INTERNATIONAL PEARL MILLET DISEASE RESISTANCE TESTING PROGRAM

(IPMDRTP)

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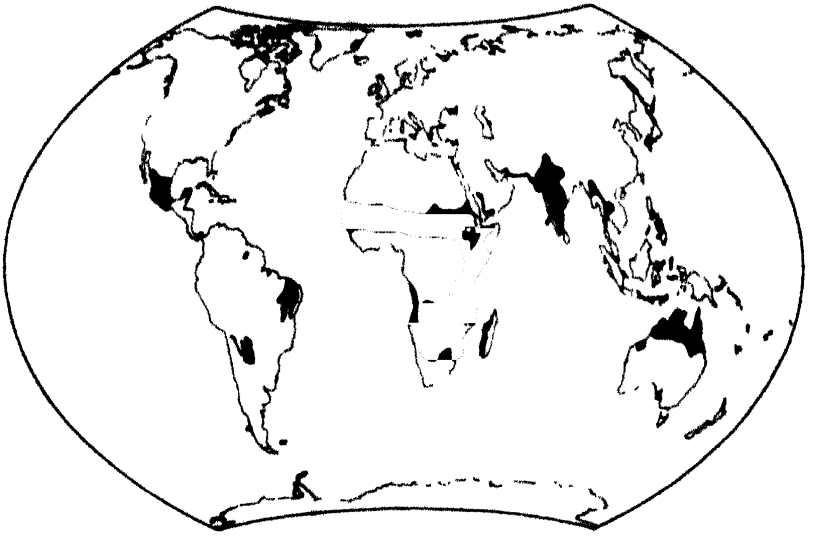
RP

Progress Report: PMPDM 8001



REPORT OF THE 1979 PRE-IPMDMN

ICRISAT

International Crops Research Institute for the Semi-Arid Tropics

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1980

INTRODUCTION

The acceptance of the concept of multilocational testing for identification of stable disease resistance led in 1976 to the establishment of the International Pearl Millet Disease Resistance Testing Program containing the International Pearl Millet Downy Mildew Nursery (IPMDMN). In the IPMDMN 40 to 50 elite resistant materials are tested by cooperators throughout India and West Africa for reactions to the local downy mildew populations From the results of the 1976 IPMDMN (and other trials) it was obvious that certain locations (particularly some in West Africa) provided much more severe downy mildew (DM) pressure than others. In early 1977, in discussion with several pathologists from other programs, it was decided that a PRE-IPMDMN trial should be established in which a large number of IPMDMN candidate entries are tested at a few key locations Those succeeding would then go into the IPMDMN in the following year So in 1977 the PRE-IPMDMN program was initiated with the cooperation of colleagues at H ssar in India and at Samaru, Nigeria and Kamboinse, Upper Volta in West Africa The results from the 1978 PRE-IPMDMN were interesting and useful (see Report on the 1978 PRE-IPMDMN) and it was decided to continue this nursery annually

COOPERATORS IN THE 1979 PRE-IPMDMN

Cooperators and locations in the 1979 PRE-IPMDMN

J A. Frowd - Kamboinse, Upper Volta

N.V Sundaram - Samaru, Nigeria

D P Thakur - Hissar, India

S.D Singh - ICRISAT Center, India

TEST ENTRIES

The 150 test entries consisted of promising population progenies DM resistant in the ICRISAT Center DM screening nurseries and new germplasm and breeders lines from regions that had previously been shown to be good sources of DM resistance. Cooperators were requested to plant a local susceptible check at intervals throughout the trial.

NURSERY MANAGEMENT

Cooperators were requested to plant the trial in two replications in a DM nursery with assured high inoculum provided by prior-planted infector rows and/or the use of a DM sick-plot. The local susceptible was to be planted after every ten entries throughout the nursery.

RESULTS

The detailed data for each location by replication including plant population, and final incidence and infection index (severity) values are presented in Table 1 and 2

Plant population was generally adequate at ICRISAT Center, Kamboinse and Hissar. At Samaru most entries had low plant population. We believe that at least 30 plants are needed to give a reliable DM rating and that the entries should be replicated.

PERFORMANCE OF ENTRIES AT DIFFERENT LOCATIONS

A summary of results is presented in Table 3 and the entries ranked on the across location mean severity values.

SAMARU

DM developed in all the test entries and severity ranged from 2 to 75 percent. Twenty five entries were DM low susceptible (≤10% severity). DM severity on local susceptible checks ranged from 9 to 33 percent.

KAMBOINSE

DM pressure on test entries was comparatively less than at Samaru. Thirteen entries were DM free, and an additional 70 entries were in the low susceptible category. The highest DM severity was 93 percent on SC1-8155 DM severity in the local susceptible checks averaged 39 percent, with a range of 22 to 53 percent.

ICRISAT CENTER

Sixteen entries were DM free, and 115 were low susceptible. The remaining 22 entries, with the exception of J-265-2 (27% DM), had ≤22 percent DM On the local susceptible checks DM severity ranged from 61 to 81 percent

HISSAR

Only 49 entries developed DM. DM severity for 44 entries was less than 10 percent, and on the remaining five DM severity was not more than 20 percent The DM severity on the local susceptible checks ranged from 82 to 89 percent, the highest of all the locations.

PERFORMANCE OF ENTRIES ACROSS LOCATIONS

No entry was DM free, 14 entries had less than 10 percent DM severity in all replications at all locations, and 31 entries had no more than 15 percent severity in any replication at any location. Most of these entries will enter the 1980 IPMDMN.

As in previous years distinct differential reactions of entries were observed between India and Africa, and between certain African locations (Table 4). Generally, entries resistant in India were susceptible in Africa. Differences in the level of susceptibility of several entries between India and Africa and between African locations were also evident.

DISCUSSION

Despite the low DM severity on the entries used as local susceptible at Samaru and Kamboinse, the screening of test entries has been effective at the four locations. A large number of resistant entries were identified for wide scale testing through IPMDMN program. Entries with distinct differential reactions will be further tested in International Pearl Millet Downy Mildew Differential trial. If their differential reaction is confirmed they will be included in the downy mildew differential set.

