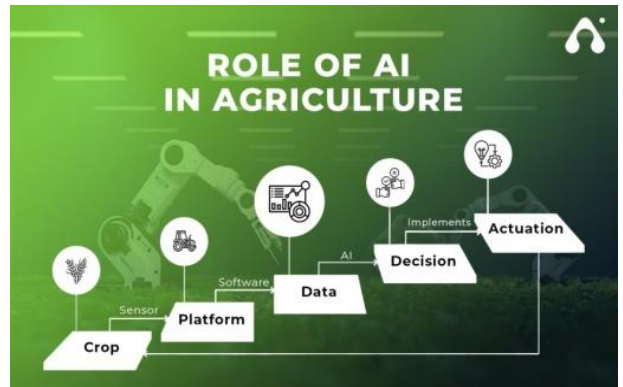
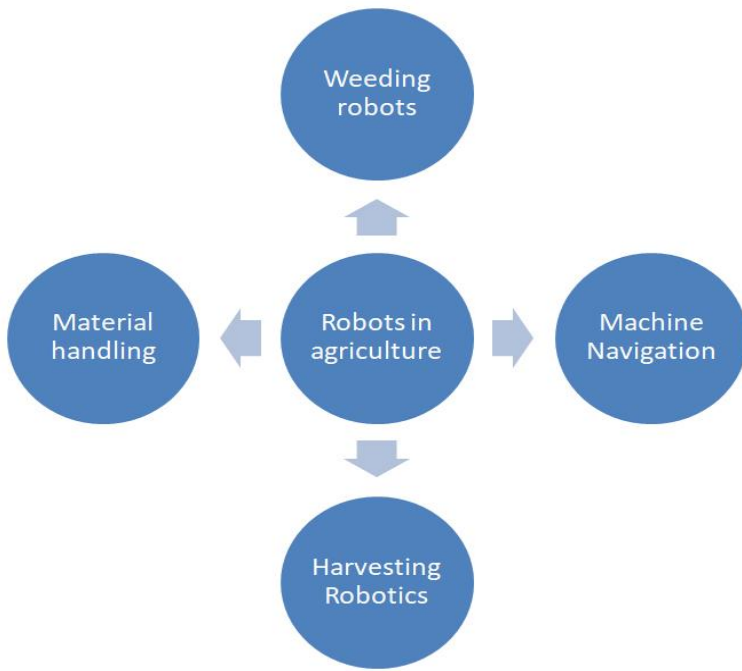




THEME ARTICLE



SPECIAL EVENTS



WHAT'S INSIDE

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From the Director General's Desk

Agriculture plays a pivotal role in the Indian economy in ensuring food security for the nation. Agriculture faces many challenges today, including climate change, depleted land quality, water shortages, poor water quality, and economic pressures. Agriculture, an essential consideration of any country, is still one of the major challenges currently. AI and IoT (sensors) can be used to create intelligent systems that can be embedded in machines to make it work with higher accuracy. These technologies help in the spatial and temporal evaluation of individual plots or plants making agriculture more sustainable in near future.

Now-a-days, IoT smart agriculture products are designed to help monitor crop fields using sensors and by automating irrigation systems. As a result, farmers and associated brands can easily monitor the field conditions from anywhere without any hassle. The applications of the Internet of Things in agriculture target conventional farming operations to meet the increasing demands and decrease production losses.

IoT in agriculture uses robots, drones, remote sensors, and computer imaging combined with continuously progressing machine learning and analytical tools for monitoring crops, surveying, and mapping the fields, and providing data to farmers for rational farm management plans to save both time and money. Drones equipped with sensors and cameras are also used widely for imaging, mapping, and surveying farms. From the drone data, insights can be drawn regarding crop health, irrigation, spraying, planting, soil and field, plant counting, yield prediction, and much more.

Climate change issues such as increased temperature, erratic rainfall pattern and other associated problems have increased the importance of the AI system in agriculture in recent years. AI based technologies support farmers in the management of risk and uncertainty in agriculture by facilitating the preparedness of farmers to handle the crisis efficiently.

The present theme article envisages about the prominence of artificial intelligence in agriculture which enable the farmers to map and project current and future fluctuations in precipitation, temperature, crop output etc. towards a better sustainable farming.

राष्ट्र के लिए खाद्य सुरक्षा सुनिश्चित करने में कृषि भारतीय अर्थव्यवस्था में महत्वपूर्ण भूमिका निभाती है। आज कृषि को कई चुनौतियों का सामना करना पड़ रहा है, जिनमें जलवायु परिवर्तन, भूमि की घटती गुणवत्ता, पानी की कमी, खराब पानी की गुणवत्ता और आर्थिक दबाव शामिल हैं। कृषि, किसी भी देश का एक अनिवार्य विचार, वर्तमान में भी प्रमुख चुनौतियों में से एक है। एआई और आईओटी (सेंसर) का उपयोग बुद्धिमान सिस्टम बनाने के लिए किया जा सकता है जिसे उच्च सटीकता के साथ काम करने के लिए मशीनों में एम्बेड किया जा सकता है। ये प्रौद्योगिकियां निकट भविष्य में कृषि को अधिक टिकाऊ बनाने के लिए व्यक्तिगत भूखंडों या पौधों के स्थानिक और लौकिक मूल्यांकन में मदद करती हैं।

आजकल, IoT स्मार्ट कृषि उत्पाद सेंसर का उपयोग करके और सिंचाई प्रणालियों को स्वचालित करके फसल क्षेत्रों की निगरानी करने में मदद करने के लिए डिज़ाइन किए गए हैं। परिणामस्वरूप, किसान और संबंधित ब्रांड बिना किसी परेशानी के कहीं से भी खेत की स्थितियों की आसानी से निगरानी कर सकते हैं। कृषि में इंटरनेट ऑफ थिंग्स के अनुप्रयोग बढ़ती मांगों को पूरा करने और उत्पादन घाटे को कम करने के लिए पारंपरिक कृषि कार्यों को लक्षित करते हैं।

कृषि में IoT रोबोट, ड्रोन, रिमोट सेंसर और कंप्यूटर इमेजिंग का उपयोग करता है, जो फसलों की निगरानी, सर्वेक्षण और खेतों की मैपिंग के लिए निरंतर प्रगतिशील मशीन लर्निंग और विश्लेषणात्मक उपकरणों के साथ संयुक्त होता है, और समय और धन दोनों को बचाने के लिए तर्कसंगत कृषि प्रबंधन योजनाओं के लिए किसानों को डेटा प्रदान करता है। सेंसर और कैमरों से लैस ड्रोन का उपयोग इमेजिंग, मैपिंग और खेतों के सर्वेक्षण के लिए भी व्यापक रूप से किया जाता है। ड्रोन डेटा से, फसल स्वास्थ्य, सिंचाई, छिड़काव, रोपण, मिट्टी और खेत, पौधों की गिनती, उपज की भविष्यवाणी और बहुत कुछ के बारे में जानकारी प्राप्त की जा सकती है।

जलवायु परिवर्तन के मुद्दों जैसे कि बढ़ा हुआ तापमान, अनियमित वर्षा पैटर्न और अन्य संबंधित समस्याओं ने हाल के वर्षों में कृषि में एआई प्रणाली के महत्व को बढ़ा दिया है। एआई आधारित प्रौद्योगिकियां संकट को कुशलतापूर्वक संभालने के लिए किसानों की तैयारी को सुविधाजनक बनाकर कृषि में जोखिम और अनिश्चितता के प्रबंधन में किसानों का समर्थन करती हैं।

वर्तमान थीम लेख कृषि में कृत्रिम बुद्धिमत्ता की प्रमुखता के बारे में परिकल्पना करता है जो किसानों को बेहतर टिकाऊ खेती की दिशा में वर्षा, तापमान, फसल उत्पादन आदि में वर्तमान और भविष्य के उतार-चढ़ाव को मैप और प्रोजेक्ट करने में सक्षम बनाता है।

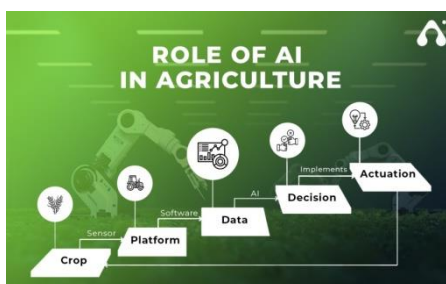
(Dr. Sagar Hanuman Singh IPoS)
Director General

ARTIFICIAL INTELLIGENCE IN AGRICULTURE

Er. M Udaya Bhanu, Scientific Officer (PHE)

Introduction

Agriculture, an essential consideration of any country, is still one of the major challenges currently. It is approximated that over 820 million people are in hunger today. Furthermore, with the global expected to reach 9.1 billion in 2050, 70 percent more food needs to be produced. In addition to the projected investments in agriculture, further investment will be needed, otherwise about 370 million people would be in hunger in 2050. In addition, an expanding gap between a growing water demand and the available water supply is anticipated, and it is likely that over three billion people would experience water stress by 2025.



Potential of AI in Indian Agriculture



Agricultural Growth driven by IoT:

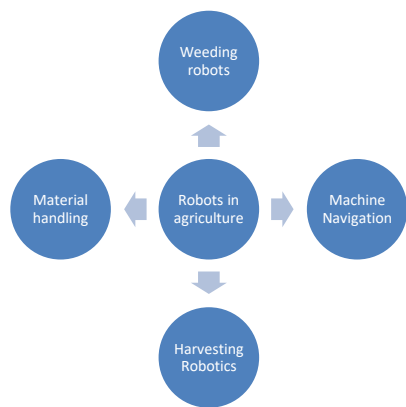
AI and IoT (sensors) can be used to create intelligent systems that can be embedded in machines to make it work with higher accuracy. These technologies help in the spatial and temporal evaluation of individual plots or plants.



