

## RELATIVE SUSCEPTIBILITY OF COWPEA VARIETIES TO INFESTATION BY *MELOIDOGYNE INCOGNITA*\*

Cowpea, *Vigna unguiculata* (L.) Walp is a widely cultivated pulse crop in Kerala. However, some of the popular varieties are susceptible to infestation by the root-knot nematode *Meloidogyne incognita*. The cultivation of resistant or moderately resistant varieties in areas endemic to this nematode infestation would be desirable to reduce crop losses. In the present study, ten varieties of cowpea, namely, PTB 1, PTB 2, C 152, HG 22, New Era, V 16, V 37, V 240, Pathinettumaniyan and Sundari, were screened for resistance to *M. incognita*. Out of these ten varieties, the seeds of PTB 1, PTB 2, C 152, HG 22, New Era, Pathinettumaniyan and Sundari were obtained from the Department of Agronomy, College of Agriculture, Vellayani while the seeds of remaining three varieties, V 16, V 37 and V 240 were obtained from the Department of Plant Breeding, College of Agriculture, Vellayani.

A pot culture experiment using sterilized soil was conducted under aseptic conditions. The seeds cowpea were surface sterilized prior to inoculation with an appropriate *Rhizobium* culture. After germination, one seedling each of uniform growth was maintained in every pot. The seedlings were inoculated with 1000 numbers of second stage larvae of *M. incognita* on the 14th day of plant growth. Three replications were maintained for each treatment. The observations on gall number, gall fresh weight, nodule number, nodule fresh weight, root length, leaf number, plant height, fresh and dry weight of shoot and the nematode population per gram fresh weight of root and 100 g of the inoculated soil were taken on the 50th day of plant growth.

Among the 10 varieties of cowpea tested for resistance of *M. incognita*, PTB 2 and New Era were found to be highly susceptible. The remaining varieties were resistant to this nematode infestation. In PTB 2 and New Era 64.30 and 141.30 galls were formed per plant (Table 1). The number of nodules formed in these varieties was only 24.30 and 19.67 respectively. A significant reduction in nodule fresh weight, leaf number, plant height and fresh and dry weight of shoot was also observed. The nematode population per gram fresh weight of root and 100 g of the inoculated soil of these varieties increased significantly as compared to the other varieties (Table 2). In varieties such as PTB 1, C 152, HG 22, V 16, V 37, V 240, Pathinettumaniyan and Sundari, there was no gall formation at all. The number of nodules formed, nodule fresh weight, leaf number, plant height and fresh and dry weight of shoot, were significantly higher in these varieties in comparison to the susceptible varieties (Table 1 and Plate 1). The residual nematode population per

Table 1

Host varietal variations in cowpea to infestation by *Meloidogyne incognita* \*

Cowpea variety	Gall number	Gall fresh weight (g)	Nodule number	Nodule fresh weight (g)	Root length (cm)	Leaf number	Plant height (cm)	Fresh weight of shoot (g)	Dry weight of shoot (g)
PTB 1	0 (1)	0	55.30 (7.40)	1.15	16.53	11.67 (3.40)	62.47	23.23	1.99
PTB 2	64.30 (8.07)	0.22	24.30 (4.79)	0.40	15.13	4.67 (2.16)	13.50	12.31	1.11
C 152	0 (1)	0	72.00 (8.45)	1.35	17.30	10.30 (3.21)	28.70	22.90	1.52
HG 22	0 (1)	0	60.67 (7.77)	1.37	16.70	11.67 (3.41)	50.47	32.05	1.79
New Era	141.0 (11.75)	1.41	19.67 (4.30)	0.26	11.07	4.00 (1.95)	12.70	10.50	0.71
V 16	0 (1)	0	61.67 (7.84)	1.34	31.70	12.00 (3.46)	30.47	21.39	1.66
V 37	0 (1)	0	90.00 (9.48)	1.83	19.40	12.67 (3.55)	32.47	21.67	1.61
V 240	0 (1)	0	58.33 (8.26)	1.15	21.47	12.00 (3.46)	30.97	19.10	1.58
Pathinettu- maniyar	0 (1)	0	64.30 (6.53)	1.15	21.23	11.33 (3.33)	37.00	23.73	1.79
Sundari	0 (1)	0	44.30 (6.63)	1.28	24.67	11.30 (3.35)	29.67	18.74	1.71
CD (0.05)	1.24	0.29	0.45	0.61	4.16	0.58	14.18	6.13	0.20

\* Mean of 3 replications

Figures in paranthesis are  $\sqrt{X+1}$  transformation values for gall number and  $\sqrt{X}$  transformation values for nodule number and leaf number respectively.

