



राष्ट्रीय वनस्पति स्वास्थ्य प्रबंधन संस्थान
National Institute of Plant Health Management

<https://niphm.gov.in>

Promoting Plant Health Management
since 2008 ...

Quarterly
Plant Health

Volume: XX
January - March, 2024

Issue: 1

NEWS LETTER

THEME ARTICLE



SPECIAL EVENTS



WHAT'S INSIDE

TOPIC/ ARTICLE

PAGES

Theme Article	3 – 13
Around the World	13
Trainings	14 - 52
Research & Development	53 – 55
Extension Activities	55
Other Activities	56 – 59





From the Director General's Desk

Adopting natural farming practices and sustaining them poses many challenges for the farmers; particularly poor knowledge dissemination, increased efforts to procure raw materials, and lack of access to valued markets amongst others. The preparation and availability of bio-inputs, which is an alternate option for synthetic chemical pesticides and fertilizers have been a roadblock in the journey to elevate natural farming in India. The knowledge-intensive procedure, lower shelf life, storage constraints, and availability of raw materials were some of the hurdles while dealing with bio-inputs

Bio-input Resource Centers' (BRCs) are one of the possible input support systems that could help in resolving this issue of accessibility to natural farm inputs. Its promotion, as a single-stop shop for all bio input needs, will not only help farmers to learn but also adopt these technologies in their farms to sustain their livelihood and to make it professionally viable and profitable.

As you know the importance of moving towards 'natural and regenerative agriculture, he gave special emphasis on the need to 'ensure the quality of bio-inputs prepared and supplied by the BRC enterprises' and how such centers can play a vital role in the transition towards Natural Farming.

National Institute of Plant Health Management (NIPHM), an Autonomous Organization under Department of Agriculture & Farmers Welfare (MoA & FW), Govt. of India aims to develop a committed and competent cadre of professionals to promote sustainable plant health management in India. Since, Plant health is influenced by several biotic and abiotic factors such as soil, nutrient management, insect pests, diseases, weeds, etc; NIPHM is putting efforts into the synergistic use of complementary management practices to promote soil fertility and plant health.

Further, the institute has developed various low-cost technologies and inputs to minimize chemicals in agriculture and to promote non-chemical ways to control pests and soil/plant health management. 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. Experiences of NIPHM while working in the States of Tamil Nadu, Maharashtra, Telangana, Andhra Pradesh, Chhattisgarh, etc. have revealed that awareness and accessibility of low-cost bio-input production technologies may be keys to boosting the adoption of organic and natural farming in the country.

Specific to promoting INM, organic farming and natural farming; NIPHM is conducting a number of programs viz. Certificate Course in Organic Farming, ASCI programme for Organic Growers & Vermicomposting for rural youths, training on INM for officers, on-farm production of bio-control agents, bio-pesticides, bio-fertilizers, etc. The institute has lab facilities for the preparation of various natural & bio-inputs, a farm unit for demonstration of organic/natural farming interventions, etc.

This type of small microenterprise unit accommodates support to the practice of Natural Farming and improves the productivity of crops, vegetables, and fruit crops in the villages improving the confidence levels of farmers about the use of organic and bio inputs will go up. Further, the quality of soil improved for the future of agriculture. The improved production levels of the village will pave the way for the development of infrastructure facilities like Storage godowns, Market outlets, etc.

प्राकृतिक कृषि पद्धतियों को अपनाया एवं उन्हें बनाए रखने में किसानों को कई चुनौतियाँ का सामना करना पड़ता है; खास तौर पर खराब जानकारी का प्रसार, कच्चे माल की खरीद के लिए बढ़ते प्रयास और मूल्यवान बाजारों तक पहुँच की कमी आदि। जैवइनपुट की- तैयारी और उपलब्धता, जो सिंथेटिक रासायनिक पीड़कनाशियों एवं उर्वरकों के लिए एक वैकल्पिक विकल्प है, भारत में प्राकृतिक खेती को आगे बढ़ाने की यात्रा में एक बाधा रही है। जैवहनन प्रक्रिया-इनपुट से निपटने में ज्ञान-, कम शेल्व लाइफ, भंडारण की बाधाएँ और कच्चे माल की उपलब्धता कुछ बाधाएँ थीं।

बायोसंभावित इनपुट सहायता प्रणालियों में से एक है जो प्राकृतिक कृषि इनपुट (बीआरसी) इनपुट रिसोर्स सेंटर- तक पहुँच के इस मुद्दे को हल करने में मदद कर सकता है। सभी जैव इनपुट आवश्यकताओं के लिए एकलस्टॉप - शॉप के रूप में इसका प्रचार न केवल किसानों को सीखने में मदद करेगा बल्कि अपनी आजीविका को बनाए रखने एवं इसे व्यावसायिक रूप से व्यवहार्य और लाभदायक बनाने के लिए अपने खेतों में इन तकनीकों को अपनाने में भी मदद करेगा।

जैसा कि आप 'प्राकृतिक एवं पुनरुत्पादक कृषि' की ओर बढ़ने के महत्व को जानते हैं, उन्होंने 'बीआरसी उद्यमों द्वारा तैयार एवं आपूर्ति की गई जैवइनपुट की गुणवत्ता सुनिश्चित करने-' की आवश्यकता पर विशेष जोर दिया और बताया कि कैसे ऐसे केंद्र प्राकृतिक खेती की ओर संक्रमण में महत्वपूर्ण भूमिका निभा सकते हैं।

राष्ट्रीय वनस्पति स्वास्थ्य प्रबंधन संस्थान (ईपीएचएमएनआ), कृषि एवं किसान कल्याण विभाग एमओए एवं) (एफडब्ल्यू भारत सरकार के अंतर्गत एक स्वायत्त संगठन है। इसका उद्देश्य भारत में स्थायी वनस्पति स्वास्थ्य प्रबंधन को बढ़ावा देने के लिए व्यावसायिक का एक प्रतिबद्ध एवं सक्षम कैंडिड विकसित करना है। जबकि, वनस्पति स्वास्थ्य कई जैविक और अजैविक कारकों जैसे मिट्टी, पोषक तत्व प्रबंधन, पीड़क कीट, रोग, खरपतवार आदि से प्रभावित होता है; एनआईपीएचएम मिट्टी की उर्वरता और पादप स्वास्थ्य को बढ़ावा देने के लिए पूरक प्रबंधन प्रथाओं के सहक्रियात्मक उपयोग में प्रयास कर रहा है।

इसके अलावा, संस्थान ने कृषि में रसायनों के उपयोग को कम करने तथा पीड़कों एवं मृदापौधों के स्वास्थ्य / रासायनिक तरीकों को बढ़ावा देने के लिए विभिन्न कम लागत वाली-प्रबंधन को नियंत्रित करने के लिए गैर प्रौद्योगिकियों और इनपुट का विकास किया है। संस्थान विभिन्न राज्य सरकारों, आईसीएआर, केवीके, एसएचजी, एफपीओ और अन्य संगठनों को ऑनकैम्पस-, ऑफकैम्पस और ऑनलाइन मोड के माध्यम से - प्रशिक्षण, प्रदर्शन और जागरूकता गतिविधियों को प्रदान करके तकनीकी सहायता भी प्रदान करता है। तमिलनाडु, महाराष्ट्र, तेलंगाना, आंध्र प्रदेश, छत्तीसगढ़ आदि राज्यों में काम करते हुए एनआईपीएचएम के अनुभवों से पता चला है कि कम लागत वाली जैवइनपुट उत्पादन प्रौद्योगिकियों के बारे में जागरूकता और - पहुँच देश में जैविक और प्राकृतिक खेती को अपनाने को बढ़ावा देने की कुंजी हो सकती है।

आईएनएम, जैविक खेती एवं प्राकृतिक खेती को बढ़ावा देने हेतु एनआईपीएचएम कई कार्यक्रम चला रहा है जैसे जैविक खेती में सर्टिफिकेट कोर्स, जैविक उत्पादकों के लिए एएससीआई कार्यक्रम एवं ग्रामीण युवाओं के लिए वर्मीकंपोस्टिंग, अधिकारियों के लिए आईएनएम पर प्रशिक्षण, जैवनिय-ंत्रण एजेंटों, जैवपीड़कनाशियों -, जैव-इनपुट की तैयारी के लिए-फार्म उत्पादन। संस्थान में विभिन्न प्राकृतिक एवं जैव-उर्वरकों आदि का ऑन प्रयोगशाला सुविधाएं, जैविक प्राकृतिक खेती हस्तक्षेपों के प्रदर्शन के लिए एक फार्म इकाई आदि हैं।

इस प्रकार की लघु सूक्ष्म उद्यम इकाई प्राकृतिक खेती के अभ्यास को समर्थन प्रदान करती है और गांवों में फसलों, सब्जियों एवं फलों की फसलों की उत्पादकता में सुधार करती है, जिससे जैविक और जैव इनपुट के उपयोग के बारे में किसानों का आत्मविश्वास बढ़ता है। इसके अलावा, कृषि के भविष्य के लिए मिट्टी की गुणवत्ता में सुधार हुआ है। गांव के बेहतर उत्पादन स्तर से भंडारण गोदामों, बाजार दुकानों आदि जैसी बुनियादी सुविधाओं के विकास का मार्ग अनुकूल होगा।

Dr. Saagar

(डॉ. सागर हनुमान सिंह, भा.डा.से.)

महानिदेशक

Establishment of Bio-input Resource centers: Need to sustainable farming

Dr. OP Sharma, Director-PHM & Dr K Damodara chari, ASO-microbiology,
Plant Health Management Division, NIPHM, Rajendranagar, Hyderabad

With the advent of modern inputs, namely, chemical fertilizers, pesticides etc. during post world war II and to meet the demand for food production for the huge population from limited land area, India too started using chemical inputs etc. during late fifties. This was the advent of ‘Green Revolution’ in India in 1968 with new chemical inputs and high yielding varieties of crops. Undoubtedly, this was a great stride towards self-sufficiency in food. But, the Green Revolution is now showing the second generation problems like soil fatigue due to intensive cultivation and inadequate and imbalanced fertilizer use, stagnation in yield of high yielding varieties, continuous decrease in the input use efficiency, declining soil organic carbon content, declining water table, increasing problems of soil salinity and environmental degradation, etc. The productivity of major cereal crops like wheat and rice is declining in many states. Soil in the U.S.A. has lost much of its fertility within a span of just three hundred years, whereas India’s soil retains its fertility till today, even though farming has been going on for last years. Tractor’s ploughing and use of fertilizers will bring loss of fertility, eventually causing incalculable and irreparable harm to the country.”

Therefore, what we need is a reduction in the use of market purchased chemical input and not of inputs per se. It is in this context that integrated system of nutrient supply suitable for easy adoption includes crop rotations, green manure, bio-fertilizers and bio dynamic systems that make significant use of compost and humus, will help to improve soil structure and fertility”. Report of the working group on ‘Organic and biodynamic farming’ for the five year plan published by Planning Commission, Government of India in 2001 also supports the above mentioned views and suggests organic and biodynamic farming principle and practices to improve the health of soil, plants, animals, men and environment. It is estimated that 65% of the country’s cropped area is organic by default as the small farmers have no choice but to farm without chemical fertilizers and pesticides as they cannot afford these.

Keeping in view the importance of soil and plant health, NIPHM aims to develop a committed and competent cadre of professionals to promote sustainable plant health management in India. Since, Plant health is influenced by several biotic and abiotic factors such as soil, nutrient management, insect pests, diseases, weeds, etc; NIPHM is putting efforts into the synergistic use of complementary management practices to promote soil fertility and plant health. NIPHM opens its annual training schedule well in advance to all States and stakeholders at the national and international levels to offer capacity-building programs in the areas of plant health management, plant bio-security, invasive alien species, market access, pesticide management, plant health engineering, etc. for eco-friendly pest management approaches.

