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## Theme Article

## Training Programs

## Special Events

## What's Inside


| Topic/ Article | Pages |
|---|---|
| Theme Article | 3 – 12 |
| Around the World | 13 |
| Trainings | 14 - 55 |
| Research & Development | 56 – 57 |
| Extension Activities | 58 |
| Other Activities | 59 – 61 |
| Special Events | 61 – 62 |


## From the Director General's Desk

The importance of pheromone technology in insect pest management lies in its ability to offer an eco-friendly alternative to chemical pesticides. By releasing synthetic pheromones that mimic the natural mating signals of pests, this technology disrupts their reproductive cycles, leading to a natural reduction in pest populations without harming beneficial insects or the environment. This method is highly targeted, reducing the need for broad-spectrum chemicals and minimizing environmental impact. Notably, pheromone technology is allowed and widely adopted in both organic and natural farming systems because it aligns with the core principles of these practices—sustainability, minimal chemical use, and ecological balance. Organic certification standards often permit the use of pheromone-based pest control as it doesn't involve synthetic pesticides or harmful substances, making it a safe, non-toxic solution for pest management. In natural farming, which emphasizes working in harmony with nature, pheromone technology fits seamlessly into the system's holistic approach. When integrated into farming systems like organic or natural farming, pheromone technology helps reduce reliance on harmful chemicals, promotes the health of ecosystems, and supports the production of food that is both healthier for consumers and safer for the planet. Thus, it enhances the effectiveness and sustainability of organic farming by providing a natural, eco-friendly pest management solution.

Despite these advantages, adoption has been slow due to gaps in knowledge, availability of traps and lures, and technical training. To address this, there is a growing need to popularize pheromone technology through demonstrations, training, and awareness programs tailored for farmers, extension workers, and rural communities. Field-level promotion and hands-on training can help farmers understand how to deploy traps effectively, identify target pests, and manage lure replacement cycles. Integrating pheromone traps with other biological control methods also strengthens Integrated Pest Management (IPM) strategies aligned with organic and natural farming systems.

The National Institute of Plant Health Management (NIPHM), under the Ministry of Agriculture & Farmers Welfare, Government of India, has taken a leading role in mainstreaming low cost bio-inputs. NIPHM has developed various low cost bio-inputs including low-cost fruitfly traps and natural enemy friendly light traps. Its outreach through on-farm demonstrations and capacity-building programs across different states has shown that awareness and practical training are essential for farmer adoption.The institute also provides technical support to various State Governments, ICAR, KVKs, SHGs, FPOs, and other organizations by imparting training, demonstration and awareness activities through on-campus, off-campus and online modes.

फेरोमोन तकनीक कीट प्रबंधन में एक पर्यावरण-अनुकूल विकल्प प्रदान करती है, जो रासायनिक कीटनाशकों के उपयोग की आवश्यकता को कम करती है। इस तकनीक में ऐसे कृत्रिम रासायनिक संकेत या फेरोमोन का इस्तेमाल किया जाता हैं जो शत्रु कीटों के प्राकृतिक प्रजनन संकेतों की नकल करते हैं। इससे शत्रु कीटों की प्रजनन चक्र में बाधा आती है। इससे लाभकारी कीटों या पर्यावरण को नुकसान पहुँचाए बिना ही शत्रु कीटो की संख्या प्राकृतिक रूप से घटती । यह विधि अत्यंत लक्षित होती है, जिससे व्यापक-प्रभाव वाले रसायनों की आवश्यकता कम हो जाती है और पर्यावरण पर प्रतिकूल प्रभाव नहीं पड़ता। जैविक और प्राकृतिक खेती में इस तकनीक को इसलिए अपनाया गया है क्योंकि यह इन प्रणालियों के मूल सिद्धांतों— टिकावूपन, न्यूनतम रसायन उपयोग और पारिस्थितिक संतुलन के अनुरूप है। जैविक प्रमाणन मानक भी फेरोमोन आधारित कीट नियंत्रण की अनुमति देते हैं क्योंकि यह रासायनिक कीटनाशकों या हानिकारक पदार्थों का प्रयोग नहीं करता, और इसलिए यह एक सुरक्षित व विषरहित समाधान माना जाता है। प्राकृतिक खेती, जो प्रकृति के साथ सामंजस्य पर आधारित है, में भी यह तकनीक पूरी तरह उपयुक्त है।

जब फेरोमोन तकनीक को जैविक या प्राकृतिक खेती प्रणालियों में शामिल किया जाता है, तो यह हानिकारक रसायनों पर निर्भरता को कम करती है, पारिस्थितिकी तंत्र के स्वास्थ्य को बढ़ावा देती है, और उपभोक्ताओं के लिए सुरक्षित तथा पर्यावरण के लिए हितकारी खाद्य उत्पादन को संभव बनाती है। इस प्रकार, यह जैविक खेती की प्रभावशीलता और स्थिरता को एक प्राकृतिक और टिकाऊ कीट प्रबंधन उपाय के रूप में सुदृढ़ बनाती है। हालाँकि, इस तकनीक को अपनाने की गति अपेक्षाकृत धीमी रही है। इसका प्रमुख कारण जानकारी की कमी, ट्रैप और प्रलोभन पदार्थ (ल्योर) की सीमित उपलब्धता तथा तकनीकी प्रशिक्षण का अभाव है। इसे दूर करने के लिए, किसानों, विस्तार अधिकारियों और ग्रामीण समुदायों को ध्यान में रखकर प्रदर्शन, प्रशिक्षण और जागरूकता कार्यक्रमों की आवश्यकता है। खेत स्तर पर प्रचार और व्यावहारिक प्रशिक्षण से किसानों को यह समझने में मदद मिलेगी कि ट्रैप कैसे स्थापित करें, लक्षित कीटों की पहचान कैसे करें और ल्योर को कब और कैसे बदलें। फेरोमोन ट्रैप को अन्य जैविक नियंत्रण विधियों के साथ मिलाकर अपनाने से एकीकृत कीट प्रबंधन (IPM) रणनीतियाँ और अधिक प्रभावी हो सकती हैं, जो जैविक और प्राकृतिक खेती के अनुरूप हैं।

**राष्ट्रीय वनस्पति स्वास्थ्य प्रबंधन संस्थान (NIPHM),** कृषि एवं किसान कल्याण मंत्रालय, भारत सरकार के अंतर्गत, कम लागत वाले जैव-इनपुट्स को बढ़ावा देने में अग्रणी भूमिका निभा रहा है। संस्थान ने कम लागत वाले फल मक्खी ट्रैप और मित्र कीटों के अनुकूल प्रकाश ट्रैप जैसे अनेक जैव-इनपुट्स विकसित किए हैं। देश के विभिन्न राज्यों में ऑन-फार्म प्रदर्शन और क्षमता विकास कार्यक्रमों के माध्यम से यह स्पष्ट हुआ है कि किसानों को इस तकनीक को अपनाने के लिए जागरूकता और व्यावहारिक प्रशिक्षण अत्यंत आवश्यक हैं। संस्थान राज्य सरकारों, भारतीय कृषि अनुसंधान परिषद (ICAR), कृषि विज्ञान केंद्रों (KVKs), स्वयं सहायता समूहों (SHGs), कृषक उत्पादक संगठनों (FPOs) और अन्य संगठनों को प्रशिक्षण, प्रदर्शन और जागरूकता कार्यक्रमों के ज़रिए, चाहे वे ऑन-कैंपस हों, ऑफ-कैंपस हों या ऑनलाइन—तकनीकी सहायता प्रदान करता है।

**(डॉ. सागर हनुमान सिंह, भा.डा.से.)**
**महानिदेशक**

# Recent Advances in Pheromone Based Insect Pest Management

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Insect pests are a significant constraint in agriculture, forestry, and public health, leading to considerable economic losses and raising environmental concerns due to the widespread use of chemical pesticides. As a sustainable and eco-friendly alternative, pheromone-based insect pest management has gained prominence for its species-specific targeting and minimal environmental impact. Pheromones—naturally occurring chemical compounds used by insects to communicate and regulate behaviors such as mating, foraging, aggregation, and colony organization—are increasingly utilized in Integrated Pest Management (IPM) strategies. Their application allows for effective pest control while preserving beneficial insect populations and reducing pesticide dependence. The Indian agricultural pheromone market reflects this growing interest, projected to rise from $4.05 million in 2022 to $11.03 million by 2029, driven by advancements in precision farming, sustainable agriculture initiatives, and favourable regulatory support. Central to this approach are pheromone-based traps, which serve as essential tools for both monitoring and managing pest populations, supported by ongoing innovations in trap technologies and lure formulations.

**Role of Pheromones in Insect Communication**

Pheromones are vital chemical signals used by insects to communicate with conspecifics, regulating essential behaviors such as mating, defense, foraging, and social organization. Among these, sex pheromones are especially significant in pest management due to their species-specific nature, enabling targeted control strategies that minimize environmental impact. For instance, moths like *Tuta absoluta* and *Bombyx mori* use sex pheromones to attract mates, while honeybees and ants employ alarm pheromones to warn colony members of danger. Trail and aggregation pheromones facilitate efficient resource exploitation and group coordination, as seen in ants and bark beetles. Additionally, epideictic and queen pheromones help manage population dynamics and maintain colony hierarchy. Understanding these diverse pheromonal functions is crucial for developing environmentally sustainable pest control methods, such as pheromone traps and mating disruption techniques.

**Important pheromones used by insects for communication**

| Sl. No. | Type of pheromone | Purpose | Example | Image |
|---|---|---|---|---|
| 1 | Alarm Pheromone | Flight or Fight | Flight-Aphids, Fight-Honey bees |   |
| 2 | Aggregation Pheromones | Feeding/ Mating | Coconut rhinoceros beetle and Red palm weevil |   |
| 3 | Trail marking pheromones | Adhering to colony | Ants & termites |   |
| 4 | Sex pheromones | Mating & reproduction | Lepidopteran pests |   |

**Pheromone-Based Insect Traps and Lure Formulations**

Pheromone-based insect traps are an effective, environmentally friendly tool in integrated pest management, designed to monitor and control specific insect species by mimicking natural chemical signals. Several types of traps are available, each tailored to attract particular pests.

- **Funnel traps**: are shaped like a funnel and guide insects into a central chamber where they are unable to escape. These are especially effective against medium to large-sized moths such as Armyworms (*Spodoptera spp.*), which are significant pests of crops like corn, wheat, and rice, and Cutworms (*Agrotis spp.*), whose larvae cut through plant stems at the soil surface, severely damaging seedlings.
- **Delta traps**: with their triangular structure, are commonly used for smaller moth species. They use pheromone lures to target pests like *Tuta absoluta* (tomato leaf miner), which causes serious damage to tomato crop and diamondback moth (*Plutella xylostella*), a destructive pest of cruciferous vegetables such as cabbage and cauliflower.
- **Fruit fly traps** are specifically designed to capture fruit flies, utilizing either pheromones or food-based attractants. A key target is *Bactrocera dorsalis* and *Bactrocera cucurbitae* which infests a wide range of fruits and vegetables including mango, guava, and papaya, bottle guard, bitter guard etc. leading to significant yield losses.

- **Water pan traps**: use shallow containers filled with water, often mixed with a surfactant, to trap insects that are lured in by attractants. These traps are particularly effective against pests like the brinjal fruit and shoot borer (*Leucinodes orbonalis*), a major threat to eggplant cultivation.
- **Bucket traps:** consist of a container baited with lures and are ideal for larger pests such as the coconut rhinoceros beetle (*Oryctes rhinoceros*), which damages palm trees by boring into their crowns, and the red palm weevil (*Rhynchophorus ferrugineus*), a serious pest of various palm species that can cause tree death.
- **Sticky traps**: coated with adhesive substances, are color-specific to attract different pest groups. Yellow sticky traps are widely used to monitor sap-sucking insects like aphids, whiteflies, and leafhoppers (jassids). Blue sticky traps are tailored to attract thrips, while white sticky traps are effective against mites.

To enhance the effectiveness of these traps, various pheromone lure formulations are employed. These include rubber septa and fiber wicks for slow and gradual release, polymeric dispensers for controlled diffusion, and gel formulations that provide steady, uniform volatilization. Tablet formulations offer a long shelf life with consistent emission, while sprayable microcapsules are used for area-wide mating disruption by releasing pheromones over broad zones.

