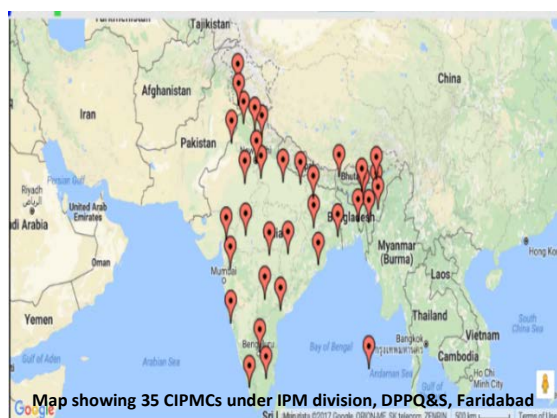


IPMe- Newsletter

A platform to share knowledge for agricultural sector

The Integrated Pest Management (IPM) is an ecological approach which aims at keeping pest below economic threshold level by employing all available alternate pest control management practices such as cultural, mechanical and biological control with greater emphasis on use of bio-pesticides and pesticides of plant-origin. To enhance the production and productivity of crops by protecting them from the ravages of pests, Govt. of India, Ministry of Agriculture & Farmers Welfare, Department of Agriculture, Co-Operation & Farmers welfare (DAC& FW) has launched a scheme “Strengthening and Modernization of Pest Management Approach in India” by adopting Integrated Pest Management (IPM) as cardinal principle and main plank of plant protection strategy in overall crop production and protection programme. In 1992, 26 Central Integrated Pest Management Centres (CIPMCs) were established by merging all Central Plant Protection Stations (CPPS), Central Surveillance Stations (CSS) and Central Biological Control Stations (CBCS). Later on five more CIPMCs were established in 10th Five Year Plan & further four nos. in 12th Five Year Plan period. As on date, total 35 CIPMCs are working in 29 States & one Union Territory.



The mandate of scheme is pest/disease/weed monitoring through Rapid Roving Survey; mass multiplication, augmentation conservation & release of bio-control agents; production of bio-pesticides and HRD programmes for Extension functionaries of State Agriculture departments, pesticides dealers/ NGOs/students and progressive farmers on IPM

Activities

CIPMCs under IPM division impart training to Agriculture / Horticulture Extension functionaries of State Agriculture Department. CIPMCs also organise Farmers Field Schools (FFSs) exclusively for farmers. Fundamental aim of FFS is to train the farmers on the latest IPM technology emphasizing about the judicious use of pesticides so that the crop can be grown with barest minimum use of chemical pesticides. Below listed are main activities of CIPMCs:

- Popularizing IPM among farming community.
- Conducting pest surveillance and monitoring to assess pest/disease situation.
- Mass production of biological control agents for releasing in the fields and conservation of naturally occurring bio-control agents.
- Promotion of bio-pesticides as an alternative to chemical pesticides.
- To play a catalytic role in spread of innovative IPM technology among the agriculture extension workers and farmers
- Human Resource Development in IPM by imparting training to Extension workers of State Agriculture Department and farmers through Farmer Field Schools (FFSs).
- Conducting short duration courses (two days and five days) for Extension functionaries of State Agriculture departments, pesticides dealers/NGOs/students and progressive farmers.

- Conducting Season Long Training (SLT) programme for 30 days on major agricultural/horticultural crops for Extension workers of the State Agriculture/ State Agricultural Universities (SAUs).

IPM Packages

Packages of Practices on IPM have been developed for 87 crops. These packages are available on the Directorate of Plant protection, Quarantine and Storage (DPPQ&S) website http://ppqs.gov.in/ipmpakpra_revised.htm.

Kisan Suvidha Mobile App

Kisan Suvidha is an omnibus mobile app developed to help farmers by providing relevant information to them quickly. With click of a button, they can get the information on weather of current day and next 5 days, dealers, market prices, agro advisories, plant protection, IPM practices etc. Unique features like extreme weather alerts and market prices of commodity in nearest area and the maximum price in state as well as India have been added to empower farmers in the best possible manner.