The institute has developed various low-cost technologies and inputs to minimize chemicals in agriculture and to promote non-chemical ways to control pests and soil/plant health management. The institute also provides technical support to various State Governments, ICAR, KVKs, SHGs, FPOs and other organizations by imparting training, demonstration and awareness activity through on-campus, off-campus and online modes. While working in the States of Tamil Nadu, Maharashtra, Telangana, Andhra Pradesh, Chhattisgarh, etc. NIPHM experienced that awareness and accessibility of low-cost bio-inputs and its production technologies may be keys to boosting the adoption of organic and natural farming in the country.

Specific to promoting INM, organic farming and natural farming; NIPHM is conducting several programs viz. Certificate Course in Organic Farming, ASCI program for Organic Growers and vermicomposting for rural youths, training on INM for officers, on-farm production of biocontrol agents, biopesticides, biofertilizers, etc. The institute has lab facilities for the preparation of various natural & bio-inputs, a farm unit for demonstration of organic/natural farming interventions, etc.

Adopting natural farming practices and sustaining them poses many challenges for the farmers; particularly poor knowledge dissemination, increased efforts to procure raw materials, and lack of access to valued markets amongst others. Of which access to farm inputs can be cited due to the following reasons:

- Lack of exposure and knowledge of different bio-formulations and bio-inputs Unavailability of raw materials
- Lack of knowledge on handling, usage and storage of inputs
- Limited hand-holding support
- Extra efforts are required in the procurement of the raw materials and their subsequent preparation
- Maintaining the quality of the prepared bio-input.

Scope & opportunities

Though there is increasing acceptance of organic farming and natural farming in India, its adoption is very limited. Most of the farmers rely on chemical fertilizers and pesticides to enhance yield and pest control restricting the area of organic farming. Growers are not aware of nonchemical options available for soil and plant health management. The use of broad-spectrum insecticides for pest control has adverse effects on the environment and bio-control agents leading to a reduction in bio-control agent's numbers. Therefore, the need of the hour is bio-intensive nutrient & pest management and as well as low-cost mass production and application of bio-inputs. There is great potential for setting up mass production units for the production of bio-fertilizers/bio-control agents/bio-pesticides by farmers for use in their farms. In this connection, NIPHM may play an important role as a knowledge repository in the promotion of organic and natural farming as a catalyst in the process of establishment of rural production units. Bio-Resource Input

Centers' (BRCs) are one of the possible input support systems that could help in resolving this issue of accessibility to natural farm inputs. Its promotion, as a single-stop shop for all bio input needs, will not only help farmers to learn but also adopt these technologies in their farm to sustain their livelihood and to make it professionally viable and profitable.

A Bio-Input Resource Centre (BRC), where time-tested, locally prepared Inputs/formulations utilizing biological entities or biologically derived inputs useful for improving soil health, crop growth, pest or disease management and habitat management are made available for purchase by farmers in a defined geographical area.

The BRCs serve five purposes:

- Maintaining and sale of cultures of bio-fertilizers and bio-pesticides for multiplication and use by farmers
- Preparation and sale of ready-to-use organic inputs
- Training farmers on the preparations of botanical extracts and animal-based inputs
- Sharing knowledge of natural farming practices
- Sale of pheromone traps, lures, sticky traps and others

Issues of input availability in organic and natural farming practices

- So far organic & natural farming is mostly confined to farmers who can prepare bio-inputs on their methods.
- Issues of availability of raw materials
- Shorter shelf-life- many inputs must be used quickly.
- Poor market development for inputs
- Bio-resource centres are a huge opportunity for small enterprises

Protocols and Requirements for Bio Input Production Units

The possible items in BRC could be

<i>Soil fertility and Soil health</i>	<i>Pest or Disease management</i>	<i>For habitat management:</i>
<ul style="list-style-type: none"> • Seeds of green manuring crops • Vermiculture / compost Neem / Karanj cake Cow dung/cow urine • Organic preparations like Jeevamrut, GhanaJeevamrith, Waste Decomposer, etc. • Other microbial inputs such as VAM, <i>Rhizobium</i>, PSB, <i>Azospirillum</i>, <i>Azotobacter</i>, Potash / Zinc Mobilizers, etc 	<ul style="list-style-type: none"> • Seeds / seedlings of trap crops • Botanical decoctions like Panchagavya, Dashparni, Neemastra, brahmastra, Agni Astra, NSKE • Bio pesticides – <i>Beauveria</i>, <i>Verticillium</i>, <i>Trichoderma</i>, <i>Pseudomonas</i>, NPV formulations / cultures • Pheromone traps, sticky traps, light traps 	<ul style="list-style-type: none"> • Seeds / Seedlings of Glyricidia, Drumstick, Pongam, Neem Seeds for Border crop/ • Intercrop/ • Cover crop. • Navadhanya Seed Kits

The agriculture sector creates immense scope for prospective investors in agribusiness. The agri-entrepreneur can successfully establish Agribusiness units. NIPHM has developed various low cost technologies and inputs to minimize chemicals in agriculture and to promote non-chemical ways to control pests and soil / plant health management. The institute is also providing technical support to various State Governments, ICAR, KVKs, SHGs, FPOs and other organization by imparting training, demonstration and awareness activity through on campus, off campus and online programmes.

Successful Bio-input models: NIPHM is promoting use of low cost biological control agents and bio-inputs which can be successfully produced and used for reducing chemicals in agriculture. Few of the technologies are indicated here.

Establishment of Biofertilizer unit

Biofertilizers are cost effective, eco-friendly & renewable source of soil nutrients. Important biofertilizers are *Rhizobium*, *Azotobacter*, *Azospirillum*, Phosphate solubilizing bacteria (PSB), Potassium Releasing Bacteria (KRB), Zinc Solubilizing Bacteria (ZnSB) & Mycorrhizae (VAM), Azolla, etc. The efficient strains of cultured microbes can be formulated as bio fertilizers. Even at small scale with essential infrastructure, costing around Rs.12 lakhs provided entrepreneurs having their own constructed area of around 500 sqm. For commercial manufacturing and marketing license from respective state department of agriculture is required as per the FCO,1985 order. As a licensed bio-fertilizer production unit, different liquid bio-fertilizers are produced at NIPHM to make it available to larger beneficiaries like farmers and other stakeholders.



Vermitechnology:

The application of vermicompost helps in increasing the organic matter content of the soil, maintains soil natural productivity and provides additional substance that are not found in chemical fertilizers. Because of the simple technology and low cost of investment vermicomposting is gaining popularity. The farmers/ agri-entrepreneurs have started their vermicomposting. Unit on large scale and some of them are receiving good profits by selling the vermincompost and earthworms. Vermiwash is a dark brown color liquid byproduct in the vermicompost unit which can be used as organic fertilizer. It contains vitamins, hormones, enzymes, microbes in addition to plant nutrients.





Mass production of *Trichoderma* spp & *Psuedomonas* spp

Trichoderma & *Psuedomonas* are recognized as important biocontrol agents to protect crops against several soil and air borne plant pathogens. They also stimulate plant growth, enhances germination, plant survival rate, growth of roots & shoots. After getting them other cultures from reliable source, the multiplications can be carried out at small scale using tray method developed by NIPHM. The produce may be use by farmers on their own fields but not for commercial purposed without CIBRC registration. A novel technique using GS-I & GS-II media for mass production of fungal and bacterial biocontrol agents. The low cost media is available at NIPHM.



NPV production unit

Nuclear Polyhedrosis viruses (NPV) like Ha NPV, SI NPV are increasingly being used as alternatives to chemicals for insect pest control. These viruses have distinct advantages over other methods of pest control. These are highly specific and do not affect beneficial insects like parasitoids and predators and are safe to fish, birds, animals and humans.



EPN production for Soil insect pests

Entomo Pathogenic Nematodes (EPN) are beneficial nematodes parasitizing insect pests and are being effectively used as a biocontrol agent against a wide variety of insect pests including soil borne root grubs. Use of EPN preparations is a viable alternative to chemical pesticides. A novel technique for mass production and formulation of EPN is developed and patented by NIPHM. Using this technique, a small scale unit can be established with approximate cost of 5 lakh.





Tricho cards preparation:

Trichogramma are primary parasitoids eggs of Lepidoptera. Since this parasitoid kills the pest in the egg stage itself before the pest could cause any damage to the crop and also that it is quite amenable to mass production in the laboratories, it has the distinction of being the highest produced and most utilized biological control agents in the world.



Fruit fly lure production unit

Fruit flies are responsible for 20-40% of loss in fruits and vegetables both in the field and post harvest scenario. In some cases, the damages are caused even up to 90-100%. In addition, they are also major impediments for export of fresh fruits and vegetables. Control by pesticide application is costly and not safe to consumers. Sex pheromones such as methyl eugenol (ME lure) lure and CUE lure can be used to manage fruit flies in fruit and vegetable crops.



Experiences of NIPHM:

- Conducted several training programs on *on-farm production of bio-fertilizers & bio-pesticides* to different stakeholders.
- In collaboration with *Mahila Abhivruddhi Society, Andhra Pradesh (APMAS)*: Organized a training program on On-farm production of bio-fertilizers and bio-pesticides to FPOs/SHG group members.

- In collaboration with the *Deshpande Foundation*, conducted training on on-farm production of bio-inputs to FPO group members.
- **Tamil Nadu Irrigated Agriculture Modernization Programme (TN-IAMP):** NIPHM and the Department of Agriculture, Tamil Nadu has completed a project on ‘Model IPM village under the scheme of TN-IAMP and provided technical assistance to all beneficiary farmers in 20 IPM villages under the Lower Palar Sub basin for the establishment of cost-effective sustainable Bio- input production units in Kancheepuram and Chengalpattu Districts of Tamil Nadu. Imparted training to progress the farmers in the understanding of Good Practices in production and quality maintenance. Circulated the Standard Production Protocol Manual in Tamil on ‘On-Farm Production of Bio-inputs.
- **Technical support to establish Bio input Centre in Dantewada, Chhattisgarh:** Organized training for SHG members of Rural Industrial park (RIPA), Bairamband village, Dantewada Dist., C.G on farm level production of biofertilizers and bio-pesticides and executing Bio-input Production Center and guided for production unit establishment and protocols for bio-input production.
- **Establishment of Bio-input production center at KVK, Medak:** Technical support has been given to Ekalavya Grammena Vikas Foundation, Krishi Vigyan Kendra, Tuniki, Medak (KVK-Medak) to establish the mass production unit of bio-inputs.
- **Collaboration with PDNSM-Maharashtra:** Director of Agriculture (ATMA) & Project Director, Panjabrao Deshmukh Naisargik Sheti Mission (PDNSM), Maharashtra State has requested NIPHM to provide capacity building and technical support for promotion of Organic and Natural farming, through establishment of Bio-input production centres in the State of Maharashtra. In this connection, PDNSM has executed an MoU with NIPHM on 14th November 2023 and sought support of NIPHM in capacity building of officers / staff of the mission. It is proposed to conduct training programs at NIPHM in 2023 & in coming two years on payment basis. A total of 33 training programs are proposed under this organic / natural farming mission to be completed by March 2026. The programmes are already initiated and completed 8 batches till March, 2024. These programs were participated by Project Directors, deputy project director, field level officers and FPOs of different districts of Maharashtra.
- **Collaboration with Organic Mission-Kerala:** collaboration is initiated with Department of Agriculture, Government of Kerala for implementation of Soil health Management and Productivity improvement scheme in 2023-24. The proposal on supply of NIPHM media and bio-input cultures to the stakeholders for farm level production and application.

Conclusion:

Organic and Natural farming is spreading and the Government is also taking several programs like BPKP for its promotion. *Lack of easy access to bio-inputs has been a major constraint in the spread of organic and natural farming*

practices at field level. Easing this constraint helps in effective scaling up. Also, there is an *enormous opportunity created with the spread of natural farming for rural enterprises*. The bio-inputs can be locally made and supplied by individual entrepreneurs or by FPOs or a combination of both.