IoT smart agriculture products are designed to help monitor crop fields using sensors and by automating irrigation systems. As a result, farmers and associated brands can easily monitor the field conditions from anywhere without any hassle.

The applications of the Internet of Things in agriculture target conventional farming operations to meet the increasing demands and decrease production losses. IoT in agriculture uses robots, drones, remote sensors, and computer imaging combined with continuously progressing machine learning and analytical tools for monitoring crops, surveying, and mapping the fields, and providing data to farmers for rational farm management plans to save both time and money.

a) **Robots in agriculture:** With increasing demands and shortage of labour across the globe, agriculture robots or commonly known as Agribots are starting to gain attention among farmers. Crop production decreased by an estimated 213 crores approximately (\$3.1 billion) a year due to labour shortages in the USA alone. Recent advancements in sensors and AI technology lets machines train on their surroundings have made agribots more notable. We are still in the early stages of an ag-robotics revolution, harnessing the full potential of the Internet of Things in agriculture, with most of the products still in early trial phases and R&D mode.



Weeding Robots: These smart Agri robots use digital image processing to look through the images of weeds in their database to detect similarities with crops and weed out or spray them directly with their robotic arms.



Machine Navigation: Tractors and heavy ploughing equipment can be run automatically from the comfort of home through GPS. These integrated automatic machines are highly accurate and self-adjust when they detect differences in terrains, simplifying labour-intensive tasks.



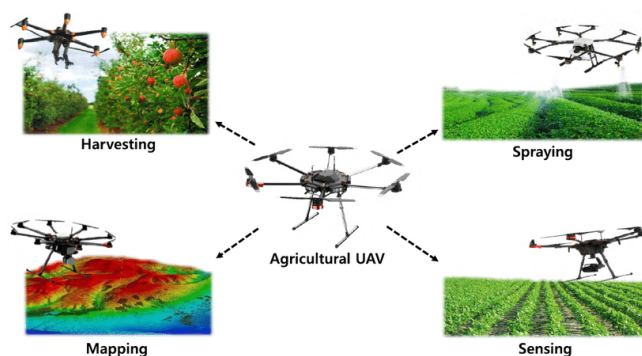
Harvesting Robotics: Utilizing agribots to pick crops is solving the problem of labour shortages. Working the delicate process of picking fruits and vegetables these innovative machines can operate 24/7. A combination of image processing and robotic arms is used by these machines to determine the fruits to pick hence controlling the quality.



Material Handling: Robots can perform dreaded manual labour tasks working alongside the labours. They can lift heavy materials and perform tasks like plant spacing with high accuracy, therefore optimizing the space and plant quality and reducing production costs.



b) Drones in agriculture: They are used to enhance and optimize various farming activities such as crop monitoring, crop spraying, soil analysis, and mapping. In fact, agriculture is one of the major sectors to incorporate drones. Drones equipped with sensors and cameras are used for imaging, mapping, and surveying farms. There are ground-based drones and aerial drones. Ground drones are bots that survey the fields on wheels. Aerial drones, formally known as unmanned aerial vehicles (UAVs) or unmanned aircraft systems (UAS), are flying robots. Drones can be controlled remotely or they can fly automatically through software-controlled flight plans in their embedded systems, working in coordination with sensors and GPS. From the drone data, insights can be drawn regarding crop health, irrigation, spraying, planting, soil and field, plant counting, yield prediction, and much more.



c) Remote sensing in agriculture: Remote sensing in agriculture is revolutionizing the way data is acquired from different nodes in a farm' IoT-based remote sensing utilizes sensors placed along with the farms like weather stations for gathering data, which is transmitted to analytical tools for analysis. Sensors are devices sensitive to anomalies. Farmers can monitor the crops from the analytical dashboard and take action based on insights.



Crop Monitoring

Sensors placed along the farms monitor the crops for changes in light, humidity, temperature, shape, and size. Any anomaly detected by the sensors is analyzed and the farmer is notified. Thus remote sensing can help prevent the spread of diseases and keep an eye on the growth of crops.

Weather conditions

The data collected by sensors in terms of humidity, temperature, moisture precipitation, and dew detection helps in determining the weather pattern in farms so that cultivation is done for suitable crops.

Soil quality

Soil health analysis helps in determining the nutrient value and drier areas of farms, soil drainage capacity, or acidity, which allows for adjustment of the amount of water needed for irrigation and opting for the most beneficial type of cultivation. The soil health data can also help leverage regenerative agriculture by providing insights into how and when to increase organic matter and therefore achieve a better soil structure and eventually pave a path for climate-smart agriculture.

- d) Computer imaging in Agriculture:** Computer imaging involves the use of sensor cameras installed at different corners of the farm or drones equipped with cameras to produce images that undergo digital image processing. Digital image processing is the basic concept of processing an input image using computer algorithms. Image processing views the images in different spectral intensities such as infrared, compares the images obtained over a period of time, and detects anomalies, thus analysing limiting factors and helping a better management of farms.

Image-based Insight Generation:

Using the satellite and drone imagery real-time alerts can be generated in precision farming. These artificial intelligence systems not only save time but also increase safety and reduce potential human error while improving effectiveness.

Computer Vision:

Computer vision technology can be used to grade the agricultural produce (grading of fruits and vegetables), enhance the quality of produce, and fetch high market values and profit to farmers. This will help to reduce post-harvest losses of perishable commodities. Also, the technology can make use in the procurement, storage, and distribution of food grains.

Identification of Optimal Agronomic Product Mix:

AI helps to generate farm specific recommendations analysing different parameters like soil health, weather forecast, type of seeds, and pest infestation in the area. Though the recommendation include best choice of crops and technologies for a specific farm, it can be further personalized based on the farm's requirements, local conditions, and past data on successful farming.

Crop Health Monitoring Systems:

Remote sensing techniques, hyperspectral imaging and AI build crop health monitoring systems that can monitor crop health from both time and effort perspectives. AI facilitates identification of pests, diseases, and weeds problems and automates the management of these problems. AI-enabled agricultural production systems also predict future situations and issue advisories for sowing, pest control and commodity pricing.

Smart Irrigation Systems:

Smart irrigation involves providing the right quantity of water at the right place at the right time for the right crop so as to improve crop yield. Using sensor based automated irrigation system issues associated with the low irrigation

efficiency of Indian agriculture (around 38%) can be resolved to a greater extent. Also, automated irrigation scheduling is possible using machines trained on historical weather patterns and soil quality of the locality along with the kind of crops to be grown.

Agriculture Risk Management:

Climate change issues such as increased temperature, erratic rainfall pattern and other associated problems have increased the importance of the AI system in agriculture in recent years. AI based technologies support farmers in the management of risk and uncertainty in agriculture by facilitating the preparedness of farmers to handle the crisis efficiently.

Natural Language Processing (NLP) for Agro Advisory:

India is a multi-lingual society and majority of farmers are illiterate. A lot of content failed to reach the desired people due to lack of human-resource to convert it to the end-user's language. This gap can be effectively filled through natural language processing.

Attract Youth to Agriculture:

Decreasing agriculture labour force due to migration of youth to other jobs can be well addressed using AI based agriculture. AI based technologies will attract the tech-savvy youth, reduce drudgery and save natural resources and agriculture.

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Around the World

Er. M. Udaya Bhanu, Scientific Officer
Plant Health Engineering Division

At present, most of the multinational technology providers are working on Artificial Intelligence in agriculture and providing the platforms for researchers. Therefore, researchers must start working on the provided platforms to extract the uses of AI in agriculture easily. Another significant development is education in AI. Around the globe, most of the educational institutions have introduced Artificial Intelligence and Machine Learning (ML) in their course curriculum at bachelor's level. Design of AI and ML courses are even offered to students belonging to agricultural and allied sectors. This global initiative may lead to enhanced and efficient outputs for research and development in artificial intelligence in agriculture.

Global challenges:

Data Science and Big Data analytics along with AI technologies enables most accurate predictions for farming community. International statistical institutions and research and development centers are already working on various data resources. Some of the applications (open source and paid) which were developed using Artificial Intelligence and fulfil global agricultural needs are:

- **Plantix:** It is an advisory and predictive services provider application which is used to identify the crops and also diseases.
- **PlanNet:** PlaNet is also an advisory system, which provides plant information. It identifies the plants using Artificial Intelligence visual recognition system.
- **PictureThis:** PictureThis is a special kind of AI application which is used to identify the flowers using deep learning and cognitive vision.
- **Merlin Bird ID:** Merlin Bird Id is a bird identification application, which can identify birds based on computer vision and deep learning methods.
- **iNaturalist:** iNaturalist is an AI based application used to identify the plants and animals.
- **ripeSense:** ripeSense is an intelligence device which is used to predict the ripeness of fruits.
- **Stellapps:** Stellapps is an AI based device which analyses the flow of milk to identify the quantity of elements in milk.
- **ROXAN:** ROXAN is an AI technology which is used to identify the location and health characteristics of farm animals.
- **Daisy:** Daisy is an intelligent device for plants. It provides automatic irrigation for indoor and outdoor plants.

There are several applications of AI in Agriculture at the International level, and many initiatives in India by the name AI and machine learning.

International Status

- Blue River Technology company has developed a robot known as "See & Spray" that uses computer vision technology to monitor and precisely spray weedicides on cotton and soybean farm.
- Harvest CROO Robotics company has developed a robot to help strawberry farmers in picking and packing of their produce.