An additional tab directly connects the farmer with the Kisan call centre where technical experts answer their queries. Total 12,000 queries have been answered during 2016-17 through e-Pest Surveillance.

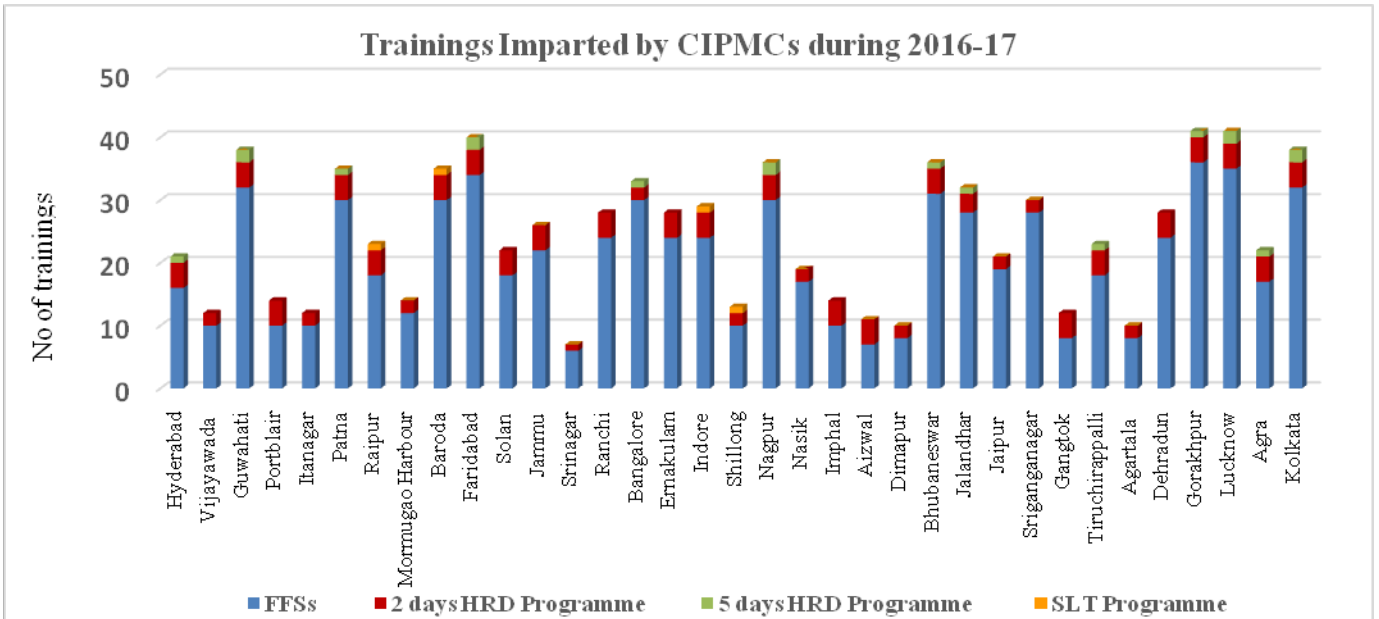


Kisan Suvidha Mobile App

Achievements....2016-17

Mandate of IPM division is monitoring of pest/disease monitoring, production and release of bio-control agents/ bio-pesticides, conservation of bio-control agents and Human Resource Development by imparting training to Agriculture / Horticulture Extension Officers. To achieve the goal, trainings for farmers, State Agriculture officers, stakeholders etc. are being organised by CIPMCs to create awareness about the IPM techniques among farmers and agriculture extension workers of State Government. In addition to this, rapid roving pest survey

is being undertaken by CIPMCs to assess the condition of pest problems in the farmer's fields. Accordingly, CIPMCs plan to organise different trainings in different areas. During 2016-17, 942.62 thousand ha area was surveyed all over India and 716 FFS have been organised under which 21480 farmers were trained on IPM techniques. 116 two days and 18 five days programmes were organised under which 4640 and 720 respectively agriculture extension workers & farmers were trained. Four SLTPs were organised by



CIPMCs viz. on Soybean CIPMC Indore, on Gram CIPMC Raipur, on Rice CIPMC Shillong and on Cotton CIPMC Baroda under which 160 agriculture extension officers were trained for Master trainer. During this period, 214.8 millions of bio-agents were produced and released in the farmers' field.

