PLANT HEALTH MANAGEMENT DIVISION
Objectives & Goals of Training Programmes

I. CROP-SPECIFIC AGRO-ECOSYSTEM ANALYSIS (AESA) BASED PLANT HEALTH MANAGEMENT IN CONJUNCTION WITH ECOLOGICAL ENGINEERING FOR PEST MANAGEMENT IN RICE/VEGETABLES

- **Aim of the course**
  - Promote AESA based Plant Health Management in conjunction with Ecological Engineering for Pest Management to reduce reliance on the use of agrochemicals.

- **Course Outline:**
  - Living soil concept & Rhizosphere engineering;
  - Principles of Integrated Nutrient Management;
  - AESA based PHM
  - Good Agricultural Practices (GAP)
  - Ecological engineering for Pest Management;
  - Principles of Integrated Weed Management;
  - Role of semiochemicals in pest management;
  - Principles of pesticide application technology;
  - Integrated rodent pest management;
  - Plant parasitic nematodes and their management;
  - Role of Entomopathogenic nematodes in pest management
  - FFS methodology, characteristics, structure and process;
  - P:D ratio in rice / vegetable ecosystem & AESA chart preparation
  - On-farm mass production of biocontrol agents, microbial biopesticides and biofertilizers.

- **Duration of the programme:** 30 days

- **Methodology adopted:**
a) Theory: 35%
b) Case studies/Exercises: 10%
c) Practicals: 40%
d) Field visits: 15%

- **Hands on Skills acquired:**
  During the training course the participants will acquire skill/hands-on practices in the following areas:
  - Agro Ecosystem Analysis based Plant Health Management
  - Ecological Engineering for pest management
  - Integrated Rodent Pest Management
  - Organization of FFS.
  - Safe and judicious use of pesticides
  - Seed treatment & biopriming
  - On-farm production of Biocontrol agent (predators & parasitoids)
  - On-farm production of Microbial Biopesticides
  - Production of vermicomposting and biofertilizers including mycorrhiza
  - Production of low cost fruit fly traps.

- **F. Utility of skills learnt:**
  On completion of the training course the participants will be able to
  - Organize AESA based PHM in conjunction with Ecological Engineering for Pest Management
  - Organize FFS for promoting safer crop production technologies and non-formal education methods in educating the farmers
  - Promote Soil health management, Seed treatment & biopriming
  - Promote On-farm production and use of microbial biopesticides at farm level
✓ Promote Vermicomposting and biofertilizer production including VAM
✓ Popularize use of low cost fruit fly traps
✓ Promote Safe and judicious use of pesticides (as a last resort)

II. FUNDAMENTALS OF PLANT HEALTH MANAGEMENT FOR PLANT HEALTH DOCTORS:

➤ A. Aim of the course:
✓ To enhance skills of trainers Plant Health Doctors in promotion of AESA based plant health management in conjunction with Ecological Engineering for Pest Management

➤ B. Course outline:
✓ Identification and management of plant health problems (abiotic & biotic),
✓ AESA based PHM in conjunction with Ecological Engineering (EE) for Pest Management (PM).
✓ Living Soil Concept, Rhizosphere Engineering for enhancing Soil Health,
✓ Principles and Concepts of Biological control, and application techniques
✓ FFS methodology, characteristics, structure and process
✓ Integrated rodent pest management,
✓ Safe and judicious use of chemical pesticides (as a last resort)
✓ On-farm mass production of biocontrol agents and microbial biopesticides,
✓ Good Agricultural Practices (GAP)

➤ C. Duration of the programme: 21 days

➤ D. Course Design & framework:
   a) Theory: 45%
   b) Practicals/Exercises: 40%
   c) Field visits: 15%

➤ E. Hands on Skills acquired:
During the training course the participants will acquire skill/hands-on practices in the following areas:
✓ Ability to identify plant health problems (abiotic & biotic)
✓ Agro Ecosystem Analysis based Plant Health Management
✓ Ecological Engineering for pest management
✓ Integrated Rodent Pest Management
✓ Organization of FFS
✓ Safe and judicious use of chemical pesticides (as a last resort)
✓ Seed treatment & biopriming
✓ On-farm production of Biocontrol agent & microbial biopesticides
✓ Production of vermicomposting and biofertilizers including mycorrhiza and
✓ Low cost fruit fly traps.