These strategies of NIPHM to realise an opportunity and to help spread of organic and natural farming practices for sustainable farming. NIPHM has taken up an action-research-policy program to develop a larger scaling up protocols and program design by on-ground promotion of 200 Bio-input Resource Centres across the Indian states in partnership with other esteemed organizations etc.

‘NIPHM – A Catalyst in promoting Organic and Natural Farming at Scale’

References:

1. MoA& FW, 2023. Sustainable Practices. Ministry of Agriculture & Farmers Welfare, PIB release, 28th March 2023.
2. MoA& FW, 2023. Organic Farming. Ministry of Agriculture & Farmers Welfare, PIB release, 14th March 2023.
3. Promotion of Natural Farming- Natural Mission on Natural Farming (NMNF) by up scaling the Bharatiya Prakritik Krishi Paddhati (BPKP) to promote natural farming-GOI Scheme.
4. Anonymous, 2022, Natural Farming book, Manage, Hyderabad
5. Natural Farming Technical Process Manual by National Coalition for Natural Farming

Around the World

The country has the potential for the use of about 18-20 lakh tons of biofertilizers/bio-inputs (keeping the gross cropped area as a parameter). But harvestable potential is about 11-12 lakh tons (60% area coverage). Therefore, there is huge potential for increasing the production capacity and making it available at farmers doorsteps. A Bio-Input Resource Centre, where locally prepared Inputs/formulations utilizing biologically derived inputs useful for improving soil health, crop growth, pest or disease management and habitat management are made available for purchase by farmers in a defined geographical area. To make bio-inputs such as Biofertilizers / biopesticides and biocontrol agents easily accessible at farmers doorstep in villages, it is necessary to promote and support bio-input resource centers/units across the country where each production unit is catering to the needs of demanding areas. On-farm production and local supplies will also solve their problems of high-temperature storage and short shelf life. Such BRCs shall produce locally during the season and ensure their utilization within the season with no or little storage time. Short supply chains shall also help in delivering fresh and active microorganisms to the farmers for better effectiveness. The establishment of BRCs to help spread organic and natural farming practices for sustainable farming. NIPHM has taken up an action-research-policy program to develop larger scale-up protocols and program design by on-ground promotion of Bio-input Resource Centres across the Indian states in partnership with other esteemed organizations etc.

Also, there is an enormous opportunity created with the spread of natural farming for rural enterprises. The bio-inputs can be locally made and supplied by individual entrepreneurs by FPOs or a combination of both.

Training Programs

Plant BioSecurity Division

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

CAPACITY BUILDING PROGRAMMES:

S. No.	Name of The Programme	Duration	Date	
			From	To
Plant Biosecurity Division (PBD)				
1.	Phytopathology Inspection training for Phytopathology Service Agency and Phytopathology Service Provider for Inspection of Plants/Plant Products & other Regulated Articles in Export	30 days (one month)	18.01.2024	16.02.2024
2.	Customized programme on Stored Grain Pest Management for QC Officials of FCI	05 days	29.01.2024	02.02.2024
3.	Fruitfly surveillance and Management	05 Days	05.02.2024	09.02.2024
4.	Invasive Alien Species: Introduced and Emerging Pests	03 days	19.02.2024	21.02.2024
5.	Fumigation as a Phytopathology Treatment(MBr and ALP fumigation) -	15 days	26.02.2024	11.03.2024
6.	Seed Health Testing for Healthy Seed Production and Safe Export	02 Days	18.03.2024	19.03.2024
Workshop				
1.	Awareness workshop on ISPM 15 & NSPM 9	02 days	08.02.2024	09.02.2024
International Programme				
1.	ITEC-MEA programme on "Phytopathology Treatment Measures (Heat Treatment)" for Bhutan Officials- International Programme	07 Days	13.03.2024	19.03.2024
Vertebrate Pest Management (VPM)				
1.	Training on "Safe and Judicious use of Glyphosate for the Pest control Operators"	03 days	16.11.23 & 17.11.23 (Online) 04.01.2024 (Physical mode)	16.11.23 & 17.11.23 (Online) 04.01.2024 (Physical mode)
2.	Urban Pest Management for Technicians at Vishakhapatnam, Andhra Pradesh-	02 days	28.12.2023	29.12.2023

3.	Urban Pest Management for Technicians at Kolkata, West Bengal	02 days	08.01.2024	09.01.2024
12	Urban Pest Management for Technicians at Pune	02 Days	31.01.2024	01.02.2024
13	Urban Pest Management for technicians of Tamil Nadu State warehousing Corporation , Chennai	02 Days	22.02.2024	23.02.2024
14	ASCI - Skill Course on Vermicompost Producer	One Month	01.02.2024	29.02.2024
15	Training on “Safe and Judicious use of Glyphosate for the Pest control Operators”	03 Days	01.03.2024 & 02.03.2024 (Online) 04.03.2024 (Physical mode)	01.03.2024 & 02.03.2024 (Online) 04.03.2024 (Physical mode)
16	Urban Integrated Pest Management	15 Days	28.02.2024	13.03.2024
VPM- International programme				
17	eITEC on Vertebrate Pest Management - Wild boar, Monkeys and Birds- International programme	05 Days	18.03.2024	22.03.2024
VPM- FARMERS PROGRAMME				
18	Farmers training on Rodent Pest Management	01 Day	11.03.2024	11.03.2024

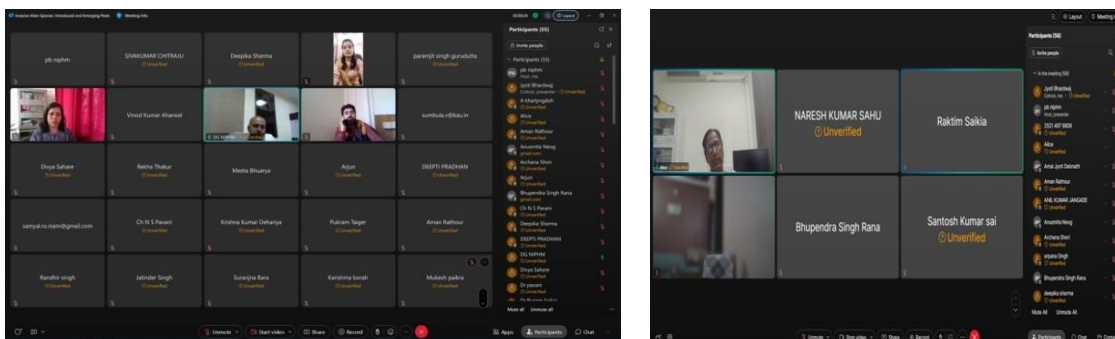
A. DETAILS OF TRAINING PROGRAMMES (Govt. Officials & Private sector)

- **Phytosanitary Inspection training for Phytosanitary Service Agency and Phytosanitary Service Provider for Inspection of Plants/Plant Products & other Regulated Articles in Export:** National Standards of Phytosanitary Measures -23 (NSPM-23) is prepared by Directorate of Plant Protection, Quarantine & Storage N.H-IV, Faridabad. The Plant Protection Adviser (PPA) is the authority for accreditation of Phytosanitary Service Agency (PSSA) and personnel employed for inspection purpose will be Phytosanitary Service Provider (PSSP) for exportable plants, plant products & other regulated articles.

The registered Phytosanitary Service Provider shall carry out phytosanitary inspection of the plant & plant products intended for export within jurisdiction approved by the Plant Protection Adviser. One month programme was organized at NIPHM, Hyderabad and 12 eligible participants were attended the programme.



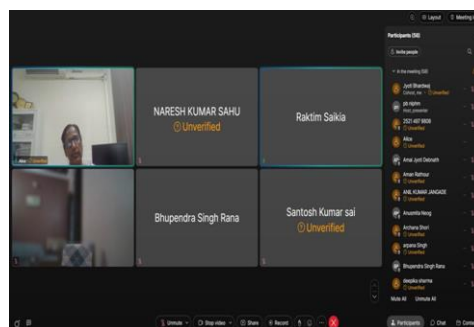
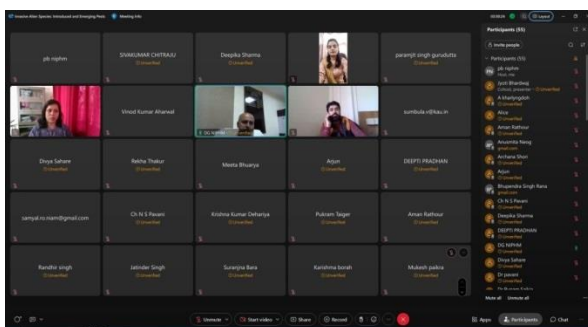
- **Fruitfly Surveillance and Management:** 5-days online training program was organized from 5th to 09th February, 2024 with an objective to create awareness on identification of different fruit fly species that are damaging fruits and vegetables, role of para-pheromones in trapping and monitoring, preparation of low cost traps and lures, management of fruit flies, Sanitary and Phytosanitary (SPS) measures for the pest. The programme was attended by 26 officers from different states and departments.



- **Customized programme on Stored Grain Pest Management for QC Officials of FCI:** 05 days training program on Stored Grain Pest Management for QC officers of was organized during 29th January to 02nd February, 2024. The participants were trained regarding different concepts of scientific storage of food grains. Participants have acquired proper knowledge of identifying the stored grain pests, management/remedial measures (Sprayings/fumigation with ALP). Total 29 participants were participated in the programme.



- **Invasive Alien Species: Introduced and Emerging Pests:** To create comprehensive awareness on Plant Biosecurity and Emerging Challenges to South Asian Regions and the impact of introduced pests, National Institute of Plant Health Management, Hyderabad, Telangana has organised a 03 days online training programme from 19th- 21st February, 2024. A total of 74 officers from State departments & Universities were attended the program.



➤ **Fumigation as a Phytosanitary Treatment (MBr and ALP fumigation):** Among the Phytosanitary treatments, Fumigation is most accepted treatment. Fumigation treatment providers form an important and indispensable part for the import/export of agricultural commodities in international trade and knowledge and skill sets possessed by them can make a great difference in the success of Phytosanitary treatments. 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. A 15- Days programme was organized from 26th February to 13th March, 2024. Thirty Four participants attended the programme.



➤ **Seed Health Testing for Healthy Seed Production and Safe Export:** A two days' special program was organized at NIPHM during 18th to 19th March, 2024 for ten officers of Syngenta India Pvt. Ltd. working in different states. The programme was organized to train the officers on different aspects of seed health testing methods, detection and identification of pathogens etc.



- **Awareness workshop on ISPM 15 & NSPM 9:** NIPHM is the only Institute in India to offer a specialized training programme on Forced Hot Air Treatment (FHAT) for industry stakeholders. In this programme the participants are learning the critical requirements for establishing FHAT facilities, calibration of sensors, placement of sensors, identification of coolest point, safety precautions, conducting the treatments, use of appropriate mark, audit protocols and record keeping in accordance with ISPM – 15 and NSPM – 9.

To understand the issues and challenges during the treatment and export of solid wood packing material to meet out the phytosanitary requirement as per the international standard, the NIPHM has organized 02 days' workshop from 08th-09th February, 2024 to discuss the industry/operator's/exporter's concern. Detailed panel discussion was carried out on various related aspects. The workshop was attended by 15 stakeholders from different states across the country.



- **Training on “Safe and Judicious use of Glyphosate for the Pest control Operators”:** The programme was organized from 16.11.2023 & 17.11.2023 (Online) and 04.01.2024 (Physical mode at Mumbai). During the programme total 25 Pest control operators were trained.



- **Level -1 Training on “Urban Pest Management for Technicians” at Vishakhapatnam, Andhra Pradesh:** NIPHM organized the programme from 28th – 29th December, 2023. Total 20 participants were trained on various aspects such as biology and management of mosquitos, cockroaches, rodent, bedbug and termites.

Further, the participants also learnt about the Insecticide Act, 1968, safe handling of pesticides and spraying techniques.



