

TECHNICAL PROGRAMME FOR THE YEAR 2013-14

I. TRAP TECHNOLOGY

A. Species profiling of soil arthropods through light trap:

The light trap of NCIPM (with timer) will be installed for few months to monitor scarabaeid beetles' activity (according to agro ecological region of each center) and the light sources will be switched on for few hours every day during evening to catch the adults. Daily collection of beetles be sorted species wise and correlated with corresponding weather data pertaining to Temperature, Relative Humidity, Rainfall etc. The GPS will be used to record the geographical details with respect to distribution pattern of species restricted by altitude/latitude/longitude. LED will be included in the light trap.

All centres will do this experiment (funded as well as non-funded).

B. Pheromone: The Jorhat centre will isolate glands of the relevant species and the same (glands) may be sent to NBAll, Bangalore for further study.

C. Population Monitoring of soil arthropods and their extent of damage in different crops:

Visual monitoring of soil arthropod pest species and their extent of damage in different crops will be recorded. Survey will be carried out once in a month and extent of damage to different crops by soil arthropod pest species be reported periodically in MPR. All information should be supported by GPS locations.

All centres will do this experiment (funded as well as non-funded)

D. Monitoring of natural enemies of soil arthropods:

To monitor the prevalence of natural enemies (parasitoids, predators & pathogens) of major soil arthropods, seasonal soil sampling be done in the endemic pockets. Each centre will undertake the sampling method of each organism according to the cropping system. Natural enemies should be sent to Dr. M.Nagesh, Principal Scientist, NBAll, Bangalore, who will act as Nodal Officer on behalf of this group and will facilitated its identification and culturing and providing necessary details regarding receipt No. and code numbers. **All centres will do this experiment (funded as well as nonfunded).**

II. MANAGEMENT OF WHITEGRUBS THROUGH CHEMICALS:

Insecticides be applied in soil, seed, furrows/ through seed treatment if the sowing time coincides with the emergence of beetles. If the crops are sown much earlier than beetle emergence, the insecticides be applied by soil drenching method in standing crops at the time of occurrence of eggs and neonate first instar grubs. In areas where both the situations occur (crops sown earlier than monsoon and crops sown with the onset of

monsoon coinciding with beetle emergence) trials should be laid out separately for both the situations. In all the cases the critical timing of pesticide application should be according to the presence of eggs and first instar grubs for targeting the key species of each region. Pesticides residues analysis and B:C should also be given. Correlation of grub population with damage needs to be established.

A. Evaluation of granular insecticides against whitegrub:

| Treatments | Hills | Plains |
|-------------------------------------|----------------|-----------------|
| Chlorpyriphos 10G | 2.0 kg a.i./ha | 2.0 kg a.i. /ha |
| Phorate 10 G | 2.5 kg a.i./ha | 2.5kg a.i. /ha |
| Carbofuran 3G | 750 g a.i./ha | 750 g a.i./ha |
| Clothianidin 50 WDG (Dantotsu) | 120 g a.i./ha | 120 g a.i./ha |
| Fipronil 0.3G | - | 50 a.i./ha |
| Fipronil 0.3G | - | 100 a.i./ha |
| Thiamethoxam 25WG (Actara) | 80 g a.i./ha | 80 g a.i./ha |
| Amamectin Benzoate 5% SG (Proclaim) | 12.5 g a.i./ha | 12.5 g a.i./ha |
| Imidacloprid 70 WG (Admire) | 300g a.i./ha | 300ga.i./ha |
| Untreated control | | |

Crops

Potato : Jorhat and Palampur
 Arecanut : Bangalore
 Soyabean : Ranichauri
 Groundnut : Durgapura

B. Evaluation of some insecticides against white grub:

| Treatment | Hill | | Plain | |
|--------------------------------------|------------------------------|----------------------------|------------------------------|----------------------------|
| | Seed soil furrow application | Drenching in standing crop | Seed soil furrow application | Drenching in standing crop |
| Chlorpyriphos | 400 g a.i./ha | 800 g a.i./ha | - | - |
| Imidacloprid 17.8 SL | 48 g a.i./ha | 60 g a.i./ha | - | - |
| Thiamethoxam 70WS | 80 g a.i./ha | 150 g a.i./ha | 80 g a.i./ha | 150 g a.i./ha |
| Thiamethoxam25 WS | 80 g a.i./ha | 150 g a.i./ha | 80 g a.i./ha | 150 g a.i./ha |
| Bifenthrin 10EC | 50 g a.i./ha | 200 g/ha | 50 g a.i./ha | 200 g/ha |
| Fipronil 5SC | | | 100 g a.i./ha | 150 g a.i./ha |
| Clothianidin 50 WDG (standard check) | 120 g a.i./ha | 150 g a.i./ha | 120 g a.i./ha | 150 g a.i./ha |
| Imidacloprid 600 FS | 500 g a.i./ha | 750 g a.i./ha | 500 kg/ha | 750 g a.i. /ha |
| Acephate 50% + imidacloprid 1.8% | 4 g per kg seed | 1.25 kg/ha | 1.25 kg/ha | 1.25 kg/ha |
| Untreated check | | | | |