**Different types of traps used in insect pest monitoring and management**

| Sl. No. | Type of trap | Target pest | Image |
|---|---|---|---|
| 1 | Funnel trap | Medium to large sized lepidopteran moths |   |
| 2 | Delta trap | Small to medium sized lepidopteran moths |  |
| 3 | Fruit fly trap | Fruit flies of fruits and vegetables |  |
| 4 | Water pan trap | Brinjal FSB, Tomato leaf miner etc. |  |

| | | | |
|---|---|---|---|
| 5 | Bucket trap | Coconut Rhinoceros Beetle and Red palm weevil |  |
| 6 | Yellow sticky traps | Aphids, Whiteflies, Jassids, etc. |  |
| 7 | Blue sticky traps | Thrips, Black thrips |  |
| 8 | White sticky traps | Mites |  |

**CIB&RC Guidelines on Pheromone Traps and Lures in India**

The Central Insecticides Board and Registration Committee (CIB&RC) in India has set forth detailed guidelines for the use and regulation of pheromone traps and lures, ensuring their safe and effective application in agricultural pest management. According to the CIB&RC, pheromones used for mating disruption are classified as insecticides under the Insecticides Act of 1968 and require mandatory registration. This registration process involves submitting data on product chemistry, efficacy (such as a minimum 50% insect attractancy in wind tunnel tests), and multi-location field trials conducted over two seasons. In contrast, pheromones intended for pest monitoring and mass trapping are exempt from insecticide classification and registration, facilitating their use in Integrated Pest Management (IPM). Furthermore, the CIB&RC specifies that lures should be made from approved materials like sulfur-free rubber or polypropylene, with a minimum field efficacy of 15 days. These lures must also have a shelf life of at least six months when stored in original packaging at room temperature. The traps themselves, whether funnel, sticky, or fly traps, are designed with specific dimensions and materials to ensure their durability and efficiency in various environmental conditions. For optimal pest control, traps should be placed 1-2 feet above the crop canopy, with trap densities varying based on the intended purpose (2-3 traps per acre for monitoring and higher densities for mass trapping). Lures should be replaced every 15–20 days to maintain their effectiveness. These guidelines are outlined in official CIB&RC documentation, such as the "Guidelines for Registration of Insect Pheromones" published by

the Directorate of Plant Protection, Quarantine & Storage (DPPQS) (ppqs.gov.in), and they provide a framework for the safe deployment of pheromone-based pest control strategies in India's agricultural practices.

**Latest developments in pheromone based insect pest management:**

**i) CREMIT 4% RTU (Ready-to-Use)**

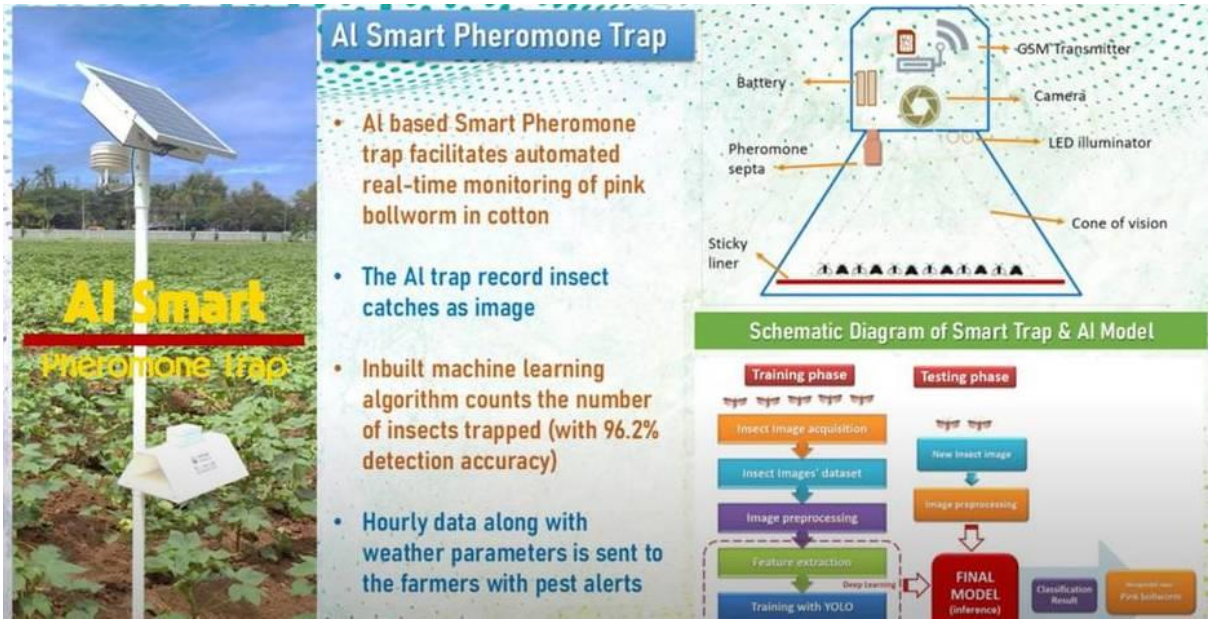
CREMIT 4% RTU is an innovative pheromone-based paste specifically designed to manage the pink bollworm (*Pectinophora gossypiella*), a major pest affecting cotton crops. This ready-to-use formulation is applied at specific intervals to disrupt the insect's mating cycle, effectively reducing their population over time. Its eco-friendly composition makes it a sustainable alternative to conventional pesticides, minimizing harm to beneficial insects and the environment. Additionally, the paste is rain-resistant, ensuring long-lasting efficacy even in varying weather conditions. Its ease of application and reduced labor requirements make it a practical solution for farmers looking to implement integrated pest management strategies efficiently.


**ii) PB ROPE-L for Pink Bollworm Mating Disruption**

PB ROPE-L is a pheromone-based solution designed to prevent the mating of pink bollworms by releasing synthetic sex pheromones into the environment. These pheromones create confusion among male moths, making it difficult for them to locate females and reproduce, ultimately reducing the pest population. The controlled-release mechanism ensures long-lasting efficacy, making it a reliable option for farmers seeking extended protection. Moreover, PB ROPE-L is easy to install and significantly reduces the dependence on chemical pesticides, promoting a more sustainable approach to pest management while maintaining crop health.


### iii) AI-Powered Smart Pheromone Traps (Developed by CICR, Nagpur)

Developed by the Central Institute for Cotton Research (CICR) in Nagpur, AI-powered smart pheromone traps utilize artificial intelligence and image recognition technology to monitor pink bollworm infestations in cotton fields. These advanced traps are integrated with a mobile application that provides real-time data on pest counts, weather conditions, and recommended control measures. This technology enables farmers to make informed decisions about pest management, reducing unnecessary pesticide applications. The system has been successfully deployed in Punjab, where it has enhanced real-time pest surveillance and contributed to more effective and sustainable crop protection strategies.



### iv) Solar Light Cum Pheromone Traps

This innovative pest management solution combines solar-powered lights with pheromones to attract and capture nocturnal pests. The solar light attracts insects during nighttime, while the pheromone lure enhances the trap's effectiveness by drawing in specific pests. This dual-action approach significantly reduces the reliance on chemical pesticides, contributing to eco-friendly farming practices. Additionally, the system is energy-efficient and can be deployed in various agricultural settings to improve pest control efficiency while minimizing environmental impact.

### v) Plastic Glass Traps for Fruit Flies

Plastic glass traps provide an affordable yet effective method for managing fruit fly infestations in orchards and farms. These traps use pheromone lures to attract and capture fruit flies, preventing them from laying eggs in fruits and causing damage. Their low-cost design makes them accessible to small and large-scale farmers alike, offering a practical and sustainable solution for pest control. By reducing the need for chemical insecticides, plastic glass traps help maintain fruit quality and ensure safer produce for consumers.

### vi) Catch Housefly Trap

The Catch Housefly Trap is a chemical-free and environmentally friendly method for controlling housefly populations. It features a patented design that incorporates specially formulated eco-friendly lures to attract and trap houseflies effectively. This solution is particularly useful in poultry farms, food processing units, and residential areas, where hygiene and pest control are critical. By eliminating the need for chemical sprays, the Catch Housefly Trap provides a safe and sustainable alternative for maintaining fly-free environments.

### vii) Tablet Formulations for *Tuta absoluta*

Tablet formulations for *Tuta absoluta*, a destructive pest affecting tomato crops, offer a controlled-release system that gradually emits pheromones over an extended period. These tablets are typically used in conjunction with delta traps, which capture and monitor the pest population to assess infestation levels. By providing a long-lasting and efficient method of pest management, these formulations help farmers protect their crops while minimizing pesticide usage, promoting a more balanced and sustainable agricultural approach.

### viii) Pheromones/ attractants for whiteflies, aphids, Jassids, thrips (Developed by ICAR-CICR,Nagpur.):

ICAR-CICR, Nagpur, has developed pheromones/attractants for whiteflies, aphids, jassids, and thrips to improve pest management in cotton farming. Sucking pests significantly impact cotton yield and quality, while conventional insecticides contribute to resistance, pest resurgence, loss of natural predators, and environmental pollution. Although yellow sticky traps (YST) are commonly used for pest control, their efficiency can be enhanced. Microbial volatile organic compounds (mVOCs) provide an eco-friendly alternative, functioning as attractants or repellents. The institute has formulated bacterial-based mVOCs (CICR-BVW, CICR-BVJ, CICR-BVA, CICR-BVT), which improve YST attraction efficiency by 168%-197% for various sucking pests. These formulations are cost-effective, environmentally friendly, and commercially viable, supporting sustainable cotton farming.

**ix) Low-Cost Fruit Fly Trap and Lures – Developed by NIPHM Hyderabad**

The low-cost fruit fly trap, developed by the National Institute of Plant Health Management (NIPHM) in Hyderabad, offers an affordable and effective solution for managing fruit fly infestations. This innovative trap is made using simple household materials and is easy to assemble, making it accessible to farmers of all scales.

a) **Bottle Preparation:** To create the trap, a 1-litre empty plastic water bottle is used as the base. The wrapper is removed, and three small windows, each approximately 1 inch in size, are cut into the bottle, positioned about 3 inches from the top. These openings allow fruit flies to enter the trap while preventing them from escaping.

**b) Cap Modification:** The cap is modified to accommodate a hanging mechanism and lure attachment. A small hole is made in the center of the cap using a needle, through which a 10-inch thin wire is inserted. The wire is knotted at the center inside the cap, with an external loop formed for easy hanging. Inside the bottle, the wire is shaped into a hook to hold the lure securely.

c) **Lure Preparation:** The lure plays a crucial role in attracting fruit flies. Thick cotton rope is cut into 2-inch pieces and tied at both ends using a thin copper wire to maintain its shape. These cotton pieces are then soaked in a prepared solution consisting of 60 ml of ethyl alcohol, 40 ml of a specific lure (Methyl Eugenol or Cue Lure), and 20 ml of insecticide. This soaking process lasts for 24 hours, ensuring complete absorption of the attractant and insecticide. The soaked lures are then wrapped in aluminum foil and stored until they are needed for use.

d) **Using the Lure:** Before deployment, one-third of the aluminum foil covering is removed to expose the lure. The prepared lure is then attached to the inner hook of the bottle cap using the thin wire, ensuring it remains suspended inside the trap.

e) **Application:** The choice of lure depends on the type of crop being protected. Methyl Eugenol (ME) is suitable for fruit crops such as guava, mango, papaya, and citrus, effectively attracting and trapping fruit flies specific to these fruits. Cue Lure is used for vegetable crops, including cucumber, gherkin, melon, pumpkin, snake gourd, ridge gourd, bottle gourd, and mango. This selective targeting helps maximize the effectiveness of the trap while reducing harm to beneficial insects. This low-cost and eco-friendly trap provides a sustainable solution for farmers, reducing reliance on chemical pesticides while effectively managing fruit fly populations. It enhances crop protection, minimizes yield losses, and promotes integrated pest management practices in agriculture.

**x) NIPHM Natural Enemy Friendly Light Trap- Developed by NIPHM Hyderabad:**

Light traps are mainly used for attracting moths & other night flying insects which are attracted towards the light. The insects are actively caught or encouraged to enter a trap. The simplest light trap consists of a light on a cable hanging out in the field for attracting the pests during nights. However, besides a number of species of moths, beetles, flies, and other insects, most of which are not pests, are also attracted to artificial light. So identification of pests and beneficial insects is of prime importance before any control operation is executed. The Institute has developed an affordable Natural Enemy Friendly Light Trap to enable insect trapping in field conditions thereby reduce application of chemical pesticides. The trap is provided with a plastic funnel catcher through which the insects fall into a perforated plactic holding jar. Perforations are so made in the holding jar to enable the escape of the smaller size insects (mostly defenders) back into the field. A CFL lamp serves to provide the blue colour light to attract the insects in the field. This light trap enables segregation of beneficial insects which returns to the field to augment the ecosystem as part of AESA & Ecological Engineering approach to pest management.