విశాలాంధ్ర

సీతంలో ముగిసిన పెస్ట్ కంట్రోల్ మేనేజ్మెంట్ శిక్షణ

విశాలాంధ్ర-విజయనగరం టౌన్ : స్థానిక గాజులరంగ పరిధిలోగల సీతం జంతురంగ కళాశాలలో పెస్ట్ కంట్రోల్ మేనేజ్మెంట్ పై ఎన్.వి.సి.హెచ్.ఎమ్ ఇన్స్టిట్యూట్ లోను లోకాల శిక్షణ కార్యక్రమం విశాలాంధ్రంకి చెందిన డి.కె.ఎస్. శ్రీరామ్ తండ్రి కంపెనీ నిర్వహించింది. ఈ శిక్షణ కార్యక్రమంలో సత్య దీక్ష కళాశాల విద్యార్థులు రెండుండు పాల్గొన్నారు. కార్యక్రమంలో డాక్టర్ కె.మల్లాదిక్ష్ణి, డాక్టర్ ఓ.శివారెడ్డి, కె. విహార్ కుమార్, డి. ప్రకాష్ రావు విద్యార్థులను శిక్షణ తరగతులు నిర్వహించారు. శిక్షణలో వారు విద్యార్థులకు చెదవురుగులు, బొద్దింకలు, సజ్జల నివారణ, వివిధ నియంత్రణ పద్ధతులు మరియు శాస్త్రీయ పద్ధతులను వివరించగా వివరించారు. కార్యక్రమంలో సత్య విద్యార్థులను బ్రాడ్లర్ డాక్టర్ ముక్తి శశిభాషణ రావు, సత్య దీక్ష కళాశాల ప్రెసిడెంట్ డాక్టర్ సాయిబహదూర్, సీతం ప్రెసిడెంట్ డాక్టర్ డి.వి.రామమూర్తి, లెస్టెనియంట్ ముక్తి వరలక్ష్మి, డి.ఎస్. శైలజ విద్యార్థులు పాల్గొన్నారు.

- **Level-1 Training on “Urban Pest Management for Technicians” at Kolkata:** Two days programme was conducted from 8th-9th January, 2024 and total 53 Pest control technicians/operators were trained during the said period.



- **Urban Pest Management for Technicians at Pune:** Level 1 - Training on Urban Pest Management for technicians in association with Pest Control Association was organized at Pune from 31.01.24 to 01.02.24. ASO (VPM) attended the training and handled a 3 sessions on Cockroach Management, Rodent Management and safe and judicious use of pesticides. Total 98 Pest control technicians/operators were trained. The participants were trained in various aspects such as biology and management of mosquitos, cockroaches, rodent, bedbug and termites. Further, participants were learnt about the Insecticide Act, 1968 and safe handling of pesticides and spraying techniques.



- **Urban Pest Management for technicians of Tamil Nadu State warehousing Corporation, Chennai:** Level 1 - Training on Urban Pest Management for technicians of Tamil Nadu State warehousing Corporation was organized from 22nd -23rd February, 2024 at TNWC, Chennai. The participants were trained on various aspects of pests and their managements such as Mosquito, Storage insect pests including Termite Biology and Management in Pre and Post treatment construction situations, Vertebrate Pest Management in storage, Bedbug management and safe and judicious use of pesticides. Total 60 Warehouse officials from the different districts of Tamil Nadu were trained in this programme.



- **ASCI - Skill Course on Vermicompost Producer:** NIPHM is organizing two skill development courses i.e Organic Growers (210 hrs) and Vermicompost Producer (210 hrs) from 01.02.2024 to 29.02.2024. Training for Vermicompost Producer (Batch No. 2421809 & 2421842 (Regular) for total of 24 rural youth and farmers was also organized. The participants learnt about the biology, morphology, various composting methods, safety measures, hands on experience training on vermicompost shed construction, different methods of vermicomposting preparation and vermiwash etc.



- **Certificate course on Urban Integrated Pest Management:** As per the Insecticides Rules framed under Insecticides Act, 1968 the PCOs who apply for grant of license for undertaking pest control operations should be at least a graduate in Agriculture or in Science with Chemistry as a subject with a 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.

The programme was organized for the structural pest management professionals from 28th February to 13th March, 2024. Twenty one participants attended the programme.



- **Training on “Safe and Judicious use of Glyphosate for the Pest control Operators:** NIPHM organized for the PCOs from 01st to 02nd March, 2024 (Online) and 04th March, 2024 at NIPHM (Physical mode at NIPHM). Rural youth / Pest control operators were trained in various aspects of glyphosate and their usage, spraying techniques and safe use of glyphosate.

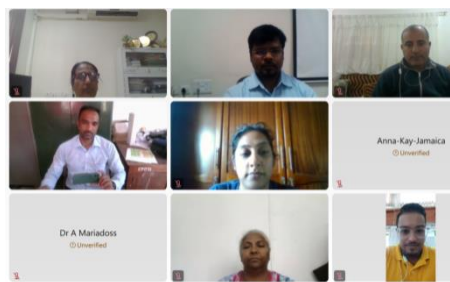
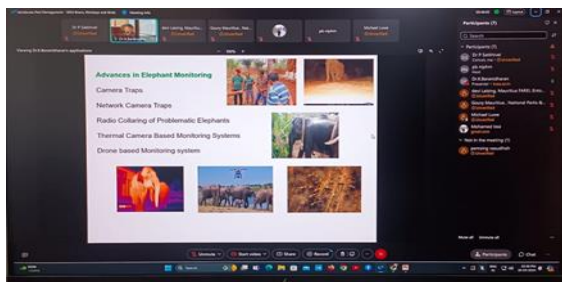


INTERNATIONAL PROGRAMMES

- **ITEC-MEA programme on Phytosanitary Treatment Measures (Heat Treatment):** NIPHM is the training partner with the Indian Technical and Economic Cooperation (ITEC) under the Ministry of External Affairs (MEA), Govt. of India. The training program of seven days was organized from 13.03.2024 to 19.03.2024 for the officials of Bhutan (20 nos.). In this programme the participants learnt the critical requirements for establishing FHAT facilities, calibration of sensors, placement of sensors, identification of coolest point, safety precautions, conducting the treatments, use of appropriate mark, audit protocols and record keeping in accordance with ISPM – 15.



- **e- ITEC – MEA Training programme on Vertebrate Pest Management- Wild Boar, Monkey and Birds:** The programme was organized from 18th to 22nd March, 2024 under the sponsorship of Indian Technical and Economic Cooperation (ITEC), Government of India. Total 4 officers from different states (Mauritius-2, Egypt-1 and Jamaica-1) have attended the training. The training program included theory sessions on Biology and management of wild boar, monkey, birds, Human Elephant conflict and their Management, Recent advances in vertebrate pest management, research gaps and issues and Management birds in agricultural and horticultural ecosystem. The participants were also imparted session on Wild Life (Protection) Act, 1972. The wild boar management modules tested by NIPHM were also explained in details to the trainees.



FARMERS PROGRAMME

- **Farmers training on Rodent Pest Management:** A one day online programme was organized for the farmers and rodent pest management practices were explained to be opted and practiced in their fields. The programme was conducted on 11th March, 2024 and attended by 38 farmers.

B. FORTHCOMING PROGRAMMES OF PBD & VPM (APRIL- JUNE, 2024)

Name of the programme	No. of Days	From	To
Plant Bio Security Incursion Management and emergency preparedness for pest	05	22.04.2024	26.04.2024
Forced Hot Air Treatment (FHAT)	05	22.04.2024	26.04.2024
Stored Grain Pest Management	05	29.04.2024	03.05.2024
Plant Quarantine Procedures for Import and Export	05	06.05.2024	10.05.2024
Introduced and Emerging Pest threats to India	03	20.05.2024	22.05.2024
Orientation for PSC Issuing Authorities for promotion of Agricultural and Horticultural export	05	27.05.2024	31.05.2024
Pest Risk Analysis w.r.t protecting agriculture and trade	05	03.06.2024	07.06.2024
Plant Bio Security Incursion Management and emergency preparedness for pest	05	10.06.2024	14.06.2024

Fumigation as a Phytosanitary Treatment (Methyl Bromide and Aluminium Phosphide)	15	18.06.2024	02.07.2024
Rodent Pest Management	05	13.05.2024	17.05.2024
Vertebrate Pest Management–Wild boar, Monkey and Birds	03	05.06.2024	07.06.2024
Level 1 Technician training for pest control operators	Dates to be decided		
Certificate Course on Urban Integrated Pest Management	Dates to be decided		

Plant Health Management Division

Training programmes

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

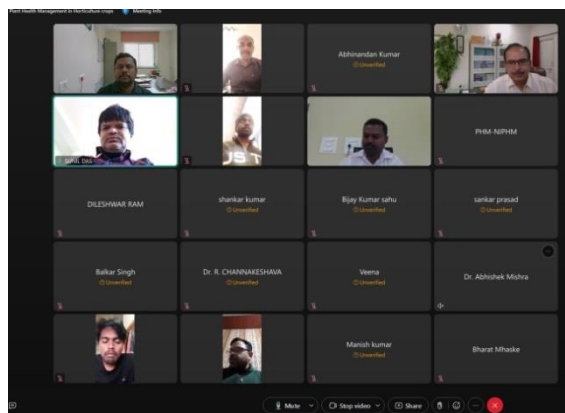
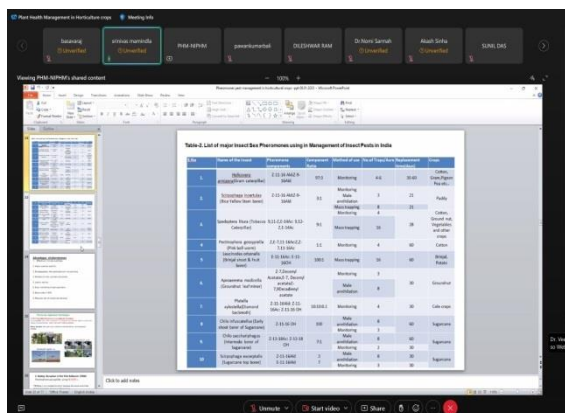
S No	Name of the programs	No. of Days	From	To
I.	Officers programme			
1.	Plant Health Management in Horticulture Crops	05	08.01.2024	12.01.2024
2.	Plant Health Management Strategies for Organic and Natural Farming Systems	05	16.01.2024	20.01.2024
3.	Bio-input Production and Application in Organic and Natural Farming Systems	05	22.01.2024	26.01.2024
4.	Quality Control of Microbial Biopesticides	10	31.01.2024	09.02.2024
5.	Plant Health Management Strategies for Organic and Natural Farming Systems	05	05.02.2024	09.02.2024
6.	Advances in Weed Management	03	12.02.2024	14.02.2024
7.	Bio-input Production and Application in Organic and Natural Farming Systems	05	19.02.2024	23.02.2024
8.	On-farm production of bio inputs	05	04.03.2024	08.03.2024
9.	Training of Trainers (TOT) on “On farm Production of Biocontrol Agents and Microbial Biopesticides”	03	05.03.2024	07.03.2024

10.	Bio-input Production and Application in Organic and Natural Farming Systems	05	11.03.2024	15.03.2024
II. Farmers training programme				
1.	On-farm production of bio control inputs	03	23.01.2024	25.01.2024
2.	On-farm production of bioinputs	03	29.01.2024	31.01.2024
3.	Organic farming Practices	01	07.02.2024	07.02.2024
4.	Mass production and application of entomopathogenic nematodes (EPN) for the management of white grub in sugarcane	03	12.02.2024	14.02.2024
5.	Organic cultivator (Small unit)	30	01.02.2024	29.02.2024
6.	On-farm production of bioinputs (FPOs)	03	26.02.2024	28.02.2024
7.	On-farm production of bioinputs (FPOs)	03	19.03.2024	21.03.2024
8.	On-farm production of bio inputs	3	13.03.2024	15.03.2024
9.	Certificate course on PHM in Organic and Natural Farming (III part)	10	04.03.2024	13.03.2024
III. Webinars/Workshop				
1.	National Network of Plant Health Experts	1	23.02.2024	23.02.2024
IV. Student training programme				
	Nil			

A. Officers Training Programmes

➤ Plant Health Management in Horticulture Crops

As per the training calendar of NIPHM 2023-24, the program on 'Plant Health Management in Horticulture Crops' was conducted from 08.01.2024 to 12.01.2023 (5 days) in online mode. A total of 20 participants from different organizations have attended this program. The training sessions on importance of plant health management in horticulture crops, integrated pest and disease management in major horticulture crops, diagnosis and management of major diseases, role of biopesticides in disease management, management of fruit fly, role of entomopathogenic nematodes and ecological engineering for insect pest management, vertebrate pest management in horticulture crops, important plant parasitic nematodes infecting horticultural crops and their management and safe & judicious use of pesticides were conducted.



