

Assessment of yield losses due to root-knot nematode, *Meloidogyne incognita* infesting okra [*Abelmoschus esculentus* (L.) Moench]

A.G. SHENDGE, N.L. MHASE, S.A. LANDGE AND R.V. KADU

International Journal of Plant Protection (October, 2010), Vol. 3 No. 2 : 325-326

See end of the article for authors' affiliations

Correspondence to :

A.G. SHENDGE

Department of
Entomology, Mahatma
Phule Krishi
Vidyapeeth, Rahuri,
AHMEDNAGAR
(M.S.) INDIA

SUMMARY

The micro plot experiment was conducted to assess the avoidable yield loss in okra due to root-knot nematode, *M. incognita*. The results indicated that the loss in yield of okra was recorded to the extent of 27.02 per cent, when the crop was treated with carbofuran 3G @ 2 kg a.i./ha.

Key words :

Okra [*Abelmoschus esculentus* (L.) Moench] also known as 'lady's finger' in western style or 'Bhindi' in Indian language is grown extensively in all the tropical and sub-tropical parts of the world. It is one of the important pod vegetable crops being cultivated all over India. The crop is attacked by various insect and non-insect pests. In addition to insect pests and diseases, plant parasitic nematodes have also becoming a limiting factor in the successful cultivation of this crop. Many species of phytonematodes have been found associated with rhizosphere of okra. Amongst these, root-knot nematode, *Meloidogyne incognita* is considered to be of great economic importance. It has a host range of 232 host genera (Krishnappa, 1985). The estimated losses in yield of okra due to plant parasitic nematodes are 20.40 per cent on worldwide basis (Sasser, 1987).

MATERIALS AND METHODS

The present investigation was carried out in root knot nematode sick microplots (1.8 x 1.1 m size) of AICRP on Nematodes, Department of Agricultural Entomology, Mahatma Phule Krishi Vidyapeeth, Rahuri during Rabi, 2008. The nematocide Carbofuran 3G was applied at 2 kg a.i./ha at sowing. Two to three seeds of okra (cv. ARKA ANAMIKA) were sown at 30 x 15 cm spacing. Seven days

after germination only one healthy seedling was maintained per hill. There were two treatments including untreated control, replicated ten times in paired plot design. The crop in the microplots was grown by following the recommended agronomic practices. The 200 g soil samples were processed by Cobb's sieving and decanting method in laboratory for initial and final root-knot nematode population in the microplots. From these observations, per cent decrease in nematode population was worked out.

At termination, ten plants from each microplot were uprooted carefully and washed under clean tap water to remove the adhering soil particles to the roots. Number of root galls and egg masses on roots per plant were recorded and gall indices 1 to 5 scales were worked out. From these observations per cent decrease in gall index over an untreated control was worked out. Length, fresh and dry weights of shoots and roots were also recorded at termination. From these observations, per cent increase in length, fresh and dry weights of shoots and roots over an untreated control were worked out. The okra fruit yield obtained from the plants in the micro plots of each treatment at each picking made at 3 days interval commencing from 55 days after sowing up to termination was recorded and expressed in quintals per hectare. From these observations,

Accepted :
August, 2010

Table 1 : Yield losses due to root knot nematode, *M. incognita* in okra

| Sr. No. | Treatments | Nematode population/200 ml of soil | | No. of root galls / plant | Gall index/ plant | Length /plant (cm) | | Fresh weight/plant (g) | | Dry weight /plant(g) | | Yield in q/ha |
|---------|-------------------|------------------------------------|--|---------------------------|-------------------|--------------------|---|---|---|--|--|--------------------------------|
| | | Initial | Final | | | Root | Shoot | Root | Shoot | Root | Shoot | |
| | | 1. | Treated (Carbofuran 3G at 2 kg a.i./ha) | | | 527.0 | 206.00 ^a (76.48) ¹ | 35.9 ^a (70.19) ² | 3.00 ^a (40.00) ³ | 29.90 ^a (66.37) ⁴ | 46.45 ^a (71.02) ⁵ | |
| 2. | Untreated control | 532.0 | 876.00 | 121.00 | 5.00 | 17.96 | 27.17 | 3.22 | 18.34 | 0.62 | 3.69 | 10.50 (27.02) ¹⁰ |

a= Highly significant (p=0.01) differences from an untreated plots according to 't' tests for paired comparisons

the per cent loss in yield of an untreated control was ascertained.

RESULTS AND DISCUSSION

The initial root-knot nematode population ranged from 460 to 600 nematodes per 200 cm³ of soil in microplots. The reduction in nematode population, number of root galls and gall index in treated plots ranged from 71.05 to 81.91, 64.40 to 76.56 and 40 per cent, respectively. The increase in length, fresh and dry weight of root and shoot per plant in treated plots ranged from 49.45 to 88.16, 56.13 to 81.13, 82.58 to 99.35, 58.11 to 97.42; 87.5 to 123.33 and 77.74 to 95.71 per cent, respectively. The yield recorded in treated and an untreated plots were 14.41 and 10.50 q/ha, respectively. The loss in yield of okra in untreated plots ranged from 24.33 to 35.40 per cent. However, the average loss of 27.02 per cent in the yield of okra was recorded in the untreated plots, when the crop was treated with carbofuran 3G @ 2 kg a.i./ha. The results obtained under study are in conformity with those of Mote and Mhase (1997), who also reported 27.20 per cent loss in yield of okra, when the crop was treated with carbofuran 3G @ 2 kg a.i./ha. Reddy (1986) also reported yield loss of 28.00 to 43.00 per cent in okra.

Authors' affiliations:

N.L. MHASE, S.A. LANDGE AND R.V. KADU,
Department of Entomology, Mahatma Phule Krishi Vidyapeeth, Rahuri, AHMEDNAGAR (M.S.) INDIA

REFERENCES

- Chitwood, B.G. (1949).** Root-knot nematodes. Part I. A revision of the genus *Meloidogyne goeldi*, 1987. *Proc. Helm. Soc. Wash.*, **16** : 90-104.
- Krishnappa, K. (1985).** In : *An advance treatise on Meloidogyne Vol. I. Biology and Control*, 381 pp.
- Mote, U.N. and Mhase, N.L. (1997).** Two decades of nematology (1977-97)" of AICRP on plant parasitic nematodes with integrated approach for their control. Department of Entomology, Mahatma Phule Krishi Vidyapeeth, Rahuri. 21 pp.
- Reddy, P.P. (1986).** Estimation of crop losses in certain vegetables due to *Meloidogyne incognita*. *Internat. Nematol. Network Newsl.*, **3** (4) : 3-5.
- Sasser, J.N. (1987).** In : Plant parasitic nematodes. The Farmers Hidden Enemy, 11 p.