ENTRIES FOR THE 1980 PRE-IPMDMN

The bulk of the test entries for the PRE-IPMDMN will come through the ICRISAT Center DM screening program. Additional entries for this annual trial are welcome from scientists from national and regional programs, provided they have been shown to be DM resistant at the home location. Because of plant quarantine requirements in India, seed sent from abroad will take one year before it can be included in the trial.

SEED SUPPLY

Seeds of entries listed in this report are available to any scientist. Please send seed requests to the Principal Pathologist (Millet) at ICRISAT Center (address is given on the cover of this report) indicating that the seed requested is from the 1979 PRE-IPMDMN entries.

Table 1. Plant population, downy mildew incidence (%) and severity (%) of 150 test entries and local susceptible in the 1979 PRE-IPMDMN at Samaru and Kamboinse.

Entry	SAMARU						KAMBOINSE					
	Total plants		Incidence		Severity		Total plants		Incidence		Severity	
	R-1	R-2	R-1	R-2	R-1	R-2	R-1	R-2	R-1	R-2	R-1	R-2
J 78-1	42	19	35 7	36.8	32.7	15.8	42	48	16.2	19.4	13.5	9.7
700770	33	30	24.2	23.3	13.6	15.0	34	42	3.2	5.6	3.2	5.6
700158	37	29	45.9	10.3	42.6	7.8	38	42	0	2.2	0	2.2
700335	29	35	17.2	17.1	13.8	9.3	51	40	5.7	3.0	5.7	3.0
700349	23	20	30.4	10	22.8	5	34	39	0	15.8	0	11.8
J 102-SB	35	31	31.4	9.7	27.1	5.6	62	44	24.3	7.7	19.6	5.1
700278	16	14	25	14.3	25	14.3	44	44	3.1	0	2.3	0
700622	32	11	28.1	18.2	27.3	18.2	47	31	2.9	10.7	0.7	4.5
700560	23	16	17.4	18.8	17.4	10.9	40	37	0	2.6	0	2.0
700537	14	26	28.6	3.7	25	1.9	40	41	0	5.3	0	4.6
700254	34	25	35.3	32.0	31.6	27.0	34	44	21.4	11.9	19.6	10.7
700546	9	29	11.1	6.9	11.1	4.3	45	38	4.8	0	4.8	0
700647	31	19	32.3	15.8	22.6	14.5	28	46	4.3	21.9	2.2	19.5
700179	34	27	23.5	14.8	19.9	9.3	48	41	0	2.5	0	2.5
700556	7	14	42.9	28.6	39.3	19.6	47	39	27.3	9.1	25.8	6.1
700572	22	35	22.7	17.1	15.9	12.1	34	22	3.0	28.6	3.0	17.9
700561	24	29	20.8	20.7	14.6	14.7	39	37	0	0	0	0
700486	14	25	21.4	8	21.4	7	45	41	20.7	6.3	20.7	4.7
700711	40	14	7.5	14.3	5.6	10.7	45	42	21.1	7.7	17.8	6.4
700489	13	34	38.5	17.6	38.5	12.5	36	45	8.1	0	7.4	0
700568	7	8	28.6	37.5	25	18.8	46	37	20.7	0	15.5	0
J-264	-	6	-	0	-	45.8	44	46	2.8	27.0	2.8	25.0
700482	17	22	41.2	9.1	39.7	9.1	52	39	7.7	2.3	6.4	2.3
700787	37	9	21.6	22.2	18.9	16.7	48	43	9.4	7.1	9.4	4.5
700479	37	35	24.3	28.6	18.2	20	53	38	2.4	0	1.8	0
700599	32	25	18.8	12.0	14.8	11.0	24	35	9.1	0	4.5	0
700724	5	16	40	25	25	10.9	47	49	0	0	0	0
700590	25	38	20	5.3	17	5.3	38	45	0	0	0	0
700688	23	9	30.4	33.3	21.7	25	31	25	22.9	3.7	19.3	1.9
700619	40	29	10	13.8	9.4	6.9	49	30	2.7	10.0	2.7	7.5
J-215-1	38	41	13.2	4.9	10.5	2.4	33	39	6.7	5.4	2.5	2.0
J-238	30	21	36.7	57.1	29.2	50.0	41	47	2.9	8.6	2.9	8.6
700742	33	26	42.4	34.6	35.6	27.9	41	42	51.4	37.0	49.3	30.6
700490	37	35	29.7	14.3	24.3	10.0	45	37	20.0	16.1	15.7	8.1
700487	37	33	32.4	15.2	26.4	12.9	49	45	2.5	2.4	0.6	1.8
J-52-SB	16	21	56.3	23.8	32.8	11.9	56	27	20.0	50.0	17.9	43.3
700576	15	20	13.3	10.0	8.3	5.0	37	37	6.8	3.0	6.8	1.5
J-71	43	29	51.2	27.6	34.3	19.8	41	37	55.2	65.7	46.6	57.9
700549	37	16	13.5	12.5	11.5	6.3	44	31	32.4	27.6	27.2	24.1
J-64	38	43	36.8	30.2	34.9	18.0	29	29	15.4	0	13.5	0

Table 1. contd.

