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LOSSES DUE TO *MELOIDOGYNE INCOGNITA* IN OKRA IN LIBERIA

by
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Summary. *Meloidogyne incognita* is the prevalent species of the root-knot nematodes in okra in Liberia. *M. javanica* also occurs alone or in concomitant infestation with *M. incognita*. *M. arenaria* was found only once in a mixed population with *M. incognita*. Heavy infestations of *M. incognita* significantly reduced the growth and yield of cv. Clemson spineless.

Okra (*Abelmoschus esculentus* L.) is severely attacked by root-knot nematodes in Liberia. *Meloidogyne incognita* (Kofoid *et* White) Chitw. is the prevalent species found in 32 out of the 41 samples examined during a country wide survey. *M. javanica* (Treub) Chitw. occurred in eight samples, three of which also contained *M. incognita*; *M. arenaria* (Neal) Chitw. was found in one instance only, in concomitant infestation with *M. javanica*.

Root systems are heavily galled (Fig. 1) and devoid of lateral roots in the final stage (Fig. 2), especially when *M. incognita* or *M. javanica* occur. However, the effect on plant growth and yield is difficult to evaluate because of the absence in many cases of evident symptoms of decline and of a suitable comparison with uninfected plants growing in the same situation.

An experiment was therefore undertaken in 1986 to assess, under field conditions, losses due to *M. incognita*.

Materials and methods

An infested field, consisting of a sandly soil, at the Central Agricultural Research Institute at Suakoko, was ploughed, rotavated and subdivided in 24 4×2 m plots distributed at random in four blocks. There was a 1 m interspace between plots. On November 21 groups of 4 plots were treated either with methomyl wettable

Fig. 1 - Large galls induced by *Meloidogyne incognita* on the root system of okra plant in Liberia.

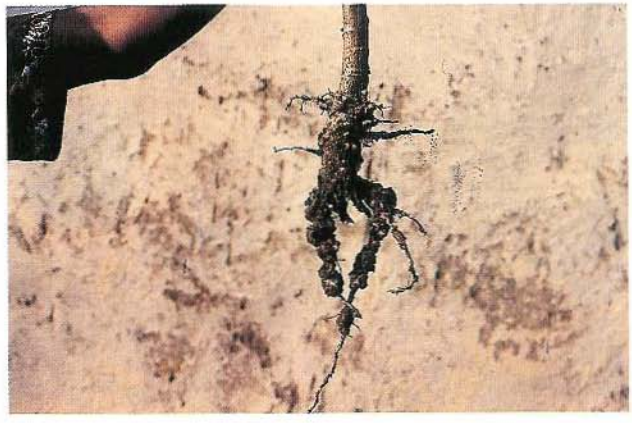

Fig. 2 - Root system of an okra plant damaged by the attacks of *M. incognita*.

powder at the rate of 8 kg a.i./ha, or with a granular formulation of carbofuran at the rates of 4, 8, 10 or 12 kg a.i./ha. Both chemicals were broadcast on the plot surface and incorporated into the soil to a depth of 10-15 cm. Four plots were left untreated as control. On the same day, seeds of okra cv. Clemson spineless were sown at 75 cm spacing in rows spaced 80 cm apart.

To evaluate the effect of the treatments the following data were recorded: plant height, of five plants selected at random at the centre of each plot three and six weeks after sowing, pod yield, number of plants surviving to harvest and number of galls on the root system of five plants selected at the centre of each plot at the end of the experiment, 23 February 1987. Data were statistically analysed.

Results and conclusions

Unfortunately, the uneven distribution of *M. incognita* in the experimental field gave erratic results that were unsuitable for sound statistical analysis. Nevertheless, some correlations were calculated which indicate the significance of some of the parameters that were examined (Table I).

TABLE I. - *Coefficients of correlation between the variables examined*

Yield	Number of galls per root system	Plant height 3 weeks after sowing	Plant height 6 weeks after sowing
Yield	—.440*	.851***	.833***
No of galls		—.481**	—.433*
Plant height 3 weeks after sowing			.847***

*** r significant for P=0.001; ** r significant for P=0.01; * r significant for P=0.05.

When the soil was heavily infested by the root-knot nematode, numerous galls were produced on the root systems and plant growth (Fig. 3) and yield (Fig. 4) were negatively affected. In the case of the most severe degree of galling, the crop losses were as high as 90%.

It can be therefore stated that as in India (Bhatti and Jain, 1977), *M. incognita* is a limiting factor of okra production in Liberia.

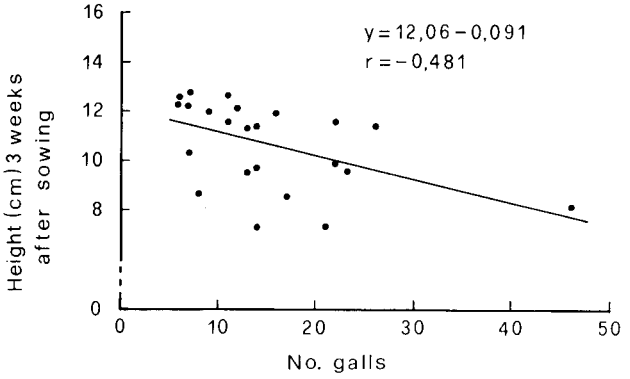

Fig. 3 - Correlation between height of plants and number of root galls per plant at the end of the experiment.

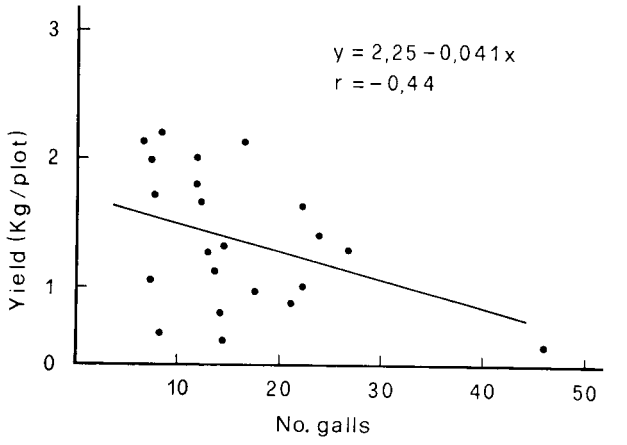

Fig. 4 - Correlation between yield and number of root galls per plant at the end of the experiment.

Literature cited

BHATTI D.S. and JAIN R.K., 1977 - Estimation of loss in okra, tomato and brinjal yield due to *Meloidogyne incognita*. *Indian J. Nematol.*, 7: 37-41.

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