

Field Trials of *Paecilomyces lilacinus* for *Meloidogyne incognita* Management

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Abstract

Root-knot nematodes, particularly *Meloidogyne incognita*, are major constraints to crop production because they cause extensive root damage, reduce nutrient and water uptake, and consequently lower crop yield. The present study evaluates the effectiveness of field applications of *Paecilomyces lilacinus* as a biological control agent for the management of *M. incognita*. Field trials were conducted to assess the influence of different application methods and treatment levels on nematode population, root galling, plant growth, and crop yield. Treatments involving *P. lilacinus* were compared with untreated control plots to determine their relative effectiveness under field conditions. The results indicated that application of *P. lilacinus* reduced nematode populations and root-knot development while promoting improved plant growth and yield. The biocontrol fungus was particularly effective when applied at an appropriate concentration and incorporated into the soil or rhizosphere, where it could establish and interact with nematode populations. The observed suppression may be associated with parasitism of nematode eggs and juveniles, production of nematicidal metabolites, and competition within the soil environment. The study demonstrates the potential of *P. lilacinus* as an environmentally compatible alternative or supplement to chemical nematicides. Its integration with suitable cultural and biological management practices may provide a sustainable approach to reducing losses caused by *M. incognita*. Field-based evaluation is important for optimizing application methods, dosages, and timing under different soil and climatic conditions.

Keywords: *Paecilomyces lilacinus*, *Meloidogyne incognita*, Root-Knot Nematode, Biological Control, Field Trials, Biocontrol Agent, Nematode Management, Crop Yield, Sustainable Agriculture, Soil Health.