- Progressive Environmental and Agricultural Technologies (PEAT) has developed an AI based application "Plantix" crop-damage diagnosis App that considers and correlates plant foliage patterns with certain defects, crop pests and diseases. PEAT in collaboration with international research institutes and inter-governmental organizations such as ICRISAT, CIMMYT, CABI, ZALF and Government of Andhra Pradesh is using Plantix App for extension services and successfully demonstrating this cutting edge technology with farmers at several sites of India. In particular, PEAT's Plantix mobile App has been customized not only to ICRISAT's mandate crops but also for cereals, pulses, fruits and vegetables. Plantix enables farmers to identify pests and diseases using their smart phones and obtain remedial measures.
- Trace Genomics, Inc. provides soil analysis services to farmers. The system uses machine learning techniques and tools to provide advices on the strength and weaknesses of soil. Services offered in the analysis of soil include not only analysis summary but also information related to bacteria and fungi through pathogen screening and microbial evaluation by performing the soil DNA analysis.
- aWhere Inc. uses satellites imagery data in the farms based on many points daily data on agronomic and climatic data such as temperature, precipitation, wind speed, and solar radiation etc. and uses this for decision making by applying machine learning techniques to predict weather, crop sustainability and the occurrence of diseases and pests.
- CropX an ag-analytics company has developed cloud based software solutions integrated with wireless sensors for adaptive irrigation. The solution involves taking data from field ground sensors, measuring soil moisture and temperature and uploading the data to the cloud, and offers a mapping and optimal irrigation planning as a service to the grower through a mobile application.
- FarmBeats is an AI and IoT based solution given by Microsoft Research to increase farm productivity. UAV drones and sensors collect real-time data of factors that may affect the growth of the crops during cultivation processes, including wind speed, wind direction, soil moisture and temperature, CO₂, atmospheric moisture and temperature, atmospheric pressure, as well as rain and light exposure and after machine learning-based backend analytics with predictive features information is accessible to farmers on the FarmBeats app.
- Alibaba Cloud- ET Brain is the innovative cloud based AI platform offering services in almost all the sectors by Chinese tech giant Alibaba. ET Agricultural Brain is built upon the Alibaba Cloud's proprietary AI for providing services in agricultural industry. The cutting- edge AI programme has been adopted by a number of leading pig farming, fruit and vegetable growing enterprises in China, and is set to revolutionize the agricultural industry.

Training Programs

Plant BioSecurity Division

CAPACITY BUILDING PROGRAMMES:

The Plant Biosecurity Division has organized following training programmes during the months of **April-June, 2024.**

S. No.	Name of The Programme	Duration	Date	
			From	To
Plant Biosecurity Division (PBD)				
1)	Export Promotion of Agriculture/ horticulture produce through effective field management of pests	01 day	06.04.2024	06.04.2024
2)	Forced Hot Air Treatment- Payment program /private industry	05 Days	22.04.2024	26.04.2024
3)	Plant Quarantine Procedures for Export and Import	05 Days	06.05.2024	10.05.2024
4)	Introduction and Emerging Pest threats to India	03 Days	20.05.2024	22.05.2024
5)	Training Program on Orientation for PSC Issuing Authorities	05 days	27.05.2024	31.05.2024
6)	Regional Workshop on Pest Risk Analysis (PRA) using CABI Decision Support Tools – International Programme	05 Days	03.06.2024	07.06.2024
7)	Pest Surveillance	05 Days	10.06.2024	14.06.2024
8)	Fumigation as a Phytosanitary Treatment - Payment program /private industry	15 Days	18.06.2024	02.07.2024
Vertebrate Pest Management (VPM)				
9)	Urban Integrated Pest Management - Payment program /private industry	15 Days	25.04.2024	09.05.2024
10)	Training on vertebrate pest management - wild boar, monkey and birds	03 Day	05.06.2024	07.06.2024
11)	Level 1: Urban Pest Management for Tamil Nadu Warehousing Corporation officials- Payment program /private industry	02 Day	13.06.2024	14.06.2024
12)	Certificate course on Urban Integrated Pest Management- Payment program /private industry	15 Days	14.06.2024	28.06.2028
PBD - FARMERS PROGRAMME				

1)	One day Awareness program on “Export Promotion of Agricultural and Horticultural Commodities” at Holistic Himalaya Farmers Producer Company Salooni, Chamba, Himachal Pradesh	01 Day	23.05.2024	23.05.2024
2)	On Farm Production of bio inputs to promote organic export” In Collaboration with Project Director, ATMA Nasik, Maharashtra (2 Programmes)	01 Day	12.06.2024	12.06.2024
3)	On Farm Production of bio inputs to promote organic export” In Collaboration with Project Director, ATMA Nasik, Maharashtra (2 Programmes)	01 Day	13.06.2024	13.06.2024
VPM- FARMERS PROGRAMME				
4)	Farmers training on RPM for Maharashtra farmers	01 Days	05.04.2024	05.04.2024

PLANT BIOSECURITY DIVISION (PBD)

➤ **Export Promotion of Agriculture/horticulture produce through effective field management of pests:** A one day training programme was organized at Panchayat Raj Dept, Pendurthi Mandal, Visakhapatnam district, Andhra Pradesh on 06.04.2024. The programme was inaugurated by Sh. Dokula Atchum Naidu, Executive Engineer and 15 extension officers of various departments of Pendurti Mandal have participated in the training programme. In Pendurti the major crops grown are Paddy, Maize, Pulses, Cotton, Vegetables and fruit crops (Mango/Banana). The training program was focused on export promotion through effective field management of pests. PBD Faculty explained the extension officers on importance, detection, diagnosis and identification of major & minor pests, host range, management practices and also briefed the role of APEDA in export, export procedures, phytosanitary measures etc.



- **Forced Hot Air Treatment (*Payment program/private industry*):** The packaging material is one of the most threatening pathways for incursion of timber pests across the globe. Forced Hot Air Treatment (FHAT) is one of the approved treatments for packaging material under ISPM -15. National Standard for Forced Hot Air Treatment (NSPM-9) has been developed which prescribes treatment procedures and the steps to register the facility. It is essential to certify the FHAT facilities to ensure that wood packaging material is treated and marked in consistence with the provisions of ISPM -15.

NIPHM is the only Institute in India to offer a specialized training programme on FHAT for industry stakeholders. The training programme was organized during 22nd-26th April, 2024 at NIPHM and attended by 44 aspirants. The participants learnt the critical requirements for establishing FHAT facilities, calibration of sensors, placement of sensor, identification of coolest point, safety precautions, conducting the treatments, use of appropriate mark and record keeping in accordance with ISPM – 15 and NSPM – 9.

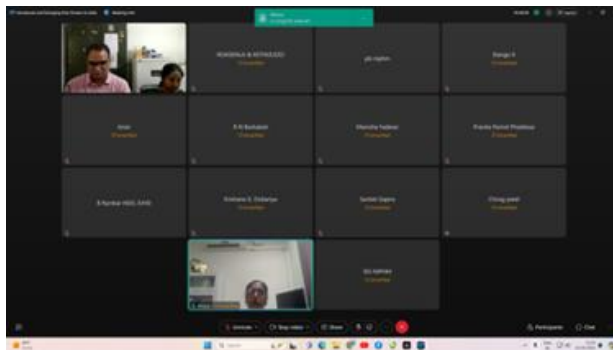


- **Plant Quarantine Procedures for Export and Import:** The training “Plant Quarantine Procedures for Export and Import” was organized from 6th -10th, May, 2024 and 14 participants (11 from govt. sector and 3 from private sector) attended the training. The topics covered were plant biosecurity, plant quarantine system, export and import procedures for plants and plant products and Post Entry Quarantine for propagative material.



- **Introduction and Emerging Pest threats to India:** Rapid globalization and advancements in transport, travel, tourism coupled with liberalization of trade pose increased risk of introduction of exotic and invasive pests into the country. Alien Plant Pests which gained entry into India are causing significant economic damage to agricultural

production. The online training programme of 03 days duration was organised from 20th -22nd May 2024 wherein 12 participants attended the training programme. Training provided the exposure to participants in biosecurity concepts, impact of invasive alien species, exotic pest threats, and pest risk analysis and plant pest incursion management.



- **Training Program on Orientation for PSC Issuing Authorities:** Phytosanitary certification is one of the basic measures employed by the IPPC member countries to prevent global movement of plant pests in traded agricultural commodities. Phytosanitary certificates are issued by the exporting NPPO as a plant health certificate after carrying out inspection, sampling, testing and treatment (if required) to promote safe trade. In order to create awareness about the plant quarantine procedures involved in export and agencies involved in export promotion, 05 days (27th-31st May, 2024) was organized at NIPHM and the said programme was attended by 05 officials from state departments.



- **Regional Workshop on Pest Risk Analysis (PRA) using CABI Decision Support Tools (*International Programme*):** In collaboration with CAB International (CABI), India five days pivotal “Regional Workshop on Pest Risk Analysis (PRA) using CABI Decision Support Tools” was organized at NIPHM and attended by 23 participants from India, Nepal, Bhutan, Bangaldesh, Sri Lanka and Kenya. Globalization and reduced tariff barriers have increased the movement of alien species across borders, posing significant risks to ecosystems and economies and Pest Risk Analysis is the only effective tool to regulate invasive/quarantine pests. This workshop was

organized to bolster regional cooperation and enhance the capabilities of Asian countries in managing invasive pests.



