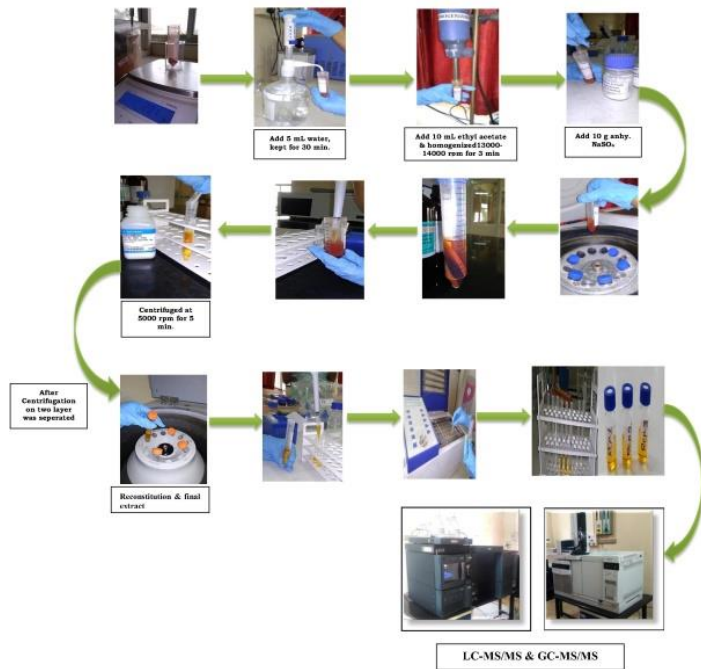




SPECIAL EVENTS



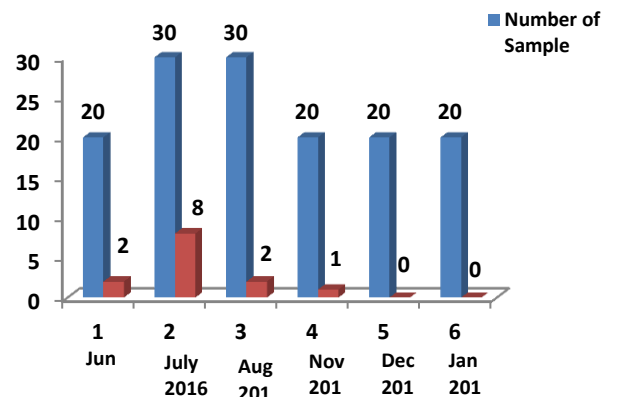
THEME ARTICLE



WHAT'S INSIDE

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Tomato





From the Director General's Desk

Agriculture production system facing challenges from an increasing demand because of growing population, adverse climate change effects, overexploitation of natural resources, loss of biodiversity. Therefore, Food Agriculture Organization (FAO) promotes Sustainable Food and Agriculture (SFA) to meet the needs of present and future generations while ensuring profitability, environmental health and social and economic equity. The agriculture sector plays an important role in Indian economy and India is the largest producer of spices, pulses, milk, tea, cashew, jute and the second-largest producer of wheat, rice, fruits and vegetables. Availability of quality and safe food i.e food free from any chemical contaminants for human consumption is a major concern as consumers are aware of health. Therefore, regulatory bodies play a significant role in availability of quality and safe food to human to protect the consumer health. Food safety and standard Act, 2006 an Act to consolidate the laws relating to food, established Food safety standard of India (FSSAI) and regulates their manufacture, storage, distribution, sale and import to ensure availability of safe and wholesome food for human consumption. Food safety standard of India (FSSAI) under Ministry of Health and Family Welfare through scientific panel expert recommends the Maximum Residues Level (MRL) on the basis of data provided by Central Insecticide Board & Registration Committee (CIB&RC) for the safety of food consumers.

Pesticide is an input to the agriculture for productivity to meet the demand of food in growing population. At the same time, use of pesticide judiciously is also necessary to reduce the residues in agricultural crops and environment. Therefore, it is very important to assess their residues in food commodities and environment. Under the central sector scheme "Monitoring of Pesticide Residues at National Level" initiated during 2005-2006, regularly monitoring pesticide residues in various food commodities and environmental samples by NABL accredited participating laboratories located in different parts of India. Additionally, NIPHM has taken initiative to study pesticide residues in some common vegetables available in local market of Hyderabad to make consumer awareness on pesticide residues in vegetables.

The theme article in this issue presented about the study on presence of pesticide residues in tomato and green chillies sample collected in and around the city of Hyderabad. The analytical method applied in analysis of pesticide residues is based on QuEChERS (quick, easy, cheap, effective, rugged and safe) extraction procedure and dispersive solid phase clean up. In all, 400 samples of tomato and green chillies collected in and around the city of Hyderabad were analyzed to assess the pesticide residues pattern in these commodities. No pesticide was detected in 94% sample of tomato and 57% green chillies. The levels of pesticide residues in vegetable such as tomato and green chillies are within the Regulatory limit of pesticide residues.

कृषि उत्पादन प्रणाली को बढ़ती जनसंख्या, प्रतिकूल जलवायु परिवर्तन प्रभाव, प्राकृतिक संसाधनों के अत्यधिक दोहन, जैव विविधता की हानि के कारण बढ़ती मांग से काफी चुनौतियों का सामना करना पड़ रहा है। इसलिए, खाद्य कृषि संगठन (एफएओ) लाभप्रदता, पर्यावरणीय स्वास्थ्य एवं सामाजिक और आर्थिक समानता सुनिश्चित करते हुए वर्तमान और भविष्य की पीढ़ियों की जरूरतों को पूरा करने हेतु सतत खाद्य एवं कृषि (एसएफए) को बढ़ावा देता है। कृषि क्षेत्र भारतीय अर्थव्यवस्था में एक महत्वपूर्ण भूमिका निभाती है और मसालों, दालों, दूध, चाय, काजू, जूट का भारत सबसे बड़ा उत्पादक और गेहूं, चावल, फल एवं सब्जियों का दूसरा सबसे बड़ा उत्पादक देश है। गुणवत्तापूर्ण और सुरक्षित भोजन यानी मानव उपभोग के लिए किसी भी रासायनिक संदूषक से मुक्त भोजन की उपलब्धता एक प्रमुख चिंता का विषय है क्योंकि उपभोक्ता स्वास्थ्य के प्रति जागरूक हैं। इसलिए, उपभोक्ता स्वास्थ्य की रक्षा के लिए मानव को गुणवत्तापूर्ण एवं सुरक्षित भोजन की उपलब्धता में नियामक निकाय महत्वपूर्ण भूमिका निभाता है। भारतीय खाद्य सुरक्षा मानक (FSSAI) खाद्य से संबंधित कानूनों को समेकित करने हेतु एक अधिनियम, खाद्य सुरक्षा एवं मानक अधिनियम, 2006 की स्थापना की एवं मानव उपभोग के लिए सुरक्षित एवं पौष्टिक भोजन की उपलब्धता सुनिश्चित करने हेतु भंडारण, वितरण, बिक्री, आयात एवं उनके निर्माण को नियंत्रित करता है। स्वास्थ्य एवं परिवार कल्याण मंत्रालय के तहत भारतीय खाद्य सुरक्षा मानक (FSSAI) वैज्ञानिक पैनल विशेषज्ञ के माध्यम से खाद्य उपभोक्ताओं की सुरक्षा के लिए केंद्रीय कीटनाशक बोर्ड एवं पंजीकरण समिति (CIB&RC) द्वारा उपलब्ध कराए गए आंकड़ों के आधार पर अधिकतम अवशेष स्तर (MRL) की सिफारिश करता है।

बढ़ती जनसंख्या में भोजन की मांग को पूरा करने एवं उत्पादन को बढ़ाने हेतु पीड़कनाशी कृषि में एक उत्पादन सामग्री है। साथ ही कृषि फसलों और पर्यावरण में अवशेषों को कम करने के लिए पीड़कनाशी का विवेकपूर्ण उपयोग भी आवश्यक है। इसलिए, खाद्य वस्तुओं और पर्यावरण में उनके अवशेषों का आकलन करना बहुत महत्वपूर्ण है। 2005-2006 के दौरान शुरू की गई केंद्रीय क्षेत्र की योजना "राष्ट्रीय स्तर पर पीड़कनाशी अवशेषों की निगरानी" के तहत, भारत के विभिन्न हिस्सों में स्थित एनएवीएल मान्यता प्राप्त प्रयोगशालाओं में प्रतिभागियों के द्वारा नियमित रूप से विभिन्न खाद्य वस्तुओं एवं पर्यावरण के नमूनों में पीड़कनाशी अवशेषों की निगरानी की जाती है। इसके अतिरिक्त, एनआईपीएचएम ने हैदराबाद के स्थानीय बाजार में उपलब्ध कुछ सामान्य सब्जियों में पीड़कनाशी अवशेषों का अध्ययन करने की पहल की है ताकि सब्जियों में पीड़कनाशियों के अवशेषों पर उपभोक्ता को जागरूकता पैदा की जा सके।

इस विषय में हैदराबाद शहर एवं उसके आसपास से एकत्र किए गए टमाटर और हरी मिर्च के नमूने में पीड़कनाशी अवशेषों की उपस्थिति पर अध्ययन के बारे में एक लेख प्रस्तुत किया गया। पीड़कनाशी अवशेष विश्लेषण में लागू विश्लेषणात्मक विधि क्वेशर (त्वरित, आसान, सस्ता, प्रभावी, वीहड और सुरक्षित) निष्कर्षण प्रक्रिया और फैलाव टोस चरण सफाई पर आधारित है। इन वस्तुओं में पीड़कनाशी अवशेषों के पैटर्न का आकलन करने हेतु हैदराबाद शहर एवं उसके आसपास से एकत्र किए गए टमाटर और हरी मिर्च के कुल 400 नमूनों का विश्लेषण किया गया। टमाटर के 94 प्रतिशत और हरी मिर्च के 57 प्रतिशत नमूनों में कोई पीड़कनाशी नहीं पाया गया। टमाटर और हरी मिर्च जैसी सब्जियों में पीड़कनाशी अवशेषों का स्तर पीड़कनाशी अवशेषों की नियामक सीमा के भीतर है।

(Dr. Sagar Hanuman Singh IPoS)
Director General

PRESENCE OF PESTICIDE RESIDUES ANALYSIS IN TOMATO & GREEN CHILLI

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 Pesticide Management Division, National Institute of Plant Health Management, Hyderabad

Introduction:

Tomato (*Lycopersicon esculentum* Mill) and Green Chilli (*Capsicum annuum* L.) are among the most important vegetables for Indian cuisine and Indian food is incomplete without these vegetables. Andhra Pradesh is the major contributor of tomatoes and green chillies in India. These vegetables are susceptible to several pest and diseases that have been controlled with pesticide to avoid significant yield losses. The judicious and approved use of pesticides provides the benefit to the crop and safe for environment. However, serious negative aspects might rise up from the indiscriminate use of pesticide in agriculture that may contaminate soil, water and non-target species. Moreover, these vegetables are eaten in the form of processes or raw. Hence, a study was conducted to find out the pesticide residues pattern in Tomato and Green Chilli in Hyderabad.



Analytical method in Tomato and Green Chilli

Sample Collection

Samples of tomatoes and green chillies (2 kg) were monthly collected from different market in and around the city of Hyderabad, Telangana. Sampling of tomato was carried out during the period between June to July 2016, and Nov 2018 to Jan 2019. Green chillies were collected during September to December 2016 and February to April 2021. A total of 400 samples were analyzed in duplicate for the presence of 156 pesticides. The analytical method was validated by using samples of tomatoes and green chillies which are free from pesticide.

Standards and reagents

Pesticide standards were purchased from *Dr. Ehrenstorfer*, *AccuStandard* and Chem service with a minimum of 99% purity. Methanol ULC/MS and acetonitrile ULC/MS were obtained from JT Baker. Acetonitrile of HPLC or spectra grade, acetone, ethyl acetate, acetic acid, formic acid and ammonium format/ammonium acetate are high quality analytical grade. Other reagents such as primary secondary amine, anhydrous $MgSO_4$ and Na_2SO_4 of sufficient quality were procured from Merck. Anhydrous sodium sulfate (Na_2SO_4), anhydrous magnesium sulfate ($MgSO_4$, powder form; purity > 98%) were heated to $500^{\circ}C$ for > 5 hrs. to remove phthalates and residual water before use.

Preparation of Stock Solution:

Stock solutions of individual standards ($1000 \mu g mL^{-1}$) were prepared in toluene: hexane (1:1), considering standard purity, and stored at $-20^{\circ}C$. Pesticide standard mixture $100 \mu g mL^{-1}$ for LC-MS/MS (90 pesticides) and for GC-MS/MS (100 pesticides) were prepared from individual stock solution. The standard mixture were diluted to 10, 1, 0.5, 0.08, 0.06, 0.02, $0.01 \mu g mL^{-1}$ for standardization of instrument method and calibration. Standard solutions prepared in acetone were used for spiking of tomato and green chillies to verify and validation of the method.

Preparation of sample:

The laboratory sample size 2 kg were crushed and homogenized to make analytical sample. The samples were stored and maintained at $\sim -20^{\circ}C$ for analysis.



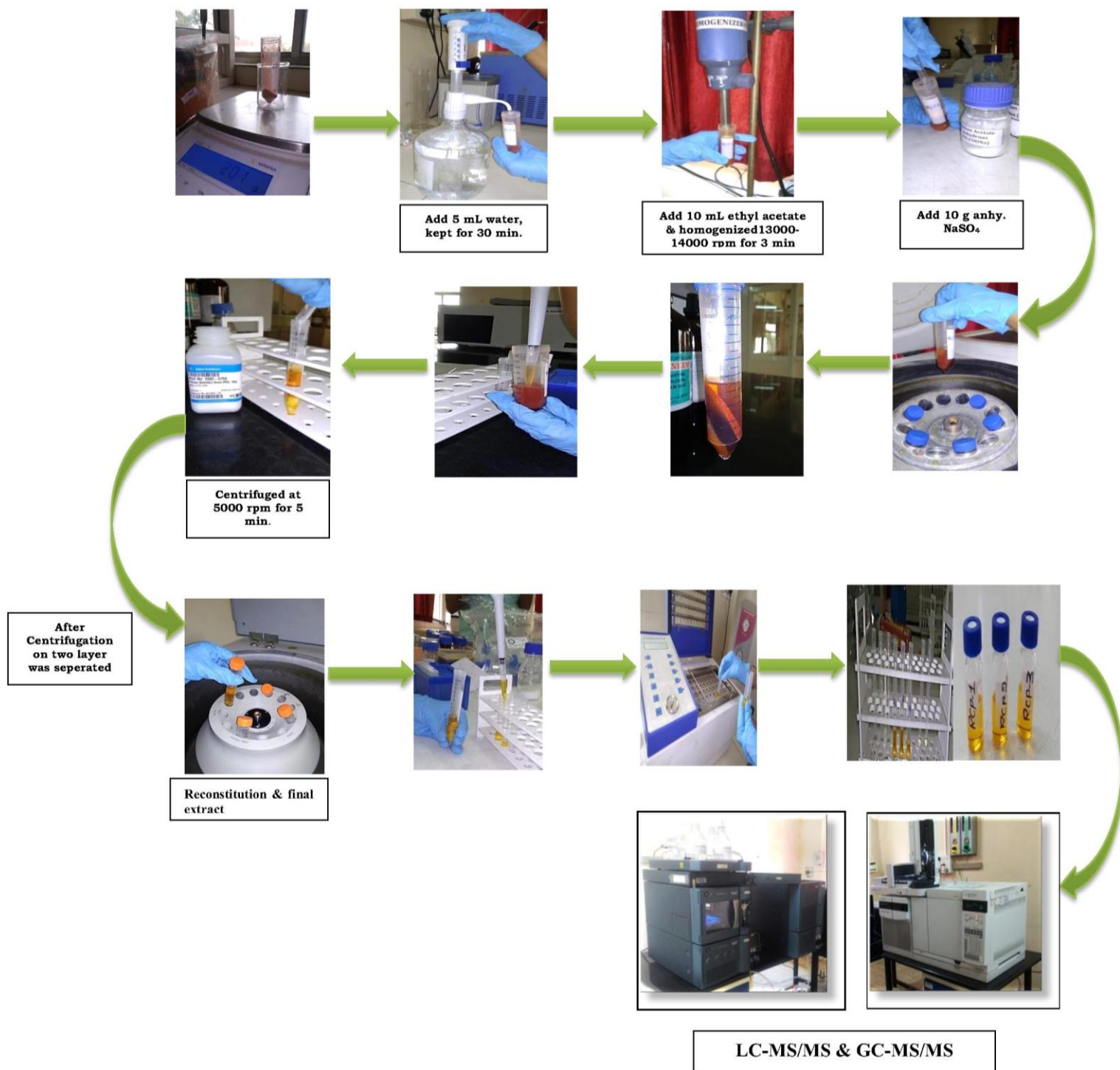
Green Chillies and Tomato sample preparation

Green Chillies and Tomato sample preparation

Method of analysis:

Method for the determination of 180 pesticides was standardized using a QuEChERS (quick, easy, cheap, effective, rugged and safe) based extraction procedure in tomato and green chilli. Analytical portion of 10 g was weighed from the laboratory sample in a 50 mL centrifuge tube and 5 mL distilled water was added. It was kept for 30 minutes for interaction of pesticide with the sample matrix. For extraction, 10 mL of ethyl acetate was added and homogenized with the help of homogenizer at 13000-14000 rpm for 3 min. Then, 10 g anhydrous sodium sulphate (activated at 500 °C for 5 hours) was added and vortexed or shaken well. The sample was centrifuged at 5000 rpm for 5 minutes at 10⁰C temperature. After centrifugation, 6 mL extract was transferred to 15 mL centrifuge tube containing 0.15 g of primary secondary amine (PSA) and 0.9 g of magnesium sulfate (MgSO₄) for clean-up the sample (dispersive solid phase). The sample was vortexed well for 1 minute and centrifuged at 5000 rpm for 5 minutes. As the sample was extracted by ethyl acetate, 2 mL extract after filtration through 0.2 μ PTFE membrane filter was directly analyzed by GC-MS/MS without solvent exchange. The extract 2 mL after cleanup, was transferred in a tube and evaporate the content using nitrogen concentrator at 35-40°C temperature for those pesticides to be analyzed by LC-MS/MS. The extract was reconstituted with 2 mL solvent mixture 80:20 (methanol: 0.1% acetic acid in HPLC water). It was filtered through 0.2 μ PTFE membrane filter before analysis by LC-MS/MS. The filtrate 5 μL and 2 μL were injected in LC-MS/MS and GC-MS/MS respectively.

