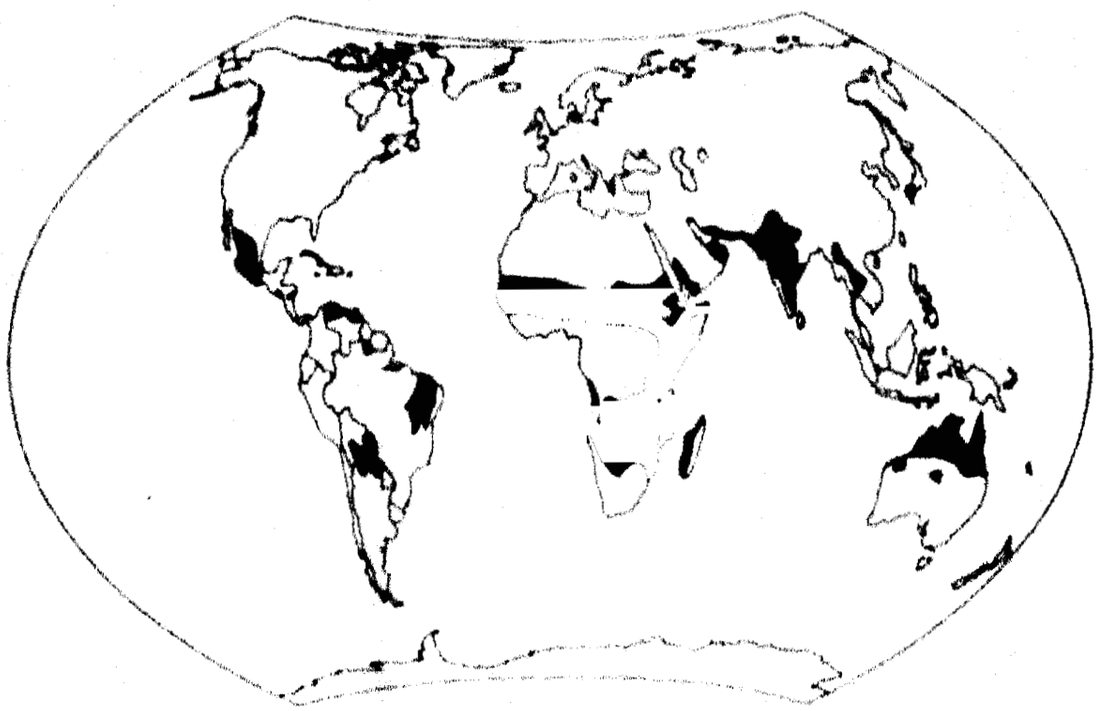
RP 03012

PULSE PATHOLOGY
Progress Report 33

INTERNATIONAL CHICKPEA DISEASE RESISTANCE TESTING PROGRAM



THE SEVENTH INTERNATIONAL CHICKPEA ROOT ROTS/WILT NURSERY

REPORT
1982-83

ICRISAT

International Crops Research Institute for the Semi-Arid Tropics
ICRISAT Patancheru P.O.
Andhra Pradesh 502 324, India

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(March 1985)

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INTRODUCTION

In 1977-78 we initiated the International Chickpea Root Rots/ Wilt Nursery (ICRRWN). The objectives of this nursery are to:

1. identify genetic sources with tolerance/resistance to various root rots and wilt,

2. develop improved cultivars incorporating disease resistance,

3. provide a convenient medium for the exchange of genetic material and information among cooperators.

The report of the ICRRWN (1982-83) is presented below

NURSERY COMPOSITION

Seventy-four (+ one susceptible check--ICC-4951) originating in 5 countries and from ICRISAT were included in the ICRRWN for 1982-83. It included 31 breeding lines. The list is given in Table 1.

NURSERY LOCATIONS

The nursery was sent to 25 locations in 18 countries. The data were received from 8 locations in 7 countries till September 1984. Summary of the findings from all locations have been given in this report. The list of the locations and cooperators from whom data were received is given in Table 2.