Table 2  
Residual nematode population in infected root and soil \*

Cowpea variety	Nematode population per gram fresh weight of root	Nematode population in 100 g soil
PTB 1	7.67 (0.88)	2.00 (0.26)
PTB 2	147.33 (2.17)	86.67 (1.95)
C 152	2.67 (0.40)	2.67 (0.42)
HG 22	3.33 (0.49)	2.67 (0.36)
New Era	342.30 (2.53)	203.77 (2.31)
V 16	4.00 (0.58)	3.00 (0.36)
V 37	5.33 (0.62)	4.33 (0.59)
V 240	4.67 (0.62)	2.33 (0.36)
Pathinettumaniyan	2.33 (0.63)	2.00 (0.26)
Sundari	7.33 (0.81)	3.67 (0.48)
CD (0.05)	0.32	0.40

\* Mean of 3 replications  
Figures in paranthesis are log X transformation values for nematode population per g fresh weight of root and 100 g soil.

gram fresh weight of root and 100 g soil was also significantly low (Table 2). However, the root length in varieties such as PTB 1, C 152, HG 22 and V 37 was on par with that of PTB 2. The occurrence of this type of varietal variations in cowpea for resistance against infestation by *M. incognita* is reported earlier also. Thus Cavenuss (1975) could select four resistant lines of cowpea out of the 241 screened for susceptibility to infestation by this nematode. Similar results were also reported by Sharma and Sethi (1978) and Ibrahim *et al.* (1983).

The results obtained during this investigation also indicated variations in the varietal susceptibility in cowpea to infestation by *M. incognita*. Out of the ten varieties used for the study, the two varieties PTB 2 and New Era, were highly

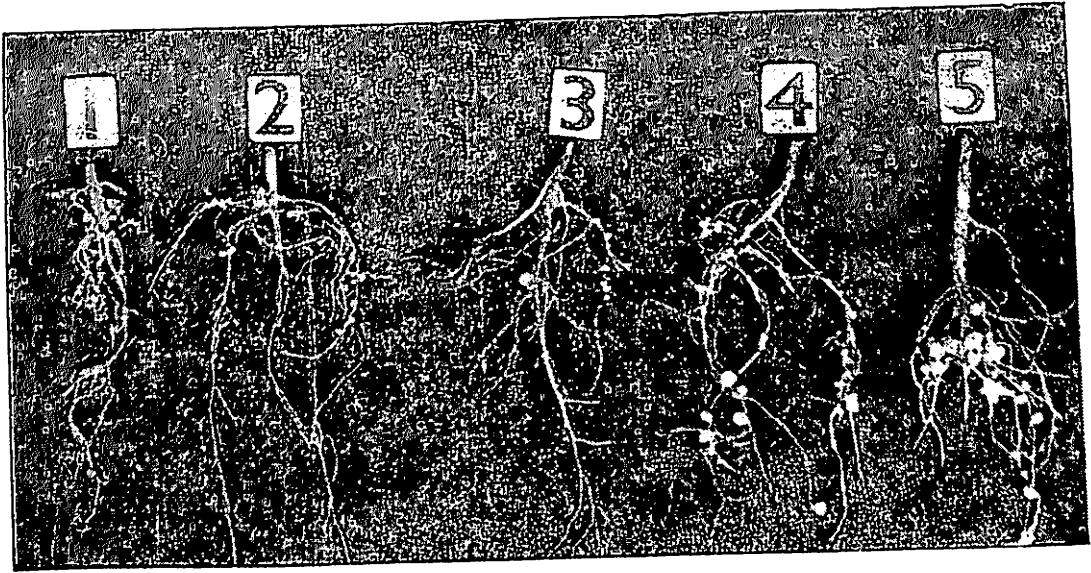


Plate 1. Varietal variations in cowpea to infestations by  
*Meloidogyne incognita*

- |            |                      |
|------------|----------------------|
| 1) New Era | 2) Pathinettumaniyan |
| 3) PTB 2   | 4) C 152             |
|            | 5) PTB 1             |

susceptible. In these varieties, *M. incognita* infestation had a severe deleterious effect on various plant characters including the nodulation by *Rhizobium*. Therefore, it appears that infestation by this nematode could be a major limiting factor for the large scale cultivation in areas endemic with *M. incognita*. In such areas the resistant varieties such as PTB 1, C 152, HG 22, etc. can be recommended for cultivation.

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