- **Pest Surveillance:** Pest surveillance provides insights into the health status of a country's agriculture and strengthens preparedness for preventive actions both in addressing the problems due to domestic pests of serious concern as well as in protection of native agricultural biodiversity from the incursion threats of exotic pests. During the five days training programme, conducted from 10th- 14th June, 2024 the participants (06 Nos.) learnt various pest surveillance strategies such as detection, monitoring and delimiting surveys. The tools required for surveillance of target pests and the procedures for establishment of Pest Free Areas to gain Market Access, various lures and traps for carrying out fruit fly surveillance for monitoring as well as for area-wide control will be covered during the programme.



- **Fumigation as a Phytosanitary Treatment (Payment program/private industry):** 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. Fifteen days program was organized from 18th June to 02nd July, 2024 and attended by 23 participants. The participants acquainted the understanding of 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 PPQ&S.



VERTEBRATE PEST MANAGEMENT (VPM)

- **Training on “Vertebrate Pest Management - Wild Boar, Monkey and Birds:** The programme was organized from 05th to 07th June, 2024. Total 06 agriculture officers from different states were attended the training. The aim of the training was to create the trained manpower and to create awareness about of the major vertebrate pests like wild boar, monkey and birds and it is management techniques to the extension functionaries.



- **Level 1: Urban Pest Management for Tamil Nadu Warehousing Corporation officials (Payment program/private industry):** Two day off-campus training on Level 1: Urban Pest Management for Tamil Nadu Warehousing Corporation officials was organized at Tamil Nadu Warehousing Corporation, Chennai from 13th to 14th June, 2024 (on consultancy basis). Total 61 warehousing officers from different districts of Tamil Nadu were attended the training and PBD faculty imparted the knowledge on principles of scientific storage structure and vertebrate pest management, biology and management of mosquitos, flies, bedbugs and termites etc.



- **Certificate course on Urban Integrated Pest Management (Payment program/private industry):** As per the Insecticides Rules framed under Insecticides Act, 1968 the PCOs who apply for grant of license for undertaking pest control operations should have certificate of minimum 15 days training on “Urban Integrated Pest Management” (UIPM). National Institute of Plant Health Management (NIPHM) is one of the notified institutes for giving training on UIPM for the pest control professionals and one programme was organized during this month for the structural pest management professionals (private industry). During the programme the trainees will develop skills about 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. Two programmes of 15 days duration were organised from 25th April to 09th May, 2024 and 14th to 28th June, 2024, wherein a total 25 and 19 participants attended the training programmes respectively.



PBD - FARMERS PROGRAMME

- **One day Awareness program on “Export Promotion of Agricultural and Horticultural Commodities”:** The programme was organized at Holistic Himalaya Farmers Producer Company (an all women social enterprise company with 2556 members and 480 shareholders) at Salooni, Chamba, Himachal Pradesh on 23.05.2024. The programme was attended by the progressive farmers and PBD faculty elaborated the export opportunities, International and National regulations, export procedures, phytosanitary measures required for concerned crops/products of the region. The farmers step forward with the queries pertaining to various challenges in agriculture sector of concerned region and appropriate advisory was given by the officer.

Chamba farmers trained to boost agri exports

CHAMBA, MAY 24
 In a collaborative effort to boost exports of agricultural and horticultural products, the National Institute of Plant Health Management (NIPHM), Ministry of Agriculture and Farmers Welfare, Government of India, conducted a one-day training programme at the Holistic Himalaya Farmer Producer Company in the Salooni subdivision of Chamba.

The training programme, conducted by scientific officer Jyoti Bhardwaj, was supported by the Department of Horticulture (Salooni).

The meeting saw active participation from Holistic Himalaya president Yunus Bano, CEO Mohammad Riaz, and female farmers associated with the organisation. Dr. Bhardwaj provided



Farmers and NIPHM scientist Dr. Jyoti Bhardwaj at the workshop at Bhandal village in Salooni.

insights into the agricultural activities facilitated by NIPHM, emphasising the institute’s role in training for plant health management and export capacity enhancement at both national and international levels. She highlighted NIPHM’s

focus on modern agricultural practices, which could be implemented across various sectors of agriculture. Dr. Bhardwaj informed the attendees about export-related aspects of agricultural products. She assured them that NIPHM would support the

promotion of agriculture through export enhancement. Efforts would be made to assist farmers in remote areas by providing technical knowledge, which would help them market their Himalayan resources and products effectively, she said. She also discussed plans for raising awareness through government initiatives. The farmers assured Dr. Bhardwaj that they would adopt good agricultural practices and improve their field collection methods. She acknowledged the aspirational status of Chamba and its significant potential in agriculture. These collective efforts are expected to boost farmers’ income and enable them to standardise their agricultural practices through technology. — OC



आधुनिक तकनीकों से खेतीबाड़ी करें किसान : भारद्वाज

विजय न्यूज
Updated Fri, 24 May 2024 06:17 AM IST

संवाद न्यूज एजेंसी
चंबा। राष्ट्रीय वनस्पति स्वास्थ्य प्रबंधन संस्थान कृषि एवं किसान कल्याण मंत्रालय की ओर से कृषि एवं बागवानी उत्पादों के निर्यात प्रोत्साहन के लिए भांदल में एक कार्यक्रम का आयोजन किया गया। इसमें हैदराबाद में कार्यरत वैज्ञानिक अधिकारी डॉ. ज्योति भारद्वाज विशेष रूप से मौजूद रहीं। बागवानी अधिकारी अनिल डोगरा के सहयोग से यह कार्यक्रम संपन्न हुआ। इसमें होलिस्टिक हिमालय के महिला किसान और अध्यक्ष युनिस बानो, सीईओ डॉ. मोहम्मद रियाज़ और संस्था के अन्य सदस्य भी उपस्थित रहे। डॉ. ज्योति भारद्वाज ने उनके संस्थान की कृषि संबंधित गतिविधियों की जानकारी दी। उन्होंने बताया कि संस्थान अंतरराष्ट्रीय और राष्ट्रीय स्तर पर पादप स्वास्थ्य प्रबंधन और निर्यात क्षमता बढ़ाने के क्षेत्र में प्रशिक्षण प्रदान करता है। इसके अलावा संस्थान की ओर से आधुनिक कृषि पद्धतियों पर भी जोर दिया जाता है। यह क्षमता निर्माण किसी भी कृषि क्षेत्र में किया जा सकता है। डॉ. ज्योति ने किसानों को कृषि उत्पादों के निर्यात संबंधित जानकारी दी और अच्छी कृषि पद्धतियों के बारे में अवगत करवाया। उन्होंने किसानों को आश्चर्य किया कि उनका संस्थान निर्यात संवर्धन द्वारा कृषि को बढ़ावा देगा। डॉ. ज्योति ने बताया कि उनका संस्थान किसानों की हर संभव मदद करेगा। इससे किसानों का उत्साह बढ़ेगा। इस मौके पर काफी संख्या में ग्रामीण मौजूद रहे।

भांदल में किसानों को किया जागरूक



भांदल में आयोजित कार्यक्रम के दौरान डॉ. ज्योति भारद्वाज के साथ किसान • जयकृष्ण सक्ली : राष्ट्रीय वनस्पति स्वास्थ्य प्रबंधन संस्थान (एनआइपीएचएम) कृषि एवं किसान कल्याण मंत्रालय, भारत सरकार की ओर से चंबा के दुर्गम क्षेत्र भांदल में जागरूकता कार्यक्रम का आयोजन किया। किसानों को कृषि एवं बागवानी उत्पादों के निर्यात को लेकर प्रोत्साहित किया गया। कार्यक्रम में एनआइपीएचएम संस्थान हैदराबाद की विज्ञानी अधिकारी डा. ज्योति भारद्वाज मौजूद रहीं। उन्होंने बताया कि संस्थान द्वारा आधुनिक कृषि पद्धतियों पर भी जोर दिया जाता है। यह क्षमता निर्माण किसी भी कृषि क्षेत्र में किया जा सकता है। डाक्टर ज्योति ने किसानों को कृषि उत्पादों के निर्यात संबंधी जानकारी दी। उन्हें प्रोत्साहित किया। किसानों को आश्चर्य किया कि उनका संस्थान निर्यात संवर्धन द्वारा कृषि को बढ़ावा देगा। (सस)

Programme coverage in newspapers (The Tribune, Dainik Jagaran & Amar Ujala)

- **On Farm Production of bio inputs to promote organic export:** In Collaboration with Agricultural Technology Management Agency (ATMA) Nasik, Maharashtra, a total of 04 training programs were conducted on 12th and 13th June and during the period 574 farmers were trained to promote export of natural farming products using organic bio inputs were conducted.



VPM- FARMERS PROGRAMME

- **Farmers training on RPM for Maharashtra farmers:** One day online training was conducted for the farmers of Maharashtra on 05th April, 2024 and the said programme was attended by 55 farmers.

FORTHCOMING PROGRAMMES – PBD (JULY-SEPTEMBER, 2024)

Name of the programme	No. of Days	From	To
Pest Surveillance techniques for Agricultural and Horticultural crops (Kharif / Rabi)	05 Days	01.07.2024	05.07.2024
Phytosanitary Inspection Training	30 days	01.07.2024	30.07.2024
Forced Hot Air Treatment (FHAT)	05 Days	22.07.2024	26.07.2024
Online digital tools in Plant Protection for Pest Surveillance techniques for Agricultural and Horticultural crop pests	03 Days	05.08.2024	07.08.2024
Detection and Identification of Pests (Insects, Pathogens, Weeds and Nematodes)	10 Days	20.08.2024	29.08.2024
Pest Free Area for market access	02 Days	12.09.2024	13.09.2024
Fruit fly: Surveillance and Management for major fruits and cucurbits	05 Days	23.09.2024	27.09.2024
Non-Insect Pest Management – Mites, crabs, snails, slugs and avian	03 Days	02.07.2024	04.07.2024
Eco-friendly approaches for management of vertebrate pests in agriculture and horticultural ecosystem	05 Days	08.07.2024	12.07.2024
Certificate Course on Urban Integrated Pest Management	15 Days	Dates to be decided	
Rodent Pest Management	05 Days	02.09.2024	06.09.2024

Plant Health Management Division

CAPACITY BUILDING PROGRAMMES:

Plant Health Management Division has organized following training programmes during the period **April-June, 2024**.

