

## All India Coordinated Research Project on Sugarcane

### ENTOMOLOGY

#### Technical Programme – 2023-2024

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**Project E. 4.1 : Evaluation of zonal varieties/genotypes for their reaction against major insect-pests**

**Objective:** To grade the entries in the zonal varietal trials for their reaction against major insect pests in the area.

**Year of Start:** 1985-86 (continuing)

**Locations:** Karnal, Lucknow, Shahjahanpur, Seorahi, Pusa, Coimbatore, Padegaon, Pune, Mandya, Thiruvalla, Belagavi and Anakapalle

**No. of replications:** Three

**Plot size:** Minimum of 3 six meter rows per variety per replication

**Methodology:** The experiment should be conducted separately without insecticidal application. The seed material is to be obtained from the breeders of the respective centres and evaluation of only zonal entries be done. The susceptible check variety for each major insect-pest is to be included.

**Observations to be recorded:** Please follow 'Research Methodology' (The soft copy has already been sent to the Entomologist of the centre).

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#### **Project E. 28: Survey and surveillance of sugarcane insect-pests**

**Objective:** To assess insect pest population and damage at different growth stage of the crop and status of existing and new insect pest species.

**Duration:** Long term

**Year of start:** 2003-2004

**Locations:** Karnal, Lucknow, Shahjahanpur, Seorahi, Pusa, Coimbatore, Padegaon, Pune, Mandya, Thiruvalla, Tharsa, Belagavi and Anakapalle

**Methodology & Observations:** Observations on insect pest incidence should be recorded three times preferably at an interval of three months after germination (shoot stage, cane formation stage, maturity stage) from command areas of at least 5 sugar mills.

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### **Project E. 30: Monitoring of insect-pests and bio-agents in sugarcane agro-ecosystem under changing climate scenario**

**Objective:** To monitor the key insect pests and natural enemies in a fixed plot/area and to study the influence of weather parameters on pests and natural enemies.

**Locations:** Karnal, Lucknow, Shahjahanpur, Seorahi, Pusa, Coimbatore, Padegaon Pune, Mandya, Thiruvalla, Tharsa, Belagavi and Anakapalle

**Year of start:** 2006-2007

**Duration:** Long term

**Methodology & Observations:** Please follow 'Research Methodology' (The soft copy has already been sent to the Entomologist of the centre).

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### **Project E. 34: Standardization of simple and cost effective techniques for mass multiplication of sugarcane bio-agents**

**Objective:** To develop simple and cost effective mass-multiplication techniques of promising bio-agents of the area.

**Duration:** Long term

**Year of start:** 2017-18

**Locations and bio-agents to be multiplied:** Lucknow (*Tetrastichus howardi*, *Cotesia flavipes*), Coimbatore (*Beauveria brongniartii*, *Metarhizium anisopliae*) VSI Pune EPN for white grub\$

**Methodology:** Use simple and cost effective host insect/ media for multiplication of parasitoids/predators and insect pathogens.

Note: For mass multiplication of entomopathogenic fungi, plant pathologist at the centre may be requested to jointly work

**\$ - VSI pune may work on EPN mass production as they have reported (through email & personal discussion) EPN found effective in their trials against white grub**

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## **Project E. 40: Integrated approach to manage white grubs in sugarcane**

**Objective:** To develop suitable integrated pest management approach for the management of white grubs in sugarcane.

**Year of start:** 2019-20

**Locations:** Pune, Padegaon, Coimbatore and Belagavi, Sankeshwar\*

### **Treatments:**

#### Chemical Module:

1. Spraying of host trees (along with pruned branches) nearby sugarcane fields with insecticides (Profenophos 40% + Cypermethrin 4% EC @ 1 ml/ liter water or Chlorpyrifos 50% + Cypermethrin 5% EC @ 1 ml/ liter water during adult emergence in the night hours).
2. Installation of IISR Combo Insect Trap or any other locally available light trap @ 1 Trap/ ha near host trees or about 20 feet away from the sugarcane field
3. Soil application of combination product Fipronil 40.0%+Imidacloprid 40.0% WG @ 450gm formulation/ha within 10 days of mass emergence of white grub beetles

#### Organic Module:

1. Jarring & shaking of host trees in night hours, collection of beetles and killing in water with kerosene oil. Spray host trees and pruned branches with NSKE during adult emergence in the night hours).
2. Installation of IISR Combo Insect Trap or any other locally available light trap @ 1 Trap/ ha near host trees or about 20 feet away from the sugarcane field
3. Soil application of recommended dose of *Beauveria bassiana* or *B. brongniartii* or *Metarhizium anisopliae* or EPN or any other effective local bioagent

#### Untreated Control (UTC):

No application of any of the above treatment in the field.

#### **Note:**

- All the three set of treatments (Chemical, Organic and UTC) should be about 200 meters away from each other
- Experimental area should be at least 1 acre
- **Experiment may be attempted in farmers field**
- **While reporting indicate bioagents used**

#### **Observations to be recorded:**

- Species diversity of white grubs in sugarcane
  - Number of beetle catches per trap during the season
  - Average number of grubs/clump out of 5 clumps in each month
  - Relative percent reduction/increase in grub population in different modules
  - NMC and Cane Yield
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## **Project E.41: Assessment of yield losses for important regional pests of sugarcane under changing climate scenario**

**Objective:** To assess actual yield loss due to different species of borer pests of sugarcane in changing climatic scenario.

**Year of start:** 2019-20

**Locations:** NW Zone (Karnal, Lucknow, Shahjahanpur), NC & E Zone (Pusa), Peninsular Zone (Coimbatore, Padegaon, Pune, Mandya, Thiruvalla, Tharsa, Belagavi, Sankeshwar\*) and East zone (Anakapalle)

### **Target Pests:**

Stalk Borer (Karnal, Lucknow, Shahjahanpur); Plassey borer (Pusa); Crown Mealy bug (Coimbatore), Internode Borer (Pune, Padegaon, Mandya, Tharsa, Thiruvella, Anakapalle), Early Shoot Borer (Belagavi, Sankeshwar\*)

### **Methodology:**

Area – 0.1ha

Treatments – 4

T1 - Treated with recommended effective chemical insecticide

T2 – Treated with recommended cultural/mechanical/intercropping/mass trapping/Biocontrol agents

T3 - T1 +T2

T4 - Untreated open for natural normal infestation of borers

### **Observations:**

- Recording of targeted pest incidence/intensity as per methodology
- Recording of different yield parameters and juice parameters of infested and healthy canes (sample size - 25 canes)
- Weight of infested and healthy canes for comparison.
- Analysis of cane juice quality of infested cane and healthy canes
- The same data can also be used for working out a regression equation between yield and infestation/ intensity of different species of borers
- Correlation between crop yield and degree of infestation
- **While reporting indicate treatments**

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## **Project E.42: Development of grading scale for Plassey borer for varietal assesement**

**Year of start:** 2023

**Locations:** Pusa

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