NURSERY MANAGEMENT OF *MELOIDOGYNE INCOGNITA* BY *GLOMUS MOSSEAE* IN EGGPLANT

G. Jothi and R. Sundarababu

Department of Nematology, Tamil Nadu Agricultural University, Coimbatore-641003, India

Summary. *Glomus mosseae* at different doses was applied in a nursery for the management of *Meloidogyne incognita* in the field. Seedling vigour and weight were maximum in plots which received 2 kg *G. mosseae* per m^2. The growth parameters, *G. mosseae* colonization and yield increased in all *G. mosseae* treated plots and at all doses, but it was maximum at 2 kg *G. mosseae* per m^2. Eggplants treated with carbofuran yielded significantly more fruits than untreated plants. Significant increase in *G. mosseae* colonization and chlamydospore densities was observed in treated plots. The P content was more in the 2.5 kg per m^2 treatment. The gall index was less in all *G. mosseae* treatments. Transplanting of mycorrhizal seedlings into root-knot nematode infested soil performed better than non-mycorrhizal seedlings both quantitatively and qualitatively.

Eggplant is one of the most popular vegetable crops of tropical countries. It is very susceptible to nematodes, particularly to the root knot nematode, *Meloidogyne incognita* which is considered to be the most destructive. The average annual losses in yield of eggplant in India due to this nematode range from 27 to 45 percent (Ranganathan *et al.*, 1998).

Among the various control measures, efforts are being made to utilize naturally occurring biocontrol agents like, VA Mycorrhiza, *Glomus spp.* The effect of incorporating *G. mosseae* into nursery soil planted with eggplant seedlings, followed by transplanting to *M. incognita* infested soil to study infection under field conditions was conducted at Tamil Nadu Agricultural University.

MATERIALS AND METHODS

A total of 21 raised nursery beds (1 m square) were treated with commercially available VAM culture and mixed in the soil at various rates. Eggplant seeds were sown in five rows on each raised bed. Field treatments consisted of randomized block design replicated three times comprising seven treatments with VAM at five doses and compared to carbofuran treatment and an untreated control. Each 10 m^2 plot consisted of six rows with seven plants per row, spaced at 60 cm. One month old seedlings from the nursery were transplanted to the field after determining the initial nematode population in the field. Treatments are shown in Table I. The field experiment was carried out during Jan-Feb, 1998, in a sandy loam soil to study the effect of *G. mosseae* (Nicol *et* Gerd) Gerd *et* Trappe, with *M. incognita* (Kofoid *et* White) Chitw., on eggplant, *Solanum melongena* L., cv. Co.2. Carbofuran granules were applied near the root zone fifteen days after transplanting in the respective plots in the field. Soil samples were collected 15 days after carbofuran application. Harvesting commenced 90 days after transplanting, and continued at five to six days interval up to 150 days, when the experiment was concluded and observations on shoot and root weights, gall index, nematode populations, spore counts, VAM colonization in the roots and yields were recorded. To assess mycorrhizal infection, root sample were collected and stained to assay VAM fungal colonization using a modified technique of Phillips and Hayman (1970). The fungal spores in the soil were estimated by wet sieving and decanting (Gerdemann and Nicolson, 1963). The P content was estimated by the vanadomolybdate method in nitric acid (Jackson, 1973).

RESULTS AND DISCUSSION

G. mosseae inoculation had a beneficial effect on plant growth. When nursery plants in VAM inoculated soil were transplanted in the field they showed an increase in growth and yield compared to untreated plants (Table I) which was due to nematode suppression as a result of competition for plant nutrients between VAM fungi and root-knot nematode (Carling and Brown, 1980). VAM fungi are dependent on host photosynthates during the early stages of root colonization (Harley and Smith, 1983).

G. mosseae effectively colonized the roots since the nursery was incorporated with *G. mosseae* and it was transplanted to the field only after 30 days. Further, transplanting of mycorrhizal seedlings in root-knot nematode infested field increased the yield and reduced nematode damage. The yield was greatest in plots treated with 2 kg/m^2 VAM inoculum. Carbofuran reduced the soil nematode population and increased yield. It is suggested that the mycorrhizal fungus 2 kg/m^2 could be

Table I. Growth of eggplant in soil inoculated with *Glomus mosseae* and transplanted into *Meloidogyne incognita* infested field soil.

Treatment (dose/m^2)	Plant weight (g)		Nematode final soil population (200 g)	Soil spore count (10 g)	VAM root Colonization (%)	Gall index	Phosphorous (%)		Yield (kg/10 m^2)
	Shoot	Root					Shoot	Root	
G. mosseae 0.5 kg	211	233	197	96	50	2.6	0.22	0.28	62.2
G. mosseae 1.0 kg	270	202	195	99	45	2.6	0.21	0.26	73.5
G. mosseae 1.5 kg	243	185	190	134	55	3.0	0.23	0.32	70.0
G. mosseae 2.0 kg	384	303	158	196	80	2.3	0.28	0.39	80.7
G. mosseae 2.5 kg	417	320	123	194	75	2.0	0.27	0.42	78.8
Carbofuran 1 kg a.i/ha	267	252	222	–	–	3.3	0.19	0.25	72.7
Control	220	228	248	–	–	3.6	0.17	0.23	64.6
CD (P = 5%)	127.4	63.8	22.4	20.7	NS	0.95	–	–	2.3

advantageously used in the management of the root-knot nematode in eggplant nurseries and also to decrease the phosphorus requirements of the plant by 50 per cent.

When cost benefit ratio was considered, it was convenient when *G. mosseae* was applied in nurseries. Incorporation of *G. mosseae* into nurseries is economically beneficial with an optimum application of 2 kg *G. mosseae*/m^2. So, VAM can be applied for all nursery transplantable crops. The benefit of carbofuran was comparatively less when VAM was considered, but there was an increase over untreated control.

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