S No	Name of the programs	Days	From	To
I. Officers programme				
1.	Bio-input Production and Application in Organic and Natural Farming Systems	05	22.04.2024	26.04.2024
2.	Locust Pest Management	03	29.04.2024	01.05.2024
3.	Bio-input Production and Application in Organic and Natural Farming Systems	05	20.05.2024	24.05.2024
4.	On-farm production of Trichoderma and Pseudomonas using NIPHM media'	02	30.05.2024	31.05.2024
5.	Plant Health Management in Protected Cultivation (Online)	05	3.06.2024	7.06.2024
6.	Plant health management strategies for organic and natural farming systems	05	03.06.2024	07.06.2024
7.	Plant Health Management in Kharif Oilseed crops (Online)	03	18.06.2024	20.06.2024
8.	Integrated Soil Health and Weed Management	05	24.06.2024	28.06.2024
II. Farmers training programme				
1.	Plant Health Management in Organic Farming	03	03.04.2024	05.04.2024
2.	On-farm production of bioinputs	02	25.04.2024	26.04.2024
3.	On-farm production of bio-inputs (A special programme for Development foundation, Ghaziabad)	2	06.05.2024	07.05.2024
4.	On-farm production of bio-inputs (A special programme for PDNSM, Maharashtra)	3	06.05.2024	08.05.2024
5.	Bio-input production and demonstration in FCV tobacco	2	09.05.2024	10.05.2024
6.	On-farm production of bio-inputs	02	10.06.2024	11.06.2024
7.	Training cum demonstration program on On-farm production of bio-inputs and application methods	02	12.06.2024	13.06.2024
8.	Bio-input production and application in Organic and Natural Farming Systems	05	18.06.2024	22.06.2024

Training programme for officers

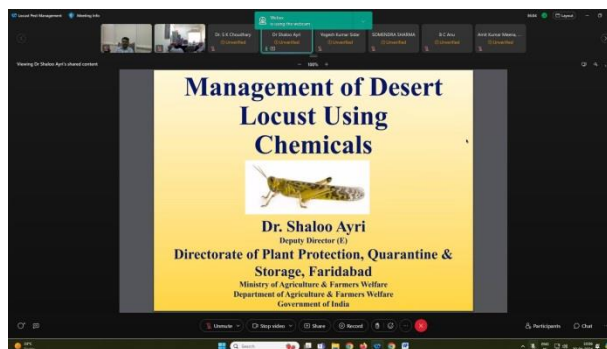
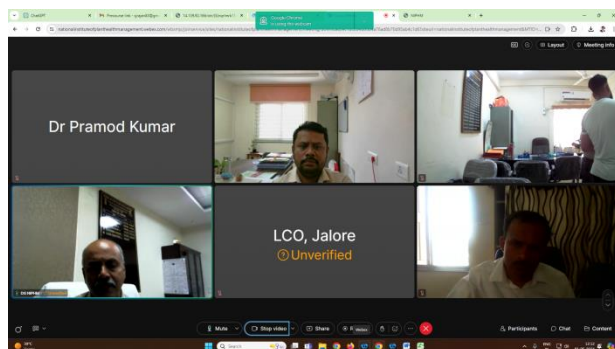
➤ Bio-input Production and Application in Organic and Natural Farming Systems

As part of the capacity building programs proposed under Panjabrao Deshmukh Naisargik Sheti Mission (PDNSM)-Maharashtra, two training programmes on “Bio-input Production and Application in Organic and Natural Farming Systems” were organized from 22.04.2024 to 26.04.2024 and 20.05.2024 to 24.05.2024. A total of 44 field officers from different districts of Maharashtra have participated. They underwent sessions on the 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 was helpful to the participants in the knowledge and skills in on-farm production of bio-inputs, application methods, and establishment of BRCs. Officers shall be able to other field-level staff and farmers in the execution of the bio-inputs production and relevant schemes.



➤ Officers training program on Locust Pest Management

As per the NIPHM training calendar 2024-25, a program on ‘Locust Pest Management’ was organized in online mode from 29th April to 1st May, 2024 (3 days). In this program a total of 39 officers/scientists from different centres of DPPQ&S, SAUs, KVKs, ICAR institutes and state department have participated. In this training the participants were trained with respect to desert locust pest, historical perspective and current status, classification, distribution and diversity of locusts, management of desert locust using chemical methods, surveillance mechanism of desert locust, mechanical control methods, desert locust biology, behaviour and critical factors leading to locust outbreak and bio pesticides uses to control desert locust.



- **Officer training program on ‘On-Farm production of Trichoderma and Pseudomonas using NIPHM media’**
 The training on ‘On-farm production of Trichoderma and Pseudomonas using NIPHM media’ was conducted for Kerala officers from 30.05.2024 to 31.05.2024 (2 days) at NIPHM. A total of 24 officers from different districts of Kerala state have attended this program. Training sessions were conducted on importance of Trichoderma and Pseudomonas in improvement of soil health, on-farm Production of Trichoderma and Pseudomonas using NIPHM media, hands on practice and demonstration on application methods of bio pesticides etc. were organised. The trained officers shall train other officers and farmers who will be beneficiaries under soil health management and productivity improvement scheme.



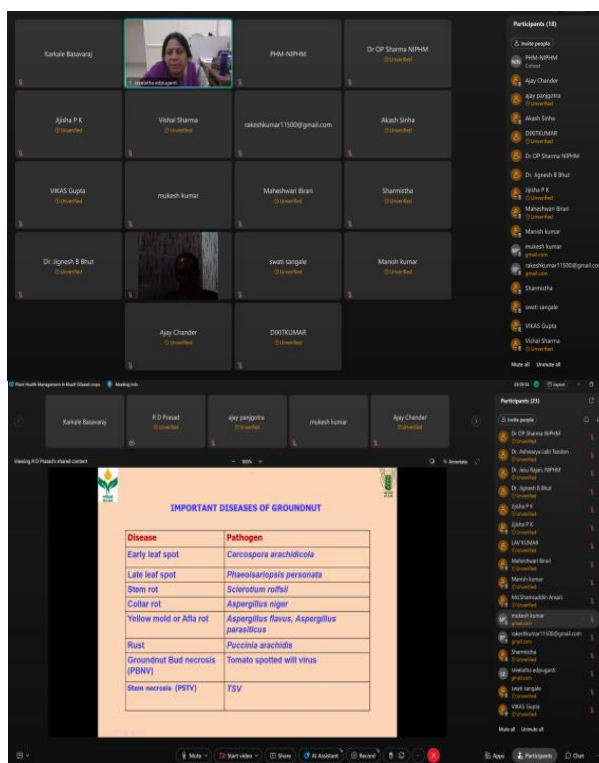
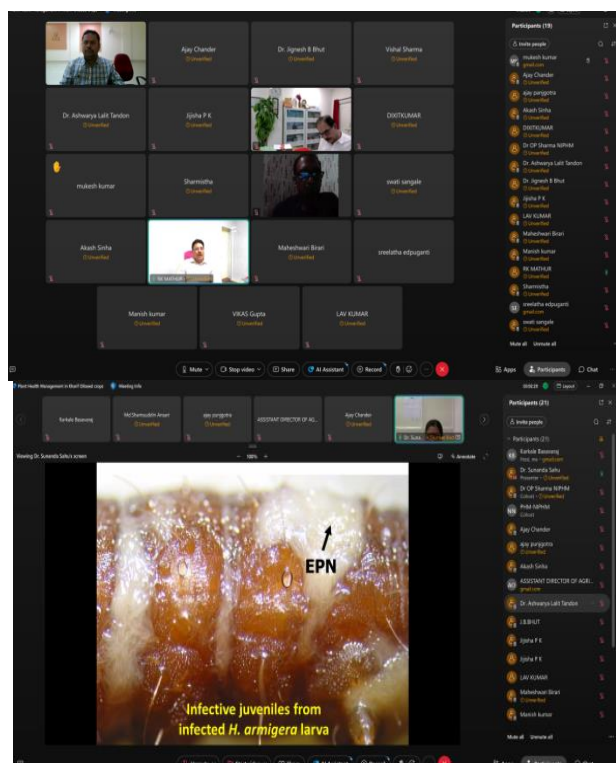
- **Officers training program on ‘Plant Health Management in Protected Cultivation’**
 As per the approved training calendar, organized a training programme on ‘Plant Health Management in Protected Cultivation’ (On-line) 3.06.2024 to 7.06.2024 (5 days). In this program, a total of 15 officials from different states have participated. The participants have undergone different sessions such as IPM in protected cultivation, integrated disease management in protected cultivation, role of predators and parasitoids in protected cultivation, botanical and ITK consortia, preparation and application in protected cultivation. Use of biofertilizers in polyhouse cultivation, predators in protected cultivation, nematode management, role of insect hormones/pheromones in pest management in protected cultivation of high value vegetable crops. Protected cultivation: Opportunity and challenges in protected cultivation of flowers etc. This programme will be more useful for the trained personals as good agricultural practices coupled with integrated pest, disease and nutrient management practices are advocated as comprehensive solution.
- **Officers training program on ‘Plant health management strategies for organic and natural farming systems’**
 As part of the capacity building programs proposed under Panjabrao Deshmukh Naisargik Sheti Mission (PDNSM)-Maharashtra, a training programme on Plant health management strategies for organic and natural farming systems has been organized from 03.06.2024 to 07.06.2024 (5 days). A total of 23 officers from different districts of Maharashtra have participated. They underwent sessions on the concept and principles of organic and natural farming, agro ecosystem analysis, ecological engineering for pest management, protocols and requirements for the establishment of bio-input production centers, hands-on practice sessions on farm-level production of bio-fertilizers, bio-pesticides, and biological control agents, etc. This program shall be helpful to the participants in the

knowledge on protocols for on-farm production of bio-inputs, application methods, and establishment of BRCs. Officers shall be able to train other field-level staff in the execution of the natural farming and relevant schemes.