➤ F. Utility of skills learnt:
On completion of the training course the participants will be able to deliver the duties in the following areas:
✓ Organize AESA based PHM in conjunction with Ecological Engineering for Pest Management
✓ Organize FFS for promoting safer crop production technologies and non-formal education methods in educating the farmers
✓ Promote GAP principles and practices
✓ Promote Integrated Rodent Pest Management
✓ Promote rhizosphere engineering, seed treatment & biopriming for sustainable agriculture
✓ Promote on-farm production of Biocontrol agents and microbial biopesticides
✓ Promote vermicomposting and biofertilizers including mycorrhiza,
✓ Promote use of use of low cost fruit fly traps
✓ Promote safe & judicious use of chemical pesticides.

III. ON-FARM PRODUCTION OF BIOCONTROL AGENTS AND MICROBIAL BIOPESTICIDES TO PROMOTE AESA BASED PLANT HEALTH MANAGEMENT IN CONJUNCTION WITH ECOLOGICAL ENGINEERING FOR PEST MANAGEMENT

▶ A. Aim of the course:
✓ Promote production and utilization of biocontrol agents and microbial biopesticides to reduce reliance on the use of chemical pesticides in sustainable crop production.
✓ Promote AESA based Plant Health Management in conjunction with Ecological Engineering for Pest Management

▶ B. Course outline:
✓ Biological Control, Principles and concepts, classification of biocontrol agents,
✓ AESA based PHM in conjunction with Ecological Engineering (EE) for Pest Management (PM)
✓ Good Agricultural practices
✓ On-farm production of
  a. Corcyra - host-insect for production of biocontrol agents
  c. Predators – Reduviids, Spiders, Chrysoperla, Coccinellids
  d. Biopesticides – Trichoderma, Entomopathogenic fungi, Pseudomonas, Bacillus NSKE, etc.
  e. Biofertilizers – Mycorrhizae,
✓ Vermicomposting.
✓ Low cost fruit fly trap production

▶ C. Duration of the programme: 10 days

▶ D. The course contains
  a) Theory: 30%
  b) Practicals/ Exercises: 60%
  c) Field visits: 10%

▶ E. Hands on Skills acquired:
During the training course the participants will acquire skill/hands-on practices in the following areas:
✓ Agro Ecosystem Analysis based Plant Health Management
✓ Ecological Engineering for pest management
✓ Rhizosphere engineering for sustainable agriculture
✓ Seed treatment & biopriming,
✓ On-farm production of Biocontrol agent (predators & parasitoid) and microbial biopesticides and application of biocontrol agents and biopesticides
✓ Production of vermicomposting
✓ On-farm production of Mycorrhiza
✓ Low cost fruit fly trap production

▶ F. Utility of skills learnt:
On completion of the training course the participants will be able to:
✓ Organize AESA based PHM in conjunction with Ecological Engineering for Pest Management
✓ Organize FFS for promoting safer crop production technologies and non-formal education methods in educating the farmers
✓ Promote soil health management, seed treatment & biopriming for sustainable agriculture
✓ Promote on-farm production of Biocontrol agents and microbial biopesticides
✓ Promote vermicomposting and biofertilizers including mycorrhiza,
✓ Promote use of low cost fruit fly traps

IV. INTEGRATED SOIL NUTRIENT AND WEED MANAGEMENT (ISNWM)

➢ Aim of the course:
✓ To promote skills in sustainable soil health and weed management.

➢ Course outlines:
✓ AESA based PHM in conjunction with Ecological Engineering for Sustainable Agriculture,
✓ Living soil concept & Rhizosphere Engineering,
✓ Principles of Integrated nutrient management & PGPRs
✓ GAP with focus on soil health management,
✓ Weed dynamics in crop fields, vegetation analysis, and IWM techniques
✓ Weed survey & Surveillance - Collection and identification of weeds species,
✓ On farm production and application of bio inoculants including mycorrhiza for soil health
✓ Demonstration of on-farm production of biocontrol agent and microbial biopesticides.
✓ Vermiculture
✓ On farm soil testing,

➢ Duration: 7 days

➢ Methodology:
   a) Theory: 40%
   b) Practicals/Exercises: 45%
   c) Field visits: 15%

➢ Skills to be acquired by the participants:
On completion of the course participants will acquire skills in
✓ Techniques for increasing microbial population in soil to enhance nutrient availability
✓ On farm production of mycorrhiza, PSB (Pseudomonas & Bacillus) and Trichoderma
✓ On farm soil testing with the help of soil testing kit
✓ Identification of weeds and weed vegetation analysis
✓ Adoption of Agroecosystem Analysis for plant health management in conjunction with Ecological Engineering for pest management

➢ Utility of the skills learnt: Participants will be able to
✓ Train farmers to harness the potential role of living organisms in soil fertility management
✓ Train farmers to use non chemical approaches for sustainable agriculture
✓ Develop skill of farmers for on farm production of microbial soil inoculants.