In addition to this, DPPQ&S participated in different programmes, like Kisan melas/ Exhibitions etc. organised by different agencies to make the farmers aware about various agricultural practices/ techniques. DPPQ&S participated in Kisan Mela at ICAR, New Delhi, Exhibitions –cum Seminar (Sangam) at Deen Dayal Upadhyay Dham Farah, Mathura (UP), India International Trade Fair, New Delhi and Krishi Unnati Mela, Pusa, New Delhi, Krushi Mela and Krushi seminar at Baroda (Gujarat) and national Agriculture Fare at Chamaparan (Bihar).

Advisories issued

Total 93 advisories were issued during 2016-17 to State Agriculture Dept/ State Agricultural Universities/ ICAR/ CIPMCs for the management of different pests/ diseases in different crops. Advisories were issued for different pests/ diseases like *White fly*, *Spiralling White fly*, *Armyworm*, *Pink bollworm*, *South American pinworm*, *Hairy caterpillar*, *Tobacco caterpillar*, *Sugarcane top borer*, *Brown plant hopper*, *Fruit and*

shoot borer, *Aphids*, *Leaf miner*, *White Grub*, *Semilooper*, *Climbing Cut worm*, *Bacterial leaf bight*, *Leaf curl virus*, *Yellow rust*, *White rust*, *Brown leaf spot*, *Budnecrosis viral disease*, *Brinjal leaf curl virus*, *Eriophyid mite*, *Root knot nematode*, *Giant African snail* etc.

Special Surveys

DPPQ&S along with State Agriculture Department conducted special surveys for the management of following pests/ diseases:

1. Whitefly (*Bemisia tabaci*), Sooty mould, & Leaf curl virus in Cotton growing areas of Punjab state.
2. New pest, Rugose Spiralling Whitefly (RSW), *Aleurodicus rugioperculatus* Martin, on Coconut palm in Tamil Nadu & Kerala states.
3. Rice swarming caterpillar (*Spodoptera mauritia*) in rice growing areas of Assam state.
4. South American Pinworm (*Tuta absoluta*) in tomato growing areas of Maharashtra state.
5. Pink bollworm (PBW) on cotton crop in the States of Gujarat, Maharashtra, Andhra Pradesh, Telangana and Karnataka.
6. Panama wilt in Banana growing areas of Bihar state.

Special coverage

CIPMC Faridabad- At A Glance

Courtesy: CIPMC, Faridabad

Central Integrated Pest Management Centre, Faridabad is a sub-office of the Directorate of Plant Protection Quarantine & Storage, NH IV, Faridabad under the Ministry of Agriculture & Farmers Welfare. It was established in June, 1991 by merging Central Plant Protection Station, New Delhi (CPPS), Central Biological Control Stations, Faridabad (CBCS) and Central Surveillance Station, Karnal (CSS). This station has 27 trained technical/ administrative staff whose contribution has made possible in achieving the targets.



The main objectives of Central Integrated Pest Management Centre are to popularize IPM technology of crop protection among farmers and state agriculture functionaries through regular Pest monitoring surveys and organizing farmers field training - cum -IPM demonstration programmes. Farmers are made aware about the hazardous effects of chemical pesticides and usefulness of farmer's friends in the form of bio-agents. Emphasis is laid on conservation and augmentation of natural enemies already present in the farmer's fields. Insect pest and disease situation on major crops is being monitored and necessary information being furnished to the State Department of Agriculture Haryana and Directorate of PPQ&S, Faridabad for further necessary action.

