	9.1
426	-P400	24	8.3
427.	-P410	29	55.2
428.	-P420	26	3.9
429.	-P430	22	4.6
430.	-P440	25	20.0
431.	-P450	25	4.0
432	-P460	13	7.7
433.	-P470	20	0.0
434.	-P480	10	0.0
435.	-P490	26	46.2
436.	-P500	28	0.0
437.	-P510	15	0.0
438.	-P520	16	25.0
439.	-P530	17	41.2
440.	-P540 (8NDT)	13	15.4

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1	2	3	4
441.	74262-P55Q (8NDT)	20	45.0
442.	-P56Q	27	0.0
443.	-P57Q	10	50.0
444.	-P58Q	11	18.2
445.	-P59Q	21	14.3
446.	-P60Q	11	18.2
447.	-P61Q	26	7.7
448.	-P62Q	22	4.6
449.	-P63Q	26	42.3
450.	-P64Q	12	50.0
451.	-P65Q	18	88.9
452.	-P66Q	19	10.5
453.	-P67Q	28	21.4
454.	-P68Q	26	3.9
455.	-P69Q	15	66.7
456.	-P70Q	14	0.0
457.	-P71Q	33	9.1
458.	-P72Q	28	0.0
459.	-P73Q	12	16.7
460.	-P74Q (8NDT)	13	61.5
461.	-P75Q (8NDT)	4	100.0
462.	-P76Q	16	75.0
463.	-P77Q	15	20.0
464.	-P78Q	20	0.0
465.	-P79Q	26	69.2
466.	-P80Q	17	58.8
467.	-P81Q	21	0.0
468.	-P82Q	20	0.0
469.	-P83Q	10	90.0
470.	-P84Q	15	6.7
471.	-P85Q	16	6.3
472.	-P86Q	15	0.0
473.	-P87Q	23	95.7
474.	-P88Q (8NDT)	5	100.0
475.	-P89Q (9NDT)	21	9.5
476.	-P90Q (9NDT)	20	5.0
477.	-P91Q (9NDT)	12	33.3
478.	74290-P1Q (3NDT)	2	100.0
479.	-P2Q	22	50.0
480.	-P3Q (5NDT)	20	55.0
481.	-P4Q	23	8.7
482.	-P5Q (6NDT)	26	15.4
483.	-P6Q (6NDT)	22	0.0
484.	-P7Q (6NDT)	22	9.1
485.	-P8Q (6NDT)	21	9.5
486.	74290-P9Q (6NDT)	23	30.4
487.	-P10Q (6NDT)	22	4.6
488.	-P11Q (6NDT)	26	23.1
489.	-P12Q (6NDT)	24	20.8
490.	-P13Q (6NDT)	26	42.3
491.	-P14Q (6NDT)	24	12.5
492.	-P15Q (6NDT)	26	53.8
493.	-P16Q (6NDT)	24	8.3
494.	-P17Q (6NDT)	23	8.7
495.	-P18Q (6NDT)	22	27.3
496.	-P19Q (6NDT)	24	8.3
497.	-P20Q (6NDT)	20	40.0
498.	-P21Q (6NDT)	23	56.5
499.	-P22Q (6NDT)	23	43.5
500.	-P23Q (6NDT)	28	10.7
501.	-P24Q (6NDT)	27	25.7
502.	-P25Q (6NDT)	29	93.1
503.	-P26Q (6NDT)	25	32.0
504.	-P27Q (6NDT)	25	68.6
505.	-P28Q (6NDT)	23	21.7
506.	-P29Q (6NDT)	25	12.0
507.	-P30Q (6NDT)	28	53.6
508.	-P31Q (6NDT)	22	18.2
509.	-P32Q (6NDT)	26	15.4
510.	-P33Q (6NDT)	22	13.6
511.	-P34Q (6NDT)	29	13.8
512.	-P35Q (6NDT)	21	0.0
513.	-P36Q (6NDT)	26	26.9
514.	-P37Q (6NDT)	25	16.0
515.	-P38Q (7NDT)	23	30.4
516.	-P39Q (7NDT)	22	4.6
517.	-P40Q (7NDT)	22	27.3
518.	-P41Q (7NDT)	26	50.0
519.	-P42Q (7NDT)	23	21.7
520.	-P43Q (7NDT)	26	0.0
521.	-P44Q (7NDT)	25	12.0
522.	-P45Q (7NDT)	27	11.1
523.	-P46Q (7NDT)	21	0.0
524.	-P47Q (7NDT)	22	50.0
525.	-P48Q (7NDT)	24	29.2
526.	-P49Q (7NDT)	19	36.8
527.	-P50Q (7NDT)	25	24.0
528.	-P51Q (7NDT)	15	40.0
529.	-P52Q (7NDT)	19	47.4
530.	-P53Q (7NDT)	25	40.0

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1	2	3	4	1	2	3	4
531	74290-P540 (7NDT)	25	16.0	578.	74318-P10 (6NDT)	23	4.4
532	-P550 (7NDT)	22	14.3	579.	-P20 (7NDT)	19	68.4
533	-P560 (7NDT)	23	8.7	580.	-P30 (7NDT)	22	22.7
534	-P570 (7NDT)	26	23.1	581.	-P40 (7NDT)	26	26.9
535	-P580 (7NDT)	23	39.1	582.	-P50 (7NDT)	25	52.0
536	-P590 (7NDT)	24	8.3	583.	-P60 (8NDT)	30	13.3
537	-P600 (7NDT)	25	12.0	584.	-P70 (8NDT)	23	60.9
538.	-P610 (7NDT)	26	7.7	585.	-P80	25	24.0
539	-P620 (7NDT)	25	12.0	586.	-P90	22	4.6
540	-P630 (7NDT)	25	12.0	587.	-P100	21	19.1
541.	-P640 (7NDT)	25	4.0	588.	-P110	21	52.4
542.	-P650 (7NDT)	27	37.0	589.	-P120	23	13.0
543	-P660 (7NDT)	23	17.4	590	-P130	19	36.8
544	-P670 (7NDT)	29	20.7	591.	-P140	30	0.0
545.	-P680 (7NDT)	26	34.6	592.	-P150	26	23.1
546	-P690 (7NDT)	21	9.5	593.	-P160	23	69.6
547	-P700 (7NDT)	25	28.0	594.	-P170	26	23.8
548	-P710 (7NDT)	23	0.0	595.	-P180	21	9.5
549	-P720 (7NDT)	27	74.1	596	-P190	22	63.6
550	-P730 (7NDT)	27	7.4	597	-P200	20	35.0
551.	-P740 (7NDT)	27	29.6	598.	-P210	23	17.4
552	-P750 (7NDT)	25	4.0	599.	-P220	26	92.3
553.	-P760 (7NDT)	27	68.9	600.	-P230 (8NDT)	15	6.7
554	-P770 (7NDT)	20	5.0	601.	-P240 (8NDT)	10	10.0
555.	-P780 (7NDT)	15	26.7	602.	-P250	19	100.0
556	-P790 (7NDT)	22	9.1	603.	-P260	17	76.5
557.	-P800 (7NDT)	25	12.0	604.	-P270	15	0.0
558	-P810 (8NDT)	24	45.8	605.	-P280	19	0.0
559.	-P820 (8NDT)	19	0.0	606.	-P290	10	20.0
560	-P830 (8NDT)	24	58.3	607.	-P300	21	76.2
561	-P840 (8NDT)	27	11.1	608.	-P310	9	22.0
562	-P850 (8NDT)	24	16.7	609.	-P320	25	0.0
563.	-P860 (8NDT)	26	50.0	610.	-P330	23	39.1
564	-P870 (8NDT)	23	60.9	611.	-P340	20	45.0
565	-P880 (8NDT)	26	7.7	612.	-P350	19	100.0
566	-P890 (8NDT)	24	12.5	613	-P360	27	85.2
567	-P900 (8NDT)	25	0.0	614.	-P370	21	14.3
568	-P910 (8NDT)	23	73.9	615	-P380	26	19.2
569.	-P920 (8NDT)	29	17.2	616	-P390	21	42.9
570	-P930 (8NDT)	25	12.0	617.	-P400	19	84.2
571	-P940 (8NDT)	28	10.7	618.	-P410	16	25.0
572.	-P950 (8NDT)	25	40.0	619.	-P420	11	0.0
573.	-P960 (8NDT)	25	28.0	620	-P430 (8NDT)	11	18.2
574	-P970 (8NDT)	26	11.5	621.	-P440	22	59.1
575.	-P980 (8NDT)	25	20.0	622.	-P450	16	25.0
576	-P990 (8NDT)	27	14.8	623.	-P460	22	95.5
577.	-P1000 (8NDT)	25	16.0	624.	-P470	21	0.0

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1	2	3	4	1	2	3	4
625.	74318-P48Ø	23	86.9	671.	74318-P94Ø	27	59.3
626.	-P49Ø	27	7.4	672.	-P95Ø	25	24.0
627.	-P50Ø	25	72.0	673.	-P96Ø	24	37.5
628.	-P51Ø	22	54.5	674.	-P97Ø	21	23.8
629.	-P52Ø	25	28.0	675.	-P98Ø	24	58.3
630.	-P53Ø	22	9.1	676.	-P99Ø (9NDT)	25	8.0
631.	-P54Ø	25	8.0	677.	74332-P1Ø (7NDT)	21	14.3
632.	-P55Ø	20	35.0	678.	-P2Ø	15	20.0
633.	-P56Ø	24	0.0	679.	-P3Ø	23	60.9
634.	-P57Ø	21	19.0	680.	-P4Ø (7NDT)	19	10.5
635.	-P58Ø	24	50.0	681.	-P5Ø (7NDT)	19	26.3
636.	-P59Ø	8	12.5	682.	-P6Ø (7NDT)	24	16.7
637.	-P60Ø	23	65.2	683.	-P7Ø (8NDT)	7	85.7
638.	-P61Ø	25	0.0	684.	-P8Ø	24	12.5
639.	-P62Ø	18	50.0	685.	-P9Ø	27	81.5
640.	-P63Ø	(8NDT) 14	71.4	686.	-P10Ø	24	79.2
641.	-P64Ø	(8NDT) 20	75.0	687.	-P11Ø	25	76.0
642.	-P65Ø	18	88.9	688.	-P12Ø	18	44.4
643.	-P66Ø	10	60.0	689.	-P13Ø	25	16.0
644.	-P67Ø	15	46.6	690.	-P14Ø	24	8.3
645.	-P68Ø	17	0.0	691.	-P15Ø	19	68.4
646.	-P69Ø	16	62.5	692.	-P16Ø	19	78.9
647.	-P70Ø	27	88.9	693.	-P17Ø	22	27.2
648.	-P71Ø	13	84.6	694.	-P18Ø	18	5.6
649.	-P72Ø	26	88.8	695.	-P19Ø	23	60.8
650.	-P73Ø	16	50.0	696.	-P20Ø	22	45.5
651.	-P74Ø	12	66.7	697.	-P21Ø	22	36.4
652.	-P75Ø	18	11.1	698.	-P22Ø	21	23.8
653.	-P76Ø	17	88.2	699.	-P23Ø	22	54.5
654.	-P77Ø	19	26.3	700.	-P24Ø (8NDT)	19	15.8
655.	-P78Ø	20	30.0	701.	-P25Ø	23	47.8
656.	-P79Ø	17	0.0	702.	-P26Ø	21	33.3
657.	-P80Ø	16	62.5	703.	-P27Ø	24	33.
658.	-P81Ø	10	0.0	704.	-P28Ø	24	29.
659.	-P82Ø	22	0.0	705.	-P29Ø	18	55.
660.	-P83Ø	20	65.0	706.	-P30Ø	26	23.
661.	-P84Ø	15	46.7	707.	-P31Ø	23	13.
662.	-P85Ø	12	33.3	708.	-P32Ø	24	20.
663.	-P86Ø	20	10.0	709.	-P33Ø	15	13.
664.	-P87Ø	27	33.3	710.	-P34Ø	21	19.
665.	-P88Ø	8	37.3	711.	-P35Ø	14	7.
666.	-P89Ø	21	38.1	712.	-P36Ø	24	37.
667.	-P90Ø	22	9.1	713.	-P37Ø	23	21.
668.	-P91Ø	25	24.0	714.	-P38Ø	24	83.
669.	-P92Ø	21	14.3	715.	-P39Ø	23	60.
670.	-P93Ø	19	63.2	716.	-P40Ø	19	63.

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1	2	3	4
717	74332-P410	21	28.6
718	-P420	22	36.4
719	-P430	26	80.8
720	-P440 (8NDT)	22	36.4
721	-P450 (8NDT)	31	23.1
722	-P460	21	19.0
723	-P470	18	0.0
724	-P480	22	59.1
725	-P490	20	50.0
726	-P500	22	72.7
727	-P510	21	52.4
728	-P520	19	42.1
729	-P530	24	12.5
730	-P540	19	36.8
731	-P550	21	80.9
732	-P560	21	71.4
733	-P570	13	38.5
734	-P580	25	64.0
735	-P590	13	23.1
736	-P600	24	20.8
737	-P610	24	45.8
738	-P620	23	17.4
739	-P630	25	100.0
740	-P640 (8NDT)	23	26.1
741	-P650	17	70.6
742	-P660	21	52.3
743	-P670	22	40.9
744	-P680	25	72.0
745	-P690	23	17.4
746	-P700	26	46.2
747	-P710	19	10.5
748	-P720	25	40.0
749	-P730	21	52.4
750	-P740	21	33.3
751	-P750	21	95.2
752	-P760	25	12.0
753	-P770	26	69.2
754	-P780	25	88.0
755	-P790 (9NDT)	21	14.3
756	-P800	25	96.0
757	-P810	23	86.9
758	-P820	22	18.2
759	-P830	23	17.4
760	-P840	16	25.0
761.	74332-P850 (9NDT)	11	100.0
762.	-P860	21	95.2
763.	-P870	24	25.0
764.	-P880	26	46.1
765.	-P890	14	35.7
766.	-P900	26	15.4
767	-P910	22	81.8
768.	-P920	31	100.0
769.	-P930	16	43.7
770.	74332-B-P10 (6NDT)	27	77.8
771	-P20 (6NDT)	21	57.1
772.	-P30	22	59.1
773.	-P40	22	86.4
774.	-P50	23	82.6
775.	-P60	18	72.2
776	-P70	25	48.0
777.	-P80	25	20.0
778.	-P90	24	25.0
779.	-P100	25	100.0
780.	-P110	24	95.8
781.	-P120	22	31.8
782	-P130	25	88.0
783.	-P140	21	28.6
784.	-P150	25	20.0
785.	-P160	23	13.0
786.	-P170	24	41.7
787.	-P180	24	16.7
788.	-P190	19	31.6
789.	-P200 (6NDT)	16	68.8
790.	-P210 (7NDT)	24	25.0
791.	-P220 (7NDT)	24	33.3
792.	-P230	24	45.8
793.	-P240	24	41.7
794	-P250	21	19.0
795.	-P260	21	0.0
796.	-P270	24	54.2
797.	-P280	17	58.8
798	-P290	22	90.9
799	-P300	20	95.0
800	-P310	22	95.5
801.	-P320	22	50.0
802	-P330	22	59.1
803	-P340	24	50.0
804	-P350	18	66.7

Contd

1	2	3	4	1	2	3	4
805.	74332-B-P36Ø	21	100.0	849.	74332-B-P80Ø	27	66.7
806.	-P37Ø	20	65.0	850.	-P81Ø (8NDT)	22	36.4
807.	-P38Ø	23	78.3	851.	-P82Ø (8NDT)	14	7.1
808.	-P39Ø	23	82.6	852.	-P83Ø	22	22.7
809.	-P40Ø	24	76.5	853.	-P84Ø	14	14.3
810.	-P41Ø (7NDT)	35	100.0	854.	-P85Ø	20	70.0
811.	-P42Ø (7NDT)	23	82.6	855.	-P86Ø	21	38.1
812.	-P43Ø	21	80.9	856.	-P87Ø	9	88.9
813.	-P44Ø	25	92.0	857.	-P88Ø	15	60.0
814.	-P45Ø	20	100.0	858.	-P89Ø	6	66.7
815.	-P46Ø	17	82.4	859.	-P90Ø	24	29.2
816.	-P47Ø	24	75.0	860.	-P91Ø (8NDT)	10	80.0
817.	-P48Ø	19	73.7	861.	74360-P1Ø (6NDT)	22	4.5
818.	-P49Ø	22	54.5	862.	-P2Ø (7NDT)	26	92.3
819.	-P50Ø	19	73.7	863.	-P3Ø (7NDT)	20	100.0
820.	-P51Ø	25	40.0	864.	-P4Ø (7NDT)	17	41.2
821.	-P52Ø	26	34.6	865.	-P5Ø (7NDT)	18	22.2
822.	-P53Ø	25	24.0	866.	-P6Ø (7NDT)	22	36.4
823.	-P54Ø	21	23.8	867.	-P7Ø (7NDT)	10	90.0
824.	-P55Ø	25	92.0	868.	-P8Ø	12	100.0
825.	-P56Ø	25	36.0	869.	-P9Ø (8NDT)	15	0.0
826.	-P57Ø	26	76.9	870.	-P10Ø (8NDT)	16	33.3
827.	-P58Ø	21	78.6	871.	-P11Ø	7	0.0
828.	-P59Ø	20	30.0	872.	-P12Ø (8NDT)	14	50.0
829.	-P60Ø	18	33.3	873.	-P13Ø	5	40.0
830.	-P61Ø (7NDT)	20	35.0	874.	-P14Ø (8NDT)	15	100.0
831.	-P62Ø (7NDT)	24	20.8	875.	-P15Ø (8NDT)	4	50.0
832.	-P63Ø	19	89.5	876.	-P16Ø (8NDT)	8	12.5
833.	-P64Ø	21	42.9	877.	-P17Ø (8NDT)	10	50.0
834.	-P65Ø	17	29.4	878.	-P18Ø (8NDT)	10	20.0
835.	-P66Ø	19	21.1	879.	-P19Ø (8NDT)	12	25 0
836.	-P67Ø	19	100.0	880.	-P20Ø (8NDT)	12	0.0
837.	-P68Ø	16	62.5	881.	-P21Ø (8NDT)	3	33.3
838.	-P69Ø (7NDT)	21	42.9	882.	-P22Ø (8NDT)	12	16.7
839.	-P70Ø (8NDT)	23	0.0	883.	-P23Ø (8NDT)	18	33.3
840.	-P71Ø	25	20.0	884.	-P24Ø (8NDT)	20	75.0
841.	-P72Ø	24	58.3	885.	-P25Ø (8NDT)	23	95.6
842.	-P73Ø	25	60.0	886.	-P26Ø (8NDT)	19	21.0
843.	-P74Ø	23	26.1	887.	-P27Ø (8NDT)	16	31.2
844.	-P75Ø	25	28.0	888.	-P28Ø (8NDT)	16	18.7
845.	-P76Ø	21	28.6	889.	-P29Ø (8NDT)	18	5.5
846.	-P77Ø	17	35.3	890.	-P30Ø (8NDT)	17	23.5
847.	-P78Ø	24	100.0	891.	-P31Ø	17	11.8
848.	-P79Ø	20	50.0	892.	-P32Ø	15	26.[illegible]

Contd.

1	2	3	4
893.	74360-P330	1	100.0
894.	-P340 (8NDT)	22	45.4
895.	-P350 (8NDT)	28	25.0
896.	-P360 (8NDT)	15	20.0
897.	-P370 (8NDT)	11	9.1
898.	-P380 (8NDT)	24	0.0
899.	-P390 (8NDT)	8	0.0
900	-P400 (8NDT)	15	86.7
901	-P410 (8NDT)	16	12.5
902.	-P420	19	84.2
903.	-P430	20	20.0
904.	-P440 (8NDT)	25	24.0
905.	-P450 (8NDT)	20	20.0
906.	-P460 (8NDT)	21	0.0
907	-P470	21	38.1
908.	-P480 (8NDT)	42	2.4
909.	-P490 (8NDT)	16	93.7
910.	-P500	21	14.3
911.	-P510	19	68.4
912.	-P520 (8NDT)	17	17.6
913.	-P530 (8NDT)	15	6.6
914.	-P540 (8NDT)	22	9.1
915	-P550	11	36.4
916.	-P560 (8NDT)	23	13.0
917.	-P570 (8NDT)	24	0.0
918	-P580	8	62.5
919.	-P590 (8NDT)	15	40.0
920	-P600 (8NDT)	18	22.2
921.	-P610 (8NDT)	23	0.0
922	-P620 (8NDT)	16	12.5
923.	-P630 (9NDT)	22	81.8
924.	-P640 (9NDT)	20	100.0
925.	-P650 (9NDT)	10	10.0
926.	-P660 (9NDT)	22	100.0
927.	-P670 (9NDT)	33	3.0
928.	-P680 (9NDT)	16	0.0
929.	-P690 (9NDT)	30	93.3
930.	-P700 (9NDT)	4	100.0
931.	-P710 (9NDT)	13	76.9
932	-P720	12	100.0
933	-P730	10	30.0
934	-P740	14	42.8
935	-P750	12	50.0
936.	-P760	19	84.2
937.	-P770	15	100.0
938.	-P780	20	90.0
939.	74360-P790	23	73.9
940.	-P800	27	3.7
941.	-P810 (9NDT)	24	12.5
942.	-P820 (9NDT)	26	0.0
943	-P830 (9NDT)	22	18.2
944.	-P840 (9NDT)	25	40.0
945.	-P850 (9NDT)	22	50.0
946.	-P860 (9NDT)	18	27.8
947.	-P870	21	14.3
948.	-P880 (9NDT)	19	15.8
949.	-P890 (9NDT)	25	4.0
950.	-P900 (9NDT)	24	29.2
951.	-P910 (9NDT)	25	72.0
952.	-P920	26	88.5
953.	-P930	17	35.3
954.	-P940	13	92.3
955.	-P950	22	22.7
956.	-P960 (9NDT)	25	16.0
957.	-P970	22	40.9
958.	74363-P10 (8NDT)	26	84.6
959.	-P20 (8NDT)	21	95.2
960.	-P30 (8NDT)	24	83.3
961.	-P40 (8NDT)	22	86.4
962.	-P50	21	28.6
963.	-P60 (8NDT)	22	86.4
964.	-P70 (8NDT)	18	83.3
965.	-P80 (8NDT)	25	100.0
966	-P90	26	42.3
967.	-P100	16	81.2
968	-P110	12	83.3
969	-P120	17	94.1
970	-P130	15	100.0
971.	-P140	20	100.0
972.	-P150 (8NDT)	23	69.6
973.	-P160	17	82.3
974.	-P170 (8NDT)	15	26.7
975	-P180 (8NDT)	22	13.6
976	-P190	21	0.0
977.	-P200	21	28.6
978	-P210 (8NDT)	23	65.2
979	-P220 (8NDT)	4	50.0
980.	-P230 (8NDT)	25	44.0
981	-P240 (8NDT)	24	83.3
982	-P250	8	37.5
983.	-P260	20	60.0
984	-P270 (8NDT)	24	25.0

Contd

1	2	3	4	1	2	3	4
985.	74363-P28⊗ (8NDT)	23	95.6	1030.	74363-P73⊗ (8NDT)	21	33.3
986.	-P29⊗ (8NDT)	21	4.8	1031.	-P74⊗ (8NDT)	24	37.5
987.	-P30⊗ (8NDT)	27	96.3	1032.	-P75⊗ (8NDT)	20	0.0
988.	-P31⊗ (8NDT)	24	95.8	1033.	-P76⊗ (8NDT)	20	0.0
989.	-P32⊗ (8NDT)	24	91.7	1034.	-P77⊗ (8NDT)	25	20.0
990.	-P33⊗ (8NDT)	18	55.6	1035.	-P78⊗ (8NDT)	20	5.0
991.	-P34⊗ (8NDT)	22	0.0	1036.	-P79⊗ (8NDT)	21	0.0
992.	-P35⊗ (8NDT)	24	37.5	1037.	-P80⊗ (8NDT)	19	0.0
993.	-P36⊗ (8NDT)	24	12.5	1038.	-P81⊗ (8NDT)	24	12.5
994.	-P37⊗ (8NDT)	25	20.0	1039.	-P82⊗ (8NDT)	24	16.7
995.	-P38⊗ (8NDT)	21	19.1	1040.	-P83⊗ (8NDT)	25	24.0
996.	-P39⊗ (8NDT)	24	41.7	1041.	-P84⊗ (8NDT)	23	13.0
997.	-P40⊗ (8NDT)	24	12.5	1042.	-P85⊗ (8NDT)	18	66.7
998.	-P41⊗ (8NDT)	24	33.3	1043.	-P86⊗ (8NDT)	24	100.0
999.	-P42⊗ (8NDT)	18	77.8	1044.	-P87⊗ (8NDT)	25	4.0
1000.	-P43⊗ (8NDT)	25	24.0	1045.	-P88⊗ (8NDT)	25	20.0
1001.	-P44⊗ (8NDT)	26	50.0	1046.	-P89⊗	20	25.0
1002.	-P45⊗ (8NDT)	24	4.2	1047.	-P90⊗ (8NDT)	22	9.1
1003.	-P46⊗ (8NDT)	22	54.5	1048.	-P91⊗ (9NDT)	17	29.4
1004.	-P47⊗ (8NDT)	24	70.8	1049.	-P92⊗	24	100.0
1005.	-P48⊗ (8NDT)	24	4.2	1050.	-P93⊗ (9NDT)	15	0.0
1006.	-P49⊗ (8NDT)	24	62.5	1051.	-P94⊗	16	93.8
1007.	-P50⊗ (8NDT)	25	56.0	1052.	-P95⊗	9	88.9
1008.	-P51⊗ (8NDT)	24	87.5	1053.	-P96⊗ (9NDT)	9	88.9
1009.	-P52⊗ (8NDT)	24	62.5	1054.	-P97⊗ (9NDT)	13	23.1
1010.	-P53⊗ (8NDT)	25	88.0	1055.	74369-P1⊗ (8NDT)	19	21 1
1011.	-P54⊗ (8NDT)	24	91.7	1056.	-P2⊗ (8NDT)	14	7.1
1012.	-P55⊗ (8NDT)	24	91.7	1057.	-P3⊗	17	17.6
1013.	-P56⊗ (8NDT)	24	100.0	1058.	-P4⊗	27	11.1
1014.	-P57⊗ (8NDT)	25	100.0	1059.	-P5⊗	26	3.9
1015.	-P58⊗ (8NDT)	21	100.0	1060.	-P6⊗	25	0.0
1016.	-P59⊗ (8NDT)	25	92.0	1061.	-P7⊗	24	4.2
1017.	-P60⊗ (8NDT)	27	74.1	1062.	-P8⊗	11	0.0
1018.	-P61⊗ (8NDT)	24	62.5	1063.	-P9⊗	13	0.0
1019.	-P62⊗ (8NDT)	21	66.7	1064.	-P10⊗	16	25.0
1020.	-P63⊗ (8NDT)	22	36.4	1065.	-P11⊗	15	0.0
1021.	-P64⊗ (8NDT)	24	37.5	1066.	-P12⊗	21	0.0
1022.	-P65⊗ (8NDT)	26	88.5	1067.	-P13⊗	16	0.0
1023.	-P66⊗ (8NDT)	23	60.9	1068.	-P14⊗	9	0.0
1024.	-P67⊗ (8NDT)	22	36.4	1069.	-P15⊗	19	15.8
1025.	-P68⊗ (8NDT)	27	44.4	1070.	-P16⊗	12	8.3
1026.	-P69⊗ (8NDT)	24	70.8	1071.	-P17⊗ (8NDT)	22	4.5
1027.	-P70⊗ (8NDT)	25	44.0	1072.	-P18⊗ (8NDT)	17	0.0
1028.	-P71⊗ (8NDT)	26	15.4	1073.	-P19⊗	16	37.5
1029.	-P72⊗ (8NDT)	No germination		1074.	-P20⊗	16	0.0

Contd.