## Conclusion:

Advances in pheromone-based insect pest management highlight a significant shift towards more sustainable and eco-friendly pest control strategies in agriculture. The development of various pheromone-based tools, including traps and lures, has revolutionized Integrated Pest Management (IPM) systems by offering precise, species-specific control methods that minimize environmental impact and reduce dependence on chemical pesticides. These innovations, such as AI-powered smart traps, solar light-pheromone traps, and low-cost, natural enemy-friendly solutions, demonstrate the potential for improved pest management with minimal ecological disruption. Additionally, the growing market for pheromone products in countries like India reflects the increasing adoption of such technologies, driven by their effectiveness and the desire for sustainable farming practices. Government guidelines, like those from the Central Insecticides Board and Registration Committee (CIB&RC), ensure that these products are safely used while maintaining their efficacy, promoting wide-scale adoption in diverse agricultural sectors. By enhancing pest monitoring, improving pest population control, and supporting the preservation of beneficial insects, these advances contribute to the broader goal of reducing pesticide use, improving crop yield, and safeguarding environmental health. The continued development of pheromone-based products, along with further research into new formulations and technologies, holds great promise for achieving more resilient, sustainable, and economically viable agricultural systems worldwide.

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## Around the World

Globally, the agricultural sector faces substantial losses due to insect pests, diseases, and weeds, with estimates suggesting that approximately 20–40% of crop yield is lost annually. Insects alone contribute to 15–25% of this loss, leading to an economic damage of billions of dollars worldwide. While the figures vary by region, with developing nations like India facing challenges due to limited pest control measures, the country is increasingly making strides in addressing these issues. The overall trend of insect-induced crop loss remains a critical concern globally, but with growing advancements in pest management and technology, India has the potential to turn these challenges into opportunities, strengthening its agricultural sector and food security. Pheromone-based insect pest management has emerged as a crucial component of sustainable agriculture worldwide due to its eco-friendly, species-specific, and non-toxic nature. Worldwide, pheromones are primarily used for monitoring, mass trapping, and mating disruption in different crops. The global pheromone market, valued at approximately USD 3.1 billion in 2023, is projected to reach USD 5.7 billion by 2030, with a robust growth rate of 9–12%. While countries like the United States and those in Europe have successfully implemented pheromone-based strategies, such as the widespread use of mating disruption in apple orchards and effective grapevine moth management in vineyards, India's pheromone market, currently estimated at USD 20–30 million, is poised for significant growth. As India continues to embrace innovative pest control technologies, there is great potential for the country to expand its adoption of pheromone-based solutions, enhancing agricultural productivity and sustainability. With increasing awareness and advancements in the sector, India is well-positioned to leverage the benefits of pheromone technology, ensuring a promising future for its agricultural landscape.

Insect pheromones play a vital role in organic and natural farming systems by offering an eco-friendly and sustainable approach to plant health management. This targeted control minimizes the impact on non-target species, including beneficial insects such as pollinators and natural predators, which are crucial for maintaining ecological balance. Recent advances in pest management by Indian research institutions are promoting eco-friendly solutions like pheromone and light traps. The Central Institute for Cotton Research (CICR), Nagpur, has developed AI-enabled pheromone traps for real-time pest monitoring and microbial consortia to biologically attract and eliminate pests, reducing reliance on chemical pesticides. The National Institute of Plant Health Management (NIPHM), Hyderabad, introduced affordable fruit fly traps for farmers and light traps that target harmful pests while sparing beneficial insects. New pheromone formulations like "Cremit" and "PB Ropel" enhance mating disruption for pink bollworm, cutting infestations without toxic chemicals. Institutes like CSIR-IICT Hyderabad and ICAR-NRRI Cuttack are also advancing pheromone-based pest control. CSIR-IICT developed synthetic lures for pests like the white stem borer in coffee, deployed in Andhra Pradesh's Araku Valley and extended to crops like tomato, brinjal, and cabbage using species-specific pheromones. ICAR-NRRI, with IICT, used pheromone lures against yellow stem borer in rice, reducing pesticide use. Private companies are also offering effective, eco-friendly products targeting pests like pink bollworm, tobacco caterpillar, melon fly, and fall armyworm. These innovations are driving a shift toward sustainable, precise pest control that boosts yields while preserving ecological balance.

# Training Programs

## Plant BioSecurity Division

The Plant Biosecurity Division has organized following training programmes during the months of **January-March, 2025.**

**CAPACITY BUILDING PROGRAMMES:**

| S. No. | Name of The Programme | Duration | Date | |
|---|---|---|---|---|
| | | | From | To |
| | **Plant Biosecurity Division (PBD)** | | | |
| 1) | Awareness program on Phytosanitary Regulations in cross border e commmerce-1st batch | *03 Days* | *16.01.2025* | *17.01.2025* |
| 2) | Awareness program on Phytosanitary Regulations in cross border e commmerce-2nd Batch | *03 Days* | *20.01.2025* | *21.01.2025* |
| 3) | Awareness program on Phytosanitary Regulations in cross border e commmerce-3rd batch | *03 Days* | *23.01.2025* | *24.01.2025* |
| 4) | Training on Safe export of tobacco and its products | *01 Day* | *28.01.2025* | *28.01.2025* |
| 5) | Phytosanitary Inspection | *30 Days* | *01.01.2025* | *30.01.2025* |
| 6) | Workshop on Recent Scenario in Urban Pest Management | *01 Day* | *10.01.2025* | *10.01.2025* |
| 7) | Workshop on "Judicious Strategies in Professional Pest Management" | *01 Day* | *19.01.2025* | *19.01.2025* |
| 8) | Urban Integrated Pest Management | *15 Days* | *20.01.2025* | *03.02.2025* |
| 9) | Risk Assessment and Management of Vertebrate Pests in Agriculture and Horticulture Ecosystem | *05 Days* | *17.02.2025* | *21.02.2025* |
| 10) | Introduced and Emerging Pest Threats to India | *03 Days* | *24.02.2025* | *26.02.2025* |
| 11) | Urban Integrated Pest Management | *15 Days* | *12.02.2025* | *26.02.2025* |
| 12) | Level 1: Urban Pest Management for Technicians | *03 Days* | *05.03.2025* | *07.03.2025* |

| | | | | |
|---|---|---|---|---|
| 13) | Fumigation as Phytosanitary Treatments: Aluminium Phosphide (ALP) and Methyl Bromide (MBr)" | 15 Days | 11.03.2025 | 25.03.2025 |
| **FARMERS PROGRAMME** | | | | |
| 14) | WDRA and e NWR | 01 Day | 31.12.2024 | 31.12.2024 |
| 15) | Enhancing export of fruits through Area wide management of Fruits- Wardhannapet, Warangal | 01 Day | 03.01.2025 | 03.01.2025 |
| 16) | Enhancing fruit export competitiveness through Area wide management of fruitflies targeting export clusters and production sites-Ippalpalli, Shadnagar, Rangareddy, Telangana | 01 Day | 07.01.2025 | 07.01.2025 |
| 17) | Area wide management of fruit fly in pomegranate is organized in collaboration with APEDA and KVK Ahmednagar, Maharashtra | 01 Day | 24.01.2025 | 24.01.2025 |
| 18) | Area-wide Management of Fruit flies in Mango- Krishi Vigyan Kendra, Lanja, Ratnagiri, Maharashtra | 01 Day | 05.02.2025 | 05.02.2025 |
| 19) | Area-wide fruit fly management at KVK Solapur, Maharashtra | 01 Day | 06.02.2025 | 06.02.2025 |
| 20) | Area-wide Management of Fruit flies in Orange at Nagpur, Maharashtra | 01 Day | 11.02.2025 | 11.02.2025 |
| 21) | WDRA and e NWR at APSWC, Parawada | 01 Day | 27.2.2025 | 27.2.2025 |
| 22) | WDRA and e NWR at CWC, Anakapalli | 01 Day | 28.2.2025 | 28.2.2025 |
| 23) | WDRA and e NWR at Rythubharosa kendram, Anakapalli | 01 Day | 4.03.2025 | 4.03.2025 |
| 24) | WDRA and e NWR at Bayyavaram, Kasimkota | 01 Day | 05.03.2025 | 05.03.2025 |
| 25) | WDRA and e NWR at Nerudacherla, Suryapet | 01 Day | 22.03.2025 | 22.03.2025 |
| 26) | Farmers Awareness training program on “Area wide Management of fruit flies in Mango” at Krishi Vigyan Kendra, Hastinapur, Meerut, Uttar Pradesh | 01 Day | 22.03.2025 | 22.03.2025 |

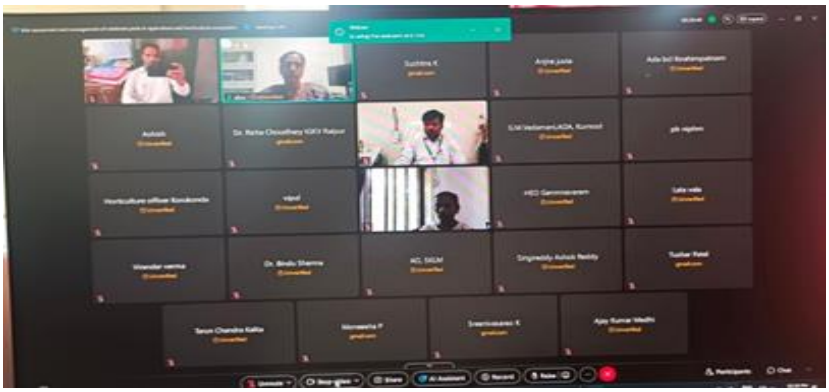
## DETAILS OF TRAINING PROGRAMMES

- **Awareness programme on Phytosanitary Regulations in cross border e commerce:** In collaboration with Ministry of Communication, Department of Posts, Govt. of India, three customized programmes were organized for the postal officials during 16th -17th January, 2025, 20th-21st January, 2025 and 23rd-24th January, 2025 and attended by 13, 24 and 24 officers from foreign post offices (Bengaluru, Chennai, Mumbai, Kolkata, Kochi, New Delhi, Hyderabad) respectively.

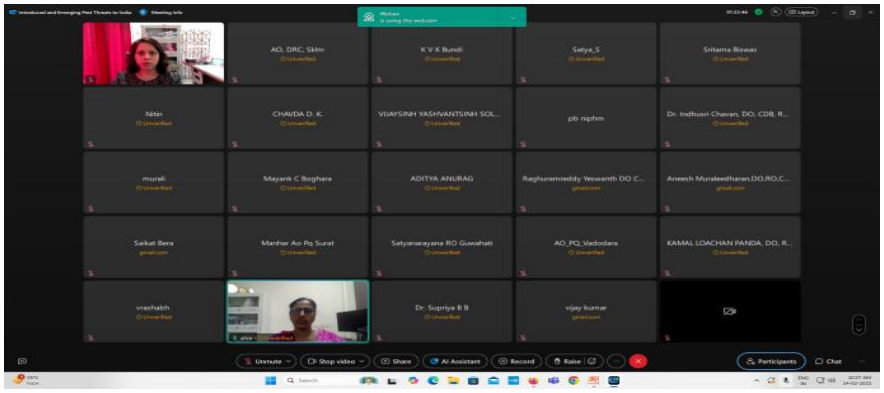

- One day Training on **Safe Export of Tobacco and its Products** was organized on 28th January, 2025 at NIPHM, Hyderabad for 10 officers of Tobacco Board Guntur, Andhra Pradesh.
- One month **Phytosanitary Inspection training programme** for Phytosanitary Service Agency and Phytosanitary Service Provider for inspection of Plants/plants products and other regulated articles for export was organized from 01st-30th January, 2025 and attended by thirteen participants.

- Workshop on "**Recent Scenario in Urban Pest Management"** was organized on 10th January, 2025 at Goa in association with Pest Control Association (PCA) and total 71 pest management professionals from Maharashtra, Goa, Meghalaya, Telangana, and Gujarat were attended the workshop.
- Workshop on "**Judicious Strategies in Professional Pest Management"** was organized on 19th January, 2025 at Indore, Madhya Pradesh and total 89 professionals from Madhya Pradesh, Gujarat, Maharashtra and Uttar Pradesh attended the workshop.


- Online programmes on "Risk Assessment and management of vertebrate pests in agriculture and horticulture ecosystem" was organized from 17th – 21st February, 2025 and attended by 25 officials.



- **Introduced and Emerging Pest Threats to India**: To create comprehensive awareness on plant biosecurity and emerging challenges to South Asian Regions and the impact of introduced pests, a three days online programme was organized from 24th- 26th February, 2025 and attended by 58 government officials respectively from different states and organizations.



- Urban Integrated Pest Management*:* Fifteen days training programmes for private industry was organized during 20th January - 03rd February, 2025 and attended by 30 participants, 12th -26th February, 2025 and attended by 42 participants. As per the Insecticides Act, 1968 the PCOs applies for grant of license to undertake pest control operations should be trained and obtain certificate of minimum 15 days training. The training provided an opportunity to the participants to develop skills in urban pest's biology, bionomics and management practices and prepares the participants for emergency preparedness to prevent the outbreak of communicable zoonotic diseases, to develop skills in safe use of chemical pesticides.