FLOW CHART FOR ANALYSIS OF SAMPLE



Result and Discussion:

The method was validated by verification of various validation parameters such as selectivity, range, linearity, limit of detection, limit of quantification, accuracy, precision and robustness of the method for 156 pesticides in tomato and green chillies. The samples were analyzed for 156 types of pesticide residues using validated method with confirmatory analysis on LC-MS/MS and GC-MS/MS at 0.01 µg mL⁻¹ (parts per million) level. With this validated method, 140 tomato samples were analyzed during June to August 2016 and November 2018 to January 2019 (Figure 1). A total of 260 Green chillies samples were analyzed during September to December 2016 & February 2021 to April 2021 (Figure 2).

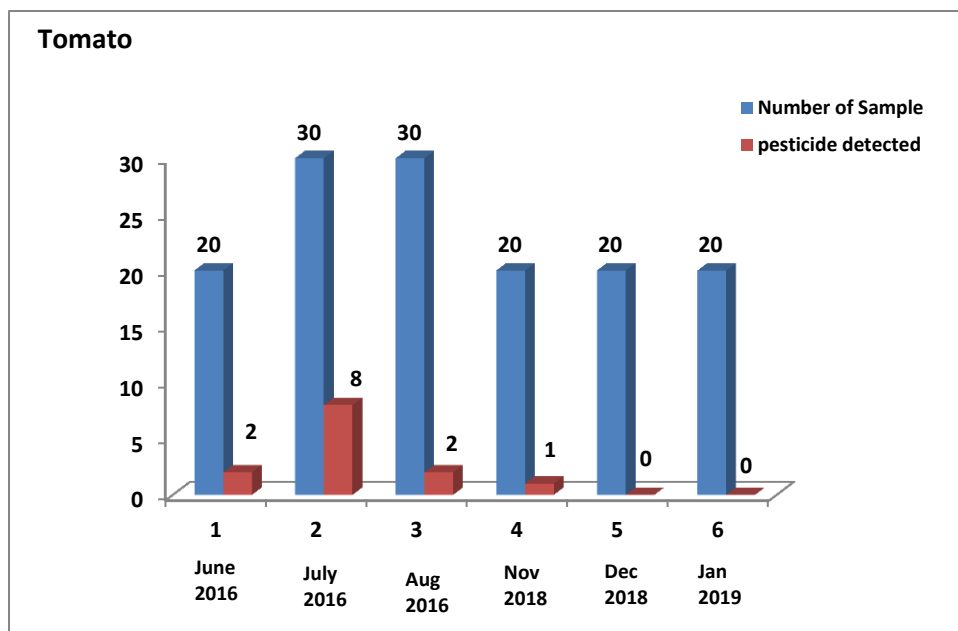


Figure 1: Tomato sample analysed during 2016 & 2018

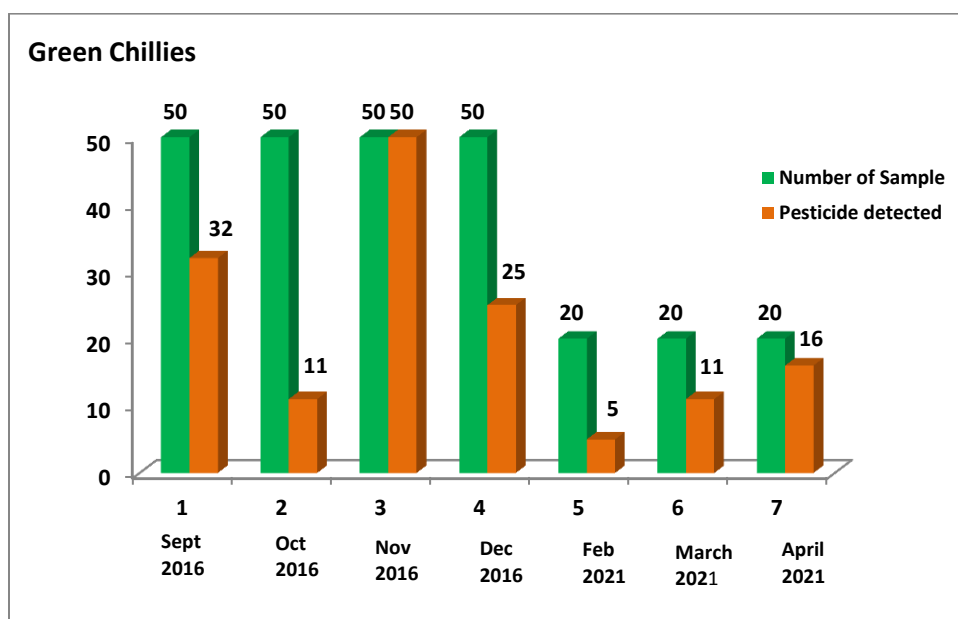


Figure 2: Green chillies sample analysed during 2016 & 2021

Pesticide such as triazophos and carbendazim were detected in 12 sample out of 80 tomato samples analysed during June to August 2016. However, triazophos and carbendazim are not approved for vegetables in India. Only one pesticide i.e. indoxacarb in one sample was detected at very traces level out of 60 samples analysed during 2018. All the detected pesticides were below the FSSAI (Food Safety Standard Authority of India) MRL (Maximum Residue Level). The pesticide indoxacarb is recommended pesticide for tomato and it was found below FSSAI MRL. The FSSAI MRL of indoxacarb is 0.5 mg/Kg in tomato. Whereas in green chillies, 59% and 53% of samples were detected with the pesticide viz acephate, acetamiprid, azoxystrobin, bifenthrin, carbendazim, carbofuran, chlorpyrifos, cypermethrin, deltamethrin, difenconazole, emamectin benzoate, ethion, fipronil, hexaconazole, lambda cyhalothrin, monocrotophos, myclobutanil, profenofos, tebuconazole, triazophos, tricyclazole during 2016 and 2021 respectively. Some of the pesticide detected in green chillies were above the FSSAI MRL. The list of pesticide is presented in Tables no.1 & Table 2.

Table no. 1: Pesticide detected in Tomato

Sl. No.	Pesticide	Approved uses (chillies)	Types of pesticide	Name of the pest
1.	Carbendazim	Not Approved	Fungicide	
2.	Indoxacarb	Approved	Insecticide	Fruit borer
3.	Triazophos	Not Approved	Insecticide	

Table no. 2: Pesticide detected in Green Chillies

Sl. No.	Pesticide	Approved uses (chillies)	Types of pesticide	Name of the pest
1.	Acephate	Approved	Insecticide	Thrips, Fruit borer (<i>Helicoverpa armigera</i>), Aphid
2.	Acetamiprid	Approved	Insecticide	Thrips
3.	Azoxystrobin	Approved	Fungicide	Fruit rot, Powdery mildew
4.	Bifenthrin	Not Approved	Insecticide	
5.	Carbendazim	Approved	Fungicide	Leaf Spot, Fruit rot, and Powdery mildew, Damping Off
6.	Carbofuran	Approved	Insecticide	Aphid , Thrips
7.	Chlorpyrifos	Not Approved	Insecticide	
8.	Cypermethrin	Not Approved	Insecticide	
9.	Deltamethrin	Approved	Insecticide	Fruit Borers
10.	Difenconazole	Approved	Fungicide	Die-back, Fruit rot
11.	Emamectin Benzoate	Approved	Insecticide	Fruit borer, Thrips, Mites
12.	Ethion	Approved	Insecticide	Mites & thrips
13.	Fipronil	Approved	Insecticide	Thrips, Aphids, Fruit borers
14.	Hexaconazole	Approved	Fungicide	Powdery mildew & Fruit rot
15.	Imidachloprid	Approved	Insecticide	Jassid, Aphid, Thrips
16.	Lambda cyhalothrin	Approved	Insecticide	Thrips, Pod borer
17.	Monocrotophos	Not Approved	Insecticide	

18.	Myclobutanil	Approved	Fungicide	Powdery mildew, Leaf spot, Die-back
19.	Profenofos	Approved	Insecticide	Thrips, Mites, Fruit borer
20.	Tebuconazole	Approved	Fungicide	Fruit rot, Powdery mildew
21.	Triazophos	Not Approved	Insecticide	
22.	Tricyclazole	Not Approved	Insecticide	

Conclusion:

The method of analysis was validated by verification of characteristic performance parameters and the method involved ethyl acetate liquid-liquid extraction followed by liquid - solid extraction cleanup (called dispersive SPE, abbreviated d-SPE) to remove the matrix interferences and quantification by LC-MS/MS and GC-MS/MS based on QuEChERS (quick, easy, cheap, effective, rugged and safe) extraction procedure (Lehotay et.al). All the verified & validated parameters are within the accepted range. The modified and validated QuEChERS method with low LOD, LOQ and good analytical precision may be used for routine monitoring of pesticide residues due to easy, quick analysis, use of less solvent and reagents, effective, safe and ruggedness of the method.

It was observed from the above studies that comparatively less pesticide are used for pest management in tomato samples whereas various insecticides and fungicides are used in green chillies. No pesticide was detected in 94% sample of tomato and 57% green chillies. However, it is observed that uses of some of the pesticides which are not approved in India by CIBRC. This study shows that level of pesticide residues in vegetable such as tomato and green chillies are within the Regulatory limit of pesticide residues.

References:

1. Steven J. Lehotay, Michelangelo Anastassiades, Ronald E. Majors. The QuEChERS Revolution September 1, 2010. Chromatography Online, <https://www.researchgate.net/publication/295924116>
2. Report on “Monitoring of Pesticide Residues at National Level”, MA &FW, (www.fssai.gov.in › upload › advisories › 2019/10).
3. Graziela C. R. Moura Andrade, Rosana M. O. Freguglia, Regina P. Z. Furlani, Nádia H. Torres and Valdemar L. Tornisiolo (2011). Determination of Pesticide Residues in Tomato using Dispersive Solid-Phase Extraction and Gas Chromatography/Ion Trap Mass Spectrometry *J. Braz. Chem. Soc.*, Vol. 22, No. 9, 1701-1708, 2011.
4. <http://ppqs.gov.in/divisions/cib-rc/major-uses-of-pesticides>

Around the World

- The 61st meeting of the Central Insecticides Board held on 11.11.2021 discussed on various agenda on,
 - report made by RC in approving additional and new packing for approved pesticides by the RC under Section 9(3) of the Insecticides Act, 1968,
 - Re-notification of the complete list of Schedule to the Insecticides Act, 1968, Enhancement of shelf-life registered u/s 9(3)& 9(4) of the Insecticides Act, 1968,
 - Import permits issued for Multiuse/Dual-use Pesticides (for Non-Insecticidal purpose),
 - Waiting period/ pre-harvest interval between application of the pesticides and harvest in respect of various commodities in case of new formulations registered under section 9(3) & label expansion of already registered formulations,
 - Draft SOP for use of Drone application of pesticide for crop protection (small, marginal and organized sector) in agriculture, forestry, non-cropped areas-reg,
 - Consideration of Notification issued by Ministry of Agriculture and Farmers Welfare,
 - Consideration of proposals for Inclusion of New Molecules/substances in the Schedule to the Insecticides Act, 1968.
- The Codex Committee on Pesticide Residues (CCPR), 52 sessions was held from 26 – 30 July 2021 in virtual mode with adoption of the report on 3 August 2021. As per the report (dated 23.08.2021), CCPR wrapped up its 52nd session advancing new Codex Maximum Residue Limits (MRLs) for spices, seeds, fruits, and other commodities to the 44th Session of the Codex Alimentarius Commission (CAC44). These limits for pesticide residues in food are established by Codex based on a risk assessment and limits for safe intake set by an FAO/WHO international expert scientific group named Joint FAO/WHO Meeting on Pesticide Residues (JMPR).
- EPA Announces Updated Schedule, Completes Safety Assessments and Decisions for Hundreds of Pesticides to Address Risk and Ensure Safe Pesticide Use.. <https://www.epa.gov/pesticides/pesticide-news-stories>, December 2, 2021
- EPA Releases Summary of Dicamba-Related Incident Reports from the 2021 Growing Season. <https://www.epa.gov/pesticides/epa-releases-summary-dicamba-related-incident-reports-2021-growing-season>, December 21, 2021.
- EPA Releases Final Biological Evaluations for Glyphosate, Atrazine, and Simazine. <https://www.epa.gov/pesticides/epa-releases-final-biological-evaluations-glyphosate-atrazine-and-simazine>: November 12, 2021

Training Programs

Plant BioSecurity Division

The Plant Biosecurity Division has organized following training programmes during the months of **October-December, 2021**.

CAPACITY BUILDING PROGRAMMES:

S. No	Name of the Programme	No. of days	From	To
I. Officers Programme				
1.	Irradiation as a phytosanitary treatment	5 Days	04.10.2021	08.10.2021
2.	Fumigation as a Phytosanitary Treatment (Methyl Bromide and Aluminium Phosphide Fumigation)- Payment Programme)	15 Days	18.10.2021	01.11.2021
		15 Days	29.11.2021	13.12.2021
3.	Orientation for PSC Issuing Authority	1 Day	05.11.2021	05.11.2021
4.	Invasive Alien Species: Introduced and Emerging Pests	3 Days	16.11.2021	18.11.2021
5.	Stored Grain Pest and Warehouse Management to APSWC, AP (Payment Programme)	5 Days	16.11.2021	20.11.2021
		5 Days	22.11.2021	26.11.2021
6.	Forced Hot Air Treatment (FHAT)- Payment Programme	5 Days	22.11.2021	26.11.2021
		5 days	29.11.2021	03.12.2021
7.	Advance Techniques for Identification of Quarantine Pathogens	5 days	29.11.2021	03.12.2021
8.	Collaborative training programme with Department of Horticulture, Andhra Pradesh on Export promotion procedures of APEDA Cluster crops (Mango, Banana and Pomegranate) - Payment Programme	2 Days	28.12.2021	29.12.2021
9.	Vertebrate Pest Management – Wild boar, Monkey and Birds	3 Days	06.10.2021	08.10.2021
10.	Rodent Pest Management in Food Grain Warehouses	5 Days	22.11.2021	26.11.2021
11.	Certificate Course on Urban Integrated Pest Management (Payment program)	15 Days	01.12.2021	15.12.2021
II. Farmers Training Programme				
1.	Export procedures and export promotion in collaboration with KVK Jalna, Maharashtra	1 Day	05.10.2021	05.10.2021
2.	Good Agricultural Practices (GAP) and export promotion of Mango in collaboration with Laxmi Jan Kalyan Sewa Sansthan, Muradnagar, Ghaziabad, UP	1 day	06.10.2021	06.10.2021

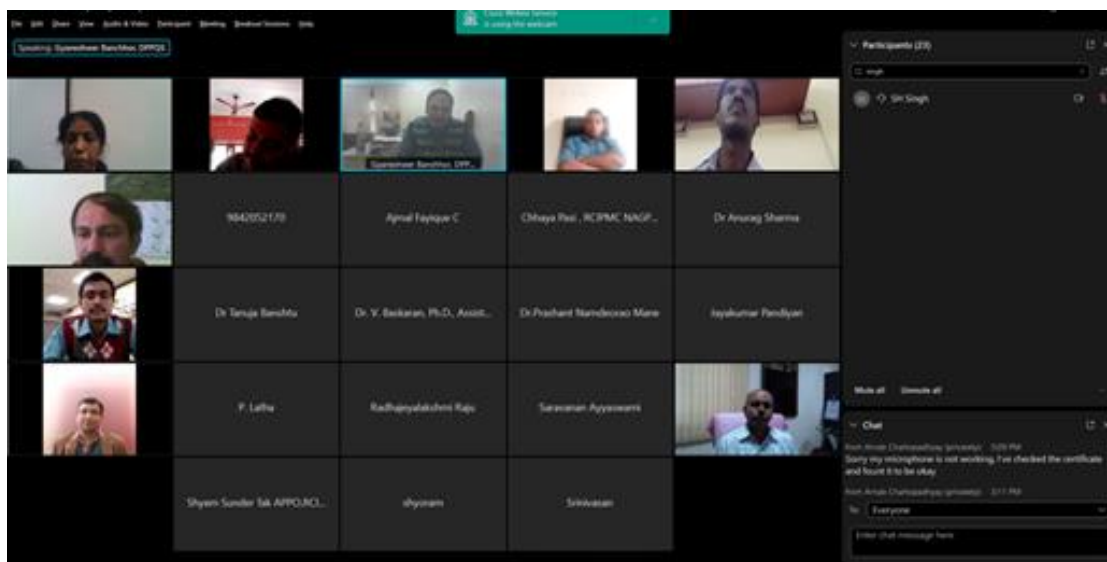
3.	Dhaanyam Nilvalo Cheeda peedala gurtimpu marriyu nivarana to the farmers of West Godavari District, Andhra Pradesh	1 day	13.10.2021	13.10.2021
4.				
5.	Rodent Pest Management for farmers of Erode District	1 Day	08.10.2021	08.10.2021
6.	Vertebrate Pest Management	1 Day	13.10.2021	13.10.2021
7.	Vermitechnology to the farmers of Tamil Nadu	1 Day	06.11.2021	06.11.2021
III. Webinars for students/Officers/Scientists				
1.	Perspectives in Plant Biosecurity and Plant Quarantine in collaboration with College of Agriculture and Research Station, Jangir-Champa, Chhattisgarh	1 Day	18.11.2021	18.11.2021
2.	Plant Quarantine and Plant Biosecurity regulations in India in collaboration with Assam Agricultural University, Jorhat, Assam	1 Day	07.12.2021	07.12.2021
3.	Webinar on “Plant Quarantine system in India” in Collaboration with Agricultural College, Jagtial, PJTSAU, Telangana	1 Day	30.12.2021	30.12.2021

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

- Irradiation as a phytosanitary treatment:** This 5- day’s online training was organized from 04.10.2021 to 08.10.2021. Irradiation is used as one of the phytosanitary treatments in the trade of agricultural commodities as a pest risk management option for prevention of exotic pests. The main objective of this training is to create awareness about irradiation as phytosanitary treatment for export of agricultural and horticultural commodities, treatment development and validation, safety measures and post treatment security. Two participants from state agricultural university of Karnataka and Tamil Nadu attended the online program and acquired knowledge on irradiation as a phytosanitary treatment.
- Fumigation as a Phytosanitary Treatment (Methyl Bromide and Aluminium Phosphide Fumigation):** Two On Campus programmes of 15 days were conducted from 18.10.2021 to 01.11.2021 and 29.11.2021 to 13.12.2021 on payment basis and a total 18 and 25 participants were attended the programme respectively. The participants got familiarized with physical and chemical properties of Phosphine and Methyl bromide, safety precautions to be followed while handling fumigants, mode of action of fumigants, principles of fumigation, monitoring the fumigant concentration, appropriate use and maintenance of fumigants and safety equipments. The participants were made to understand the guidelines laid in NSPM-11, 12 (MBr fumigation) and NSPM-22 (Phosphine fumigation) to conduct appropriate fumigation procedures as well as the accreditation procedure of fumigation operators prescribed by the DPPQ&S. The trainees gained hands-on practical experience in creating gas-tight enclosure, laying gas supply and monitoring lines, use of vaporizer, fan, leak detector and gas concentration monitor.