Entry	SAMARU						KAMBOINSE					
	Total plants		Incidence		Severity		Total plants		Incidence		Severity	
	R-1	R-2	R-1	R-2	R-1	R-2	R-1	R-2	R-1	R-2	R-1	R-2
700255	35	36	37.1	25	29.3	19.4	40	41	31.4	4.8	30.7	4.2
700583	32	39	21.9	7.7	21.9	6.4	36	41	0	0	0	0
700797	25	31	40	3.2	34	3.2	44	47	0	0	0	0
SDN 720-1	17	24	23.5	41.7	17.6	30.2	40	48	14.3	12.5	14.3	6.9
J 92-1	16	3	12.5	0	12.5	0	40	35	7.1	0	7.1	0
J 83-1	1	4	100	50	100	50	48	28	29.5	18.5	24.4	13
J-163-1	32	5	46.9	20	36.7	5	52	33	30.8	20	29.5	18.3
J-76	17	29	23.5	17.2	14.7	12.1	39	48	10.3	14.3	6.9	12.5
700633	20	5	15	0	11.3	0	42	39	2.7	3.6	2.0	3.6
700491	30	23	23.3	30.4	22.5	17.4	37	28	3.7	12.1	3.7	9.1
700687	39	8	12.8	12.5	10.3	12.5	52	35	4.5	9.1	4.5	8.3
J-192-1	7	36	85.7	16.7	75	11.8	43	39	30.9	8.3	26.2	7.6
J-234-1	34	3	23.5	33.3	23.5	25.0	53	45	5.4	28.1	4.1	25.8
700593	12	11	8.3	9.1	6.3	4.5	40	41	55.6	9.5	49.1	6.5
J-150-1	32	8	21.9	100	19.5	78.1	25	45	0	0	0	0
700706	13	7	23.1	0	11.5	0	43	38	11.8	5.7	8.8	1.4
J-201-1	9	9	22.2	11.1	22.2	8.3	43	12	14.6	16.7	11.6	8.3
700646	7	7	14.3	14.3	3.6	7.1	46	45	16.1	15.6	16.1	14.1
J-260-2	33	13	45.5	23.1	33.3	9.6	42	37	14.3	17.2	12.1	10.3
J-123-1	20	18	80	33.3	71.3	20.8	43	41	50	32.6	44.5	30.8
700781	11	35	27.3	11.4	27.3	9.3	47	41	0	2.6	0	2.0
J-85-1	41	39	26.8	10.3	22	5.1	43	31	11.1	46.7	9.0	40.8
700792	20	3	20	0	15	0	37	36	0	3.8	0	3.8
700596	40	34	15	23.5	12.5	14	46	41	40.7	21.4	37.0	17.9
700612	38	15	15.8	26.7	11.8	21.7	39	48	12.5	10.0	10.2	5.0
SDN-714	39	34	5.1	11.8	5.1	11.8	43	45	15.6	5.9	12.5	3.7
B282x3/4 EB 100-9	9	16	33.3	6.3	22.2	3.1	42	45	97.2	66.7	94.4	59.8
J-262	8	17	37.5	11.8	31.3	5.9	33	48	9.1	5.4	6.8	3.4
J 1644x3/4 S6-2	31	37	12.9	23.7	11.3	19.1	42	33	68.9	18.4	63.8	14.5
J 1644x3/4 S6-3	37	40	24.3	10	16.9	9.4	43	48	32.5	22.7	23.8	19.9
3/4 HK 128-1	14	32	92.9	12.5	58.9	7.8	38	48	25	2.4	22.7	1.8
3/4 EB 171-2	40	14	17.5	28.6	14.4	28.6	45	33	37.8	19.4	35.1	16.9
R-58-8-3-1	42	35	4.8	31.4	4.8	29.3	49	35	0	9.7	0	8.9
R-310-4-3-3	26	29	11.5	6.9	9.6	4.3	41	40	0	0	0	0
R-303-5-4-4	21	31	19.0	12.9	13.1	8.9	36	46	5.4	0	3.4	0
R-238-1-2-2	16	7	12.5	14.3	10.9	7.1	38	50	13.9	42.9	10.4	32.1
R-238-1-2-1	37	37	10.8	24.3	8.8	16.2	41	36	4.5	20	1.7	16.7

Table 1 contd.

Entry	Total plants		Incidence		Severity		Total plants		Incidence		Severity	
	R-1	R-2	R-1	R-2	R-1	R-2	R-1	R-2	R-1	R-2	R-1	R-2
R-238-1-1-5	3	27	33.3	29.6	16.7	14.8	26	32	0	0	0	0
R-238-1-1-2	42	35	28.6	15.8	23.8	9.2	39	43	28.1	19.5	22.7	17.1
R-203-4-3-2	36	12	22.2	33.3	19.4	18.8	39	40	3.3	4.8	3.3	3.6
R-203-4-3-1	20	-	20	-	16.3	-	43	43	2.7	2.9	2.0	2.2
R-203-4-1-3	27	38	70.4	34.2	63.9	25.7	48	45	0	4.5	0	4.5
R-203-4-1-1	42	36	64.3	33.3	34.5	25.7	48	43	2.9	0	2.9	0
EC(S4)-211-1	36	39	44.4	0	34.7	0	48	38	4.3	0	3.3	0
EC (S4)-86-4	28	15	35.7	20	21.4	8.3	36	41	13.5	3.0	13.5	0.8
EC(S4)-129-6	26	5	50	20	29.8	10	42	43	35.1	29.7	25.7	16.2
EC(S4)-177-1	35	5	8.6	0	7.9	0	37	34	65.7	20	61.4	15.8
EC(S4)-177-4	13	19	53.8	15.8	32.7	7.9	35	32	85.7	100	79.5	97
EC(S4)-177-5	25	12	56	16.7	43	14.6	28	35	41.7	57.1	38.5	45
EC(S4)-69-10	34	18	52.9	50	33.8	44.4	26	43	92	96.6	89	91.4
EC(S4)-29-4	38	35	68.4	42.9	65.8	38.6	35	43	23.5	56.4	21.3	52.6
EC(S4)-10-4	24	36	11.8	8.3	9.6	5.6	45	44	0	2.5	0	0.6
IVS-P77	37	37	5.4	24.3	3.4	16.9	37	47	11.1	2.9	9.3	2.9
WC-B77	39	30	30.8	10.0	26.3	5.8	46	44	21.1	13.5	16.4	13.5
MC-K77	40	44	17.5	20.5	12.5	13.1	37	34	18.6	22.6	18.6	17.7
WC-8015	25	36	24	11.1	14	8.3	43	40	0	21.2	0	14.4
WC-8082	29	14	10.3	21.4	10.3	17.9	45	38	0	2.9	0	0 7
WC-8097	38	37	52.6	24.3	41.4	18.9	52	46	2.3	5.4	1.1	5.4
WC-8129	39	38	46.2	13.2	35.9	9.2	45	34	0	14.7	0	10.3
WC-8189	40	38	25	26.3	15	24.3	40	45	7.7	13.5	6.7	9.5
WC-8220	32	16	12.5	0	8.6	0	38	45	3.4	0	3.4	0
IVS-8038	38	35	21.1	8.6	15.1	5	47	45	5.9	10.5	2.9	9 9
IVS-8088	28	25	32.1	12	29.5	9	35	36	20	18.9	20	16.2
IVS-8093	40	31	15	12.9	8.1	9 7	23	45	28.6	9.8	20.2	9.1
IVS-8172	27	27	14.8	11.1	11.1	4.6	48	47	2.6	2.6	2.6	2.6
IVS-8178	40	42	27.5	16.7	24.4	14.3	43	41	10.8	2.8	8.1	2.8
IVS-8206	35	41	31 4	36.6	25	23.2	38	42	32.1	29.3	28.6	27.4
NEC-8010	40	35	60	51.4	60	40	50	35	9.1	2.9	6.8	1.4
NEC-8121	39	37	5 1	18.9	2.6	11.5	43	42	15	36.7	11.9	19 2
NEC-8127	38	37	18.4	29.7	12.5	18.9	39	43	15.6	8.1	10.2	5.4
NEC-8178	41	37	34.1	5.4	28.7	2.0	46	43	33.3	47.4	30.3	42.1
NEC-8187	10	27	50	25.9	40	18.5	51	45	41.0	45.7	38.5	40.0
NELC-8124	31	21	19 4	19.0	16.1	9.5	37	40	0	0	0	0
NELC-8127	38	35	47.4	22.9	38.8	15.7	41	27	20	30	14.3	21.7
NELC-8156	40	29	12.5	20.7	10.6	17.2	56	43	3.8	6.3	3.8	6.3
NELC-8221	28	16	10.7	62.5	6.3	59.4	36	33	66.7	63.3	63.3	56.7
SC_1-8003	42	36	42.9	16.7	38.1	11.8	40	43	75	78.1	70.1	74.2
SC_1-8014	37	44	10.8	18.2	10.1	12.5	49	39	12.8	16.7	9.6	11.1
SC_1-8082	40	37	22.5	29.7	19.4	20.3	40	45	14.6	7.3	13.4	7.3
SC_1-8129	35	33	34.3	30.3	26.4	25.0	45	47	8.8	10.3	8.8	6.4
SC_1-8155	38	31	34.2	29.0	31.6	26.6	39	34	100	94.1	95.6	89.7
NELC-8010	40	17	17.5	5.9	8.8	2.9	43	35	5.9	0	3.7	0