- **Level 1: Urban Pest Management for Technicians**: Three days training programme for private industry in collaboration with Pest Managers Association Vadodara, Gujarat was organized during 05th-07th March, 2025 and attended by 57 participants. The training provided an opportunity to the participants to develop skills in urban pest's biology, bionomics and management practices and prepares the participants for emergency preparedness to prevent the outbreak of communicable zoonotic diseases, to develop skills in safe use of chemical pesticides.


- **Fumigation as a Phytosanitary Treatment (Methyl Bromide and Aluminium Phosphide)** : For fifteen days programme on NIPHM is one of the notified Institutes under Insecticides Rules 1971 Chapter III -10, (3a) (iii) for imparting training for commercial pest control operators on fumigation using Methyl bromide and Phosphine. The programme was organized for private industry , wherein during the training period (11th -25th March, 2025) the participants (35 Pest Control Operators) get acquainted to the guidelines laid in NSPM-11, 12 (MBr fumigation) and NSPM-22 (Phosphine fumigation) to conduct appropriate fumigation procedures as well as the accreditation procedure of fumigation operators prescribed by the Directorate of Plant Protection Quarantine &Storage.


## PBD - FARMERS PROGRAMMES

- **WDRA Sponsored Programmes:**

**Farmers Awareness Programme on WDRA and e NWR *(WDRA Sponsored)*:** Warehousing Development Regulatory Authority (WDRA) has implemented e NWR system in the country and regulates through registration of warehouses intending to issue e NWRs against deposited commodities. By storing goods in WDRA registered warehouses food grains will be stored in good condition protecting the stock from infestation and farmers can be benefited by pledging loans from bank against the e-NWR issued. Thereafter, they can sell the produce when prices improve and adjust the pledge loan. This will help in improving farmers' income also. One farmer's awareness programme on WDRA and e NWR was organized at Karimnagar, Telangana on 31$^{st}$ December 2024. The programmes were attended by total of 50 farmers. Programme on WDRA and e NWR as well visit to WDRA registered warehouse were organized at APSWC, Parawada (27.2.2025), CWC, Anakapalli (28.2.2025), Rythubharosa kendram, Anakapalli (4.03.2025) and Bayyavaram, Kasimkota (05.03.2025) and at Nerudacherla, Suryapet (22.03.2025), wherein total 250 farmers, traders, dal mill owners got benefited.

ప్రజానావ

ధాన్యం నిల్వలపై అవగాహన

ప్రజానావ, జమ్మికుంట: జమ్మికుంటలోని కేవీకేలో ధాన్యం నిల్వ, గోదాములపై రైతులకు సైంటిస్టు డాక్టర్ మారియాధాస్ అవగాహన కల్పించారు. మంగళవారం స్థానిక కృషివిజ్ఞాన కేంద్రంలో జాతీయ మొక్కల పరిరక్షణ సంస్థ ఆధ్వర్యంలో రైతులు, మిల్లర్లకు వప్పుధాన్యాలు, నూనె గింజలు, వరి ధాన్యం నిల్వచేసుకోవడానికి వేర్ హౌస్ డెవలప్మెంట్ రెగ్యులేటరీ అధారిటీ పథకాల గురించి వివరించారు. అంతేకాక గోదాముకు రైతులను తీసుకుని వెళ్లి గోదాములల్లో ప్రభుత్వం వారు తీసుకుంటున్న జాగ్రత్తలు గురించి వివరించారు. ఈ కార్యక్రమంలో కేవీకే శాస్త్రవేత్తలు డీ. శ్రీనివాస్ రెడ్డి, ఏ ప్రశాంతి, జే విజయ్, దాదాపు 54 మంది రైతులు పాల్గొన్నారు.

Training at Karimnagar, Telangana

Training at APSWC, Parawada

Training at CWC, Anakapalli


Training at Rythubharosa Kendram, Anakapalli


Training at Bayyavaram, Kasimkota


గిడ్డంగులలో ధాన్యాన్ని నిల్వ చేసుకుని రైతులు
అధిక లాభాలను పొందవచ్చు: డా. మరియదాస్

రైతులను ఉద్దేశించి మాట్లాడుతున్న డాక్టర్

Training at Nerudacherla, Suryapet

**APEDA Sponsored Programmes:**

- **Enhancing fruit export competitiveness through Area wide management of fruit flies targeting export clusters and production sites":** The programmes were organized on 03rd January, 2025 (Wardhannapet, Warangal, Telangana); 07th January, 2025 (Ippalpalli, Shadnagar, Rangareddy, Telangana) and 24th January, 2025 (Ahmednagar Maharashtra).The programmes were attended by 130, 63 and 65 farmers respectively.


Training at Wardhannapet, Warangal

- National Institute of Plant Health Management, Hyderabad, Telangana in collaboration with APEDA, New Delhi and Regional Office, APEDA, Mumbai, Maharashtra has organized farmers awareness training program at Krishi Vigyan Kendra, Lanja, Ratnagiri, Maharashtra on 05th February, 2025 and attended by 65 Farmers. In collaboration with APEDA and RCIPMC, Nagpur, Maharashtra on 11th February, 2025 attended by 65 participants. Programme at KVK Solapur, Maharashtra on 06th February, 2025 and attended by 70 farmers. One programme organized at Krishi Vigyan Kendra, Hastinapur, Meerut, Uttar Pradesh on 22nd March, 2025 was attended by 55 farmers, FPOs, FPCs and exporters for the management of fruit flies in mango crop.


Weekly
दैनिक भारत समाचार पत्र
DAINIK BHARAT SAMACHAR PATRA
23 मार्च 2025 दिन रविवार
मेरठ मवाना हस्तिनापुर आसपास

**राष्ट्रीय वनस्पति से संबंधित कृषि विज्ञान केंद्र हस्तिनापुर में एक दिवसीय गोष्ठी का आयोजन किया गया**

मेरठ जनपद के हस्तिनापुर कृषि ज्ञान केंद्र में राष्ट्रीय वनस्पति स्वास्थ्य प्रबंधन संस्थान, राजेंद्र नगर,हैदराबाद द्वारा एक दिवसीय आम उत्पादक कृषक गोष्ठी का आयोजन किया गया । संस्थान के वैज्ञानिक डा चंद्रशेखर गुप्ता द्वारा आम की फल मक्खी कीट का मिथायल यूजिनोल क्यू लूर द्वारा फ्रूट फ्लाई नर कीटो के नियंत्रण के बारे में विस्तार से किसानो के मध्य चर्चा की । डा गुप्ता ने देसी ट्रैप बनाने की विधि बताई ।केंद्र प्रभारी डा राकेश तिवारी ने सभी सदस्यों का परिचय कराते हुए केंद्र के बारे में जानकारी दी ।कीट वैज्ञानिक डॉ नवीन चंद्र ने आम के कीट नियंत्रण के बारे में बताया । डा आर्या ने आम की वैज्ञानिक खेती के बारे में विस्तार से जानकारी दी । गोष्ठी में धन्यवाद डा शुभम आर्य ने किया

**FORTHCOMING PROGRAMMES (April-June, 2025)**

| Name of the programme | No. of Days | From | To |
|---|---|---|---|
| **PBD** | | | |
| Level 1 Technician training for pest control operators Pest Control Operators with 10th std pass (for Private Industry) | 02 Days | 16.04.2025 | 17.04.2025 |
| Plant Biosecurity – trends and perspectives | 05 Days | 21.04.2025 | 25.04.2025 |
| Forced Hot Air Treatment (FHAT) | 05 Days | 1.04.2025 | 25.04.2025 |
| Scientific storage practices for agro commodities | 05 Days | 28.04.2025 | 02.05.2025 |
| Plant Quarantine Procedures for Import and Export | 05 Days | 05.05.2025 | 09.05.2025 |
| Invasive Pest threats to Indian Agriculture | 03 Days | 14.05.2025 | 16.05.2025 |
| Rodent Pest Management | 05 Days | 19.05.2025 | 23.05.2025 |
| Orientation for PSC issuing authorities on ISPMs related to PSC, Phytosanitary requirements of importing countries and procedure in India | 03 Days | 26.05.2025 | 28.05.2025 |
| Pest Risk Analysis w.r.t. protecting agriculture and trade | 05 Days | 02.06.2025 | 06.06.2025 |
| Vertebrate Pest Management – Wild boar, Monkey and Bird | 05Days | 09.06.2025 | 11.06.2025 |
| Fumigation as a Phytosanitary Treatment (Methyl Bromide and Aluminium Phosphide) | 15 Days | 0.06.2025 | 24.06.2025 |

## Plant Health Management Division

The Plant Health Management Division has organized following training programmes during the months of **January-March, 2025.**

**CAPACITY BUILDING PROGRAMMES:**

| S No | Name of the programs | No. of Days | From | To |
|---|---|---|---|---|
| **I.** | **Officers programme** | | | |
| 1. | Bio-inputs production and application in organic and natural farming systems | 05 | 06.01.2025 | 10.01.2025 |
| 2. | Production and application techniques of bio-inputs | 10 | 22.01.2025 | 31.01.2025 |
| 3. | Bio-input Production and Application in Organic and Natural Farming Systems | 05 | 27.01.2025 | 31.01.2025 |
| 4. | Quality control of microbial biopesticides | 05 | 03.02.2025 | 07.02.2025 |
| 5. | Bio-inputs production and application in organic & natural farming systems | 05 | 10.02.2025 | 14.02.2025 |
| 6. | Advances in Weed Management – In collaboration with ICAR – DWR(Online ) | 03 | 17.02.2025 | 19.02.2025 |
| 7. | Bio-inputs production and application in organic & natural farming systems | 05 | 24.02.2025 | 28.02.2025 |
| 8. | Sustainable Plant Health Management for Organic Turmeric Production | 03 | 27.02.2025 | 01.03.2025 |
| 9. | Sustainable Plant Health Management for Organic Turmeric Production | 03 | 03.03.2025 | 05.03.2025 |
| 10. | Production Protocol for Microbial Bio-pesticides | 05 | 03.03.2025 | 07.03.2025 |
| 11. | Training on Natural Farming Under National Mission on Natural Farming (NMNF) | 04 | 10.03.2025 | 13.03.2025 |
| 12. | Bio-inputs production and application in organic & natural farming systems | 05 | 17.03.2025 | 21.03.2025 |
| 13. | Training on Natural Farming Under National Mission on Natural Farming (NMNF) | 04 | 18.03.2025 | 21.03.2025 |
| **II.** | **Farmers training programme** | | | |
| 1. | On-farm production of Bio-inputs | 03 | 21.01.2025 | 23.01.2025 |
| 2. | On-farm production of Bio-inputs | 03 | 20.01.2025 | 22.01.2025 |
| 3. | On-farm production of Bio-inputs and application in cotton crop | 03 | 28.01.2025 | 30.01.2025 |

| | | | | |
|---|---|---|---|---|
| 4. | On-farm production of Bio-inputs and application in cotton crop | 03 | 03.02.2025 | 05.02.2025 |
| 5. | Establishment of Bio-input Resource Centres (BRCs) | 03 | 23.01.2025 | 25.01.2025 |
| 6. | On-farm production of Bio-inputs | 03 | 17.02.2025 | 19.02.2025 |
| 7. | On-farm production of Bio-inputs | 03 | 17.02.2025 | 19.02.2025 |
| 8. | On-farm production of Bio-inputs and application in paddy crop | 03 | 24.02.2025 | 26.02.2025 |
| 9. | On-farm production of Bio-inputs | 03 | 10.03.2025 | 12.03.2025 |
| 10. | Sustainable Plant Health Management Practices in Organic Farming (A special program for Farmers of Pune Dist. Maharashtra under SMART Project) | 04 | 10.03.2025 | 13.03.2025 |
| 11. | On-farm production of Bio-inputs and application in vegetable crops | 03 | 17.03.2025 | 19.03.2025 |
| 12. | Sustainable Plant Health Management Practices in Organic Farming (A special program for Farmers of Pune Dist. Maharashtra under SMART Project) | 04 | 17.03.2025 | 20.03.2025 |
| 13. | Sustainable Plant Health Management Practices in Organic Farming (A special program for Farmers of Pune Dist. Maharashtra under SMART Project) | 04 | 24.03.2025 | 27.03.2025 |
| 14. | Certificate course on PHM in Organic and Natural Farming (III part) | 10 | 24.02.2025 | 05.03.2025 |
| **III.** | **Webinars/Workshop** | - | - | - |
| **IV.** | **Student training programme** | - | - | - |

## i) Training programme report (officers)

### ➢ Production and Application Techniques of Bio-Inputs

An officers training programme on 'Production and Application Techniques of Bio-Inputs' was organized from 22.01.2025 to 31.01.2025 (10 days). A total of 12 officers from different states have attended this program. The participants underwent sessions on introduction to biological control of insect pests – principles and concepts, mass production techniques of different biocontrol agents and bio-fertilizers, agroecosystem analysis , field observations & demonstration of NPSS App, role of bio-stimulants in organic farming. As a part of training participants have visited ICRISAT, ICAR-IIOR, NIPHM field and laboratories.