V. RHIZOSPHERE ENGINEERING

➢ Aim of the course:
✓ To impart skills in rhizosphere engineering for promoting sustainable agriculture.

➢ Course outline:
✓ AESA based PHM in conjunction with Ecological Engineering for pest management,
✓ Rhizosphere Engineering & concept of Living Soil, & PGPRs
✓ GAP with focus on soil health management
✓ On farm soil testing using soil test kit,
✓ Mass multiplication of fungal biopesticides,
✓ Mass Production of Biocontrol agents
✓ Vermicomposting
Duration: 6 days
Methodology:
  a) Theory classes – 40 %
  b) Practical sessions- 50 %,
  c) Field and lab visits – 10 %.
Skills to be acquired by the participants
  ✓ Techniques for increasing microbial population in soil to enhance nutrient availability.
  ✓ On farm production of mycorrhiza, PSB (Pseudomonas & Bacillus) and Trichoderma
  ✓ Developing skills in improving below ground biodiversity through Ecological Engineering
  ✓ Agroecosystem Analysis based decision making
Utility of the skills learnt: Participants will be able to
  ✓ Train farmers to harness the potential role of living organisms in soil fertility management
  ✓ Train farmers to use non chemical approaches for sustainable agriculture
  ✓ Develop skill of farmers for on farm production of microbial soil inoculants.

VI. GOOD AGRICULTURAL PRACTICES:
Aim of the course:
  ✓ Impart skills to promote Good Agricultural Practices.
Course outline:
  ✓ Introduction to India GAP- BIS,
  ✓ Introduction to AESA based PHM and Ecological Engineering for pest management,
  ✓ Biopriming,
  ✓ Soil test based INM, Cultural practices,
  ✓ Sanitary, Phytosanitary, Food Safety issues in relation to GAP,
  ✓ Pesticide application & Storage techniques,
  ✓ On Farm multiplication and application of biological control agents,
 Duration: 6 days
Methodology:
  a) Theory classes – 50 %,
  b) Practical sessions- 30 %,
  c) Field and lab visits – 20 %.
Skills that will be acquired:
  ✓ Skills in on farm production of biocontrol agents, biopesticides and biofertilizers and their use in GAP.
  ✓ Skills in Agroecosystem analysis based decision making for pest management.
  ✓ Ecological Engineering for pest management
Utility of skills learnt: Participants will be able to
  ✓ Motivate farmers to harness the potential role of GAP in sustainable agriculture and market access.
  ✓ Train farmers in adoption of Good Plant Health Management practices.
  ✓ Develop skill of farmers to promote sustainable agriculture production through AESA based PHM in conjunction with Ecological Engineering for Pest Management.

VII. FARMERS FIELD SCHOOL (FFS) METHODOLOGY
Aim of the course:
  ✓ To impart skills for organizing Farmers Field Schools.
Course outline:
  ✓ FFS Methodology, Characteristics and structure,
  ✓ Organization and management of FFS, Group Dynamics,
✓ Role of AESA based PHM in conjunction with EE for Pest Management,
✓ Facilitation skills,
✓ Ballot Box Test.
✓ Designing FFS Curriculum,
✓ On farm production biocontrol agents, biopesticides and Mycorrhiza,

**Duration : 6 days**

**Methodology:**
- a) Theory classes – 40 %,
- b) Practical sessions- 40 %,
- c) Field and lab visits – 20 %

**Skills that will be acquired:**
- ✓ Skills in Organizing FFS as a tool for broad basing extension activities
- ✓ Agroecosystem analysis and decision making based on the field observations.
- ✓ Skill for designing FFS curriculum
- ✓ Skills for conducting Ballot Box Test.

**Utility of the skills learnt** - Participants will be able to
- ✓ Organize FFS as a season long training programme.
- ✓ Train farmers in use of non-chemical approaches for sustainable agriculture
- ✓ Develop skill of farmers for on farm production of biocontrol agents, biopesticides and biofertilizers.