Table 1 contd

Entry	SAMARU						KAMBOINSE					
	Total plants		Incidence		Severity		Total plants		Incidence		Severity	
	R-1	R-2	R-1	R-2	R-1	R-2	R-1	R-2	R-1	R-2	R-1	R-2
MC-8044	39	27	23.1	22.2	22.4	14.8	39	34	26.7	10.7	22.5	8.9
MC-8055	40	40	5	30	5	18.1	43	43	2.4	12.0	2.4	4.0
MC-8080	35	33	20	9.1	16.4	5.3	48	41	9.5	6.5	7.1	1.6
MC-8151	40	38	35	7.9	26.9	3.9	42	48	8.1	22.9	8.1	11.4
MC-8196	32	10	28.1	10	17.2	10	44	51	6.8	7.5	3.4	6.3
E298-2-4	26	11	68	90.9	60	65.9	46	31	5.7	3.4	4.3	3.4
E298-2-1-8	11	39	0	5.1	0	3.2	49	38	2.7	2.8	1.4	2.8
ML 7903	46	9	23.9	44.4	15.8	30.6	36	46	10.7	4.9	7.1	3.7
F4-FC-1474-2-2-2	40	32	12.2	21.9	6.1	18.8	46	21	21.9	14.3	14.8	10.7
ML-7901	37	20	40.5	10.0	36.5	6.3	43	37	22.2	14.7	20.8	6.6
700043	38	11	18.4	54.5	14.5	50	26	41	16.7	12.8	9.7	11.5
700780	40	11	12.5	18.2	11.9	11.4	50	42	0	0	0	0
700512	22	27	0	7.4	0	3.7	44	30	2.9	0	2.9	0
SDN 617	25	35	56	20.0	44	15.0	41	48	0	0	0	0
700638	29	27	17.2	18.5	12.1	13.9	42	29	17.1	30.3	13.6	25.8
700563	12	17	23.1	35.3	15.4	33.8	44	41	12.9	15.0	8.9	8.8
J-6	8	25	25	40.0	21.9	32.0	52	45	35.1	41.2	31.8	22.8
700190	28	25	25	20	22.3	14	47	36	0	0	0	0
J-18-1	21	5	33.3	0	31.0	0	37	35	33.3	16.7	32.6	12.5
J-265-2	16	3	12.5	0	3.1	0	36	30	37.0	17.9	33.3	17
700481	29	29	44.8	31.0	31.9	19.8	39	37	21.2	14.7	13.6	11.8
J-235	36	32	55.6	31.3	47.2	29.7	35	48	39.3	64.1	33.0	59.6
700726	25	26	60	46.2	60	35.6	41	46	2.9	6.3	2.9	6.3
J-78	-	24	-	29.2	-	21.9	45	42	36.8	27.0	32.2	21.6
J-87-1	17	35	11.8	11.4	10.3	10.7	43	39	15.6	33.3	12.5	28.0
700526	16	25	25	40	18.8	26	52	37	14.3	12.1	12.5	5.3
700283	12	10	33.3	0	27.1	0	46	46	0	0	0	0
J-50-1	4	3	66.7	33.3	41.7	25	12	30	100.0	32.1	79.0	31.3
Local susceptible[a/]	28	28	27	21	21.6	14.8	43	39	41.7	45.9	36.5	41.1

a/ Mean of 15 in each replication

Table 2 Plant population, downy mildew incidence (%) and severity (%) of 150 test entries and local susceptible in the 1979 PRE-IPMDMN at ICRISAT Center and Hissar.