1	2	3	4	1	2	3	4
1075.	74369-P21Ø	18	5.6	1121	74369-P67Ø	24	100 0
1076.	-P22Ø	21	14.3	1122.	-P68Ø	24	4 2
1077.	-P23Ø	29	3 5	1123.	-P69Ø	20	10 0
1078.	-P24Ø	26	3 9	1124.	-P71Ø	24	4.2
1079.	-P25Ø	25	4.0	1125.	-P72Ø(8NDT)	20	15 0
1080	-P26Ø	21	66.7	1126.	-P73Ø(9NDT)	22	13 6
1081.	-P27Ø	24	20.8	1127.	-P74Ø	23	0.0
1082.	-P28Ø	27	0.0	1128	-P75Ø	19	57 9
1083.	-P29Ø	18	0.0	1129.	-P76Ø	20	35 0
1084.	-P30Ø	19	63.2	1130.	-P77Ø(9NDT)	17	11 8
1085.	-P31Ø	11	9.1	1131.	-P78Ø(9NDT)	23	39 1
1086	-P32Ø	14	0.0	1132.	-P79Ø	22	18 2
1087.	-P33Ø	14	0.0	1133.	-P80Ø	21	4 8
1088.	-P34Ø	11	0.0	1134.	-P81Ø	18	11 1
1089.	-P35Ø	26	19 2	1135	-P82Ø	32	13.0
1090.	-P36Ø	19	15.8	1136	-P83Ø	23	13 0
1091	-P37Ø (8NDT)	15	13.3	1137.	-P84Ø	20	5 0
1092.	-P38Ø (8NDT)	17	47.1	1138	-P85Ø	21	4 8
1093.	-P39Ø	23	0.0	1139.	-P86Ø	24	12 5
1094.	-P40Ø	11	0 0	1140.	-P87Ø	18	5 6
1095.	-P41Ø	7	42.9	1141.	-P88Ø	25	44 4
1096.	-P42Ø	11	18.2	1142.	-P89Ø	25	28 0
1097	-P43Ø	20	50.0	1143.	-P90Ø	20	45 0
1098	-P44Ø	12	15.7	1144.	-P91Ø	25	16.0
1099.	-P45Ø	18	33.3	1145.	-P92Ø	23	34 8
1100.	-P46Ø	16	0.0	1146	-P93Ø	26	61 5
1101.	-P47Ø	19	42 1	1147.	-P94Ø	22	36 4
1102.	-P48Ø	18	27 8	1148.	-P95Ø	20	95 C
1103.	-P49Ø	16	6.3	1149	-P96Ø(9NDT)	4	100 (
1104.	-P50Ø	19	0.0	1150	74332-W1Ø	40	82 5
1105	-P51Ø	19	21.1	1151	-W2Ø	42	26 2
1106.	-P52Ø	18	16 7	1152.	-W3Ø	41	39 (
1107.	-P53Ø	23	21 7	1153.	-W4Ø	44	34
1108	-P54Ø	17	70 6	1154	-W5Ø	53	11
1109.	-P55Ø	21	19 1	1155	-W6Ø	48	22 (
1110.	-P56Ø	17	0.0	1156	-W7Ø	6	100 (
1111	-P57Ø (8NDT)	2	100.0	1157.	-W8Ø	11	18
1112	-P58Ø (8NDT)	26	0.0	1158	-W9Ø	31	51 (
1113.	-P59Ø	5	15 4	1159	-W10Ø	17	35
1114	-P60Ø	21	0 0	1160	-W11Ø	1	100
1115.	-P61Ø	16	19.1	1161	-W12Ø	5	60
1116.	-P62Ø	18	12.5	1162	-W13Ø	4	50
1117.	-P63Ø	10	27 8	1163.	-W15Ø	2	100.
1118.	-P64Ø	22	10 0	1164.	-W16Ø	8	100
1119.	-P65Ø	20	77.3	1165.	-W17Ø	24	87
1120.	-P66Ø	4	10 0	1166.	-W18Ø	4	100

Contd

1	2	3	4	1	2	3	4
1167.	74332-W19Ø	21	42.9	1184.	74332-W36Ø	50	38.0
1168.	-W20Ø	27	29.6	1185.	-W37Ø	57	21.1
1169.	-W21Ø	38	57.9	1186.	-W38Ø	60	53.3
1170.	-W22Ø	24	95.8	1187.	-W39Ø	56	62.5
1171.	-W23Ø	49	59.2	1188.	-W40Ø	63	93.7
1172.	-W24Ø	40	87.5	1189.	-W41Ø	68	92.6
1173.	-W25Ø	55	94.6	1190.	-W42Ø	40	92.5
1174.	-W26Ø	63	53.9	1191.	-W43Ø	60	95.0
1175.	-W27Ø	72	43.1	1192.	-W44Ø	64	100.0
1176.	-W28Ø	58	37.9	1193.	-W45Ø	61	78.7
1177.	-W29Ø	72	87.5	1194.	-W46Ø	46	73.9
1178.	-W30Ø	63	88.9	1195.	-W47Ø	56	53.6
1179.	-W31Ø	65	24.6	1196.	-W48Ø	66	56.1
1180.	-W32Ø	68	10.3	1197.	-W49Ø	28	100.0
1181.	-W33Ø	57	19.3	1198.	-W50Ø	76	65.8
1182.	-W34Ø	71	52.1	1199.	-W51Ø	73	64.4
1183.	-W35Ø	46	34.8	1200.	-W52Ø	66	30.3

APPENDIX-XXXVII

Results of screening of West Indies lines (SPP)[a/] for resistance to Phytophthora blight [b/]

Sl. No.	Pedigree	No. of plants	Percent blight
1.	ICP-6901-P1⊗	19	42 1
2.	-P2⊗	27	62 9
3	-P3⊗	20	70.0
4	-P4⊗	29	31.0
5.	-6903-P1⊗	23	65 2
6.	-P2⊗	25	84 0
7.	-P3⊗	26	65.4
8.	-P4⊗	24	87 5
9	-6915-P1⊗	23	86.9
10	-P2⊗	22	81.8
11	-P3⊗	23	82.6
12.	-P4⊗	18	88.9
13.	-6919-P1⊗	14	92 9
14	-P2⊗	17	94 1
15.	-P3⊗	20	90.0
16	-P4⊗	20	90 0
17	-6926-P1⊗	30	93.3
18	-P2⊗	23	78 3
19.	-P3⊗	25	100 0
20.	-P4⊗	22	86 4
21.	-6930-P1⊗	23	65 2
22	-P2⊗	24	87.5
23	-P3⊗	18	72 2
24.	-P4⊗	25	72 0

a/ SPP - Single plant progenies.

b/ The susceptible check, HY-3C showed 87.8% blight incidence

APPENDIX- XXXVIII

Results of screening of progenies of germplasm and parental lines for Phytophthora blight [a/]

Sl. No.	Pedigree	No. of plants	Percent blight
1.	ICP-3-P1⊗	23	4.3
2.	-4-P1⊗	26	73.1
3.	-5-P1⊗	26	80.8
4.	-25-P1⊗	23	86.9
5.	-31-P1⊗	22	18.2
6.	-40-P1⊗	28	96.4
7.	-52-P1⊗	17	41.2
8.	-102-P1⊗	24	0.0
9.	-106-P1⊗	22	31.8
10.	-168-P1⊗	21	57.1
11.	-218-P1⊗	24	45.8
12.	-288-P1⊗	22	40.9
13.	-301-P1⊗	26	0.0
14.	-309-P1⊗	14	0.0
15.	-432-P1⊗	22	90.9
16.	-444-P1⊗	24	25.0
17.	-1204-P1⊗	24	8.3
18.	-3868-P1⊗	27	3.7
19.	-4234-P1⊗	25	16.0
20.	-4741-P1⊗	19	26.3
21.	-4780-P1⊗	24	79.2
22.	-6443-P1⊗	25	96.0
23.	-6526-P2⊗	19	15.8
24.	-6929-P1⊗	23	4.4
25.	-6973-P1⊗	30	43.3
26.	-6978-P1⊗	22	81.8
27.	-7175-P1⊗	31	0.0
28.	-7196-P1⊗	6	66.7
29.	-7197-P1⊗	24	100.0
30.	-7198-P1⊗	20	40.0
31.	-7199-P1⊗	26	3.9
32.	-7200-P1⊗	24	66.7
33.	K-28-P1⊗	30	3.3

a/ The susceptible check, HY-3C showed 87.8% blight incidence.

APPENDIX-XXXIX

Screening of single plant progenies of promising lines to Phytophthora blight in RA-9 nursery a/

Sl No	Pedigree	No. of plants	Percent blight
1	2	3	4
1.	ICP-24-P1⊗	22	0.0
2	ICP-24-P2⊗	23	4.4
3	ICP-24-P3⊗	29	100.0
4.	ICP-24-P4⊗	28	64.3
5.	ICP-2376-P1⊗	16	6.3
6.	ICP-2376-P2⊗	14	7.1
7.	ICP-3753-P1⊗	21	4.8
8.	ICP-3753-P2⊗	21	0.0
9	ICP-3753-P3⊗	25	8.0
10.	ICP-3753-P4⊗	18	0.0
11	Pant-A3-P1⊗	24	8.3
12.	Pant-A3-P2⊗	13	7.3
13.	Pant-A3-P3⊗	27	3.7
14	Pant-A3-P4⊗	25	4.0
15.	ICP-7065-P1⊗	15	0.0
16	ICP-7065-P2⊗	24	8.3
17	ICP-7065-P3⊗	17	5.9
18	ICP-7065-P4⊗	21	9.5
19.	BDN-1-P1⊗	31	3.2
20.	BDN-1-P2⊗	26	7.7
21	BDN-1-P3⊗	18	0.0
22	BDN-1-P4⊗	19	5.3
23	Pusa Ageti-P1⊗	23	8.7
24.	Pusa Ageti-P2⊗	27	7.4
25.	Pusa Ageti-P3⊗	20	0.0
26	Pusa Ageti-P4⊗	24	8.3
27	Pusa Ageti-P6⊗	24	8.3
28.	Pusa Ageti-P7⊗	22	4.6
29	Pusa Ageti-P8⊗	26	0.0
30	Pusa Ageti-P9⊗	24	0.0
31	Pusa Ageti-113-P1⊗	19	0.0
32	Pusa Ageti-113-P2⊗	27	0.0
33	Pusa Ageti-113-P3⊗	17	0.0
34	Pusa Ageti-113-P4⊗	14	7.1
35	Pusa Ageti-231-P1⊗	26	3.8
36	Pusa Ageti-231-P2⊗	22	0.0
37.	Pusa Ageti-231-P3⊗	23	8.7
38.	Pusa Ageti-231-P4⊗	23	4.3
39	Pusa Ageti-339-P1⊗	28	3.6
40.	Pusa Ageti-339-P2⊗	22	9.1

Contd.

1	2	3	4
41.	Pusa Ageti-339-P3⊗	29	3.5
42.	Pusa Ageti-339-P4⊗	25	4.0
43.	Pusa Ageti-758-P1⊗	15	0.0
44.	Pusa Ageti-758-P2⊗	16	0.0
45.	Pusa Ageti-758-P3⊗	21	9.5
46.	Pusa Ageti-758-P4⊗	20	0.0
47.	Pusa Ageti-1117-P1⊗	10	100.0
48.	Pusa Ageti-1175-P1⊗	15	86.7
49.	Pusa Ageti-1175-P2⊗	22	9.1
50.	Pusa Ageti-1175-P3⊗	24	8.3
51.	Pusa Ageti-1175-P4⊗	26	7.7
52.	Pusa Ageti-1188-P1⊗	22	90.9
53.	Pusa Ageti-1188-P2⊗	25	84.0
54.	Pusa Ageti-1200-P1⊗	24	95.8
55.	Pusa Ageti-1205-P1⊗	15	93.3
56.	ICP-1205-P2⊗	17	82.3
57.	ICP-1208-P1⊗	13	0.0
58.	ICP-1208-P2⊗	8	0.0
59.	ICP-1208-P3⊗	22	9.1
60.	ICP-1209-P2⊗	28	21.4
61.	ICP-1209-P3⊗	25	8.0
62.	ICP-1209-P4⊗	21	0.0
63.	ICP-1209-P5⊗	16	100.0
64.	ICP-1211-P1⊗	8	75.0
65.	ICP-1249-P1⊗	21	28.6
66.	ICP-1249-P2⊗	18	66.7
67.	ICP-1372-P1⊗	11	90.1
68.	ICP-1510-P2⊗	17	0.0
69.	ICP-1510-P3⊗	18	72.2
70.	ICP-1516-P1⊗	10	90.0
71.	ICP-1522-PB⊗	44	31.8
72.	ICP-1522-P5⊗	19	0.0
73.	ICP-1522-P6⊗	22	27.3
74.	ICP-1529-P2⊗	17	5.9
75.	ICP-1529-P3⊗	30	6.7
76.	ICP-1529-P4⊗	10	40.0
77.	ICP-1529-P5⊗	20	5.0
78.	ICP-1531-P1⊗	20	0.0
79.	ICP-1531-P2⊗	20	35.0
80.	ICP-1531-P3⊗	26	7.7
81.	ICP-1531-P4⊗	22	9.1
82.	ICP-1535-P3⊗	28	3.6
83.	ICP-1535-P4⊗	30	10.0
84.	ICP-1535-P5⊗	21	9.5
85.	ICP-1559-P1⊗	9	88.9
86.	ICP-1559-P2⊗	24	37.5
87.	ICP-1559-P3⊗	13	100.0

Contd.

1	2	3	4
88.	ICP-1587-P1⊗	4	25.0
89	ICP-1587-P2⊗	25	0.0
90.	ICP-1587-P3⊗	22	0.0
91	ICP-1587-P4⊗	36	63.9
92	ICP-1622-P2⊗	27	7.4
93.	ICP-1622-P3⊗	22	9.1
94.	ICP-1622-P4⊗	16	12.5
95	ICP-1622-P5⊗	14	42.9
96.	ICP-1643-P1⊗	6	0.0
97.	ICP-1643-P2⊗	13	7.7
98.	ICP-1643-P3⊗	21	4.8
99.	ICP-1643-P5⊗	10	80.0
100.	ICP-1673-P1⊗	28	67.9
101	ICP-1673-P2⊗	14	50.0
102	ICP-1673-P3⊗	21	28.6
103.	ICP-1673-P4⊗	15	93.3
104	ICP-1686-P1⊗	6	33.3
105	ICP-1686-P2⊗	23	34.8
106	ICP-1686-P3⊗	31	6.5
107.	ICP-1686-P4⊗	47	36.7
108	ICP-1708-P1⊗	14	92.9
109.	ICP-1708-P2⊗	26	3.9
110	ICP-1708-P3⊗	13	69.2
111	ICP-1708-P4⊗	13	0.0
112.	ICP-214	33	9.1
113	ICP-580	43	4.7
114	ICP-752	40	5.0
115	ICP-913	41	9.8
116.	ICP-934	46	8.7
117	ICP-1088	47	8.5
118	ICP-1090	51	9.8
119	ICP-1120	46	0.0
120	ICP-1123	51	9.8
121.	ICP-1149	49	8.2
122	ICP-1150	50	10.0
123	ICP-1151	48	8.3
124	ICP-1258	50	10.0
125	ICP-1321	47	8.5
126	ICP-1529	48	6.3
127	ICP-1535	46	8.7
128	ICP-1570	42	7.1
129	ICP-1586	49	8.2

a/ The susceptible check, HY-3C, showed 87.8% blight incidence.

APPENDIX-XL

Screening of wilt promising progenies for Phytophthora blight resistance in RA-9 nursery [a/]

Sl. No.	Pedigree	No. of plants	Percent blight
1	2	3	4
1.	T-17-W1⊗-W2⊗-W1⊗	25	8.0
2.	T-17-W1⊗-W3⊗-W1⊗	24	0.0
3.	T-17-W1⊗-W5⊗-W1⊗	25	0.0
4.	T-17-W1⊗-W9⊗-W1⊗	24	4.2
5.	T-17-W1⊗-W12⊗-W1⊗	24	8.3
6.	T-17-W1⊗-W13⊗-W1⊗	23	4.3
7.	T-17-W1⊗-W17⊗-W1⊗	25	4.0
8.	T-17-W2⊗-W1⊗-W3⊗	27	0.0
9.	T-17-W2⊗-W3⊗-W8⊗	22	22.7
10.	T-17-W2⊗-W7⊗-W1⊗	20	20.0
11.	T-17-W2⊗-W9⊗-W2⊗	27	0.0
12.	T-17-W3⊗-W2⊗-W5⊗	26	23.1
13.	T-17-W3⊗-W3⊗-W2⊗	29	6.9
14.	T-17-W3⊗-W4⊗-W2⊗	22	9.1
15.	T-17-W3⊗-W6⊗-W1⊗	17	0.0
16.	T-17-W3⊗-W7⊗-W1⊗	27	3.7
17.	T-17-W3⊗-W9⊗-W1⊗	25	8.0
18.	T-17-W3⊗-W12⊗-W2⊗	25	36.0
19.	NP(WR)-15-W1⊗-W2⊗-W1⊗	25	28.0
20.	NP(WR)-15-W1⊗-W2⊗-W5⊗	17	58.8
21.	NP(WR)-15-W1⊗-W3⊗-W8⊗	25	24.0
22.	NP(WR)-15-W1⊗-W4⊗-W8⊗	23	65.2
23.	NP(WR)-15-W1⊗-W7⊗-W1⊗	23	8.7
24.	NP(WR)-15-W1⊗-W12⊗-W2⊗	30	10.0
25.	NP(WR)-15-W1⊗-W13⊗-W8⊗	22	45.5
26.	NP(WR)-15-W1⊗-W14⊗-W2⊗	25	36.0
27.	NP(WR)-15-W1⊗-W16⊗-W1⊗	22	22.7
28.	NP(WR)-15-W1⊗-W17⊗-W3⊗	25	8.0
29.	NP(WR)-15-W1⊗-W19⊗-W1⊗	25	36.0
30.	NP(WR)-15-W1⊗-W20⊗-W7⊗	22	18.2
31.	NP(WR)-15-W1⊗-W21⊗-W1⊗	27	18.5
32.	NP(WR)-15-W2⊗-W1⊗-W9⊗	24	33.3
33.	NP(WR)-15-W2⊗-W3⊗-W1⊗	23	13.0
34.	NP(WR)-15-W2⊗-W5⊗-W1⊗	23	4.5
35.	NP(WR)-15-W2⊗-W12⊗-W1⊗	24	4.2
36.	NP(WR)-15-W2⊗-W14⊗-W1⊗	25	52.0
37.	NP(WR)-15-W2⊗-W15⊗-W1⊗	21	71.4
38.	NP(WR)-15-W2⊗-W16⊗-W1⊗	23	56.5
39.	NP(WR)-15-W2⊗-W19⊗-W1⊗	21	52.4
40.	NP(WR)-15-W2⊗-W20⊗-W1⊗	22	27.3

Contd...

1	2	3	4
41	NP(WR)-15-W30-W60-W10	27	66.7
42	NP(WR)-15-W30-W70-W20	24	41.7
43	NP(WR)-15-W30-W80-W10	25	16.0
44	NP(WR)-15-W30-W90-W10	19	15.8
45	NP(WR)-15-W30-W140-W10	27	3.7
46	NP(WR)-15-W30-W150-W10	27	11.1
47	NP(WR)-15-W30-W170-W70	24	4.2
48	NP(WR)-15-W30-W180-W10	22	9.1
49	EXE-Rb3-W50-W10-W40	19	0.0
50	73039-Rb3-W40-W10-W190	28	10.7
51	73039-Rb3-W40-W20-W30	25	4.0
52	ICP-6970-S10-W30	24	8.3
53	ICP-6970-S10-W40	26	0.0
54	ICP-6970-S20-W10	25	84.0
55	ICP-6970-S20-W30	26	3.9
56	ICP-6970-S30-W10	52	53.8
57	ICP-6970-S40-W10	51	25.5
58	ICP-6970-S50-W50	24	33.3
59	ICP-6970-S60-W10	25	24.0
60	ICP-6970-S70-W10	24	8.3
61	ICP-6970-S80-W10	24	25.0
62	ICP-6970-S90-W10	25	32.0
63	ICP-6970-S100-W10	26	3.8
64	C-11-W20-W100-W50	26	34.6
65	No 1258-W20-W50-W30	26	0.0
66	15-3-3-W20-W130-W40	25	0.0
67	15-3-3-W20-W160-W30	28	28.6
68	20-1-W10-W40	24	0.0
69	KWR-1-W10-W30-W30	23	65.2
70	KWR-1-W10-W30-W50	26	23.1
71	KWR-1-W10-W50-W30	26	0.0
72	KWR-1-W20-W20-W10	26	7.7
73	KWR-1-W20-W30-W10	27	25.9
74	KWR-1-W20-W70-W80	26	19.2
75	KWR-1-W20-W100-W70	22	31.8
76	KWR-1-W20-W110-W70	26	30.8
77	KWR-1-W20-W130-W20	25	20.0
78	KWR-1-W30-W10-W30	22	13.6
79	KWR-1-W30-W50-W20	25	24.0
80	KWR-1-W30-W110-W40	27	14.8
81	KWR-1-W30-W130-W50	24	20.8
82	ICP-1-6-W20-W10	16	12.5
83	ICP-1-6-W30-W10	24	8.3
84	ICP-1-6-W50-W20	26	3.9
85	ICP-4745-4-W50-W30	7	0.0

Contd

1	2	3	4
86.	ICP-4745-4-W5⊗-W4⊗	22	0.0
87.	ICP-6426-4-W4⊗-W8⊗	23	0.0
88.	HY-3C-12-W3⊗-W3⊗	23	95.7
89.	HY-3C-12-W5⊗-W1⊗	23	100.0
90.	ICP-2812-W4⊗	26	7.7
91.	ICP-4698-W1⊗	26	7.7
92.	ICP-5174-W1⊗	30	0.0
93.	ICP-5579-W1⊗	22	63.6
94.	NP(WR)-15-W1⊗	25	24.0
95.	ICP-6524-W5⊗	27	100.0
96.	ICP-6588-W1⊗	23	30.4
97.	ICP-6812-W5⊗	23	30.4
98.	ICP-6815-W4⊗	19	42.1
99.	ICP-6897-W4⊗	23	26.1
100.	ICP-6915-W3⊗	21	100.0
101.	ICP-6927-W1⊗	22	9.1
102.	ICP-7336-W2⊗	24	100.0
103.	ICP-7424-W3⊗	23	8.7
104.	ICP-7549-W3⊗	25	20.0

a/ The susceptible check, HY-3C, showed 87.8% blight incidence.

APPENDIX-XLI & XLII

Screening of sterility mosaic resistant progenies (Germplasm selections & Breeding materials) for Phytophthora blight in RA-9 nursery [a/]

Sl. No.	Pedigree	No of plants	Percent blight
1	2	3	4
1.	ICP-3782-S1⊗	29	100.0
2	ICP-4769-3-S2⊗	28	50.0
3.	ICP-4866-1-S3⊗	26	0.0
4.	ICP-4885-1-S1⊗	39	7.7
5.	ICP-5051-2-S4⊗	28	42.9
6.	ICP-5097-1-S3⊗	31	9.7
7.	ICP-5436-1-S2⊗	22	9.1
8.	ICP-5467-1-S1⊗	25	88.0
9	ICP-5651-1-S3⊗	27	7.4
10	ICP-5656-1-S2⊗	31	3.2
11	ICP-5701-1-S1⊗	23	34.8
12	ICP-6748-3-S2⊗	33	100.0
13.	ICP-6831-1-S2⊗	32	96.9
14.	ICP-6975-1-S3⊗	32	100.0
15.	ICP-7185-1-S1⊗	37	5.4
16	ICP-7184-2-S5⊗	34	85.2
17	ICP-7194-1-S4⊗	28	0.0
18	ICP-7201-2-S1⊗	25	100.0
19	ICP-7217-1-S1⊗	32	100.0
20	ICP-7232-2-S4⊗	37	86.5
21	ICP-7233-2-S1⊗	9	77.8
22	ICP-7234-2-S1⊗	29	58.6
23	ICP-7237-1-S3⊗	20	100.0
24	ICP-7238-1-S5⊗	16	87.5
25	ICP-7239-1-S1⊗	29	100.0
26	ICP-7240-3-S1⊗	31	100.0
27	ICP-7243-7-S1⊗	31	61.3
28	ICP-7246-2-S9⊗	10	10.0
29.	ICP-7248-7-S4⊗	4	100.0
30	ICP-7250-1-S1⊗	26	100.0
31	ICP-7258-1-S4⊗	15	86.7
32	ICP-7273-1-S3⊗	24	54.2
33.	ICP-7306-2-S2⊗	27	100.0
34	ICP-7336-1-S3⊗	24	87.5
35	ICP-7337-2-S4⊗	24	100.0
36	ICP-7345-3-S2⊗	21	66.7
37.	ICP-7346-1-S3⊗	26	96.2
38.	ICP-7349-1-S1⊗	25	84.0

Contd

1	2	3	4
39.	ICP-7353-1-S4⊗	25	88.0
40.	ICP-7372-3-S3⊗	25	100.0
41.	ICP-7378-2-S2⊗	26	100.0
42.	ICP-7387-5-S5⊗	29	100.0
43.	ICP-7403-2-S2⊗	30	96.7
44.	ICP-7407-1-S2⊗	24	95.8
45.	ICP-7411-1-S1⊗	19	94.8
46.	ICP-7414-1-S3⊗	26	0.0
47.	ICP-7445-4-S5⊗	28	7.1
48.	ICP-7501-2-S2⊗	23	100.0
49.	ICP-7864-1-S5⊗	23	9.6
50.	ICP-7867-1-S4⊗	16	100.0
51.	ICP-7870-1-S1⊗	17	100.0
52.	ICP-7873-5-S1⊗	21	100.0
53.	ICP-7874-6-S4⊗	23	100.0
54.	ICP-7875-3-S4⊗	21	100.0
55.	ICP-7898-3-S3⊗	23	100.0
56.	ICP-7904-5-S5⊗	23	100.0
57.	ICP-7906-1-S5⊗	20	60.0
58.	ICP-7942-1-S4⊗	23	95.7
59.	ICP-7983-1-S2⊗	25	100.0
60.	ICP-7998-4-S5⊗	20	95.0
61.	ICP-8014-3-S4⊗	27	100.0
62.	ICP-8021-3-S5⊗	25	96.0
63.	ICP-8029-1-S4⊗	30	26.7
64.	ICP-8032-1-S4⊗	29	62.1
65.	ICP-8033-2-S1⊗	20	50.0
66.	ICP-8035-1-S3⊗	24	100.0
67.	ICP-8036-13-S1⊗	24	95.8
68.	ICP-8038-2-S1⊗	31	29.0
69.	ICP-8057-3-S1⊗	26	100.0
70.	ICP-8058-3-S4⊗	29	100.0
71.	ICP-8061-3-S1⊗	31	100.0
72.	ICP-8063-5-S1⊗	30	100.0
73.	ICP-8067-2-S2⊗	27	100.0
74.	ICP-8075-2-S2⊗	24	8.3
75.	ICP-8084-7-S5⊗	25	96.0
76.	ICP-8093-2-S1⊗	26	26.9
77.	ICP-8094-1-S2⊗	34	8.8
78.	ICP-8101-2-S2⊗	21	9.5
79.	ICP-8102-5-S1⊗	24	0.0
80.	ICP-8103-3-S2⊗	30	0.0
81.	ICP-8106-2-S5⊗	32	0.0
82.	ICP-8111-2-S1⊗	30	0.0
83.	ICP-8113-1-S5⊗	28	28.6

Contd.

