Efficacy Assessment of Different Management Strategies on Root Knot Nematodes (*Meloidogyne* spp.) in Tomato Plant

A thesis submitted in partial fulfillment of the Master's degree in Zoology with special paper Parasitology

Submitted by

Sarita Khadka

Submitted to

Central Department of Zoology

Institute of Science and Technology

Tribhuvan University

Kirtipur, Kathmandu

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Date: ……...

LETTER OF RECOMMENDATION

It is recommended that Miss **Sarita Khadka** has completed her dissertation work entitled "**EFFICACY ASSESSMENT OF DIFFERENT MANAGEMENT STRATEGIES ON ROOT KNOT NEMATODE (*Meloidogyne* spp.) IN TOMATO PLANT"** under our supervision. This is the candidate's original work, which brings out useful findings in the concerned field. To the best of our knowledge, this dissertation has not been submitted for any other degree in any institution. Hence, we recommend this dissertation to be accepted for the partial fulfillment of requirement for the degree of Master's of Science in Zoology (Parasitology).

Supervisor
Dr. Ranjana Gupta
Associate Professor
Central Department of Zoology
Tribhuvan University
Kirtipur, Kathmandu.

Co- Supervisor
Mr. Suraj Baidya
Technical Officer
Plant Pathology Division
NARC
Khumaltar, Lalitpur

Date: …….

LETTER OF APPROVAL

On the recommendation of Supervisor Dr. Ranjana Gupta, Associate Professor, Central Department of Zoology, Tribhuvan University, the dissertation work entitled "**EFFICACY ASSESSMENT OF DIFFERENT MANAGEMENT STRATEGIES ON ROOT KNOT NEMATODE (*Meloidogyne* spp.) IN TOMATO PLANT"**, submitted by **Sarita Khadka** has been approved for the examination.

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Prof. Dr. Vasanta Kumar Thapa
Department Head
Central Department of Zoology
Tribhuvan University
Kirtipur, Kathmandu.

Date: …….

LETTER OF ACCEPTANCE

The dissertation work entitled "**EFFICACY ASSESSMENT OF DIFFERENT MANAGEMENT STRATEGIES ON ROOT KNOT NEMATODE (*Meloidogyne* spp.) IN TOMATO PLANT"** submitted by **Sarita Khadka** has been accepted as the partial fulfillment of the requirement for Master's Degree of Science in Zoology with "Parasitology" as special paper.

EXPERT COMMITTEE

Head of Department

Internal Examiner

External Examiner

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Sarita Khadka

Roll No. 1182

T.U. Regd. No. 5-1-48-196-98

Batch No. 2061/062

ABSTRACT

Root knot nematodes, *Meloidogyne* spp. are important pathogens affecting vegetable production including tomato (*Lycopersicon esculentum);* which is a popular vegetable crop grown in Nepal. Very little work has been done regarding its management. Studies were conducted in the screenhouse under pot conditions to assess the efficacy of fungus *Trichoderma harzianum* @300g/pot, fungus *Paecilomyces lilacinus* @ 10ml/pot, mustard cake @30g/kg soil, mixture of cow dung and urine @300g/pot, poultry manure @250g/pot and chemical Furadan (Carbofuran) @1g/kg soil, against root knot nematode, *Meloidogyne* spp. in tomato. All together 35 pots with five replication of each treatment inoculated with 4 eggs per gram of soil were placed in RCBD. Nematodes were extracted from the whole root system and 100g-soil sample after 36 days of inoculation. All the treatments except Furadan showed significant reduction in root galling and suppression of the reproduction factor (*Rf*) of the nematodes; in comparison to control. Analysis of the data showed that the mixture of cow dung and urine, mustard cake and poultry manure application reduced root galling and reproduction factor significantly than the treatment of *P. lilacinus, T. harzianum* and Furadan. Mustard cake was highly effective than other treatments while the chemical Furadan did not seem to function properly with the highest *Rf* nearing to the control treatments and *GI* even greater than the control treatments.

Key words : ***Meloidogyne*** spp., Tomato, *T. harzianum, Paecilomyces lilacinus,* Mustard cake, Furadan, Poultry manure, Cow dung and urine.

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Abbreviations and Acronyms

@ :	At the rate
µ :	Micron
AMF :	Arbuscular micorrhizal fungi
CMA:	Corn meal agar
Cv :	Cultivar
DEGO :	Dorsal oesophageal gland orifice
e.g :	Example
GI :	Gall index
GM :	Gelatinous matrix
HRD :	Horticulture Research Division
i.e :	That is
J_2 :	Second stage juvenile
J_4 :	Fourth stage juvenile
Kg :	Kilogram
LSD:	Least significant difference.
NaCl :	Sodium chloride
NaOCl:	Sodium hypochloride
NARC:	National Agriculture Research Council
Pf :	Final population
Pi :	Initial population
PPD:	Plant Pathology Division
ppm:	Parts per million
RBCD :	Randomized Complete Block Design
Rf :	Reproduction factor
SE :	Standard error
SEM :	Scanning electron microscope
Spp :	Species
USA :	United States of America
Var.	Variety