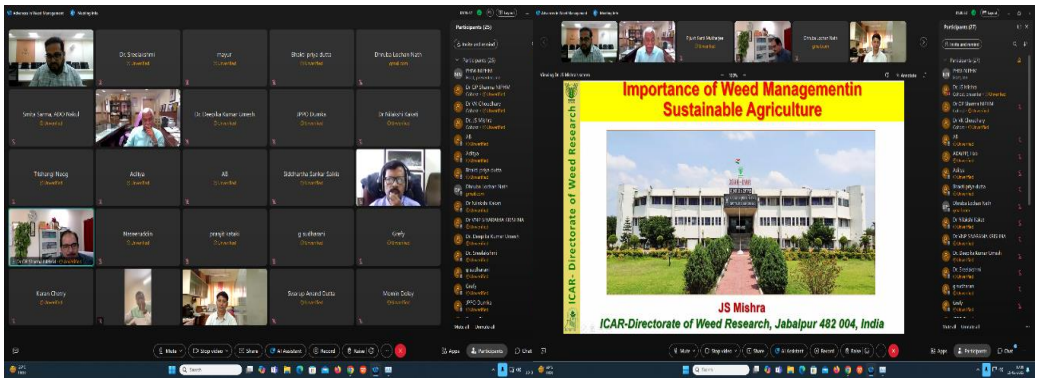
➢ **Bio-input Production and Application in Organic and Natural Farming Systems**

As part of the capacity building programs under Panjabrao Deshmukh Naisargik Sheti Mission (PDNSM)-Maharashtra, four training programmes on Bio-input Production and Application in Organic and Natural Farming Systems have been organized from 06.01.2025 to 10.01.2025 ; 27.01.2025 to 31.01.2025 ; 10.02.2025 to 14.02.2025 and 24.02.02025 to 28.02.2025 (5 days). A total of 111 officers from different districts of Maharashtra have participated. They underwent sessions on concept & principles of organic and natural farming, Agro Ecosystem Analysis, Ecological Engineering for pest management, protocols and requirements for the establishment of Bio-input Production Centres, hands-on practice sessions on farm-level production of bio-fertilizers, bio-pesticides, and biological control agents, etc. This program is helpful to the participants in terms of on-farm production of bio-inputs, application methods, establishment of BRCs and quality control aspects.




➢ **Advances in Weed Management- in collaboration with ICAR-DWR, Jabalpur (MP).**

An online training programme on 'Advances in Weed Management' - in collaboration with ICAR-DWR, Jabalpur (MP) was organized from 19.02.2025 to 21.02.2025 (3 days). Dr. J. S. Mishra , Director, ICAR-DWR and scientists of DWR has delivered sessions on various aspects of weed management. A total of 48 officers from different states & organizations have attended this program. They underwent sessions on Importance of weed management in sustainable agriculture, Mechanical weed control and spraying techniques, chemical weed control specific to new molecules and herbicide resistance, biological control of weeds, weed biology and its relevance in weed management, herbicide residues & its impact on ecosystem, invasive weed species & their impact on ecosystem, Weed management in organic agriculture, Weed management in conservation agriculture. Program was aimed to enhance the knowledge of participants about latest developments in weed management.



➢ **Quality Control of Microbial Biopesticides**

A training program on Quality Control of microbial bio-pesticides organized at NIPHM from 03.02.2025 to 07.02.2025 (5 days). In this program, a total of 17 participants from different private biopesticides industries have participated on payment basis. The participants underwent various aspects of the Insecticide Act, 1968 -Registered biopesticides under Insecticide Act, 1968. Explained about Preparation and Maintenance of pure cultures of fungus and bacteria and parameters to be tested for Quality control of bio pesticides such as NPV, Trichoderma spp., Pseudomonas spp., physico chemical parameters (pH, Moisture content), quality control parameters for entomopathogenic fungi, gram staining technique and POB count for NPV. The participants also underwent classes regarding the laboratory quality management system as per ISO/IEC 17025-2017 and microbial biopesticides of plant diseases and quality issues with special reference to Trichoderma.



➢ **Sustainable Plant Health Management for Organic Turmeric Production**

Meghalaya Basin Management Agency (MBMA) has approached NIPHM to conduct two off-campus training programs on 'Sustainable Plant Health Management for Organic Turmeric Production' for farmers of Mookyndeng, Laskein block, Meghalaya from 27.02.2025 to 01.03.2025& 03.03.2025 to 05.03.2025. In these training programs, Community Based Organization members were sensitized and trained on Good Agricultural Practices, soil health & nutrient management,

insect pest management through organic and natural farming practices, INM and IPM based methods, demonstration of low-cost bio-input production and application in Turmeric. A total of 75 farmer members have actively participated and learnt about organic turmeric production and plant protection aspects.


➢ **Training on Natural Farming Under National Mission on Natural Farming (NMNF)**

Government of India has launched the National Mission on Natural Farming (NMNF) to promote sustainable agricultural practices in November, 2024. In this regard, NIPHM in collaboration with MANAGE has conducted two training programs on 'Natural Farming' from 10th to 13th March, 2025 and 18th to 21st March, 2025 (4 days each) to sensitize the field functionaries about Natural Farming and its implementation in Telangana State.

During these programs 48 officers from Department of Agriculture, Telangana were trained. In these programs participants underwent sessions on introduction to NMNF, soil health management, roles and responsibilities of different stakeholders, market linkages and certification, crop production and cropping systems, integration of livestock system, NF model farms and monitoring, training programs for stakeholders, extension system, initiation and Implementation of natural farming in clusters..




- **Production protocol for microbial bio pesticides**

A training program on 'Production protocol for microbial bio pesticides' was conducted from 03.03.2025 to 07.03.2025 (5 days) at NIPHM. Participants from Agriculture Department Haryana have attended the training program. Topics such as importance of bio pesticides in Plant Health Management, Mass production of bio pesticides, Role and mass production of EPN & NPV, Mass production of Trichoderma, pseudomonas etc. were covered in this programme

## II. Farmers training programmes

- **On-farm production of Bio-inputs**

In collaboration with Development Foundation, Ghaziabad, one FPO farmer-training programme on 'On-farm production of Bio-inputs was organized from 21.01.2025 to 23.01.2025(3 days). During this program on-farm production of bio-inputs and their applications in crops like onion, garlic and paddy crops were covered. A total of 35 FPO members/ farmers from Gadchiroli district of Maharashtra have participated. Participants underwent practical sessions on natural farming preparations and its application methods, on-farm production of bio-pesticides (Trichoderma & Pseudomonas), On-farm production of bio-fertilizers, EPF, NPV, predators, parasitoids and nematodes. This program shall be helpful to the participants in providing the knowledge of protocols for on-farm production of bio-inputs, application methods, and establishment of BRCs.

- **On-farm production of Bio-inputs**

As a part of capacity building programs under Panjabrao Deshmukh Naisargik Sheti Mission (PDNSM)-Maharashtra, three FPO farmers training programmes on on-farm production of bio-inputs have been organized from 20.01.2025 to 22.01.2025 ; 17.02.2024 to 19.02.2025 and 10.03.2025 to 12.03.2025 (3 days). A total of 61 FPO farmers from different districts of Maharashtra have participated. They underwent hands-on training sessions like Agro Ecosystem Analysis, Ecological Engineering for pest management, on-farm production of bio-fertilizers, biopesticides, and biological control agents, etc. This program shall be helpful to the farmers in the knowledge of protocols for on-farm production of bio-inputs, application methods, establishment of BRCs, etc. FPO group farmers shall be able to initiate the bioinputs production as rural enterprises and it may enhance the area under organic and natural farming in Maharashtra.

- **Establishment of Bio-input Resource Centres**

A special training programme on Establishment of Bio-input Resource Centres (BRCs) under sponsorship of PD-ATMA, Nandurbar, Maharashtra has been organized from 23.01.2025 to 25.01.2025 (3 days). In this program, a total of 40 FPO farmers of Maharashtra have participated. They underwent sessions on protocols and requirements for the establishment of Bio-input Production Centres, hands-on practice sessions on farm-level production of bio-fertilizers, bio-pesticides, and biological control agents, scale-up for commercial production of biofertilizers/biopesticides, etc. This program shall be helpful to the participants in the knowledge on protocols for low-cost production of bio-inputs and application methods.


➢ **On-farm production of Bio-inputs**

As per the request received from ATMA Raigad a special training program was conducted for 30 farmer of Tala block Maharashtra from 17.02.2024 to 19.02.2025 (3 days). During this program on-farm production of bio-inputs and their applications in different crops were covered. Participants underwent practical sessions on natural farming preparations and its application methods, on-farm production of bio-pesticides (Trichoderma & Pseudomonas), On-farm production of bio-fertilizers, EPF, NPV, predators, parasitoids and nematodes. This program shall be helpful to the participants in providing the knowledge of protocols for on-farm production of bio-inputs, application methods, and establishment of BRCs.

➢ **On-farm production of Bio-inputs and application in vegetable crops**

As a part of the capacity building program in collaboration with Development foundation, Ghaziabad, 4 FPO farmers training programme on 'On-farm production of Bio-inputs and applications were organized from 28.01.2025 to 30.01.2025 (Cotton crop); 03.02.2025 to 05.02.2025 (Cotton crop); 24.02.2025 to 26.02.2025(Paddy crop) and 17.03.2025 to 19.03.2025 (Vegetable crops)(3 dayseach). A total of 96 FPO members/ farmers from different districts of Maharashtra have participated. Participants underwent sessions on Natural farming preparations and its application methods, On-farm production of different bio inputs, role of pheromones in pest management, agroecosystem analysis based decision making for pest management, use of NPSS App for pest diagnosis and management recommendations etc.,

were covered. This program will be helpful to the participants in growing vegetable crops with minimum use of pesticides and establishment of BRCs.





- **Sustainable Plant Health Management Practices in Organic Farming (A special program for Farmers of Pune Dist. Maharashtra under SMART Project)**

Special training programs on 'Sustainable Plant Health Management Practices in Organic Farming' for farmers of Pune Dist. Maharashtra under SMART Project have been organised by NIPHM in 3 batches from 10th to 13th March, 2025, 17th to 20th March, 2025 and 24th to 27th March, 2025 (4 days). In these programs 109 farmers from Pune district of Maharashtra have participated. In these programs the farmers underwent sessions on different sustainable PHM concepts such as agroecosystem analysis based decision making for pest management, INM, IPM, organic and natural farming practices & certification procedures, low-cost methodologies for bio-inputs and application, etc. This program will be helpful to the participants in getting the hands-on experience and enhancing the knowledge on plant health management practices, protocols for on-farm production of bio-inputs and their application methods. The FPO farmers have visited NIPHM laboratories, Organic farm at Maheswaram, RR dist., and experienced the crop rotation,

mixed cropping, production and application of different bio-inputs in organic and natural farming practices in peri urban areas.

- **Certificate Courses**: Certificate Course on PHM in Organic and Natural Farming:

  As part of three months course on Certificate Course on Plant Health Management in Organic & Natural Farming (CCONF), the part-III of the program was conducted at NIPHM from 24.02.2025 to 05.03.2025 (10 days). A total 23 rural youth farmers have presented their field experience along with project work and concerned mentors evaluated project work. Director General and Director PHM division has interacted with participants and emphasized on organic and natural farming practices and their impact on soil properties and entrepreneurship development through low-cost production technologies promoted by NIPHM etc.

**FORTHCOMING PROGRAMMES (April-June, 2025)**

| S No | Name of the programme | No. of Days | From | To |
|---|---|---|---|---|
| **I.** | **Officers training programmes** | | | |
| 1. | Bio-inputs production and application in organic and natural farming systems | 05 | 12.05.2025 | 16.05.2025 |
| 2. | Pest Diagnosis and advisories using NPSS App | 01 | 21.05.2025 | 21.05.2025 |
| 3. | Pest Diagnosis and Management in Vegetable crops | 05 | 26.05.2025 | 30.05.2025 |
| 4. | Plant Health Management in Kharif Oilseed crops | 03 | 17.06.2025 | 19.06.2025 |
| 5. | Plant Health Management in Protected Cultivation | 05 | 23.06.2025 | 27.06.2025 |
| **II.** | **Farmers training programmes** | | | |
| 1. | Establishment of Bio-input Resource Centers (BRCs) | 01 | Dates yet to be decided | |
| **III.** | **Certificate course- NIL** | | | |
| **IV** | **Webinars/Workshop** | | | |
| **1.** | National Network of Plant Health Experts | 01 | 16.4.2025 | 16.04.2025 |
| **V** | **Student training programme** | | | |
| | Nil | | | |

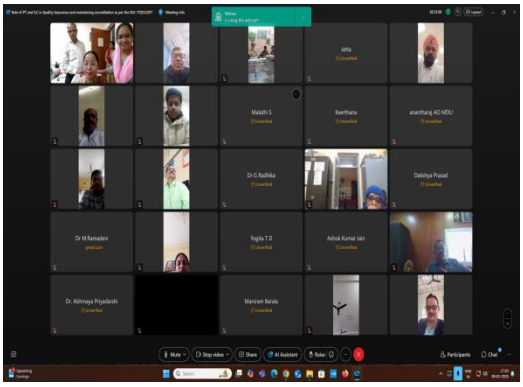
## Pesticide Management Division

The Pesticide Management Division has organized following training programmes during the months of **January-March, 2025**.