➤ **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 16.01.2024 to 20.01.2024 (5 days). A total of 21 senior officers from different districts of Maharashtra have participated. They underwent sessions on 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, establishment of BRCs and quality control aspects.



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

As part of the capacity building programs sponsored under Panjabrao Deshmukh Naisargik Sheti Mission (PDNSM) Maharashtra, the training programme on “Bio-input Production and Application in Organic and Natural Farming Systems” has been organized from 22.01.2024 to 26.01.2024 (5 days). A total of 22 field officers from different districts of Maharashtra have participated. They underwent sessions on 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 centres, 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.



➤ Quality Control of Microbial Biopesticides

As scheduled in NIPHM training calendar 2023-24, the training programme on “Quality Control of Microbial Biopesticides” was organized from 31.01.2024 to 09.02.2024 (10 days) in physical mode. In this programme total 15 officers/scientists from different states & organizations have been participated. 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, Parameters to be tested for quality control of bio pesticides, quality control parameters of NPV and practical session on bioassay of NPV, quality control parameters for *Trichoderma* spp. and *Pseudomonas* spp., antagonistic ability of *Trichoderma* spp., physico chemical Parameters (pH, Moisture content) and quality control parameters for entomopathogenic fungi and entomotaxic bacteria, analysis of bio-pesticides for chemical contaminants, insect rearing techniques-bioassay, PCR for identification of plant pathogens, microscopy, gram staining technique, POB count for NPV and visit to state biopesticides testing lab - State Agriculture Management and Extension Training Institute (SAMETI). The participants also underwent classes regarding the establishment of microbial biopesticide laboratory, requirements to get accreditation as per ISO-17025.



➤ **Plant Health Management Strategies for Organic and Natural Farming Systems**

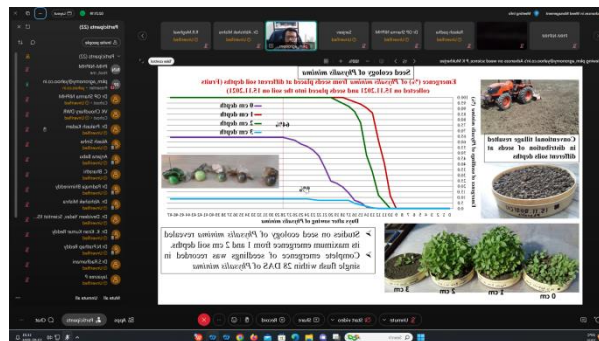
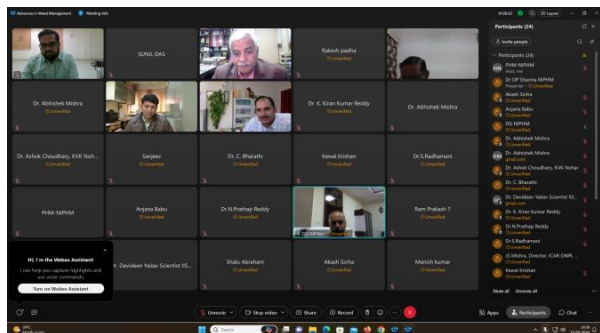
As part of the capacity building programs sponsored under Panjabrao Deshmukh Naisargik Sheti Mission (PDNSM)-Maharashtra, a training programme on Plant Health Management Strategies for Organic and Natural Farming Systems has been organized from 05.02.2024 to 09.02.2024 (5 days). A total of 28 senior officers from different districts of Maharashtra have participated. Participants underwent sessions on 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 Centres, hands on practice sessions on farm-level production of biofertilizers, biopesticides, 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, establishment of BRCs and quality control aspects. Officers will be able to train and guide other field level staff in execution of the bio-inputs production and relevant schemes.



➤ **Advances in weed management :**

As per the NIPHM training Calendar 2023-24, a scheduled training program on ‘Advances in Weed Management’ was organised by NIPHM in collaboration with ICAR-DWR, Jabalpur (M.P.) in online mode from 12.02.2024 to 14.02.2024 (3 day). Total of 24 participants from ICAR/ SAUs/ State Agri. Dept./ KVKs attended this training program. Dr JS Mishra Director ICAR -DWR Jabalpur pointed out the need of holistic management of weeds in the

agricultural fields. Dr SH Singh DG NIPHM emphasised that as part of the agro ecosystem, weeds can also serve are also In this training program, topics such as Importance of weed management in sustainable agriculture, Weed biology and its importance in weed management, 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, were covered and this program is expected to enhance knowledge among the participants with respect to advanced aspects in weed management.



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

As part of Panjabrao Deshmukh Naisargik Sheti Mission (PDNSM)-Maharashtra, a training programme on ‘Bio-input Production and Application in Organic and Natural Farming Systems’ has been organized from 19.02.2024 to 23.02.2024 (5 days). A total of 24 field officers from different districts of Maharashtra have participated. 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 centres, hands-on practice sessions on farm-level production of bio-fertilizers, bio-pesticides, and biological control agents, etc. were learned by the participants. This program shall be helpful to the participants in the knowledge of protocols for on-farm production of bio-inputs, application methods, and establishment of BRCs.



- **Bio-input Production and Application in Organic and Natural Farming Systems.** As part of the capacity building programs sponsored under Panjabrao Deshmukh Naisargik Sheti Mission (PDNSM)-Maharashtra, a training programme on “Bio-input Production and Application in Organic and Natural Farming Systems” has been organized from 11.03.2024 to 15.03.2024 (5 days). A total of 20 field 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 centres, 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 of 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 bio-inputs production and relevant schemes. The officers have visited NIPHM laboratories, farm, 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. The trainee officers have keenly observed and practiced the production methods of different bio-inputs.



- **On-farm production of bio inputs**

On request of the Chhattisgarh Agricon Samiti, NIPHM had organized a programme on “On-farm production of bio inputs’ for field level officials from 04.03.2024 to 08.03.2024 (5 days)’ In this program, a total of 15 field level officials from Chhattisgarh were attended. In this training programme, the participants have undergone different sessions such as Introduction about bio control agents, Mass production methods of Trichoderma and Pseudomonas, mass production methods of bio fertilizers, agro-eco system analysis, protocols and requirements for bio input production units, natural farming preparations, preparation of fruit fly traps and lures and Vermicomposting techniques were majorly covered in this training. This programme will be more useful for the trained personnel to create an awareness about use of organic and natural farming practices for the farming community. In the valedictory session of the programme, DG NIPHM interacted with participants and coordinators Mr Banerjee and Ms Manisa of the Agricon Society.



➤ **“On farm Production of Biocontrol Agents and Microbial Biopesticides”**

A special on campus Training of Trainers (TOT) on “On farm Production of Biocontrol Agents and Microbial Biopesticides” under Assam Agribusiness and Rural Transformation Project (APART) of IRRI Assam Agri Univ. was conducted from 05.03.20.24 to 07.03.2024 (3 days). In this training program 12 participants from Assam have participated. Among 12 participants 8 persons are the board of directors of Farmer Producer Companies (FPC) and 4 are from KVKs. As per schedule theory and practical classes viz. Introduction to biological control of insect pests and diseases, AESA, on farm production of important hosts and parasitoids, preparation of vermicompost and vermiwash, on farm production of important predators, on farm production of *Trichoderma* sp. and *Pseudomonas fluorescense*, production protocols for entomopathogenic nematodes, on farm production of entomopathogenic fungi, on farm production of biofertilisers, on farm production of NPV etc. were taken by different faculty of PHM. During the practical sessions the participants were given through hands on practice in mass production of different bio agents.



B. Farmers training programmes

On the request of various agencies, training to progressive farmers, FPO members, etc. is organized by the PHM. The programmes are more focused on bioinput production and application to reduce the pesticide load in farming system. A brief account of these programs is indicated below:

➤ On-farm production of bio control inputs

A special paid training program on 'On-farm production of bio control agents' for FPO members of Sarnagiti Kisan Agro Producer Co. Ltd. Chechat Tehsil, District Kota Rajasthan has been conducted at NIPHM from 23-01-2024 to 25-01-2024. Various topics such as Introduction about bio control agents, Mass production technique of predator, parasitoids, Trichoderma, Pseudomonas, bio fertilizers, EPN, NPV and EPF. Good Agricultural Practices safe and judicious use of pesticides, preparation of fruit fly traps and lures, vermicomposting and visit to vermicompost unit, role of pheromones in insect pest management were covered. Total of 14 participants (12 male, 2 female) have attended the program.



➤ **Mass production and application of entomopathogenic nematodes (EPN) for the management of white grub in sugarcane**

On the request of Project Director ATMA State Department of Agriculture, Maharashtra state an on-campus farmer training program on ‘Mass production and application of entomopathogenic nematodes (EPN) for the management of white grub in sugarcane’ was conducted from 12.02.2024 to 14.02.2024 (3 days). As a part of these training program 27 farmers from Maharashtra were trained on on-farm Mass production of host insect, entomopathogenic nematodes, success stories of use of EPN for the management of soil insects pests, application methods of EPN.



➤ **On-farm production of bio-inputs**

A farmers training programme on ‘on-farm production of bio-inputs’ from 29.01.2024 to 31.01.2024 (3 days) was organized as part of the capacity building programs proposed under Panjabrao Deshmukh Naisargik Sheti Mission (PDNSM)-Maharashtra. A total of 31 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 biofertilizers, biopesticides, and biological control agents, etc. This program shall be helpful to the farmers in the knowledge on protocols for on-farm production of bio-inputs, application methods, establishment of BRCs etc. FPO group farmers shall be able to initiate the bio inputs production as rural enterprises and it may enhance cultivable area of organic and natural farming in Maharashtra.



➤ **Organic farming practices**

An off-campus farmers training program on ‘Organic farming practices’ was organised by NIPHM in Adopted village of Peddashapur on 07.02.2024 (1 day). Total of 16 farmers have participated in this program. Topics such as field diagnosis of pest problems in organic farming, spraying techniques for organic farming preparations, natural farming preparations, botanical preparations for pest management & demonstration of fruit fly lures and pheromone traps were covered. This training knowledge and awareness among farmers in organic farming practices.



➤ **On-farm production of bio-inputs :** As part of the capacity building programs proposed under Panjabrao Deshmukh Naisargik Sheti Mission (PDNSM)-Maharashtra, two FPO farmer-training programme on “On-farm production of bio-inputs” were organized from 26.02.2024 to 28.02.2024 (3 days) and from 19.03.2024 to 21.03.2024 (3 days). A total of 31 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 bio inputs production as rural enterprises and it may enhance the cultivable area 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. The farmers have keenly observed and practiced the production methods of different bio-inputs.



- **On-farm Production Protocol for Bio control agents** : A special paid training program of 3 days was conducted from 13th to 15th March, 2024 in PHM division on ‘On-farm production of bio control agents’ for farmers of Latur District of Maharashtra state. A total of 30 farmers attended the training program. Various topics such as introduction to biological, integrated disease management, on-farm production of bio control agents, bio pesticides and entomopathogenic nematodes, preparation and installation of fruit fly traps, vermicomposting and safe & judicious use of pesticides, plant parasitic nematodes of agriculture and horticulture crops were covered. A visit to AICRP on IFS farm of PJTSAU was also organized.