1	2		3	4
84.	ICP-8120-2-S50		28	57.1
85	ICP-8121-2-S10		30	3.3
86	ICP-8123-1-S50		30	26.7
87.	ICP-8127-2-S40		28	57.1
88.	ICP-8128-1-S10		26	100.0
89.	ICP-8130-5-S40		20	5.0
90.	ICP-8132-2-S30		25	4.0
91.	ICP-8133-1-S40		30	66.7
92.	ICP-9134-1-S10		28	82.1
93.	ICP-8136-1-S10		29	68.9
94.	ICP-8137-4-S40		28	7.1
95.	ICP-8138-2-S40		30	70.0
96.	ICP-8139-3-S10		21	23.8
97.	ICP-8140-1-S40		29	20.7
98	ICP-8141-2-S20		32	37.5
99.	ICP-8144-3-S30		29	3.5
100.	ICP-8146-1-S50		44	47.7
101.	ICP-8147-1-S20		34	0.0
102.	ICP-8151-7-S40		24	0.0
103	ICP-8160-1-S30		27	74.1
104.	ICP-8161-1-S10		42	4.8
105.	ICP-8167-1-S30		29	27.6
106	ICP-8501-2-S20		27	66.7
107	Pant-B-76-5-S10		23	100.0
108	74360-S10-S10		47	89.4
109.	74360-S10-S20		47	78.7
110	74360-S10-S30		56	7.1
111	74360-S10-S40	(7NDT)	23	30.4
112	74360-S10-S50		54	98.2
113	74360-S10-S60	(7NDT)	34	70.6
114.	74360-S10-S70		50	14.0
115	74360-S10-S80		44	15.9
116.	74360-S10-S90	(8NDT)	24	16.7
117.	74360-S10-S100		49	75.5
118	74360-S10-S110	(7NDT)	32	18.8
119.	74360-S10-S120		49	85.7
120.	74360-S10-S130		47	27.7
121	74360-S10-S140		55	69.1
122	74360-S10-S150		54	33.3
123	74360-S10-S160	(8NDT)	42	47.6
124	74360-S30-S10		41	9.8
125.	74360-S30-S20		46	36.9
126.	74360-S30-S30	(7NDT)	27	70.3
127.	74360-S30-S40		49	85.7
128.	74360-S30-S50	(8NDT)	43	11.6

Contd

1	2		3	4
129.	74360-S40-S10	(8NDT)	50	20.0
130.	74360-S40-S20		46	80.4
131.	74360-S40-S30		46	2.2
132.	74360-S40-S40		51	5.9
133.	74360-S40-S50		49	32.7
134.	74360-S40-S60		54	14.8
135.	74360-S40-S70		48	25.0
136.	74360-S40-S80	(8NDT)	34	32.3
137.	74360-S40-S90	(8NDT)	27	14.8
138.	74360-S40-S100		23	4.3
139.	74360-S40-S110		53	5.6
140.	74360-S40-S120		51	25.5
141.	74360-S40-S130	(8NDT)	35	80.0
142.	74360-S40-S140	(8NDT)	48	20.8
143.	74360-S40-S150		37	18.9
144.	74360-S40-S160		46	4.3
145.	74360-S40-S170		40	12.5
146.	74360-S40-S180		46	19.6
147.	74360-S40-S190		43	4.7
148.	74360-S40-S200		49	28.6
149.	74360-S40-S210		42	0.0
150.	74360-S40-S220	(8NDT)	48	56.3
151.	74360-S40-S230		57	87.7
152.	74360-S40-S240	(8NDT)	39	25.6
153.	74360-S40-S250	(8NDT)	21	14.3
154.	74360-S40-S260		52	1.9
155.	74360-S40-S270	(8NDT)	11	0.0
156.	74360-S40-S280	(8NDT)	20	10.0
157.	74360-S40-S290	(8NDT)	39	2.6
158.	74360-S40-S300		43	6.9
159.	74360-S100-S10		54	20.3
160.	74360-S100-S20	(8NDT)	48	16.7
161.	74360-S100-S30		47	25.5
162.	74360-S100-S40	(8NDT)	42	28.6
163.	74360-S100-S50	(8NDT)	33	42.5
164.	74360-S100-S60		42	47.6
165.	74360-S100-S70	(8NDT)	40	67.5
166.	74360-S100-S80		47	14.9
167.	74360-S100-S90		49	42.9
168.	74360-S100-S100	(8NDT)	43	23.3
169.	74360-S100-S110		52	84.6
170.	74360-S100-S120		53	22.6
171.	74360-S100-S130		45	31.1
172.	74360-S100-S140		49	36.7
173.	74360-S100-S150		45	17.8
174.	74363-S30-S10		55	23.6
175.	74363-S30-S20		47	2.1

1	2	3	4
176.	74363-S30-S30	51	23.5
177.	74363-S40-S10 (6NDT)	55	83.6
178	74363-S40-S20	34	20.0
179.	74363-S50-S10 (8NDT)	66	72.7
180.	74363-S50-S20 (8NDT)	49	97.9
181.	74363-S50-S30 (7NDT)	48	93.8
182.	74363-S50-S40	50	100.0
183.	74363-S50-S50	27	100.0
184.	74363-S50-S60	54	96.3
185.	74363-S50-S70	56	50.0
186.	74363-S60-S10	52	17.3
187.	74363-S60-S20	56	19.6
188.	74363-S60-S30	55	20.0
189.	74363-S60-S40	50	22.0
190.	74363-S60-S50	54	7.4
191.	74363-S60-S60	23	17.4
192.	74363-S60-S70	52	1.9
193.	74363-S60-S80	54	92.6
194.	74363-S60-S90	53	0.0
195.	73047-8-S20-S10 (2NDT)	54	14.8
196.	73047-8-S20-S20 (2NDT)	50	14.0
197.	73047-8-S20-S30 (2NDT)	36	2.8
198.	73047-8-S20-S40 (2NDT)	38	5.3
199.	73047-8-S20-S50 (2NDT)	47	8.5
200.	73047-19-S20-S10(3NDT)	45	8.9
201.	73047-19-S20-S20(3NDT)	49	8.2
202.	73047-19-S20-S30(3NDT)	56	0.0
203.	73047-19-S20-S40(3NDT)	45	4.4
204.	73047-19-S20-S50(3NDT)	50	0.0
205.	73047-27-S10-S10(4NDT)	49	0.0
206.	73047-27-S10-S20(4NDT)	19	0.0
207.	73047-27-S10-S30(4NDT)	25	20.0
208.	73047-27-S10-S40(4NDT)	47	10.6
209.	73047-40-S40-S10(8NDT)	50	28.0
210.	73047-40-S40-S20(8NDT)	56	32.1
211.	73047-42-S10-S10(3NDT)	47	8.5
212.	73047-42-S10-S20(3NDT)	55	0.0
213.	73047-42-S10-S30(3NDT)	37	0.0
214.	73047-42-S10-S40(3NDT)	47	2.1
215.	73047-42-S10-S50(3NDT)	55	0.0
216.	73047-22-1-3-S20-S10	44	11.4
217.	73047-22-1-3-S20-S20	51	3.9
218.	73047-22-1-3-S20-S30	10	0.0
219.	73047-22-1-3-S20-S40	27	0.0
220.	73047-22-1-3-S20-S50	41	2.4

Contd.

1	2	3	4
221.	73047-30-1-S4Ø-S1Ø (5NDT)	50	4.0
222.	73047-30-1-S4Ø-S2Ø	26	3.9
223.	73047-30-1-S4Ø-S3Ø	12	16.7
224.	73047-30-1-S4Ø-S4Ø	6	0.0
225.	73047-30-1-S4Ø-S5Ø	15	0.0
226.	73047-30-1-S4Ø-S6Ø	37	16.2
227.	73047-6-2-S7Ø-S1Ø	60	13.3
228.	73047-6-2-S7Ø-S2Ø	52	11.5
229.	73047-6-2-S7Ø-S3Ø	22	4.5
230.	73047-6-2-S7Ø-S4Ø	48	18.8
231.	73047-6-2-S11Ø-S1Ø	54	0.0
232.	73047-6-2-S11Ø-S2Ø	53	3.8
233.	73047-6-2-S11Ø-S3Ø	57	3.5
234.	73047-6-2-S11Ø-S4Ø	48	6.3
235.	73047-6-2-S11Ø-S5Ø	39	7.7
236.	73047-24-8-2-S1Ø-S1Ø (3NDT)	46	6.5
237.	73047-24-8-2-S1Ø-S2Ø (DT)	48	2.1
238.	73047-24-8-2-S1Ø-S3Ø (5NDT)	55	12.7
239.	73047-24-8-2-S1Ø-S4Ø (6NDT)	46	13.0
240.	73047-24-8-2-S1Ø-S5Ø (6NDT)	51	25.5
241.	74236-35-S8Ø-S1Ø (7NDT)	51	92.2
242.	74236-35-S8Ø-S2Ø (7NDT)	49	85.7
243.	74236-35-S8Ø-S3Ø (7NDT)	45	91.1
244.	74236-35-S8Ø-S4Ø (7NDT)	48	91.7
245.	74236-35-S8Ø-S5Ø (7NDT)	37	75.7
246.	73047-10-S8Ø-S1Ø (6NDT)	20	85.0
247.	73047-10-S8Ø-S2Ø (5NDT)	13	69.2
248.	73047-10-S8Ø-S3Ø (6NDT)	24	83.3
249.	73047-10-S8Ø-S4Ø (6NDT)	24	79.2
250.	73047-10-S8Ø-S5Ø (7NDT)	25	80.0
251.	73047-24-1-5-S2Ø-S1Ø (2DT)	37	24.3
252.	73047-24-1-5-S2Ø-S2Ø (3DT)	35	20.0
253.	73047-24-1-5-S2Ø-S3Ø (3NDT)	40	47.5
254.	73047-24-1-5-S2Ø-S4Ø (2NDT)	51	64.7
255.	73047-24-1-5-S2Ø-S5Ø (3NDT)	46	91.3
256.	73047-24-1-5-S3Ø-S1Ø (5NDT)	44	54.6
257.	73047-24-1-5-S3Ø-S2Ø (6NDT)	51	35.3
258.	73047-24-1-5-S3Ø-S3Ø (6NDT)	52	38.5
259.	73047-24-Bulk II-S1Ø-S1Ø(5NDT)	40	42.5
260.	73047-24-Bulk II-S1Ø-S2Ø(5NDT)	50	64.0
261.	73047-24-Bulk II-S1Ø-S3Ø(4NDT)	30	56.7
262.	73047-24-Bulk II-S1Ø-S4Ø(5NDT)	49	55.1
263.	73047-24-Bulk II-S1Ø-S5Ø(5NDT)	39	12.8

Contd.

1	2	3	4
264.	74236-21-S6⊗-S1⊗ (6NDT)	51	100.0
265.	74236-21-S6⊗-S2⊗ (6NDT)	42	85.7
266.	74236-21-S6⊗-S3⊗ (6NDT)	53	100.0
267.	74236-21-S6⊗-S4⊗ (6NDT)	52	100.0
268.	74236-21-S6⊗-S5⊗ (6NDT)	43	100.0
269.	73047-2-S2⊗-S1⊗ (6NDT)	53	9.4
270.	73047-2-S2⊗-S2⊗ (6NDT)	35	2.9
271.	73047-2-S2⊗-S3⊗ (6NDT)	53	1.9
272.	73047-6-S2⊗-S1⊗ (7NDT)	48	6.3
273.	73047-6-S2⊗-S2⊗ (6NDT)	50	2.0
274.	73047-6-S2⊗-S3⊗ (7NDT)	42	2.4
275.	73047-6-S2⊗-S4⊗ (6NDT)	48	12.5
276.	73047-6-S2⊗-S5⊗ (7NDT)	40	5.0
277.	73047-6-S4⊗-S1⊗ (6NDT)	45	8.9
278.	73047-6-S4⊗-S2⊗ (6NDT)	46	0.0
279.	73047-1-2-S2⊗-S1⊗ (7NDT)	25	76.0
280.	73047-23-1-2-S2⊗-S2⊗ (7NDT)	41	36.6
281.	73047-23-1-2-S2⊗-S3⊗	46	34.8

a/ The susceptible check, HY-3C, showed 87.7% blight incidence.

APPENDIX- XLIII

Results of screening of ACT[a/] pigeonpea lines against Phytophthora blight in the field (RA-9) during 1978 K

Sl. No.	Pedigree/ Cultivar	No. of plants	No. blighted	Percent blight	Yield/plant (g)
1	2	3	4	5	6
	EACT (extra early)				
1.	H-73-20	90	8	8.9	22.1
2.	ICPL-1	93	28	30.1	20.2
3.	ICPL-2	113	37	32.7	15.7
4.	UPAS-120	106	71	67.0	11.0
5.	H-76-19	149	112	75.2	6.8
6.	ICPL-3	87	67	77.0	1.4
7.	HPA-2	73	58	79.5	14.8
8.	H-76-20	104	84	80.8	8.2
9.	H-76-35	80	66	82.5	5.3
0.	H-76-53	85	71	83.5	3.9
1.	ICPL-4	94	80	85.1	2.6
2.	Prabhat	96	90	93.8	2.5
	ACT-1 (early)				
1.	ICPL-5	106	22	20.8	22.0
2.	ICPL-6	105	36	34.3	24.8
3.	ICPL-8	110	42	38.2	15.2
4.	T-21	92	46	50.0	12.3
5.	JA-919	79	48	60.8	11.5
6.	HY-5	82	50	61.0	11.6
7.	ICPL-7	105	66	62.9	19.5
8.	TT-6	124	88	71.0	4.0
9.	Sehore-197	129	99	76.7	2.6
0.	4-84	120	103	85.8	2.7
1.	TT-5	112	99	98.4	2.1
2.	Sehore-68	48	43	89.6	4.4
3.	DL-74-1-3	100	95	95.0	1.5
4.	TT-4	95	91	95.8	1.0
	ACT-2 (medium)				
1.	BDN-1	78	4	5.1	41.0
2.	HY-4	124	10	8.1	18.8
3.	JA-8	87	9	10.3	33.5
4.	ICPL-42	128	21	16.4	25.4
5.	Sehore-75-4	120	28	23.3	25.4
6.	JA-15	123	29	23.6	28.5

Contd.

1	2	3	4	5	6
	ACT-2 (medium)				
7.	JA-3	79	21	26.6	32.7
8.	ICPL-43	90	24	26.7	14.0
9.	ICP-1	137	42	30.7	23.3
10.	BDN-2	102	33	32.4	14.3
11.	No. 148	110	54	49.1	28.5
12.	JA-5	114	59	51.8	34.3
13.	AS-71-37	87	48	55.2	28.7
14.	GS-1	94	54	57.5	33.3
15.	HY-2	109	72	66.1	15.0
16.	C-11	80	68	85.0	17.9
	ACT-3 (late)				
1.	AS-29	71	8	11.3	61.3
2.	K-28	63	8	12.7	26.0
3.	K-23	93	14	15.1	33.2
4.	PS-65	82	14	17.1	33.4
5.	Group-8	92	24	26.1	29.4
6.	Group-10	101	29	28.7	23.7
7.	1234	79	29	36.7	21.6
8.	PS-41	93	35	37.6	28.1
9.	K-16	130	51	39.2	15.0
10.	Composite-4	87	45	51.7	11.1
11.	Gwalior-3	101	54	53.5	23.3
12.	NP(WR)15	119	64	53.8	9.0
13.	T-7	91	52	57.1	18.5
14.	PS-43	82	47	57.3	38.7
15.	1258	66	44	66.7	16.1
16.	PS-66	89	85	95.5	8.5

a/ ACT - Arhar (pigeonpea) coordinated trial. These are organized by the All India Coordinated Pulse Improvement Project.

APPENDIX- XLIV

Screening of pigeonpea germplasm for Phytophthora blight resistance in pot culture

Sl. No.	ICP No.	No. of plants	Percent blight	Sl. No.	ICP No.	No. of plants	Percent blight
1	2	3	4	1	2	3	4
1.	1206	25	76.00	41.	1282	35	77.10
2.	1210	25	76.00	42.	1283	30	70.00
3.	1212	25	80.00	43.	1289	40	70.00
4.	1213	24	95.80	44.	1291	34	58.80
5.	1214	27	74.00	45.	1293	34	76.50
6.	1216	29	82.70	46.	1296	27	77.80
7.	1217	32	42.90	47.	1299	30	36.70
8.	1219	37	83.80	48.	1303	30	96.70
9.	1220	29	65.50	49.	1304	37	91.90
10.	1222	25	64.00	50.	1307	30	100.00
11.	1223	26	73.10	51.	1311	33	84.80
12.	1224	33	87.90	52.	1313	37	81.10
13.	1225	36	77.80	53.	1314	38	39.50
14.	1226	38	26.30	54.	1315	35	91.40
15.	1228	34	41.20	55.	1316	40	90.00
16.	1229	38	81.50	56.	1319	37	64.90
17.	1230	34	79.40	57.	1321	36	0.00
18.	1231	32	43.70	58.	1323	38	26.30
19.	1232	33	90.90	59.	1327	30	30.00
20.	1233	31	51.60	60.	1333	33	30.30
21.	1236	34	55.90	61.	1336	27	100.00
22.	1237	31	90.30	62.	1340	36	27.80
23.	1239	23	91.30	63.	1342	32	90.60
24.	1245	30	96.70	64.	1345	35	71.40
25.	1252	34	88.20	65.	1347	36	91.67
26.	1254	33	90.90	66.	1350	40	87.50
27.	1256	37	94.60	67.	1351	37	54.00
28.	1258	40	0.00	68.	1353	31	45.16
29.	1261	30	90.00	69.	1355	33	69.70
30.	1262	27	74.10	70.	1357	33	54.50
31.	1264	39	100.00	71.	1364	17	52.90
32.	1265	37	75.70	72.	1366	25	72.00
33.	1267	32	90.60	73.	1367	28	39.30
34.	1270	33	66.70	74.	1369	34	79.40
35.	1272	34	88.20	75.	1370	35	97.10
36.	1274	33	97.00	76.	1377	39	46.10
37.	1277	28	64.30	77.	1379	34	94.10
38.	1279	32	65.60	78.	1380	31	74.20
39.	1280	32	87.50	79.	1381	23	87.00
40.	1281	25	84.00	80.	1384	32	53.10

Contd.

1	2	3	4	1	2	3	4
81	1387	27	88.90	126.	1540	24	91.70
82.	1391	33	42.40	127.	1541	33	100.00
83.	1395	34	91.20	128.	1542	28	92.90
84.	1398	38	84.20	129.	1544	38	97.40
85.	1399	28	89.30	130.	1547	27	96.30
86.	1405	34	85.30	131.	1548	30	90.00
87.	1406	32	68.70	132.	1550	27	100.00
88.	1407	38	73.70	133.	1555	36	63.90
89.	1409	20	95.00	134.	1556	28	85.70
90.	1413	37	73.00	135.	1557	27	96.30
91.	1415	27	96.30	136.	1560	36	94.50
92.	1417	39	94.90	137.	1561	38	92.10
93.	1421	32	78.10	138.	1563	31	90.30
94.	1425	17	29.40	139.	1564	36	94.50
95.	1431	30	80.00	140.	1568	29	100.00
96.	1433	29	75.90	141.	1569	32	87.50
97.	1437	37	97.30	142.	1571	33	90.90
98.	1438	19	94.70	143.	1575	33	100.00
99.	1441	33	93.90	144.	1576	26	96.10
100.	1444	21	100.00	145.	1577	39	97.40
101.	1448	33	90.90	146.	1578	34	100.00
102.	1452	28	78.60	147.	1579	39	94.90
103.	1456	35	100.00	148.	1580	33	97.00
104.	1458	16	87.50	149.	1581	38	52.60
105.	1462	29	86.20	150.	1583	38	89.50
106.	1468	39	100.00	151.	1586	25	4.00
107	1473	30	96.70	152.	1589	32	84.40
108	1474	30	80.00	153.	1590	32	21.90
109.	1476	34	23.50	154.	1593	25	100.00
110.	1482	38	92.10	155.	1596	28	100.00
111	1483	34	70.60	156.	1597	22	100.00
112.	1486	29	89.60	157.	1601	37	100.00
113.	1490	31	90.32	158.	1602	20	60.00
114.	1491	36	91.70	159.	1604	40	45.00
115.	1492	33	93.90	160.	1611	31	96.80
116.	1497	36	88.90	161.	1613	33	93.90
117.	1500	31	77.40	162.	1615	32	93 80
118.	1504	31	71.00	163.	1621	35	97.10
119.	1505	25	96.00	164.	1625	28	100.00
120.	1512	34	94.10	165.	1628	34	97.10
121	1513	35	88.60	166.	1629	33	87.90
122	1523	30	60.00	167.	1630	36	100 00
123.	1527	30	93.30	168.	1632	32	96.90
124.	1534	22	95.50	169.	1641	37	70.30
125.	1537	29	93.10	170.	1644	40	92.50

Contd

1	2	3	4	1	2	3	4
171.	1648	34	70.60	216.	1756	31	67.70
172.	1650	35	100.00	217.	1757	35	97.10
173.	1654	26	84.60	218.	1758	39	97.40
174.	1655	36	41.70	219.	1761	42	100.00
175.	1658	38	97.40	220.	1762	29	72.40
176.	1661	33	87.90	221.	1763	35	68.60
177.	1663	35	74.30	222.	1764	40	65.00
178.	1664	38	81.60	223.	1769	38	86.80
179.	1666	37	75.70	224.	1770	30	80.00
180.	1669	36	88.90	225.	1771	32	75.00
181.	1670	28	82.10	226.	1777	39	100.00
182.	1671	40	87.50	227.	1779	44	88.60
183.	1672	33	60.60	228.	1781	35	100.00
184.	1675	32	59.40	229.	1782	39	100.00
185.	1676	37	18.92	230.	1784	45	93.30
186.	1680	29	93.10	231.	1785	33	97.00
187.	1682	33	84.90	232.	1786	31	96.80
188.	1683	26	80.80	233.	1787	29	89.60
189.	1684	31	93.60	234.	1788	27	3.70
190.	1688	35	94.30	235.	1790	24	100.00
191.	1691	40	82.50	236.	1792	43	100.00
192.	1693	31	87.10	237.	1793	28	85.70
193.	1697	30	87.10	238.	1794	33	100.00
194.	1699	33	87.90	239.	1795	37	91.90
195.	1704	34	94.10	240.	1796	34	88.20
196.	1711	38	76.32	241.	1800	42	100.00
197.	1712	36	83.30	242.	1802	40	100.00
198.	1718	31	87.10	243.	1803	32	100.00
199.	1720	25	88.00	244.	1804	39	100.00
200.	1724	37	86.50	245.	1805	39	100.00
201.	1725	35	88.60	246.	1806	32	78.10
202.	1726	36	88.90	247.	1807	28	53.50
203.	1727	29	62.10	248.	1809	35	88.60
204.	1728	35	80.00	249.	1811	32	90.60
205.	1730	20	85.00	250.	1814	24	87.50
206.	1732	40	80.00	251.	1815	37	100.00
207.	1733	20	95.00	252.	1817	32	100.00
208.	1735	38	71.00	253.	1818	37	86.50
209.	1737	39	64.10	254.	1820	33	57.60
210.	1739	30	73.30	255.	1822	36	100.00
211.	1742	25	84.00	256.	1823	32	96.90
212.	1747	34	94.12	257.	1829	41	97.60
213.	1751	30	76.70	258.	1830	36	100.00
214.	1752	34	64.70	259.	1833	38	79.00
215.	1754	40	97.50	260.	1835	35	80.00

Contd.

1	2	3	4
261.	1836	34	79.40
262.	1837	28	92.90
263.	1838	34	100.00
264.	1842	34	100.00
265.	1843	40	90.00
266.	1845	39	100.00
267.	1846	31	93.60
268.	1852	31	100.00
269.	1853	39	92.30
270.	1854	34	70.60
271.	1855	62	91.50
272.	1857	48	95.80
273.	1860	61	91.80
274.	1862	44	95.50
275.	1863	38	100.00
276.	1864	60	98.30
277.	1865	55	100.00
278.	1866	34	100.00
279.	1869	43	100.00
280.	1871	54	94.40
281.	1875	47	97.90
282.	1877	52	94.20
283.	1882	49	100.00
284.	1889	35	100.00
285.	1893	41	100.00
286.	1896	50	98.00
287	1897	53	100.00
288.	1898	50	100.00
289.	1900	51	90.20
290	1901	32	100.00
291.	1903	58	100.00
292	1908	43	97.70
293.	1910	43	93.00
294.	1912	35	100.00
295	1915	46	100.00
296.	1920	53	100.00
297.	1921	28	89.30
298.	1923	50	98.00
299	1925	46	100.00
300	1926	33	81.80
301	1927	47	100.00
302	1929	27	100.00
303.	1931	33	100.00
304.	1933	43	95.40
305.	1935	45	97.80
306.	1938	41	100.00
307.	1940	48	81.20
308.	1941	40	100.00
309.	1943	45	100.00
310.	1944	41	100.00
311.	1946	42	76.20
312.	1947	45	97.80
313.	1950	60	5.00*
314.	1951	41	100.00
315.	1952	49	100.00
316.	1956	34	88.20
317.	1958	37	89.20
318.	1959	51	80.40
319.	1962	42	76.20
320.	1963	49	81.60
321.	1964	41	100.00
322.	1966	45	100.00
323.	1967	35	100.00
324.	1968	46	100.00
325.	1970	37	100.00
326.	1972	29	100.00
327.	1974	40	90.00
328.	1975	50	88.00
329.	1979	42	92.90
330.	1983	19	100.00
331.	1987	21	95.20
332.	1992	28	92.90
333.	1994	22	95.50
334.	1995	25	88.00
335.	1997	24	29.20
336.	1998	18	94.40
337.	2003	28	60.70
338.	2009	29	65.50
339.	2010	24	58.30
340.	2011	23	82.60
341.	2013	21	90.50
342.	2016	13	100.00
343.	2017	15	100.00
344.	2019	12	100.00
345.	2020	13	100.00
346.	2022	29	82.80
347.	2023	28	100.00
348.	2024	26	76.90
349.	2028	13	92.30
350.	2032	20	90.00

Contd.

1	2	3	4	1	2	3	4
351.	2035	29	79.30	396.	2150	36	86.10
352.	2039	23	87.00	397.	2153	44	9.1*
353.	2044	28	93.00	398.	2154	29	72.40
354.	2045	29	96.60	399.	2155	27	81.50
355.	2049	25	100.00	400.	2158	29	89.70
356.	2050	27	88.90	401.	2164	30	93.30
357.	2051	21	100.00	402.	2169	33	90.90
358.	2053	22	100.00	403.	2170	37	81.10
359.	2054	21	95.20	404.	2173	46	65.20
360.	2057	15	46.70	405.	2174	43	88.40
361.	2059	26	84.60	406.	2178	13	76.90
362.	2060	16	100.00	407.	2184	45	48.90
363.	2063	16	100.00	408.	2187	43	69.80
364.	2064	19	68.40	409.	2192	56	94.60
365.	2067	18	77.80	410.	2196	37	81.10
366.	2068	19	89.50	411.	2203	46	80.40
367.	2070	22	77.30	412.	2205	38	76.30
368.	2073	24	100.00	413.	2208	48	64.60
369.	2076	27	100.00	414.	2209	43	76.70
370.	2077	13	84.60	415.	2210	41	61.00
371.	2083	18	100.00	416.	2211	45	82.20
372.	2084	28	96.40	417.	2213	30	93.30
373.	2085	29	82.80	418.	2216	36	75.00
374.	2086	33	84.90	419.	2218	39	33.30
375.	2088	29	100.00	420.	2223	40	55.00
376.	2092	29	55.20	421.	2224	40	90.00
377.	2096	26	100.00	422.	2226	44	93.20
378.	2097	28	100.00	423.	2230	40	20.00
379.	2098	28	78.60	424.	2231	41	14.60
380.	2101	27	100.00	425.	2233	48	12.50
381.	2103	28	60.70	426.	2235	47	78.70
382.	2106	26	84.60	427.	2236	46	84.80
383.	2110	27	92.60	428.	2238	37	86.50
384.	2112	11	45.50	429.	2239	44	93.20
385.	2114	30	100.00	430.	2241	31	96.78
386.	2118	38	100.00	431.	2246	39	76.90
387.	2121	11	100.00	432.	2247	36	91.70
388.	2122	23	78.30	433.	2248	42	92.90
389.	2124	16	87.50	434.	2250	38	92.10
390.	2126	40	90.00	435.	2252	35	65.70
391.	2130	39	74.40	436.	2253	35	100.00
392.	2133	44	70.50	437.	2255	41	90.20
393.	2136	40	47.50	438.	2257	35	94.30
394.	2137	28	67.90	439.	2260	39	89.70
395.	2142	42	90.50	440.	2262	37	100.00

Contd.