Mass Multiplication of Bio Agents:

Production/ mass multiplication of bio-agents and their release in the farmers' field to control pest diseases is one of the key component of IPM activities. Efforts are made to curtail the pest damage of various crops in the region

through use of the bio-agents. A larger number of bio-control agents *Trichogramma chilonis*, *Trichogramma japonicum*, *Chrysoperla carnea*, *Trichoderma viride*, *Beauveria bassiana*, *Chelonus blackburni*, *Zygogramma bicolorata*, *Neochetina sp*, H -NPV, S -NPV are cultured in the laboratory for their subsequent augmentation in the crop fields against their target host.



Major Activities

Pest Surveillance and Monitoring:

Rapid Roving Surveys are conducted in Wheat Bajra, Pulses, Rice, Sugarcane, Cotton, Sorghum, Mustard, Guar, Gram, Cucurbits, Cauliflower, Cabbage, Tomato, Brinjal, Chilly, Okra, Potato etc. Timely advice on pest/ disease management and IPM measures are accorded to farmers and the concerned state agriculture authorities with a view to minimize crop damage. Some of the fore warnings are being issued for white grub on sugarcane; aphids on mustard, grass hopper, brown plant hopper (BPH) and white backed plant hopper (WBPH) on rice; yellow rust in wheat; stem

borer on rice and wheat; whitefly and mealy bug on cotton from time to time. Timely forewarnings to the concerned State Department of Agriculture/ Horticulture helps to facilitate them to control the pest flur up and avoid crop losses by adopting timely and need based pest management practices.

Popularization of IPM Technology among farmers and State Extension Functionaries



a. Organizing Farmer Field school:

In order to popularize IPM Technology among the farmers and State Agriculture Extension functionaries, IPM Demonstration-cum-Training Program (FFSs) are conducted in different districts of Haryana state. The basic objective of organizing FFS is to make the farmers self-decision maker about their own field on crop cultivation and to be able to choose IPM practice best suited to his field.

Table 1: Farmer Field Schools conducted by CIPMC, Faridabad during last five years

Year	No. of FFS In Kharif	No. of FFS in Rabi	Total No. of FFS	No. of Farmers trained
2012-13	20	17	37	1110
2013-14	16	16	32	900
2014-15	16	16	32	960
2015-16	16	10	26	780
2016-17	16	18	34	1020

b. Human Resource Development Training in IPM

Table 2: Two and five days HRD orientation programmes conducted by CIPMC, Faridabad during last five years

Year	No. of 2 days HRD programme	No. of Farmers trained	No. of 5 days HRD programme	No. of Farmers trained
2012-13	8	320	2	80
2013-14	5	200	2	80
2014-15	3	120	1	40
2015-16	4	202	2	87
2016-17	4	263	2	131

Two days and Five days orientation training programs of short duration Human Resource Development Programme are organized to promote validation of IPM technology in farmers, implementation of all plant protection measures in coordination with state agriculture functionaries and to support the growth of healthy crops at low input cost for appraisal about IPM technology.



2 days and 5 days HRD orientation programmes organized by CIPMC, Faridabad

Participation in Exhibitions, Conferences, Seminars

During 2016-17, CIPMC, Faridabad has participated in Exhibitions –cum Seminar(Sangam) at DeenDayalUpadhyayDham Farah, Mathura (UP), India International Trade Fair, New Delhi and Krishi UnnatiMela, Pusa, New Delhi for promoting IPM technology.



Campaign / awareness Programs

Against use of pesticides

In view of the need to check the manufacturing and sale of spurious pesticides, DAC&FW/ Directorate of PPQS launched a campaign against sub-standard and spurious pesticides. CIPMC Faridabad participated in the drive.

Seed Treatment Campaign

Country wide campaign on Seed treatment has been launched by Government of India ensuring 100% seed treatment. Under which, CIPMC, Faridabad demonstrates Seed treatment procedure to farmers & extension officers of State Agriculture department during all the trainings (FFS & HRD programmes).