**CAPACITY BUILDING PROGRAMMES:**

| Sl. No. | Name of the programme | No. of Days | From | To |
|---|---|---|---|---|
| **A.** | **Schedule Programme** | | | |
| 1. | Role of PT and ILC in Quality Assurance and maintaining accreditation as per the ISO 17025:2017 (Online) | 1 | 08.01.2025 | |
| 2. | Pesticide Formulation Analysis (60 days) | 60 | 20.01.2025 | 20.03.2025 |
| 3. | Documentation procedures for NABL accreditation | 5 | 10.02.2025 | 14.02.2025 |
| 4. | Laboratory quality Management system and Internal Audit as per ISO/IEC 170252017 | 5 | 10.03.2025 | 13.03.2025 |
| **B.** | **Unschedule Programme** | | | |
| 5. | Instrumentation and Data Interpretation for Students/Analysts | 10 | 19.02.2025 | 28.02.2025 |

- Role of PT & ILC in Quality Assurance and maintaining accreditation as per the ISO 17025:2017 (Online):
  The Division has conducted one day virtual training programme on "Role of PT & ILC in Quality Assurance and maintaining accreditation as per the ISO 17025:2017**"** on 08.01.2025. A total of 52 participants were participated from State Agriculture Department of Andhra Pradesh, Bihar, Karnataka, Odisha, Punjab, Rajasthan, Tamil Nadu and Telangana. The training imparts on importance of Proficiency Testing (PT) and Inter Laboratory Comparison (ILC) in Quality Assurance and maintaining accreditation as per ISO/IEC 17025:2017.



Training programme on "Role of PT & ILC in Quality Assurance and maintaining accreditation as per the ISO 17025:2017

- **Pesticide Formulation Analysis (PFA)**:
  A 60 days training programme on **"Pesticide Formulation Analysis"** was conducted from 20.01.2025 to 20.03.2025 for the officials working in Pesticide Testing Laboratory to impart hands on training on various techniques involved in quality control of pesticide. A total of 27 officials/analyst from the State Agriculture Department of Andhra Pradesh, Karnataka, Orissa, Punjab, Rajasthan, Tamil Nadu, Tripura, Madhya Pradesh and Telangana were participated. Participants were trained on testing of quality parameters by various techniques such as volumetric, spectrophotometer, GLC and HPLC as per BIS methods.

Training on Pesticide Formulation Analysis (PFA), 60 Days

- **Documentation procedures for NABL accreditation:**
  Training programme on "Documentation procedures for NABL accreditation" was conducted from 10.02.2025 to 14.02.2025. A total of 26 trainees participated from the various State of Agriculture Dept. of Andhra Pradesh, Uttarakhand, Punjab, Maharashtra, Odisha and Telangana. The training imparts on documentation procedure and process of laboratory quality management system as per ISO/IEC 17025 2017.
- **Laboratory Quality Management System and Internal Audit as per ISO/IEC 17025: 2017**
  Training programme on "Laboratory Quality Management System and Internal Audit as per ISO/IEC 17025: 2017**"** was conducted from 10.03.2025 to 13.03.2025. A total of 29 trainees from State Agriculture Dept. of Kerala, Punjab, Andhra Pradesh, Karnataka, Orissa, Rajasthan, Tamil Nadu, Tripura, Madhya Pradesh and Telangana have participated. The trainees were trained on general requirements of testing laboratory for competency as per ISO/IEC 17025 2017 and procedure of Internal Audit through practical.


Training on Laboratory quality Management system & Internal Audit as per ISO/IEC 17025:2017

- Instrumentation and Data Interpretation for Students/Analysts

  Training programme on "Instrumentation and Data Interpretation for Students/Analysts" was conducted from 19.02.2025 to 28.02.2025. A total of 5 students were participated from the State of Andhra Pradesh, Bihar, Kerala and Telangana. The main objectives of the training are to imparts hands on training on chromatographic Instrumentation such as Gas and liquid chromatography and data interpretation techniques.



Training on Instrumentation and Data Interpretation (Students/Analysts)

**FORTHCOMING PROGRAMMES (April-June, 2025)**

| Sl. No. | Title of the Programme | Duration (Day) | From | To | Eligibility Criteria |
|---|---|---|---|---|---|
| 2. | Inspection and Sampling of pesticides under the Insecticide Act, 1968 | 3 | 07.04.2025 | 09.04.2025 | Agricultural / Horticultural Officers of State Deptt./ designated Insecticide Inspectors |
| 3. | Role of PT and ILC in Quality Assurance and maintaining accreditation as per the ISO: 17025:2017 | 1 (online) | 30.04.2025 | | Analysts / Scientists working in Govt. labs/Universities |
| 4. | Inspection, Sampling and Prosecution Procedures under Insecticide Act, 1968 (ISPP) | 5 | 07.07.2025 | 11.07.2025 | Agricultural / Horticultural Officers of State Deptt./ designated Insecticide Inspectors |
| 5. | Laboratory Quality Management System and Internal Audit as per ISO/IEC 17025: 2017 | 5 | 14.07.2025 | 18.07.2025 | Analysts / Scientists working in Govt. laboratories/Universities |
| 6. | Sampling of Fruits, Vegetables and other items for Pesticide Residue Analysis | 2 | 14.07.2025 | 15.07.2025 | Analysts / Scientists working in Govt. lab s/Universities |

| | | | | | |
|---|---|---|---|---|---|
| 7. | Pesticide Formulation Analysis (PFA) | 45 | 29.07.2025 | 11.09.2025 | Analysts working at SPTLs / RPTLs/ CIL |

- **Agri. Input Management for Input Dealers (Online Diploma Course):**

As per the FCO, 1985, and the Insecticide (Amended) Rule, 2017, Agri-input dealers of seed, fertilizer and pesticide need to undergo a course that makes them eligible for getting a license for dealership of Agri-inputs. In view of this, a one year diploma in Agri-input Management is proposed to conduct from the year 2025-26 through online mode.

NIPHM has recorded videos of Theory and Practical classes for this course during the period. The brochure was circulated to all the pesticide dealers, pesticide/fertilizer companies about the online course.

## Plant Health Engineering Division

The Plant Health Engineering Division has organized following training programmes during the months of **January-March, 2025**.

**CAPACITY BUILDING PROGRAMMES:**

| S No | Category | Name of the programme | No. of Days | From | To |
|---|---|---|---|---|---|
| 1. | Officers | Pesticide Application Techniques and Safety Measures (Collabrative training)-Virtual Mode | 03 | 22.01.2025 | 24.01.2025 |
| 2. | Officers | Pesticide Application Techniques and Safety Measures - Physical Mode | 05 | 20.01.2025 | 24.01.2025 |
| 3. | Officers | Digital Agricultur-Virtual Mode | 03 | 20.01.2025 | 22.01.2025 |
| 4. | Officers | Pesticide Application Techniques and safety Measures | 05 | 11.02.2025 | 13.02.2025 |
| 5. | Officers | Drone workshop | 01 | 17.02.2025 | |
| 6. | Officers | Pesticide Application Techniques and safety Measures | 05 | 24.03.205 | 28.03.2025 |
| 7. | Officers | Pesticide Application Techniques and safety Measures | 03 | 25.03.2025 | 27.03.2025 |
| 8. | Farmers | Pesticide Application Techniques and safety Measures -Physical Mode | 01 | 24.01.2025 | |
| 9. | Farmers | Pesticide Application Techniques and safety Measures -Physical Mode | 01 | 24.01.2025 | |
| 10. | Farmers | Pesticide application Techniques & Safety Measures | 01 | 04.02.2025 | |
| 11. | Farmers | *Drone application in Agriculture and entrepreneurial opportunities* | 01 | 17.02.2025 | |
| 12 | Farmers | Pesticide application Techniques & Safety Measures | 01 | 22.02.2025 | |
| 13 | Students | Drone advancements | 01 | 22.02.2025 | |
| 14 | Students | Drone applications in agriculture awareness cum demonstration | 01 | 08.03.2025 | |

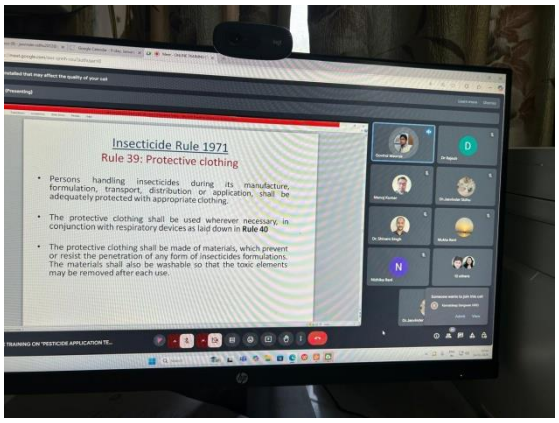
## Drone Remote Pilot Certification

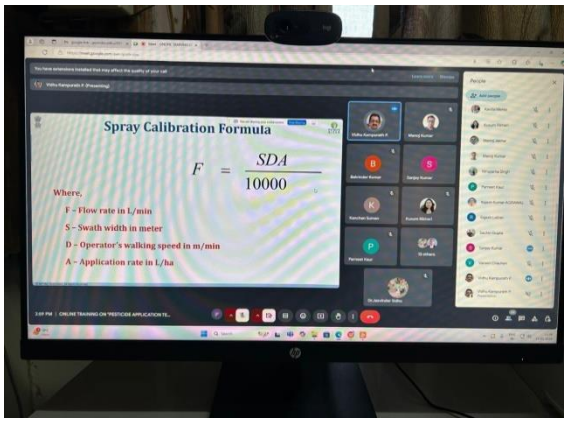
| S No. | Name of Training Program/ Webinar | Duration (in days) | On/Off Campus |
|---|---|---|---|
| 1. | Basic Remote Pilot Certification | 06.01.2025 to 11.01.2025 | On campus |
| 2. | | 13.01.2025 to 18.01.2025 | |
| 3. | | 10.02.2025 to 14.02.2025 | |
| 4. | | 25.02.2025 to 01.03.2025 | |
| 5. | | 10.03.2025 to 14.03.2025 | |

**Description of the programme:**

- **Pesticide Application Techniques and Safety**

  Plant health engineering division conducted online 3 days training programme on "Pesticide Application Techniques and Safety Measures" in collaboration with EEI, Nilokeri, Haryana from 22.01.2025 to 24.01.2025. Total 51 officers (Male – 39, Female – 12) had successfully completed the training programme. The participants were trained on different aspects such as principles of pesticide application techniques, Insect- pests of field crops and their management, efficient spraying techniques, nozzle selection and calibration, extension strategies for promoting plant protection, safety measures while handling pesticides, Use of GIS for pesticide application.



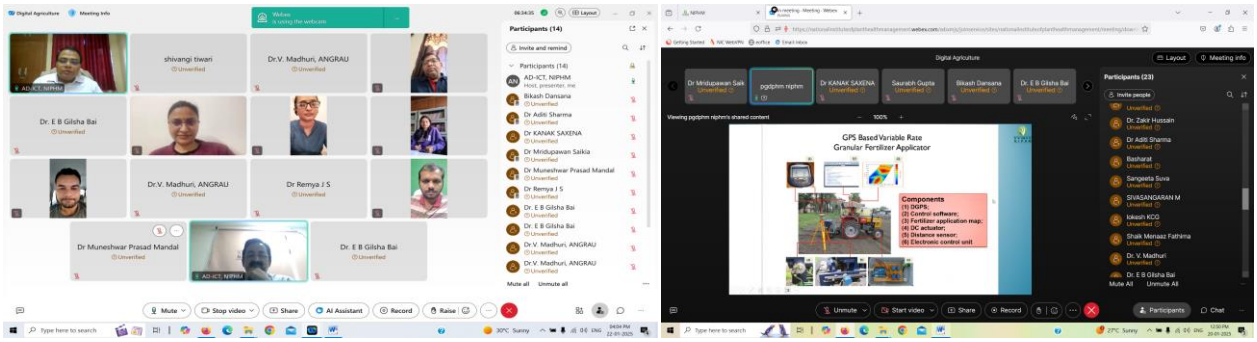




- **Pesticide Application Techniques and safety Measures:**

  PHE conducted five days on campus training programme on "Pesticide Application Techniques and Safety Measures". Total 18 officers (Male – 16, Female – 2) had successfully completed the training programme. The participants were trained on different aspects such as principles of pesticide application techniques, efficient spraying techniques, nozzle selection and calibration, safety measures while handling pesticides, Pesticide Formulation and Compatibility with practical.


