

found promising against the above mentioned diseases at their locations. The seed may be sent to:

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## Physiologic Races of the Chickpea Wilt Pathogen

Preliminary studies conducted in 1977 (ICRISAT Annual Report, 1977-78) with isolates collected from Hyderabad, Jabalpur, Kanpur, Hissar, and Gurdaspur in India, indicated the existence of races in *Fusarium oxysporum* f.sp. *ciceri*. To confirm these findings, wilted plants were collected in December 1978 at Hissar and Kanpur. The fungus was isolated from these plants and single spored. The cultures were then used in repeating the study. The reactions obtained by inoculating 10 chickpea cultivars confirmed the earlier findings.

The results shown in Table 1 indicate that C-104 was resistant to the Gurdaspur isolate but susceptible to all other iso-

Table 1. Reaction of chickpea cultivars to five isolates of *Fusarium oxysporum* f.sp. *ciceri*<sup>a</sup>.

S. No.	Cultivar	Reaction to isolate <sup>b</sup>																			
		Hyderabad				Hissar				Jabalpur				Kanpur				Gurdaspur			
		1	2	3	4 <sup>c</sup>	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
1	JG-62	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	M	M	M	M
2	C-104	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	R	R	R	R
3	BG-212	R	R	R	R	M	M	M	M	M	M	M	M	S	S	S	S	M	M	M	M
4	JG-74	R	R	R	R	R	R	R	R	R	R	R	R	S	M	S	M	R	R	R	R
5	CPS-1	R	R	R	R	M	M	M	M	S	M	M	M	S	S	S	S	S	S	S	S
6	WR-315	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	S	S	M	M
7	Annigeri	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S
8	Chafa	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	M	M	M
9	L-550	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	M	M	M	M
10	850-3/27	S	S	S	S	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M

<sup>a</sup> Readings were taken 40 days after inoculation

<sup>b</sup> R = Resistant (0-20% wilt); M = Moderately susceptible (21-50% wilt); S = Susceptible (51% and above wilt). Seedling number of each cultivar varied from 20 to 25 in different tests.

<sup>c</sup> The test was carried out four times.

lates. JG-74 was resistant to all isolates except the Kanpur isolate. CPS-1 was resistant only to the ICRISAT isolate. WR-315 was resistant to all isolates except the Gurdaspur isolate. JG-62, L-550, and Chafa were susceptible to four isolates and moderately susceptible to the Gurdaspur isolate. Cultivar 850-3/27 was susceptible to the Hyderabad isolate and moderately susceptible to all other isolates. Annigeri was susceptible to all isolates.

The Hissar and Jabalpur isolates appeared to be identical and can be considered nearer to the ICRISAT isolate. The Kanpur isolate was more aggressive and quite distinct. It appeared to be a different physiologic race. The Gurdaspur isolate also gave a distinct reaction on C-104 and can be considered a separate race.

The cultures of these races are being maintained in the pulse pathology laboratory of ICRISAT.

- M.P. Haware and Y.L. Nene (ICRISAT).

### ✧ Symptomless Carriers of the Chickpea Wilt Fungus

Field and pot studies over two years indicated that *Fusarium oxysporum* f.sp. *ciceri*, the chickpea wilt pathogen, parasitized the roots of pea (*Pisum sativum*), lentil (*Lens esculentus*), and pigeonpea (*Cajanus cajan*) without causing any apparent symptoms. Chickpea wilt fungus was successfully isolated from plants collected from a wilt-sick plot and those raised in pots in wilt-infested soil. The isolates proved pathogenic to chickpea, and cultures were identical to the standard culture of the chickpea wilt *Fusarium*.

We could not isolate the wilt fungus from the following crop plants grown in wilt-sick soil: sorghum, pearl millet, black gram, green gram, climbing bean, french bean, tomato, brinjal, lucern, groundnut, chilli, maize, cucumber, radish, lady's finger, cowpea, watermelon, and soybean.

Thus, our experiments revealed that the wilt fungus can survive in plants other than chickpea, and that the non-host crops mentioned above may be suitable for rotating with chickpea to reduce wilt sickness of a field.

- M.P. Haware and Y.L. Nene (ICRISAT).

### Chickpea Disease Bulletin

Information Bulletin No. 3, 44 pp. 1978,

of ICRISAT, entitled "Diagnosis of some wilt-like disorders of chickpea (*Cicer arietinum* L.)," by Y.L. Nene, M.P. Haware, and M.V. Reddy has been published to help agricultural scientists and extension workers diagnose the disorders of chickpea that lead to premature drying of plants. The bulletin includes a disease identification key and description of the diagnostic symptoms of 12 disorders with 37 full color illustrations. Single copies are available free of charge from the Head, Information Services, ICRISAT.

- Y.L. Nene (ICRISAT).

### ✧ Pea Leaf Roll Virus Causes Chickpea Stunt

Considerable confusion has existed in diagnosing various chickpea disorders, particularly wilt and root rots. In 1974, ICRISAT initiated a project to investigate the "Wilt Complex" of chickpea. A viral disorder characterized by stunting and phloem-browning was found to be one of the important causes of premature death of plants (Nene *et al.*, 1978)\*. Based on the symptomatology, host range, aphid transmission, serology, and electron microscopy of the purified preparations, the causal agent was identified as pea leaf roll virus.

Extensive screening of the germplasm is being carried out to find resistance sources. Screening is done at Hissar in North India where the natural incidence of the disease is quite high. Early planting of hosts of the pea leaf roll virus and a stunt-susceptible cultivar of chickpea is done in the form of interlards to promote high disease incidence. During the 1978-79 season, the susceptible check WR-315 showed more than 80 percent infection. So far 21 lines that showed less than 10 percent infection in three consecutive years have been identified and are available for use by breeders and pathologists.

- M.V. Reddy and Y.L. Nene (ICRISAT), and J.P. Verma (HAU, Hissar).

\* Nene, Y.L., M.P. Haware, and M.V. Reddy. 1978. Diagnosis of some wilt-like disorders of chickpea (*Cicer arietinum* L.). Information Bulletin No. 3. International Crops Research Institute for the Semi-Arid Tropics (ICRISAT), Patancheru, India.