➤ **Officers training program on ‘Plant Health Management in *Kharif* Oilseed crops’**

As scheduled in NIPHM calendar, an online program on ‘Plant Health Management in Oilseed Crops’ was conducted from 18.06.2024 to 20.06.2024 (3 days) in collaboration with ICAR-IIOR. A total of 17 officers from different states have attended this program. Various topics of Plant Health Management viz., integrated pest management, resistant genotypes, nutrient management, diagnosis & management of major diseases, agro ecosystem analysis and ecological engineering in oil seeds, use of entomopathogenic nematodes in insect pest management, on-farm production and use of bio fertilizers and bio pesticides in *Kharif* oilseed crops were covered.



➤ **Officer training program on ‘Integrated Soil Health and Weed Management’**

A training programme on Integrated Soil Health and Weed Management was organized at NIPHM from 24.06.2024 to 28.06.2024 (5 days). A total of 23 officials from different organizations have participated. During

this training programme, different aspects such as living soil concept, soil health management approaches, carbon management, role of bio-fertilizers in soil health management, integrated nutrient management for sustainable farming, soil diagnosis- rapid and automated, carbon crediting in agriculture, ecological engineering for soil pest management, nematode management for healthy soil, rhizosphere engineering strategies for enhancing microbial population in soil, problematic weeds and their management, herbicide uses & its impact on agro-ecosystem, approaches in integrated weed management, soil health assessment- biological soil indicators, soil microbial count estimation, weed surveillance & invasive weeds, application of remote sensing in soil health mapping etc. and practical sessions held accordingly. The participants have visited soil health institute, PJTSAU. Participants interacted in groups for on-going activities and shared their experiences.



Farmers training programmes

➤ Farmer training programs on Plant Health Management in Organic Farming

A special programme for the farmers of Latur, Maharashtra State on “Plant Health Management in Organic Farming” was organised from 3.04.2024 to 05.04.2024 (3 Days). The training program was sponsored by state department of agriculture under ATMA Project. Total 38 farmers have attended this program. Farmers have been trained on scope and opportunities of bio-control in organic and natural farming, agro ecosystem analysis, ecological engineering for pest management, protocols and requirements for the establishment of bio-input production centers, hands-on

practice sessions on farm-level production of bio-fertilizers, biopesticides, and biological control agents, etc. The participants visited to AICRP-IFS unit, PJTSAU, Rajendranagar and seen the farming models available for dry and irrigated lands.



➤ **Farmers training programs on On-farm production of bioinputs**

Plant Health Management division in collaboration with Development Foundation, Gaziabad has organized a training program for farmers of Maharashtra from 25.04.2024 to 26.04.2024 (2 days) with 30 farmers, two BTM and one facilitator from Development Foundation. The participants underwent sessions on on-farm production of bio-fertilizers, bio-pesticides, and biological control agents, etc. This program shall be helpful to the farmers in the knowledge and skills for on-farm production of bio-inputs and their application methods.



➤ **Farmers training program on ‘On-farm production of bio-inputs (A special programme for Development Foundation, Ghaziabad)**

The FPO farmers training programme on *On-farm production of bio-inputs* was organized from 06.05.2024 to 07.05.2024 (2 days). A total of 41 FPO farmers from different districts of Maharashtra have participated. They underwent hands-on training sessions like on-farm production of bio-fertilizers, biopesticides, 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. The farmers were also exposed to different facilities of NIPHM such as, insect museum, laboratories of PBD, PHM & PHE workshop.



➤ **Farmer training program on On-farm production of bio-inputs (A special programme for PDNSM, Maharashtra)**

As part of the capacity building programs funded under Panjabrao Deshmukh Naisargik Sheti Mission (PDNSM)-Maharashtra, training programme on *On-farm production of bio-inputs* was organized from 06.05.2024 to 08.05.2024 (3 days). A total of 27 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, bio pesticides, and biological control agents, etc. This program shall be helpful to the farmers in gaining knowledge of protocols for on-farm production of bio-inputs, skills in application methods, establishment of BRCs, etc. Participants shall be able to initiate the bio inputs production as rural enterprises and it may support in promotion of organic and natural farming in Maharashtra. The farmers have visited NIPHM laboratories, AICRP-IFS unit, PJTSAU, Hyderabad and experienced the significance of integrated farming systems in organic and natural farming practices and preparations adopted by the unit.



➤ **Farmer training program on Bio-input demonstration in FCV tobacco**

As requested by Tobacco Board, the demonstration was facilitated at Periyapatna and Ramnathpura regions of Karnataka. During this programme, the importance of bio-inputs (*Trichoderma*, *Pseudomonas fluorescens*, potassium releasing bacterial bio-fertilizer) in FCV tobacco was explained. A total of 160 tobacco growers attended and interacted about application methods of bio-inputs. Further, demonstrated the usage of bio inputs in the enrichment of coco peat and FYM, drenching in trays with NIPHM bio-inputs. The two-day demonstrations were facilitated successfully in collaboration with Tobacco Board, Karnataka.



➤ **Farmer training program on ‘On-farm production of bio-inputs**

Plant Health Management division in collaboration with Development foundation, Gaziabad has organized a farmer training program for farmers of Maharashtra from 10.06.2024 to 11.06.202 (2 days). A total of 21 FPO farmers from different districts of Maharashtra have been participated in the training program. They underwent

hands-on training sessions like on-farm production of bio-fertilizers, biopesticides, biological control agents, etc. This program shall be helpful to the farmers in the knowledge on protocols for on-farm production of bio-inputs and their application methods.



➤ **Farmer training cum demonstration program on ‘On-farm production of bio-inputs and application methods’**

In collaboration with ATMA, Nashik two off-campus training programs on 12.06.2024 & 13.06.2024 were conducted in different locations of Nashik district, Maharashtra. A total of 574 farmers are benefited in these training programs. By creating awareness on different bio-inputs (*Trichoderma*, *Pseudomonas fluorescens*, liquid bio-fertilizers, and VAM biofertilizers) and their role in plant health management. On-farm production of liquid biofertilizers, VAM biofertilizers, biopesticides using low-cost media technology was shown to farmers





➤ **Farmer training program on ‘Bio-input production and application in Organic and Natural Farming Systems’**

A special training programme on Bio input Production and application in organic and natural farming systems under sponsorship of PD-ATMA, Solapur, and Maharashtra has been organized from 18.06.2024 to 22.06.2024 (5 days) with a total of 34 FPO members. The participants underwent hands-on training sessions like Agro Ecosystem Analysis, Ecological Engineering for pest management, on-farm production of bio-fertilizers, bio-pesticides, and biological control agents, etc. The program was appreciated by farmers in terms of acquiring knowledge and skills of protocols for on-farm production of bio-inputs, application methods, establishment of BRCs, etc. FPO group members shall able to initiate the bio-inputs production as rural enterprises and it may enhance cultivated areas under organic and natural farming in Maharashtra.



Forthcoming training programmes in PHM Division

S No	Name of the programme	No. of Days	From	To
I. Officers training programmes				
1.	Production Protocol for Bio-control Agents (Predators, parasitods, microbial bio pesticides & Bio fertilizers)	21	18.07.2024	07.08.2024
2.	Bio-inputs production and application in organic and natural farming systems	05	29.07.2024	02.08.2024
3.	Production Protocol for Bio- fertilizers	03	05.08.2024	07.08.2024
4.	Plant Health Management in Vegetable Crops	05	12.08.2024	14.08.2024
5.	Bio-inputs production and application in organic and natural farming systems	05	19.08.2024	23.08.2024
6.	On-Farm production of biocontrol agents and microbial biopesticides	10	21.08.2024	30.08.2024
7.	Bio-inputs production and application in organic and natural farming systems	05	02.09.2024	06.09.2024
8.	Production Protocol for Entomopathogenic Nematodes	05	09.09.2024	13.09.2024
9.	Pest problems and their management under changing climatic scenario – Online	03	18.09.2024	20.09.2024
10.	Pest diagnosis and management in major crops	05	23.09.2024	27.09.2024
11.	Plant Health Management in Rabi Oilseed crops – Online	03	25.09.2024	27.09.2024
II. Farmers training programmes				
1.	Establishment of bio-input production centre (One program in each quarter)	03	Dates to be decided	
2.	On farm production of bioinputs	03		
3.	On farm production of bioinputs	03		
4.	On farm production of bioinputs	03		

