Efficacy of neem (*Azadirachta indica*) cake as nursery bed treatment in the management of root knot nematode (*Meloidogyne javanica*) infecting tomato

R.K. JAIN AND D.C. GUPTA

Department of Nematology, CCS Haryana Agricultural University, Hisar- 125 004.

Neem (*Azadirachta indica*) cake, a potential organic amendment having nematicidal properties was evaluated at different doses as nursery bed treatment against *M. javanica* infecting tomato. The studies were carried out in root knot nematode (*M. javanica*) infested nursery beds (1 x 0.5m) using neem cake @ 5, 10, 20, 40 and 80 q/ha, 15 days prior to sowing. Carbofuran @ 2 kg a.i./ha and untreated control was included for comparison. Each treatment was replicated three times in a randomised block design. Carbofuran was added one day prior to sowing. The beds were kept moist and free of weeds. Soil samples from each bed were taken again at the time of sowing for assaying nematode population. Tomato (cv. HS 101) seeds @ 2.5g per bed were sown and observations were recorded on plant stand, weight/20 plants and number of galls per 20 seedlings per bed four weeks after germination. Initial nematode population in the nursery beds ranged between 145.3 to 189.3 J_2/250 g soil (Table 1). Fifteen days after addition of neem cake, nematode population was minimum (63.7 J_2/250 g soil) in neem cake used @ 80q/ha leading to 63.9 per cent reduction in nematode population over initial level. This was followed by 80.1 J_2/250 g soil in carbofuran applied beds thus accounting for 49.9 per cent reduction in nematode population. In untreated control also, 3.0 per cent reduction in nematode population over initial level was obtained.

The lower doses of neem cake i.e. 5, 10, 20 and 40 q/ha though showed significant higher kill of nematodes as compared to untreated control, but, these doses were at par with one another. Alam (1991) also observed neem cake @ 110 kg/ha to be effective in managing plant-parasitic nematodes infecting vegetable crops. Plant stand four weeks after germination was however, maximum (239.5) in carbofuran treated beds and minimum (115.0) in neem cake @ 80 q/ha) applied beds. This could be due to the phytotoxic effect of the decomposing neem cake on the seed germination, thus suggesting that probably higher decomposition period is needed to avoid phytotoxic effect of the decomposing neem cake.

The weight per 20 seedlings four weeks after germination was maximum (85.0 g) in neem cake used @ 80 q/ha followed by 68.2 g in 40 and 20 q/ha, respectively. Carbofuran treated beds had 61.8 g weight per 20 seedlings in comparison to 42.2 g in control. Further, all the treatments exhibited significantly less

TABLE 1: Efficacy of neem (*Azadirachta indica*) cake against *M. javanica* in tomato. (Mean of three replicates)

Treatment	Plant stand	Weight/20 seedlings (g)	Number of galls/20 seedlings	Initial nematode population/250cc soil	Nematode population at sowing	Per cent decrease in nematode population over initial level
Neem cake @ 5 q/ha	195.0	49.5	40.0	157.3 (12.5)*	101.1 (10.2)*	35.7
Neem cake @ 10 q/ha	178.3	63.8	45.7	146.4 (12.1)	104.7 (10.3)	28.5
Neem cake @ 20 q/ha	143.0	66.3	35.7	170.7 (13.0)	107.7 (10.4)	36.6
Neem cake @ 40 q/ha	133.3	68.2	35.0	145.3 (12.0)	82.5 (9.1)	43.2
Neem cake @ 80 q/ha	115.0	85.0	15.7	176.7 (13.3)	63.7 (7.9)	63.9
Carbofuran @ 0.2g a.i./m^2	239.3	61.8	28.3	160.0 (12.7)	80.1 (9.0)	49.9
Untreated control	196.7	42.2	93.3	189.3 (13.7)	183.5 (13.5)	3.0
C.D. (5 per cent)	83.7	16.0	34.4	(NS)	(1.6)	

* $\sqrt{n}$ transformed values.

galling per 20 seedlings than untreated control. However, it was minimum (15.7) in 80 q/ha dose which was at par with carbofuran treatment (28.3). Thus, neem cake application as nursery bed treatment seems to be a viable method of controlling root-knot nematode.

REFERENCE

Alam, M.M. (1991). *Pakistan J. Nematol.* 9: 21-30.

Minimising yield losses due to root knot nematode (*Meloidogyne incognita*) by using non-infected tomato seedlings

R.K. JAIN, D.C. GUPTA AND SEWAK RAM

Department of Nematology, CCS Haryana Agricultural University, Hisar- 125 004

Avoidable yield losses in tomato to the extent of 71.9 per cent due to *Meloidogyne incognita* and 47.3 per cent due to *M. javanica* have been reported (Jain *et al.*, 1994). The major source of spread of this disease to the non-infested areas is through the use of root-knot infected seedlings from the nursery beds. Hence, in order to estimate and compared the yield losses in tomato by using infected and non-infected seedlings, the present studies were undertaken. In addition, a root-knot nematode resistant tomato (cv. Hisar-Lalit) was also included for comparison (Jain *et al.*, 1991).

Seedlings of tomato (cv. HS 101) and resistant variety (Hisar-Lalit) were raised in *M. javanica* infested and non-infested soil. Six-week-old seedlings were used for transplanting. Hence, three types of tomato seedlings, viz., root-knot nematode infected and non-infected of cultivar HS 101 (T_1 and T_2, respectively) and a resistant variety Hisar-Lalit (T_3) were used. In the field, each type of seedlings were transplanted alone and in combination with field application of carbofuran @ 1.0 kg a.i./ha in plots (3x3m). accommodating thirty plants per plot. Observations on initial nematode population in the nursery and in the main field at the time of transplanting, yield per plot and root-knot index (1-5 scale) at harvest were recorded.

Hisar-Lalit recorded significant higher and maximum yield (13.5 kg/plot) followed by transplanting of non-infected seedlings of HS 101 (12.9 kg) in comparison to 11.2 kg in infected seedlings of HS 101, irrespective of carbofuran application in the field. However, individually, carbofuran applied plots had higher yield than the untreated plots. Minimum yield (10.0 kg/plot) was in infected HS 101 seedlings (check). The maximum increase in yield (36.0 per cent) over check was in Hisar-Lalit + carbofuran followed by 33.0 per cent