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Department of Nematology Rajasthan College of Agriculture
Udaipur (Raj.) India

PATHOGENICITY OF *ROTYLENCHULUS RENIFORMIS* ON COWPEA (1)

by

D. C. GUPTA (2) and B. S. YADAV

Although there are records from India of the association of *Rotylenchulus* species with cowpea, *Vigna unguiculata* (L.) Walp, (Dasgupta and Seshadri, 1971; Dasgupta and Raski, 1968) there have been no detailed investigations to determine the extent of damage to the crop. The following investigation was undertaken to determine the effect of inoculum levels of *Rotylenchulus reniformis* Linford *et* Oliveira on the growth of cowpea and the rate of increase of nematode populations.

MATERIALS AND METHODS

Seedlings of cowpea cv Local were planted singly in 10 cm diameter clay pots containing 500 g sterilized soil. After 10 days, when the plants, were well established, *R. reniformis* larvae were poured around the exposed roots in a logarithmic inoculum series 10, 100, 1000 and 10,000 per pot and the roots then covered with soil. Each treatment was replicated three times.

After 40 days the plants were removed from the pots and the roots washed gently in water, until no soil remained attached. The fresh shoots and roots were weighed and the root then stained with

(1) Part of the Ph. D. thesis submitted by the senior author to University of Udaipur.

(2) Present address: Assistant Professor, Department of Nematology, HAU, Hissar (Haryan) India.

Table I - *Effect of increasing inoculum levels of* Rotylenchulus reniformis *on plant growth and nodule formation on cowpea var. local.*

Inoculum density	Plant height (cm)	Fresh shoot weight (g)	Fresh root weight (g)	No. nodules per plant
0	33.9	51.2	8.5	56.0
10	31.9	46.8	7.5	41.0
100	30.3	35.8	6 6	36.0
1000	27.8	29.7	4.2	39.0
10000	20.2	25.9	3.0	55.0
C.D. at 5% (P = 0.05)	2.505	6.257	2.122	11.223
C.D. at 1% (P = 0.01)	3.644	9.104	3.087	16.329

Table II - *Effect of increasing inoculum levels of* R. reniformis *on its multiplication on cowpea.*

Inoculum density	Number of egg masses per plant	Number of eggs per egg mass	Soil population per pot	Reproduction potential $R = \frac{Pf}{Pi}$
0	0.0	0.0	0.0	0.0
10	2.3	69.0	29.0	2.9
100	16.6	69.0	782.3	7.8
1000	60.6	64.0	1709.3	1.7
10000	100.3	58.0	4080.0	0.4
C.D. at 5% (P = 0.05)	8.234	7.976	182.727	
C.D. at 1% (P = 0.01)	11.980	11.604	265.850	

0.1% acid fuchsin-lactophenol to reveal egg masses. Nematodes were extracted from the soil in each pot.

RESULTS AND DISCUSSION

A significant reduction was recorded in plant height, fresh shoot and root weights with a nematode inoculum of 1000 larvae or more per pot (Table 1). The effect increased with increasing inoculum level. The presence of nematodes appeared to have no significant effect on the number of bacterial nodules on the roots. The results do not agree with those of Epps and Chambers (1962) who reported that nematodes, especially root-knot and cyst types, affect the normal nodulation by *Rhizobium japonica* in soybean.

The highest rate of nematode reproduction occurred in pots inoculated with 100 nematodes and this correlated with the highest rate of egg mass production per plant. The lowest rate of reproduction occurred at the highest inoculum level (Table II). An initial population density of 1000 nematodes per 500 g soil caused a significant reduction in plant growth and can be considered as the threshold level for *R. reniformis* on cowpea, according to the concept of Seinhorst (1970).

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