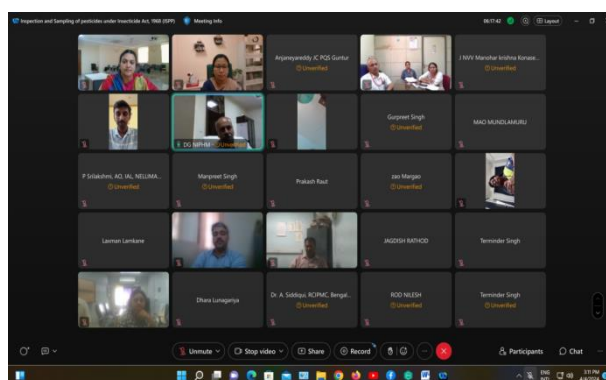
CAPACITY BUILDING PROGRAMMES:

Pesticide Management Division has organized following training programmes during the period **April-June, 2024.**

Sl. No.	Name of the programme	No. of Days	From	To
1.	Inspection, Sampling and Prosecution Procedures under Insecticide Act, 1968 (ISPP)	03 (online mode)	02.04.2024	04.04.2024
2.	Role of PT and ILC in maintaining accreditation as per the ISO/IEC 17025:2017”	01 (online mode)	22.05.2024	-
3.	Laboratory Quality Management and Internal Audit as per the ISO/IEC17025:2017	05	10.06.2024	14.06.2024

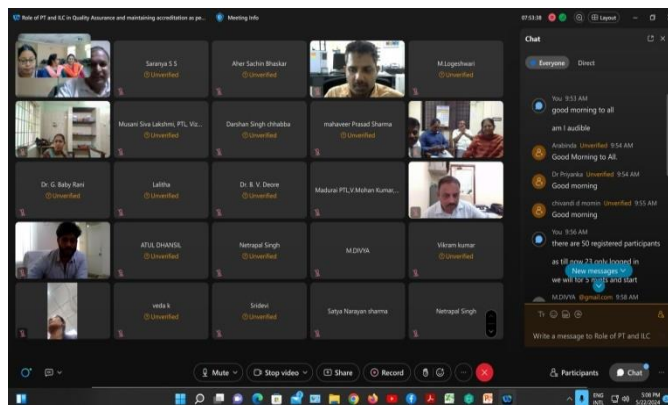
➤ **Inspection, Sampling and Prosecution Procedures under Insecticide Act, 1968 (ISPP):**

The division has conducted 3 days training programme on **“Inspection and Sampling of pesticides under Insecticide Act, 1968 (ISPP)”** from **02.04.2024 to 04.04.2024 (Online mode)**. A total of **44 officers** have participated from nine States viz. Jammu & Kashmir, Karnataka, Punjab, Maharashtra, Gujarat, Goa, Assam, Andhra Pradesh and Tamil Nadu. The participants were trained on various techniques of inspection, sampling of pesticides for quality control and various aspects of the Insecticide Act , 1968 & Insecticide Rules 1971.



➤ **Role of PT and ILC in Quality Assurance and maintaining accreditation as per the ISO/IEC 17025: 2017**

The division has conducted one day training programme on **“Role of PT and ILC in maintaining accreditation as per the ISO/IEC 17025:2017”** on **22.05.2024 (online mode)**. A total of **50 participants** were participated from State Agriculture Department of Andhra Pradesh, Gujarat, Kerala, Maharashtra, Meghalaya, Orissa, Rajasthan, Punjab and Tamil Nadu. The participants have trained on importance of participation of Proficiency Testing/ILC and the process of conduction of Interlaboratory comparison (ILC) programme.



➤ **Laboratory Quality Management and Internal Audit as per the ISO/IEC17025:2017:**

The division has conducted training programme on “**Laboratory Quality Management system and Internal Audit as per the ISO/IEC 17025:2017**” from 10.06.2024 to 14.06.2024. A total of 13 participants were participated from State Agriculture Department of, Maharashtra, Himachal Pradesh, Tamil Nadu and Horticulture Univ. Andhra Pradesh, ICAR-IIHR Karnataka and Agriculture Univ. (SKUAST) Jammu & Kashmir. The participants were trained on importance of laboratory accreditation and the requirements for the competence of testing laboratory as per ISO/IEC 17025:2017



Laboratory Quality Management system & Internal Audit as per the ISO/IEC17025:2017

Forthcoming training programmes:

Sl. No.	Title of the Programme	Duration (days)	From	To	Eligibility Criteria
1.	Inspection, Sampling and Prosecution Procedures under Insecticide Act, 1968 (ISPP)	4	02.07.2024	05.07.2024	Prospective or designated Insecticide Inspector (Central / State)
2.	*Sampling of Fruits, Vegetables and other items for Pesticide Residue Analysis	2	08.07.2024	09.07.2024	Analysts / Scientists working in Govt. labs/Universities

3.	*Sampling of Fruits, Vegetables and other items and Calibration of laboratory equipment for Pesticide Residue Analysis	5	08.07.2024	12.07.2024	Analysts / Scientists working in Govt. labs/Universities
4.	Pesticide Formulation Analysis (PFA)	60	23.07.2024	20.09.2024	Analysts working at SPTLs / RPTLs/ CIL
5.	Testing of Physicochemical properties of Pesticide formulations	5	05.08.2024	09.08.2024	Analysts working at SPTLs / RPTLs/ CIL
6.	Impact of Pesticide Residues on food safety & agri. Exports	4	26.08.2024	29.08.2024	Agricultural / Horticultural Officer (or equivalent position) working in State Department / Science Graduates

Plant Health Engineering Division

CAPACITY BUILDING PROGRAMMES:

Plant Health Engineering Division has conducted the following programs during the period Apr-Jun 2024

S No	Category	Name of the programme	No. of Days	From	To
1.	Officers	Remote Sensing and GIS applications in Plant Health Management	03	14.05.2024	16.05.2024
2.	Officers	Pesticide Application Techniques and Safety Measures	05	10.06.2024	14.06.2024

Drone Remote Pilot Certification

S No.	Name of Training Program/ Webinar	From (dd-mm-yyyy)	To (dd-mm-yyyy)	Duration (in days)	On/Off Campus
1.	Drone remote Pilot Certification	23.04.2024	27.04.2024	05 days	On campus
2.	Basic Remote Pilot Certification	06.05.2024	11.05.2024	05 Days	On campus
3.		14.05.2024	18.05.2024	05 Days	On campus

4.	Agricultural Drone Remote Pilot Certification	14.05.2024	25.05.2024	12 Days	On campus
5.		20.05.2024	31.05.2024	12 Days	On campus
6.	Basic RPC (Drone Training) course	03.06.2024	07.06.2024	05 Days	On campus
7.		11.06.2024	16.06.2024	05 Days	On campus
8.		18.06.2024	22.06.2024	05 Days	On campus

➤ **Drone remote Pilot Certification:**

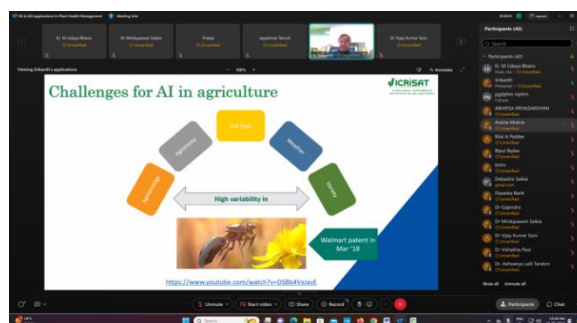
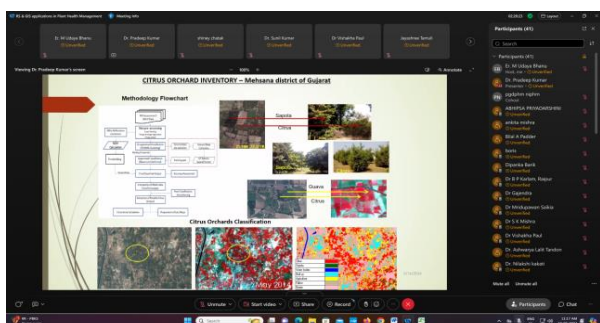
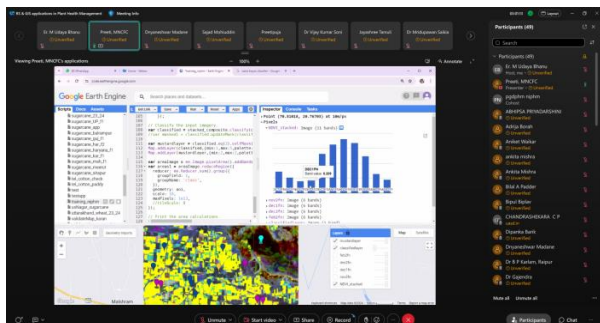
A 5-day programme conducted during **23rd to 27th April 2024** for 06 (Male-3, Female-3) participants. Lectures were arranged on topic Introduction about international civil aviation organization, RPAS with in ICAO frame work, formation of RPAS, Classification of drones, Drone operation zones, ATC procedure , 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 and simulation practical and filed practical on drone completed.



➤ **Remote Sensing and GIS applications in Plant Health Management**

A 3 day virtual training program on “Remote Sensing and GIS applications in Plant Health Management” was organized from 14th to 16th May 2024. 48 participants from 11 different states participated in the training program. The participants were enriched with basic principle of remote sensing, basic concepts of GIS, and applications of RS & GIS in agriculture, different open source and commercial software available. Also the participants enriched their knowledge on various case studies of RS & GIS in agriculture through different Crop models, Crop yield forecasting and Crop Insurance inputs based on estimation of crop damage; Digital Image Processing on how to enhance the quality of images, extract meaningful information from images, and automate image-based tasks; Image classification and accuracy assessment for different crops identification using pixels, method of crop area

identification, how the crop area is estimated from Google engine and demonstration of FASAL; different data sources available along with their platforms, demonstrated drought monitoring mapping, mapping of flood and effected areas; RS & GIS for horticulture assessment and development by the Eminent speakers.