1	2	3	4
441.	2265	43	90.70
442.	2269	39	100.00
443.	2273	36	88.90
444.	2277	31	100.00
445.	2281	44	100.00
446.	2282	35	94.30
447.	2286	49	95.90
448	2288	30	100.00
449.	2290	31	100.00
450.	2294	30	80.00
451.	2299	33	84.90
452.	2300	28	71.40
453.	2302	27	70.40
454.	2305	34	79.40
455.	2307	27	100.00
456.	2309	30	96.70
457.	2313	29	62.10
458.	2315	33	45.50
459.	2316	19	84.20
460.	2317	26	96.10
461.	2319	27	96.30
462.	2321	28	78.60
463.	2324	23	100.00
464.	2325	30	93.30
465	2326	30	100.00
466.	2328	29	100.00
467	2335	29	100 00
468.	2338	29	89.70
469.	2341	35	94 30
470	2344	31	54.80
471	2345	30	80.00
472.	2350	31	90.30
473.	2351	23	95.70
474.	2352	27	88.90
475.	2355	34	100.00
476.	2360	26	100.00
477.	2361	34	97.10
478.	2362	31	80 60
479.	2363	27	92.60
480.	2364	28	53.60
481.	2365	26	65.40
482	2366	32	100.00
483.	2369	37	94.60
484	2372	32	100.00
485.	2376	50	2.0*
486.	2377	30	56 70
487.	2379	28	96 40
488.	2380	28	100 00
489.	2381	24	100 00
490.	2382	22	100 00
491.	2384	28	78.60
492.	2385	32	100.00
493.	2386	33	90 90
494	2387	30	100 00
495.	2389	34	97.10
496.	2390	26	96.10
497.	2391	31	100.00
498.	2396	30	100.00
499.	2399	29	100 00
500.	2400	29	96.60
501.	2402	29	89 70
502.	2404	32	96.90
503.	2405	28	100.00
504.	2407	32	90.60
505.	2409	35	74.30
506.	2412	33	97.00
507.	2413	31	100.00
508.	2415	37	94.60
509.	2419	36	83 30
510.	2420	22	100 00
511.	2421	38	97 40
512.	2422	39	100 00
513.	2423	39	92.30
514.	2424	35	100 00
515.	2425	33	100 00
516.	2426	38	94 70
517.	2429	33	97 00
518.	2430	41	95 10
519.	2431	44	100 00
520	2435	27	66 70
521.	2437	32	93 80
522.	2439	44	95 40
523.	2440	50	94.00
524.	2441	45	95.60
525.	2442	42	85.70
526.	2444	49	95.90
527	2445	41	92 70
528.	2447	37	94 60
529.	2448	36	86 10
530.	2449	35	100.00

Contd

1	2	3	4	1	2	3	4
531.	2451	44	100.00	576.	2552	30	83.30
532.	2454	41	100.00	577.	2554	31	80.70
533.	2457	34	100.00	578.	2557	27	88.90
534.	2459	37	91.90	579.	2560	30	93.30
535.	2460	31	100.00	580.	2562	29	82.80
536.	2461	33	100.00	581.	2564	28	46.40
537.	2463	35	97.10	582.	2569	28	28.60
538.	2464	37	100.00	583.	2571	24	95.80
539.	2467	34	100.00	584.	2573	24	33.30
540.	2469	33	84.90	585.	2577	27	100.00
541.	2471	28	100.00	586.	2579	32	56.20
542.	2472	30	100.00	587.	2581	31	74.20
543.	2479	37	75.70	588.	2586	30	90.00
544.	2481	41	92.70	589.	2587	35	88.60
545.	2482	40	100.00	590.	2588	33	42.40
546.	2484	39	100.00	591.	2589	30	66.70
547.	2485	40	100.00	592.	2591	30	73.30
548.	2489	35	100.00	593.	2594	27	70.40
549.	2493	23	100.00	594.	2595	27	44.40
550.	2494	20	100.00	595.	2599	25	84.00
551.	2496	27	100.00	596.	2602	32	93.80
552.	2499	25	100.00	597.	2603	45	15.60
553.	2500	26	100.00	598.	2605	36	63.90
554.	2502	25	100.00	599.	2608	32	18.80
555.	2503	25	60.00	600.	2612	52	76.90
556.	2505	48	0.00*	601.	2613	29	79.30
557.	2506	23	78.30	602.	2617	31	90.30
558.	2508	30	100.00	603.	2619	26	96.10
559.	2514	43	100.00	604.	2621	32	84.40
560.	2515	39	100.00	605.	2622	32	87.50
561.	2518	23	78.30	606.	2624	33	88.80
562.	2522	35	100.00	607.	2625	26	38.50
563.	2526	26	34.60	608.	2626	32	28.10
564.	2529	30	73.30	609.	2627	27	55.60
565.	2530	22	100.00	610.	2628	28	50.00
566.	2536	26	100.00	611.	2629	28	82.10
567.	2537	27	100.00	612.	2630	27	100.00
568.	2538	29	38.00	613.	2631	27	100.00
569.	2539	30	36.70	614.	2634	34	94.10
570.	2540	28	42.90	615.	2635	31	93.60
571.	2542	30	36.70	616.	2638	26	76.90
572.	2543	29	86.20	617.	2639	27	81.50
573.	2546	25	88.00	618.	2641	31	90.30
574.	2549	31	38.70	619.	2642	30	70.00
575.	2550	29	48.30	620.	2645	31	74.20

Contd.

	2	3	4	1	2	3	4
621	2648	29	37.90	666.	2724	35	74 30
622	2651	35	77.10	667.	2725	36	94.40
623	2652	34	55.80	668.	2726	38	73.70
624	2654	38	39.50	669.	2727	30	86 70
625	2656	33	84.80	670	2730	34	79 40
626	2660	27	92.60	671.	2732	26	84.60
627	2661	32	37.50	672.	2733	34	82.30
628	2662	40	52.50	673.	2734	35	82 90
629	2664	36	63.90	674.	2735	31	67.70
630	2666	30	73.30	675	2736	48	4 2*
631	2667	35	77.10	676.	2738	29	79 30
632	2668	33	75.80	677.	2739	35	88 60
633	2670	27	66.70	678.	2740	40	70 00
634	2671	29	41.40	679.	2745	32	75.00
635	2673	51	2.0*	680	2746	41	90 20
636	2676	37	94.60	681.	2748	36	47.20
637	2677	37	32.40	682.	2749	34	76 50
638	2679	27	70 40	683.	2753	33	97 00
639	2680	30	90.00	684.	2755	32	93 80
640.	2681	35	71.40	685.	2756	41	19.50
641	2682	66	9.10*	686	2757	38	84 20
642.	2685	31	41.90	687.	2758	38	86.80
643.	2686	28	82.10	688.	2761	31	74 20
644.	2688	31	48.40	689.	2763	67	13 4*
645.	2689	29	51.70	690.	2764	35	97 10
646	2690	26	84.60	691	2767	33	45 40
647	2691	33	36.40	692	2772	32	90 60
648	2692	23	73.90	693	2775	38	65 80
649	2693	32	56.20	694	2776	31	16 10
650	2694	30	86.70	695	2777	25	28 00
651	2698	40	90.00	696.	2780	29	79 30
652	2699	40	80.00	697.	2783	38	76 30
653	2701	31	67.70	698.	2785	32	68 70
654	2703	28	78.60	699.	2786	26	92 30
655	2705	29	65.50	700	2787	30	26 70
656	2707	25	88.00	701	2789	40	80 00
657	2709	26	80.80	702	2790	35	51 40
658	2711	36	100.00	703.	2792	33	48 50
659	2714	30	83.30	704.	2793	28	71 40
660	2716	36	72 20	705	2795	40	40 00
66'	2717	26	69 20	706.	2797	40	55 00
662	2718	39	64.10	707	2799	32	65 60
663	2719	69	1 4*	708.	2801	31	77 40
664	2721	36	75.00	709.	2803	33	81 80
665	2722	35	94.30	710.	2804	27	44 40

Contd

1	2	3	4
711.	2805	36	88.90
712.	2808	40	67.50
713.	2809	28	50.00
714.	2811	36	86.11
715.	2812	22	45.40
716.	2815	31	74.20
717.	2816	32	87.50
718.	2819	27	92.60
719.	2820	43	81.40
720.	2821	24	95.80
721.	2823	34	94.10
722.	2824	34	67.60
723.	2827	35	74.30
724.	2828	36	77.80
725.	2829	30	70.00
726.	2831	21	85.70
727.	2832	28	82.10
728.	2833	36	77.80
729.	2834	33	48.50
730.	2836	35	94.30
731.	2839	30	66.70
732.	2840	43	86.00
733.	2841	36	72.20
734.	2844	35	85.70
735.	2846	20	85.00
736.	2848	23	95.60
737.	2849	26	96.10
738.	2851	34	88.20
739.	2852	32	56.20
740.	2858	35	80.00
741.	2860	38	65.80
742.	2862	36	83.30
743.	2863	34	67.60
744.	2865	29	58.60
745.	2868	37	83.80
746.	2873	25	96.00
747.	2875	25	68.00
748.	2876	35	94.30
749.	2877	30	73.30
750.	2880	35	94.30
751.	2881	36	50.00
752.	2883	34	70.60
753.	2884	34	85.30
754.	2886	38	31.60
755.	2888	28	100.00
756.	2889	38	92.10
757.	2890	26	80.80
758.	2894	36	75.00
759.	2895	27	74.10
760.	2898	34	64.70
761.	2900	27	63.00
762.	2901	23	73.90
763.	2902	31	96.80
764.	2905	36	94.40
765.	2907	25	80.00
766.	2909	30	43.30
767.	2912	34	44.10
768.	2913	44	54.50
769.	2930	28	100.00
770.	2931	30	93.30
771.	2941	29	86.20
772.	2949	28	89.30
773.	2964	34	97.10
774.	2969	26	100.00
775.	2970	24	87.50
776.	2974	66	1.5*
777.	2978	28	100.00
778.	2985	33	97.00
779.	2993	31	54.80
780.	2998	27	88.90
781.	2999	29	75.90
782.	3008	56	3.6*
783.	3012	37	94.60
784.	3023	36	91.70
785.	3027	30	63.30
786.	3032	34	94.10
787.	3041	25	92.00
788.	3053	38	71.00
789.	3062	34	91.20
790.	3082	35	85.70
791.	3092	42	45.20
792.	3130	31	54.80
793.	3133	36	69.40
794.	3138	32	28.10
795.	3145	33	81.80
796.	3146	38	81.60
797.	3181	31	16.10
798.	3183	33	84.80
799.	3185	38	57.90
800.	3187	31	12.90

Contd

1	2	3	4
801	3197	31	29.00
802.	3208	29	93.10
803.	3259	80	3.7*
804	3268	29	89.60
805.	3273	35	40.00
806.	3278	34	94.10
807.	3284	35	94.30
808.	3286	35	91.40
809.	3298	41	95.10
810.	3317	38	73.70
811	3318	34	97.10
812.	3323	38	36.80
813.	3327	20	30.00
814.	3329	36	91.70
815.	3341	25	76.00
816	3352	24	91.70
817.	3359	34	94.10
818.	3365	24	83.30
819.	3367	57	7.0*
820.	3370	30	80.00
821.	3386	36	69.40
822.	3394	40	100.00
823	3418	35	97.10
824	3424	29	31.00
825.	3430	25	60.00
826.	3431	22	95.40
827.	3435	41	29.30
828	3462	35	25.70
829.	3486	34	88.20
830	3487	32	93.70
831	3498	28	57.10
832.	3500	30	93.30
833.	3509	35	77.10
834	3513	20	95.00
835.	3537	26	19.20
836	3539	36	11.10
837.	3545	30	83.30
838.	3551	27	96.30
839.	3552	22	86.40
840.	3553	35	91.40
841	3556	33	72.70
842	3561	36	72.20
843.	3566	29	96.50
844	3568	30	73.30
845.	3581	30	20.00
846.	3597	28	17.90
847.	3600	35	94.30
848.	3643	25	76.00
849.	3651	29	79.30
850.	3652	33	93.90
851.	3699	29	17.24
852.	3704	31	93.50
853.	3708	25	88.00
854.	3719	33	78.80
855.	3720	34	88.20
856.	3725	37	86.50
857.	3730	26	34.60
858.	3735	22	77.30
859.	3737	30	23.30
860.	3739	31	100.00
861.	3741	64	0.00*
862.	3747	34	94.10
863.	3748	30	70.00
864.	3749	34	70.60
865.	3751	36	100.00
866.	3753	62	1.6*
867.	3755	27	88.90
868.	3757	31	87.10
869.	3758	31	87.10
870.	3769	34	14.70
871.	3773	37	97.30
872.	3776	31	87.10
873.	3781	25	72.00
874.	3785	30	96.70
875.	3792	28	100.00
876.	3793	26	34.60
877.	3798	22	86.40
878.	3799	36	66.70
879.	3801	37	62.20
880.	3806	34	85.30
881	3816	33	48.50
882.	3817	33	97.00
883.	3819	29	100.00
884.	3821	33	90.90
885.	3840	65	10.8*
886.	3846	28	100.00
887.	3855	30	23.30
888	3858	28	92.90
889.	3861	71	11.3*
890.	3863	23	73.90

Contd

1	2	3	4
891.	3867	59	23.70*
892.	3868	69	0.00*
893.	3869	28	35.70
894.	3891	67	3.00*
895.	3899	37	2.70*
896.	3904	27	25.90
897.	3906	32	50.00
898.	3912	34	23.50
899.	3914	33	42.40
900.	3920	31	64.50
901.	3923	31	61.30
902.	3927	31	35.50
903.	3937	64	0.00*
904.	3945	60	11.70
905.	3951	26	84.60
906.	3953	34	88.20
907.	3964	26	15.40
908.	3971	23	43.50
909.	3979	29	79.30
910.	3982	28	89.30
911.	3990	44	97.70
912.	3997	29	96.60
913.	4008	28	64.30
914.	4017	12	41.70
915.	4023	23	78.30
916.	4024	31	38.70
917.	4043	29	62.10
918.	4057	25	60.00
919.	4063	33	75.70
920.	4074	23	87.00
921.	4076	42	83.30
922.	4094	33	93.90
923.	4097	28	60.70
924.	4101	38	39.50
925.	4104	38	89.50
926.	4113	34	47.10
927.	4125	28	78.60
928.	4126	32	90.60
929.	4127	36	83.30
930.	4129	34	79.40
931.	4132	29	13.80
932.	4135	71	1.40*
933.	4138	32	28.10
934.	4141	67	1.50*
935.	4142	38	50.00
936.	4165	49	16.30
937	4168	86	2.30
938.	4174	43	95.30
939.	4176	29	86.20
940.	4180	36	58.30
941.	4182	26	84.60
942.	4186	40	60.00
943.	4193	33	69.70
944.	4196	43	81.40
945.	4199	31	74.20
946.	4213	36	61.10
947.	4220	30	100.00
948.	4221	35	65.70
949.	4224	34	82.30
950.	4229	21	95.20
951.	4231	11	36.40
952.	4234	33	60.60
953.	4236	33	90.90
954.	4240	31	100.00
955.	4245	28	71.40
956.	4255	26	84.60
957.	4260	30	90.00
958.	4266	32	90.60
959.	4286	28	78.60
960	4290	31	80.60
961.	4292	33	81.00
962.	4295	31	83.90
963.	4314	29	72.40
964.	4317	35	71.40
965.	4326	29	86.20
966.	4328	26	84.60
967.	4333	36	69.40
968.	4340	26	96.10
969.	4344	23	100.00
970.	4360	26	100.00
971.	4367	27	96.30
972.	4368	31	100.00
973.	4379	29	65.50
974.	4380	31	100.00
975.	9382	20	95.00
976.	4396	26	69.20
977.	4404	55	41.80*
978.	4412	29	100.00
979.	4414	28	100.00
980.	4423	26	100.00

Contd.

1	2	3	4	1	2	3	4
981	4509	30	90.00	1026.	4851	30	93.30
982.	4523	18	83.30	1027.	4852	32	90.60
983.	4526	30	100.00	1028.	4856	33	100.00
984.	4533	27	37.00	1029.	4865	19	94.70
985	4536	22	72.70	1030.	4882	56	0.00*
986.	4567	10	100.00	1031.	4885	33	75.80
987.	4595	22	59.10	1032.	4886	32	56.20
988.	4619	23	95.60	1033.	4890	39	87.20
989.	4638	26	80.80	1034.	4896	36	69.40
990	4640	30	86.70	1035.	4899	34	82.30
991.	4653	30	86.70	1036.	4905	30	70.00
992.	4665	31	87.10	1037.	4919	24	58.30
993.	4673	33	100.00	1038.	4928	19	100.00
994	4674	29	100.00	1039.	4955	27	11.10
995.	4691	28	100.00	1040.	4961	25	52.00
996	4692	26	96.10	1041.	4969	33	63.60
997	4697	33	27.30	1042.	4975	33	18.20
998	4698	28	42.90	1043.	4999	25	72.00
999.	4699	61	0.00*	1044.	5006	22	81.80
1000	4711	26	96.10	1045.	5010	10	50.00
1001	4721	33	100.00	1046.	5011	10	100.00
1002	4741	29	100.00	1047.	5020	11	90.90
1003	4744	16	93.70	1048.	5044	41	21.9*
1004	4746	31	71.00	1049.	5099	30	63.30
1005	4752	50	4.0*	1050.	5101	24	37.50
1006	4756	35	100.00	1051.	5107	27	63.00
1007	4762	30	83.30	1052.	5130	32	25.00
1008	4765	31	54.80	1053.	5142	28	96.40
1009	4768	28	89.30	1054.	5444	35	62.90
1010	4769	30	100.00	1055.	5450	60	3.3*
1011	4779	25	100.00	1056.	5452	33	24.20
1012	4780	32	93.70	1057.	5454	25	76.00
1013	4782	30	100.00	1058.	5455	25	92.00
1014	4783	32	100.00	1059.	5456	34	64.70
1015	4784	29	82.80	1060.	5457	33	87.90
1016	4785	35	94.30	1061.	5462	19	31.60
1017	4788	32	96.90	1062.	5463	25	72.00
1018	4796	30	96.70	1063.	5464	24	58.30
1019	4801	31	96.80	1064.	5468	32	78.10
1020	4804	27	59.30	1065.	5470	30	80.00
1021	4809	25	92.00	1066.	5486	30	90.00
1022	4814	28	67.90	1067.	5487	38	73.70
1023	4818	29	93.10	1068.	5489	30	96.70
1024	4832	25	92.00	1069.	5499	35	42.90
1025	4839	31	96.80	1070.	5506	29	44.80

Contd.

1	2	3	4
1071.	5511	29	69.00
1072.	5516	27	96.30
1073.	5528	32	87.50
1074.	5541	21	42.90
1075.	5542	21	66.70
1076.	5543	19	36.80
1077.	5544	24	66.70
1078.	5545	17	52.90
1079.	5547	26	76.90
1080.	5549	24	95.80
1081.	5551	25	84.00
1082.	5558	26	100.00
1083.	5560	34	79.40
1084.	5575	30	76.70
1085.	5579	26	53.80
1086.	5584	32	65.60
1087.	5591	28	57.10
1088.	5601	35	68.60
1089.	5612	25	92.00
1090.	5616	23	91.30
1091.	5618	28	85.70
1092.	5639	35	71.40
1093.	5642	31	54.80
1094.	5675	35	37.10
1095.	5723	38	23.70
1096.	5762	38	28.90
1097.	5774	38	18.40
1098.	5800	31	100.00
1099.	5802	24	25.00
1100.	5804	44	97.70
1101.	5823	31	100.00
1102.	5838	28	100.00
1103.	5860	65	4.6*
1104	5886	38	81.60
1105	5893	29	55.20
1106.	5904	24	20.80
1107.	5906	37	100.00
1108.	5909	29	69.00
1109.	5919	30	50.00
1110.	5925	38	94.70
1111.	5939	24	54.20
1112	5950	28	78.60
1113.	5964	26	80.80
1114.	6770	34	29.40
1115.	6773	27	40.70
1116.	6798	28	96.40
1117.	6799	29	100.00
1118.	6805	28	100.00
1119	6808	68	51.5*
1120.	6815	31	100.00
1121.	6861	35	17.10
1122.	6865	55	3.6
1123.	6867	36	100.00
1124.	6868	30	90.00
1125.	6871	33	90.90
1126.	6876	34	91.20
1127.	6878	33	48.50
1128.	6884	23	26.10
1129.	6885	24	91.70
1130.	6891	33	97.00
1131.	6896	33	30.30
1132.	6902	34	100.00
1133.	6914	30	86.70
1134.	6917	26	80.80
1135.	6919	26	73.10
1136.	6924	27	96.30
1137.	6930	29	93.10
1138.	6932	31	93.50
1139.	6936	27	92.60
1140.	6944	30	43.30
1141.	6946	32	65.60
1142.	6951	31	12.90
1143.	6952	30	6.70
1144.	6953	58	8.6*
1145.	6954	28	89.30
1146.	6955	26	100.00
1147.	6956	53	5.7*
1148.	6958	29	96.50
1149.	6959	30	66.70
1150.	6961	32	59.40
1151.	6962	16	75.00
1152.	6963	37	54.00
1153.	6970	27	70.40
1154.	6973	29	65.50
1155.	6974	59	0.00*
1156.	6975	22	81.80
1157.	6979	13	61.30
1158.	6982	27	77.80
1159.	6984	27	59.30
1160.	6985	13	92.30

Contd

1	2	3	4
1161.	6991	24	95.80
1162.	6992	28	100.00
1163.	6994	33	66.70
1164.	6996	16	100.00
1165.	6997	30	83.30
1166.	6999	37	94.60
1167.	7000	35	88.60
1168.	7001	21	47.60
1169.	7002	37	48.60
1170.	7003	35	68.60
1171.	7004	33	97.00
1172	7005	44	86.40
1173	7008	29	13.80
1174.	7010	37	16.20
1175.	7011	31	58.10
1176.	7012	36	36.10
1177.	7013	39	20.50
1178.	7014	38	57.90
1179.	7016	37	73.00
1180.	7017	30	93.30
1181.	7021	27	100.00
1182.	7025	24	95.80
1183.	7028	16	81.20
1184.	7038	25	88.00
1185.	7044	21	95.20
1186.	7052	19	31.60
1187.	7054	31	38.70
1188	7055	37	27.00
1189.	7057	42	0.00*
1190	7059	32	46.90
1191.	7065	27	3.70
1192	7067	32	100.00
1193.	7073	40	47.50
1194.	7079	16	100.00
1195.	7094	31	48.40
1196	7099	29	17.20
1197	7100	29	72.40
1198	7102	32	31.20
1199	7104	26	61.50
1200.	7107	27	74.10
1201	7108	27	59.30
1202	7110	28	71.40
1203	7112	30	93.30
1204	7114	27	96.30
1205.	7115	30	66.70
1206.	7117	21	76.20
1207.	7120	20	60.00
1208.	7122	32	100.00
1209.	7123	25	100.00
1210.	7124	25	48.00
1211.	7125	23	78.30
1212.	7128	19	78.90
1213.	7129	25	92.00
1214.	7130	24	83.30
1215.	7131	20	75.00
1216.	7134	19	100.00
1217.	7135	28	96.40
1218.	7136	31	100.00
1219.	7138	41	85.40
1220.	7139	33	93.90
1221.	7140	25	100.00
1222.	7141	40	17.50
1223.	7142	28	82.10
1224.	7143	16	93.70
1225.	7144	19	89.50
1226.	7145	30	76.70
1227.	7146	40	82.50
1228.	7147	36	88.90
1229.	7148	36	97.22
1230.	7149	39	82.00
1231.	7150	35	100.00
1232.	7151	34	5.90
1233.	7152	24	100.00
1234.	7154	22	95.40
1235.	7155	30	90.00
1236.	7156	30	83.30
1237.	7158	29	85.20
1238.	7159	29	82.80
1239.	7160	24	83.30
1240.	7182	24	0.00
1241.	7185	18	0.00
1242	7186	27	74.10
1243.	7187	24	83.30
1244.	7189	29	96.50
1245.	7191	20	85.00
1246.	7192	25	88.00
1247.	7195	30	46.70
1248.	7196	19	0.00
1249.	7197	37	34.80*
1250.	7198	53	57.50*

Contd

1	2	3	4
1251.	7199	44	34.10
1252.	7200	51	1.80*
1253	7201	18	72.20
1254.	7205	36	75.00
1255.	7206	20	45.00
1256	7208	32	21.90
1257.	7209	37	78.40
1258.	7211	31	71.00
1259.	7212	26	88.50
1260.	7214	24	83.30
1261.	7215	42	92.90
1262.	7219	47	61.70
1263	7220	17	76.50
1264.	7221	50	54.00
1265.	7222	32	75.00
1266.	7223	30	33.30
1267.	7228	31	54.80
1268.	7231	27	74.10
1269.	7232	41	0.00
1270.	7233	21	57.10
1271.	7234	40	95.00
1272.	7235	35	85.70
1273.	7236	35	60.00
1274.	7237	39	25.60
1275.	7238	30	56.70
1276.	7245	36	58.30
1277.	7246	25	32.00
1278.	7247	35	28.60
1279.	7250	32	40.60
1280.	7254	27	25.90
1281.	7257	13	46.10
1282.	7259	23	34.80
1283.	7261	19	68.40
1284	7263	24	62.50
1285.	7269	45	4.40
1286.	7270	25	48.00
1287	7273	23	4.30
1288.	7276	26	42.30
1289.	7283	26	30.80
1290.	7286	28	96.40
1291.	7289	28	92.80
1292	7290	27	55.50
1293.	7291	20	35.00
1294.	7293	30	90.00
1295	7295	24	41.70
1296.	7296	25	48.00
1297.	7297	29	93.10
1298	7302	28	75.00
1299.	7303	25	56.00
1300.	7306	23	39.10
1301	7310	28	89.30
1302.	7312	16	93.70
1303.	7319	28	71.40
1304.	7320	26	57.70
1305.	7321	24	100.00
1306.	7322	28	50.00
1307.	7323	28	75.00
1308.	7325	22	27.30
1309.	7399	21	19.00
1310.	7475	15	100.00
1311.	7480	23	82.60
1312.	7483	16	0.00
1313.	7488	24	91.70
1314.	7489	22	59.10
1315.	7522	32	46.90
1316.	7523	25	24.00
1317.	7529	27	29.60
1318.	7530	34	50.00
1319.	7532	28	60.70
1320.	7533	23	0.00
1321	7535	22	95.40
1322	7536	30	93.30
1323	7553	28	75.00
1324.	7554	26	50.00
1325	7555	19	73.70
1326.	7556	27	40.70
1327.	7557	27	70.40
1328.	7559	23	95.60
1329.	7560	24	37.50
1330.	7561	23	47.80
1331.	7562	22	40.90
1332.	7565	20	90.00
1333.	7616	24	95.80
1334.	7618	27	96.30
1335.	7619	31	100.00
1336.	7623	25	8.00
1337.	7624	19	0.00
1338.	7625	19	100.00
1339.	7626	25	92.00
1340.	7626	25	92.00

Contd.