➤ **Certificate course on plant health management in organic & natural farming (CCONF)**

As part of three months of the Certificate Course on Plant Health Management in Organic & Natural Farming (CCONF), part-III conducted at NIPHM from 04.03.2024 to 13.03.2024 (10 days). A total 19 rural youth farmers have presented their field experience-project work and concerned mentors evaluate project work. Honourable Director General 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 of NIPHM etc.



Forthcoming training programmes

S No	Name of the programme	No. of Days	From	To
I.	Officers training programmes			
1.	Plant Health Management strategies for organic and natural farming systems	05	01.04.2024	05.04.2024
2.	Bio-inputs production and application in organic and natural farming systems	05	22.04.2024	26.04.2024
3.	Locust Pest Management	03	29.04.2024	01.05.2024
4.	Plant Health Management Practices in Natural Farming	05	06.05.2024	10.05.2024

5.	Plant Health Management strategies for organic and natural farming systems	05	06.05.2024	10.05.2024
6.	Field Diagnosis and Management of Plant Parasitic Nematodes	05	13.05.2024	17.05.2024
7.	Bio-inputs production and application in organic and natural farming systems	05	27.05.2024	31.05.2024
8.	Plant Health Management in Protected Cultivation	05	03.06.2024	07.05.2024
9.	Plant Health Management strategies for organic and natural farming systems	05	10.06.2024	14.06.2024
10.	Plant Health Management in Oilseed crops	03	18.06.2024	20.06.2024
11.	Induction training on Plant Health Management to newly recruited DPPQ&S officers	30	20.06.2024	19.07.2024
12.	Integrated Soil Health and Weed Management	05	24.06.2024	28.06.2024
II.	Farmers training programmes			
1.	On farm production of bio control agents	03	Dates yet to be decided	
2.	Organic farming methods for crop protection	03		
3.	On farm production of bio control agents	03		

Pesticide Management Division

Training Programme:

A. During January to March, 2024, the division has conducted seven offline scheduled training programme.

Sl. No.	Name of the programme	No. of Days	From	To
1.	Sampling of Fruit, vegetables, cereals, pulses, Spice and Condiments (Virtual, Paid Programme)	01	03.01.2024	
2.	Refresher program on Pesticide Formulation Analysis	10	03.01.2024	12.01.2024
3.	Role of PT & ILC in maintaining accreditation as per ISO/IEC 17025: 2017 (Virtual)	01	10.01.2024	
4.	Management of Pesticides and their Residues for the Protection of Food Crop (ITEC- MEA Training in collaboration with NIPHM)	14	16.01.2024	29.01.2024
5.	Pesticide Formulation Analysis	60	22.01.2024	21.03.2024
6.	Laboratory Quality Management and Internal Audit as per ISO/IEC 17025:2017	05	11.03.2024	15.03.2024

➤ **Sampling of Fruit, vegetables, cereals, pulses, Spice and Condiments:**

A one day training programme on “**Sampling of Fruit, vegetables, cereals, pulses, Spice and Condiments**” was conducted on **03.01.2024** through online mode for private Laboratories. A total of 11 participants from Intertek India Private Limited (Food Services), Jeedimetla, Hyderabad, Telangana and 6 participants from Intertek India Private Limited (Food Services), Udyog Vihar, Gurgaon, Haryana were participated. Participants were trained on sampling of fruits, vegetables, cereals, pulses and condiments as per the standard guidelines.

➤ **Refresher programme on Pesticide Formulation Analysis:**

The division has conducted training on “**Refresher programme on Pesticide Formulation Analysis**” from **03.01.2024 to 12.01.2024**. A total of 6 participants were participated from Central Insecticide Laboratory, Faridabad and State Agriculture Department of Chhattisgarh. The participants were trained on quality control of pesticide analysis.



➤ **Role of PT & ILC in maintaining accreditation as per ISO/IEC 17025: 2017:**

The division has conducted one day training programme on “**Role of PT & ILC in maintaining accreditation as per ISO/IEC 17025 2017 on 10.01.2024**”. A total of **45 participants** were participated from State Agriculture Department of Andhra Pradesh, Telangana, Tamil Nadu, Utter Pradesh, Punjab, Meghalaya and Uttarakhand. The participants were imparted knowledge on role of ILC and PT in quality assurance as per ISO/IEC 17025

➤ **Management of Pesticides and their Residues for the Protection of Food Crop (ITEC- MEA Training in collaboration with NIPHM):**

The division has conducted a training programme on “**Management of Pesticides and their Residues for the Protection of Food Crop from 16.01.2024 to 29.01.2024** in collaboration with ITEC- MEA. A total of **29 participants** from 19 countries (Bangladesh, Ethiopia, Fiji, Ghana, Malawi, Malaysia, Mauritius, Mongolia, Nepal, Nigeria, South Africa, South Sudan, Sri Lanka, Tanzania, Turkey, Uganda, Vietnam, Thailand and Zambia) were participated.

The trainees were benefited and gained knowledge on pesticide regulation, Quality control of pesticides, Food safety and GAP practices. They also gained knowledge through hands on practical of Pesticide Residues Analysis and testing of pesticides for Quality Control. Participants were also visited to Varsha Bioscience & Technology India Pvt. Ltd. and some of the historical places of Hyderabad.



➤ **Pesticide Formulation Analysis:**

The division has conducted training programme on “**Pesticide Formulation Analysis**” from **22.01.2024 to 21.03.2024 (60 days)**. A total of **21 participants** have participated from State Agriculture Department of Chhattisgarh, Jammu and Kashmir, Karnataka, Orissa, Punjab and Tamil Nadu. The participants were trained on various techniques of analysis for Quality control of pesticides such as Volumetric analysis, Chromatographic and spectrophotometric techniques.



➤ **Laboratory Quality Management and Internal Audit as per ISO/IEC 17025:2017**

The division has conducted a 5 days training programme on “**Laboratory Quality Management and Internal Audit as per ISO/IEC 17025:2017**” from **11.03.2024 to 15.03.2024**. A total of **39 participants** including 21 participants of pesticide formulation trainees were participated. The participants were from State Agriculture Department of Chhattisgarh, Jammu and Kashmir, Karnataka, Orissa, Punjab, Telangana, Maharashtra and Tamil Nadu. The participants were trained on general requirements for the competence of testing laboratory as per **ISO/IEC 17025:2017**.



Forthcoming training programmes

Sl. No.	Title of the Programme	Duration	From	To	Eligibility Criteria
1.	Inspection and Sampling of pesticides under Insecticide Act, 1968 (ISPP)	3	02.04.2024	04.04.2024	Prospective or designated Insecticide Inspector (Central / State)
2.	Calibration of laboratory glassware for Pesticide Quality Testing Laboratories	2	22.04.2024	23.04.2024	Analysts working at SPTLs / RPTLs/ CIL
4.	Calibration of Laboratory Glassware and equipment for pesticide Quality Testing Laboratories	5	22.04.2024	26.04.2024	Analysts working at SPTLs / RPTLs/ CIL
3.	Role of PT and ILC in Quality Assurance and maintaining accreditation as per the ISO: 17025:2017	1	15.05.2024		Analysts / Scientists working in Govt. labs/Universities
4.	Laboratory Quality Management System and Internal Audit as per ISO/IEC 17025: 2017	5	10.06.2024	14.06.2024	Analysts working in Government Laboratories

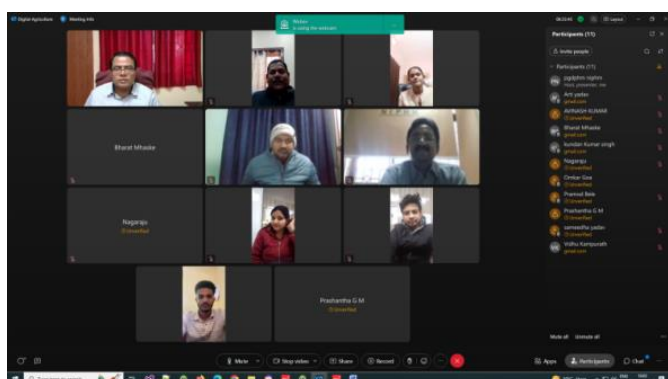
Plant Health Engineering Division

The Plant Health Engineering Division has organized following training programmes during the months of **January-March, 2024**.

S No	Category	Name of the programme	No. of Days	From	To
1.	Officers	Digital Agriculture	03	22.01.2024	24.01.2024
2.	Officers	Pesticide Application Techniques and Safety Measures	01	06.02.2024	06.02.2024
3.	Officers	Post Harvest Management and Storage Techniques	05	04.03.2024	08.03.3024
4.	Officers	Pesticide Application Techniques and Safety Measures	05	18.03.2024	22.03.2024
5.	Students	Pesticide Application techniques and safety measures (Awarness programme)	01	14.03.2024	14-03-2024
6.	Farmers	Pesticide Application Techniques and Post-Harvest Management for different crops (virtual mode)	01	17.01.2024	17.01.2024
7.	Farmers	Micro-Irrigation	01	29.01.2024	29.01.2024
8.	Farmers	Pesticide Application Techniques and Safety Measures	01	29.01.2024	29.01.2024
9.	Farmers	Pesticide Application Techniques and Safety Measures	01	29.01.2024	29.01.2024
10.	Farmers	Pesticide Application Techniques and Safety Measures	01	31.01.2024	31.01.2024
11.	Farmers	Pesticide Application Techniques	01	07.02.2024	07.02.2024
12.	Farmers	Pesticide Application Techniques and Safety Measures	01	13.02.2024	13.02.2024
13.	Farmers	Pesticide Application Techniques and Safety Measures	01	28.02.2024	28.02.2024

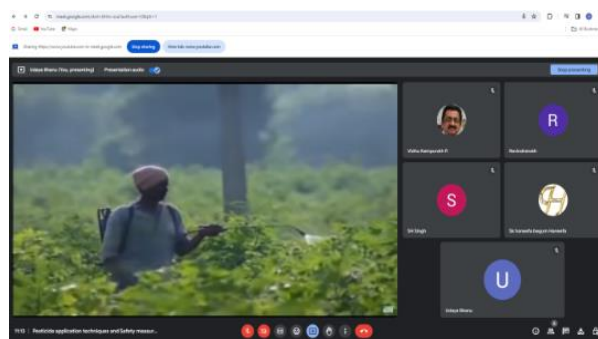
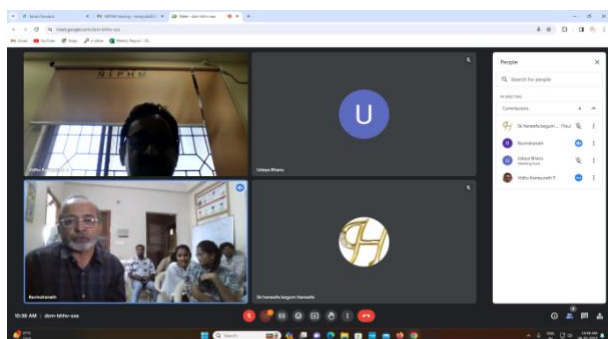
➤ **Digital Agriculture:**

An online program on Digital Agriculture was conducted, total of 09 officers (male: 10 and female: 3) completed the course with pre-course, post-course evaluations, provided nomination letters and attended almost all sessions. The lectures covered topics related to basics of ICT, GIS, GPS, Big Data, IoT, Precision Agriculture, CABI Apps, Smart Precision Models for Agriculture, Sensor based Agriculture, Decision Support Systems and their uses with use case examples on each technology in agriculture, aspects of enabling use of ICT by smallholder farmers, field state wise agriculture tools and uses, various sources of agriculture related information and digital tools available, types of ICT-enabled services useful for enhancing livelihoods of smallholder farmers, key drivers of ICT in agriculture. Innovative business models and partnerships, designing an ideal ICT solution for various needs, various principles of digital development, importance of feasibility studies, Requirements Analysis with focus on agriculture applications, the SDLC process, various software development process etc.



