

References

- Arulprabhu, C. (1998). Studies on certain aspects of seed production and storage in pole bean (*Phaseolus vulgaris* L.). M.Sc. (Ag.) Thesis, Tamil Nadu Agricultural University, Coimbatore-3.
- Jayabharathi, M. (1982). A study on seed development and maturation, production and storage in soybean (*Glycine max* L.). M.Sc.(Ag.) Thesis, Tamil Nadu Agricultural University, Coimbatore.
- Jegathambal, R. (1992). Studies on seed production techniques and phosphorus fertilization in soybean. M.Sc.(Ag.) Thesis, Tamil Nadu Agricultural University, Coimbatore -3.
- Nargis, S. (1995). Influence of pelleting, magnetic treatment and radiation on the performance of differentially aged seeds in tomato (*Lycopersicon esculentum* Nill.) cv. PKM 1. M.Sc.(Ag.) Thesis, Tamil Nadu Agricultural University, Coimbatore -3.
- Sabir-Ahamed, A. (1989). Studies on the production of quality seed and storage in soybean (*Glycine max* (L.) Merrill). M.Sc.(Ag.) Thesis, Tamil Nadu Agricultural University, Coimbatore -3.
- Viswanatha Reddy, K. (1995). Studies on pre-sowing seed treatment in differentially aged seeds of Brinjal (*Solanum melongena* L.) cv. PKM-1. M.Sc.(Ag.) Thesis, Tamil Nadu Agricultural University, Coimbatore-3.

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Research Notes

Nursery Management of rice root knot nematode *Meloidogyne graminicola*

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Meloidogyne graminicola Golden et Birchfield, a nematode pest of rice causes serious damage in nurseries, upland rice and rainfed lowland rice (Prot *et al.*, 1994). The nematode infestation was noticed for the first time in Tamil Nadu in rice nurseries of Cauvery delta areas during the year 2000. The nematode is also found to occur subsequently in the main field of irrigated rice in other parts of Tamil Nadu as reported earlier by Prot (1994) from Phillipines (Unpubl. Data). Considering the yield losses due to

this nematode attempts were made for the management of nematode using pesticides (Krishna Prasad and Rao, 1976a and 1976b), vegetable oil (Prasad, botanicals and Goswamy and Vijayalakshmi, 1981) through identifying nematode resistant varieties (Kalita and Phukan, 1995). So far very limited work has been made on the biological control of *M. graminicola*. Therefore the present study has been carried out to evaluate the biocontrol potential of *Pseudomonas fluorescens* in comparison with neem cake and currently recommended chemical

Table 1. Nursery management of rice root knot nematode *Meloidogyne graminicola**

Treatments	Shoot wt. (g)	Shoot length (cm)	Root wt. (g)	Root length(cm)	Root pop./ g root (cm)	No.of eggs/ g root	Gall index
Seed treatment with <i>Pseudomonas fluorescens</i> @ 10 g/kg seed (15 x 10 ⁸ cfu/g)	1.15	20.64	0.85	6.75 (17.18)	16.8 (38.46)	806.8 (11.17)	4
Nursery soil application with <i>Pseudomonas fluorescens</i>	1.18 (7.27)	21.51	0.96	7.53 (23.51)	10.5 (61.54)	589.3 (35.12)	3
Neem cake @ 1 ton/ha	1.16	21.88	0.90	7.18 (19.78)	14.8 (45.79)	662.5 (34.46)	4
Phorate 10 G1 kg a.i./ha	1.24	23.06	0.96	7.03 (18.97)	15.3 (43.96)	595.3 (34.46)	3
Carbofuran 3 G @ 1 kg a.i. /ha	1.19 (8.19)	21.24	1.10	7.65 (24.71)	10.5 (61.54)	506.3 (44.26)	3
Control	1.10	21.07	0.78	5.76	27.3	908.3	5
CD (P=0.05)	0.08	2.41	0.41	0.07	5.38	65.82	-

* Pooled analyses of two seasons data. Figures in parentheses are per cent increase / decrease over control.

nematicides in order to combat the nematode problem in an ecofriendly manner.

Experiments were carried out on rice varieties ADT 38 and CO.47 with a plot size of 1 m² in two different nematode sick fields during samba season (July-November). Paddy seeds were surface sterilized with mercuric chloride at 0.05% followed by treatment. The treated seeds were sown through broadcasting @ 750 g/m after applying the test bioagent of *P. fluorescens*, neem cake and chemical nematicides of carbofuran 3G and phorate 10G (Table 1). All the treatments were replicated four times in Randomized Block Design.

The experiments were terminated 30 days after sowing. The biometric observations were made on representative plant samples of 25 seedlings drawn randomly per plot. Besides observations on root gall index (Taylor and Sasser, 1987) root nematode population and the number of eggs/g root (Prasad *et al.*, 2002) were also recorded. The observations recorded were pooled and analysed statistically.