1	2	3	4
1341	7643	30	86.70
1342	7645	22	95.40
1343	7646	26	65.40
1344	7657	22	0.00
1345	7658	26	76.90
1346	7659	24	95.80
1347	7660	21	100.00
1348	7661	16	81.20
1349	7662	24	79.20
1350	7663	16	93.70
1351	7665	26	100.00
1352	7666	19	94.70
1353	7667	24	20.80
1354	7668	27	100.00
1355	7669	21	14.30
1356	7671	25	76.00
1357	7672	28	0.00
1358	7673	25	92.00
1359	7674	27	59.20
1360	7675	30	86.70
1361	7676	22	90.90
1362	7677	24	87.50
1363	7678	26	57.70
1364	7680	22	27.30
1365	7681	19	52.60
1366	7682	34	88.20
1367	7683	27	100.00
1368	7684	30	100.00
1369	7685	29	100.00
1370	7686	30	96.70
1371	7687	27	100.00
1372	7688	26	96.10
1373	7689	25	100.00
1374	7691	23	69.60
1375	7692	28	3.60
1376	7693	33	39.40
1377	7694	35	22.80
1378	7695	28	50.00
1379	7696	28	78.60
1380	7697	29	41.40
1381	7698	27	37.00
1382	7699	21	85.70
1383	7700	22	81.80
1384	7701	33	9.10
1385	7702	32	34.40
1386.	7703	33	78.80
1387.	7704	34	85.30
1388.	7705	36	22.20
1389.	7706	34	35.30
1390.	7707	32	50.00
1391.	7708	33	75.70
1392.	7709	41	78.00
1393.	7710	36	69.40
1394.	7711	32	25.00
1395.	7712	17	70.60
1396.	7713	36	55.50
1397.	7715	19	31.60
1398.	7716	30	83.30
1399.	7717	40	70.00
1400.	7718	37	48.60
1401.	7719	35	68.60
1402.	7720	27	63.00
1403.	7721	35	82.80
1404.	7722	35	54.30
1405.	7723	28	71.40
1406.	7724	46	76.10
1407.	7725	47	89.40
1408.	7726	43	88.40
1409.	7727	40	62.50
1410.	7728	35	42.80
1411.	7729	49	20.40
1412.	7730	43	60.50
1413.	7731	37	48.60
1414.	7732	42	83.30
1415.	7733	33	75.70
1416.	7734	27	70.40
1417.	7735	30	50.00
1418.	7736	39	61.50
1419.	7737	34	47.00
1420.	7738	41	78.00
1421.	7739	44	38.60
1422.	7740	32	43.70
1423.	7741	37	35.10
1424	7742	16	31.20
1425.	7743	27	96.30
1426.	7744	19	73.70
1427.	7745	33	54.50
1428.	7746	14	0.00
1429.	7747	23	47.80
1430.	7748	23	95.60

Contd

1	2	3	4	1	2	3	4
1431.	7749	20	0.0	1447.	7765	35	85.7
1432.	7750	16	93.7	1448.	7766	41	87.8
1433.	7751	30	80.0	1449.	7767	33	81.8
1434.	7752	29	75.9	1450.	7768	29	75.9
1435.	7753	36	100.0	1451.	7769	21	95.2
1436.	7754	42	0.0	1452.	7770	22	95.4
1437.	7755	26	96.1	1453.	7771	23	86.9
1438.	7756	39	74.3	1454.	7772	27	37.0
1439.	7757	41	100.0	1455.	7773	28	89.3
1440.	7758	45	100.0	1456.	7774	27	40.7
1441.	7759	47	76.6	1457.	7775	16	62.5
1442.	7760	11	100.0	1458.	7776	19	100.0
1443.	7761	15	66.7	1459.	7777	27	70.4
1444.	7762	42	71.4	1460.	7778	20	100.0
1445.	7763	19	68.4	1461.	7779	27	96.3
1446.	7764	44	31.8				

* Average of two tests.

APPENDIX-XLV

Screening of sterility mosaic resistant (SMR) germplasm selections against Phytophthora blight of pigeonpea (pot culture)

Sl. No.	Pedigree	No. of plants tested	Percent blight
1	2	3	4
1.	ICP-504-1-4-S15⊗	10	100.00
2.	-2828-1-5-S1⊗	10	100.00
3.	-3782-16⊗	10	100.00
4.	-3783-3-21-IS⊗B	10	100.00
5.	-4765-3-5S⊗	15	0.00*
6.	-4769-3-2S⊗	15	80.00
7.	-4866-1-6S⊗	28	0.00*
8.	-5097-1-2S⊗	10	60.00
9.	-5277-1-3S⊗	9	22.20
10.	-5436-3-2S⊗	10	90.00
11.	-5467-1-1S⊗	11	72.70
12.	-5651-1-7S⊗	10	70.00
13.	-5656-1-2S⊗	21	0.00
14.	-5701-1-3S⊗	10	90.00
15.	-5729-1-1S⊗	10	100.00
16.	-5907-1-3S⊗	9	77.80
17.	-6831-1-2S⊗	10	100.00
18.	-6975-1-2S⊗	10	100.00
19.	-6997-139-12-1S⊗B	10	100.00
20.	-7035-34-34-1S⊗B	10	100 00
21.	-7119-2-2-S4⊗	10	100.00
22.	-7185-1-6S⊗	20	30.00*
23.	-7194-2-1S⊗	10	10.00
24.	-7196-3-7S⊗	8	100.00
25.	-7197-3-S1⊗	16	6 20*
26.	-7201-7-4S⊗	10	100.00
27.	-7217-7-2S⊗	10	100.00
28.	-7232-2-4S⊗	10	80.00
29.	-7233-3-2S⊗	13	100.00
30.	-7234-6-4S⊗	10	100.00
31.	-7237-2-1S⊗	8	100.00
32.	-7239-3-1S⊗	10	100.00
33.	-7240-7-1S⊗	10	90.00
34.	-7246-2-8S⊗	13	100.00
35.	-7248-9-4S⊗	10	100 00
36.	-7249-1-4S]⊗	9	100.00
37.	-7250-3-1S⊗	9	100.00

Contd.

1	2	3	4
38.	ICP-7258-1-5S⊗	9	100.00
39.	-7282	11	100.00
40.	-7306-1-3S⊗	10	100.00
41.	-7336-2-8S⊗	10	100.00
42	-7337-3-4S⊗	10	100.00
43.	-7345-9-18⊗	14	100.00
44.	-7346-3-2S⊗	9	100.00
45.	-7349-9-1S⊗	11	100.00
46.	-7353-2-S4⊗	10	100.00
47.	-7372-3-3S⊗	9	100.00
48.	-7378-2-4S⊗	10	100.00
49.	-7387-5-5S⊗	10	100.00
50.	-7403-1-S1⊗	10	100.00
51.	-7411-1-3S⊗	10	100.00
52.	-7414-1-4S⊗	20	0.00*
53.	-7445-5-S2⊗	10	100.00
54.	-7501-2-4S⊗	10	100.00
55.	-7864-1-4S⊗	9	100.00
56.	-7867-1-5S⊗	10	100.00
57.	-7870-1-1S⊗	10	100.00
58.	-7871-1-1S⊗	9	100.00
59.	-7873-8-S1⊗	10	100.00
60.	-7874-6-3S⊗	10	100.00
61.	-7875-1-5S⊗	10	100.00
62.	-7878	10	100.00
63.	-7893-7S⊗	10	100.00
64.	-7898-2-3S⊗	10	100.00
65.	-7904-5-5S⊗	10	100.00
66.	-7906-3-1S⊗	10	100.00
67.	-7942-1-2S⊗	10	100.00
68.	-7983-1-6S⊗	9	100.00
69.	-7997-1-8S⊗	10	100.00
70.	-7998-4-5S⊗	10	100.00
71.	-8014-3-3S⊗	9	100.00
72.	-8021-4-2S⊗	7	100.00
73.	-8029-1-5S⊗	10	100.00
74.	-8032-1-1S⊗	7	100.00
75.	-8033-2-1S⊗	9	100.00
76.	-8035-1-2S⊗	10	90.00
77.	-8036-13-5S⊗	10	100.00
78.	-8038-2-3S⊗	10	100.00
79.	-8042-10-1S⊗	10	100.00
80.	-8051-2-6S⊗	10	100.00
81.	-8057-3-3S⊗	9	88.90

Contd

1	2	3	4
82.	ICP-8058-3-1S⊗	10	100.00
83.	-8061-4-8S⊗	9	100.00
84	-8063-5-3S⊗	10	100.00
85	-8067-1-1-1S⊗	10	100.00
86	-8075-2-3S⊗	9	100.00
87	-8084-7-1S⊗	10	100.00
88	-8093-2-1S⊗	9	88.90
89	-8094-1-1S⊗	10	100.00
90.	-8101-5-1S⊗	24	0.00*
91	-8103-5-5S⊗	10	90.00
92.	-8106-2-5S⊗	20	5.00*
93	-8111-3-3S⊗	8	12.50
94	-8113-1-3S⊗	10	100.00
95.	-8120-1-1S⊗	15	6.70*
96	-8121-1-1S⊗	11	100.00
97	-8123-2-4S⊗	10	100.00
98	-8127-8-1S⊗	27	0.00*
99	-8128-1-4S⊗	10	90.00
100.	-8130-5-3S⊗	10	100.00
101.	-8132-2-3S⊗	22	0.00*
102.	-8133-1-4S⊗	9	100.00
103.	-8134-2-3S⊗	9	88.90
104	-8136-1-4S⊗	8	100.00
105	-8137-3-1S⊗	10	40.00
106.	-8138-3-3S⊗	8	100.00
107	-8139-3-1S⊗	24	0.00*
108	-8140-3-1S⊗	9	33.30
109	-8141-3-3S⊗	9	88.90
110	-8144-3-3S⊗	29	6.90
111	-8146-1-5S⊗	9	100.00
112	-8147-1-2S⊗	21	0.00*
113	-8151-7-3S⊗	28	0.00*
114	-8160-1-5S⊗	9	100.00
115	-8167-1-1S⊗	9	100.00
116	-8501-2-1S⊗	10	100.00
117	Pant-B-76-5-1S⊗	9	88.90
	HY-3C (susceptible check)	27	85.20*

* Average of two test results

APPENDIX-XLVI

Trip report of Dr. J. Kannaiyan

Visit to : Delhi

Dates : September 6 and 9, 1978

Purpose : 1. To study pigeonpea Phytophthora blight situation

2. To obtain *Phytophthora* isolates

Contact : Dr. J.S. Grewal, Sr. Pulse Pathologist, IARI

Other persons met : Dr. V.V. Chenulu, Head, Division of Mycology and Plant Pathology, IARI; Dr. M. Pal and Dr.Kulshresht, Pulse Pathology staff, IARI

Places visited : IARI (Pulse Pathology Lab. and experimental plots)

Notes

1. Moderate incidence of Phytophthora blight was observed at a particular location of the IARI farm. It was in the same location that considerable blight disease was observed last year also.

2. The intensity of Phytophthora blight (as observed in an Agronomy trial) did not seem to differ between sole and mixed crops. However, variation in intensity was observed between different blocks in the same trial.

3. Diseased plant samples were collected and isolations were made at IARI itself.

Visit to : Kanpur

Dates : September 7 and 8, 1978

Purpose : 1. To study the prevalence of pigeonpea Phytophthora blight in and around Kanpur

2. To obtain *Phytophthora* isolates

3. To look at ICRISAT lines being grown in the National Uniform Wilt Trial

Contact : Drs. H.K. Saksena, Head, Department of Plant Pathology, and P. Shukla, Pulse Pathologist

Other persons met : Dr. Laxman Singh, Director, Pulses; Dr. Mathai, Breeder; Mr. A.N. Mishra and Mr. R.R. Singh, Pulse Pathology staff and Mr. R.N. Gupta, Superintendent, Deeg Farm

Places visited : C.S. Azad University of Agriculture and Technology, Kanpur; Directorate of Pulses, Kalyanpur and Deeg Farm

Notes

1. At Kanpur, a visit was made to the wilt sick plot for observing the National Uniform Wilt Trial where ICRISAT lines are also under test. In this plot, natural incidence of Phytophthora blight was about 10 percent. Diseased plant samples were collected and isolations were subsequently made of the pathogen in the laboratory.

2. At Kalyanpur, pigeonpea experimental plots were visited and Phytophthora blight was observed at two locations. The incidence was around 5 percent. A *Phytophthora* isolate was obtained from the diseased samples.

3. At Deeg Farm, the blight incidence was much higher (50 percent) in Cv. T-21. Diseased samples were collected for isolation.

Conclusions : In the places visited, the prevalence of pigeonpea Phytophthora blight could be seen both in sole and mixed crops. Isolates of *Phytophthora* were obtained from Delhi, Kanpur, Kalyanpur and Deeg.

Two possible testing locations for Phytophthora blight were identified; one at IARI, Delhi and the other at Deeg Farm, Kanpur.

APPENDIX - XLVII

Results of screening sterility mosaic resistant progenies (F_3 & F_4) in multiple disease nursery

Sl. No.	Pedigree	No. of plants	Percent blight	Percent SM	No. of plants	Percent wilt
1	2	3	4	5	6	7
1.	ICP-7035-45-27-S2⊗ P1	27	88.9	0.0	3	33.3
2.	C.NO-74360-F4B-S1⊗-VII NDT	31	54.8	0.0	15	80.0
3.	-S2⊗-VIII NDT	24	16.7	0.0	22	27.3
4.	-S3⊗-VIII NDT	29	68.9	0.0	9	11.1
5.	-S4⊗-VIII NDT	53	41.5	6.4	35	40.0
6.	-S5⊗-VIII NDT	22	54.5	0.0	11	18.2
7.	-S6⊗-VIII NDT	27	18.5	0.0	22	22.7
8.	-S7⊗-VIII NDT	50	70.0	0.0	16	25.0
9.	-S8⊗	31	51.6	0.0	18	72.2
10.	-S9⊗-VII NDT	7	71.4	0.0	4	25.0
11.	-S10⊗-VIII NDT	31	32.2	4.8	21	57.1
12.	-S11⊗-VIII NDT	45	24.4	0.0	34	79.4
13.	-S12⊗-VIII NDT	55	14.5	0.0	47	78.7
14.	-S13⊗-VIII NDT	61	32.8	0.0	18	43.9
15.	-S14⊗-VIII NDT	55	45.4	0.0	31	77.4
16.	-S15⊗-VIII NDT	43	30.2	0.0	31	87.1
17.	-S16⊗-VIII NDT	50	36.0	0.0	32	90.6
18.	-S17⊗-VIII NDT	30	60.0	0.0	12	58.3
19.	-S18⊗-VIII NDT	29	51.7	0.0	15	80.0
20.	-S19⊗-VIII NDT	18	38.9	0.0	11	72.7
21.	-S20⊗-VII NDT	38	47.4	0.0	22	13.6
22.	-S21⊗-VII NDT	40	27.5	0.0	30	23.3
23.	-S22⊗-VIII NDT	32	43.7	0.0	18	50.0
24.	-S23⊗-VII NDT	40	47.5	0.0	23	60.9
25.	-S24⊗-VIII NDT	36	50.0	5.5	18	55.5
26.	-S25⊗-VIII NDT	48	33.3	0.0	33	21.2
27.	-S26⊗-VII NDT	38	10.5	0.0	37	27.4
28.	-S27⊗-VIII NDT	31	71.0	0.0	12	16.7
29.	-S28⊗-VII NDT	56	85.7	0.0	8	25.0
30.	-S29⊗-VII NDT	44	25.0	0.0	33	39.4
31.	-S30⊗-VII NDT	40	35.0	0.0	30	23.3
32.	-S31⊗-VII NDT	27	74.1	0.0	8	50.0
33.	-S32⊗-VIII NDT	40	32.5	0.0	28	42.8
34.	-S33⊗-VII NDT	54	74.1	0.0	14	71.4
35.	-S34⊗-VII NDT	28	64.3	0.0	12	50.0
36.	-S35⊗-VIII NDT	54	51.8	0.0	26	80.8
37.	-S36⊗-VII NDT	35	45.7	0.0	21	90.5
38.	-S37⊗-VIII NDT	46	69.6	0.0	14	92.8

Contd.

1	2	3	4	5	6	7
39.	C.NO-74360-F4B-S38Q-VIII NDT	22	0.0	4.2	24	62.5
40.	-S39Q-VIII NDT	40	37.5	0.0	25	96.0
41.	-S40Q-VIII NDT	43	44.2	0.0	27	70.4
42.	-S41Q	75	38.7	0.0	46	97.8
43.	-S42Q	30	83.3	0.0	8	62.5
44.	-S43Q	44	84.1	0.0	9	77.8
45.	-S44Q-VIII NDT	47	87.2	16.7	6	66.7
46.	-S45Q-VII NDT	36	30.5	0.0	25	84.0
47.	-S46Q-VII NDT	19	73.7	0.0	5	100.0
48.	-S47Q-VII NDT	44	38.0	0.0	32	84.4
49.	-S48Q-VIII NDT	29	13.8	0.0	25	96.0
50.	-S49Q-VIII NDT	30	86.7	0.0	4	100.0
51.	-S50Q	49	57.1	0.0	21	76.2
52.	-S51Q-VII NDT	44	18.2	0.0	36	61.1
53.	-S52Q-VII NDT	24	25.0	0.0	18	83.3
54.	-S53Q-VIII NDT	57	10.5	0.0	54	35.2
55.	-S54Q-VIII NDT	33	54.5	0.0	15	53.3
56.	-S55Q-VIII NDT	48	39.6	0.0	29	65.5
57.	-S56Q-VIII NDT	49	51.0	4.2	26	84.6
58.	-S57Q-VII NDT	38	18.4	0.0	31	77.4
59.	-S58Q-VII NDT	48	58.3	0.0	21	66.7
60.	-S59Q-VII NDT	39	74.3	0.0	12	75.0
61.	-S60Q-VII NDT	49	49.0	0.0	25	100.0
62.	-S61Q-VII NDT	33	24.2	0.0	25	100.0
63.	-S62Q-VII NDT	27	14.8	0.0	24	75.0
64.	-S63Q-VII NDT	43	11.6	0.0	30	89.5
65.	-S64Q-VII NDT	36	44.4	0.0	20	90.0
66.	-S65Q-VII NDT	25	0.0	0.0	25	40.0
67.	-S66Q-VII NDT	49	28.6	0.0	35	60.0
68.	-S67Q-VII NDT	42	42.8	0.0	29	48.3
69.	-S68Q-VII NDT	54	20.4	0.0	45	22.2
70.	-S69Q-VII NDT	51	37.2	0.0	32	93.7
71.	-S70Q-VII NDT	38	50.0	0.0	22	36.4
72.	-S71Q	53	52.8	0.0	25	72.0
73.	-S72Q	57	15.8	0.0	48	81.2
74.	-S73Q	27	25.9	0.0	22	68.2
75.	-S74Q	65	56.9	0.0	31	51.6
76.	-S75Q	36	44.4	0.0	22	31.8
77.	-S76Q	18	83.3	0.0	5	0.0
78.	-S77Q	33	69.7	0.0	11	0.0
79.	-S78Q	48	33.3	0.0	35	62.8
80.	-S79Q	28	64.3	0.0	10	80.0
81.	-S80Q	47	23.4	0.0	39	48.7
82.	-S81Q	36	36.1	0.0	32	56.2

Contd.

1	2	3	4	5	6	7
83.	C.NO-74360-F_4B-S82Ø	46	63.0	0.0	29	69.0
84.	-S83Ø	41	31.7	3.7	34	70.6
85.	-S84Ø	19	15.8	0.0	16	93.7
86.	-S85Ø	43	16.3	0.0	36	55.5
87.	-S86Ø	46	34.8	0.0	31	83.9
88.	-S87Ø	61	44.3	0.0	35	57.1
89.	-S88Ø	27	33.3	0.0	20	65.0
90.	-S89Ø	11	18.2	0.0	9	77.8
91.	-S90Ø	44	27.3	0.0	32	96.9
92.	-S91Ø	21	9.5	0.0	20	80.0
93.	-S92Ø	41	65.8	0.0	21	57.1
94.	-S93Ø	20	40.0	0.0	12	41.7
95.	-S94Ø	47	25.5	0.0	36	75.0
96.	-S95Ø	35	37.1	0.0	22	86.4
97.	-S96Ø	45	37.8	0.0	29	24.1
98.	-S97Ø	41	39.0	0.0	29	55.2
99.	-S98Ø	43	51.2	0.0	23	78.3
100.	-S99Ø	41	31.7	0.0	31	58.1
101.	-S100Ø	34	50.0	0.0	18	55.5
102.	-S101Ø	58	63.8	0.0	22	27.3
103.	-S102Ø	41	31.7	0.0	31	22.6
104.	-S103Ø	47	59.6	0.0	20	40.0
105.	-S104Ø	19	57.9	0.0	8	25.0
106.	-S105Ø	50	56.0	0.0	33	63.6
107.	-S106Ø	54	48.2	0.0	38	84.2
108.	-S107Ø	12	83.3	0.0	3	33.3
109.	-S108Ø	23	26.1	0.0	18	38.9
110.	-S109Ø	50	36.0	0.0	34	26.5
111.	-S110Ø	37	29.7	0.0	26	80.8
112.	-S111Ø	35	40.0	0.0	22	4.5
113.	-S112Ø	47	42.5	0.0	28	75.0
114.	-S113Ø	53	24.5	0.0	40	62.5
115.	-S114Ø	36	30.5	0.0	25	40.0
116.	-S115Ø	27	3.7	0.0	27	44.4
117.	-S116Ø	34	50.0	0.0	19	31.6
118.	-S117Ø	37	37.8	0.0	15	40.0
119.	-S118Ø	41	68.3	0.0	14	50.0
120.	-S119Ø	54	51.8	0.0	28	78.6
121.	-S120Ø	45	15.5	0.0	42	35.7
122.	-S121Ø	40	32.5	0.0	33	18.2
123.	-S122Ø	40	15.0	0.0	38	68.4
124.	-S123Ø	41	39.0	0.0	27	18.5
125.	-S124Ø	57	38.6	0.0	37	32.4
126.	-S125Ø	28	50.0	0.0	20	75.0
127.	-S126Ø	36	75.0	0.0	9	44.4

Contd.

1	2	3	4	5	6	7
128.	C NO-74360-F4B-S1270	36	94.4	0.0	2	100.0
129.	-S1280	34	70.6	0.0	10	90.0
130.	-S1290	12	8.3	0.0	12	16.7
131.	-S1300	9	22.2	0.0	9	77.8
132.	-S1310	50	40.0	0.0	32	64.0
133.	-S1320	42	61.9	0.0	16	62.5
134.	-S1330	34	61.8	0.0	19	36.8
135.	-S1340	34	35.3	0.0	23	30.4
136.	-S1350	16	43.7	0.0	9	11.1
137.	-S1360	32	28.1	0.0	23	26.1
138.	-S1370	43	48.8	0.0	22	27.3
139.	-S1380	28	64.3	0.0	10	60.0
140.	-S1390	0	0.0	10.0	0	0.0
141.	-S1400	45	37.8	0.0	28	35.7
142.	-S1410	44	38.6	0.0	27	74.1
143.	-S1420	27	18.5	0.0	25	36.0
144.	-S1430	29	82.7	0.0	7	28.6
145.	-S1440	43	9.3	0.0	39	94.9
146.	-S1450	30	90.0	0.0	3	100.0
147.	-S1460	48	29.2	0.0	37	67.6
148.	-S1470	17	76.5	0.0	5	40.0
149.	-S1480	26	46.1	0.0	14	78.6
150.	-S1490	54	63.0	0.0	34	44.1
151.	-S1500	39	25.6	0.0	33	33.3
152.	-S1510	38	26.3	0.0	29	93.1
153.	-S1520	49	24.5	0.0	37	70.3
154.	-S1530	43	39.5	0.0	28	92.8
155.	-S1540	41	68.3	0.0	13	100.0
156.	-S1550	27	92.6	0.0	2	50.0
157.	-S1560	25	24.0	0.0	19	94.7
158.	-S1570	34	55.9	0.0	15	60.0
159.	-S1580	25	68.0	0.0	9	22.5
160.	-S1590	45	46.7	0.0	30	76.7
161.	-S1600	38	44.7	0.0	21	95.2
162.	-S1610	40	22.5	0.0	31	35.5
163.	-S1620	29	48.3	0.0	15	13.3
164.	-S1630	42	19.0	0.0	35	5.7
165.	-S1640	53	24.5	0.0	45	26.7
166.	-S1650	41	56.1	0.0	22	45.4
167.	-S1660	46	73.9	0.0	14	57.1
168	-S1670	42	30.9	0.0	29	44.8
169.	-S1680	53	49.1	0.0	27	96.3
170.	-S1690	41	46.3	0.0	22	95.4
171.	-S1700	44	20.4	0.0	38	78.9

Contd

1	2	3	4	5	6	7
172.	C.NO-74360-F_4B-S171⊗	49	30.6	0.0	40	77.5
173.	-S172⊗	63	30.1	0.0	45	95.5
174.	-S173⊗	36	61.1	0.0	14	71.4
175.	-S174⊗	51	29.4	0.0	37	8.1
176.	-S175⊗	48	20.8	0.0	38	60.5
177.	-S176⊗	30	26.7	0.0	22	72.7
178.	-S177⊗	63	12.7	0.0	57	43.8
179.	-S178⊗	43	37.2	0.0	32	12.5
180.	-S179⊗	44	20.4	0.0	35	77.1
181.	-S180⊗	17	29.4	0.0	17	35.3
182.	-S181⊗	39	25.6	0.0	29	24.1
183.	-S182⊗	38	26.3	0.0	31	29.0
184.	-S183⊗	45	15.5	0.0	38	34.2
185.	-S184⊗	50	16.0	0.0	43	67.4
186.	-S185⊗	15	0.0	0.0	15	53.3
187.	-S186⊗	34	35.3	0.0	22	95.4
188.	-S187⊗	40	47.5	0.0	27	51.8
189.	-S188⊗	24	20.8	0.0	19	73.7
190.	-S189⊗	25	76.0	0.0	7	71.4
191.	-S190⊗	46	60.9	0.0	28	53.6
192.	-S191⊗	28	64.3	0.0	10	60.0
193.	-S192⊗	57	31.6	0.0	41	85.4
194.	-S193⊗	52	25.0	0.0	41	56.1
195.	-S194⊗	44	61.4	0.0	19	42.1
196.	-S195⊗	48	35.4	0.0	32	0.0
197.	-S196⊗	33	33.3	0.0	23	60.9
198.	-S197⊗	52	19.2	0.0	42	71.4
199.	-S198⊗	41	51.2	0.0	20	80.0
200.	-S199⊗	41	21.9	0.0	33	66.7
201.	-S200⊗	53	28.3	0.0	38	100.0
202.	-S201⊗	49	38.8	0.0	30	76.7
203.	-S202⊗	40	15.0	0.0	34	70.6
204.	-S203⊗	30	40.0	0.0	20	70.0
205.	-S204⊗	30	46.7	0.0	17	52.9
206.	-S205⊗	57	33.0	0.0	40	47.5
207.	-S206⊗	19	68.4	0.0	6	50.0
208.	-S207⊗	45	22.2	0.0	39	25.6
209.	-S208⊗	40	15.0	0.0	35	45.7
210.	-S209⊗	22	4.5	0.0	21	71.4
211.	-S210⊗	47	25.5	0.0	36	33.3
212.	-S211⊗	55	49.1	3.6	28	46.4
213.	-S212⊗	22	100.0	0.0	0	0.0
214.	-S213⊗	45	60.0	0.0	21	28.6
215.	-S214⊗	45	8.9	0.0	43	93.0

Contd.