Table 1. List of entries

S.No.	ICC No.	Pedigree	Origin
1.	537	P-422	India
2.	858	P-678	"
3.	1338	P-1208-1	"
4.	1376	P-1231	"
5.	2664	P-2687-3	Iran
6.	2883	P-3251	"
7.	3354	P-4029-1	"
8.	3415	P-4095	Israel
9.	3428	P-4102-2	Turkey
10.	3528	P-4230	Iran
11.	3782	P-4400	"
12.	4485	P-5614	Turkey
13.	4843	P-6622	Portugal
14.	5727	C-16-1	India
15.	6384	NEC-344	Iran
16.	6440	NEC-433	"
17.	6488	NEC-510	"
18.	6501	NEC-539	"
19.	6668	NEC-774	"
20.	6687	NEC-815	"
21.	6772	NEC-934	"
22.	6815	NEC-985	"
23.	6817	NEC-987	"
24.	7489	GC-79	India
25.	8166	NEC-2314	"
26.	8170	NEC-2318	"
27.	8933	WR-315	"
28.	8999	NEC-421	Iran
29.	9039	NEC-530	"
30.	9041	NEC-536	"
31.	9103	NEC-810	"
32.	9112	NEC-832	"
33.	9127	NEC-897	"
34.	10382	RPSP-117	India
35.	10384	RPSP-119	"
36.	10399	RPSP-134	"
37.	10466	Coll.No.570	"
38.	10539	RPSP-270	"
39.	10630	H-362	"
40.	10809	H-73-27-1	"
41.	11088	BG-212	"
42.	11224	Gw-9	"
43.	12266	RAVP-52	"
44.	ICCL-80001	(P-99 x NEC-108) x Radhey	ICRISAT
45.	ICCL-80002	K-4 x WR-315	"
46.	ICCL-80004	L-550 x USA-613	"
47.	ICCL-80031	G-130 x WR-315	"

Table 1. (Contd.)

S.No.	ICC No.	Pedigree	Origin
48.	ICCL-80035	(G-130 x B-108) x (NP-34 x Gw-5/7)	"
49.	ICCL-81001	[(K-850 x BG-1) x K-4] x [(P-404 x L-550) x Gw-5/7]	"
50.	ICCL-81002	(H-208 x RS-11) x (JG-221 x L-550)	"
51.	ICCL-81004	H-208 x E-100	"
52.	ICCL-81005	K-850 x B-108	"
53.	ICCL-81006	(JG-62 x F-496) x (K-850 x Radhey)	"
54.	ICCL-81007	(P-1786 x C-214) x (F-496 x L-550)	"
55.	ICCL-81008	(K-850 x Gw-5/7) x (H-208 x Annigeri)	"
56.	ICCL-81009	(K-850 x Gw-5/7) x (H-208 x Annigeri)	"
57.	ICCL-81010	(G-130 x JG-221) x (E-100 x H-355)	"
58.	ICCL-81011	(H-355 x BEG-482) x (JG-62) x P-1381)	"
59.	ICCL-81012	(H-355 x BEG-482) x (JG-62 x P-1381)	"
60.	ICCL-81013	NEC-240 x (H-355 x K-850)	"
61.	ICCL-81014	K-850 x P-2774	ICRISAT
62.	ICCL-81015	(H-208 x RS-11) x (JG-221 x L-550)	"
63.	ICCL-81016	K-4 x WR-315	"
64.	ICCL-81017	(P-99 x NEC-108) x Radhey	"
65.	ICCL-81201	(P-99 x NEC-108) x Radhey	"
66.	ICCL-81249	(H-208 x RS-11) x (JG-221 x L-550)	"
67.	ICCL-91250	NEC-802 x (P-1863 x P-3827)	"
68.	ICCL-81251	No.52 x H-223	"
69.	ICCL-81253	Kaka x WFWG-111	"
70.	ICCL-81254	(H-355 x BEG-482) x (JG-62 x P-1387)	"
71.	ICCL-81255	(H-208 x RS-11) x (JG-221 x L-550)	"
72.	ICCL-81256	G-130 x BG-1	"
73.	ICCL-81257	C-235 x 7341-8-1-B	"
74.	ICCL-81258	(H-208 x RS-11) x (JG-221 x L-550)	"
75.	ICC-4951	JG-62	"

Wilt susceptible check.