Entry	ICRISAT CENTER						HISSAR					
	Total plants		Incidence		Severity		Total plants		Incidence		Severity	
	R-1	R-2	R-1	R-2	R-1	R-2	R-1	R-2	R-1	R-2	R-1	R-2
J 78-1	65	44	1 5	9.1	0.4	5.7	78	87	5.1	0	3.2	0
700770	50	53	4 0	0	4.0	0	66	27	0	0	0	0
700158	64	47	1 6	0	0 8	0	87	69	0	0	0	0
700335	47	49	2.1	4.1	2 1	3.1	95	95	0	0	0	0
700349	54	50	0	6.0	0	4.5	53	117	0	0	0	0
J 102-SB	56	47	1.8	8.5	0.9	7.4	118	51	3.4	0	1.5	0
700278	59	52	0	0	0	0	75	68	0	0	0	0
700622	58	44	1.7	4.5	1.7	1 7	97	82	11.3	12 2	6.4	5.5
700560	50	65	14	4 6	9	3 8	75	27	0	0	0	0
700537	60	60	0	0	0	0	111	72	0	0	0	0
700254	49	53	8.2	13.2	6.1	12.7	23	102	0	15 7	0	8.3
700546	37	58	5.4	0	4.1	0	73	3	0	0	0	0
700647	42	44	11.9	2.3	8 9	2.3	84	80	42 9	23 8	26 5	12.8
700179	57	53	7.0	3.8	6 1	1 4	93	81	0	0	0	0
700556	57	52	1 8	0	0 9	0	68	57	0	0	0	0
700572	46	56	6 5	3.6	3 8	3.6	41	72	0	19.4	0	9 7
700561	58	51	3 4	3.9	1 3	2 9	121	35	0	0	0	0
700486	58	47	1 7	0	1 7	0	78	61	0	0	0	0
700711	49	54	2 0	3.7	2 0	3 7	89	66	0	0	0	0
700489	49	47	2 0	0	1.0	0	77	68	0	0	0	0
700568	54	56	1 9	3.6	0 5	2 7	82	57	0	0	0	0
J-264	48	32	16 7	6.3	12.0	4 7	78	38	0	0	0	0
700482	64	53	1 6	0	0 8	0	74	53	6 8	0	4 7	0
700787	57	39	8 8	2.6	5 7	2 6	36	104	0	0	0	0
700479	37	50	2 7	2 0	2.7	2.0	78	130	0	0	0	0
700599	50	51	6 0	0	5 0	0	35	9	0	0	0	0
700724	48	50	4 2	6 0	1 6	5 0	90	41	0	0	0	0
700590	53	56	0	1 8	0	1.8	84	77	0	0	0	0
700688	50	51	4.0	0	1.5	0	41	39	0	0	0	0
700619	55	59	1.8	0	1.8	0	78	97	0	0	0	0
J-215-1	54	50	3 7	2.0	2 3	2 0	71	53	0	0	0	0
J-238	50	38	0	0	0	0	17	71	0	0	0	0
700742	54	56	0	3 6	0	1 3	35	65	0	0	0	0
700490	50	51	2.0	0	0 5	0	56	68	0	0	0	0
700487	57	51	1 8	1.9	0 9	2.0	78	47	0	0	0	0
J-52-SB	58	56	1.7	1.8	0 4	0 9	35	77	0	0	0	0
700576	43	58	18 6	24 1	18 6	17.7	19	56	0	0	0	0
J-71	62	57	12.9	7.0	10 1	7.0	55	106	0	0	0	0
700549	68	52	10.3	3 8	8.8	1.4	73	72	0	0	0	0
J-64	42	36	2 4	19.4	2.4	14.6	39	45	0	0	0	0

Table 2 contd.

Entry	ICRISAT CENTER						HISSAR					
	Total plants		Incidence		Severity		Total plants		Incidence		Severity	
	R-1	R-2	R-1	R-2	R-1	R-2	R-1	R-2	R-1	R-2	R-1	R-2
700255	63	57	20.6	21.1	16.7	16.7	61	61	23	0	10.2	0
700583	45	33	2.2	0	1.1	0	83	64	0	0	0	0
700797	48	58	0	0	0	0	27	112	0	0	0	0
SDN 720-1	53	42	3.8	0	1.4	0	45	77	0	0	0	0
J 92-1	47	46	0	2.2	0	2.2	42	45	0	0	0	0
J 83-1	49	47	12.2	23.4	11.2	20.2	53	112	0	3.6	0	2.0
J-163-1	43	57	4.7	1.8	3.5	1.8	25	36	0	0	0	0
J-76	47	54	17.0	14.8	13.3	11.1	15	111	0	0	0	0
700633	46	55	2.2	3.6	1.1	1.4	65	92	0	0	0	0
700491	51	50	3.9	4.0	2.9	4.0	94	95	0	0	0	0
700687	56	57	1.8	1.8	0.4	0.9	88	68	0	1.5	0	1.5
J-192-1	51	45	21.6	26.7	17.2	20.0	84	62	20.2	0	10.1	0
J-234-1	37	57	10.8	1.8	4.7	1.8	31	53	0	9.4	0	6.1
700593	70	37	4.3	2.7	2.5	2.7	52	32	0	0	0	0
J-150-1	50	47	14.0	6.4	10.5	3.7	16	37	0	0	0	0
700706	46	41	2.2	2.4	1.1	1.2	57	35	0	0	0	0
J-201-1	54	56	11.1	3.6	9.3	2.2	58	98	55.2	6.1	36.2	3.6
700646	42	53	7.1	3.8	6.0	3.8	62	8	0	0	0	0
J-260-2	52	51	1.9	1.9	1.9	0.5	51	81	0	0	0	0
J-123-1	45	52	15.6	19.2	13.9	19.2	34	31	38.2	38.7	17.6	20.2
700781	52	55	3.8	0	1.4	0	69	48	0	0	0	0
J-85-1	51	56	0	1.8	0	0.4	84	86	0	14	0	7.8
700792	44	59	0	3.4	0	2.5	103	109	0	0	0	0
700596	61	56	1.6	0	1.6	0	86	117	0	0	0	0
700612	55	40	0	7.5	0	5.6	87	107	6.9	0	3.7	0
SDN-714	53	53	0	0	0	0	98	84	0	0	0	0
B282x3/4 EB 100-9	50	51	0	0	0	0	74	45	44.6	22.9	22.6	10.4
J-262	41	41	7.1	12.2	14.6	11.0	51	61	0	6.6	0	2.9
J 1644x3/4 S6-12	46	59	4.3	1.7	3.8	0.8	82	59	0	0	0	0
J 1644x3/4 S6-3	53	53	1.9	13.2	1.9	8.5	56	82	0	0	0	0
3/4HK 128-1	54	61	0	0	0	0	87	48	0	0	0	0
3/4 EB 171-2	51	65	0	0	0	0	41	58	0	0	0	0
R-58-8-3-1	52	58	3.8	0	2.9	0	70	43	20	0	9.6	0
R-310-4-3-3	51	57	19.6	29.8	16.2	28.1	46	59	0	0	0	0
R-303-5-4-4	55	62	21.8	25.8	13.6	17.3	23	56	0	0	0	0
R-238-1-2-2	52	50	0	0	0	0	49	70	0	0	0	0
R-238-1-2-1	45	59	4.4	0	3.3	0	65	65	0	0	0	0
R-238-1-1-5	39	48	0	2.1	0	2.1	23	17	0	52.9	0	26.5
R-238-1-1-2	48	58	0	0	0	0	56	51	0	0	0	0
R-203-4-3-2	67	55	5.9	3.6	5.2	2.7	84	113	6	0	5.1	0
R-203-4-3-1	57	58	3.5	0	2.6	0	107	58	0	0	0	0