1	2	3	4	5	6	7
216.	C.NO-74360-F_4B-S215⊗	38	34.3	0.0	27	55.5
217.	-S216⊗	13	38.5	0.0	9	44.4
218.	-S217⊗	24	70.8	0.0	7	28.6
219.	-S218⊗	55	23.6	0.0	42	9.5
220.	-S219⊗	39	33.3	0.0	27	0.0
221.	-S220⊗	44	56.8	0.0	19	52.6
222.	-S221⊗-7NDT	41	34.1	0.0	29	79.3
223.	-S222⊗-8NDT	17	47.0	0.0	11	54.5
224.	-S223⊗-8NDT	40	72.5	0.0	29	24.1
225.	-S224⊗-8NDT	37	64.9	0.0	15	26.7
226.	-S225⊗-8NDT	41	61.0	0.0	16	68.7
227.	-S226⊗	51	49.0	0.0	29	31.6
228.	-S227⊗-8NDT	42	33.3	0.0	29	24.1
229.	-S228⊗-8NDT	31	41.9	0.0	21	38.1
230.	-S229⊗-VIII NDT	53	41.5	0.0	35	42.8
231.	-S230⊗	36	38.9	0.0	25	40.0
232.	-S231⊗	44	90.9	0.0	4	50.0
233.	-S232⊗-VIII NDT	50	74.0	0.0	18	36.0
234.	-S233⊗	64	21.9	0.0	52	25.0
235.	-S234⊗	46	15.2	0.0	39	12.8
236.	-S235⊗	67	16.4	0.0	56	30.3
237.	-S236⊗	44	2.3	0.0	44	70.4
238.	-S237⊗	38	60.5	0.0	17	76.5
239.	-S238⊗	61	68.8	0.0	19	73.7
240.	-S239⊗-VIII NDT	38	34.2	0.0	26	42.3
241.	-S240⊗-VIII NDT	29	75.9	0.0	7	42.8
242.	-S241⊗-VIII NDT	47	74.5	0.0	17	47.0
243.	-S242⊗-VIII NDT	41	70.7	0.0	15	46.7
244.	-S243⊗	41	75.6	0.0	12	0.0
245.	-S244⊗	45	42.2	0.0	30	20.0
246.	-S245⊗	51	29.4	0.0	36	22.2
247.	-S246⊗-VIII NDT	56	83.9	0.0	12	8.3
248.	-S247⊗	42	69.0	0.0	14	92.8
249.	-S248⊗	61	27.9	0.0	44	63.6
250.	-S249⊗-VIII NDT	50	28.0	0.0	36	97.2
251.	-S250⊗	50	40.0	0.0	30	80.0
252.	-S251⊗	49	16.3	0.0	42	30.9
253.	-S252⊗	61	82.0	0.0	11	45.4
254.	-S253⊗	60	90.0	0.0	8	0.0
255.	-S254⊗-VI NDT	53	45.3	0.0	32	90.6
256.	-S255⊗-VIII NDT	41	48.8	0.0	30	0.0
257.	-S256⊗	52	26.9	0.0	40	77.5
258.	-S257⊗	51	0.0	0.0	51	58.8
259.	-S258⊗-VII NDT	31	45.2	0.0	19	89.5
260.	-S259⊗-VII NDT	65	41.5	0.0	39	84.6

Contd.

1	2	3	4	5	6	7
261.	C.NO-74360-F_4B-S260⊗-VII NDT	66	57.6	0.0	34	73.5
262.	-S261⊗-VII NDT	65	84.6	0.0	11	90.9
263.	-S262⊗	23	60.9	0.0	11	81.8
264.	-S263⊗-VII NDT	54	42.6	0.0	34	14.7
265.	-S264⊗-VII NDT	40	87.5	20.0	8	25.0
266.	-S265⊗-VI NDT	54	59.2	0.0	24	91.7
267.	-S266⊗-VIII NDT	48	72.9	0.0	16	18.7
268.	-S267⊗-VII NDT	48	83.3	0.0	15	40.0
269.	-S268⊗	14	35.7	0.0	9	44.4
270.	-S269⊗	16	12.5	0.0	14	92.8
271.	ICP-7065-1-P_2	64	50.0	9.4	37	62.2
272.	ICP-6997-137-1-Br-P1	51	98.0	0.0	1	0.0
273.	C.NO-74236-F_4B-S1⊗-VIII NDT	40	10.0	0.0	36	97.2
274.	-S2⊗-VI NDT	21	23.8	0.0	16	100.0
275.	-S3⊗-VII NDT	62	21.0	0.0	49	95.9
276.	-S4⊗-VII NDT	13	46.1	0.0	8	62.5
277.	-S5⊗-VI NDT	52	34.6	0.0	39	15.4
278.	-S6⊗-VI NDT	34	88.2	0.0	4	100.0
279.	-S7⊗-VII NDT	69	56.5	0.0	34	88.2
280.	-S8⊗-VIII NDT	38	94.7	0.0	3	66.7
281.	-S9⊗-VI NDT	29	72.4	0.0	8	100.0
282.	-S10⊗-VII NDT	50	34.0	0.0	24	79.4
283.	-S11⊗-VIII NDT	72	30.5	0.0	50	100.0
284.	-S12⊗	28	7.1	0.0	26	100.0
285.	-S13⊗-VII NDT	72	34.7	0.0	48	87.5
286.	-S14⊗-VII NDT	57	77.2	0.0	13	100.0
287.	-S15⊗-VII NDT	70	28.6	0.0	52	86.5
288.	-S16⊗-VII NDT	50	22.0	0.0	39	66.7
289.	-S17⊗-VII NDT	45	48.9	0.0	26	65.4
290.	-S18⊗-VII NDT	37	24.3	0.0	28	46.4
291.	-S19⊗-VII NDT	64	39.1	0.0	39	56.4
292.	-S20⊗-VII NDT	65	23.1	0.0	51	70.6
293.	-S21⊗-VII NDT	58	13.8	0.0	50	72.0
294.	-S22⊗-VII NDT	70	14.3	0.0	60	61.7
295.	-S23⊗-VII NDT	58	22.4	0.0	48	89.6
296.	-S24⊗-VII NDT	61	22.9	0.0	47	95.7
297.	-S25⊗-VII NDT	57	26.3	0.0	44	9.1
298.	-S26⊗-VII NDT	44	29.5	0.0	33	12.1
299.	-S27⊗-VII NDT	41	56.1	0.0	18	50.0
300.	-S28⊗-VII NDT	67	22.4	0.0	53	30.2
301.	-S29⊗-VI NDT	51	33.3	0.0	35	54.3
302.	-S30⊗-VII NDT	51	45.1	0.0	28	92.8
303.	-S31⊗-VII NDT	46	32.6	0.0	34	35.3
304.	-S32⊗-VII NDT	52	36.5	0.0	33	78.8
305.	-S33⊗-VII NDT	62	50.0	0.0	31	93.5

Contd.

1	2		3	4	5	6	7
306.	C.NO-74236-F_4B-S340-VI	NDT	47	61.7	0.0	20	75.0
307.	-S350-VII	NDT	47	38.3	0.0	31	83.9
308.	-S360-VI	NDT	41	56.1	0.0	18	100.0
309	-S370-VII	NDT	42	50.0	0.0	21	76.2
310.	-S380-VII	NDT	39	48.7	0.0	20	55.0
311.	-S390-VI	NDT	23	60.9	0.0	9	77.8
312.	-S400-VII	NDT	41	39.0	0.0	27	74.1
313.	-S410-VII	NDT	12	25.0	0.0	12	41.7
314.	-S420-VII	NDT	48	25.0	0.0	36	66.7
315.	-S430-VIII	NDT	56	30.3	0.0	41	58.5
316.	-S440-VII	NDT	48	25.0	0.0	39	56.4
317.	-S450-VII	NDT	45	46.7	0.0	26	80.8
318.	-S460-VII	NDT	53	56.6	0.0	23	91.3
319.	-S470-VIII	NDT	46	39.1	0.0	30	70.0
320.	-S480-VII	NDT	50	94.0	0.0	3	100.0
321.	-S490-VIII	NDT	53	37.7	0.0	35	62.8
322.	-S500-VII	NDT	16	37.5	0.0	12	16.7
323.	-S510-VIII	NDT	30	50.0	0.0	15	80.0
324.	-S520-VIII	NDT	24	0.0	0.0	24	95.8
325.	-S530-VII	NDT	66	30.3	0.0	47	57.4
326.	-S540-VII	NDT	41	41.5	0.0	24	79.2
327.	-S550-VII	NDT	45	24.4	0.0	34	82.3
328.	-S560-VI	NDT	47	47.5	0.0	28	67.8
329.	-S570-VIII	NDT	62	35.5	0.0	40	95.0
330.	-S580-VII	NDT	51	45.1	0.0	27	14.8
331.	-S590-VII	NDT	58	41.4	0.0	34	73.5
332.	-S600-VII	NDT	76	64.5	0.0	29	82.7
333.	-S610-VII	NDT	25	48.0	0.0	15	33.3
334.	-S620-VII	NDT	48	12.5	0.0	47	63.8
335.	-S630-VIII	NDT	44	79.5	0.0	11	81.8
336.	-S640-VIII	NDT	30	70.0	0.0	10	30.0
337.	-S650-VIII	NDT	36	41.7	0.0	22	4.5
338.	-S660-VII	NDT	42	57.1	0.0	18	44.4
339.	-S670-VIII	NDT	17	41.2	0.0	12	33.3
340.	-S680-VII	NDT	55	38.2	0.0	35	17.1
341.	-S690-VIII	NDT	35	91.4	0.0	4	0.0
342.	-S700-VII	NDT	44	52.3	0.0	22	31.8
343.	-S710-VIII	NDT	37	43.2	0.0	22	13.6
344.	-S720-VIII	NDT	29	27.6	0.0	21	23.8
345.	-S730-VIII	NDT	23	39.1	0.0	16	68.7
346.	-S740-VIII	NDT	47	14.9	0.0	40	52.5
347.	-S750-VIII	NDT	9	33.3	0.0	6	50.0
348.	-S760-VIII	NDT	26	38.5	0.0	16	75.0
349.	-S770-VII	NDT	46	34.8	0.0	30	43.3
350.	-S780-VII	NDT	47	29.8	0.0	35	51.4

Contd.

1	2	3	4	5	6	7
351.	C.NO-74326-F_4B-S79⊗-VIII NDT	15	0.0	0.0	15	26.7
352.	-S80⊗-VIII NDT	46	39.1	0.0	28	96.4
353.	-S81⊗-VIII NDT	43	51.2	0.0	30	93.3
354.	-S82⊗-VIII NDT	43	41.9	0.0	25	100.0
355.	-S83⊗-VII NDT	54	25.9	0.0	41	73.2
356.	-S84⊗-VII NDT	64	20.3	0.0	54	74.1
357.	-S85⊗-VI NDT	33	21.2	0.0	29	65.5
358.	-S86⊗-VIII NDT	54	33.3	0.0	37	67.6
359.	-S87⊗-VIII NDT	39	35.9	0.0	26	96.1
360.	-S88⊗-VII NDT	42	64.3	0.0	15	100.0
361.	-S89⊗-VII NDT	49	42.8	0.0	28	78.6
362.	-S90⊗-VII NDT	47	40.4	0.0	29	86.2
363.	-S91⊗-VII NDT	45	95.5	0.0	2	0.0
364.	-S92⊗-VII NDT	39	38.5	0.0	25	4.0
365.	-S93⊗-VII NDT	35	54.3	0.0	17	17.6
366.	-S94⊗-VII NDT	30	80.0	0.0	8	25.0
367.	-S95⊗-VII NDT	19	36.8	3.8	8	0.0
368.	-S96⊗-VII NDT	54	11.1	0.0	48	50.0
369.	-S97⊗-VII NDT	55	47.3	0.0	29	89.6
370.	-S98⊗-VIII NDT	21	19.0	0.0	17	82.3
371.	-S99⊗-VII NDT	19	0.0	0.0	19	68.4
372.	-S100⊗-VIII NDT	53	30.2	0.0	44	25.0
373.	-S101⊗-VII NDT	56	21.4	0.0	46	82.6
374.	-S102⊗-VIII NDT	46	45.6	0.0	28	67.8
375.	-S103⊗-VII NDT	45	40.0	0.0	27	96.3
376.	-S104⊗-VIII NDT	34	0.0	0.0	34	88.2
377.	-S105⊗-VII NDT	20	20.0	0.0	16	100.0
378.	-S106⊗-VIII NDT	50	62.0	0.0	27	70.4
379.	-S107⊗-VII NDT	25	0.0	0.0	25	88.0
380.	-S108⊗-VIII NDT	24	4.2	0.0	23	69.6
381.	-S109⊗-VII NDT	38	10.5	8.8	37	29.7
382.	No-148-P2	59	22.0	19.6	48	93.7
383.	ICP-6997-P1	61	98.4	0.0	4	25.0
384.	C.NO-74335-F_4B-S1⊗-V NDT	8	100.0	0.0	0	0.0
385.	-S2⊗-VII NDT	48	79.2	20.0	18	50.0
386.	-S3⊗-VII NDT	51	68.6	0.0	25	24.0
387.	-S4⊗-VIII NDT	43	44.2	0.0	26	61.5
388.	-S5⊗-VII NDT	50	72.0	0.0	17	17.6
389.	-S6⊗-VII NDT	23	65.2	0.0	12	0.0
390.	-S7⊗-VII NDT	17	100.0	0.0	0	0.0
391.	-S8⊗-VII NDT	47	21.3	0.0	47	44.7
392.	-S9⊗-VII NDT	46	47.8	0.0	30	33.3
393.	-S10⊗-VII NDT	48	45.8	0.0	29	37.9
394.	-S11⊗-VII NDT	46	36.9	0.0	29	82.7
395.	-S12⊗-VII NDT	20	90.0	0.0	3	66.7

Contd.

1	2		3	4	5	6	7
396	C.NO-74335-F_4B-S13⊗-VII	NDT	22	95.4	0.0	1	0.0
397	-S14⊗		11	90.9	0.0	1	100.0
398	-S15⊗		27	96.3	0.0	1	0.0
399	-S16⊗		41	56.1	0.0	24	37.5
400	-S17⊗-VII	NDT	35	85.7	0.0	8	12.5
401	-S18⊗-VII	NDT	37	83.8	0.0	8	37.5
402	-S19⊗		34	100.0	0.0	2	0.0
403	-S20⊗-VII	NDT	33	66.7	0.0	13	53.8
404	-S21⊗-VIII	NDT	37	78.4	0.0	16	43.7
405	-S22⊗-VII	NDT	19	57.9	0.0	10	30.0
406	-S23⊗-VI	NDT	25	80.0	0.0	5	20.0
407	-S24⊗-VII	NDT	17	47.0	0.0	10	30.0
408	-S25⊗-VII	NDT	35	42.8	0.0	23	39.1
409	-S26⊗-VII	NDT	38	89.5	0.0	6	33.3
410	-S27⊗-VI	NDT	28	100.0	0.0	0	0.0
411	-S28⊗-VII	NDT	10	90.0	0.0	1	0.0
412	-S29⊗-VII	NDT	31	87.1	0.0	4	50.0
413	-S30⊗-VII	NDT	30	96.7	0.0	1	0.0
414	-S31⊗-VIII	NDT	26	84.6	0.0	4	25.0
415	-S32⊗-VIII	NDT	48	95.8	0.0	2	50.0
416	-S33⊗-VII	NDT	42	85.7	0.0	9	11.1
417	-S34⊗-VII	NDT	37	45.9	0.0	24	45.8
418	-S35⊗-VIII	NDT	22	59.1	0.0	12	16.7
419	-S36⊗-VII	NDT	48	81.2	0.0	11	18.2
420	-S37⊗-VII	NDT	17	88.2	0.0	3	0.0
421	-S38⊗-VII	NDT	47	93.6	0.0	5	40.0
422	-S39⊗-VII	NDT	25	92.0	0.0	5	6.0
423	-S40⊗-VII	NDT	45	51.1	0.0	25	52.0
424	-S41⊗-VII	NDT	31	80.6	0.0	8	0.0
425	-S42⊗-VIII	NDT	39	92.3	0.0	8	12.5
426	-S43⊗-VII	NDT	28	67.8	0.0	11	54.5
427	-S44⊗-VII	NDT	47	55.3	0.0	21	42.8
428	-S45⊗-VII	NDT	45	93.3	0.0	3	33.3
429	-S46⊗-VII	NDT	18	83.3	0.0	4	50.0
430	-S47⊗-VIII	NDT	46	60.9	0.0	19	73.7
431	-S48⊗-VIII	NDT	18	77.8	0.0	8	12.5
432	-S49⊗-VIII	NDT	38	92.1	0.0	4	0.0
433	-S50⊗-VIII	NDT	28	89.3	0.0	4	75.0
434	-S51⊗-VII	NDT	16	62.5	0.0	7	14.3
435	-S52⊗		35	42.8	0.0	20	35.0
436	-S53⊗		24	75.0	0.0	6	33.3
437	-S54⊗-VII	NDT	16	81.2	0.0	3	0.0
438	-S55⊗-VII	NDT	35	71.4	0.0	10	50.0
439	-S56⊗-VII	NDT	38	97.4	0.0	1	0.0
440	-S57⊗-VII	NDT	25	96.0	0.0	1	0.0

Contd.

1	2	3	4	5	6	7
441.	C.NO-74335-F_4B-S58⊗-VII NDT	22	72.7	0.0	8	50.0
442.	-S59⊗-VII NDT	29	96.5	0.0	4	25.0
443.	-S60⊗-VIII NDT	15	100.0	0.0	0	0.0
444.	-S61⊗-VIII NDT	31	58.1	0.0	18	50.0
445.	-S62⊗-VII NDT	37	16.2	0.0	32	53.1
446.	-S63⊗-V NDT	34	97.0	0.0	1	100.0
447.	-S64⊗-V NDT	20	65.0	0.0	11	36.4
448.	-S65⊗-VII NDT	37	81.1	0.0	12	8.3
449.	-S66⊗-VIII NDT	34	76.5	0.0	10	40.0
450.	-S67⊗-VII NDT	27	85.2	0.0	4	0.0
451.	-S68⊗-VII NDT	42	61.9	0.0	20	25.0
452.	-S69⊗-VII NDT	32	78.1	0.0	10	50.0
453.	-S70⊗-VII NDT	25	100.0	0.0	0	0.0
454.	-S71⊗-VII NDT	14	71.4	0.0	6	0.0
455.	-S72⊗-VII NDT	44	75.0	0.0	15	40.0
456.	-S73⊗-VII NDT	50	98.0	0.0	1	100.0
457.	-S74⊗-VI NDT	25	68.0	0.0	9	55.5
458.	-S75⊗-VI NDT	31	41.9	0.0	21	38.1
459.	-S76⊗-VII NDT	25	84.0	0.0	5	20.0
460.	-S77⊗-VIII NDT	30	80.0	0.0	6	100.0
461.	-S78⊗-VII NDT	31	71.0	0.0	12	50.0
462.	-S79⊗-VI NDT	36	66.7	0.0	16	25.0
463.	-S80⊗-VII NDT	22	86.9	0.0	4	25.0
464.	-S81⊗	20	100.0	0.0	0	0.0
465.	-S82⊗-VII NDT	26	100.0	0.0	-	-
466.	-S83⊗-VII NDT	51	78.4	0.0	14	14.3
467.	-S84⊗-VII NDT	41	90.2	0.0	5	60.0
468.	-S85⊗-VII NDT	50	96.1	0.0	1	0.0
469.	-S86⊗-VII NDT	15	100.0	0.0	-	-
470.	-S87⊗-VI NDT	40	62.5	0.0	17	76.0
471.	-S88⊗-VII NDT	42	100.0	0.0	-	-
472.	-S89⊗-VII NDT	45	73.3	0.0	15	20.0
473.	-S90⊗-VII NDT	46	78.3	0.0	11	54.5
474.	-S91⊗	35	94.3	0.0	2	100.0
475.	-S92⊗-VII NDT	18	94.4	0.0	2	50.0
476.	-S93⊗-VII NDT	51	76.5	0.0	16	6.2
477.	-S94⊗-VII NDT	39	82.0	0.0	7	85.7
478.	-S95⊗-VII NDT	14	78.6	0.0	3	100.0
479.	-S96⊗-VIII NDT	45	93.3	0.0	6	0.0
480.	-S97⊗-VII NDT	22	45.4	0.0	13	7.7
481.	-S98⊗-VII NDT	30	63.3	9.1	12	50.0
482.	-S99⊗-VII NDT	14	100.0	0.0	-	-
483.	-S100⊗-VII NDT	23	78.3	0.0	8	12.5
484.	-S101⊗-VII NDT	30	93.3	0.0	3	33.3
485.	-S102⊗-VII NDT	25	92.0	0.0	4	0.0

Contd.

1	2	3	4	5	6	7
486.	C.NO-74335-F_4B-S103Ø-VII NDT	41	100.0	0.0	0	-
487.	-S104Ø-VII NDT	43	88.4	0.0	5	80.0
488.	-S105Ø-VII NDT	25	80.0	0.0	5	0.0
489.	-S106Ø-VIII NDT	33	48.5	0.0	19	21.0
490.	-S107Ø-VII NDT	35	31.4	0.0	26	7.7
491.	-S108Ø-VII NDT	16	93.7	0.0	1	100.0
492.	-S109Ø-VII NDT	19	78.9	0.0	4	0.0
493.	-S110Ø-VII NDT	28	21.4	0.0	25	16.0
494.	-S111Ø-VII NDT	37	89.2	0.0	7	14.3
495.	-S112Ø-VII NDT	25	92.0	0.0	2	50.0
496.	-S113Ø-VII NDT	8	100.0	0.0	0	-
497.	-S114Ø-VII NDT	34	100.0	0.0	0	-
498.	-S115Ø-VII NDT	10	100.0	0.0	0	-
499.	-S116Ø-VII NDT	37	100.0	0.0	0	-
500.	-S117Ø-VII NDT	45	95.5	0.0	4	0.0
501.	-S118Ø-VII NDT	36	75.0	0.0	12	33.3
502.	-S119Ø-VII NDT	35	85.7	0.0	12	8.3
503.	-S120Ø-VII NDT	29	100.0	0.0	0	-
504.	-S121Ø-VIII NDT	38	89.5	0.0	5	0.0
505.	-S122Ø	37	100.0	0.0	0	-
506.	-S123Ø-VII NDT	19	100.0	0.0	0	-
507.	-S124Ø-VII NDT	24	95.8	0.0	2	0.0
508.	-S125Ø-VII NDT	41	95.1	0.0	3	0.0
509.	-S126Ø-VII NDT	15	100.0	0.0	0	-
510.	-S127Ø-VII NDT	38	97.4	0.0	1	0.0
511.	-S128Ø-VII NDT	41	90.2	0.0	7	28.6
512.	-S129Ø-VII NDT	13	84.6	0.0	3	0.0
513.	-S130Ø-VII NDT	42	100.0	0.0	0	-
514.	-S131Ø-VII NDT	30	100.0	0.0	0	-
515.	-S132Ø-VII NDT	19	89.4	0.0	2	50.0
516.	-S133Ø-VII NDT	38	94.7	0.0	2	50.0
517.	-S134Ø-VI NDT	29	96.5	0.0	1	0.0
518.	-S135Ø-VI NDT	39	100.0	0.0	0	-
519.	-S136Ø-VII NDT	39	92.3	0.0	5	0.0
520.	-S137Ø-VI NDT	41	90.2	0.0	6	33.3
521.	-S138Ø-VII NDT	40	95.0	0.0	2	50.0
522.	-S139Ø-VIII NDT	14	92.8	0.0	2	50.0
523.	-S140Ø-VII NDT	14	57.1	0.0	10	20.0
524.	-S141Ø-VII NDT	32	96.9	0.0	2	50.0
525.	-S142Ø-VI NDT	17	0.0	0.0	17	94.0
526	-S143Ø-VII NDT	53	98.1	0.0	2	50.0
527.	-S144Ø-VII NDT	37	19.9	0.0	5	40.0
528.	-S145Ø-VII NDT	15	86.7	0.0	5	40.0
529.	-S146Ø-VII NDT	45	95.5	0.0	2	50.0
530.	-S147Ø-VII NDT	29	69.0	0.0	14	28.6

Contd.

1	2		3	4	5	6	7
531.	C.NO-74335-F4B-S1480-VII	NDT	14	85.7	0.0	2	0.0
532.	-S1490-VII	NDT	19	78.9	0.0	8	50.0
533.	-S1500-VII	NDT	14	100.0	0.0	0	-
534.	-S1510-VII	NDT	42	59.5	0.0	21	23.8
535.	-S1520-VII	NDT	47	55.3	0.0	26	23.1
536.	-S1530-VII	NDT	15	93.3	0.0	1	100.0
537.	-S1540-VII	NDT	30	100.0	0.0	0	-
538.	-S1550-VII	NDT	36	91.7	0.0	6	50.0
539.	-S1560-VI	NDT	48	79.2	0.0	16	18.7
540.	-S1570-VI	NDT	43	97.7	0.0	1	100.0
541.	-S1580-VII	NDT	40	52.5	0.0	22	27.3
542.	-S1590-VII	NDT	48	85.4	0.0	11	18.2
543.	-S1600-VII	NDT	50	100.0	0.0	0	-
544.	-S1610-VI	NDT	45	93.3	0.0	4	0.0
545.	-S1620		35	80.0	0.0	9	44.4
546.	-S1630-VII	NDT	18	61.1	0.0	10	0.0
547.	-S1640-VI	NDT	19	68.4	0.0	6	33.3
548.	-S1650-VI	NDT	32	78.1	0.0	9	22.2
549.	-S1660-VI	NDT	21	71.4	0.0	13	0.0
550.	-S1670-VI	NDT	40	85.0	0.0	8	25.0
551.	-S1680-VI	NDT	17	88.2	0.0	2	50.0
552.	-S1690-VII	NDT	28	78.6	0.0	6	16.7
553.	-S1700-VII	NDT	40	70.0	0.0	18	0.0
554.	-S1710-VII	NDT	28	35.7	0.0	19	21.0
555.	-S1720-VII	NDT	24	58.3	0.0	13	15.4
556.	-S1730-VII	NDT	8	50.0	0.0	5	20.0
557.	-S1740-VII	NDT	45	48.9	0.0	33	39.4
558.	-S1750-VII	NDT	41	90.2	0.0	4	100.0
559.	-S1760		29	93.1	0.0	3	33.3
560.	-S1770-VII	NDT	40	60.0	0.0	22	9.1
561.	-S1780-VII	NDT	40	80.0	0.0	3	37.5
562.	-S1790-VII	NDT	25	96.0	0.0	1	0.0
563.	-S1800-VII	NDT	50	50.0	0.0	34	38.2
564.	-S1810		28	42.8	0.0	24	16.7
565.	-S1820-VII	NDT	42	83.3	0.0	9	55.5
566.	-S1830-VII	NDT	13	69.2	0.0	6	33.3
567.	-S1840-VII	NDT	38	71.0	0.0	15	33.3
568.	-S1850-VII	NDT	35	94.3	0.0	3	66.7
569.	-S1860-VII	NDT	13	84.6	0.0	3	33.3
570.	-S1870-VII	NDT	20	85.0	0.0	4	75.0
571.	-S1880-VII	NDT	15	73.3	0.0	4	0.0
572.	-S1890-VII	NDT	25	100.0	0.0	0	-
573.	-S1900-VII	NDT	17	88.2	0.0	2	50.0
574.	-S1910		37	97.3	0.0	1	100.0
575.	-S1920-VII	NDT	47	100.0	0.0	0	-

Contd.