Table 2. List of the locations and cooperators from whom data were received

S.No.	Cooperator(s)	Location	Country
1.	Dr. H.U. Ahmed and Mr. H. Rahaman	Bangladesh Agrl. Research Institute Joydebpur, Dacca	Bangladesh
2.	Geletu Bejiga	Agrl. Expt. Station Addis Ababa Univ. Debre Zeit	Ethiopia
3.	ILiadis Costan Tinos	Fodder Crops and Pastures Institute Larissa	Greece
4.	Dr. M.P. Haware and Dr. Y.L. Nene	ICRISAT Patancheru Andhra Pradesh	India
5.	Mr. G. Chowdhary and R.P. Shah	Agriculture Station Parwanipur, Birganj Narayani Zone	Nepal
6.	Ing. Elva Llontop Castro	Experimental Station Viste, CIPA II Floride, Chiclayo	Peru
7.	Dr. A. Trapero Casas and Dr. R.M. Jimenez Diaz	Montilla, Cordoba Southern Spain	Spain
8.	Dr. John C. Phillips	California Polytechnic State University San Luis Obispo California	U.S.A

SUMMARY OF RESULTS

Bangladesh

The nursery was planted in a field at Joydebpur, Dacca. The incidence of wilt recorded in susceptible check ICC-4951 was not more than 20%. Only one line ICC-3354 was free from wilt. Thirty-eight lines showed less than 10% wilt. They were ICC-858, 1338,1376, 2664, 2883, 3415, 3428, 3528, 3782, 4485, 4843, 5727, 6772, 8170, 8999, 9039, 9103, 9112, 10539, 10630, ICCL-80001, 80002, 81002, 81005, 81006, 81009, 81010, 81012, 81013, 81015, 81249, 81250, 81251, 81253, 81254, 81255, 81256, and 81257. Four lines ICC-1376, 3528, ICCL-81249, 81250 were free from any mortality due to root-rots. All the remaining lines showed less than 10% mortality due to root rots.

Ethiopia

Debre-Zeit Research Station has the problem of wilt and root rots. The incidence of wilt recorded in susceptible check ICC-4951 was not more than 20%. Fifty seven lines showed less than 10% wilt. These lines were ICC-537, 858, 2664, 2883, 3354, 3415, 3528, 3782, 4485, 4843, 5727, 6384, 6440, 6488, 6501, 6668, 6687, 6772, 6815, 6817, 7489, 8166, 8170, 8933, 8999, 9039, 9041, 9103, 9112, 9127, 10382, 10384, 10399, 10539, 10630, 10809, 11088, 11224, 12266, ICCL-80002, 80004, 80031, 81002, 81004, 81005, 81006, 81007, 81008, 81009, 81012, 81013, ICCL-81016, 81017, 81253, 81254, 81255, and

81256. All the lines showed less than 10% mortality due to root rots except ICC-6501, 9039, 10384, 10466, 10809, ICCL-80004, 80031, and 81002.

Greece

The nursery was planted in March at Fodder Crops Research Station, Larissa. As there was a poor incidence of the disease, no data was given on wilt and root rots.

India

The nursery was raised at ICRISAT centre, Patancheru, in a multiple disease sick plot with the wilt fungus (F. oxysporum f.sp. ciceri) as the most dominant one. Other pathogens which caused root rots were mainly Rhizoctonia bataticola, Sclerotium rolfsii, Rhizoctonia solani and Fusarium solani. The susceptible check ICC-4951 showed 100% mortality. Forty-two lines were completely free from any mortality due to wilt. These lines were ICC-537, 858, 2664, 2883, 3354, 3415, 3782, 4485, 4843, 6384, 6440, 6488, 6501, 6668, 6687, 6772, 6815, 6817, 8166, 8933, 8999, 9039, 9041, 9112, 9127, 10384, 10630, 10809, 11224, ICCL-80001, 80002, 80004, 81001, 81002, 81004, 81005, 81016, 81017, 81201, 81255, 81256, and 81258. All the remaining lines showed less than 10% mortality due to wilt except ICC-10539, ICCL-80031, 80035, 81006, 81007, 81012, 81250, 81251, 81253, and 81257. Three lines ICC-4843, ICCL-80002, and 81016 were completely free from any mortality due to root rots. Fifty-three lines showed

less than 10% mortality due to root rots. They were ICC-537, 858, 1338, 1376, 2664, 2883, 3354, 3415, 3428, 3528, 3782, 4485, 5727, 6384, 6440, 6488, 6501, 6668, 6687, 6772, 6815, 6817, 7489, 8166, 8933, 8999, 9039, 9041, 9103, 9112, 9127, 10384, 10399, 10466, 10630, 10809, 11224, ICCL-80001, 80004, 81001, 81002, 81004, 81005, 81008, 81010, 81014, 81017, 81201, 81249, 81254, 81255, 81256, and 81258:

Nepal

The nursery was planted in a wilt sick plot at the Agriculture Station, Parwanipur. The susceptible check ICC-4951 showed 95 to 100% mortality due to wilt. Three lines ICC-2664, 3354, 4485 showed less than 10% wilt. Thirty-nine lines were free from root rots. They were ICC-2664, 5727, 6384, 6488, 6772, 6815, 8166, 8170, 9103, 9112, 9127, 10382, 10384, 10399, 10539, 11088, 12266, ICCL-80002, 80031, 81001, 81002, 81004, 81005, 81006, 81007, 81010, 81013, 81014, 81015, 81016, 81017, 81201, 81250, 81251, 81253, 81254, 81256, 81257, and 81258. All the remaining lines showed less than 10% mortality due to root rots.

Peru

The nursery was planted in Vista Florida, Experimental Station, Chiclayo in July. The plot was not uniformly sick. The susceptible check ICC-4951 showed 10 to 100% mortality due to wilt. Thirty-one lines which showed less than 10% mortality were, ICC-537, 858, 1338, 1376, 3354, 3415, 3428,

3528, 4843, 6384, 6440, 6501, 6668, 8170, 9112, 10466, 10630, ICCL-81005, 81007, 81011, 81014, 81015, 81017, 81201, 81249, 81251, 81253, 81254, 81255, 81256, and 81257.

Spain

The nursery was planted at Montella in Cardoba province in March. Interestingly, the susceptibile check ICC-4951 was not highly susceptible to the local isolate of the chickpea wilt fungus; while P-2245, and PV-25 repeated after every six entries showed almost 100% mortality. Mortality due to wilt and root rots was recorded together. Only one line ICC-6440 showed less than 10% wilt and root rots.

U.S.A.

The nursery was planted at San Luis Obispo in California in May. The mortality was recorded due to wilt only. The susceptible check ICC-4951 showed 90 to 100% mortality. Twenty lines were completely free from any mortality due to wilt. They were ICC-537, 2883, 3415, 3528, 3782, 4485, 5727, 6488, 6501, 6815, 7489, 8170, 9112, 12266, ICCL-81004, 81008, 81009, 81015, 81249, and 81257. Forty-three lines which showed less than 10% mortality due to wilt were ICC-1376, 2664, 3354, 3428, 4843, 6384, 6440, 6668, 6772, 6817, 8166, 8933, 8999, 9039, 9041, 9127, 10382, 10384, 10399, 10466, 10539, 10630, 10809, 11088, 11224, ICCL-80001, 80002, 81001, 81002, 81005, 81006, 81007, 81010, 81011, 81012, 81013, 81016, 81017, 81250, 81254, 81255, 81256, and 81258.

PERFORMANCE OF ENTRIES ACROSS LOCATIONS

Performance of entries across 7 locations is listed in the table 3. One entry ICC-3354, did well across 6 locations. Twelve entries, viz. ICC-2664, 3415, 3528, 4485, 4843, 6440, 9112, 10630, ICCL-81005, 81254, 81255, 81256, did well across 5 locations. Twenty-one entries did well at 4 locations, 30 at 3 locations, 8 at 2 locations, 1 at 1 location. One entry ICC-80035 was found susceptible at all the locations.

The results from Spain indicate presence of a distinctly different race of the wilt fungus.

PROGRAM FOR 1983-84

Sixty entries originating in 2 countries and from ICRISAT have been included in the ICRRWN - 1983-84. The nursery has been sent to 22 locations in 16 countries.