Table 2 contd

Entry	ICRISAT CENTER						HISSAR					
	Total plants		Incidence		Severity		Total plants		Incidence		Severity	
	R-1	R-2	R-1	R-2	R-1	R-2	R-1	R-2	R-1	R-2	R-1	R-2
R-203-4-1-3	54	50	1.9	0	0.5	0	78	78	0	0	0	0
R-203-4-1-1	50	52	0	3.8	0	3.8	72	68	0	0	0	0
EC(S4)-211-1	50	56	12	5.4	9.5	2.2	70	56	0	0	0	0
EC(S4)-86-4	53	50	1.9	2.0	0.9	2.0	42	38	4.8	0	3.0	0
EC(S4)-129-6	52	61	5.8	3.3	4.3	3.3	47	92	0	0	0	0
EC(S4)-177-1	36	54	11.1	18.5	9.7	17.6	41	77	0	0	0	0
EC(S4)-177-4	50	49	10.0	20.4	7.5	18.4	34	32	11.1	0	6.0	0
EC(S4)-177-5	62	54	0	0	0	0	68	67	0	0	0	0
EC(S4)-69-10	60	58	11.7	0	7.9	0	42	53	4.8	0	3.0	0
EC(S4)-29-4	60	72	6.7	8.3	4.6	5.9	38	102	0	6.9	0	3.9
EC(S4)-10-4	51	63	1.9	0	1.0	0	61	47	0	0	0	0
IVS-P77	49	51	2.0	0	1.0	0	81	88	0	5.7	0	2.8
WC-B77	40	61	0	3.3	0	2.5	78	33	0	0	0	0
WC-K77	40	53	5	5.7	3.1	3.8	73	57	0	17.5	0	7.9
WC-8015	47	52	4.3	3.8	4.3	2.4	81	97	21	0	10.5	0
WC-8082	52	44	0	4.5	0	1.7	36	75	0	0	0	0
WC-8097	57	67	5.3	8.9	2.6	7.5	76	62	0	0	0	0
WC-8129	59	53	1.7	1.9	1.7	1.9	78	57	0	0	0	0
WC-8189	52	51	1.9	1.9	1.9	2.0	56	66	0	18.2	0	6.4
WC-8220	67	51	0	0	0	0	87	93	0	0	0	0
IVS-8038	42	44	2.4	6.8	2.4	6.8	86	60	0	0	0	0
IVS-8088	58	49	0	0	0	0	75	91	0	7.7	0	4.1
IVS-8093	59	59	1.7	0	1.7	0	30	31	0	0	0	0
IVS-8172	44	64	0	1.6	0	1.6	38	88	0	0	0	0
IVS-8178	46	53	10.9	5.7	7.1	5.7	84	50	0	0	0	0
IVS-8206	80	54	1.3	1.9	1.3	1.9	88	46	0	0	0	0
NEC-8010	61	60	1.6	10.0	1.2	7.9	71	87	0	6.9	0	3.7
NEC-8121	55	53	12.7	3.8	10.0	3.8	88	87	11.4	0	4.8	0
NEC-8127	53	61	0	1.6	0	1.6	64	113	0	0	0	0
NEC-8178	61	59	14.8	13.6	10.7	12.7	110	117	10.9	0	4.8	0
NEC-8187	61	54	9.8	3.7	4.9	3.7	110	68	6.4	0	2.7	0
NELC-8010	50	48	12	4.2	9.5	1.6	95	102	0	0	0	0
NELC-8124	58	60	12.1	5.0	7.8	4.2	70	43	0	0	0	0
NELC-8127	54	53	14.8	5.7	12.0	5.7	85	108	0	0	0	0
NELC-8156	56	51	0	3.9	0	2.0	87	109	0	0	0	0
NELC-8221	43	50	6.9	4.0	4.1	2.0	63	88	0	0	0	0
SC_1-8003	51	50	3.9	2.0	2.9	2.0	55	52	0	0	0	0
SC_1-8014	55	59	0	5.1	0	3.4	47	51	6.4	0	3.2	0
SC_1-8082	49	46	0	4.3	0	3.3	65	45	7.7	0	3.8	0
SC_1-8129	52	54	1.9	0	1.9	0	68	102	0	0	0	0
SC_1-8155	44	54	6.8	5.6	5.7	3.7	47	98	0	9.2	0	4.6
MC-8044	50	64	12	10.9	11	7.8	98	51	12.2	0	5.9	0
MC-8055	54	52	5.6	3.8	4.2	2.9	98	80	0	0	0	0

