Research Paper :

Influence of bio-agents and pesticides in improving nutritional status of tomato infested with root-knot nematode

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SUMMARY

A field study was conducted to understand the influence of bioagents on the nutritional status of tomato cv. Pusa Ruby infested with root-knot nematode, *Meloidogyne incognita*. Two separate field trials were conducted. In Trial-I, treatments *viz*., Neemark 0.03 EC 2% solution @ 1.25 lit./m², Carbofuran 3G @ 0.3 g a.i./m² and *Pasteuria penetrans* @ 1 x 10^8 spores/g of soil and in Trial-II, treatments *viz*., *Glomus fasciculatum* (@ 50, 100 and 200 spores/g of soil) and Carbofuran 3G (0.3 g a.i./m²). *P. penetrans* treated plants recorded higher N, P and K concentration in plants (3.21, 0.28 and 3.21 per cent, respectively) and fruits (2.53, 0.78 and 3.06 per cent, respectively) compared to Neemark 0.03 EC and Carbofuran 3G in Trial-I. *G. fasciculatum* @ 200 spores/g of soil recorded increased N, P and K concentration in plants (3.98, 0.41 and 4.56 per cent, respectively) and fruits (3.11, 0.95 and 3.59 per cent, respectively) in Trial-II.

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Tomato (*Lycopersicon esculentum*) is one of the most important commercial and widely grown vegetable crops. Plant parasitic nematodes, particularly root-knot nematode, *Meloidogyne* spp. are major constraints to crop production for subsistence of farmers and small holders in many developing countries. *Meloidogyne incognita* is the dominant species accounting for 64 per cent of total population and is widely prevalent inflicting 35 per cent yield loss of tomato fruits (Jonathan *et al*., 2001). There are several reports of decreased severity of damage or adverse effects of nematodes to host plants inoculated with mycorrhiza. However, published information regarding influence of *P. penetrans* on nutrient uptake is not available. Hence, a study was conducted to evaluate the influence of *P. penetrans* and *G. fasciculatum* in comparison with Neemark 0.03 EC and Carbofuran 3G on the nutritional status of tomato infested with *M. incognita*.

MATERIALS AND METHODS

Nursery stage:

Experiments were conducted in a *M. incognita* infested field belonging to Nematology Section, Department of Plant Pathology, GKVK, UAS, Bangalore. Forty raised nursery beds each measuring one m² were prepared. First Trial (Trial-I) was taken up in 20 nursery beds including the treatments T_1 = Neemark 0.03 EC (2% solution, 1.25 lt/m²), T_2 = Carbofuran 3G (0.3 g a.i/m²), T_3 = *P. penetrans* @ 1 x 10^8 spores/g of soil and T_4 = Inoculated check. Second trial (Trial-II) was taken up in another 20 nursery beds with the treatments T_1 = Carbofuran 3G (0.3 g a.i/m²), T_2 = *G. fasciculatum* @ 50 spores/g of soil, T_3 = *G. fasciculatum* @ 100 spores/g of soil, T_4 = *G .fasciculatum* @ 200 spores/g of soil and T_5 = Inoculated check. These treatments were imposed in the nursery at the time of sowing. Nursery beds were irrigated daily for first seven days and later on alternate days. Number of days taken for germination, percentage germination and nematode population in the nursery at the time of transplanting were recorded.

Main field:

Thirty days old seedlings from the treated