Table 3. Performance of entries across locations

S. No.	Entry	No. of locations where found promising against wilt	Locations	No. of locations where found promising against root rots	Locations
1.	ICC-537	4	E,I,P,U	4	B,E,I,N
2.	-858	4	B,E,I,P	4	B,E,I,N
3.	-1338	3	B,I,P	4	B,E,I,N
4.	-1376	4	B,I,P,U	4	B,E,I,N
5.	-2664	5	B,E,I,N,U	4	B,E,I,N
6.	-2833	4	B,E,I,U	4	B,E,I,N
7.	-3354	6	B,E,I,N,P,U	4	B,E,I,N
8.	-3415	5	B,E,I,P,U	4	B,E,I,N
9.	-3428	4	B,I,P,U	4	B,E,I,N
10.	-3528	5	B,E,I,P,U	4	B,E,I,N
11.	-3782	4	B,E,I,U	4	B,E,I,N
12.	-4485	5	B,E,I,N,U	4	B,E,I,N
13.	-4843	5	B,E,I,P,U	4	B,E,I,N
14.	-5727	4	B,E,I,U	4	B,E,I,N
15.	-6384	4	E,I,P,U	4	B,E,I,N
16.	-6440	5	E,I,P,S,U	4	B,E,I,N
17.	-6488	3	E,I,U	4	B,E,I,N
18.	-6501	4	E,I,P,U	3	B,I,N
19.	-6668	4	E,I,P,U	4	B,E,I,N
20.	-6687	2	E,I	4	B,E,I,N
21.	-6772	4	B,E,I,U	4	B,E,I,N
22.	-6815	3	E,I,U	4	B,E,I,N
23.	-6817	3	E,I,U	4	B,E,I,N
24.	-7489	3	E,I,U	4	B,E,I,N
25.	-8166	3	E,I,U	4	B,E,I,N
26.	-8170	4	B,E,P,U	3	B,E,N
27.	-8933	3	E,J,U	4	B,E,I,N
28.	-8999	4	B,E,I,U	4	B,E,I,N
29.	-9039	4	B,E,I,U	3	B,I,N
30.	-9041	3	E,I,U	4	B,E,I,N
31.	-9103	3	B,E,I	4	B,E,I,N
32.	-9112	5	B,E,I,P,U	4	B,E,I,N
33.	-9127	3	E,I,U	4	B,E,I,N
34.	-10382	3	E,I,U	3	B,E,N
35.	-10384	3	E,I,U	3	B,I,N
36.	-10399	3	E,I,U	4	B,E,I,N
37.	-10466	3	I,P,U	3	B,I,N
38.	-10539	3	B,E,U	3	B,E,N
39.	-10630	5	B,E,I,P,U	4	B,E,I,N
40.	-10809	3	E,I,U	3	B,I,N
41.	-11088	3	E,I,U	3	B,E,N
42.	-11224	3	E,I,U	4	B,E,I,N
43.	-12266	3	E,I,U	3	B,E,N
44.	ICCL-80001	3	B,I,U	4	B,E,I,N

Table 3. Contd.

S. No.	Entry	No. of locations where found promising against wilt	Locations	No. of locations where found promising against root rots	Locations
45.	ICCL-80002	4	B,E,I,U	4	B,E,I,N
46.	-80004	3	E,I,U	3	B,I,N
47.	-80031	1	E	2	B,N
48.	-80035	0	-	3	B,E,N
49.	-81001	2	I,U	4	B,E,I,N
50.	-81002	4	B,E,I,U	3	B,I,N
51.	-81004	2	E,I	4	B,E,I,N
52.	-81005	5	B,E,I,P,U	4	B,E,I,N
53.	-81006	3	B,E,U	3	B,E,N
54.	-81007	3	E,P,U	3	B,E,N
55.	-81008	3	E,I,U	4	B,E,I,N
56.	-81009	4	B,E,I,U	4	B,E,I,N
57.	-81010	3	B,I,U	4	B,E,I,N
58.	-81011	3	I,P,U	3	B,E,N
59.	-81012	3	B,E,U	3	B,E,N
60.	-81013	4	B,E,I,U	3	B,E,N
61.	-81014	2	I,P	4	B,E,I,N
62.	-81015	4	B,I,P,U	3	B,E,N
63.	-81016	3	E,I,U	4	B,E,I,N
64.	-81017	4	E,I,P,U	4	B,E,I,N
65.	-81201	2	I,P	4	B,E,I,N
66.	-81249	4	B,I,P,U	4	B,E,I,N
67.	-81250	2	B,U	3	B,E,N
68.	-81251	2	B,P	3	B,E,N
69.	-81253	3	B,E,P	3	B,E,N
70.	-81254	5	B,E,I,P,U	4	B,E,I,N
71.	-81255	5	B,E,I,P,U	4	B,E,I,N
72.	-81256	5	B,E,I,P,U	4	B,E,I,N
73.	-81257	3	B,P,U	3	B,E,N
74.	-81258	2	I,U	4	B,E,I,N

B-Bangladesh, E-Ethiopia, I-India, N-Nepal, P-Peru, S-Spain, U-USA.

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