It is evident from the table 1 all the treatments viz., *P. fluorescens*, neem cake, phorate 10 G and carbofuran 3 G were effective for the management of rice root knot nematode *M. graminicola* compared to untreated although none of them had effect for of the complete eradication of the nematode.

Among the chemical nematicides carbofuran 3G @ 1 kg a.i./ha ranked first by reducing the root gall index (3) shoot enhanced the weight (8.19) and root length (24.71). The effect of this treatment was comparable with soil application of *P. fluorescens* @ 2.5 kg/ha and followed by phorate (1 kg a.i./

ha) and *P. fluorescens* as seed treatment (10 g/kg) in the management of rice root knot nematode.

Several researchers proved the effect of the chemical nematicide carbofuran 3 G and phorate 10 G in the management of wide array of nematodes in different crops for the past five decades particularly against *M. graminicola* using these chemicals as foliar spray at 500 and 1000 ppm (Krishna Prasad and Rao, 1984). The results of the present study was also fall in line with the report of effectiveness of *P. fluorescens* against *H. gracilis* in rice (Ramakrishnan *et al.*, 1988) and *M. incognita* in tomato (Santhi and Sivakumar, 1995). Further, the use of neem cake @ 1 ton/ha was also reported to be effective but the degree of nematode control was less than the effect of carbofuran 3G (1.5 kg/ha) in the management of *M. graminicola* by Debanand Das *et al.* (1999).

From the present study it was concluded that the in soil application of carbofuran 3G (1 kg a.i./ha) was comparable with the effect of biopesticide *P. fluorescens* (2.5 kg/ha) for the management of rice root knot nematode *M.graminicola*.

References

- Debanand Das, Saikia, M.K. and Samath, D.K. (1999) Comparative efficacy of botanicals and antagonistic fungi for the management of rice root knot nematode *Meloidogyne graminicola* Int. J.Tropical Agriculture **17 (4)**: 287-290
- Goswamy, B.K. and Vijayalakshmi, K. (1981). Effect of some indigenous materials and oilcakes amended soil on the growth of tomato and root knot nematodepopulation. Indian. J.Nematol., **11**: 121.

- Kalita, K and Phukan. (1995). Efficacy of certain pesticides for the management of *Meloidogyne graminicola* in rice. *Indian J.Nematol.* **25** (1): 116.
- Krishna Prasad, K.S and Rao, Y.S. (1976a). Chemo therapy of the root knot nematode (*Meloidogyne graminicola*) in rice. II. Effects of root dip treatment with nematocides on invasion and development of the nematode. *J. Pl. Dis., Prot.*, **83**: 730-735
- Krishna Prasad, K.S and Rao, Y.S. (1976b). Chemo therapy of the root knot nematode (*Meloidogyne graminicola*) in rice HI. Evaluation of pesticides as soil drench. *J. Pl. Dis., Prot.*, **83**: 736-741.
- Krishna Prasad, K.S. and Rao, Y.S. (1984). Effect of foliar application of systemic pesticides on development of *Meloidogyne graminicola* in rice. *Indian J. Nematol.* **14** (2) : 125-127.
- Prot, J.C., Villiannera, L.M. and Gergon, E.B. (1994). The potential of increased nitrogen supply to mitigate growth and yield reduction of upland rice cultivar. UPIR15 caused by *Meloidogyne graminicola*. *Fundamental and Applied Nematology*, **7**: 445-454.
- Prasad, J.S., Varaprasad, K.S., Panwar, M.S., Padhi, N.N. and Pathak, K.N. (2000). An effective method for screening rice varieties against root-knot nematode, *Meloidogyne graminicola*. *Indian J. Nematol.*, **30** (2): 210-215.
- Ramakrishnan, S., Sivakumar, C.V. and Poornima, K. (1998) Management of rice root nematode *Hirschmanniella gracilis* (de man) Luc and Goodey with *Pseudomonas fluorescens* Migula. *J.Biol.Control* **12** (2) : 135-147.
- Santhi, A and Sivakumar, C.V. (1995). Biocontrol potential of *Pseudomonas fluorescens* against root knot nematode *Meloidogyne incognita* (Kofoid and White, 1919) Chihwood, 1949 in tomato. *Journal of Biol. Control* **9**(2) : 113-115.
- Taylor, A.L. and Sasser, J.N. (1987). *Biology, identification and control of root-knot nematodes (Meloidogyne spp.)* Coop. Pub. Department of Plant Pathol. North Caroline State Univ. and U.S. Agency Int. Dev. Raleigh, NC, USA, 11 lpp.

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Research Notes

Vegetative Propagation of Annatto(*Bixa orellana*) (Linn.)

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Improvement of forest species through breeding is rather difficult because of their long generation times, prevalence of out breeding and operational difficulties (Paramathma *et*

al., 2000). Therefore, the genetic gains in forestry achieved by tree breeding including hybridization have been rather few (Tewari, 1994). Vegetative propagation is one of the