Crops

| | | |
|-----------|---|------------|
| Potato | : | Palampur, |
| Arecanut | : | Bangalore |
| Soyabean | : | Ranichauri |
| Groundnut | : | Durgapura, |
| Colocasia | : | Jorhat |

III. MICROBIAL CONTROL OF WHITEGRUBS**A. Management of Whitegrubs through Bio-control Agents****Treatments:**

1. *Heterorhabditis indica*
2. *Steinernema abbassi*
3. *Steinernema glaseri*
4. *Metarhizium anisopliae*
5. *Beauveria bassiana*
6. *H. indica* + *M. anisopliae*
7. *H. indica* + *B. bassiana*
8. Local isolates

Crops

| | | |
|------------|---|------------|
| Potato | : | Palampur |
| Arecanut | : | Bangalore |
| Soyabean | : | Ranichauri |
| Groundnut | : | Durgapura |
| Green gram | : | Jorhat |

The material will be supplied by Dr. M. Nagesh along with detailed protocol and detailed methodology. Application of biopesticides should coincide with mass emergence of beetles after first shower of monsoon.

B. Study of Local isolates of Bacteria for their Infectivity against Whitegrubs (Bangalore Centre only): The existing isolates would be screened against *Holotrichia serrata* larvae and the active isolates identified. These would be further tested against *Holotrichia* spp. and *Leucopholis* spp. As many times as possible to identify the most consistently pertaining. Relatively high activity isolates. Two to three such isolates would be field tested.

C. To evaluate the Bioefficacy of Micopesticides against Whitegrubs:

IV. TAXONOMY OF MELOLONTHINAE (Bangalore Centre only):

Collection and curation of Whitegrubs of the subfamily melolonthinae from different parts of India. Department of Description and illustrations of the whitegrubs studied. These would be confirmed for the identify by following the suitable approach.

V. SOCIAL ENGINEERING

For beetles management all centres will survey and suggest endemic areas of whitegrub infested districts. The prominent Tehsils with respect to prevalence of whitegrubs will be sort listed and further 4-5 villages will be selected on the basis of cropping pattern and host trees. Campaigns will be organized to educate the people about the adult management with light and/or pheromones. Emphasis will be on pre-monsoon training to the villagers including children as well as women. Constitution of village task forces to tackle the beetle management programme. With onset of monsoon message will be delivered to the villagers through mobile SMS involving local KVKs/department of Agriculture about the importance of spraying of host trees and installation of lures. **ALL CENTRES TO CONDUCT THIS ACTIVITY ON ONE SPECIES OF IMPORTANCE.**

VI. MANAGEMENT OF TERMITES THROUGH CHEMICALS

1. Thiamethoxam 25 WG at 3.2 g/kg seed
2. Imidacloprid 17.8 SL at 3.0 ml/kg seed
3. Acephate 50% + imidacloprid 1%4 g per kg seed
4. Fipronil 5 SC at 6.0 ml/kg seed
5. Fipronil 5 SC at 10.00 ml/kg seed
6. Fipronil 5 SC at 15.00 ml/kg seed
7. Thiamethoxam 35 FS at 2.4 ml/kg seed
8. Imidacloprid 600 FS at 500 g ai/ha
9. Clothianidin 50 WDG at 2.0 g/kg seed
10. Control

Crops

| | | |
|---------------------|---|-----------|
| Wheat | : | Palampur |
| Chickpea, Groundnut | : | Durgapura |
| Sugarcane | : | Jorhat |

VII. CUTWORM

A. Monitoring of Cutworm

Jorhat, Palampur and Ranichauri centres will monitor the population of the cutworm through light trap and pheromone traps.

B. Management of cutworms:

Palampur, Jorhat and Ranichauri centres to do location specific trials.

VIII. SOIL MICRO-ARTHROPODS

1. Extraction of soil micro-arthropods from different ecosystem.
2. Study of micro-arthropods fauna especially collembolan and mites
3. Rearing technology of collembolla and mites.

All centres to take up work on 1 and 2, however, work on 3 will be done by Jorhat centre only. The detailed methodology will be supplied by Dr. Badal Bhattacharya to all centres.

IX. LOCATION SPECIFIC TRIALS

Each centre will conduct experiments of local importance based on the feed back received from different sources and will communicate the details of the trials to the Project Coordinator at the earliest.