EFFICIENCY, COMPATIBILITY AND INTEGRATION OF VERSATILE NEMATODE MANAGEMENT TACTICS IN SUSTAINABLE AGRICULTURE

By

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B.Sc. Agric. Sci. (International Agriculture), Fac. Agric., Cairo Univ., Egypt, 2003

M.Sc. Agric. Sci. (Nematology), Fac. Agric., Cairo Univ., Egypt, 2010

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APPROVAL SHEET

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Title of Thesis: Efficiency, compatibility and integration of versatile nematode management tactics in sustainable agriculture.
Supervisors: Dr. Ahmed Ahmed Osman
Dr. Abbas Mohamed Kheir
Department: Zoology and Agricultural Nematology
Branch: Agricultural Nematology **Approval: 25 / 5 /2017**

ABSTRACT

In a preliminary study, nine commercially available bioagents were tested at three concentrations for their effectiveness in suppressing Meloidogyne incognita. Paecilomyces fumosoroseus@5ml/L proved the most effective while VAM+Bacillus megaterium @20ml/L was the worst.

Of the previously scanned nine bioagent products, two were selected for another study. That was testing the capability of four concentrations of the bioagents at four different application times. The density 20ml/L a week prior to transplanting of each of the two bioagents achieved satisfactory results regarding galling and eggmasses reduction.

The joint application of animal manures along with botanically originated manures either before or after transplanting was involved in our study. Generally, higher reduction in galling and egg-masses was achieved through pre-transplanting treatments than in case of post- transplanting ones. neem+pigeon litter was the best of all pre-transplanting treatments. In case of post transplanting treatments rabbit droppings+garlic performed best among the rest of the applied treatments.

Applying bioagents as seed dressing followed by soil drench was also of our concerns. Seed dressing with B. thuringiensis followed by one soil drench gave lowest galling and eggmasses. Little response was observed in vegetative parameters but not for root weight.

Seedling coating with bioagents followed by soil drench, was another understudied delivery technique of bioagents to soil. Seedling coating with Trichoderma album followed by one soil drench yielded best galling reduction, while egg masses were reduced in response to seedling coating with Bacillus thuringiensis followed by two soil drenchs.

Synchronized application of bioagents and ample amounts of certain Nematicides was also under trial. Generally, the bioagents almost performed better in case of 0.25 mg nematicide. Concomitant application of the bioagent and the nematicide was majorly effective than in case of any preceeding the other.

Pre amending with animal manures a couple of weeks before soil drenching with bioagents and transplanting was regarded in our study as a success or failure factor in biological control. Best galling reduction was attained via application of chicken litter followed by B. thuringiensis. However, when B. thuringiensis was preceeded with pigeon manure, egg masses reduction resulted.

An integral trial that augmented bioamenders and bioagents was also executed. Best effect on nematode parameters was obtained from treatments that included P. fluorescens(dip and drench) along with pigeon manure, neem or worm seed.

Key words: *M. incognita*, *Bacillus* spp., *animal manure*, botanicals, nematicide, seed dressing, INM, biological control, time of application, application density, sustainable agriculture.

DEDICATION

To the soul of my father, Prof. Dr. Othman Abd El-raouf. You lived your life cheering me up & believing in my capabilities to fulfill your dream. You left without seeing it becoming true. I kept my promise to cheer you up in paradise & fulfill the one thing that you have always wished for. To my mother, Nehal A. Nazmy, my very first teacher, who has always pushed me along the way and offered me everything with great love.

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