1	2		3	4	5	6	7
576.	C.NO-74335-F_4B-S193⊗-VIII	NDT	19	94.7	0.0	1	100.0
577.	-S194⊗-VII	NDT	31	100.0	0.0	0	-
578.	-S195⊗-VII	NDT	37	100.0	0.0	0	-
579.	-S196⊗-VIII	NDT	51	82.3	0.0	14	42.8
580.	-S197⊗-VII	NDT	41	65.8	0.0	21	42.8
581.	-S198⊗-VII	NDT	35	100.0	0.0	0	-
582.	-S199⊗-VII	NDT	48	60.4	0.0	19	47.4
583.	-S200⊗-VI	NDT	32	65.6	0.0	15	26.7
584.	-S201⊗-VII	NDT	32	68.7	0.0	10	60.0
585.	-S202⊗-VII	NDT	42	95.2	0.0	2	0.0
586.	-S203⊗-VII	NDT	40	62.5	0.0	21	14.3
587.	-S204⊗-VII	NDT	42	95.2	0.0	3	33.3
588.	-S205⊗-VII	NDT	21	76.2	0.0	7	0.0
589.	-S206⊗-VII	NDT	24	91.7	0.0	3	33.3
590.	-S207⊗		9	100.0	0.0	0	-
591.	-S208⊗-VIII	NDT	28	82.1	0.0	7	42.8
592.	-S209⊗-VIII	NDT	28	64.3	0.0	14	35.7
593.	-S210⊗-VIII	NDT	39	84.6	0.0	7	28.6
594.	-S211⊗-VIII	NDT	24	70.8	0.0	9	33.3
595.	-S212⊗-VIII	NDT	35	82.8	0.0	7	0.0
596.	-S213⊗-VIII	NDT	27	81.5	0.0	5	0.0
597.	-S214⊗-VIII	NDT	38	94.7	0.0	3	66.7
598.	-S215⊗-VIII	NDT	21	100.0	0.0	1	0.0
599.	-S216⊗-VIII	NDT	44	27.3	0.0	36	22.2
600.	-S217⊗-VIII	NDT	26	92.3	0.0	2	0.0
601.	-S218⊗-VIII	NDT	33	63.6	0.0	15	13.3
602.	-S219⊗-VII	NDT	37	75.7	0.0	11	36.4
603.	-S220⊗-VIII	NDT	27	96.3	0.0	1	100.0
604.	-S221⊗-VII	NDT	44	77.3	20.0	15	0.0
605.	-S222⊗-VII	NDT	48	27.1	2.8	39	46.1
606.	-S223⊗-VIII	NDT	14	78.6	0.0	3	33.3
607.	-S224⊗-VIII	NDT	32	90.6	0.0	3	0.0
608.	-S225⊗-VII	NDT	47	89.4	0.0	7	0.0
609.	-S226⊗-VII	NDT	30	86.7	0.0	4	0.0
610.	-S227⊗-VII	NDT	19	78.9	0.0	6	16.7
611.	-S228⊗-VIII	NDT	16	100.0	0.0	0	-
612.	-S229⊗-VI	NDT	37	62.2	0.0	17	82.3
613.	-S230⊗-VII	NDT	30	83.3	0.0	6	50.0
614.	-S231⊗-VIII	NDT	32	84.4	0.0	9	44.4
615.	-S232⊗-VIII	NDT	52	92.3	0.0	4	75.0
616.	-S233⊗-VIII	NDT	33	96.9	0.0	3	0.0
617.	-S234⊗-VIII	NDT	13	76.9	0.0	4	75.0
618.	-S235⊗-VIII	NDT	48	81.2	0.0	11	36.4
619.	-S236⊗-VIII	NDT	15	93.3	0.0	1	0.0
620.	-S237⊗-VIII	NDT	37	97.3	0.0	1	100.0

Contd.

1	2		3	4	5	6	7
621.	C.NO-74335-F_4B-S2380		33	100.0	0.0	0	-
622.	-S2390-VII	NDT	32	90.6	0.0	3	0.0
623.	-S2400-VII	NDT	25	100.0	0.0	0	-
624.	-S2410-VIII	NDT	31	87.1	0.0	5	20.0
625.	-S2420-VIII	NDT	36	94.4	0.0	5	20.0
626.	-S2430-VIII	NDT	32	93.7	0.0	4	50.0
627.	-S2440-VIII	NDT	34	73.5	0.0	10	80.0
628.	-S2450-VIII	NDT	33	51.5	0.0	20	50.0
629.	-S2460-VIII	NDT	33	93.9	0.0	2	50.0
630.	-S2470-VIII	NDT	30	80.0	0.0	9	33.3
631.	-S2480-VII	NDT	25	100.0	0.0	0	-
632.	-S2490-VII	NDT	30	100.0	0.0	0	-
633.	-S2500-VII	NDT	36	88.9	0.0	6	0.0
634	-S2510-VII	NDT	49	81.6	0.0	12	8.3
635.	-S2520-VII	NDT	30	90.0	0.0	4	0.0
636.	-S2530-VII	NDT	30	46.7	0.0	16	0.0
637.	-S2540-VII	NDT	47	100.0	0.0	0	-
638.	-S2550-VII	NDT	37	81.1	0.0	10	0.0
639.	-S2560-VIII	NDT	49	55.1	0.0	24	58.3
640.	-S2570-VII	NDT	50	98.0	0.0	1	100.0
641.	-S2580-VII	NDT	31	48.4	0.0	21	4.8
642.	-S2590-VII	NDT	38	55.3	0.0	28	7.1
643.	-S2600-VII	NDT	29	82.7	0.0	7	14.3
644.	-S2610-VII	NDT	36	88.9	0.0	6	0.0
645.	-S2620-VII	NDT	50	56.0	0.0	27	3.7
646.	-S2630-VII	NDT	24	100.0	0.0	0	-
647.	-S2640-VIII	NDT	38	52.6	0.0	12	25.0
648.	-S2650-VII	NDT	31	100.0	0.0	0	-
649.	-S2660-VII	NDT	35	100.0	0.0	0	
650.	-S2670-VII	NDT	32	87.5	0.0	8	50.0
651.	-S2680-VII	NDT	45	71.1	0.0	13	15.4
652.	-S2690-VII	NDT	32	90.6	0.0	4	50.0
653.	-S2700-VII	NDT	35	82.8	0.0	10	30.0
654.	-S2710-VIII	NDT	31	93.5	0.0	3	33.3
655.	-S2720-VII	NDT	40	100.0	0.0	0	-
656.	-S2730-VII	NDT	37	51.3	5.5	21	23.8
657.	-S2740-VIII	NDT	41	65.8	0.0	15	73.3
658.	-S2750-VII	NDT	34	35.3	0.0	33	24.2
659.	-S2760-VIII	NDT	46	89.1	0.0	10	30.0
660.	-S2770-VII	NDT	45	93.3	0.0	3	33.3
661.	-S2780-VI	NDT	43	100.0	0.0	0	-
662.	-S2790-VIII	NDT	17	82.3	0.0	3	33.3
663.	-S2800-VIII	NDT	45	60.0	0.0	22	4.5
664.	-S2810-VII	NDT	37	91.9	0.0	3	33.3

Contd

1	2	3	4	5	6	7
665	C.NO-74335-F_4B-S2820-VII NDT	25	100.0	0.0	0	-
666.	-S2830-VIII NDT	33	81.8	0.0	10	30.0
667	-S2840-VII NDT	14	78.6	0.0	4	0.0
668.	-S2850-VII NDT	39	71.8	0.0	15	20.0
669.	-S2860-VIII NDT	43	88.0	0.0	7	28.6
670.	-S2870-VIII NDT	42	40.5	0.0	34	26.5
671.	-S2880-VII NDT	39	74.3	0.0	19	10.5
672.	-S2890-VIII NDT	26	88.5	0.0	6	0.0
673.	-S2900-VIII NDT	47	93.6	0.0	3	33.3
674.	-S2910	39	41.0	0.0	24	29.2
675.	-S2920-VIII NDT	13	92.3	0.0	1	100.0
676.	-S2930-VII NDT	35	62.8	0.0	18	22.2
677.	-S2940-VII NDT	39	92.3	0.0	5	40.0
678.	-S2950-VIII NDT	41	97.6	0.0	1	0.0
679.	-S2960-VII NDT	37	70.3	0.0	14	28.6
680.	-S2970-VII NDT	35	48.6	0.0	20	45.0
681.	-S2980-VIII NDT	46	95.6	0.0	11	18.2
682.	-S2990-VII NDT	36	66.7	0.0	19	21.0
683.	-S3000-VII NDT	47	91.5	0.0	9	33.3
684.	-S3010-VIII NDT	50	98.0	0.0	1	100.0
685.	-S3020-VIII NDT	32	56.2	0.0	16	37.5
686.	-S3030	32	78.1	0.0	9	22.2
687.	-S3040-VI NDT	13	100.0	0.0	0	-
688.	-S3050-VIII NDT	19	84.2	0.0	6	33.3
689.	-S3060-VIII NDT	50	100.0	0.0	0	-
690.	-S3070-VIII NDT	50	100.0	0.0	0	-
691.	-S3080-VII NDT	38	38.0	0.0	0	-
692.	-S3090-VII NDT	50	96.0	0.0	2	50.0
693.	-S3100	38	92.1	0.0	5	20.0
694.	-S3110-VII NDT	42	69.0	0.0	18	5.5
695.	-S3120-VII NDT	37	81.1	0.0	7	57.1
696.	-S3130-VI NDT	45	97.8	0.0	2	0.0
697.	-S3140-VII NDT	43	88.4	0.0	6	66.7
698.	-S3150-VII NDT	32	81.2	0.0	6	66.7
699.	-S3160-VII NDT	40	62.5	0.0	21	47.6
700.	-S3170-VII NDT	47	74.5	0.0	23	39.1
701.	-S3180-VII NDT	36	69.4	0.0	17	47.0
702.	-S3190	52	71.5	0.0	23	30.4
703.	-S3200-VII NDT	42	73.8	0.0	13	30.8
704.	-S3210-VII NDT	27	88.9	0.0	7	14.3
705.	-S3220-VI NDT	50	98.0	0.0	2	0.0
706.	-S3230-VII NDT	20	95.0	0.0	2	50.0
707.	-S3240-VII NDT	44	65.9	0.0	21	23.8
708.	-S3250-VII NDT	31	83.9	0.0	7	28.6
709.	-S3260-VIII NDT	42	50.0	0.0	31	19.3
710.	-S3270-VII NDT	43	74.4	0.0	15	20.0

Contd.

1	2	3	4	5	6	7
711.	C.NO-74335-F_4B-S328⊗-VII NDT	50	100.0	0.0	0	-
712.	-S329⊗-VII NDT	37	72.9	0.0	13	0.0
713.	-S330⊗-VIII NDT	50	100.0	0.0	0	-
714.	-S331⊗-VII NDT	25	100.0	0.0	0	-
715.	-S332⊗-VII NDT	47	89.4	0.0	5	40.0
716.	ICP-7035-34-4-P2	44	95.4	0.0	3	66.7
717.	ICP-7035-45-4-P1	50	100.0	0.0	0	-
718.	C.NO-75237-F_3B-S1⊗-VII NDT	25	92.0	0.0	2	50.0
719.	-S2⊗-VI NDT	50	80.0	0.0	48	8.3
720.	-S3⊗-VIII NDT	22	90.9	0.0	4	25.0
721.	-S4⊗	43	79.1	0.0	14	21.4
722.	-S5⊗-VIII NDT	39	92.3	0.0	3	66.7
723.	-S6⊗-VII NDT	23	73.9	0.0	9	33.3
724.	-S7⊗-VIII NDT	37	91.9	0.0	3	0.0
725.	-S8⊗	50	100.0	0.0	0	-
726.	-S9⊗	41	92.7	0.0	6	0.0
727.	-S10⊗	46	82.6	0.0	8	0.0
728.	-S11⊗	50	90.0	0.0	7	0.0
729.	-S12⊗	31	61.3	0.0	13	0.0
730.	-S13⊗	18	44.0	0.0	10	70.0
731.	-S14⊗-VIII NDT	25	100.0	0.0	0	-
732.	-S15⊗-VII NDT	25	100.0	0.0	0	-
733.	-S16⊗-VII NDT	50	100.0	0.0	0	-
734.	-S17⊗-VII NDT	31	96.8	0.0	2	0.0
735.	-S18⊗-VIII NDT	42	95.2	0.0	4	25.0
736.	-S19⊗-VII NDT	48	52.0	0.0	26	11.5
737.	-S20⊗-VII NDT	34	76.5	0.0	10	0.0
738.	-S21⊗-VII NDT	42	76.2	0.0	11	36.4
739.	-S22⊗-VII NDT	50	78.0	0.0	19	36.8
740.	-S23⊗-VII NDT	55	63.6	0.0	22	13.6
741.	-S24⊗-VII NDT	50	96.0	0.0	2	100.0
742.	-S25⊗-VII NDT	37	70.3	0.0	14	0.0
743.	-S26⊗-VI NDT	48	91.7	0.0	6	16.7
744.	-S27⊗-VII NDT	38	42.1	0.0	27	29.6
745.	-S28⊗-VII NDT	36	30.5	0.0	32	0.0
746.	-S29⊗-VII NDT	37	89.2	0.0	5	20.0
747.	-S30⊗-VII NDT	38	73.7	0.0	13	53.8
748.	-S31⊗-VI NDT	48	75.0	0.0	21	19.0
749.	-S32⊗-VII NDT	25	96.0	0.0	2	50.0
750.	-S33⊗-VII NDT	43	72.1	0.0	19	10.5
751.	-S34⊗-VI NDT	25	96.0	0.0	2	50.0
752.	-S35⊗-V NDT	50	98.0	0.0	2	0.0
753.	-S36⊗-VII NDT	50	100.0	0.0	0	-
754.	-S37⊗-VII NDT	25	100.0	0.0	0	-

Contd.

1	2		3	4	5	6	7
755.	C.NO-75237-F_3B-S38⊗-VI	NDT	50	100.0	0.0	0	-
756.	-S39⊗-VII	NDT	52	53.8	0.0	30	30.0
757.	-S40⊗-VI	NDT	36	36.1	0.0	24	29.2
758.	-S41⊗-V	NDT	46	97.8	0.0	2	0.0
759.	-S42⊗-VI	NDT	50	100.0	0.0	0	-
760.	-S43⊗-VII	NDT	40	55.0	5.5	26	0.0
761.	-S44⊗-VII	NDT	43	93.0	0.0	3	0.0
762.	-S45⊗-VI	NDT	50	100.0	0.0	0	-
763.	-S46⊗-VII	NDT	47	70.2	0.0	16	12.5
764.	-S47⊗-VII	NDT	47	87.2	0.0	6	16.7
765.	-S48⊗-VI	NDT	50	100.0	0.0	0	-
766.	-S49⊗-VII	NDT	50	100.0	0.0	0	-
767.	-S50⊗-VII	NDT	25	100.0	0.0	0	-
768.	-S51⊗-VII	NDT	25	100.0	0.0	0	-
769.	-S52⊗-VII	NDT	43	95.3	0.0	2	0.0
770.	-S53⊗-VII	NDT	40	90.0	0.0	5	60.0
771.	-S54⊗-VII	NDT	25	100.0	0.0	0	-
772.	-S55⊗-VII	NDT	50	100.0	0.0	0	-
773.	-S56⊗-VII	NDT	50	98.0	0.0	1	0.0
774.	-S57⊗-VII	NDT	50	100.0	0.0	0	-
775.	-S58⊗-VII	NDT	25	100.0	0.0	0	-
776.	-S59⊗-VII	NDT	50	100.0	0.0	0	-
777.	-S60⊗-VII	NDT	34	85.3	0.0	7	0.0
778.	-S61⊗-VII	NDT	43	100.0	0.0	0	-
779.	-S62⊗-VII	NDT	47	72.3	0.0	15	20.0
780.	-S63⊗-VII	NDT	48	58.3	0.0	26	0.0
781.	-S64⊗-VII	NDT	45	80.0	0.0	10	30.0
782.	-S65⊗-VII	NDT	52	86.5	0.0	9	0.0
783.	-S66⊗-VII	NDT	36	91.7	0.0	5	0.0
784.	-S67⊗-VII	NDT	46	89.1	0.0	6	16.7
785.	-S68⊗-VII	NDT	45	75.5	0.0	15	13.3
786.	-S69⊗-VII	NDT	50	44.0	0.0	36	11.1
787.	-S70⊗-VII	NDT	41	85.4	0.0	7	0.0
788.	-S71⊗-VII	NDT	33	96.9	0.0	1	0.0
789.	-S72⊗-VII	NDT	43	58.0	0.0	21	30.0
790.	-S73⊗-VII	NDT	50	100.0	0.0	10	90.0
791.	-S74⊗-VII	NDT	36	88.9	0.0	6	0.0
792.	-S75⊗-VII	NDT	32	75.0	0.0	3	38.5
793.	-S76⊗-VIII	NDT	46	84.8	0.0	11	9.1
794.	-S77⊗-VII	NDT	48	89.6	0.0	5	40.0
795.	-S78⊗		48	79.2	0.0	16	25.0
796.	-S79⊗		48	68.7	0.0	23	4.3
797.	-S80⊗-VII	NDT	46	82.6	0.0	12	16.7
798.	-S81⊗-VII	NDT	15	100.0	0.0	0	-
799.	-S82⊗-VII	NDT	49	97.9	0.0	1	100.
800.	-S83⊗-VII	NDT	50	96.0	0.0	2	50.

1	2		3	4	5	6	7
801.	C.NO-75237-F_3B-S84⊗-VII	NDT	50	88.0	0.0	6	0.0
802.	-S85⊗-VI	NDT	25	52.0	0.0	16	18.7
803.	-S86⊗-VI	NDT	25	96.0	0.0	3	0.0
804.	-S87⊗-VII	NDT	53	69.8	0.0	18	11.1
805.	-S88⊗-VI	NDT	48	60.4	0.0	24	4.2
806.	-S89⊗-VII	NDT	40	87.5	0.0	5	0.0
807.	-S90⊗-VII	NDT	25	92.0	0.0	3	0.0
808.	-S91⊗		36	83.3	0.0	8	0.0
809.	-S92⊗		50	100.0	0.0	0	-
810.	-S93⊗		50	100.0	0.0	0	-
811.	-S94⊗		50	94.0	0.0	3	33.3
812.	-S95⊗		50	98.0	0.0	2	50.0
813.	-S96⊗		47	95.7	0.0	4	25.0
814.	-S97⊗-VI	NDT	44	84.1	0.0	9	55.5
815.	-S98⊗-VII	NDT	39	94.9	0.0	2	50.0
816.	-S99⊗-VII	NDT	35	68.6	0.0	12	66.7
817.	-S100⊗		20	70.0	0.0	12	33.3
818.	-S101⊗-VI	NDT	34	58.8	0.0	18	38.9
819.	-S102⊗-VII	NDT	43	81.4	0.0	12	33.3
820.	-S103⊗-VI	NDT	50	32.0	0.0	43	13.9
821.	-S104⊗-VII	NDT	48	77.1	0.0	14	28.6
822.	-S105⊗-VII	NDT	13	69.2	0.0	5	80.0
823.	-S106⊗-VII	NDT	44	65.9	0.0	21	19.0
824.	-S107⊗-VI	NDT	49	53.1	0.0	29	24.1
825.	-S108⊗-VII	NDT	33	63.6	0.0	13	46.0
826.	-S109⊗-VII	NDT	49	73.5	0.0	21	0.0
827.	-S110⊗-VII	NDT	39	84.6	0.0	11	0.0
828.	-S111⊗-VII	NDT	50	96.0	0.0	3	0.0
829.	-S112⊗-VII	NDT	41	34.1	0.0	30	0.0
830.	-S113⊗-VII	NDT	24	41.7	0.0	17	29.4
831.	-S114⊗-VII	NDT	15	86.7	0.0	3	0.0
832.	-S115⊗-VI	NDT	25	100.0	0.0	0	-
833.	-S116⊗-VI	NDT	50	100.0	0.0	0	-
834.	-S117⊗-VII	NDT	30	96.7	0.0	1	0.0
835.	-S118⊗-VII	NDT	46	100.0	0.0	0	-
836.	-S119⊗-VI	NDT	50	98.0	0.0	2	0.0
837.	-S120⊗-VII	NDT	22	72.7	0.0	8	0.0
838.	-S121⊗-VII	NDT	48	81.2	0.0	9	11.1
839.	-S122⊗-VII	NDT	50	100.0	0.0	0	-
840.	-S123⊗-VII	NDT	33	45.4	0.0	22	13.6
841.	-S124⊗-VII	NDT	26	53.8	0.0	12	8.3
842.	-S125⊗-VII	NDT	35	85.7	0.0	7	0.0
843.	-S126⊗-VII	NDT	50	100.0	0.0	0	-
844.	-S127⊗-VII	NDT	50	100.0	0.0	0	-
845.	-S128⊗-VII	NDT	25	100.0	0.0	0	-

Contd.

1	2	3	4	5	6	7
846.	C.NO-75237-F_3B-S1290-VII NDT	50	96.0	0.0	0	-
847	-S1300-VII NDT	50	100.0	0.0	0	-
848.	-S1310-VI NDT	41	100.0	0.0	1	100.0
849	-S1320-VI NDT	50	96.0	0.0	2	0.0
850.	-S1330	37	100.0	0.0	0	-
851.	-S1340-VI NDT	50	100.0	0.0	0	-
852.	-S1350-VI NDT	50	96.0	0.0	3	0.0
853.	-S1360-VI NDT	50	100.0	0.0	0	-
854.	-S1370-VI NDT	50	100.0	0.0	0	-
855	-S1380-VI NDT	50	90.0	0.0	6	0.0
856	-S1390-VII NDT	25	100.0	0.0	0	-
857.	-S1400-VII NDT	37	100.0	0.0	0	-
858.	-S1410-VII NDT	25	100.0	0.0	0	-
859	-S1420-VII NDT	25	100.0	0.0	0	-
860.	-S1430-VII NDT	25	100.0	0.0	0	-
861.	-S1440-VI NDT	22	77.3	0.0	6	33.3
862.	-S1450-VII NDT	50	100.0	0.0	0	-
863.	-S1460-VI NDT	36	94.4	0.0	4	25.0
864.	-S1470-VI NDT	44	100.0	0.0	0	-
865.	-S1480-VIII NDT	14	71.4	0.0	5	0.0
866.	-S1490-VII NDT	31	64.5	0.0	16	18.7
867.	-S1500-VII NDT	32	87.5	0.0	5	20.0
868.	-S1510-VII NDT	50	100.0	0.0	0	-
869.	-S1520-VII NDT	30	70.0	0.0	16	18.7
870.	-S1530-VII NDT	25	80.0	0.0	7	14.3
871.	-S1540-VII NDT	23	60.9	0.0	9	0.0
872.	-S1550-VIII NDT	27	74.1	0.0	10	40.0
873.	-S1560-VII NDT	36	83.3	16.7	13	23.1
874.	ICP-7186-P2	34	95.8	9.1	14	42.8

APPENDIX-XLVIII

Results of screening of *Phytophthora* resistant F_3 progenies of pigeonpea for sterility mosaic resistance during 1978-79

Sl. No.	Particular	No. of plants	Infected plants	Percent infection
1	2	3	4	5
	BDN-1	22	1	4.54
1.	C.No.74332-P1⊗	43	5	11.62
2.	-P2⊗	35	3	8.57
3.	-P3⊗	43	1	2.32
4.	-P4⊗	19	0	0.00
5.	-P5⊗	26	0	0.00
6.	-P6⊗	25	0	0.00
7.	-P8⊗	8	2	25.00
8.	-P9⊗	30	0	0.00
9.	-P10⊗	42	0	0.00
10.	-P11⊗	26	0	0.00
11.	-P12⊗	17	1	5.88
12.	-P13⊗	41	1	2.43
13.	-P14⊗	44	2	4.54
14.	-P15⊗	36	2	5.55
15.	-P16⊗	15	2	13.13
16.	-P17⊗	35	1	2.85
17.	-P18⊗	25	0	0.00
18.	-P19⊗	33	0	0.00
	BDN-1	25	0	0.00
19.	C.No.74332-P20⊗	36	1	2.77
20.	-P21⊗	36	0	0.00
21.	-P22⊗	46	0	0.00
22.	-P23⊗	37	0	0.00
23.	-P24⊗	13	1	7.69
24.	-P25⊗	8	0	0.00
25.	-P26⊗	35	0	0.00
26.	-P27⊗	15	0	0.00
27.	-P28⊗	30	0	0.00
28.	-P29⊗	27	3	11.11
29.	-P30⊗	44	0	0.00
30.	-P31⊗	37	0	0.00
31.	-P32⊗	44	1	2.72
32.	-P33⊗	37	0	0.00
33.	-P34⊗	39	0	0.00
34.	-P35⊗	23	1	4.34
35.	-P36⊗	32	3	9.37

contd.

1	2	3	4	5
36	C.No. 74332-P370	42	6	14.28
37.	-P380	41	0	0.00
	BDN-1	33	4	12.12
38.	C No.74332-P390	40	2	5.00
39.	-P400	27	4	14.81
40.	-P410	37	2	5.40
41.	-P420	26	1	3.84
42.	-P430	44	8	18.18
43.	-P440	27	0	0.00
44.	-P450	35	1	2.85
45.	-P460	29	1	2.56
46.	-P470	26	0	0.00
47.	-P480	21	0	0.00
48.	-P490	42	1	2.38
49.	-P500	28	0	0.00
50.	-P510	40	1	2.50
51.	-P520	22	0	0.00
52.	-P530	26	4	15.38
53.	-P540	22	1	4.54
54.	-P550	40	0	0.00
55.	-P560	22	0	0.00
56.	-P570	13	0	0.00
	BDN-1	25	0	0.00
57.	C.No. 74332-P580	35	0	0.00
58.	-P590	33	0	0.00
59.	-P600	37	0	0.00
60.	-P610	24	0	0.00
61.	-P620	5	0	0.00
62.	-P630	7	0	0.00
63.	-P640	31	1	3.22
64.	-P650	18	0	0.00
65	-P660	32	0	0.00
66.	-P670	25	0	0.00
67.	-P680	32	0	0.00
68.	-P690	31	0	0.00
69.	-P700	31	2	6.45
70.	-P710	13	0	0.00
71.	-P720	14	0	0.00
72.	-P730	2	0	0.00
73.	-P740	29	0	0.00
74.	-P750	24	0	0.00
75.	-P760	8	0	0.00
	BDN-1	7	0	0.00
76.	C.No.74332-P770	24	0	0.00
77.	-P780	14	0	0.00

contd.