- 3. Orientation for Phytosanitary Certificate (PSC) Issuing Authority:** Phytosanitary certification is one of the basic measures to prevent the movement of pests along with agricultural commodities. Phytosanitary certificates are issued by the exporting National Plant Protection Organization as a plant health certificate after carrying out inspection, sampling, testing and treatment (if required) to promote the safe trade. A one day programme /webinar was conducted on 05.11.2021 to the officers of KVK, Jalna, Maharashtra to give the information on various aspects of Import and Export as well on standards for issuance of phytosanitary certificates. The programme was attended by 15 participants for the department.
- 4. Invasive Alien Species: Introduced and Emerging Pests:** A 3 days online programme was conducted from 16.11.2021 to 18.11.2021. Invasive alien species are species that are introduced, accidentally or intentionally, outside of their natural geographic range and that become problematic. This training was organized in order to create awareness about Invasive Alien Species and to impart information on prevention and management prospective. Thirty participants from state agricultural universities, officials from DPPQ&S attended the online program and acquired knowledge on prevention and management of Invasive Alien Species in order to safeguard Plant Biosecurity.



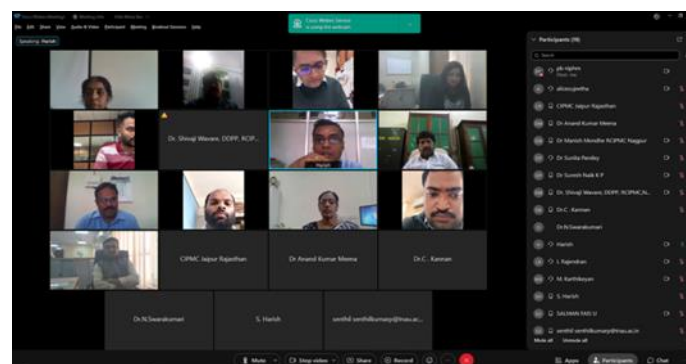
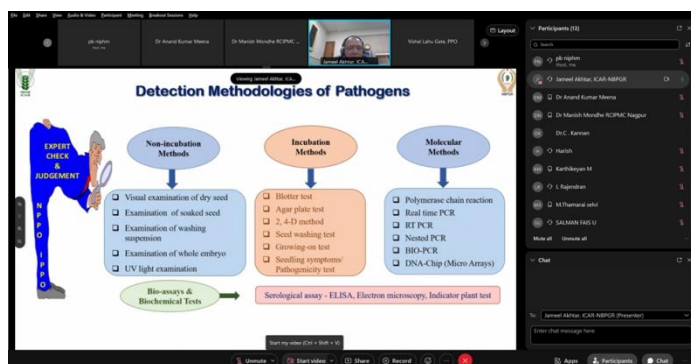
5. **Stored Grain Pest and Warehouse Management to APSWC, AP:** Two on campus programmes of 5 days duration were conducted from 16.11.2021 to 20.11.2021 and 22.11.2021 to 26.11.2021. A total of 29 and 30 participants attended the programmes. The programmes were organized with an objective to create awareness and to train the officials involved in storage of food grains at warehouse level to improve the technical efficiency in maintenance of the grain storage and other technical quality control aspects at godowns with respect to Prophylactic and Curative treatments (Fumigation with ALP).



6. **Forced Hot Air Treatment (FHAT):** Two on campus programmes of 5 days duration were organized on payment basis for Operators from 22.11.2021 to 26.11.2021 and 29.11.2021 to 03.12.2021. Total 40 and 54 participants were attended the programme respectively. The programme aimed to provide knowledge on NSPM-9 and other issues related to treatment of solid wood packing material. Training covered requisites associated with Solid wood packing material (SWPM), its associated pests (fungi, insects and nematodes), phytosanitary treatments, design and construction of FHAT, equipments and their specifications, accreditation and audit protocol and calibration of sensors and treatment procedures. NIPHM is the only resourceful institute specialized in offering training on FHAT in accordance with ISPM-15 and NSPM-9.



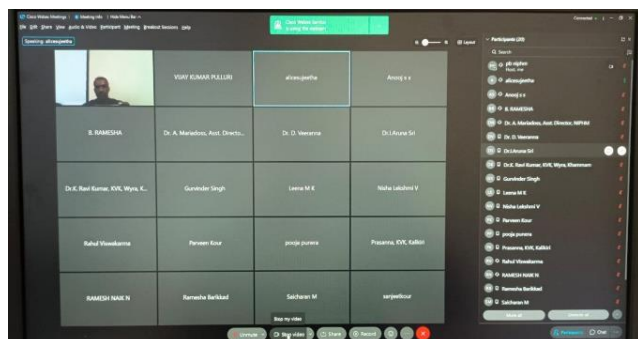
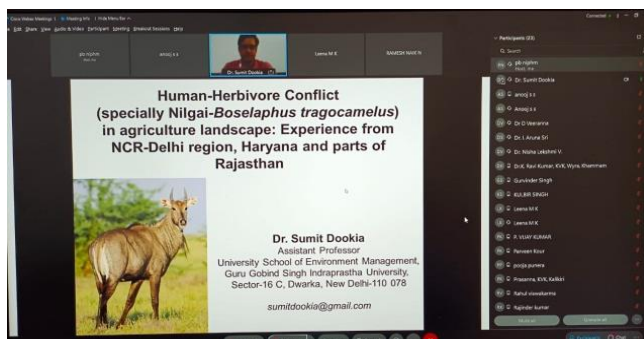
7. **Advance Techniques for Identification of Quarantine Pathogens:** A five days online training program was conducted from 29.11.2021 to 03.12.2021. Plant diseases are responsible for major economic losses in agriculture and horticulture industry worldwide. Detection and accurate identification of harmful plant pathogens is very essential to improve the strategies for controlling plant diseases. Advanced techniques such as serological and molecular based will help for early detection and identification of plant pathogens by increasing the efficacy, accuracy and speed of diagnosis. This training was organized in order to create awareness about the advanced techniques for identification of quarantine pathogens. Twenty participants were attended this online training programme.



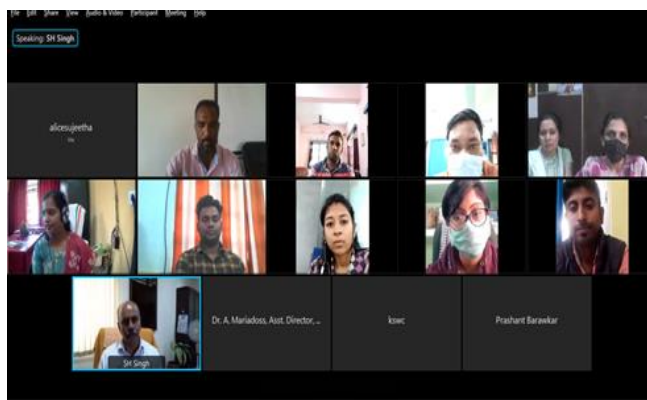
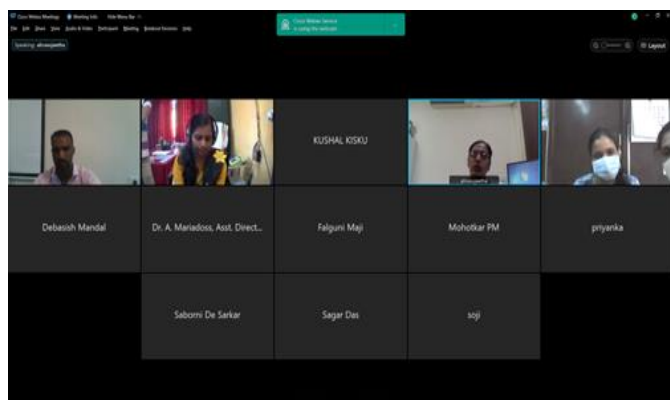
8. **Collaborative training programme with Department of Horticulture, Andhra Pradesh on Export promotion procedures of APEDA Cluster crops (Mango, Banana and Pomegranate):** Two Days on Campus programme was organized for the horticulture officers of Andhra Pradesh from 28.12.2021 to 29.12.2021 with an objective to create awareness about plant quarantine and the procedures involved in export of horticultural commodities (as per APEDA clusters) as well to improve the export performance of horticulture products by adoption of Good Agriculture Practices (GAP) which will also help in boosting the exports.. Different lectures were scheduled in such a way that all the 15 officers' get well familiar with procedures for export of Mango, Banana and Pomegranate as per the requirement of the importing country.



9. **Vertebrate Pest Management – Wild boar, Monkey and Birds:** Wild boars, monkeys and birds are the immense threat to the crops and their proper management is of much significance. This programme was conducted for 3 days from 06.10.2021 to 08.10.2021 through virtual mode. Total 23 scientists / Agriculture officers from different states were attended the training programme. During the programme the participants gained knowledge on various management practices of vertebrate pests.



10. Rodent Pest Management in Food Grain Warehouses: An online programme was conducted exclusively to the CWC and State Warehousing officials from 22.11.2021 to 26.11.2021. Total 11 officers were attended the training. The program is covered the major aspects on Economic importance of rodents in urban scenario, Major rodents pests in urban and storage premises, biology and morphology of rodents, breeding biology of rodents, rodent borne diseases, inspection procedure for rodent pests in storage godowns; Rodenticides and mode of action and Non chemical management of rodent pest in storage godowns.



11. Certificate Course on Urban Integrated Pest Management: A 15 days on campus programme was organized from 01.12.2021 to 15.12.2021 for 33 structural pest management professionals. The participants acquired knowledge on Ecology and ethology of rodents, mosquitos, termites, cockroaches, bedbug and flies etc. and their management practices. In addition, emphasis was given on safe and judicious use of pesticides, Care, handling and maintenance of pesticide application equipment, Food safety & standards in food processing industries and urban weed management etc.

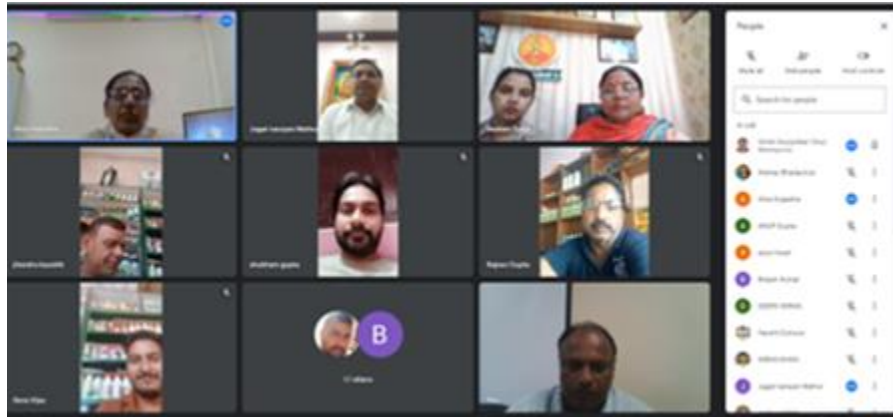


II. FARMERS PROGRAMMES

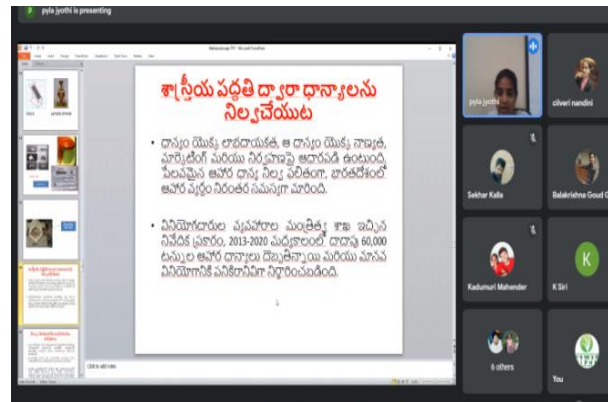
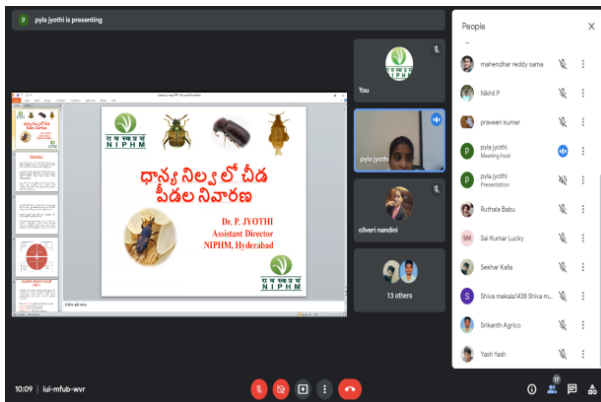
1. Export procedures and export promotion in collaboration with KVK Jalna, Maharashtra: One day webinar under Azadi- ka- Amrit- Mahotsav was conducted for the farmers on 05.11.2021. Total 116 farmers attended the programme.



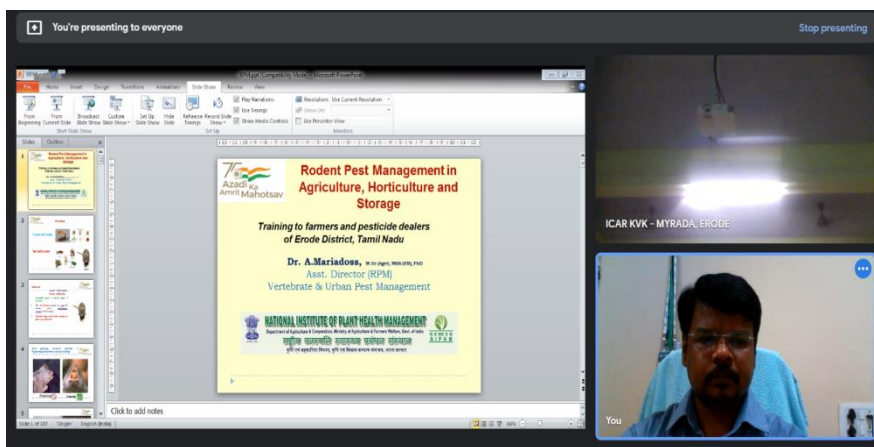
2. Good Agricultural Practices (GAP) and export promotion of Mango: Uttar Pradesh is largest producer of mango in India but very negligible share in export compared to other states of India. Hence, a one day webinar on “Good Agricultural Practices (GAP) and export promotion of Mango” was organized in collaboration with Laxmi Jan Kalyan Sewa Sansthan, Muradnagar, Ghaziabad, UP on 06th October, 2021 under Azadi ka Amrit Mahotsav. Total 37 participants (Exporters, Farmers and Pesticide Dealers) were attended the program. The farmers from Shamli, Badaun and Bahraich District of UP attended the program. The GAP in mango related to export requirement and the role of a farmer, exporter and insecticide dealers in export promotion was emphasized.



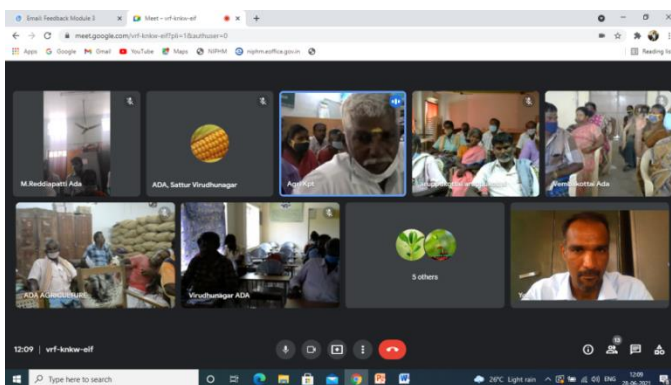
3. “Dhaanyam Nilvalo Cheeda Peedala Gurtimpu Marriyu Nivarana” to the farmers of West Godavari District, Andhra Pradesh: Under Azadi- ka- Amrit -Mahotsav, A one day virtual training program was organized on 13.10.2021 to the farmers of West Godavari District, Andhra Pradesh. Total 24 participants (Progressive Farmers/farmers) from WG district were attended the programme.



4. Rodent Pest Management for farmers of Erode District: Under Azadi ka Amrit Mahotsav, one day training was conducted to the farmers and dealers in collaboration with KVK, Gobichettipalayam, Erode, Tamil Nadu. 52 farmers and dealers attended the program. The training emphasized on sustainable rodent management in agriculture, horticulture ecosystem and in grain storage.



5. Vertebrate Pest Management: Under Azadi ka Amrit Mahotsav, one day training programme was conducted on 13.10.2021 to the famers of Aluva, Kerala. Total 22 farmers were attended the programme.

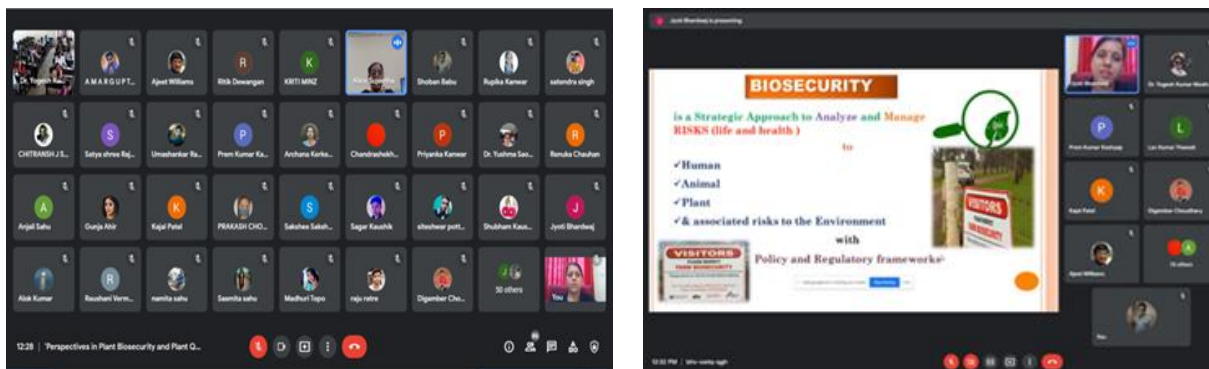


6. Vermitechnology: This programme was organized to the farmers of Kelakunnupatty, Musiri Taluk, Trichy District of Tamil Nadu on 06.11.2021. Total 17 rural youth/farmers were attended the programme. The participants were provided information on Vermicompost and Vermiwash production techniques along with the organic inputs prepared by taking all the safety measures.