Seed Treatment Campaign

In addition to this, CIPMC, Faridabad has been framed as knowledge sharing platform for Haryana farmers/ agricultural stakeholders where following literature in Hindi is available:

1. **Booklets** on IPM on Paddy, Cotton, Mustard and Sugarcane
2. **Pamphlets** on Yellow rust on Wheat, Integrated Pest Management, Safe use of pesticide, Importance of Neem and Seed treatment
3. **Posters/Charts/Bannerson** different aspects of IPM, Safe use of pesticide and Farmers friends

Mass Production technique of bio-agent-*Trichoderma*: It is a bio-control agent for management of soil borne diseases

Our planet is warming and human activity is the primary cause. Bio-pesticides are one of the solutions for minimizing the use of pesticides in the fields. They are bio-degradable, hence eco-friendly and cheaper to produce. With the use of concept of mass production of *Trichoderma spp.* at laboratory & farm level (based on maize / other cereal) lab/extension worker will be able to enhance farmer's ability towards organic farming. By this method, they can also produce different types of fungi (not only *Trichoderma* but also entomo-pathogenic fungi like- *Metarhizium*, *Beauveria*, *Verticillium*) at very low cost. *Trichoderma* spp. besides other species of the genus, is an omnipresent saprophytic fungus. Its colonization in rhizosphere of crop plants renders long time protection against diseases, improved growth of plants besides imparting resistance.

Production technique

- Take 100 gm broken maize/ sorghum grain, wash with distilled water properly and keep in hot air drier for 15 min
- Transfer the grains from drier to autoclavable polybag/ conical flask
- Add 100 ml distilled water, 1 gm D-glucose/ Jaggery and 0.5 gm Yeast extract
- Mix the content by proper shaking and plug the mouth with cotton plug and tie with thread
- Autoclave the polybag/ conical flask for 15-20 min at 15psi
- After autoclaving, remove the polybag/ conical flask and allow the content to cool
- Add 0.01gm streptomycin solution and shake
- Inoculate the *Trichoderma* culture (available in respective CIPMCs)

After full growth of mycelia, remove the material in a plastic tray, spread it and cover with thin black muslin cloth and allow it to shade dry for 5-6 days

After complete drying, grind the *Trichoderma* material

Mix it with Talcum powder and Carboxy methyl cellulose to use as formulation

Culture of *Trichoderma spp.* can be used for soil as well as for seed treatment. But it should be stored in cool, dry and well ventilated place at room temperature (24-25°C). Dose may vary according to the target of application.

Doses

Soil treatment: mix 1kg -2kg *Trichoderma* (Maize base) powder per 100kg(=1Quintal) dried cow-dung /well composed farm yard manure(FYM) and keep for 10-15 days under a polythene cover or jute bag cover. Turn over the mixture every 3 days to enable uniform multiplication of *Trichoderma* in FYM. Broadcast the FYM in 1 acre area before sowing in evening or early morning.

Nursery bed treatment: Drench nursery beds with *Trichoderma* (Maize base) powder at 5-10 gm per liter of water in 1 square meter in evening or early morning.

Seed treatment: mix 5-10gm *Trichoderma* (Maize base) powder in sufficient water to make slurry to coat 1kg seeds. Soak in shade and sow the treated seed in evening or early morning.

Cutting and seedling DIP: mix *Trichoderma* (Maize base) powder 200gm-400gm in 15-20 liter water and dip the cuttings/ rhizome/ tuber/root of seedlings for 10 minutes before planting.

For details kindly download Standard Operating Procedure of IPM from website <http://ppqs.gov.in/>

Production technique of *Trichoderma* spp



Preparation and sterilization of jaggery based media (JBM) for multiplication of *Trichoderma* spp.



Inoculation of *Trichoderma* spp in jaggery based media

Growth of *Trichoderma* spp on potato dextrose agar (PDA) & JBM



Growth of *Trichoderma* spp on PDA & JBM



Mixing of fully grown *Trichoderma* in talcum powder and carboxy methyl cellulose



Shade drying and packaging of *Trichoderma* based material

Upcoming Events

Different training programmes are proposed for the farmers/ private entrepreneurs/ pesticide dealers/ Extension Officers of State Department of Agriculture in each CIPMC throughout country.

In Kharif season, 360 FFSs, 60 two days and 10 five days HRD orientation programmes, and 2 SLTPs (30 days) will be organised.

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