1	2	3	4	5
78.	C.No.74332-P79Ø	31	0	0.00
79.	-P80Ø	21	0	0.00
80.	-P81Ø	15	0	0.00
81.	-P82Ø	30	0	0.00
82.	-P83Ø	16	0	0.00
83.	-P84Ø	7	1	14.28
84.	-P85Ø	2	0	0.00
85.	-P86Ø	5	0	0.00
86.	-P87Ø	13	2	15.38
87.	-P88Ø	28	27	96.42
88.	-P90Ø	32	20	62.50
89.	-P91Ø	25	0	0.00
90	-P93Ø	11	0	0.00
91	C.No.74363-P1Ø	30	1	3.33
92.	-P2Ø	18	0	0.00
93.	-P3Ø	31	0	0.00
94.	-P4Ø	35	0	0.00
	BDN-1	17	4	23.52
95.	C.No.74363-P5Ø	24	3	12.50
96.	-P6Ø	30	0	0.00
97.	-P7Ø	32	6	18.75
98.	-P8Ø	22	0	0.00
99.	-P9Ø	21	3	14.28
100.	-P10Ø	13	5	38.46
101.	-P12Ø	14	1	7.14
102.	-P13Ø	17	1	5.88
103.	-P14Ø	19	0	0.00
104.	-P15Ø	40	1	2.50
105.	-P16Ø	34	0	0.00
106.	-P17Ø	17	6	35.29
107.	-P18Ø	29	0	0.00
108.	-P19Ø	31	0	0.00
109.	-P20Ø	27	0	0.00
110.	-P21Ø	12	0	0.00
111.	-P22Ø	1	0	0.00
112.	-P23Ø	47	3	6.38
113.	-P24Ø	28	0	0.00
	BDN-1	32	3	9.37
114.	C.No.74363-P25Ø	5	0	0.00
115.	-P26Ø	8	0	0.00
116.	-P27Ø	41	0	0.00
117.	-P28Ø	38	0	0.00
118.	-P29Ø	35	0	0.00
119.	-P30Ø	30	0	0.00
120.	-P31Ø	33	0	0.00

contd.

1	2	3	4	5
121.	C.No.74363-P320	42	0	0.00
122.	-P330	21	0	0.00
123.	-P340	29	0	0.00
124.	-P350	21	0	0.00
125.	-P360	25	1	4.00
126.	-P370	5	0	0.00
127.	-P380	4	0	0.00
128.	-P390	-	-	-
129.	-P400	10	0	0.00
130.	-P410	5	0	0.00
131.	-P420	15	0	0.00
132.	-P430	2	0	0.00
	BDN-1	4	0	0.00
133.	C.No.74363-P440	4	0	0.00
134.	-P450	6	0	0.00
135.	-P460	7	0	0.00
136.	-P470	21	0	0.00
137.	-P480	28	0	0.00
138.	-P490	15	1	6.66
139.	-P500	27	0	0.00
140.	-P510	30	0	0.00
141.	-P520	26	0	0.00
142.	-P530	29	0	0.00
143.	-P540	17	0	0.00
144.	-P550	33	0	0.00
145.	-P560	21	0	0.00
146.	-P570	4	0	0.00
147.	-P580	10	0	0.00
148.	-P590	11	0	0.00
149.	-P600	5	0	0.00
150.	-P610	18	0	0.00
151.	-P620	25	0	0.00
	BDN-1	16	2	12.50
152.	C.No.74363-P630	45	0	0.00
153.	-P640	34	1	2.94
154.	-P650	37	0	0.00
155.	-P660	38	0	0.00
156.	-P670	33	1	3.03
157.	-P680	39	0	0.00
158.	-P690	29	0	0.00
159.	-P700	28	0	0.00
160.	-P710	36	0	0.00
161.	-P720	-	-	-
162.	-P730	45	2	4.44
163.	-P740	36	0	0.00
164.	-P750	13	0	0.00
165.	-P760	12	0	0.00

contd.

1	2	3	4	5
166.	C.No.74363-P77Ø	34	0	0.00
167.	-P78Ø	31	0	0.00
168.	-P79Ø	35	0	0.00
169.	-P80Ø	42	1	2.38
170.	-P81Ø	40	0	0.00
	BDN-1	43	3	6.97
171.	C.No.74363-P82Ø	25	0	0.00
172.	-P83Ø	39	0	0.00
173.	-P84Ø	32	0	0.00
174.	-P85Ø	35	0	0.00
175.	-P86Ø	44	0	0.00
176.	-P87Ø	30	2	66.66
177.	-P88Ø	38	0	0.00
178.	-P90Ø	42	0	0.00
179.	-P91Ø	35	0	0.00
180.	-P92Ø	9	0	0.00
181.	-P93Ø	44	1	2.27
182.	-P94Ø	39	2	5.12
183.	-P95Ø	25	0	0.00
184.	-P96Ø	31	0	0.00
185.	-P97Ø	35	0	0.00
186.	C.No.74360-P1Ø	31	1	3.22
187.	-P2Ø	9	0	0.00
188.	-P3Ø	10	0	0.00
189.	-P4Ø	9	0	0.00
	BDN-1	2	0	0.00
190.	C.No.74360-P5Ø	3	0	0.00
191.	-P6Ø	2	0	0.00
192.	-P7Ø	-	-	-
193.	-P8Ø	-	-	-
194.	-P9Ø	-	-	-
195.	-P10Ø	-	-	-
196.	-P11Ø	-	-	-
197.	-P12Ø	1	0	0.00
198.	-P13Ø	2	0	0.00
199.	-P14Ø	2	0	0.00
200.	-P15Ø	11	0	0.00
201.	-P16Ø	16	0	0.00
202.	-P17Ø	17	0	0.00
203.	-P18Ø	30	0	0.00
204.	-P19Ø	31	0	0.00
205.	-P20Ø	16	0	0.00
206.	-P21Ø	29	0	0.00
207.	-P22Ø	24	1	4.16
208.	-P23Ø	36	1	2.77
	BDN-1	42	0	0.00

contd.

1	2	3	4	5
209	C No 74360-P240	32	0	0.00
210	-P250	30	0	0.00
211	-P260	44	1	2.27
212	-P270	37	5	13.51
213	-P280	24	0	0.00
214	-P290	24	6	25.00
215	-P300	2	0	0.00
216	-P310	15	3	20.00
217	-P320	13	0	0.00
218	-P330	1	0	0.00
219	-P340	13	0	0.00
220	-P350	22	0	0.00
221	-P360	12	0	0.00
222	-P370	2	0	0.00
223	-P380	4	0	0.00
224	-P390	1	0	0.00
225	-P400	-	-	-
226	-P410	-	-	-
227	-P420	2	0	0.00
	BDN-1	-	-	-
228	C.No.74360-P440	4	0	0.00
229	-P450	5	0	0.00
230	-P460	11	0	0.00
231	-P470	10	0	0.00
232	-P480	15	0	0.00
233	-P490	3	0	0.00
234	-P500	16	0	0.00
235	-P510	21	0	0.00
236	-P520	14	0	0.00
237	-P530	24	0	0.00
238	-P540	35	1	2.85
239	-P550	19	0	0.00
240	-P560	44	2	4.54
241	-P570	39	2	5.12
242	-P580	41	1	2.43
243	-P590	41	2	4.87
244	-P600	53	1	1.88
245	-P610	44	0	0.00
246	-P620	47	0	0.00
	BDN-1	34	4	11.76
247	C.No.74360-P630	35	2	5.71
248	-P640	23	0	0.00
249	-P650	36	4	11.11
250	-P660	44	1	2.27

contd

1	2	3	4	5
251.	C.No.74360-P67[redacted]	48	0	0.00
252.	-P68[redacted]	45	3	6.66
253.	-P69[redacted]	40	6	15.00
254.	-P70[redacted]	35	1	2.85
255.	-P71[redacted]	26	0	0.00
256.	-P72[redacted]	31	0	0.00
257.	-P73[redacted]	27	0	0.00
258.	-P74[redacted]	23	0	0.00
259.	-P75[redacted]	11	0	0.00
260.	-P76[redacted]	45	0	0.00
261.	-P77[redacted]	7	0	0.00
262.	-P78[redacted]	34	2	5.88
263.	-P79[redacted]	29	0	0.00
264.	-P80[redacted]	39	0	0.00
265.	-P81[redacted]	37	1	2.70
	BDN-1	41	3	7.31
266.	C.No.74360-P82[redacted]	42	5	11.90
267.	-P83[redacted]	41	14	34.14
268.	-P84[redacted]	28	3	10.71
269.	-P85[redacted]	33	3	6.06
270.	-P86[redacted]	34	0	0.00
271.	-P87[redacted]	17	2	11.76
272.	-P88[redacted]	31	0	0.00
273.	-P89[redacted]	32	0	0.00
274.	-P90[redacted]	28	1	3.57
275.	-P91[redacted]	41	1	2.10
276.	-P92[redacted]	32	0	0.00
277.	-P93[redacted]	8	0	0.00
278.	-P94[redacted]	14	1	7.14
279.	-P95[redacted]	36	5	13.88
280.	-P96[redacted]	47	3	6.38
281.	C.No.74332-P1[redacted]	31	4	12.90
282.	-P2[redacted]	38	0	0.00
283.	-P3[redacted]	40	0	0.00
284.	-P4[redacted]	37	1	2.70
	BDN-1	26	5	19.23
285.	C.No.74332-P5[redacted]	41	0	0.00
286.	-P6[redacted]	29	0	0.00
287.	-P7[redacted]	22	2	9.09
288.	-P8[redacted]	32	2	6.25
289.	-P9[redacted]	38	0	0.00
290.	-P10[redacted]	39	2	5.12
291.	-P11[redacted]	43	0	0.00
292.	-P12[redacted]	35	0	0.00
293.	-P13[redacted]	25	1	4.00
294.	-P14[redacted]	30	1	3.33
295.	-P15[redacted]	32	1	3.12

contd

1	2	3	4	5
296.	C.No.74332-P16Ø	19	0	0.00
297.	-P17Ø	26	1	3.84
298.	-P18Ø	8	0	0.00
299.	-P19Ø	25	0	0.00
300.	-P20Ø	4	0	0.00
301.	-P21Ø	13	0	0.00
302.	-P22Ø	3	0	0.00
303.	-P23Ø	18	1	5.55
	BDN-1	13	0	0.00
304.	C.No.74332-P24Ø	2	0	0.00
305.	-P25Ø	4	0	0.00
306.	-P26Ø	1	0	0.00
307.	-P27Ø	1	0	0.00
308.	-P28Ø	2	0	0.00
309.	-P29Ø	1	0	0.00
310.	-P30Ø	-	-	-
311	-P31Ø	-	-	-
312.	-P32Ø	-	-	-
313.	-P33Ø	-	-	-
314.	-P34Ø	3	0	0.00
315.	-P36Ø	-	-	-
316.	-P37Ø	10	0	0.00
317.	-P38Ø	5	1	20.00
318	-P39Ø	2	0	0.00
319.	-P40Ø	3	0	0.00
320.	-P41Ø	-	-	-
321	-P42Ø	-	-	-
322	-P43Ø	-	-	-
	BDN-1	-	-	-
323.	C.No.74332-P44Ø	-	-	-
324.	-P45Ø	-	-	-
325.	-P46Ø	-	-	-
326.	-P47Ø	-	-	-
327.	-P48Ø	1	0	0.00
328.	-P49Ø	1	0	0.00
329.	-P50Ø	-	-	-
330.	-P51Ø	3	0	0.00
331.	-P52Ø	6	0	0.00
332.	-P53Ø	4	0	0.00
333.	-P54Ø	6	0	0.00
334	-P56Ø	18	0	0.00
335	-P57Ø	9	0	0.00
336.	-P58Ø	9	1	11.11
337.	-P59Ø	19	0	0.00
338.	-P61Ø	25	1	4.00
339.	-P62Ø	21	0	0.00
340.	-P63Ø	20	0	0.00

contd.

1	2	3	4	5
341.	C.No.74332-P640	6	0	0.00
	BDN-1	20	1	5.00
342.	C.No.74332-P650	8	0	0.00
343.	-P660	9	2	22.22
344.	-P670	18	0	0.00
345.	-P680	8	0	0.00
346.	-P690	22	2	9.09
347.	-P700	33	3	9.09
348.	-P710	45	3	6.66
349.	-P720	20	0	0.00
350	-P730	15	1	6.66
351	-P740	10	0	0.00
352	-P750	23	0	0.00
353	-P760	25	1	4.00
354	-P770	32	1	3.12
355	-P780	40	2	5.00
356	-P790	30	0	0.00
357.	-P800	33	0	0.00
358	-P810	39	0	0.00
359.	-P820	41	0	0.00
360	-P830	31	0	0.00
	BDN-1	36	12	33.33
361.	C.No.74332-P840	33	0	0.00
362.	-P850	20	0	0.00
363	-P860	19	0	0.00
364.	-P870	11	0	0.00
365.	-P890	8	0	0.00
366.	-P900	16	0	0.00
367.	-P910	32	2	6.25

APPENDIX-XLIX

Brief report on trips to Parbhani, Jabalpur, Dharwar, Hissar, Kanpur, Varanasi, and Faizabad

Y.L. Nene

The above locations were visited at different times between November 27 - December 19, 1978 as follows:

Nov.27 - Dec.01	:	Parbhani and Jabalpur
Dec.07 - Dec.09	:	Dharwar/Annigeri
Dec.14 - Dec.19	:	Hissar, Kanpur, Varanasi, and Faizabad

Purpose : Except Hissar, all the other locations were visited to see the performance of ICRISAT pigeonpea entries in the All India National Uniform Trial for pigeonpea wilt/sterility mosaic resistance. Hissar was visited to see (i) experiments on chickpea stunt and (ii) check on chickpea wilt incidence in the plot which is being developed as a sick plot.

PARBHANI

Contact : Dr. K.K. Zote, Pulse Pathologist

Other scientists met : Drs. Mai, Mali, Godbole and Kore

Notes

1. In spite of being an old wilt-sick plot, the plot was not uniformly 'sick'. This is partly because no special attempt has been made to ensure uniform wilt sickness. Fortunately, however, ICRISAT material was by chance planted in the uniformly sick area of the plot.

2. The wilt susceptible check, 1258, was planted after every two ICRISAT entries. The incidence of wilt in the susceptible check varied between 80-100 percent.

3. Performance of ICRISAT entries has been given in Table 1. All entries, except ICP-8864 and -8866, were doing extremely well.

Notes

4. Out of all other entries (about 25) in the All India trial, only AWR-74/15 from Kanpur was doing as well as ICRISAT entries.

5. Until last year Parbhani scientists were growing one susceptible check row after every 10 test rows. There was appreciation of our (ICRISAT) method of having one susceptible check row after every two test rows.

6. Cultivar, C-11, which shows susceptibility at ICRISAT, was standing well in the sick plot. We shall obtain seed of this C-11 from Parbhani for testing at ICRISAT.

7. Cooperation of Parbhani scientists with ICRISAT is excellent.

JABALPUR

Contact : Mr. S.R. Kotasthane, Pulse Pathologist

Other scientists met : Drs. Sharma (breeder), Vyas (pathologist), Srivastava (germplasm botanist), and Jain (Head, pathology department)

Notes

1. The plot was not uniformly sick. The susceptible checks, ICP-6997 and HY-2, were showing between 40-60 percent wilt.

2. Performance of ICRISAT entries has been given in Table 1. All the entries were doing extremely well. Only ICP-8866 was showing relatively more wilt.

3. I happened to see the germplasm block. Sterility mosaic was severe. Some collections from Orissa were disease-free.

DHARWAR

Contact : Dr. R.V. Hiremath, Pulse Pathologist

Other scientist met : Dr. R.G. Hegde (Head, pathology)

Notes

1. The pigeonpea wilt-sick plot is maintained at the Research Station Annigeri, about 30 km from Dharwar

2. The wilt-sick plot has been there since 1935 but not maintained well. Therefore the wilt sickness is not uniform.

3. Once again, as in Parbhani, ICRISAT entries got planted by chance in that part of the plot where sickness was relatively more uniform. Susceptible check, 1258, was showing 65-100 percent wilt.

4. Performance of ICRISAT entries has been given in Table 1. The wilt incidence at this location was more in all the entries as compared to Parbhani and Jabalpur. ICP-8861, -8863, and -8867 were better than others. All entries, however, were much better than entries from other stations in India. However C-11, 15-3-3, and AWR-74/15 were better amongst Indian entries.

5. I gave an informal talk to post-graduate students of the Department of Plant Pathology.

KANPUR

Contacts : Dr. Laxman Singh (Project Director, Pulse Research) and Dr. Prabhakar Shukla (Pulse Pathologist)

Other scientists met : Dr. H.K. Saksena (Head, Plant Pathology), Mr.R R Singh.

Notes

1. Gave a lecture on pigeonpea pathology work at ICRISAT to the staff of the Regional Research Station (RRS).

Notes

2. Saw the pigeonpea germplasm block of the RRS. Also saw "sterility mosaic resistant" lines sent by ICRISAT pigeonpea breeders. There were isolated mosaic affected plants in the whole germplasm block; therefore no conclusions could be drawn.

3. The pigeonpea wilt-sick plot is not uniformly sick. Phytophthora blight killed many plants. In the remaining plants of ICRISAT entries, no wilt was seen in ICP-8860, -8863, and -8869. All others, except ICP-8864 and -8865, showed traces of wilt. The data have been included in Table 1.

4. Saw chickpea plantings at RRS and could see about 5 percent root rot due to *Rhizoctonia solani*. The preceding crop was paddy.

5. Many chickpea entries of ICRISAT in the International Chickpea Root Rots/Wilt Nursery 1978-79 were showing wilt. We already have evidence to indicate the existence of a distinct physiologic race of *Fusarium oxysporum* f.sp. *ciceri* in Kanpur wilt-sick plot.

VARANASI

Contacts : Mr. R.B. Singh (Ph.D. student) and Dr. U.P. Singh

Other scientists met : Mr. Pundir of ICRISAT, and Mr. Chauhan (Research Assistant)

Notes

1. Although wilt incidence was severe, the plot was not fully uniform in its sickness.

2. Performance of ICRISAT entries has been given in Table 1. Eight entries out of 12 showed little wilt. ICP-8858, -8862, -8866, and -8869 showed higher wilt incidence than observed at any other location.

3. Susceptible checks were planted less frequently; one susceptible check row after about 10 test rows.

Notes

4. AWR-74/15 from Kanpur had low wilt as at other locations including ICRISAT.

5. Purple 1 of Varanasi showed resistance. At ICRISAT this line has done very well.

FAIZABAD

Contact : Dr. R.N. Singh

Notes

1. Pigeonpea lines found resistant to sterility mosaic at ICRISAT were sent to Faizabad. The disease incidence was low and none of the ICRISAT lines had any mosaic affected plant. Therefore conclusions can not be drawn. I suggested that they should ratoon all the entries and staple-inoculate fresh leaves.

2. ICRRWN was observed. Susceptible check-JG-62 was showing wilt. Stunt was more common.

HISSAR

Notes

1. Chickpea wilt is developing in the plot which is marked as wilt-sick plot for future use.

2. Plot where advance generation (F_5) material was planted had severe wilt incidence. We will have to discuss ways of avoiding wilt in plots where we do not want it.

3. The chickpea stunt nursery had poor germination. Susceptible check, WR-315, was showing high stunt incidence.

4. We (M.V. Reddy and I) saw a disease, possibly viral, which could not be identified. We will keep a watch on this disease.

5. We worked out an informal cooperative arrangement for basic work on chickpea stunt with Dr.J.P.Verma. Dr. Verma is a well-known virologist and has agreed to cooperate with us.

Notes

6. Dr.R.K. Grover, Professor of Plant Pathology, has put a student on chickpea wilt/root rots. He told me that *Verticillium sp.* and *Cephalosporium sp.* have been isolated from wilted plants. If pathogenicity is confirmed, these will be new records for India.

DELHI

I spent a couple of hours with Dr. J.S. Grewal, Principal Investigator (Plant Pathology) in the All India Pulse Improvement Project and had very useful discussions with him. I told him whatever observations I had made on pigeonpea wilt during these trips.

APPENDIX-L

Report on visit to Dholi, Bihar (April 4-6, 1979)

M.V. Reddy

The purpose of the visit was to study the performance of ICRISAT pigeonpea entries in Sterility mosaic national uniform nursery jointly conducted by AICPIP and ICRISAT. The nursery was organised from this year only and it consisted of 12 entries, from ICRISAT. It was grown at 6 different locations in India including Dholi. The other locations were Pantnagar (U.P.) Faizabad (U.P.) Varanasi (U.P.) Dharwar (KS) and Hyderabad. The main purpose of the nursery was to study the performance of the lines found resistant at ICRISAT, at other locations where the disease is a problem. It also aimed at knowing if any variability exists in the pathogen.

Dr. Jagadish Kumar, chickpea breeder who had earlier visited Dholi informed that ICRISAT entries in the nursery were showing susceptibility. It was surprising as the lines entered in the nursery were resistant at ICRISAT for at least two years under artificial inoculation conditions. Meanwhile a letter from Dr. J.S. Grewal, Principal Investigator, Pathology, AICPIP, was also received saying that ICRISAT entries were showing susceptibility at Dholi. He suggested ICRISAT Pathologists to visit Dholi.

A visit was undertaken on 4th April. Dr. Mahmood, Pulse Pathologist and his colleagues were very helpful in showing the nursery. The nursery was planted in two replications. Each entry was planted in 2 five meter rows in each replication. After each entry 2 rows of BDN-1 were planted as susceptible check. All the entries were in advanced state of maturity. Quite a few plants had died in some entries. Some entries were in defoliated state.

BDN-1, the susceptible check was showing 100% infection. Entries: ICP-8501, -8849, -8852, -8854, -8855, -8856 and 8857 were having enough fresh growth to facilitate symptom study. The fresh growth in these lines was showing symptoms which are not typical of sterility mosaic. The leaf size was very much reduced and they were in bunches because of drastic reduction in internodal length. Typical mosaic mottle was not clear which generally happens in the latter stages of crop growth. None of the plants were bearing pods. Flowering appeared to have occurred but they dropped off without setting pods. It was evident from the scars left on the peduncles. The growth of the plants was stunted. In other lines: ICP-8847, -8848, -8850, and -8851, some plants were showing similar symptoms. Data on the exact number of plants infected in each line was not possible at this late stage. It would have been clear if the symptoms were studied in early stages of growth. ICP-8853 was also showing infected plants. But the symptoms were typical of sterility mosaic. The healthy plants were bearing pods normally.

The disease incidence in the farmers fields all the way from Patna to Dholi was very alarming. None of the fields was free. The incidence varied from 50-100%. Several fields were left over without harvesting. The incidence in Dholi farm was also very high. Incidence in 1258 was more than 50%. Pathologists at Dholi expressed that the incidence in 1258 in earlier years used to be less than 5%. The reasons for very high disease incidence this year need to be investigated.

Before drawing any final conclusion on the susceptibility of ICRISAT entries at Dholi (All these entries were reported resistant at Faizabad Research centre in U.P.) the aspects to be investigated are:

1. To study the symptom picture on the resistant lines from seedling stage onwards.

2. To find out whether the disease affecting in lines at Dholi is sterility mosaic or some thing else.

3. To find out whether the different symptoms expressed by the lines is due to genotypic effect and

4. To see whether the eriophyid mite involved at Dholi is *Aceria cajani* or different one.

Diseased leaves with eriophyid mites were brought from Dholi and the above aspects are being investigated.

Table 1. Incidence of wilt in the pigeonpea lines entered by ICRISAT in the All India Uniform pigeonpea wilt trial[a]

ICP No.	ANNIGERI			ICRISAT[b]			JABALPUR			KANPUR[c]			PARBHANI			VARANASI		
	WP	TP	%	WP	TP	%	WP	TP	%	WP	TP	%	WP	TP	%	WP	TP	%
8858	7	55	12.7	17	44	38.6	0	42	0.0	1	17	5.8	0	85	0.0	18	37	48.6
8859	8	50	16.0	3	42	7.1	0	38	0.0	2	13	15.3	2	78	2.5	0	37	0.0
8860	10	63	15.8	2	28	7.1	0	50	0.0	0	19	0.0	1	87	1.1	1	43	2.3
8861	3	61	4.9	9	42	21.4	0	54	0.0	-	-	-	0	81	0.0	0	41	0.0
8862	7	60	11.6	11	33	33.3	1	49	2.0	-	-	-	1	79	1.2	16	41	39.0
8863	2	78	2.5	1	40	2.5	0	46	0.0	0	24	0.0	0	80	0.0	1	37	2.7
8864	11	68	16.1	13	39	33.3	0	58	0.0	5	37	13.5	6	78	7.6	1	34	2.9
8865	8	72	11.1	2	36	5.5	0	55	0.0	7	22	31.8	2	82	2.4	2	41	4.8
8866	6	56	10.7	6	32	18.7	5	51	9.8	2	16	12.5	4	78	5.1	11	36	30.5
8867	5	66	7.5	2	40	5.0	1	55	1.8	-	-	-	0	80	0.0	1	36	2.7
8868	8	71	11.2	12	34	35.2	0	51	0.0	1	14	7.1	1	82	1.2	0	37	0.0
8869	7	62	11.2	2	38	5.2	1	51	1.9	0	4	0.0	1	83	1.2	21	41	51.2
Susceptible check[d]	-	-	65-100	-	-	100.0	-	-	40-60	-	-	50-100	-	-	80-100	-	-	60-70

[a]Period of observations Nov. 27-Dec. 18, 1978

[b]ICRISAT data included for the purpose of comparison

[c]Phytophthora blight caused a lot of damage; some lines destroyed completely

[d]Range of wilt incidence in rows of susceptible checks planted intermittently

Soil types: Vertisol at Annigeri, Jabalpur, and Parbhani; Alfisol at ICRISAT; Alluvial at Kanpur and Varanasi

WP - Wilted plants; TP - Total plants; % - Percent wilt

PROMISING LINES: ICP-8859, -8860, - 8861, -8863, and -8867.

APPENDIX-LI

PUBLICATIONS

Published

1. Kannaiyan, J., and Y.L. Nene. 1977. Alternaria leaf spot of pigeonpea. Tropical Grain Legume Bulletin No.9: 34.

2. Kannaiyan, J., and Y.L. Nene. 1978. Screening of pigeonpea for resistance to Phytophthora blight. Third International Congress of Plant Pathology, Munchers, 16-23 August 1978: 302 (Abstract).

3. Kannaiyan, J., D.C. Erwin, O.K. Ribeiro, and Y.L. Nene. 1979. *P. drechsleri* f. sp. *cajani*, the causal organism of blight of pigeonpea in India. Phytophthora Newsletter No.7: 32-33.

4. Kannaiyan, J., and O.K. Ribeiro. 1979. *Phytophthora cryptogea:* Oospore formation in single culture at low temperature. Phytophthora Newsletter No.7: 13.

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6. Kannaiyan, J., and Y.L. Nene. 1979. Association of different *Fusarium* species with wilt disease of pigeonpea. Tropical Grain Legume Bulletin No. 15: 26-27.

7. Kannaiyan, J., and Y.L. Nene. 1979. Occurrence of powdery mildew on *Atylosia* species. Tropical Grain Legume Bulletin No.15: 22-23.

Accepted

1. Kannaiyan, J., O.K. Ribeiro, D.C. Erwin and Y.L. Nene. 1979. Phytophthora blight of pigeonpea in India. Mycology (in press).

Communicated

1. Kannaiyan, J., Y.L. Nene and V.K. Sheila. 1979. Control of mycoflora associated with pigeonpea seed. Seed Research.

2. Reddy, M.V., and Y.L. Nene. 1979. Influence of sterility mosaic resistant pigeonpeas on multiplication of the mite vector.

3. Reddy, M.V., and Y.L. Nene. 1979 Additional hosts of pigeonpea sterility mosaic virus and its vector

Presented

1. Nene, Y.L., J. Kannaiyan, M.P. Haware, and M.V. Reddy 1979 Review of the Work Done at ICRISAT on Soil-Borne Diseases of Pigeonpea and Chickpea - Prepared for the Consultants Group Discussion on the Resistance to Soil-Borne Diseases of Legumes January 8-11, 1979, ICRISAT, Hyderabad, India

2. Kannaiyan, J., Phytophthora blight of pigeonpea in India. At University of California, Riverside, U.S.A.

3. Reddy, M.V., and Y.L. Nene 1978. Sources of Resistance in Pigeonpea to Sterility Mosaic disease Paper presented at 7th meeting of the International Working Group on Legume Viruses. 24-25 August, 1978, Zurich, Switzerland.

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