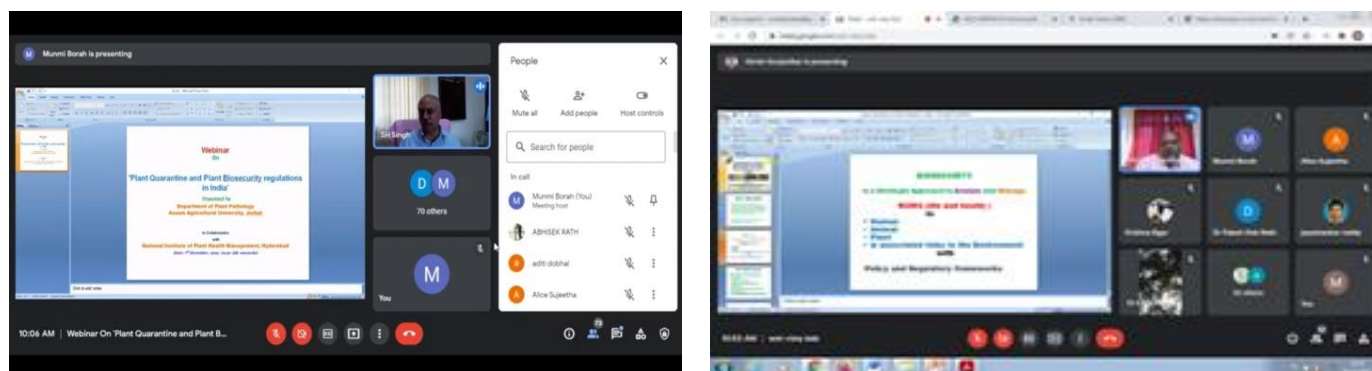


III. Webinars for students/Officers/Scientists

1. Webinar on **“Perspectives in Plant Biosecurity and Plant Quarantine”**: Under Azadi-ka- Amirt -Mahotsav, A one day webinar was organized in collaboration with College of Agriculture and Research Station, Jangir-Champa, Chhattisgarh on 18.11.2021. Programme was focused to create awareness on various emerging issues relevant to Plant Biosecurity, Plant Quarantine policies, Phytosanitary Measures and Trade Challenges. The programme was attended by 103 participants (Students, Professors & Scientists).



2. Webinar on **"Plant Quarantine and Plant Biosecurity regulations in India"** in collaboration with **Assam Agricultural University, Jorhat, Assam**: Under Azadi-ka- Amirt -Mahotsav, A one day webinar was organized for students, researchers, faculties and scientists on 07.12.2021. The topics covered were introduction to plant biosecurity, plant quarantine system in India, import procedures for plants and plant products and post entry quarantine for propagative material. One seventy four participants attended the webinar.



3. Webinar on **“Plant Quarantine system in India”** in Collaboration with **Agricultural College, Jagtial, PJTSAU, Telangana**: Under Azadi ka Amrit Mahotsav program, one day online programme was conducted on 30.12.2021 for the students and faculties of Agricultural College, Jagtial, PJTSAU, Telangana. The objective of virtual programme was to create awareness about plant quarantine system, role and responsibilities of plant quarantine officers, National Standard for Phytosanitary Measures (NSPMs) and Standard Operating Procedures (SOPs), import and export procedures of plants and plant products. The programme was attended by 96 students, Asst. Professors, Assoc. Professors and Professors of University.



IV. OTHER SIGNIFICANT ACTIVITIES:

- Online course on Plant Biosecurity (MOOCs):** In VI batch Thirty five candidates cleared the final online exam.
- Massive Open Online Course (MOOCs) in Rodent and Household Pest Management:** The final examination was conducted and 20 students were completed the course by clearing the exam.
- Kerala PGDPHM:** The contact classes of III semester for the 5th Batch (2019-21) was organised from 1st to 15th December 2021 at NIPHM, Hyderabad. Total 26 officials from the Department of Agriculture, Government of Kerala were attended. The convocation for the IV Batch is scheduled at SAMETI, Trivandrum on 04.01.2022.



FORTHCOMING PROGRAMMES OF PBD & VPM (JANUARY-MARCH, 2022)

Division	Name of the programme	No. of Days	From	To
PBD	Phytosanitary Inspection for Phytosanitary Service Providers for Inspection of Plants/ Plant Products & other regulated articles in export	30 days	03.01.2022	01.02.2022
	Fruit fly: Surveillance and Management	5 Days	31.01.2022	04.02.2022
	Plant Bio Security & Incursion Management (PBIM)	12 Days	07.02.2022	18.02.2022
	Introduction to Plant Biosecurity and Plant Quarantine	5 Days	07.02.2022	11.02.2022
	Pest Risk Analysis	5 Days	14.02.2022	18.02.2022
	Forced Hot Air Treatment (FHAT)	5 Days	21.02.2022	25.02.2022
	Fumigation as a Phytosanitary Treatment (Methyl Bromide and Aluminium Phosphide)	15 days	28.02.2022	14.03.2022
	Stored Grain Pest Detection, Identification and Management	5 Days	14.03.2022	18.03.2022
	Pest Surveillance	5 Days	21.03.2022	25.03.2022
VPM	Risk assessment and management of vertebrate pests in agriculture and horticulture ecosystem	10 Days	09.02.2022	18.02.2022
	Certificate Course on Urban Integrated Pest Management	15 Days	01.03.2022	15.03.2022

Plant Health Management Division

Training programmes

S No	Name of the programme	No. of Days	From	To
I. Officers Programme				
1.	Plant Health Management in Protected Cultivation	5	04.10.2021	08.10.2021
2.	Quality control of microbial bio-pesticides	5	25.10.2021	29.10.2021
3.	On-farm production of biocontrol agents and microbial biopesticides	5	08.11.2021	12.11.2021
4.	Indiscriminate use of pesticides and fertilizers in agriculture	3	15.11.2021	17.11.2021
5.	Plant Health Management strategies in different crops	21	10.11.2021	31.11.2021
6.	Conservation of insect pollinators in agriculture	3	22.11.2021	24.11.2021
7.	Integrated Soil Nutrient & Rhizosphere Management	3	01.12.2021	03.11.2021
8.	Training on Sustainable pest Management programmes for District levels	3	28.12.2021	30.12.2021
II. Farmers Training Programme				
1.	On-farm production of Bio-control agents	1	22.10.2021	-
2.	On-farm production of Bio-fertilizers & Bio-control agents	2	07.10.2021	08.10.2021
3.	On-farm production of Bio-fertilizers & Bio-control agents	2	11.10.2021	12.10.2021
4.	Certificate course on Plant Health Management in Organic Farming	21 days (Part-I)	06.12.2021	26.12.2021
III. Webinars/Workshop				
1.	Time-critical measures to support early warning, monitoring, and sustainable management of Fall Armyworm in India	3	21.12.2021	23.12.2021
IV. Special Programmes				
1.	A students training programme was conducted on “On-farm production of biocontrol agents	2	17.11.2021	18.11.2021

I. Training programme report (officers)

1. Plant Health Management in Protected Cultivation

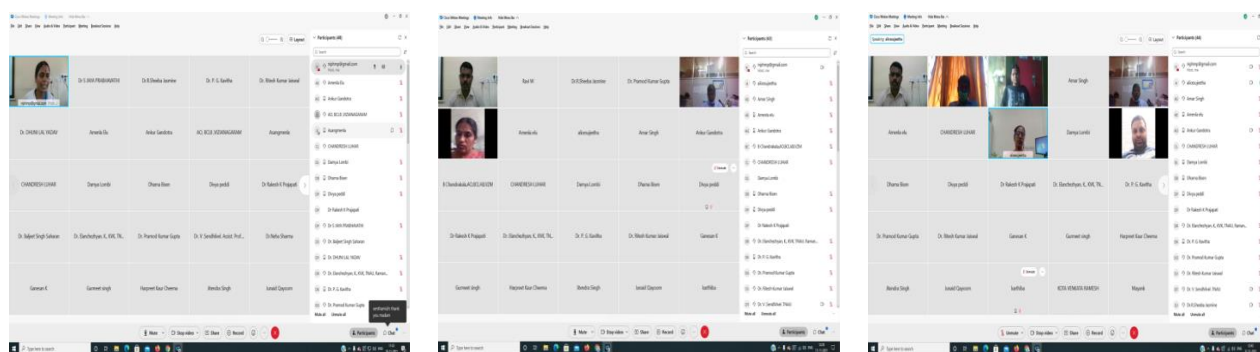
As scheduled in the NIPHM training calendar 2021-22, an online training programme on ‘Plant Health Management in Protected Cultivation’ was organized at NIPHM from 04th to 08th October 2021 (5 days). In this programme total of 89 officers/scientists from different states & organizations have participated.

2. Quality control of microbial bio-pesticides

As scheduled in the NIPHM training calendar 2021-22, an online training programme on “Quality control of microbial bio-pesticides” was organized at NIPHM from 25.10.2021 to 29.10.2021 (5 days). In this programme total of 13 officers/scientists from different states & organizations have participated.

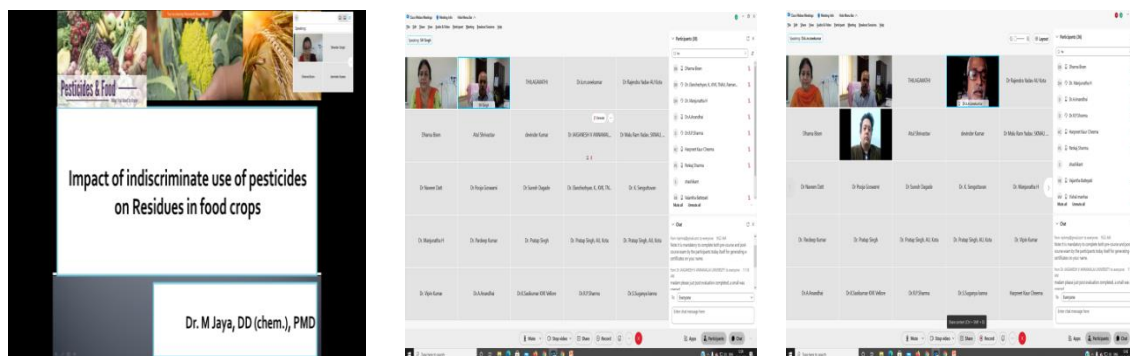
3. On-farm production of biocontrol agents and microbial biopesticides

An online training programme conducted on “On-farm production of biocontrol agents and microbial biopesticides” from 08.11.2021 to 12.11.2021(5 days). In this programme total of 60 officers/scientists from different states & organizations have participated, where 52 participants completed their pre and post-course exam and certificates have been sent to their registered mail ids. Total there were 13 lectures taken by the internal speakers for the duration of 21



4. Training on the impact of indiscriminate use of pesticides and fertilizers in agriculture

An online training programme was conducted on “Indiscriminate use of pesticides and fertilizers in agriculture” from 15.11.21 to 17.11.21. In this programme total of 41 officers/scientists from different states & organizations have participated, where 40 participants completed their pre and post-course exam and certificates has been sent to their registered mail ids. Total there were 08 lectures taken by the internal speakers for the duration of 13 ½ hours.



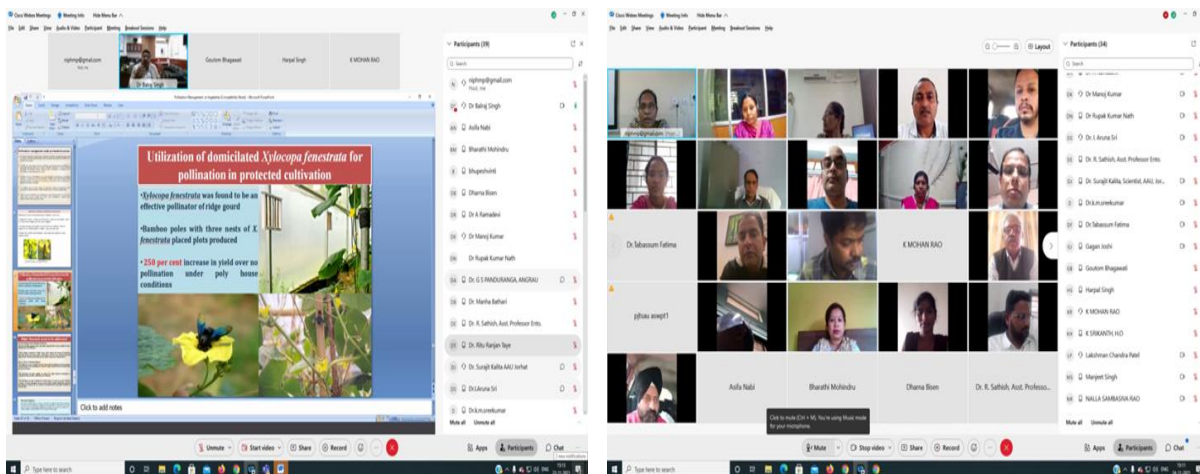
5. Plant Health Management strategies in different crops

As per the NIPHM training calendar 2021-22, a 21 days training programme on Plant Health Management strategies in different crops was organized at NIPHM from 10th to 31st November 2021 (21 days). In this programme total of 20 officers/scientists from different SAUs, KVKs, and ICAR institutes & state departments have participated. As part of the program different plant health management strategies like the use of Biocontrol agents, biopesticides, biofertilizers, and IPM, IDM, IWM, and INM were explained by different experts. Participants were taken to different institutes like IIOR, IIMR, NBPGR, IIRR and PJTSAU.



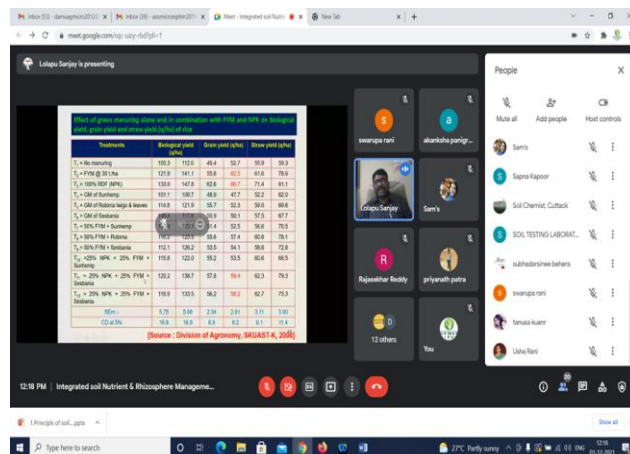
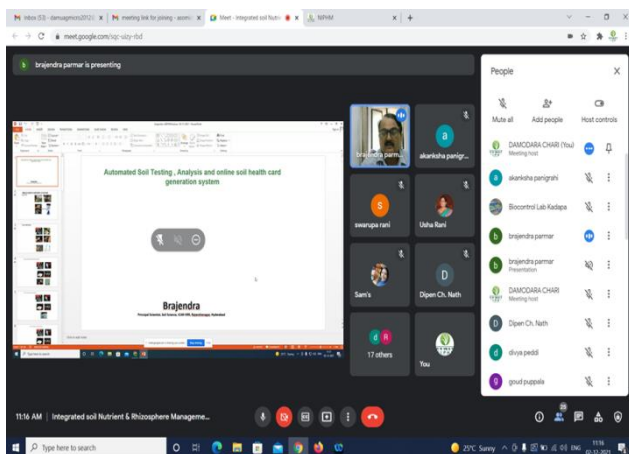
6. Conservation of insect pollinators in agriculture

As per the NIPHM training calendar 2021-22, an online training programme on ‘Conservation of insect pollinators in agriculture’ was organized at NIPHM from 22.11.2021 to 24.11.2021 (3 days). In this programme total of 40 officers/scientists from different states & organizations are participated.



7. Integrated Soil Nutrient & Rhizosphere Management (ISNRM)

As scheduled in the NIPHM training calendar 2021-22, an online training programme on ‘Integrated soil Nutrient & Rhizosphere Management’ was organized at NIPHM from 01.12.2021 to 03.12.2021 (3 days). In this programme total of 26 officers from different states & organizations have participated. During this online training session such as living soil concept and Role of Biofertilizers in soil nutrient management, Principles of soil nutrient management, Ecological Engineering for soil Health management, Vermicompost technology, Soil test-based nutrient Management and use of on-farm production kit, Integrated nematode Management, Rhizosphere engineering for soil health Management, On-farm production of Biofertilizers and biopesticides.



8. Training on Sustainable Pest Management programmes for District levels

Planning and implementation of a sustainable pest management program for the agriculture and horticulture crops at the district level this special training is proposed and scheduled. Sustainable pest management training programme can improve the village and on the usage of physical, cultural and bio-control measures of controlling pest and disease in different agricultural & horticultural crops make them to show the results IPM practices and nutrient management practices for better crop production and protection. A total of 17 participants/field level officers from different organizations are participated and demonstrated different eco-friendly techniques on sustainable plant pest management practices such as Agro Ecosystem Analysis & Ecological Engineering for pest management, IPM for agriculture and horticultural crops, on-farm production technologies for mass production of Bio-fertilizers, Bio-pesticides (*Trichoderma*, *Pseudomonas*, EPF and EPN), insects and parasitoids & insect predators.

II. Farmers training programmes

1. On-farm production of Bio-control agents

An online farmers training ‘On-farm production of Biocontrol agents’ was conducted on 22nd October 2021. A total of 32 farmers along with agriculture department people from Kattankulathoor Block, Chengalpattu District, Tamil Nadu have participated and explained about different on-farm production technologies of NIPHM.

2. On-farm production of Bio-fertilizers & Bio-control agents

The 75th year of independence of our nation is widely being celebrated as the Azadi Ka Amrit Mahotsav. To commemorate the monumental occasion, NIPHM is organizing various training programmes and campaigns in thematic areas of Indian Agriculture. As scheduled in the NIPHM training calendar 2021-22, a physical farmers training programme on “on-farm production of Bio-fertilizers & Bio-control agents” was conducted from 07.10.2021 to 08.10.2021(2 days). In this programme total of 29 farmers from Muklanoor cooperative society, Karimnagar district interested in biofertilizers and biopesticides attended. The farmers underwent various theory and hands-on training practical classes on Agro Ecosystem Analysis and Ecological Engineering in Integrated Pest Management. Preparation of lures and pheromone traps, Rodent pest management, on-farm production of bio-fertilizers, *Trichoderma*, *Pseudomonas*, and biocontrol agents (predators and parasitoids). Later, bio-fertilizers produced by NIPHM were distributed to some of the farmers to create awareness use.