➤ **Basic Remote Pilot Certification:**

This training is part of the Drone Academy who 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. Training conducted from 6th to 11th May 2024 and total 14 candidates (8 male and 6 female) attended the 5-day programme. Second programme from 14th to 18th May 2024, and 4 candidates (3 male and 1 female) attended the 5 day programme. Total 4 candidates (3 male and 1 female) attended the 5-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 2 days of on-field flying classes also were conducted in dual as well as solo mode.



➤ **Agricultural Drone Remote Pilot Certification:**

NIPHM started conducting agricultural chemical spraying training through drones. Two training programmes on agricultural drone pilot certification conducted, trainings were conducted in association certification conducted for FPO members, training was conducted in association with Cornell Sathguru Development Foundation with financial support from NABARD. Two training programmes on Agriculture Drone Remote Pilot Certification conducted. Training conducted from 14th to 25th May 2024 and total 13 male candidates attended the 12-day programme. Second programme from 20th to 31st May 2024 12 candidates (11 male and 1 female) candidates attended the 12-day programme. In addition to general aviation topics like International civil aviation organization, RPAS with in ICAO frame work, Classification of drones, Drone operation zones, ATC procedure and radio telephony and flight radio telephony, etc., Agricultural Standard Operating procedures during chemical spraying, Crop specific SOPs, Nozzles and their functionality, Dos and Don'ts in chemical spraying, safety, care and maintenance of drones and agri sparing system etc. also were dealt in detail. Lab assembly of drones and simulation experiments of drones also were conducted. Exclusive five days of flying also were arranged for the trainees.





➤ **Pesticide Application Techniques and Safety Measures**

An online training programme organized on “Pesticide application techniques and Safety Measures” for 27 (Male- 14, Female- 13) various state officials from 10.06.2024 to 14.06.2024. The participants were explained different application techniques, different nozzles for application of chemicals and special emphasize given on safety precautions while handling of pesticide with showing the adverse effects of pesticide by slow poisoning video. Participants were also explained about different types of sprayers and nozzles for major crops.

➤ **Remote Pilot Certification:**

03 RPC training for 5-days programme conducted during 03rd to 07th May 2024 for 10 participants, 11th to 16th May for 11 participants and 18th to 22nd May 2024 for 04 participants. Lectures were arranged on topic Introduction about 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 and simulation practical and filed practical on drone completed.

Forthcoming training programmes

S.No	Title of the Programme	Division	From	To	Eligibility criteria	Course Coordinator & e-mail
1.	*Irrigation systems and advancements	PHE	09.07.2024	11.07.2024	Extension officers from State Agriculture and Horticulture departments, Scientists of ICAR, SAUs and officials from KVKs, DPPQs	Er. Govind Maurya asopheniphm1-ap@nic.in

2.	Digital Agriculture	PHE	22.07.2024	24.07.2024	Extension officers from State Agriculture and Horticulture departments, Scientists of ICAR, SAUs and officials from KVKs, DPPQs	Er. Liyakhat Ali Ahmed Shaik adict-niphmhyd@gov.in
3.	Pesticide application techniques and safety measures	PHE	19.08.2024	23.08.2024	Extension officers from State Dept. of Agri./ Horti., soil survey, soil conservation, Watershed Project, Scientists of ICAR/ SAUs , etc.	Er. M. Udaya Bhanu sopheniphm2-ap@nic.in
4.	Post-harvest management and storage techniques	PHE	23.09.2024	27.09.2024	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

- World Environment Day was celebrated on 05-06-2024 @ NIPHM. Various programs were organized as part of the celebrations and the subjects covering “Land Restoration, Desertification and Drought Resilience”. PGDPHM students were given the lead to conduct a quiz on the related subjects and prizes were distributed to the winners by the Director General, Sh. Sagar Hanuman Singh I.Po.S.



- 10th International Day of Yoga was celebrated by NIPHM on 21-06-2024. Yoga session was conducted from 6.30am to 7.30 am. The staff and trainees attended the session with enthusiasm.



Research & Development

- 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.
- Hot Water Immersion Treatment (HWIT) of Chillies at Commercial scale -Funded by APEDA.
- Evaluation of Animal Out repellent against the wild boar & rodents
- In-house study on Feeding preference and development of stored pests in different millets and screening of plant powders for management
- AICRP- Biocontrol is continued during the quarter. PHM faculty attended the annual work shop through online mode.
- **Pesticide Formulation and Residue Analytical Centre (PFRAC):**

Pesticide Formulation and Residue Analytical Centre (PFRAC), Pesticide Management Division, is an accredited laboratory in accordance to ISO/IEC 17025:2017.

During the period the laboratory has collected 270 samples (Fruits, vegetables, cereals, pulses, milk and water) from Medchal-Malkajigiri Farm gate, Saidabad and Alwal market Hyderabad and Organic Outlets of Hyderabad under Central Sector Scheme “Monitoring of Pesticide Residues at National Level (MPRNL). The samples were analyzed for pesticide residues by LC-MS/MS and GC-MS/MS.

A total of 162 samples (fruit and vegetables) were received from ANGRAU and 105 water samples (extract) from CSIR-NEERI. The samples were analyzed under MPRNL scheme. The division has also received 62 tobacco samples from Tobacco Board, Guntur and the samples were analyzed.

A total of 14 botanical/bio-pesticides and 70 Azadiractin samples were received from various state of India. The samples were analyzed by GC-MS/MS and LC-MS/MS. A total of 06 pesticides formulation samples were received from National Seed Corporation (Raichur, Karnataka) for quality test of pesticide product. All the samples were analyzed. Moreover, samples under Interlaboratory Comparison programme were also analysed.



Pesticide Formulation and Residue Analytical Center laboratory

➤ **Proficiency testing (PT) programme on Pesticide Residues Analysis (PT-PRA):**

PTC, PMD has conducted PT PRA programme on Tomato and Guava in the month of January 2024 and the samples were dispatched on 31st January 2024. Analysis results of 32 participants were evaluated and final PT reports were sent to the participants.

Proficiency testing programme on Pesticide Formulation Analysis (PT-PFA):

PT-PFA programme on Ethion Technical for Active Ingredient (PTC/PF/04/23-24), Emamectin Benzoate SG for Active ingredient (PTC/PF/05/23-24), Chlorpyrifos + Cypermethrin EC for Active ingredient, Emulsion Stability (PTC/PF/06/23-24) was initiated in the month of November 2023. Final Report of Ethion Technical (Active ingredient), Emamectin Benzoate SG (Active ingredient) and Chlorpyrifos + Cypermethrin EC (Active ingredient & Emulsion Stability) were sent to 43 participants (Govt. and Pvt. Laboratories).

PT-PFA programme 2024-25: Pre-analysis of Lambda Cyhalothrin Technical, Imidacloprid WS and Fenvalerate EC (PTC/PF/01/02 & 03 /24-25) were completed for the PT-PFA programme 2024-25. Samples of Lambda Cyhalothrin Technical (60 nos.), Imidacloprid WS (55 nos.) and Fenvalerate EC (65 nos.) were prepared, packed and dispatched.



Sample preparation (PT- Pesticide Formulation Analysis)

Faculty Achievements

- AD (PS) attended International training Program on Smart farming and Precision Agriculture scheduled during 24th to 28th June, 2024 in Malaysia sponsored by MTCP, Govt. of Malaysia. Total 15 participants from 15 countries attended the program and learnt about innovative practices leverage advanced technologies like IoT, drones, AI, and big data to revolutionize agriculture. By using sensors to monitor soil and crop health, drones for aerial imaging, and data analytics for informed decision-making, farmers can optimize resource use, increase yields, and promote sustainability.



Other Activities

- **Farmer Advisory Cell Activities:**
 Under farmers advisory cell, faculty are interacted farmers about their queries related to plant protection, bioinputs usage etc. Total 103 farmers approached NIPHM through telephonic communication during the quarter.
- **NIPHM Instructional farm**
 During the quarter, crops like paddy, tomato, turmeric, cowpea, maize, green gram, brinjal and bhendi were grown and appropriate IPM practices were followed. The crops were raised with minimum use of chemical inputs.
- **Polyhouse (Protected cultivation)**
 During this quarter, chilli was sown and necessary IPM practices for the pests observed were carried out apart from routine weeding and irrigation.
- **Village Adoption:**
 As part of the development of model IPM village by NIPHM, the farmers encouraged for organic farming practices.
- **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) and sale

- Urban pest insect box preparation
 - Maintenance of vermicompost unit and sale
 - Disease specimen- Herbarium collection
- Meeting conducted attended with representatives from Ms Pavaman Aviation with regard to future possible collaborations
- The drip system for the campus orchards was initiated from the division, as advised by competent authority.
- The syllabus finalization of the course for the second semester PGDPHM was done. Course formats prepared and topics finalized.
- Worked out modules for students' training programme and drafted letter for engineering colleges offering Agricultural Engineering.
- Water conservation measures at NIPHM were initiated using the STP treated water.
- As part of the skill up gradation and uniformity in conduction of class, the second class was conducted on 6th April 2024 (Saturday). Session on transmitter and mission planer was covered in the class. The instructors and pilots took part in the programme.
- Natural Farming trainees (40) from MANAGE visited workshop acquainted with various equipment's and procedures.

**Chief Editor**

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Director General****National Institute of Plant Health Management (NIPHM)**

Department of Agriculture & Farmers Welfare,
Ministry of Agriculture & Farmers Welfare, Government of India
Rajendranagar, Hyderabad – 500 030, Telangana, India
Tele Fax. +91 40 24015346, niphm@nic.in