Table 2 contd

Entry	ICRISAT CENTER						HISSAR					
	Total plants		Incidence		Severity		Total plants		Incidence		Severity	
	R-1	R-2	R-1	R-2	R-1	R-2	R-1	R-2	R-1	R-2	R-1	R-2
MC-8080	55	62	0	1.6	0	1.6	70	67	0	0	0	0
MC-8151	36	53	5.6	1.9	4.2	0.9	77	92	0	0	0	0
MC-8196	37	39	13.5	5.1	10.1	3.8	5	63	0	6.5	0	2.8
E298-2-4	68	48	1.5	4.2	0.4	3.1	91	59	0	0	0	0
E298-2-1-8	47	44	0	0	0	0	41	58	0	0	0	0
ML 7903	41	49	9.8	3.0	8.5	1.0	23	82	0	0	0	0
F4-FC-1474-2-2-2	53	58	16.9	0	15.1	0	28	58	0	0	0	0
ML-7901	53	49	13.2	14.3	10.8	11.7	84	37	35.7	0	18.8	0
700043	37	44	10.8	0	8.8	0	35	78	0	0	0	0
700780	63	40	0	0	0	0	102	14	3.9	0	2.2	0
700512	59	50	10.2	0	5.9	0	91	77	0	0	0	0
SDN 617	49	55	4.1	1.8	3.1	1.8	81	102	0	0	0	0
700638	63	71	9.5	5.6	7.9	3.2	74	108	8.1	0	4.4	0
700563	50	55	20.0	12.7	18.0	8.2	47	127	0	0	0	0
J-6	47	48	8.5	10.4	5.3	6.3	84	56	0	0	0	0
700190	44	59	0	0	0	0	68	95	13.2	0	5.9	0
J-18-1	54	58	22.2	12.1	19.9	9.5	49	58	16.3	0	8.7	0
J-265-2	52	43	40.4	16.3	40.4	12.8	75	83	24	0	15.3	0
700481	56	60	7.1	11.7	5.8	10.8	57	68	0	0	0	0
J-235	52	59	5.8	15.3	2.4	11.9	108	102	32.4	0	17.4	0
700726	57	51	1.8	11.8	1.8	4.9	69	58	0	0	0	0
J-78	61	55	4.9	20.0	4.1	17.3	43	57	0	0	0	0
J-87-1	55	44	10.9	20.5	6.4	18.2	57	48	0	0	0	0
700526	39	65	12.8	15.4	9.0	14.6	63	175	4.8	0	3.6	0
700283	55	42	7.3	2.4	4.1	2.4	91	98	16.5	0	9.1	0
J-50-1	49	73	6.1	19.2	5.1	14.0	92	76	5.4	9.2	4.3	5.3
Local susceptible[a]	41.9	66.3	85.1	73.4	79.0	68.3	45.7	62.7	93.1	94.2	85	85.9

[a] Mean of 15 in each replication

Table 3. Percent downy mildew severity in 150 entries at four locations in 1979 PRE-IPMDMN compared with severity of local susceptibles and location mean for all these entries.

Entry	Samaru	Kambo-inse	ICRISAT	Hissar	Mean
E298-2-1-8	1.6	2.1	0	0	0.9
WC-8220	4.3	1.7	0	0	1.5
700512	1.9	1.4	3	0	1.6
EC (S4)-10-4	7.6	0.3	0.5	0	2.1
700633	5.6	2.8	1.2	0	2.4
700792	7.5	1.9	1.3	0	2.7
J-215-1	6.5	2.3	2.2	0	2.7
J 92-1	6.3	3.6	1.1	0	2.7
IVS-8172	7.9	2.6	0.8	0	2.8
700590	11.1	0	0.9	0	3
700706	5.8	5.1	1.2	0	3
700546	7.7	2.4	2	0	3
700780	11.6	0	0	1.1	3.2
NELC-8010	5.8	1.8	5.5	0	3.3
700619	8.1	5.1	0.9	0	3.5
700583	14.1	0	0.6	0	3.7
WC-8082	14.1	0.4	0.9	0	3.8
700537	13.4	2.3	0	0	3.9
MC-8080	10.9	4.4	0.8	0	4
SDN-714	8.4	8.1	0	0	4.1
700561	14.6	0	2.1	0	4.2
700599	12.9	2.3	2.5	0	4.4
IVS-P77	10.1	6.1	0.5	1.4	4.5
MC-8055	11.6	3.2	3.5	0	4.6
700335	11.5	4.4	2.6	0	4.6
700797	18.6	0	0	0	4.7
NELC-8124	12.8	0	6	0	4.7
700687	11.4	6.4	0.7	0.7	4.8
700179	14.6	1.3	3.8	0	4.9
NELC-8156	13.9	5	1	0	5
700781	18.3	1	0.7	0	5
700770	14.3	4.4	2	0	5.2
700278	19.6	1.2	0	0	5.2
IVS-8038	10.1	6.4	4.6	0	5.3
700190	18.2	0	0	2.9	5.3
700724	18	0	3.3	0	5.3
700283	13.5	0	3.2	4.5	5.3
700560	14.2	1	6.4	0	5.4
700349	13.9	5.9	2.3	0	5.5
700487	19.6	1.2	1.4	0	5.6
700479	19.1	0.9	2.4	0	5.6
700711	8.2	12.1	2.9	0	5.8
R-238-1-2-1	12.5	9.2	1.7	0	5.8
NEC-8127	15.7	7.8	0.8	0	6.1
IVS-8093	8.9	14.7	0.8	0	6.1
EC (S4)-211-1	17.4	1.6	5.9	0	6.2

Table 3. contd.

Entry	Samaru	Kambo-inse	ICRISAT	Hissar	Mean
SC1-8014	11.3	10.4	1.7	1.6	6.2
EC (S4)-86-4	14.9	7.1	1.5	1.5	6.2
700646	5.4	15.1	4.9	0	6.3
700158	25.2	1.1	0.4	0	6.7
MC-8196	13.6	4.8	7	1.4	6.7
WC-8015	11.2	7.2	3.3	5.2	6.7
R-58-8-3-1	17.0	4.4	1.4	4.8	6.9
MC-8151	15.4	9.8	2.6	0	6.9
700486	14.2	12.7	0.9	0	6.9
R-303-5-4-4	11.0	1.7	15.5	0	7.0
700787	17.8	6.9	4.1	0	7.2
700576	6.7	4.2	18.1	0	7.2
700612	16.8	7.6	2.8	1.9	7.3
R-203-4-3-2	19.1	3.5	4	2.5	7.3
R-310-4-3-3	7	0	22.1	0	7.3
700490	17.2	11.9	0.3	0	7.3
WC-8129	22.6	5.1	1.8	0	7.4
700489	25.5	3.7	0.5	0	7.4
700491	19.9	6.4	3.5	0	7.5
R-238-1-1-5	15.7	0	1	13.2	7.5
R-238-1-2-2	9.0	21.3	0	0	7.6
IVS-8178	19.3	5.4	6.4	0	7.8
700568	21.9	7.8	1.6	0	7.8
700482	24.4	4.3	0.4	2.4	7.9
NEC-8121	7.0	15.5	6.9	2.4	8
SDN 617	29.5	0	2.4	0	8
WC-B77	16.1	15	1.2	0	8.1
F4-FC-1474-2-2-2	12.4	12.8	7.5	0	8.2
WC-8189	19.7	8.1	1.9	3.2	8.2
700572	14.0	10.4	3.7	4.9	8.3
700622	22.8	2.6	1.7	6.0	8.3
ML 7903	23.2	5.4	4.8	0	8.3
R-203-4-1-1	30.1	1.5	1.9	0	8.4
J 102-SB	16.4	12.4	4.2	0.7	8.4
SC1-8082	19.8	10.4	1.6	1.9	8.4
J-260-2	21.5	11.2	1.2	0	8.5
SC1-8129	25.7	7.6	1.0	0	8.6
700688	23.4	10.6	0.8	0	8.7
SDN 720-1	23.9	10.6	0 7	0	8.8
J-76	13.4	9.7	12.2	0	8.8
700593	5.4	27.8	2.6	0	9.0
R-238-1-1-2	16.5	19.9	0	0	9.1
R-203-4-3-1	33.1	2.1	1.3	0	9.1
J-262	18.6	5.1	12.8	1.4	9.5
MC-K77	12.8	18.2	3.4	3.9	9.6
WC-8097	30.2	3.3	5.0	0	9.6
IVS-8088	19.2	18.1	0	2.1	9.9
700549	8.9	25.7	5.1	0	9.9
J 1644 x 3/4 S6-12	13.1	21.8	5.2	0	10.0
700638	13.0	19.7	5.6	2.2	10.1
J 78-1	24.3	11.6	3.0	1.6	10.1
700596	13.2	27.4	0.8	0	10.4
J-64	26.4	6.7	8.5	0	10.4
J-85-1	13.5	24.9	0.2	3.9	10.7

