

VALUE ADDED COURSE

Title: Ecofriendly Pest Management

Course No- PSZOTC-307

CREDITS: 2

Time Duration: 2hrs

MAXIMUM MARKS-50

a) Minor Test I: 10

b) Minor Test II: 10

c) Major Test: 30

Course Outcomes

Students would develop an understanding with respect to:

CO1: The basic concepts of Nematology

CO2: Nematodes as biological control agents

CO3: Integrated pest management

CO4: Commercial nematode formulations

CO5: Diseases caused by nematodes

Syllabus

Unit-1 Introduction to Nematology

1.1 General characteristics of Nematodes

- Occurrence
- Habit
- Habitat

1.2 Classification of Nematode upto family level

1.3 Nematode Morphology and reproductive structures

- Size, shape, body wall, cuticle, stylet, Body regions
- Spicules, Gubernaculum, Bursa.

1.4 Diseases and symptoms caused by-

- Root Knot Nematode
- Soybean Cyst Nematode
- Lesion Nematode
- *Trichinella spiralis*
- *Ascaris*

Unit-2 Entomopathogenic nematodes (EPNs)

2.1 Nematodes as biological control agents

- Symbiotic relation between Nematode and Bacteria

2.2 Life cycle of EPNs, First generation male female, second generation male female and Infective Juveniles (IJs)

2.3 EPN formulations and application strategies

- Aqueous suspension, Synthetic sponges, Gels, Clay and powder.

2.4 Case studies of EPNs application in

- Horticulture
- Floriculture
- Medicinal plants

Unit-3 Integrated pest Management strategies

3.1 Introduction to Integrated pest management (IPM)

- Advantages and disadvantages of IPM

3.2 Goals and steps in implementation of IPM

- Inspection, planning preventive strategies, analysis, treatment selection, monitoring and documentation

3.3 Non-chemical control methods for pest management

- Spring traps, pheromone traps, sticky traps, fly and wasp traps

3.4 Disadvantages of chemical control of insect pests

Note for Paper Setting

Examination Theory	Syllabus to be covered in examination	Time allotted for Exam	% Weightage (marks)
Minor Test I	upto 20%	1 Hr.	10
Minor Test II	21% to 40%	1 Hr.	10
Major Test	41% to 100%	2Hrs	30

i. Major test will have two sections (A & B)

ii. Section A is compulsory comprising of 10 questions of 1 mark each and be spread over entire syllabus

iii. Section B comprises of 4 questions from remaining 2 units and candidate has to attempt one question from each unit of 10 marks each.

Books Recommended:

1. Hunt, D. J., & Nguyen, K. B. (2016). *Advances in entomopathogenic nematode taxonomy and phylogeny*. Brill.

2. Grewal, P. S., Ehlers, R. U., & Shapiro-Ilan, D. I. (Eds.). (2005). *Nematodes as biocontrol agents*. CABI.
3. Zuckerman, B. (Ed.). (2012). *Plant parasitic nematodes*. Elsevier.
4. Sivaramakrishnan, S., & Razia, M. (2021). *Entomopathogenic Nematodes and Their Symbiotic Bacteria*. Springer.
5. Perry, R. N., Hunt, D. J., & Subbotin, S. A. (Eds.). (2020). *Techniques for Work with Plant and Soil Nematodes*. CABI

List of Practicals

- General Morphology of entomopathogenic nematodes(EPNs).
- Life cycle of EPNs.
- Types of EPN formulations & their applications.
- Diseases caused by Nematodes in Plants and animals
- Beneficial nematodes and their host range
- Reproductive structures of EPNs