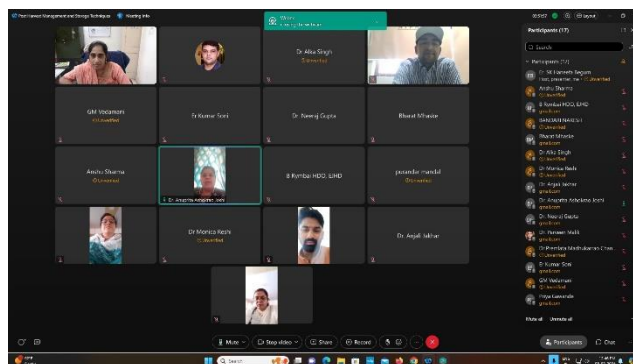
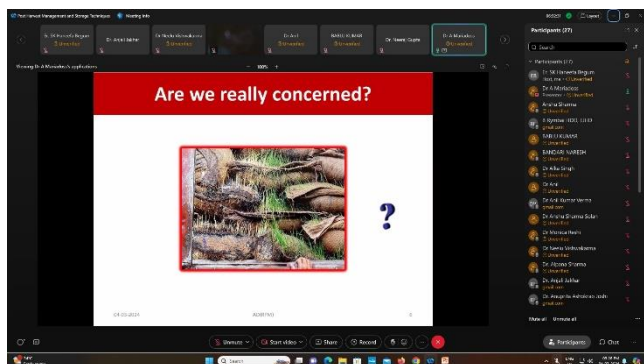
➤ **Pesticide Application Techniques and Safety Measures**

A one day online training programme on “Pesticide Application Techniques and Safety Measures” was organized in collaboration with WELSPUN on 6th February 2024. 11 participants (Male - 8, Female - 3) have attended the training program. Introduction of the participants and overview about NIPHM activities was briefed to the participants. The participants were highlighted about the adverse impact of pesticide application. They were explained in detail about the principles of application techniques, Spraying techniques, nozzles and its classification, calibration of sprayers, UAV in spraying and safety precautions while handling pesticides.



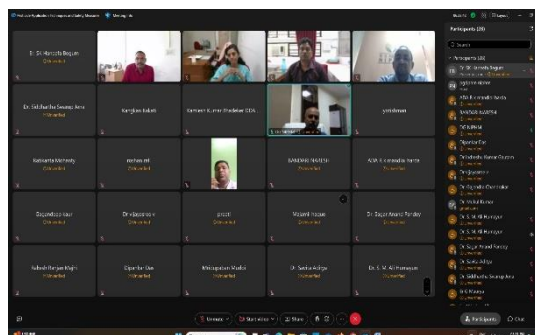
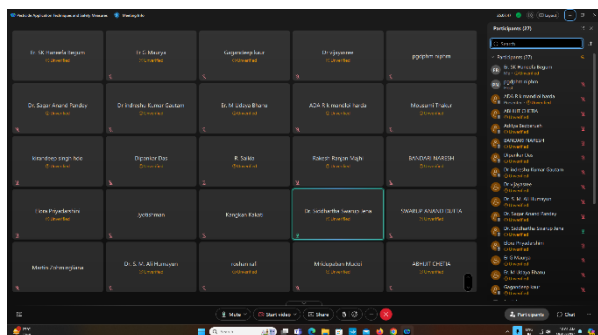
➤ Post Harvest Management and Storage Techniques

Total 29 officers, 17 male and 12 female participants attended the 5-day programme, conducted during 4th to 8th March 2024. Lectures were arranged on topic viz., Post-harvest losses of Agricultural commodity, Post-harvest losses of fruits and vegetables, Cleaning and grading of agricultural commodities, fruits and vegetables, Drying and dehydration methods, Storage methods and storage structures for fruits and vegetable and food grains, Import and export facilities for agricultural commodities, Packing methods and material, Machineries used for processing and Alternative processing methods and Rodent pest management in storage and special crops for value addition, Crop modeling to improve post-harvest supply chain. Good appreciation received from the participants.



➤ Pesticide Application Techniques and Safety Measures

A 5 day virtual training programme on “Pesticide Application Techniques and Safety Measures” was organized from 18th to 22nd March 2024. Total 30 officers 23 male and 07 female participants from 11 states. The participants were enriched with Principles of pesticide application techniques, different spraying techniques, selection of sprayer, nozzles and its classification, calibration of sprayers and nozzles, pesticide formulations and compatibility, safety precautions and minor maintenance of pesticide application techniques and drone spraying. Good appreciation received from the participants.



➤ **Pesticide Application Techniques and Safety Measures**

A one day awareness programme on “Pesticide Application Techniques and Safety Measures” was organized on 14th March 2024. Total 41 students participated from state of Maharashtra. The participants were enriched with Principles of pesticide application techniques, different spraying techniques, selection of sprayer, nozzles and its classification, calibration of sprayers and nozzles, pesticide formulations and compatibility, safety precautions and minor maintenance of pesticide application techniques and drone spraying.

➤ **Pesticide Application Techniques and Post-Harvest Management for different crops**

An online training programme organized on “Pesticide application techniques and Post-Harvest Management for different crops” at Sardar Patel Institute of Development, Surat, Gujarat. Sardar Patel Institute of Development mobilized the farmers in the village. The main crops grown in the village are Cotton, Wheat, Gram, Vegetables and leafy vegetables. The farmers 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. Farmers were explained about different types of sprayers and nozzles for major crops. In the second session postharvest losses in agriculture, harvesting and winnowing tools and methods. Traditional drying methods like sun drying, dos and don'ts and CAP storage has also discussed. Low cost storage structures like Zero energy cool chamber was explained.

➤ **Micro-Irrigation**

A farmers training on “Micro-irrigation” was conducted to Telangana State farmers at HRF-CRIDA, Hayatnagar. Total 34 farmers attended the training program. In the training program, farmers are advised on different aspects such as Importance of irrigation, suitable time for irrigation, types of irrigation methods for different crops, Micro irrigation such as drip irrigation, sprinkler irrigation, rain guns and also focused on subsidy schemes in Micro irrigation. Suitability of sprinkler irrigation for fertigation purpose and procedure of fertigation was clearly explained.



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

PHE division conducted an off campus training programme on “Pesticide Application Techniques and Safety Measures” for Chittapur village farmers at HRF, CRIDA, Telangana on 29th January 2024 (F/N). Er. M Udaya Bhanu (Scientific Officer) has organized this training programme for thirty four farmers. Dr. V. K Singh, Director, CRIDA, Dr. I Srinivas, Principal Scientist, CRIDA, Dr. S Vijay Kumar, SMS (SWE) has hosted the training program at Hayathnagar Research Farm, CRIDA. The training programme was module to cover the aspects of adverse impacts of spraying, basic spraying principles, selection of a sprayer, selection of nozzle and safety precautions. The farmers were also briefed about the types of nozzles and the importance in selecting a nozzle. The importance of safety precautions while handling chemicals and the Dos’ and Don’ts while handling chemicals was also explained.



➤ **Pesticide Application Techniques and safety measures:**

An off-campus farmers training was organized on “Pesticide Application techniques and safety measures” at HRF-CRIDA in forenoon for Telangana state farmers. The farmers are mobilized and necessary arrangements of training done by the HRF officials. Total 19 farmers were attended the programme from nearby village. In this training program farmers are advised on different aspects i.e. Basic principles of spraying, Spraying techniques, Selection of sprayer, Nozzles and its classification, Safety precautions, maintenance of sprayer and care that should be taken while spraying. “Slow Poisoning of India” was explained to the farmers. Then, Basic principles of spraying are explained i.e

suitable temperature for spraying, direction of spray according to wind direction, suitable time for spraying, proper dosages should be applied, the volume of spray liquid required for certain area depends upon the spray type and coverage, total target area, size of the spray droplet. Apart from that selection of suitable sprayers, nozzles and its classification and Safety precautions were explained.



➤ **Pesticide Application Techniques and safety measures:**

An on-campus farmers training was organized on “Pesticide Application techniques and safety measures” at NIPHM for the farmers from Chincholi mandal of Karnataka state. Total 16 male farmers attended the programme. In this training program, farmers were first explained about NIPHM and its activities. Then, farmers are advised on principles of spraying, spraying techniques, Selection of sprayer, Nozzles and Safety precautions. A practical on nozzles was conducted and awareness on selecting nozzles was explained in detail. Safety importance was also highlighted. As the farmers were interested on bio control a visit to insect museum and exhibition hall was arranged.





➤ **Pesticide Application Techniques:**

The PHE division conducted an off campus training programme on “Pesticide Application Techniques” in Pedda shapur village for sixteen farmers (14 male and 2 female). Prof. Prasad Gollapanapalli Chairman, VASORD and Mr. Chandra Shekar Sarpanch Pedda shapur village mobilized the farmers. The program started with an introduction about the institute NIPHM and the different divisional activities are explained and the farmers were explained about the good spraying practices. When to spray, how to spray, direction of spray was explained in detail. The importance of temperature and wind for spraying was also explained. The farmers were also brief about the types of nozzles and the importance safety precautions while handling chemicals and the Dos’ and Don’ts while handling chemicals was also explained.



➤ **Pesticide Application Techniques and safety measures:**

An on-campus farmers training was organized on “Pesticide Application techniques and safety measures” at NIPHM for the farmers from Kotapally mandal of Manchiryal, Telangana state. Total 20 male farmers attended the programme. The farmers were explained about NIPHM and its activities followed by principles of spraying, spraying techniques, Selection of sprayer, Nozzles and Safety precautions. Practical on nozzles were conducted and awareness on selecting nozzles was explained in detail. Safety importance during application was also highlighted.



➤ Pesticide Application Techniques and safety measures:

An on-campus farmers training was organized on “Pesticide Application techniques and safety measures” at NIPHM for the farmers from Kondampet village, Kotapally mandal of Manchiryal, Telangana state. Total 20 male farmers attended the programme. In this training program, farmers were first explained about NIPHM and advised on principles of spraying, spraying techniques, Selection of sprayer, Nozzles and Safety precautions. Practical on nozzles were conducted and awareness on selecting nozzles was explained in detail. Safety importance was also highlighted.



➤ Drone workshop cum Demonstration - 3:

NIPHM started conducting agricultural chemical spraying training through drones. Institute conducted one day drone workshop cum demonstration at College of Agriculture Engineering, Sangareddy on 17.02.2024. Fifty one students 30 male and 21 female attended.

Another workshop on drone operation was conducted at CMR technical campus Kandlakoya, Medchal on 23.02.2024. Fifty two participants (28 male and 24 female students) attended the programme.

The third workshop for drone operations was conducted at CVR College, Ibrahimpatnam on 24.02.2024. Thirty two participants (18 male and 14 female students) attended the programme.

In these orientation programmes, the of General drone rules, applications of drone in different fields, different components in drones, precaution measures while handling the drones in agriculture etc were covered. Practical demonstration of drones in filed was shown. The opportunities in drones or future trends in drones were highlighted to students. Students very actively participated and good feedback received from the students and management.