3. On-farm production of Bio-fertilizers & Bio-control agents

The 75th year of independence of our nation is widely being celebrated as the Azadi ka Amrit Mahotsav. To commemorate the monumental occasion, NIPHM is organizing various training programmes and campaigns in thematic areas of Indian Agriculture. As scheduled in the NIPHM training calendar 2021-22, a physical farmers training programme on “on-farm production of Bio-fertilizers & Bio-control agents” was conducted from 11.10.2021 to 12.10.2021(2 days). In this programme total of 22 farmers from Muklanoor cooperative society, Warangal district interested in bio-fertilizers and bio-pesticides attended. The farmers underwent various theory and hands-on training practical classes on Agro Ecosystem Analysis and Ecological Engineering in Integrated Pest Management, Preparation of lures and pheromone traps, vermicompost, on-farm production of bio-fertilizers, Trichoderma, Pseudomonas, and bio-control agents (predators and parasitoids). Later, bio-fertilizers produced by NIPHM were distributed to some of the farmers to create awareness use. Visited ICAR-NBPGR under exposor visit and created awareness on seed conservation and evaluation.





4. Certificate course on Plant Health Management in Organic Farming

The first part of the course commenced on 06th December 2021 with an inaugural address by Dr. Sagar Hanuman Singh, IPoS, Director General, NIPHM, and Dr. J. Alice RP Sujeetha, Director PHM. Part one continued for 21 days up to 26th December 2021 at NIPHM. A total of about 22 participants have attended regularly. Participants are from Andhra Pradesh, Telangana states. Most of the participants are graduates with a science background. The participants are practicing organic growers/ entrepreneurs.

Course Progression:

- During part 1 of the course, both theory and practical aspects of plant health management in organic farming are covered including organic produce certification, marketing, and entrepreneurial skill. Arranged expert guest speakers from various organizations and made four field visits where farmers/organizations are practicing organic farming. Worked out and finalized project works to be carried out during Part 2 (*on-field experience and application*): In this part, field activities shall be undertaken by the participants in the form of on-farm practice-based project work. The design of project work shall be facilitated by the identified faculty at regional centers of ICAR- IIFSR under the All India Network Programme on Organic Farming (NPOF) or AICRP on Integrated Farming Systems. (05.01.2021 to 07.03.2021 (60 days) at the respective location/ region of the candidate)
- **Part 3 (on-campus)**: This 10 days programme shall be organized at NIPHM, Hyderabad. In this part, problems faced during field activity shall be discussed with experts and shared with others. The participants shall understand the subject based on their field experience and also prepare and submit a project report for evaluation. (14.03.2022 to 23.03.2022 (10 days) at NIPHM, Hyderabad).





III. Webinars/Workshop/Conference:

1. FAO funded a national level interactive workshop on “Time-critical measures to support early warning, monitoring and sustainable management of Fall Armyworm in India”. Organized 3 days National Interactive Workshop on “Time-critical measures to support early warning, monitoring and sustainable management of Fall Armyworm in India” from 21.12.2021 to 23.12.2021 at NIPHM. About 42 scientists from different parts of the country participated in the workshop. Elaborative discussions were held through resource persons on monitoring, surveillance, and early-warning systems for management of Fall Armyworm (FAW) in maize, Farmer Field School (FFS) concepts, natural enemies of FAW, the role of bio-pesticides and on-farm production protocols of predators and parasitoids for the management of FAW.



IV. Special programmes:

1. Students training programme on On-farm production of biocontrol agents

Two days on-campus students training programme was conducted on “On-farm production of biocontrol agents” from 17.11.21 to 18.11.21. About 27 students (rural youth) from Medak and Siddipet district were attended. The students underwent hands-on training on On-farm production of Bio-fertilizers, Bio-pesticides, Biocontrol agents, Entomopathogenic nematodes, Entomopathogenic fungi, nuclear polyhedrosis virus, Preparation of vermicompost and use of vermi-technology, Preparation and use of botanicals in pest management and safe use of pesticides.





Forthcoming training programmes

S No	Name of the programme	No. of Days	From	To
I. Officers training programmes				
1.	Production Protocol for bio fertilizers	5	03.01.2022	07.01.2022
2.	Good agricultural Practices (GAP)	5	17.01.2022	17.01.2022
3.	Advances in Weed Management	3	01.02.2022	03.02.2022
4.	Integrated Soil Nutrient & Rhizosphere Management	5	07.02.2022	11.02.2022
5.	AESA and Ecological Engineering for pest Management	5	14.02.2022	18.02.2022
6.	Production Protocol for EPN	5	21.02.2022	25.02.2022
7.	Quality control of Microbial Bipesticides	5	21.02.2022	25.03.2022
8.	PHM in protected cultivation	5	07.03.2022	11.03.2022
9.	Field diagnosis and Management of plant parasitic nematodes	5	14.03.2022	18.03.2022
10.	On-farm production of biocontrol agents and Microbial Biopesticides	10	16.03.2022	25.03.2022
11.	Quarantine nematodes of economic importance	5	21.03.2022	25.03.2022
II. Farmers training programmes				
1.	On-farm production of biocontrol agents for Promotion of sustainable Agriculture	3	10.01.2022	12.01.2022
2.	On-farm production of biocontrol agents for Promotion of sustainable Agriculture	3	09.02.2022	11.02.2022
3.	On-farm production of biocontrol agents for Promotion of sustainable Agriculture	3	29.02.2022	31.03.2022
4.	Certificate course on Plant Health Management in Organic Farming((Part-III))	10	14.03.2022	23.03.2022
III. Webinars/Workshop/Conference				
1.	Bio annual subcommittee meeting of National Network of Plant Health Experts	1	25.01.2022	-

Institutional Visits by the faculty:

- Faculty of NIPHM (Dr.E.Sreelatha, AD-PHM) visited SAMETI, Kerala and handled different PHM-related theory and practical classes.
- Faculty of NIPHM (Dr. Sunanda,ASO-Nematology), Visited the CoE Jeedimetla to address the nematode problems and their management in the Polyhouse conditions
- Field visits to ICAR IIMR- an Interactive Workshop on Sustainable Management of Fall Armyworm in Maize for two days (21st and 22nd December 2021).



Field Visit by Participants

- About 40 DAESI course dealers from ATMA, Vikarabad district have arrived to NIPHM under field cum exposure visit on 22.10.2021. The team of the PHM division accompanied these visitors and showcased different PHM technologies such as on-farm production of bioagents (biofertilizers, biopesticides and biocontrol agents), cropping systems and protected cultivation practices.





- Underexposure visit during 21 days training program on Plant Health Management strategies in different crops from 10th to 30th November 2021, the participants made visits to Varsha biotech laboratory Pvt.Ltd, ICAR- Indian Institute of Rice Research, ICAR-Indian Institute of Millet Research, ICAR-Indian Institute of Oilseed Research, ICAR-National Bureau of Plant Genetic Resources and AICRP o biocontrol unit, Professor Jayashankar Telangana State Agricultural University.



Pesticide Management Division

Training Programme:

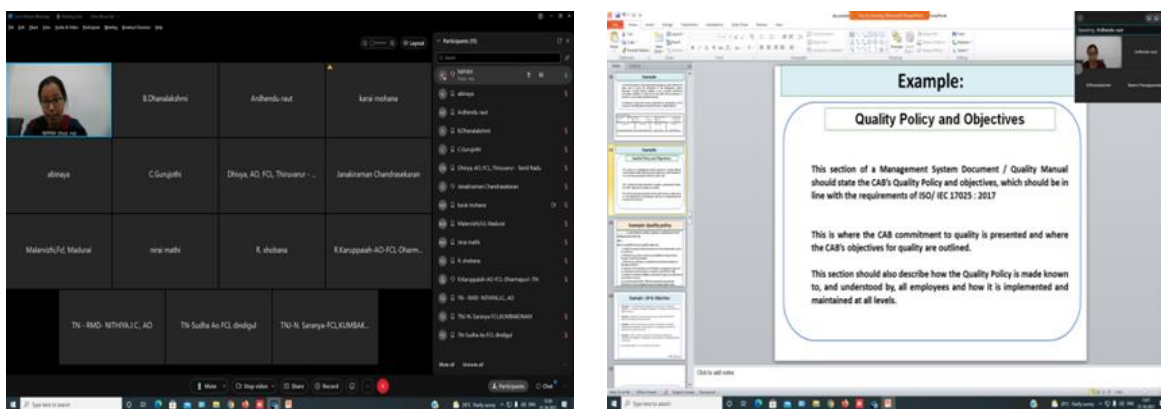
During **October to December 2021**, the division has conducted three offline and two online training.

Sl. No.	Name of the programme	No. of Days	From	To
I. Officers Programme				
1.	Documentation procedures for NABL accreditation	3 days (online)	25.10.2021	27.10.2021
2.	Method validation and Measurement of Uncertainty in Pesticide formulation and Residue Analysis	5 days (offline)	08.11.2021	12.11.2021
3.	Pesticide Residues Analysis	21 days (offline)	25.11.2021	15.12.2021
4.	Inspection and Sampling under Insecticide Act, 1968	3 days (online)	20.12.2021	22.12.2021

I. Officers Programme

1. Documentation procedures for NABL accreditation:

Training on “**Documentation procedures for NABL accreditation**” was conducted from **25th to 27th October 2021** through online mode. A total of **29 officials** were participated from state department of Agriculture of Tamil Nadu, Maharashtra and Jammu & Kashmir. This training focuses more on preparation of documents for NABL accreditation such as Quality Manual/ Management system document and other documents for testing Laboratory as per requirement of ISO/IEC 17025:2017. The training will be benefited or help for preparation of various documents in accordance to ISO/IEC 17025:2017 for the laboratories.



Documentation procedures for NABL accreditation

2. Method validation and Measurement of Uncertainty in Pesticide formulation and Residue Analysis:

Training on “**Method validation and Measurement of Uncertainty in Pesticide formulation and Residue Analysis**” was conducted from **8th to 12th November 2021**. A total of **11 officials** were attended the programme from state department of Agriculture of Andhra Pradesh, Chhattisgarh, Tamil Nadu Agriculture University and Regional Plant quarantine Station - Chennai. The training programme is practical oriented with hands on training and focused on importance of method validation and different parameters for method validation such as selectivity of method, accuracy and precision of method, Limit of detection and quantification of method etc. The trainees were also trained on estimation of Measurement of uncertainty (MOU) which is an important requirement as per ISO/IEC 17025:2017.



Method validation and Measurement of Uncertainty in Pesticide formulation and Residue Analysis
(8.11.2021 to 12.11.2021)

3. Pesticide Residue Analysis:

Training programme on “**Pesticide Residues Analysis**” was conducted from **25th Nov to 15th Dec 2021 (21 days)**. A total of **11 officials /Analyst** were attended the programme from the state of Andhra Pradesh, Telangana, Maharashtra and Odisha. The aim of the training is to impart the basic pesticide residues analysis techniques to the analyst in various agricultural commodities such as fruit, vegetables and water sample using sophisticated instrument viz. GLC, HPLC, LC-MS/MS and GC-MS/MS etc. The training programme is practical oriented with hands on training and trained on various extractions and clean up techniques, identification and confirmation of pesticides by LC-MS/MS and GC-MS/MS. Practical knowledge on maintenance of equipment and troubleshooting were also a part of the programme.



Pesticide Residue Analysis Training (25.11.2021 to 15.12.2021)

Valedictory programme for Pesticide Formulation Training on 07.10.2021

Pesticide Formulation training programme started from 9th August 2021 with 9 participants from various state departments of Agriculture of Bihar, Haryana, Maharashtra, and Tamil Nadu was completed on 07.10.2021. Certificates were distributed by Director General, NIPHM, Dr. Sagar Hanuman Singh, IPoS, after evaluation and feedback from the trainees.

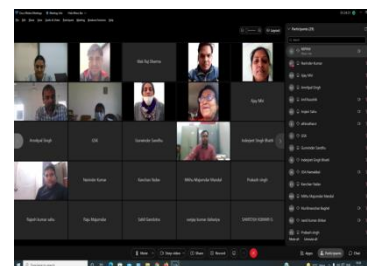




Valedictory programme for Pesticide Formulation Training, 07.10.2021

4. Inspection and Sampling under Insecticide Act, 1968

A three days online training on **Inspection and Sampling under Insecticide Act, 1968** was conducted from **20th to 22nd December 2021**. Participants were from state department of Agriculture of Andhra Pradesh, Chhattisgarh, Haryana, Jammu & Kashmir, Punjab, Tamil Nadu, Telangana, Tripura and Uttar Pradesh and **38 officials** were attended the programme. The trainees were trained on Insecticide Act 1968 and Insecticide Rule 1971 with their amendments, inspection and pesticide sampling procedure under the Insecticide Act 1968 as per BIS procedure for sampling of pesticides technical and formulation.



Forthcoming training programmes:

Sl. No.	Title of the Programme	Duration	From	To	Eligibility Criteria
1.	Sampling of Fruits, Vegetables and other items and Calibration of laboratory equipment for Pesticide Residue Analysis	3 days (online mode)	04.01.2022	06.01.022	Science Graduate Analysts / Scientists / Technical Staff working in testing labs of State Govt. / Central Govt. / ICAR / Govt. Universities
2.	Pesticide Formulation Analysis (PFA)	60 days (offline mode)	18.01.2022	18.03.2022	Analysts working at SPTLs / RPTLs/CIL and other Government Labs engaged in Pesticide Formulation Analysis with educational qualification of Science Graduate in Chemistry / Agril / Hort
3.	Laboratory Quality System Management and Internal Audit as per ISO/IEC 17025: 2017	5 days (offline mode)	14.03.2022	18.03.2022	Science Graduate with knowledge in laboratory activities, working in analytical Laboratories of state govt. / central govt. / ICAR / Govt. Universities

4.	Role of PT and ILC in Quality Assurance and maintaining accreditation as per the ISO: 17025:2017	1 day (online mode)	Date will be decided later		Analysts / Scientists / Technical Staff with training on ISO/IEC 17025 working in Laboratories of State Govt./ Central Govt / ICAR / Govt. Universities
5.	Safe handling and disposal of pesticides and Pesticides containers.	1 day			Training program for Farmers

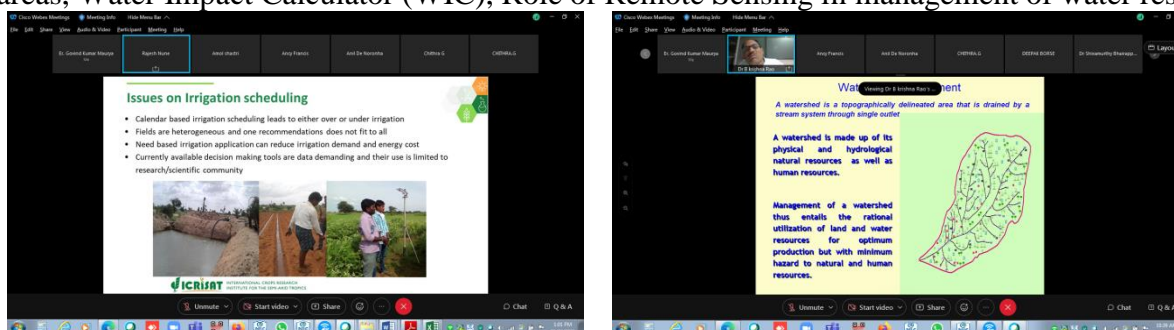
Plant Health Engineering Division

S No	Name of the programme	No. of Days	From	To
I. Officers Programme				
1.	Efficient Use of Water Resources	03	20.10.2021	22.10.2021
2.	RS & GIS applications in Plant Health Management	03	09.11.2021	11.11.2021
3.	Pesticide Application Techniques and Safety Measures	05	06.12.2021	10.12.2021
4.	Plant protection techniques for Plant Health Management:	21	03.12.2021	23.12.2021
II. Farmers Training Programme				
5.	Pesticide application Techniques and Safety Measures	01	27.12.2021	27.12.2021
III. Special Programmes				
6.	A students training programme was conducted on Plant Protection Techniques	04	08.11.2021	11.11.2021

I. Officers Programme Details:

1. Efficient use of water resources

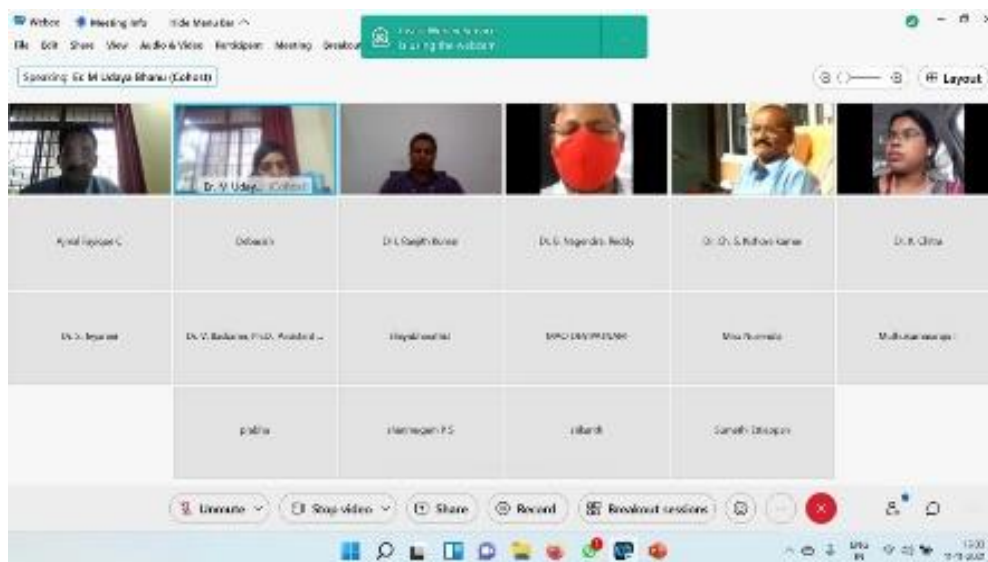
A three days online training on 'Efficient use of water resources' was conducted from 20th to 22nd October 2021. The training contents emphasized on sustainable use of existing water resources, rain water harvesting & ground water recharge. Total six (6) lectures were arranged for three days training, apart from that assignment of objectives types question were also included. Two expertise for three sessions were invited from the reputed institutions like WALAMTARI and ICRISAT. Total 35 participants were confirmed of different cadres from state department, SAUs in which 20 participants (15 Male and 5 Female) are attended the session. The topics covered in training are Efficient water management in command areas, ground water recharge and management, Watershed treatment technologies for efficient water resource management in rain fed, Rain water harvesting in urban areas, Water Impact Calculator (WIC), Role of Remote Sensing in management of water resource.



