Department of Nematology. B.A. College of Agriculture, Gujarat Agricultural University, Anand Campus - Anand 388 110 (G.S.), India

# MANAGEMENT OF ROOT-KNOT NEMATODES BY PERIWINKLE

#### by

H.R. PATEL, D. J PATEL, C.C. PATEL and N.A. THAKAR

Summary. Pink and white periwinkles were examined in pot experiments as trap plants for root-knot nematodes (*Meloidogyne incognita* and M. javanica). Pots were inoculated with 2000 eggs or second stage juveniles per plant and after three months were replaced with the susceptible okra to judge the extent of nematode suppression or trapping. There was 100 per cent reduction of root-knot nematodes on okra after pink periwinkle and 95 per cent after white periwinkle treatments, thus, indicating their value as trap crop.

Periwinkle (*Catharanthus roseus* G. Don.), an evergreen plant is reported to be antagonistic to *Meloidogyne incognita* (Jagdale *et al.*, 1985) and a non-host of *Radopholus similis* (Koshy and Sosamma, 1975). Also, extracts of periwinkle have been found to have ovistatic and nematicidal effects when tested on *M. incognita* (Desai *et al.*, 1973; Patel *et al.*, 1987). Previous pot experiments indicated that root-knot nematodes (*M. incognita* and *M. javanica*) freely enter and form galls on the roots of periwinkle, but do not develop to maturity. This observation encouraged the autors to test periwinkle as a trap crop for the management of root-knot nematodes.

## Materials and methods

Forty five days old seedlings of white and pink flowered periwinkles raised in steamed soil were transplanted singly into earthen pots (15 cm diameter) filled with one kg of steamed soil. A susceptible okra (*Abelmoschus esculentus* L.) cv. *Pusa Savni* was used as host plant to detect nematode infection. At the germination of the okra seeds and establishment of the periwinkle seedlings, plants were inoculated, either with 2000 eggs or second stage juveniles of root-knot nematodes, a mixed population of *M. incognita* (Kofoid *et* White) Chitw. and *M. javanica* (Treub) Chitw. individually, thus six treatments were replicated six times using completely randomised design. Three months after inoculation, plants were removed carefully and roots were rated for root-knot intensity using a 0-5 scale. Galled roots were stained to obeserve the developmental stages of the nematodes. The pots were again refilled with the respective soils and three okra seeds/pot were sown for nematode assessment as a test crop in all the treatments. Upon germination, plants were thinned to one per pot. Forty five days after sowing, the plants were carefully removed and roots rated for root-knot intensity. The trial was repeated twice during the season (1986-87).

### **Results and discussion**

Root galling was present on both periwinkles (white and pink) and on okra, but significantly less on the periwinkles (Table I). Microscopic examination of galled roots revealed only the presence of second stage and swollen juveniles. No spike tail stages of the nematodes were seen in the roots of both periwinkles, while different stages and females with numerous eggs were observed on okra galled roots. Observations on okra roots indicated that plants after pink periwinkle were completely free from root-knot infection while those that had followed white periwinkle, had only a slight (0.2) root-knot index compared to control plants having maximum disease index of 4. Thus, there was 100 per cent reduction in root-knot disease on okra in pink periwinkle and 95 per cent in white periwinkle. Inoculation with either eggs or juveniles of root-knot nematodes did not make any significant difference. Thus, periwinkle proves to be a good trap crop for root-knot nematodes.

Treatment	Root-knot index (0-5)* on					
	Тгар сгор			Test crop (okra)		
	Expt. 1	Expt. 2	Pooled	Expt. 1	Expt. 2	Average
Crop (C)						
White flower periwinkle	1.4	2.5	2.0	0.4· (89.5)	0.0 (100.0)	0.2 (95.1)
Pink flower periwinkle	1.3	1.9	1.6	0.0 (100.0)	0.0 (100.0)	0.0 (100.0)
Okra	3.7	4.9	4.3	3.8	4.3	4.1
C.D.	0.5	0.2	0.3		· · · · · · · · · · · · · · · · · · ·	
Inoculum (I)						
Eggs	2.1	3.6	2.9	1.2	1.1	1.1
Juveniles	2.1	2.6	2.4	1.0	1.1	1.0
C.D. 0.05	ns	0.2	ns			

TABLE I - Effect of periwinkle on root-knot nematodes.

\* 0 = free; 5 = Maximum disease intensity; figures in parantheses are per cent root-knot disease reduction over okra.

#### Literature cited

- DESAY M.V., and SHAHI H.M. and PILLAI S.N., 1973 -Nematicidal properties of some plant species. *Indian J. Nematol.*, 3: 77-78.
- JAGDALE G.B., PAWAR A.B. and DAREKAR K.S., 1985 Effect of organic amendments and antagonistic plants on control of root-knot nematode infecting betelvine (*Piper betel* L.), IV

Nematol. Symp., Mohanlal Sukhandia Uni., Udaipur, India, May 17-18, 1985, p. 8.

- KOSHY P.K. and SOSAMMA V.K., 1985 Host range of burrowing nematode (*Radopholus similis* Cobb. 1893) Thorne, 1949. Indian J. Nematol., 5: 255-257.
- PATEL H.R., TIIAKAR N.A. and PATEL C.C., 1987 Larval emergence and infestation of *Meloidogyne incognita* as influenced by periwinkle (*Catharanthus roseus*). Indian J. Agric. Sci., 57: 863-866.

Accepted for publication on 12 January 1991.