Table 3 contd.

Entry	Samaru	Kambo-inse	ICRISAT	Hissar	Mean
J-87-1	10.5	20.3	12.3	0	10.8
EC (S4)-129-6	19.9	20.9	3.8	0	11.2
700526	22.4	8.9	11.8	1.8	11.2
J-238	39.6	5.8	0	0	11.3
J-234-1	24.3	14.9	3.2	3.1	11.4
3/4 HK 128-1	33.4	12.2	0	0	11.4
700556	29.5	15.9	0.4	0	11.5
700563	24.6	8.8	13.1	0	11.6
MC-8044	18.6	15.7	9.4	2.9	11.7
700481	25.9	12.7	8.3	0	11.7
700043	32.2	10.6	4.4	0	11.8
R-203-4-1-3	44.8	2.3	0.2	0	11.8
J-163-1	20.9	23.9	2.6	0	11.8
3/4 EB 171-2	21.5	26	0	0	11.9
J-201-1	15.3	10	5.7	19.9	12.7
J-52-SB	22.4	30.6	0.7	0	13.4
IVS-8206	24.1	28	1.6	0	13.4
NELC-8127	27.3	18	8.8	0	13.5
700647	18.5	10.9	5.6	19.7	13.7
700726	47.8	4.6	3.3	0	13.9
ML-7901	21.4	13.7	11.3	9.4	13.9
J-150-1	48.8	0	7.1	0	14
EC (S4)-177-1	3.9	38.6	13.7	0	14.1
J 1644 x 3/4 S6-3	15.2	39.1	2.3	0	14.2
J-18-1	15.5	22.6	14.7	4.3	14.3
700254	29.3	15.2	9.4	4.2	14.5
J-6	26.9	27.3	5.8	0	15
NEC-8010	50	4.1	4.6	1.9	15.1
J-265-2	1.6	25.1	26.6	7.7	15.2
700255	24.4	17.4	16.7	5.1	15.9
NEC-8178	15.3	36.2	11.7	2.4	16.4
E298-2-4	63	3.9	1.7	0	17.1
J-264	47.9	13.9	8.3	0	17.5
EC (S4)-177-5	28.8	41.8	0	0	17.6
700742	31.7	39.9	0.7	0	18.1
J-78	35.9	26.9	10.7	0	18.4
NEC-8187	29.3	39.2	4.3	1.4	18.5
J-192-1	43.4	16.9	18.6	5.1	21
J-71	27.1	52.2	8.5	0	22
NELC-8221	32.8	60	3	0	24
EC (S4)-29-4	52.2	36.9	5.2	2	24.1
SC1-8003	25	72.2	2.5	0	24.9
J-235	38.5	46.3	7.1	8.7	25.1
J-50-1	33.3	55.1	9.6	4.8	25.7
B282 x 3/4 EB-100-9	12.7	77.1	0	16.5	26.6
J 83-1	75	18.7	15.7	1	27.6
J-123-1	46	37.7	16.6	18.9	29.8
EC (S4)-177-4	20.3	88.2	12.9	3	31.1
SC1-8155	29.1	92.7	4.7	2.3	32.2
EC (S4)-69-10	39.1	90.2	4	1.5	33.7
Location mean for test entries	19.8	14.2	4.3	1.3	10.0
Local susceptible mean	19.2	38.8	73.7	85.4	54.3

Table 4. Differential downy mildew reaction (% severity) of selected entries at ICRISAT Center, Kamboinse and Samaru in the 1979-PRE-IPMDMN.

Entry	ICRISAT Center	Kamboinse	Samaru
R-310-4-3-3	22.1		
SC1-8155	4.7	92.7	29.1
EC (S4)-69-10	4.0	90.2	39.1
B-282 x 3/4 EB 100-9	0	77.1	12.7
SC1-8003	2.5	72.2	25
NELC 8221	3	60	32.8
EC (S4)-177-5	0	41.8	28.8
700742	<1	39.9	31.7
J-52-SB	<1	30.6	22.4
3/4 EB-17 1-2	0	26	21.5
J-83-1	15.7	18.7	75
E -298-2-4	1.7	3.9	63
NEC-8010	4.6	4.1	50
J-150-1	7.1	0	48.8
700726	3.3	4.6	47.8
R-203-4-1-3	<1	2.3	44.8
J-238	0	5.8	39.6
3/4 HK 128-1	0	12.2	33.4
R-203-4-1-1	1.9	1.5	30.1
700556	<1	15.9	29.5
SC1-8129	1	7.6	25.7

This report was compiled by S.D. Singh and R.J. Williams, Plant Pathologist and Principal Pathologist (Millets) respectively, Millet Improvement Program, ICRISAT. They are indebted to all the Cooperators who gave so much of their time and facilities to provide the data used in this report.