Glimpses of training

2. RS & GIS applications in Plant Health Management

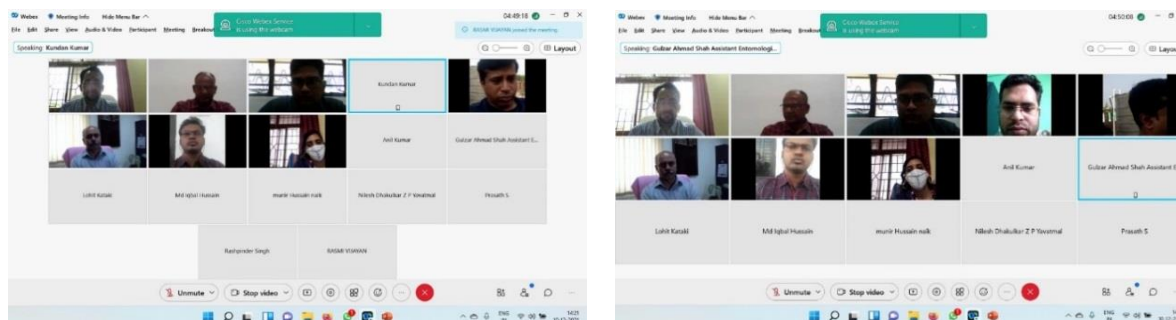
A three days online training on ‘RS & GIS applications in Plant Health Management’ was conducted from 09th to 11th November 2021. Total 39 officers from 10 states (Andhra Pradesh – 10, Gujarat-1, Jammu & Kashmir-1, Karnataka-1, Kerala-1, Maharashtra-1, Orissa-2, Tamil Nadu- 19, Uttar Pradesh-2, West Bengal-1) successfully completed the training. In this programme officers were enriched with knowledge on various topics such as Introduction to Remote sensing and GIS, Remote sensing and GIS applications in watershed management, GPS applications, Applications Spatial Interpolation and Geostatistical Analysis in Agriculture, Applications Spatial Interpolation and Geostatistical Analysis in Agriculture and Artificial Intelligence for crop production through Plantix.



Glimpses of training programme

3. Pesticide Application Techniques and Safety Measures

An online training program of 5 days duration on “Pesticide Application Techniques and Safety Measures” was organized from 6th to 10th December 2021. Total 17 officers, 16 male and 1 female participants attended the programme. Lectures were arranged on topics viz., different aspects such as basic principles of spraying, different spraying techniques, selection of sprayer, nozzles and its classification, selection of nozzle, calibration of sprayers and nozzles, pesticide formulations and compatibility, safety precautions and minor maintenance of pesticide application techniques. Pre and post evaluation along with assignments on various sessions were given to assess the knowledge transfer. Good appreciation received from the participants.



Glimpses of training programme

4. Plant protection techniques for Plant Health Management:

A offline training programme on “Plant protection techniques for Plant Health Management” was organized by Plant Health Engineering Division during 03rd to 23rd December 2021. 14 participants from 7 different states participated in the training program. The success of pest management operations depends on proper technique of application of pesticide and the equipment used. Selecting the right equipment for pesticide application is vital for successful pest control to ensure safe and judicious use of pesticides. Huge amounts of pesticides are wasted or unnecessarily applied, and persons involved in spraying are exposed to serious risks of pollution. Application of pesticides is being done mostly by untrained operators and they also take most of the decisions in the field themselves. Further, managing the various types of nozzles used, applicator selection, safety precautions, plant diseases monitoring, pesticide compatibility, insecticide acts, AESA and drones technology etc. are also important and needs to be educated to all departmental officials and stakeholders. In this context, a 21-day training programme on “Plant protection techniques for Plant Health Management” comprises with 40% theories and 60% practical was organized to trainers who in turn will be imparting training / applying the knowledge gained to other stakeholders. The participants were given hands on experience with various sprayers available during the practical sessions. A knowledge session among the participants was also arranged during the training program.

Institutional visits were arranged to the participants to CRIDA, Center of Excellence, Jeedimetla, IIMR, IIOR and IIRR. In addition to the above sessions, a pre course evaluation, recapitulation were also included to enhance the knowledge level of the participants. It was observed that most of the participants actively involved in the class and completed all the requirements of the training programme.



Glimpses of training

II. Farmers Training Programme

1. Pesticide application Techniques and Safety Measures

A one-day offcampus training programme on “Pesticide Application Techniques” was organized on 27-12-2021 for farmers of Kadumuru village, Pudur mandal, Vikarabad district of Telangana. A total of 30 participants attended and got benefitted in the training program. Basic spraying principles & Techniques and Safety precautions were emphasized in the programme. The farmers were also briefed about the types of nozzles and the importance in selecting a nozzle. They were also explained how to calibrate a nozzle to know its wear and tear. The importance of safety precautions while handling chemicals was explained. The demonstration with safety gadgets was made with a farmer. The Dos and Don'ts while handling chemicals is explained.

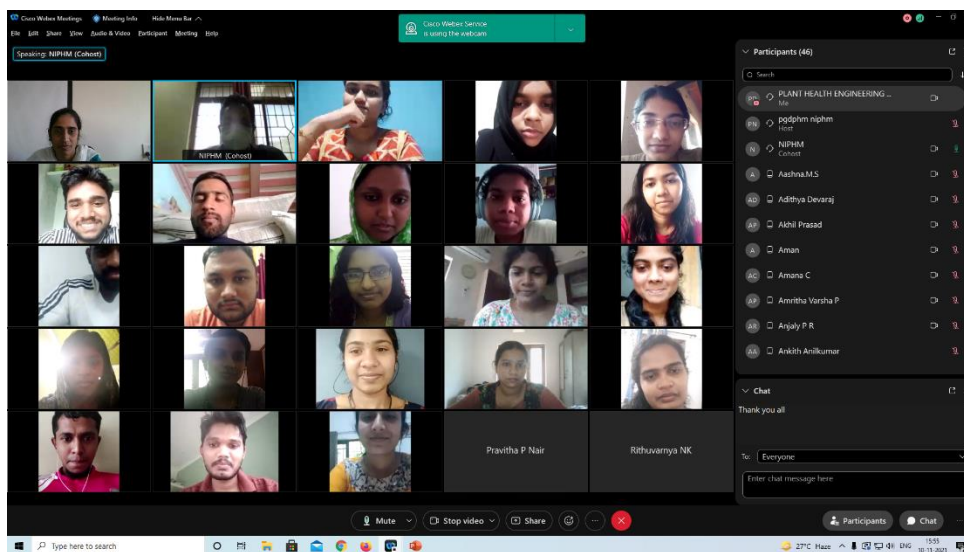


Glimpses of training

III. Special Programmes

1. Plant protection techniques

The training on ‘Plant Protection Techniques’ of four days’ duration commenced from 08th to 11th November 2021. Total 50 students (47 students from Kelappaji College of Agricultural Engineering & Technology Tavanur, Kerala Agricultural University and 3 others) successfully completed the training. In this programme students are enriched with knowledge on various topics such as basic principles of spraying, different spraying techniques, selection of sprayer, nozzles and its classification, selection of nozzle, calibration of sprayers and nozzles, pesticide formulations and compatibility, safety precautions and minor maintenance of pesticide application techniques.. Pre and post evaluation along with assignments on various sessions were given to assess the knowledge transfer. The programme on payment mode.



Glimpses of training

IV. Educational Programs:

- i. PGDPHM/DPHM: Theory and practical classes in ‘Safe and Judicious use of pesticides and Application technology were handled to the students.



Glimpses of practical session

Forthcoming training programmes

S.No	Title of the Programme	Division	From	To	Eligibility criteria	Course Coordinator & e-mail
1.	Farm equipment for plant health management	PHE	14.02.2022	16.02.2021	Extension officers from State Agriculture and Horticulture departments, Scientists of ICAR, SAUs and officials from KVKs, DPPQs. NGOs	Dr. Vidhu Kampurath Poduvattil, Joint Director-PHE Jdenggniphm-ap@nic.in

2.	National workshop on Farm mechanization for small and marginal farmers	PHE	24.02.2022	25.02.2022	Extension officers from State Agriculture and Horticulture departments, Scientists of ICAR, SAUs and officials from KVKs, DPPQs	Dr. Vidhu Kampurath Poduvattil, Joint Director-PHE jdenggniphm-ap@nic.in Er. Sk. Haneefa Begum Assistant Scientific Officer (PHE) asopheniphm2-ap@nic.in
3.	Post-harvest management and storage techniques	PHE	07.03.2022	11.03.2022	Extension officers from State Agriculture and Horticulture departments, Scientists of ICAR, SAUs and officials from KVKs, DPPQs. NGOs.	Er. Sk. Haneefa Begum Assistant Scientific Officer (PHE) asopheniphm2-ap@nic.i
4.	Pesticide application techniques and safety measures	PHE	21.03.2022	25.03.2022	Extension officers from State Agriculture and Horticulture departments, Scientists of ICAR, SAUs and officials from KVKs, DPPQs NGOs	Er. Govind Kumar Maurya Assistant Scientific Officer (PHE) asopheniphm1-ap@nic.in
5.	Pesticide application techniques and safety measures	PHE	10.02.2022	10.02.2022	Farmers	Er. Govind Kumar Maurya Assistant Scientific Officer (PHE) asopheniphm1-ap@nic.in
6.	Pesticide application techniques and safety measures	PHE	17.02.2022	17.02.2022	Farmers	Er. M. Udaya Bhanu Scientific Officer (PHE) sopheniphm2-ap@nic.in
7.	Pesticide application techniques and safety measures	PHE	23.02.2022	23.02.2022	Farmers	Er. Govind Kumar Maurya Assistant Scientific Officer (PHE) asopheniphm1-ap@nic.in

- NIPHM has observed ‘Swachhta hi Sewa’ campaign on 01.10.2021. As part of “Swachhta hi Sewa” Campaign, the activities i.e. Shramdhan activity and plantation activity organized.



14th NIPHM Foundation Day Celebrations

NIPHM has completed 14 years by 24th October 2021. The Occasion was graced by Dr. Sagar Hanuman Singh, IPoS as Chief Guest/Director General, NIPHM. The Staff and their family members, Trainees, PGDPHM Students have participated in the celebrations. Further the Chief Guest/Director General, NIPHM has inaugurated the ‘Billiards/Snooker Table’ facility at NIPHM.





- NIPHM was observed “Samvidhan Divas (Constitution Day) on 26-11-2021” to commemorate the adoption of the Constitution of India on 26-11-1949 in the Constituent Assembly of India.
- The preamble of the Constitution of India was read out by all the staff in NIPHM office on 26-11-2021 at 11.00 a.m. and banners were also displayed at appropriate places in NIPHM campus.



- NIPHM was observed Vigilance Awareness Week from 26.10.2021 to 01.11.2021 by conducting various competitions i.e. Essay writing, Elocution etc. for the Regular and Contractual staff/trainees.





- NIPHM has observed ‘Swachhta Pakhwada’ from 16th to 31st December, 2021. The following activities were carried out during the above period.

16th December 2021 (Day 1):

Organizing of ‘Swachhta Shapath’/ Pledge function at NIPHM office premises

NIPHM organized “Swachhata Shapath” at office premises. Pledge was administered by our Registrar Shri. N. Venkatesh, IAS. All the staff of NIPHM had participated following the guidelines of social distancing and wearing a mask.



Registrar Shri. N. Venkatesh, IAS
 adminstring pledge



Staff participating in pledge

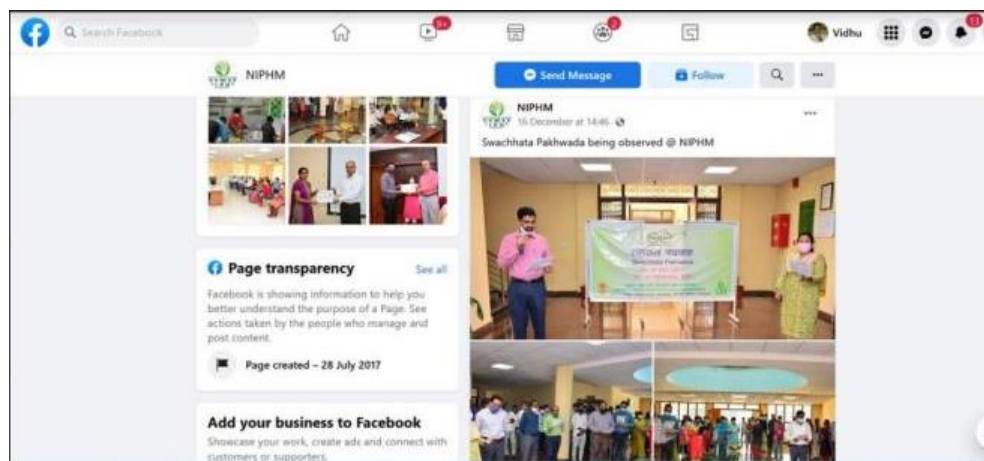
17th December 2021 (Day 2):

Display of banners and uploading of material regarding observance of Swachhata Pakwada in NIPHM website in creating awareness/ publicity by social media

Displayed banners and uploaded material regarding observance of Swachhata Pakwada in NIPHM website in creating awareness/ publicity by social media by ICT team.



Creating awareness through website



Creating awareness through social media platform

18th December 2021 (Day 3):

Cleaning of main entrance outside gate on both sides

NIPHM always ensures the proper and regular cleaning and maintenance its campus is very clean and neat.





Before and after cleaning main entrance

19th December 2021 (Day 4)

Cleaning water tanks in MG Block

Water is undoubtedly the most important part of our lives and is something one cannot do without. Not only does it quench our thirst but it is also important as far as cooking, personal hygiene, and cleaning are concerned. While it is true that water replenishes us, removes toxins from the body and helps us in uncountable ways but at the same time, a lot of diseases are also caused if one consumes water in its impure form. This is why it is important that the water that we drink or cook food is absolutely clean and pure. NIPHM always ensures the proper and regular cleaning and maintenance of water storage units /tanks installed on-premises.

NIPHM always ensures the proper and regular cleaning and maintenance of water storage units/ tanks installed on-premises. A water cleaning activities were taken in the NIPHM MG Block. If the water tank is not cleaned on a regular basis, it can lead to impurities in the water which may consist of many harmful germs periodic cleaning of storage tanks is very important.



Before and after pictures of water Tank cleaning activity at NIPHM MG block

20th December 2021 (Day 5)

Cleaning water tanks in LBS Block

A water cleaning activities were taken in the NIPHM LBS block.

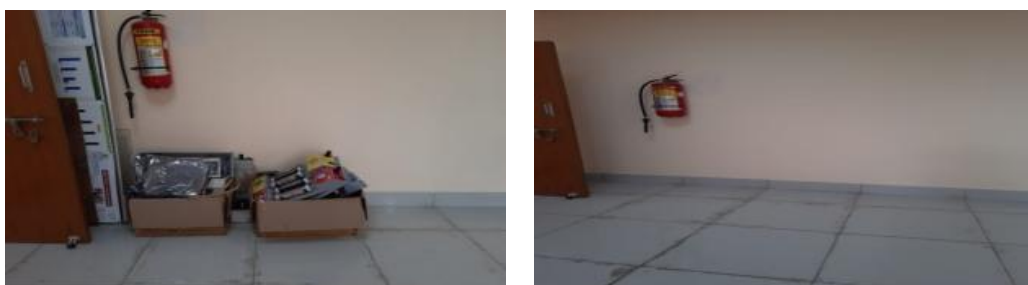


Before and after pictures of water Tank Cleaning activity at LBS block

21st December 2021 (Day 6)

Identification and recommendations exercise for weeding out of old files/ records (beyond preservation period), old furniture, equipment, stationary etc., for final disposal by all divisions

Cleanliness drive undertaken by all staff and contractual staff in their respective work areas.





22nd December 2021 (Day 7)

Cleanliness drive to be undertaken by all staff of NIPHM in their respective work areas





23rd December 2021 (Day 8)

Observance of ‘Kisan Diwas (Farmers Day) and tree plantation by PHM division under overall supervision and monitoring of AD (H&F)/ AD (PHM)

In India National Farmers day or Kisan Divas is celebrated every year on 23rd December, as 23rd is marked as the Birth Anniversary of farmers leader Sh. Chaudhary Charan Singh who followed the slogan of 2nd Prime Minister of India, Lal Bahadur shastri “Jai Jawan Jai Kisan”. Kisan Divas is celebrated to pay respect to the farmers of the country and to reward and promote the contribution of farmers to our land. In view of above NIPHM has organized the Farmers day celebrations on 23rd December, 2021. About 34 farmers from Rangareddy District visited the Biocontrol labs of the Institute. The farmers were explained about importance, mass production and use of predtaros, parasitoids and biopesticides in integrated pest management for sustainable Agriculture. Also Planting of Seedlings of Guava, Custard apple and Citrus plants was done as a part of activity scheduled.



Bio control lab visit by Farmers



Tree Plantation

24th December 2021 (Day 9):

Cleaning of terrace old hostel and new hostel

As a part of 'Swacchata Pakhwada' campaign, the activity of cleaning of terrace old hostel and new hostel with the help of the housekeeping staff of the NIPHM was undertaken in old and new hostels of NIPHM.



Terrace pictures of old and new hostel

25th December 2021 (Day 10):

Cleaning water tanks in NIPHM Quarters

Many of the staff is residing in NIPHM Quarters. This year because of the pandemic situation and floods during past months, the basic priority of clean water has become important for sustainable life. All the water tanks in the quarters were thoroughly cleaned and also it is seen that they get clean and fresh water.





26th December 2021 (Day 11):

Cleaning of water tanks in new hostel

As a part of 'Swacchata Pakhwada' campaign, the activity of cleaning water storage tanks with the help of the housekeeping staff of the NIPHM was undertaken in New Hostel.



Before and after pictures of water Tank Cleaning

27th December 2021 (Day 12):

Cleaning water tanks in old hostel

Cleaning of water tank in old hostel was carried out.



28th December 2021 (Day 13):

Cleaning of terrace of LBS building



29th December 2020 (Day 14):

Cleaning of terrace and surrounding areas of old DG Chamber, Bio-fertilizer lab , Bio-control lab, PHE workshop, Fumigation chamber, FHAT, New PMD building



Cleanliness drive undertaken in bio fertilizer lab, bio control lab



Cleanliness drive in PHE workshop



Cleanliness drive near FHAT and Fumigation



Cleanliness drive at old DG chamber

**30th December 2020 (Day 15):
Cleaning of terrace of MG Block**



31st December 2020 (Day 15):

Shramadan activity by all NIPHM staff:

Shramadan activities were undertaken by all NIPHM staff at different areas of NIPHM campus.



Clealiness drive by NIPHM staff

Research & Development**Research & Development (PHM)****1. Deciphering The Mechanism of Resistance to Root Lesion Nematode in Chickpea by Using Genetic and Genomic Approaches****Project progress during this quarter:**

- Isolated and observed the samples washed for *P. thorni*, Culturing of *Pratylenchus thorni* in open pot cultures was done. *In vitro* culturing of *Pratylenchus thorni* on carrot discs. Prepared mounts (semi-permanent) for morphological characterization of *P. thorni*. Maintaining pots with chickpea and wheat seeds and inoculated *P. thorni* populations.
- Labeling of pots repeated since there were mistakes in earlier Experimental statistical design (Replication, Randomization and Blocking). Closed openings in the glasshouse to prevent rats and squirrels problems for conducting experiments
- Received soil samples (20kg) from JNKVV Jabalpur MP for *Pratylenchus thornei* through Parcel. Washed 10kg soil samples and extracted nematodes, identified the population of *Pratylenchus thornei*
- Remaining samples kept for culturing *Pratylenchus thornei* in open pots at Glass house
- Report of research project work done till now is prepared
- Developed Posters with (Size 6×4 feet & 4×4 feet) of project for the display in the lab and glasshouse. Layout the experiment: Preparation of Pots, Pots labeled and Planting (2-3 seeds of each genotype placed on the top of soil)
- Inoculum suspension of *Pratylenchus thornei* nematodes is prepared from open pot cultures carrot disc cultures and soil received from Jabalpur.