- **Digital Agriculture:**

An online three day's training programme on "Digital Agriculture" conducted from 20.01.2025 to 22.01.2025. Total 24 officers (Male – 11, Female – 13) had successfully completed the training programme. The participants were trained on basics of ICT, GIS, GPS, Big Data, IoT, Precision agriculture, NPSS, Plantix App, Smart Precision Models for agriculture, Senso r based agriculture etc.




- **Pesticide Application Techniques and Safety Measures:**

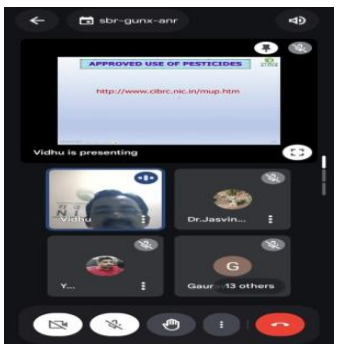
PHE conducted three days on campus payment training programme from 11th - 13th February 2025 on "Pesticide Application Techniques and Safety Measures" for 29 officers (Male – 23, Female – 06) from Ambuja Foundation, Maharashtra. The participants were trained on different aspects such as principles of pesticide application techniques, efficient spraying techniques, nozzle selection and calibration, safety measures while handling pesticides, Pesticide Formulation and Compatibility with practical sessions.

- **Pesticide application Techniques & Safety Measures*:***

  PHE conducted five days on campus training programme from 24th - 28th March 2025 on "Pesticide Application Techniques and Safety Measures" for 11 officers (Male – 09, Female – 02) from 5 states namely (A.P, Karnataka, Tamil Nadu, Telangana and Haryana). The participants were trained on different aspects such as principles of pesticide application techniques, efficient spraying techniques, nozzle selection and calibration, safety measures while handling pesticides, Pesticide Formulation and Compatibility with practical sessions.

- **Pesticide Application Techniques and safety Measures:**

  Plant health engineering division conducted three-day online training programme on "Pesticide Application Techniques and Safety Measures" in collaboration with EEI, Nilokeri, Haryana during 25th to 27th March 2025. Total 28 officers (Male – 19, Female – 09) successfully completed the training programme. The participants were trained on different aspects such as principles of pesticide application techniques, Insect- pests of field crops and their management, efficient spraying techniques, nozzle selection and calibration.




- **Pesticide Application Techniques and Safety Measures (Farmers)**

  Plant health engineering division conducted one day off campus training programme on "Pesticide Application Techniques and Safety Measures" in collaboration Seghal foundation on 24.01.2025 at Chegunta, village. Total 33 farmers (Male – 14, Female – 19) had successfully attended training programme. The training programme was module to cover the aspects of adverse impacts of spraying, basic spraying principles, selection of a sprayer, and selection of nozzle and safety precautions. The farmers were also briefed about the types of nozzles and the importance in selecting a nozzle. They were also explained how to calibrate a nozzle and sprayer for efficient application of chemical on the target areas. The importance of safety precautions while handling chemicals and the Dos' and Don'ts while handling chemicals was also explained. A practical demonstration of different pattern of spray with different nozzles was explained in detail.


- **Pesticide Application Techniques and safety Measures(Farmers)**

  Plant health engineering division conducted one day off campus training programme on "Pesticide Application Techniques and Safety Measures" in collaboration Seghal foundation on 24.01.2025 at Chegunta village, Masaipeta. Total 27 farmers (Male – 02, Female – 25) had successfully attended training programme. The training programme was module to cover the aspects of adverse impacts of spraying, basic spraying principles, selection of a sprayer, and selection of nozzle and safety precautions. The farmers were also briefed about the types of nozzles and the importance in selecting a nozzle. They were also explained how to calibrate a nozzle and sprayer for efficient application of chemical on the target areas. The importance of safety precautions while handling chemicals and the Dos' and Don'ts while handling chemicals was also explained. A practical demonstration of different pattern of spray with different nozzles was explained in detail.

- **Drone workshop**

  PHE conducted Drone workshop on 17th February 2025 at CMR Technical Campus-in association with Student Tribe and Marut Drone Tech. Total 350 students participated. (Male – 210, Female – 140). Emphasis was given about opportunities in Drone Ecosystem. Topics on applications of Drones, opportunities and career scopes in Drones, drones in Agriculture and health care, basics of RPC (rules and regulations, drone academy). Demonstration of manual and autonomous flying was done


- **Pesticide application Techniques & Safety Measures:**

  A farmers training programme on "Pesticide application Techniques & Safety Measures" was organized on 22nd February 2025 at Kollipara village, Guntur District. Total 61 (Male - 39, Female - 22) attended the training programme. The training programme was module to cover the aspects of adverse impacts of spraying, basic spraying principles, selection of a sprayer, and selection of nozzle and safety precautions. The farmers were also briefed about the types of nozzles and the importance in selecting a nozzle. Drones in Agriculture spraying were also emphasized.




- **Drone application in Agriculture and entrepreneurial opportunities:**
  An online farmers training programme on "Drone application in Agriculture and entrepreneurial opportunities" – in association with AICRP on FIM, KACEFT, Kerala Agricultural University was organized on 17th February 2025. Total 197 participants (Male – 108, Female – 89) participated. In this programme special focus was given on the entrepreneurial opportunities with drone training.


- **Drone applications in agriculture awareness cum demonstration programme:**
  PHE conducted one day off campus programme on "Drone applications in agriculture - awareness cum demonstration programme" on 08.03.2025 for 36 officers (Male – 04, Female – 32) at VFSTR, Vadlamudi. In this programme special focus was given on the entrepreneurial opportunities with drone training

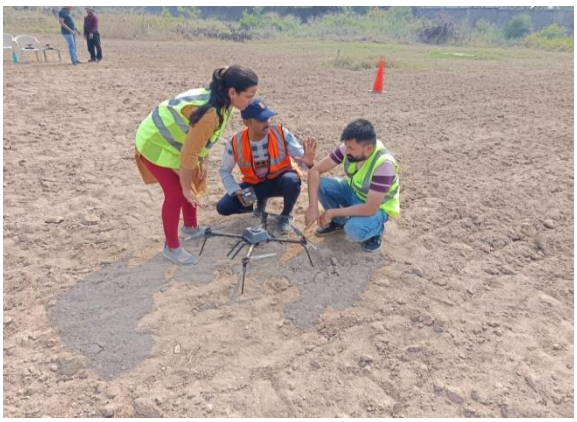

- **Pesticide Application Techniques and Safety Measures:**
  An off campus farmers training programme on "Pesticide application Techniques & Safety Measures" was organized on 4th February 2025 at Kollipara village, Guntur District. Total 61 (Male - 39, Female - 22) attended the training programme. The training programme was module to cover the aspects of adverse impacts of spraying, basic spraying principles, selection of a sprayer, and selection of nozzle and safety precautions. The farmers were also briefed about the types of nozzles and the importance in selecting a nozzle. Drones in Agriculture spraying were also emphasized.


- **Drone advancements:**
- Worksop on drone and advanced training programme was organized on 22nd February 2025 at VFSTRU. Total 50 participants (Male – 21, Female – 29) attended. Emphasis was given about opportunities in Drone and advanced training programs for skill development training in agriculture and agricultural engineering was also emphasized.



- **Drone trainings**
- **Basic Remote Pilot Certification:**

This training is part of the Drone Academy which trains and certifies the Drone Pilots for use of drones in various applications. The academy has been certified as RPTO (Remote Pilot Training Organization) in association with an Industry partner (M/s Marut Drones). Two training programmes on Basic Remote Pilot Certification conducted. One programme from 06.01.2025 to 11.01.2025 total of 12 male participants attended, second programme from 13.01.2025 to 18.01.2025 total 11 male participants attended the 6-day programme. Lectures were arranged on topic viz., Introduction on international civil aviation organization, RPAS with in ICAO frame work, formation of RPAS, Classification of drones, Drone operation zones, ATC procedure , radio telephony and flight radio telephony, Basic principles of flight, Types of wind designs, Battery maintenance, Rotorcraft operations and aerodynamics, Application of drones in each sector, Hybrid operations and aerodynamics, Weather and meteorology, Risk assessment and analysis safety management system, drone maintenance etc. The lab assembly and maintenance of drones and simulation experiments for drone flying also was included in the curriculum. Exclusive 3 days of on-field flying classes also were conducted in dual as well as solo mode.



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## Forthcoming training programmes

| S.No | Title of the Programme | Division | From | To | Eligibility criteria | Course Coordinator & e-mail |
|---|---|---|---|---|---|---|
| 1. | Professional Agri spraying through drones (Only on payment basis) | **PHE** | 07.04.2025 | 09.04.2025 | RPC (Drone pilot) holders | Dr. Vidhu Kampurath jdenggniphm-ap@nic.in |
| 2. | Professional Agri spraying through drones (Only on payment basis) | **PHE** | 26.05.2025 | 28.05.2025 | RPC (Drone pilot) holders | Dr. Vidhu Kampurath jdenggniphm-ap@nic.in |
| 3. | Pesticide application techniques and safety measures | **PHE** | 05.05.2025 | 09.05.2025 | Extension officers from State Agriculture and Horticulture departments, Scientists of ICAR, SAUs and officials from KVKs, DPPQs, NGOs | Er. Haneefa Begum asopheniphm2-ap@nic.in |
| 4. | *RS & GIS applications in Plant Health Management | **PHE** | 20.05.2025 | 22.05.2025 | Extension officers from State Dept. of Agri./ Horti., soil survey, soil conservation, Watershed Project, Scientists of ICAR/ SAUs , etc. working on GIS | Er. M. Udaya Bhanu sopheniphm2-ap@nic.in |
| 5. | Irrigation systems and advancements | **PHE** | 09.06.2025 | 11.06.2025 | Extension officers from State Agriculture and Horticulture departments, Scientists of ICAR, SAUs and officials from KVKs, DPPQs | Er. Govind Maurya asopheniphm1-ap@nic.in |
| 6. | Refresher course on Agricultural Engineering – skill based – 60 hours (Only on payment basis) | **PHE** | 16.06.2025 | 25.06.2025 | 3rd year / 4th year students of Ag Engg | Dr. Vidhu Kampurath jdenggniphm-ap@nic.in |

- **Exposure visit cum demonstration to students of Ag Engg**

  An exposure visit and demonstration on drone technology and futuristic applications with Agricultural Engineering was arranged for the final year students of D Y Patil Agriculture and Technical University, Talsande, Kolhapur, Maharashtra on 23rd January 2025. Total 95 students (71 male and 24 female) participated in the programme. The students were demonstrated with the drone spraying, its automated operations, uses in various agricultural operations etc. Basics rules of operation of drones also was briefed to them.


An MoU was signed between NIPHM and Vignan's Foundation for Science, Technology and Research University, Guntur for mutual collaboration, skill development to students and research activities. The signing ceremony was conducted at VFSTR campus, Guntur on 7th Jan 2025. The ceremony was completed in presence of Dr. Sagar Hanuman Singh, Director General of NIPHM and Dr. P. Nagabhushnam, Vice Chancellor, VFSTR.

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**శిక్షణకు అవగాహన ఒప్పందం**

ఒప్పంద పత్రాలు మార్చుకుంటున్న నాగభూషణ్, సాగర హనుమాన్ సింగ్

పాన్మూరు, న్యూస్‌టుడే: విజ్ఞాన్ యూనివర్సిటీ-నేషనల్ ఇనిస్టిట్యూట్ ఆఫ్ ప్లాంట్ హెల్త్ మేనేజ్‌మెంట్ మధ్య అవగాహన ఒప్పందం కుదిరిందని ఉపకులపతి నాగభూషణ్ మంగళవారం వెల్లడించారు. యూనివర్సిటీ ప్రాంగణంలో నాగభూషణ్ నేషనల్ ఇనిస్టిట్యూట్ ఆఫ్ ప్లాంట్ హెల్త్ మేనేజ్‌మెంట్ డైరెక్టర్ జనరల్ సాగర హనుమాన్ సింగ్, జాయింట్ డైరెక్టర్ విధు కేపీలతో ఒప్పంద పత్రాలను మార్చుకున్నారు. ఈ సందర్భంగా నిర్వహించిన సమావేశంలో నాగభూషణ్ మాట్లాడుతూ విద్యార్థులు, అధ్యాపకులు, పరిశోధకుల్లో నైపుణ్యాభివృద్ధిని పెంపొందించడానికి ఉమ్మడి శిక్షణ కార్యక్రమాలు, అవగాహన సదస్సులు నిర్వహించడానికి ఒప్పందం దోహదపడుతుందని చెప్పారు. విద్యార్థులకు ఇంటర్న్‌షిప్ అవకాశాలను అందించడంతో పాటు ప్రాక్టికల్ ఇండస్ట్రీ అనుభవాన్ని అందించే వెసులుబాటు ఉందని ప్రకటించారు.

