

ENTOMOLOGY

Technical Programme – 2021-2022

Project E. 4.1	:	Evaluation of zonal varieties/genotypes for their reaction against major insect-pests
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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 (SBI), Lucknow, Shahjahanpur, Pusa, Anakapalle, Coimbatore, Padegaon, Pune, Mandya, Tharsa (Akola), Belgavi and Seorahi

No. of replications : Three

Plot size : A 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).

Project E. 28	: Survey and surveillance of sugarcane insect-pests
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- 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 (SBI), Lucknow, Shahjahanpur, Pusa, Anakapalle, Coimbatore, Padegaon, Pune, Mandya, Tharsa (Akola), Thiruvalla, Belgavi and Seorahi
- 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.

Project E. 30	: Monitoring of insect-pests and bio-agents in sugarcane agro-ecosystem
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- 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 (SBI), Lucknow, Shahjahanpur, Pusa, Anakapalle, Coimbatore, Padegaon, Pune, Mandya, Tharsa (Akola), Thiruvalla, Belgavi and Seorahi
- 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).

Project E. 34	:	Standardization of simple and cost effective techniques for mass multiplication of sugarcane bio-agents
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Objective : To develop simple and cost effective mass-multiplication techniques of promising bio-agents of the area.

Duration : Three years

Year of start : 2017-18

Location and bio-agents to be multiplied:

Sr. No.	Locations	Target bio agents
1.	Anakapalle	<i>Cladosporium cladosporoides</i>
2.	Lucknow	<i>Tetrastichus howardi</i> , <i>Trichogramma chilonis</i> , <i>T. japonicum</i> , <i>Cotesia flavipes</i>
3.	Padegaon	<i>Beauveria bassiana</i>
4.	Coimbatore	<i>Beauveria brongniartii</i> <i>Metarhizium anisopliae</i>
5.	Pune	<i>Trichogramma chilonis</i> and <i>T. pretiosum</i>

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.

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 Belgavi

Treatments:

1. IPM Module:

- Spraying of host trees nearby sugarcane fields with insecticides (Profenophos 40% + Cypermethrin 4% EC @ 1 ml/ liter water or Chlorpyriphos 50% + Cypermethrin 5% EC @ 1 ml/ liter water at first shower of the monsoon season).
- 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 (April-September).
- Soil application of recommended dose of *Beauveria bassiana* or *B. brongniartii* or *Metarhizium anisopliae* or any other effective local bioagent just after pre-monsoon showers.
- 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

2. Organic Module:

- Jarring & shaking of host trees in night hours, collection of beetles and killing in water with kerosene oil.
- 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 (April-September).
- Soil application of recommended dose of *Beauveria bassiana* or *B. brongniartii* or *Metarhizium anisopliae* or any other effective local bioagent just after pre-monsoon showers.

3. Untreated Control (UTC):

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

Note: All the three set of treatments (IPM, Organic and UTC) should be about 200 meters away from each other. Experimental area should be at least 1 acre.

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 (May-August)
- Relative percent reduction/increase in grub population in different modules
- NMC and Cane Yield

Project E.41	: Assessment of yield losses caused by borer pests of sugarcane under changing climate scenario
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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 : Karnal (SBI), Lucknow, Shahjahanpur, Pusa, Anakapalle, Coimbatore, Padegaon, Pune, Mandya, Tharsa (Akola) and Seorahi

A. Chemical protection of the crop

Parameters	Treated with recommended effective chemical insecticide	Untreated open for natural normal infestation of borers
Area	0.1 ha	0.1 ha
Infestation (%) (for each borer)	Almost nil infestation	Value to be recorded
Yield	t/ha	t/ha

The correlation between the crop yield and degree of infestation is to be worked out.

B. Comparison of average yield of individual plants free from pest incidence with that of infested ones

- Individual plants from the same field is examined and the pest incidence and their yield are determined individually.
- The loss in yield (quantitative & qualitative) is estimated by comparing the average yield of healthy plants with that of plants showing different degrees of infestation.
- The same data can also be used for working out a regression equation between yield and infestation/ intensity of different species of borers.

Observations to be recorded

- Generation wise recording of different borer pest incidence and intensity.
- Intensity of insect damage by splitting the canes (counting of damaged internodes)
- Weight of infested and healthy canes for comparison (sample size as per availability of infested and healthy canes).
- Analysis of cane juice quality of infested cane with different intensity separately and healthy canes.