2. AICRP on Biological Control of Crop Pests (ICAR-AICRP-BC)-NIPHM, Hyderabad (Volunteer Centre)**Evaluation of NIPHM white media for the production of *Nomuraea rileyi* (*Metarhizium rileyi*) NIPHM MRF-1 strain for management of Maize Fall Army worm (*Spodoptera frugiperda*)**

This project aimed for the production of *Metarhizium rileyi* two media viz. NIPHM White media and broken rice were used. To standardize the production technology, the media under test were made into six treatments (Broken rice (without yeast extract), Broken rice (with yeast extract), 1% NIPHM white media, 2% NIPHM white media, 3% NIPHM white media, 4% NIPHM white media) and for each treatment two replications were maintained.

Project progress during this quarter:

- Quality check of *Nomuraea* multiplied on *Corcyra* waste: SMAY media @ 11×10^8 CFU/ml. Spore count of *Nomuraea* on Haemocytometer was done and prepared different concentrations of spore count at 10^5 , 10^6 , 10^7 , 10^8 dilutions.
- Bioassay performance on *Spodoptera litura* treated with *Nomuraea* multiplied on *Corcyra* waste and microscopy of *Nomuraea* morphology grown on *Corcyra* waste was observed and tested spore count and bioassay performance of *Nomuraea* on *Spodoptera frugiperda* larvae
- Bioassay performance on *Spodoptera frugiperda* treated with *Nomuraea* multiplied on *Corcyra* waste. Spore count of *Nomuraea* on Haemocytometer. Preparation of different concentrations of spore count 10^5 , 10^6 , 10^7 , 10^8 dilutions was done.
- Bioassay performance on *Spodoptera frugiperda* treated with *Nomuraea* multiplied on *Corcyra* waste. Bioassay performance on *Spodoptera frugiperda* treated with *Nomuraea* multiplied on White media. Bioassay performance on *Spodoptera frugiperda* treated with *Nomuraea* multiplied on SMAY media.
- Mass multiplication of *Nomuraea* on *Corcyra* waste without adding dextrose. First trail no growth of *Nomuraea* was seen on *Corcyra* waste without dextrose. Preparation of SMAY media broth for fresh *Nomuraea* mother culture preparation
- Inoculation of *Nomuraea* onto SMAY broth

- Mother culture broth of *Nomuraea* is under observation
- Soaking of *Corcyra* waste overnight. Adding of 10 gm dextrose to one of 200gm *Corcyra* waste and another 200gm *Corcyra* waste without dextrose. Sterilization of *Corcyra* waste. Inoculation of sporulating freshly prepared *Nomuraea* broth in sterilized *Corcyra* waste with and without dextrose. 3rd day observation of growth of *Nomuraea* on *Corcyra* waste. A quality check for *Nomuraea* grown on *Corcyra* waste was done. Observation of quality check plates of *Nomuraea* grown on *Corcyra* waste without dextrose with 2×10^8 CFU/5gms of *Corcyra* waste. Microscopy of *Nomuraea* grown on *Corcyra* waste for confirming its morphology. CFU performance Quality check for *Nomuraea* grown on *Corcyra* waste with dextrose and Observation of quality check plates of *Nomuraea* grown on *Corcyra* waste with dextrose with 6×10^8 CFU/10gms of *Corcyra* waste.



3. IPM model villages under Tamil Nadu Irrigated Agriculture Modernization Programme (TN-IAMP)

NIPHM and Department of Agriculture, Tamil Nadu has entered into an MoU for take up the project on ‘Model IPM village’ under the scheme of TNIAMP with objectives like to provide technical assistance to all beneficiary farmers in 20 IPM villages under the Lower Palar Sub basin for the establishment of cost-effective sustainable Bio-control Agents’ production units in Kancheepuram District, Tamil Nadu, to train the farmers in the understanding of Good Practices in production and quality maintenance, to provide the mother culture and media initially based on the existing norms of the institution.

Project progress during this quarter:

- The training cum interaction session on ‘On-farm production of Biocontrol agents’ was conducted on 22nd October 2021 through online mode. A total of 32 participants from Kattankulathoor Block, Chengalpattu District, Tamil Nadu have attended this program.
- Field trials of biopesticides and biofertilizers are conducted at Chengalpattu and Kancheepuram, Tamil Nadu. Monitored by a senior consultant.
- Doordarshan TV recorded farmer experience of biocontrol agents
- Visited Kanchipuram and Chengalpattu (4 clusters) regarding the progress of the project. Field trials of biopesticides and biofertilizers are conducted at Chenkalpattu and Kancheepuram, Tamil Nadu. Monitored by a senior consultant.



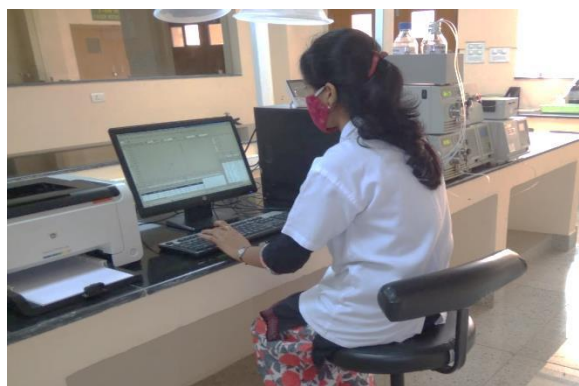
Research & Development (PMD)

The Pesticide Formulation and Residue Analytical Centre (PFRAC), Pesticide Management Division, collected about 632 samples of Fruits, vegetables, cereals, pulses, milk and water under Central Sector Scheme “*Monitoring of Pesticide Residues at National Level (MPRNL)*”. The samples were analyzed for pesticide residues. Sixty samples viz. Guava, Tomato, Apple and Green Chillies were analyzed under “*How Safes are Your Veggies*” program.

A total of 85 botanical bio-pesticides samples were received from different state of Andhra Pradesh, Bihar, Kerala, Karnataka, Maharashtra, Madhya Pradesh, Telangana, and Tamil Nadu sent by Insecticide Inspector for testing of pesticide adulteration. The samples were tested for pesticide adulteration.

The Final report of Proficiency Testing (PT) programme initiated in the month of May to June (PTC/PF/01, 02 & 03/2021-22) viz. imidacloprid technical (Active ingredient), tricyclazole technical (Active ingredient), pretilachlor -EC (Active ingredient) were sent to 74 participants. The PT programme on chlorpyriphos technical, copper oxy chloride technical and Propiconazole EC (PTC/PF/04, 5 & 6/21-22) were initiated and samples were sent to 48 participants including private laboratories. The final report of Proficiency Testing (PT) programme on pesticide residue analysis initiated in the month of July for Rice for the pesticides viz. bifenthrin, dicofol, fenpropathrin, malathion, monocrotophos and tricyclazole and cabbage samples for the pesticides viz. acetamiprid, chlorantraniliprole, emamectin benzoate, ethion, fenvelarate and methomyl were sent to 35 participant including private laboratories.

During the period about 100 tobacco samples received from Tobacco Board were analyzed. Four samples received from FSSAI, Mumbai were analyzed. Pesticide formulation samples were also analysed under interlaboratory comparison programme.





Sample Analysis

(Pesticide Formulation and Residues Analysis Center and Proficiency Testing Center, NIPHM)

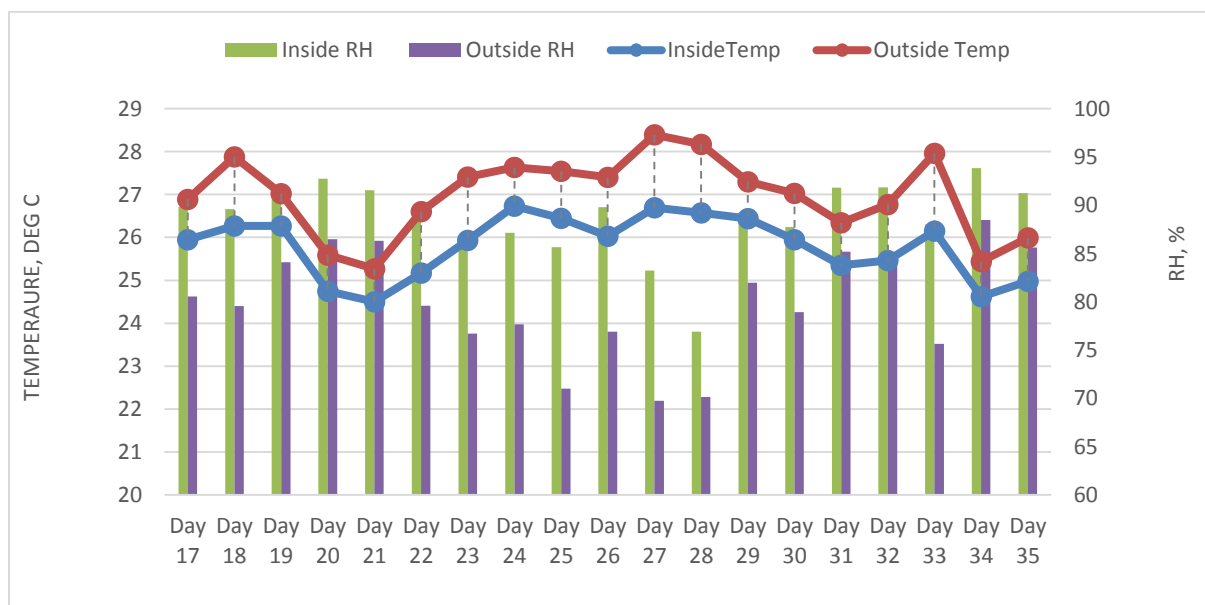
Research & Development (PHE)

1. Construction and Evaluation of Zero energy cool chamber

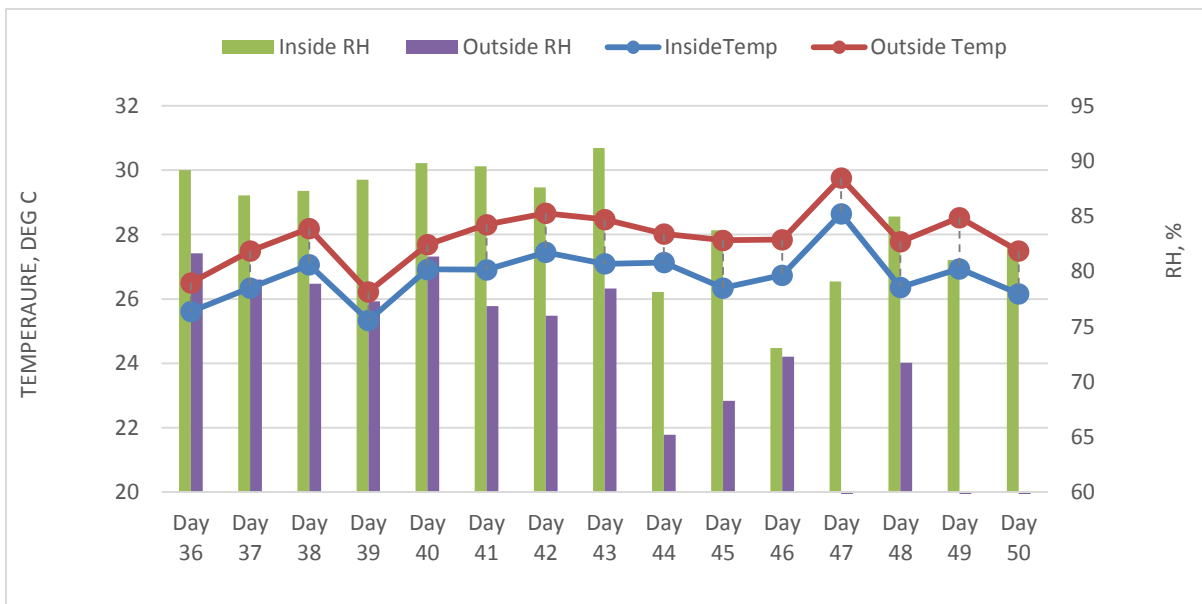
Zero Energy Cool Chamber is an eco-friendly storage system that doesn't require any type of energy to be adopted. A cool chamber was designed and constructed for the purpose of demonstration to trainees.

The performance evaluation of ZECC is under process to optimize the parameters of the chamber. The following are the parameters are measured to evaluate the ZECC.

1. Outside temperature and RH
2. Inside temperature and RH

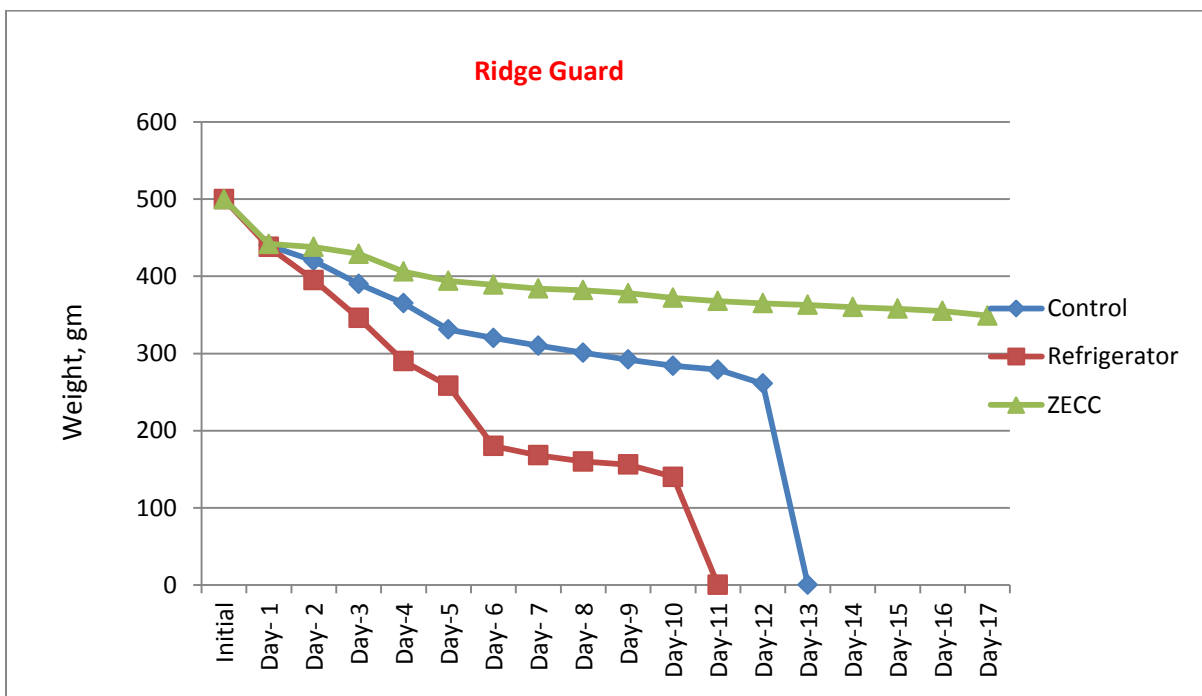


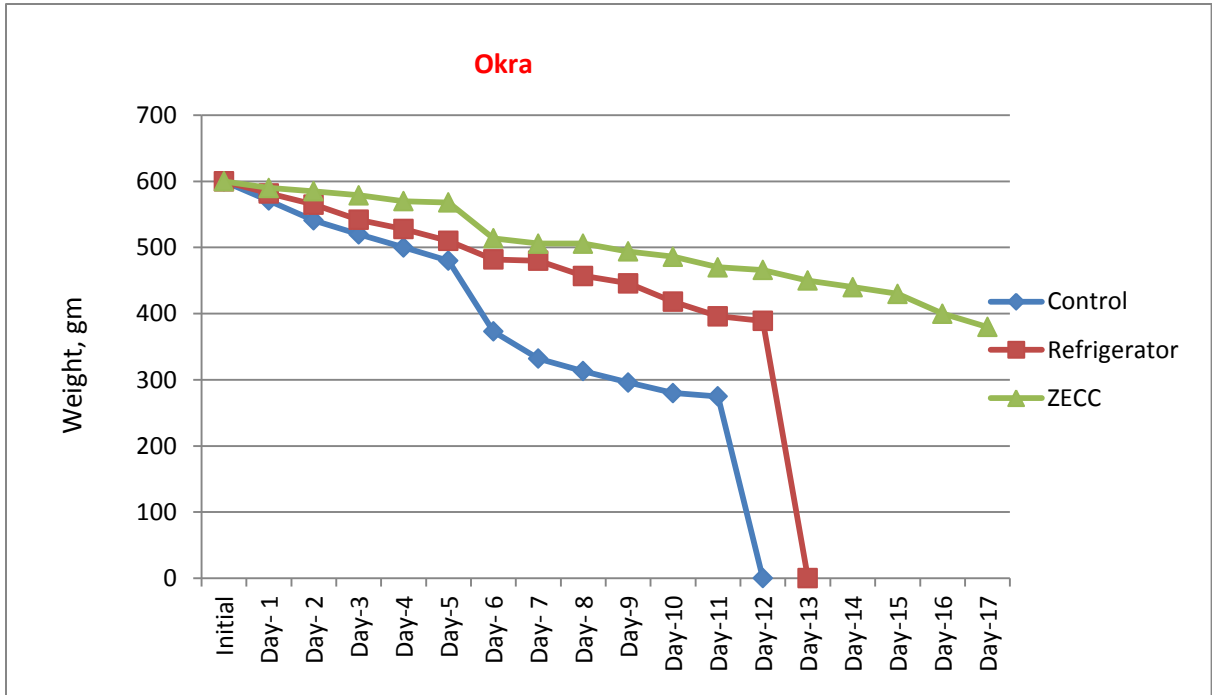
Variation in temperature and RH inside and outside of ZECC (day 17 – 35)



