

MANAGEMENT OF ROOT-KNOT NEMATODE *MELOIDOGYNE INCOGNITA* INFESTING GRAM THROUGH OIL CAKES

Y.S. YADAV, A.U. SIDDIQUI and ARUNA PARIHAR

Department of Nematology, Rajasthan College of Agriculture, Maharana Pratap University of Agriculture and Technology, Udaipur -313001, Rajasthan, India.

An experiment was conducted to study the effect of different oil cakes as seed soaking treatment for the management of root-knot nematode infecting gram. For this five oil cakes viz., neem, mustard, mahua, castor and karanj were used as seed soaking @ 10, 15 and 20 per cent (w/v) aqueous extracts. The results showed that all the oil cakes significantly increased the plant growth characters (shoot length and weight, root length and weight) of gram and reduced the nematode reproduction (number of galls and eggmass per plant, number of eggs and larvae per eggmass and soil population) of root-knot nematode. The maximum increase in plant growth characters and maximum reduction in nematode reproduction however, were observed at 20 per cent concentration of aqueous extract of neem cake followed by at 15 per cent neem cake treatment and 20 per cent karanj cake treatment.

Keywords: *Cicer arietinum*; *Meloidogyne incognita*; Oil cakes; Seed soaking management.

Gram is an important pulse crop both as human diet as well as forage for the large cattle population of the country. The root-knot nematode, *Meloidogyne incognita* has been found frequently associated with gram, *Cicer arietinum* and resulting in severe economic losses¹. Chemicals being costlier as well as hazardous in nature therefore, oil cakes could provide an alternative as these are not only safer to use but also have the capacity to improve soil fertility. In the present studies, an attempt has therefore, been made to evaluate the efficacy of different oil cakes against root-knot nematode.

The experiment was carried out in 6" size pots. The five oil cakes viz. neem, mustard, mahua, castor and karanj were used at the rate of 10, 15 and 20 per cent on w/v basis. Oil cakes were grinded well with the help of pestle and mortar and passed through 60-mesh sieve to get fine powdered form of the cakes. Different concentrations of each cake were prepared by soaking 10, 15 and 20 g powdered cake separately in 100 ml distilled water for 24 hours then filtered through muslin cloth and whatman No. 1 filter paper. The gram seeds were soaked for 12 hours in different concentration of each cake.

These seeds were sown in earthen clay pots, which were disinfested before use by rinsing them with four per cent formalin solution and filled with *M. incognita* infested soil with an initial inoculum level of 4 larvae per g of soil. Each treatment was replicated four times. After 10-12 days of germination, one plant in each pot was maintained and the roots were uprooted. The observations on plant growth characters and nematode reproduction were taken after 90 days of sowing.

Results in table 1 revealed that oil cakes of neem, mustard, mahua, castor and karanj used @ 10, 15 and 20 per cent on w/v aqueous extracts as seed soaking treatment increased the plant growth characters of gram significantly and reduced the nematode reproduction, when compared to check. Among oil cakes, neem cake aqueous extract @ 20 per cent was observed most effective in increasing plant growth characters (shoot length 31.95 cm, shoot weight 2.64 g, root length 17.20 cm, root weight 1.33 g) and reducing nematode reproduction (number of galls per plant 47, number of eggmasses per plant 21.25, number of eggs larvae per eggmass 219, soil population in 100 ml soil 592.50) followed by neem cake aqueous extract @ 15 per cent, plant growth characters (shoot length 30.10 cm, shoot weight 2.21 g, root length 15.15 cm, root weight 1.06 g) nematode reproduction (number of gall per plant 51.50, number of eggmass per plant 27.75, number of eggs and larvae per eggmass 225.25, soil population in 100 ml soil 628.50) and karanj cake aqueous extract @ 20 per cent, the reduced plant growth characters (shoot length 19.03 cm, shoot weight 1.31 g, root length 9.13 cm and root weight 0.52 g) and increased nematode reproduction (number of galls 75.50, number of egg masses per plant 60, number of eggs and larvae per eggmass 277.25 and soil population in 100 ml soil 1163.25) in check.

The present findings are in agreement with the findings of^{2,5} who also studied the efficacy of seed soaking of chickpea C.V. Pusa-240 for six hours in 100 and 50 per cent (S and S/2 concentration) aqueous extract of neem cake and found significant increase in plant growth characters (shoot length, shoot weight, root length and

Table 1. Effect of oil cakes as seed soaking on plant growth characters and reproduction of *Meloidogyne incognita* on gram.

Treatment	Plant growth characters					Nematode reproduction			
	Dose (%) (w/v)	Shoot length (cm)	Shoot weight (g)	Root length (cm)	Root weight (g)	No. of galls per plant	No. of egg-masses per plant	No. of eggs & larvae per egg mass	Final soil population /100 ml soil
Karanj	10	24.18	1.66	13.43	0.88	59.00	32.75	252.75	751.75
	15	27.13	2.20	14.73	1.02	53.75	28.25	239.75	667.75
	20	29.43	2.55	16.15	1.20	46.25	26.50	209.25	587.25
Neem	10	28.18	1.84	14.20	0.92	56.50	30.50	238.50	676.25
	15	30.10	2.21	15.15	1.06	51.50	25.75	225.25	628.50
	20	31.95	2.64	17.20	1.33	47.00	21.25	219.00	592.50
Mustard	10	23.10	1.64	12.28	0.77	62.50	35.50	260.25	771.00
	15	25.70	1.93	13.18	0.96	55.00	30.75	249.50	741.25
	20	28.03	2.36	14.15	1.17	51.25	27.25	237.25	678.00
Castor	10	23.30	1.50	11.33	0.60	64.75	39.00	264.50	811.75
	15	24.63	1.71	13.08	0.76	56.50	35.00	257.25	742.00
	20	27.05	2.26	14.83	0.99	52.75	30.00	251.25	699.25
Mahua	10	20.15	1.32	10.18	0.61	65.00	38.50	267.75	898.25
	15	21.80	1.62	12.23	0.77	63.00	34.50	259.50	832.00
	20	24.05	2.11	13.28	1.03	58.75	32.75	253.25	784.25
Check with nematode		19.03	1.31	9.13	0.52	75.50	60.00	277.25	1163.25
CD at 5 %		0.687	0.116	0.433	0.046	3.042	1.767	NS	32.144

root weight) and reduced number of root-knot galls in plant and soil population of *Meloidogyne incognita*.

References

- Dwivedi K 1997, In: Diagnosis of key nematode pests of chickpea and pigeonpea and their management, S.B. Sharma (ed.). *Proceedings of Regional Training Course*, 25-30 Nov. 1996, ICRISAT, Patancheru, India, p 99
- Vijayalakshmi K and Goswami B K 1987, Effect of root dip treatment of tomato seedlings of aqueous extracts of some oilseed cakes on root-knot nematode infestation. *Animals Agricultural Research* 8(1) 168-171
- Naik BG, Nanjgowda D and Ravi K 1997, In: *Advances in IPM for Horticultural Crops. Proceedings of First National Symposium on Pest Management in Horticultural Crops: Environmental Implications and Thrusts*, Bangalore, India, 15-17 Oct. 1997
- Mojumder V and Mishra, S D 1991, Nematicidal efficacy of some plant products and management of *Meloidogyne incognita* in pulse crops by soaking seeds in their aqueous extract. *Current Nematology* 2(1) 27-32.
- Mojumder V 1998, Effect of seed soaking in aqueous extracts of neem seed kernel, neem seed coat, and neem cake against root-knot and reniform nematodes infesting chickpea. *Neem Newsletter* 15(2) 14-15.