Date : 08/01/2025 EditionName : ANDHRA PRADESH( AMARAVATI GUNTUR ) PageNo : 03

## Research & Development

AICRP- Biocontrol is continued during the quarter.the studies are carried out on evaluation of NIPHM white media for production of *Nomuraea rileyi (Metarhizium rileyi)* NIPHM MRF-1 strain for management of Maize Fall Army worm (*Spodoptera frugiperda*).The pot culture experiment was conducted in glass house, NIPHM to evaluate the efficacy of *M.rileyi* produced on NIPHM white media. The mortality of the larvae was recorded and the results obtained were sent to AICRP-BC.

- **Studies on biodiversity of natural enemies in maize ecosystem (FAW):**

  From January- March, 2025 the different natural enemies were recorded at weekly interval in maize crop raised at NIPHM farm. The natural enemies like *Micraspis discolour, Chelonus blackburniand* Rove beetles were recorded

- **Pesticide Formulation and Residue Analytical Centre (PFRAC):**

  The Pesticide Formulation and Residue Analytical Centre (PFRAC), Pesticide Management Division, is an accreditated laboratory in accordance to ISO/IEC 17025:2017. During the period the laboratory has collected 301 samples (Fruits, vegetables, cereals, pulses, milk and water) from Banjarahill Hyderabad, Medchal/Malkajigiri, Alwal and Saidabad under Central Sector Scheme "Monitoring of Pesticide Residues at National Level (MPRNL). All the collected samples were analysed for pesticide residues by LC-MS/MS and GC-MS/MS.

  A total of 180 samples (fruit and vegetables) were received from ANGRAU and samples were analyzed under MPRNL scheme. The Laboratory also analyzed 105 water samples received from CSIR-NEERI under MPRNL scheme.

  The division has analyzed tobacco samples for pesticide residues received from Tobacco Board. Botanical/bio-pesticides samples received from Punjab, Karnataka, Kerala, Uttarakhand and Telangana also analyzed to check the presence of pesticide.

  Pesticides formulation samples from National Seed Corporation, Food Corporation of India and other pvt. customers were also analyzed for quality test during the period.

- **Bio-stimulant Analysis:**

  As per the Clause 20C (10) of Fertilizer (Inorganic, Organic or Mixed) (Control) Amendment Order, 2021 (Dt. 23.02.2021), no bio-stimulant shall contain any pesticide beyond the permissible limit of 0.01 ppm. Clause 29 (1-C) of the order directs about the quality analysis of bio stimulants. A committee was formed by INM Division, MA&FW to finalize the methods for testing of quality parameters of bio-stimulants and NIPHM is a part of the committee.

  For finalization of methods of testing, NIPHM has initiated method standardization for analysis of humic acid, organic carbon, chemical pesticides, bulk density and heavy metal in bio-stimulant samples. The division has also attended online meeting on biostimulant analysis methods conducted by Joint Secretary (INM), MA&FW

- **Proficiency Testing Center (PTC):**
- **Proficiency testing programme on Pesticide Residues Analysis (PT-PRA)**

PTC organized PT PRA programme on Water (Water: PTC/PR/03/24-25), cucumber and Red gram (PTC/PR/04/2024-25). The final reports were sent to the participant laboratories after statistical evaluation of PT results for the pesticide Chlorpyrifos, Chlorantraniliprole, Deltamethrin, Emamectin Benzoate, Lambda Cyhalothrin, Malathion, Monocrotophos, Quinalphos, Penconazole and Tebuconazole etc.

- **Proficiency testing programme on Pesticide Formulation Analysis (PT-PFA)**
  PTC conducted PT PFA programme on Acetamiprid SP (PTC/PF/04/2024-25), Fipronil SC (PC/PF/05/2024-25) & Tricyclazole Technical (PTC/PF/06/24-25) during the period. Final reports of Acetamiprid SP, Fipronil SC and Tricyclazole Technical (PTC/PF/04, 05 & 06/24-25) were sent to the participating Laboratories.

- Commercial scaling up of irradiation protocol as phytosanitary measure for major cut flowers -funded by BARC-Board of Research in Nuclear Sciences (BRNS), Department of Atomic Energy (DAE), GOI.

- Survey and field evaluation of sterile insect technique for the management of Oriental fruit fly, *Bactrocera dorsalis* (Diptera:Tephritidae) infesting economically important fruit crops-funded by BARC-Board of Research in Nuclear Sciences (BRNS), Department of Atomic Energy (DAE), GOI.

- Development of eco-friendly and integrated stored grain pest management techniques for food grain storage in FCI godowns (multi-locations) - Funded by FCI.

- Testing the Bio efficacy of pheromones in stored pests. 0n 18.03.2025 pheromones for rice weevil, lesser grain borer, *Tribolium* and grain moth were installed at TSWC, IG, Jangaon, Telangana . Lab studies in testing the Bio efficacy of pheromones has been initiated in PBD lab and data is being recorded. Request has been sent to FCI, Head office, New Delhi to conduct the trail studies in FCI godowns - M/s Amish Crop Sciences Pvt Ltd.

**Lab Activities:**

- Maintaining/Rearing of stored grain insect cultures viz. *Tribolium*, Rice weevil, Khapra, Pulse beetle, Cigarette beetle, saw toothed grain beetle and rice moth.
- Fruit fly lure preparation (ME & CUE)
- Maintenance of vermicompost unit
- Disease specimen- Herbarium collection
- Maintenance of vermicompost unit at NIPHM

- **QC lab for bio-pesticides:** During the quarter, 36 biopesticide samples other places and 10 from NIPHM were received and tested for various quality parameters.
- **Biofertilizer Laboratory:** As a licensed Biofertilizer production unit, biofertilizers like Rhizobium, Azotobacter, Azospirillum, Phosphate Solubilizing Bacteria (PSB), Potassium Releasing Bacteria (KRB), Zinc Solubilizing Bacteria (ZnSB) and Mycorrhiza (VAM) are produced at NIPHM to make it available to beneficiaries like farmers and other stakeholders such astobacco board. Biofertilisers are provided to 240 farmer/ officers during this quarter.

- **Bio-pesticide laboratory:** Activities like demonstration of on-farm production of *Trichoderma* and *Pseudomonas* to trainees, maintenance of mother culture of Trichoderma and Pseudomonas are performed in the lab. Bio-inoculum startup kits were provided to 113 trained officers / FPO farmers from different states for demonstration.
- **Host, predators and parasitoids lab:** NIPHM is maintaining and producing various parasitoids and predators for insect pest control. These beneficial insects, biocontrol agents were supplied to trainees and farmers for use in their fields. In this quarter, twenty three farmers/ Scientists have taken different predators and parasitoids from NIPHM.
- **Nematology Laboratory:** As a part of the regular activities soil testing is done for nematode population. During this quarter 6 samples were tested for nematode population and advisories were given, accordingly

## Extension Activities / Village Adoptions

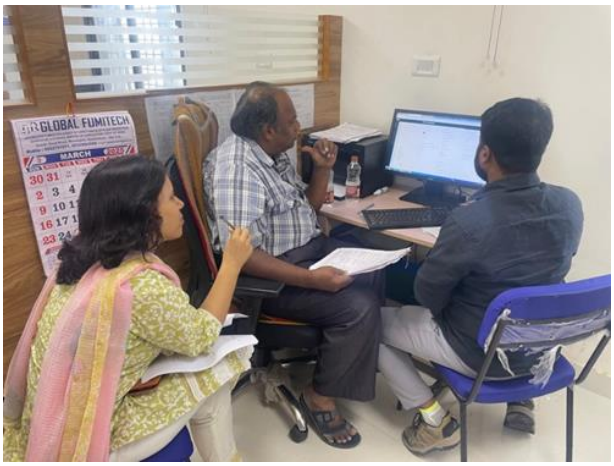
- **Village Adoption:**

As a part of the development of model IPM village by NIPHM, the farmers of Peddashapur village are encouraged for organic farming practices.

## Other Activities

- In reference to 28th EC Meeting of NIPHM, held on 02nd December, 2024 at Krishi Bhavan, New Delhi, under the chairmanship of Additional Secretary (PP Division), National Institute of Plant Health Management (NIPHM), Hyderabad has audited and inspected Plant Quarantine Stations (PQS) Hyderabad on 10th & 11th March, 2025 and Regional Plant Quarantine Station, Bengaluru on 12th & 13th March, 2025 in order to assess the functional efficiency, PQ protocols followed, knowledge skill sets and man power of respective stations. The reports have been submitted to PP Division.

Audit of RPQS, Bengaluru



Audit of PQS, Hyderabad

- **Farmer Advisory Cell Activities:**
  Farmer Advisory Cell is maintained PHM division and faculty are interacted farmers about their queries related to plant protection, bioinputs usage etc. 50 farmers approached NIPHM through telephonic communication.
- **NIPHM Instructional farm**
  PHM division is maintaining IPM demonstration farm and polyhouse with diversified crops. Biointesive approaches in various activities the farmers and trainees visit for observation and practical sessions on AESA, Ecological engineering, collection of insect pests and beneficial insects. A bio-char unit has also been operationalized using waste material collected from the campus. Paddy variety RNR 15048 cowpea, sorghum were raised for demonstration to different trainees.
- **Polyhouse (Protected cultivation)**
  During this quarter, crops viz., tomato and cucumber were monitored and necessary IPM practices for the pests were adopted.

A view of Paddy crop in NIPHM farm

Tomato grown in Polyhouse

In house Biochar production unit

Sorghum crop at NIPHM farm

- **Guidance for laboratory accreditation:** During the period, the division has guided 5 Pesticide Testing Laboratories of Andhra Pradesh in the process of laboratory accreditation as per the ISO/IEC 17025 2017.

  Laboratory accreditation renewal as per ISO/IEC 17043 has initiated and documents were updated. Laboratory assessment is scheduled during the month of May 2025.

## Special Events

**National Conference on Pesticide Residues in Agricultural/Horticulture Commodities:**

National Conference on **Pesticide Residues in Agricultural/Horticulture Commodities** was held on **05th and 06th of March, 2025** at NIPHM. The conference was chaired by Dr. Sagar Hanuman Singh, IPos, Director General, NIPHM. Esteemed dignitaries Prof. Aldas Janaiah, VC-Professor Jayashankar Telangana Agricultural University, Dr. Danda Raji Reddy, VC - Shri Konda Laxman Telangana State Horticulture University, Dr R.K. Mathur, Director, ICAR Indian Institute of Oil Seeds Research, Hyderabad and Dr. Vinod Kumar Singh, Director, ICAR – Central Research Institute for Dryland Agriculture were present at the conference and provided insightful information about the issues on pesticide residues in agricultural commodities.

The technical sessions was commenced in the presence of DG, NIPHM, guest of honour, Shri **Muktanand Agrawal** IAS, Joint Secretary, Plant Protection and a special invitee Dr. J. P. Singh, Plant Protection Advisor, DPPQS.
This conference brought together experts, scientists, policymakers and stake holders from across the country to address the challenges of pesticide residues in the present scenario, particularly in export and domestic agriculture and horticulture commodities and implementing to minimize pesticide residues. Actionable point based recommendations from the conference were disseminated to the State Agriculture Dept. for the action to be taken up.



National Conference on Pesticide Residues in Agricultural/Horticulture Commodities held on 05th & 06th of March, 2025

- During this quarter the joint secretory (PP) and team of officers from Michigan state university and other officials visited NIPHM and its biocontrol lab. They appreciated the activities of NIPHM and interacted with students and trainees.

- **Students Visit**: student group of 115 students from Telangana, 635 from Tamilnadu 65 from Himachal Pradesh , 169 from Kerala and 200 studants from Karnataka visited NIPHM in this quarter
- **Farmers Visit:** 73 input dealers from Maharashtra, 79 DAESI participants from Telangana and 48 farmers from Odisha visited NIPHM biocontrol lab, insect meuseum, demonstration farm etc.
- During the quarter, Dr. Sagar Hanuman Singh DG, NIPHM inaugurated state of art Prakruthi Hall – A facility developed for conducting seminars, online meeting and inauguration with visitors. Director General, NIPHM has inaugurated the facility on 18.03.2025in the presence of staff and trainee officers.

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