Drone Remote Pilot Certification

S No.	Name of Training Program/ Webinar	From	To	Duration (in days)	Total Trainees
1.	Agricultural Drone Remote Pilot Certification	08.01.2024	17.01.2024	08 days	18
2.	Agricultural Drone Remote Pilot Certification	26.2.2024	02.02.2024	6 Days	12
3.	Drone workshop cum Demonstration	17.02.2024	17.02.2024	1 Day	51
4.	Drone workshop cum Demonstration	23.02.2024	23.02.2024	1 Day	52
5.	Drone workshop cum Demonstration	17.02.2024	17.02.2024	1 Day	32
6.	Agricultural Drone Remote Pilot Certification	26.3.2024	01.04.2024	6 Days	3

Agricultural Drone Remote Pilot Certification:

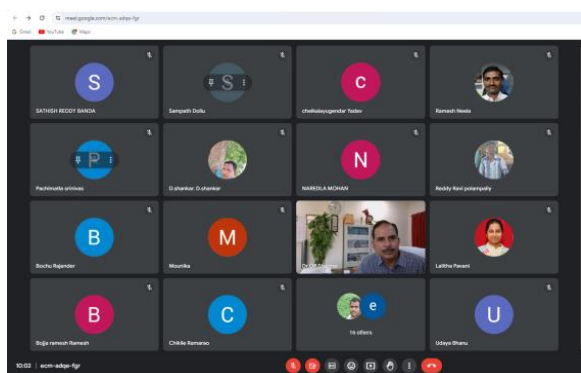
NIPHM started conducting agricultural chemical spraying training through drones. Six training programmes on drone pilot certification conducted, training was conducted in association with MNC and NGOs. In the Training there were good participation of both Male and Female from various states of country. In these trainings 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 spraying system etc. also were dealt in detail. Lab assembly of drones and simulation experiments of drones also were conducted. Exclusive three days of flying also were arranged for the trainees



Special training programme :

Safe and Judicious use of glyphosate

Er. M Udaya Bhanu, Scientific Officer (PHE) of PHE division completed Master Trainer for the training on “Safe and Judicious Use of Glyphosate”. As a Master trainer, she conducted 3 days training on “Safe and Judicious Use of Glyphosate” (2 days online and 1 day physical at GNNS KVK-Jammikunta for 51 rural youth. The program started with an introduction about the institute NIPHM and the different divisional activities are explained. The topics covered were Introduction to Glyphosate and its uses, Physical and chemical properties of Glyphosate herbicide, Available formulations of Glyphosate and their mode of action, Toxicity classification of Glyphosate including acute and chronic toxicity, carcinogenicity, reproductive effects and fate in the body, Environmental fate and Eco toxic studies of Glyphosate, Weed control efficiency, Weed index, Method of calibration and calculation on doses and quantities of Glyphosate, Types of sprayer, nozzles etc for Glyphosate use. Practical sessions on “Calculation on dose and quantities of Glyphosate”, “Do’s and Don’ts of Glyphosate application label and leaflet warnings of Glyphosate application”



Educational Programs:

- PGDPHM students visited ICRISAT, as a part of their course, they have seen advance sprayers and irrigation facilities at ICRISAT.



- PGDPHM students visited CRIDA, as a part of their course, they have seen farm implements section, farm pounds, seed processing at CRIDA HRF, Hayathnagar.



S.No	Title of the Programme	Division	From	To	Eligibility criteria	Course Coordinator & e-mail
1.	Farm equipment for plant health management (Collaborative)	PHE	23.04.2024	25.04.2024	Extension officers from State Agriculture and Horticulture departments, Scientists of ICAR, SAUs and officials from KVKs, DPPQs	Dr.VidhuKampurath Joint Director (PHE) jdenggniphm-ap@nic.in
2.	RS & GIS applications in Plant Health Management	PHE	14.05.2024	16.05.2024	Extension officers from State Dept. of Agri./ Horti., soil survey, soil conservation, Watershed Project, Scientists of ICAR/ SAUs , etc. working on GIS	Er. M. UdayaBhanu Scientific Officer (PHE) sopeniphm2-ap@nic.in

1.	Pesticide application techniques and safety measures	PHE	10.06.2024	14.06.2024	Extension officers from State Dept. of Agri./ Horti., soil survey, soil conservation, Watershed Project, Scientists of ICAR/ SAUs , etc.	Er. Haneefa Begum Assistant Scientific Officer (PHE) asopheniphm2-ap@nic.in
----	--	-----	------------	------------	--	---

Research & Development

Research Activities

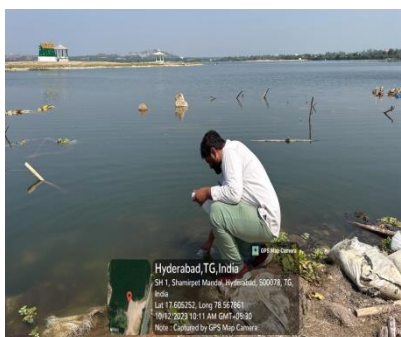
- Commercial scaling up of irradiation protocol as phytosanitary measure for major cut flowers -funded by BARC-Board of Research in Nuclear Sciences (BRNS), Department of Atomic Energy (DAE), GOI.
- Survey and field evaluation of Sterile Insect Technique for the management of Oriental fruit fly, *Bactrocera 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
- **Pesticide Formulation and Residue Analytical Centre (PFRAC):**

The 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 **276 samples** (Fruits, vegetables, cereals, pulses, milk and water) from Medchal/Malkajigiri farm gate and Alwal market 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 **181 samples** (fruit and vegetables) were received from ANGRAU and samples were analyzed under MPRNL scheme. The Laboratory also received **105 water samples** extracts from CSIR-NEERI for pesticide residues analysis by LC-MS/MS under MPRNL scheme.

A total of **43 botanical/bio-pesticides samples** were received from Haryana, Telangana, Gujarat Kerala, Karnataka, Maharashtra, Bihar, and Andhra Pradesh. The samples were analyzed by GC-MS/MS and LC-MS/MS.

A total of six pesticides formulation samples were received from Food Corporation of India and one from National Seed Corporation for quality test of pesticide product. All the samples were analyzed.



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

Laboratory has initiated PT PRA program on Tomato and Guava in the month of January 2024. The samples were prepared and homogeneity test were conducted for PT item sample of Guava and Tomato before dispatched. The samples were dispatched to 27 laboratories under MPRNL and 5 other Private participants on 31st January 2024. The last date for submission of participants result is on 6th March 2024. The participant results from 32 laboratories were received and data were analyzed by statistical technique.



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

PT-PFA programme on Ethion Technical for analysis of active ingredient (PTC/PF/04/23-24), emamectin benzoate SG for active ingredient (PTC/PF/05/23-24), chlorpyrifos + cypermethrin EC for active ingredient and emulsion stability (PTC/PF/06/23-24) was initiated in the month of November 2023. Homogeneity test were conducted for PT item sample and samples were dispatched in the month of December 2023. The participant's results from 27 State Pesticide Testing Laboratory and 19 Private Laboratory were received and participant's results were evaluated through statistical technique.

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
- Maintenance of vermicompost unit and sale
- Disease specimen- Herbarium collection
- Maintenance of vermicompost unit at NIPHM and Staff Quarters

Extension Activities / Village Adoptions

As part of the development of model IPM village by NIPHM, an off-campus farmers training program on 'Organic farming practices' was organised by NIPHM in Adopted village of Peddashapur on 07.02.2024 (1 day). Total of 16 farmers from village have been participated in this program. The farmers and rural youth of ASCI program have visited the adopted village and activities carried out by PHM division.



Other Activities

- Low cost model vermicompost Unit at NIPHM campus: A state of art vermicompost unit was established at NIPHM to facilitate hand on practice by participants during various training courses. The work has been entrusted with the help of ASCI skill trainees.
- AD (PS), AD (RPM) and SO (PRA) delivered a lecture on scientific storage and post-harvest management as guest speakers at ICM, Rajendranagar, Hyderabad on 20th and 21st March 2024.
- AD (PS) visited Centre of Excellence for fruits, Mulugu, Dept. of Horticulture, Telangana on 7th March, 2024 and had a discussion with ADH, COE regarding popularization of NIPHM technologies viz., low cost Fruitfly traps, Biopesticides etc. by organizing awareness programs and for supply of the same to the growers/farmers/extension officials.
- ASO (PP) attended Zonal Research and Extension Advisory Council (ZREAC) meeting at Nalgonda on 21st March, 2024.



- **Farmer Advisory Cell Activities:**

Under farmers advisory cell, faculty are interacted farmers about their queries related to plant protection, bioinputs usage etc. total 91 farmers approached NIPHM through telephonic communication during the quarter.

- **NIPHM Instructional farm**

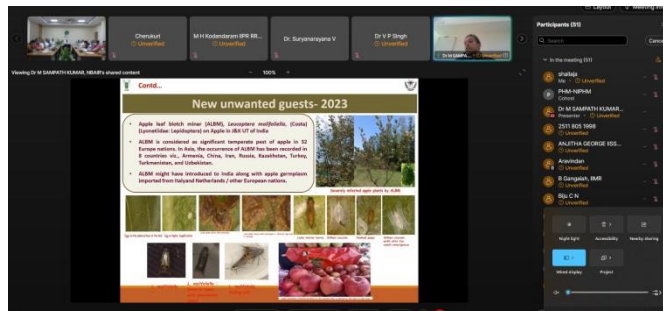
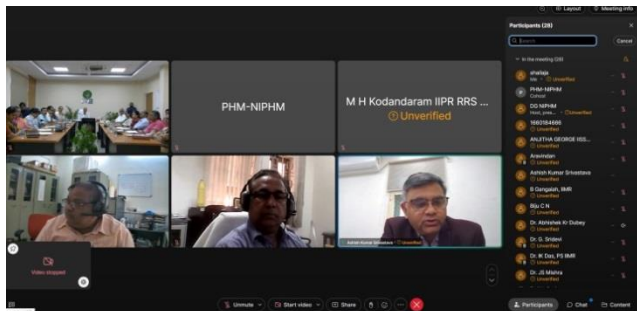
During this quarter 2023-24, for the crops like paddy, tomato and sesame and chickpea, and wheat timely irrigation was given and appropriate IPM practices were also followed. Crops were harvested after attaining maturity. Further Maize is sown for this quarter.

- **Polyhouse (Protected cultivation)**

During this quarter, crops viz., onion, cabbage, cauliflower broccoli and cucumber were monitored and necessary IPM practices for the pests observed were carried out apart from routine weeding and irrigation. Further, ridge gourd and onion is sown for this quarter.

- **National Network of Plant Health Experts:** Plant Health Management division organized workshop on 'National Network of Plant Health Experts' on 23.02.2024 in hybrid mode. In this workshop, a total of 80 experts / scientists from ICAR institutes and state agricultural and horticultural universities have participated.

The program was inaugurated by Shri Ashish Kumar Srivastava, IFoS, Joint Secretary (PP), DA&FW. As part of this workshop, scope and provisions to enhance bio-pesticides usage in India, impact of indiscriminate use of pesticides on food safety & food export and recent invasive species and their management topics were delivered by speakers.



● **Laboratory Assessment by NABL:**

Laboratory Assessment was conducted by NABL assessor on **23rd (Saturday) and 24th (Sunday) March 2024**. They assessed the competency of laboratory through witness samples and documentary evidences maintained in the laboratory. Witness samples for pesticide residue analysis and for pesticide formulation analysis were analyzed.



- Trainees from other divisions, ASCI participants visited PHE workshop acquainted with all sprayers and nozzles.



- Forty farmers from Erode and Thiruvaram district Tamil Nadu visited PHE workshop acquainted with all sprayers and thirty FPO farmers/ trainees from Maharashtra visited PHE workshop acquainted with all equipment's.



- 82 participants from DAESI, Sanga Reddy visited PHE workshop acquainted with all sprayers and thirty one farmers from PDNSM Mharashtra visited PHE workshop acquainted with all equipment's.



- Dr. Vidhu Kampurath, JD (PHE) attended Medium RPC Drone training at PBC Aero Hub and also articulated in the meeting with T-Hub officials. Possible collaboration possibilities discussed. Requested training / interaction programme with start-ups for motivation to PGDPHM students.

- Republic Day celebrations @ NIPHM



- Convocation of PGDPHM 2022-23 batch @ NIPHM



Chief Editor

Dr. Sagar Hanuman Singh IPoS, DG

Executive Editor

Dr. Christopher Alice Retna Packia Sujeetha (PBD)

Editorial Board Members

Dr. Vidhu Kampurath P, JD(PHE)

Dr. A.G. Girish, DD(PP)

Er. Shaik Liyakhat Ali Ahamed, AD(ICT)

**Published by:
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