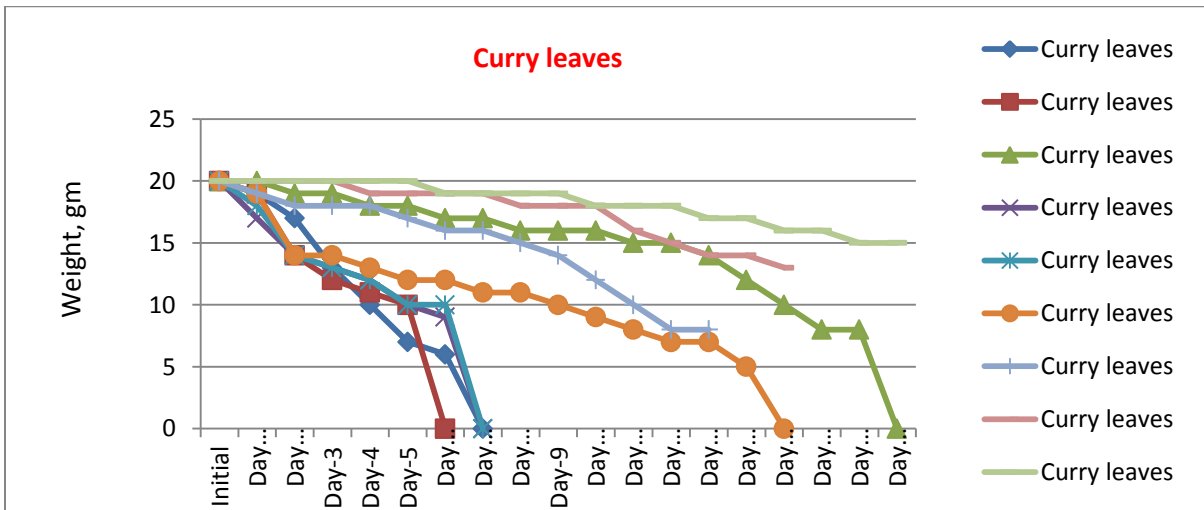
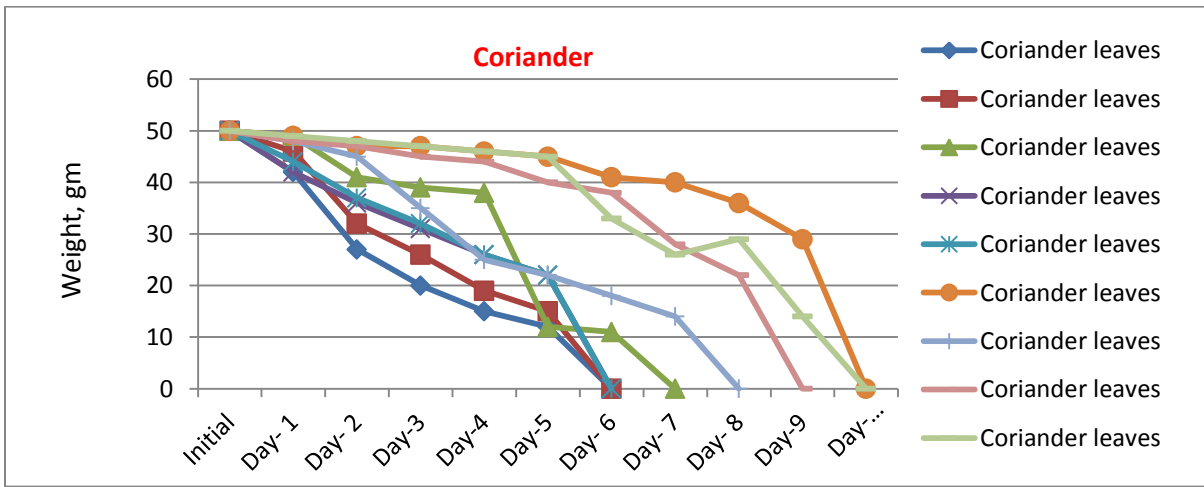
Variation in temperature and RH inside and outside of ZECC (day 35 – 50)

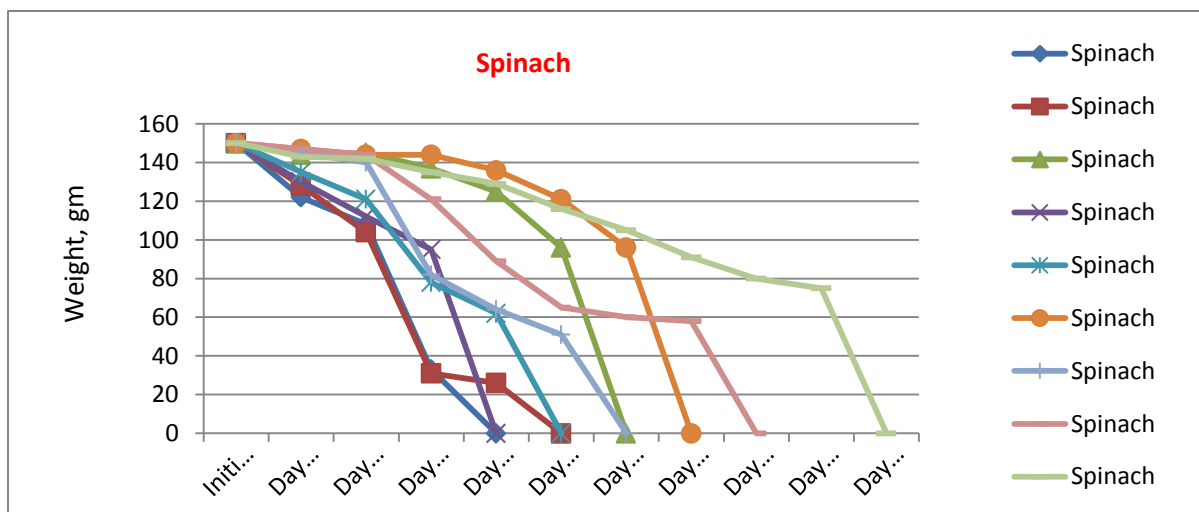
For evaluation of ZECC, the shelf life of commodities grown at NIPHM field and local market were taken to evaluate the shelf of commodities in three different storage conditions were selected like control, refrigeration and ZECC. The commodity selected are Ridge guard, okra, and leafy vegetables like coriander leaves, curry leaves and palak.



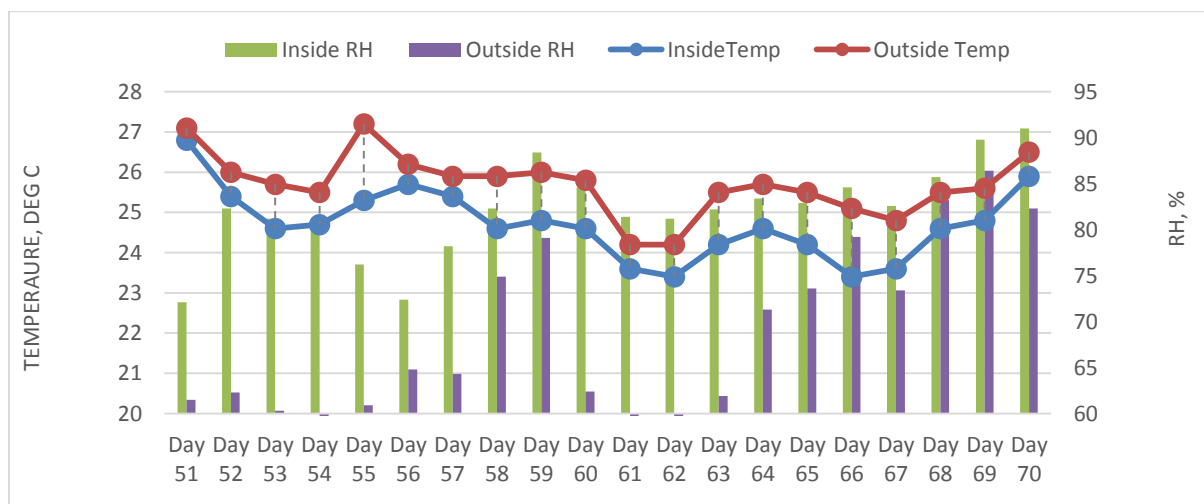


Variation of Weight loss(gm) in ZECC and control for different vegetables





Variation of Weight loss(gm) in ZECC, Refrigerator and control for different leafy vegetables

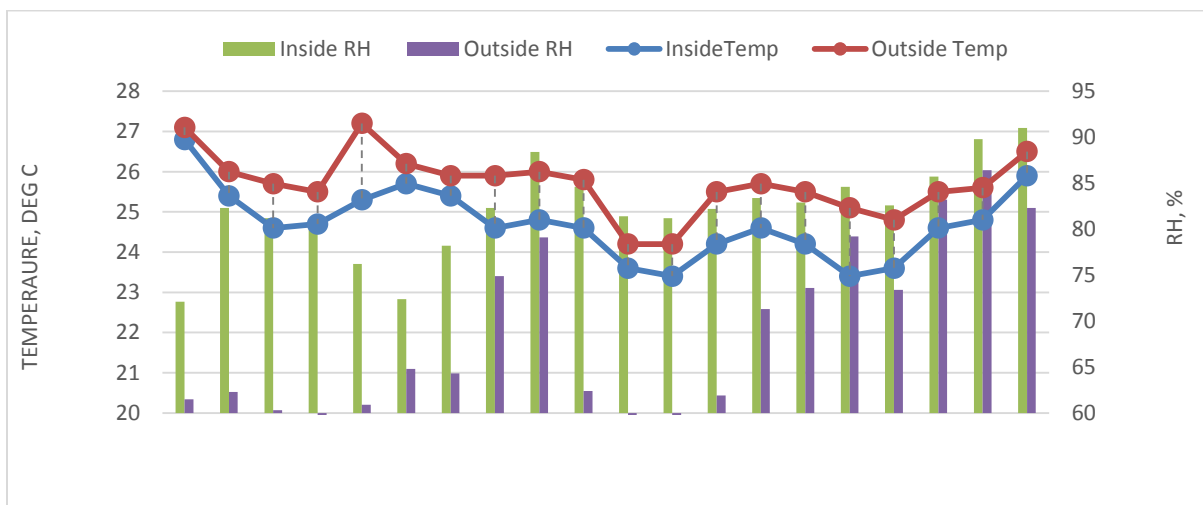


Variation in temperature and RH inside and outside of ZECC (day 51 – 70)

For performance evaluation of ZECC, the shelf life of commodities grown at NIPHM field were taken to evaluate the shelf of commodities in three different storage conditions were selected like control, refrigeration and ZECC. The commodity selected are Coriander leaves and curry leaves at three different conditions normal, wrapping in paper and placed plastic cover. In ZECC, the trays were placed 1 in row, 2 in a row and 3 in a row to study the shelf life of commodities with different conditions.

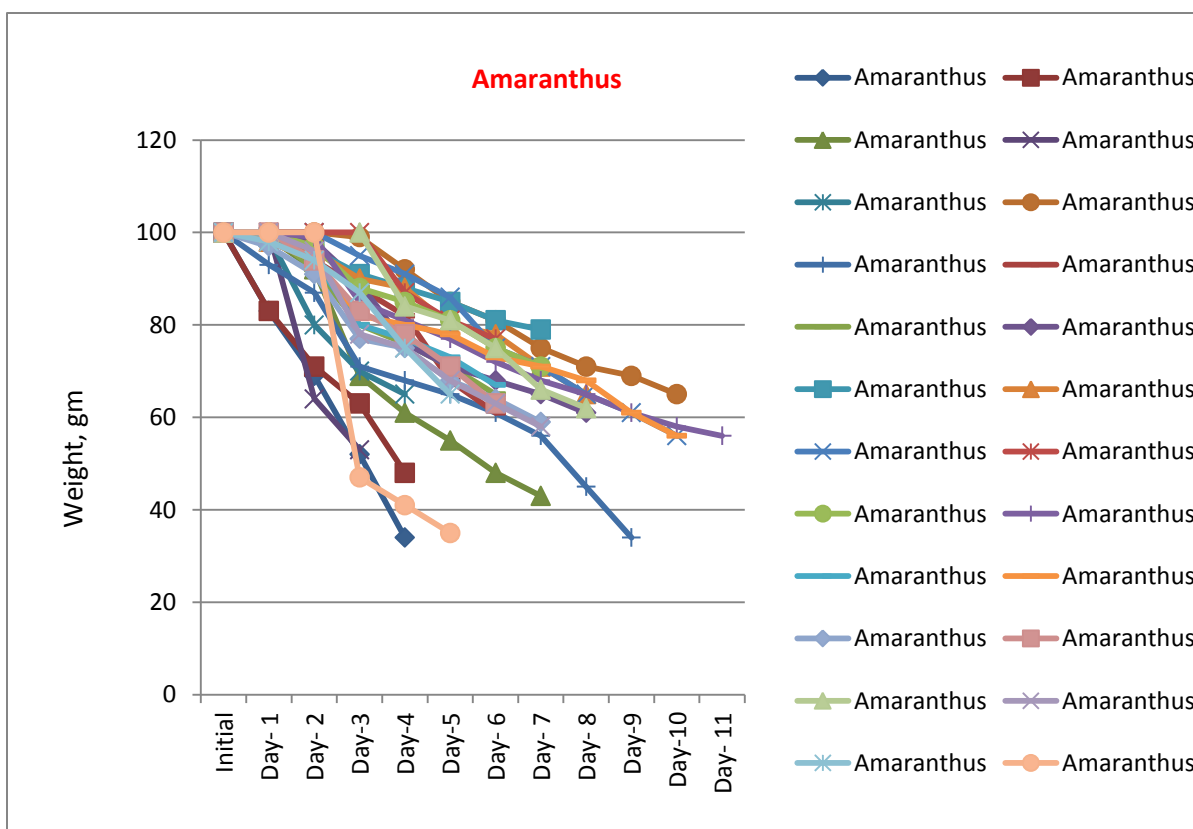


Leafy vegetables stored in ZECC



Variation in temperature and RH inside and outside of ZECC (day 71 – 90)

For performance evaluation of ZECC, the shelf life of commodities grown at NIPHM field were taken to evaluate the shelf of commodities in three different storage conditions were selected like control, refrigeration and ZECC. The commodity selected is amaranths leaves at three different conditions normal, wrapping in paper and placed plastic cover. In ZECC, the trays were placed 1 in row, 2 in a row and 3 in a row to study the shelf life of commodities with different conditions.



Leafy vegetables stored in ZECC

2. Tractor operated boom sprayer

The new addition to the division, the tractor operated boom sprayer, was evaluated. Test trials were done on tractor operated boom sprayer in field and on plane land. Field capacity and spray patterns were observed.



Trials on plane land



Trials in field

Spray droplet distribution were observed in field by placing water sensitivity papers to plant at three different heights at top of the plant, middle and below plant leaves. After spraying water sensitivity papers were observed in microscope it was observed that the bottom of the plant is also received good spray volume.



Extension Activities / Village Adoptions

Ms.Lavanya, SO(BP& BC), visited the Mohammed village along with Ekalavya Foundation, KVK, Medak on 20.10.2021 and observed the progress of the biocontrol laboratory construction and guided for further improvements and facilities required for lab establishment.



The spraying awareness project is taken up with the help of KVK, Mahaboobnagar. In the initial phase, the field level data of sprayers and spray related activities are being collected. The first phase is over and the final phase is presently being undertaken. The PGDPHM students are involved in the project for experience in field activity.

Other Activities

1. NIPHM Instructional farm:

- During this quarter (October to December 2021), the following farm activities are performed; Tomato crop-Harvesting observed mealy bug (*Phenacoccus solenopsis*), Thrips (*Thrips tabaci*), late blight (*Phytophthora infestans*), Calcium deficiency (blossom end rot), fruit cracking and management practices followed.
- Paddy-Caseworm (*Nymphula depunctalis*), Yellow stem borer (*Scirpophaga incertulas*), Rice horned caterpillar (*Melanitis leda*), Green leafhopper (*Nephotettix nigropictus*), Flea beetle, Grasshopper Release of *Trichogramma chilonis* cards. During November 2021, paddy harvested.
- In Red gram, crop identified different pests like Spotted Pod borer (*Maruca vitrata*), jassids (*Amrasca biguttula biguttula*), Mealy bug (*Phenacoccus solenopsis*) Flea beetles, Sterility mosaic virus. Removed and destroyed infected plants. And harvested the red gram.
- Groundnut Harvesting was done and groundnut was shown in C& D plots under study of bioagents efficacy on groundnut crop growth and yield.
- In okra, Aphids (*Aphis gossypii*), Jassids (*Amrasca biguttula biguttula*), Whitefly (*Bemisia tabaci*). Chilli Transplantation and botanicals are sprayed for control of sucking pests.
- Leafy vegetables and other vegetables like beetroot, carrot was planted in the field.
- Installed sticky traps.
- Under the concept of NIPHM beautification, the ornamental plant's propagation was done Established rose gardens, other flowers gardens. Maintaining Banana and spices at the front side of LBS building and herbal garden, apiary on the campus.



Weeding in okra



Release of *Trichogramma chilonis* cards



Transplantation of chilli



Weeding in tomato

2. Polyhouse (Protected cultivation)

During this quarter (October to December 2021), the following farm activities are performed under protected cultivation.

- Tomato crop plant protection measures taken (Mealy bug (*Phenacoccus solenopsis*), Late blight (*Phytophthora infestans*))
- Coriander, Spinach Harvested and kept for sale.
- Plant protection measures taken Capsicum (Aphids (*Myzus persicae*) and whitefly (*Bemisia tabaci*), Release of *Blaptostethus pallesence* adults).
- Broccoli –nutrient management practices were done.
- Cucumber - nutrient management practices were done
- Tomato crop- nutrient management practices were done
- Installed sticky traps.
- Regular calendar of works done- nutrient management, pest management practices.
- Maintenance of hydroponics.



- d. NIPHM Hyderabad has participated in 12th Agrovision Summit organized at Reshim Bagh, Nagpur, Maharashtra from 24th to 27th December, 2021. NIPHM stall was visited by approx. 4000 farmers and other stakeholders and they were briefed about the NIPHM low-cost technologies and benefits of organic farming. Many agriculture/horticulture students of Maharashtra state Agriculture universities and colleges also visited the stall and enquired about the Post Graduate Diploma in Plant Health Management and MOOCS courses conducted by NIPHM.



e. **Farmers Advisory Cell:**

Field visit: Visited nearby fields in Chenvelli, Ranga Reddy, Hyderabad for detection and diagnosis of pests.



Mealybug infestation in fields



Interaction with farmers

- i. A total 28 farmers visited NIPHM Plant Health Clinic for seeking information on Good Agricultural Practices and fruit fly traps.
- ii. The advisories were given to the farmers and stakeholders on various aspects related to organic farming, polyhouse pests, wheat irrigation, guava fruit fly traps, pruning of mango orchid, Biocontrol agents, sticky traps and pheromone traps, tomato diseases and trainings programmes was given to the farmers (602 nos.) through phone calls/visits.
- iii. The information related to fruit fly traps, UIPM training, pruning of Mango Orchids, septoria leaf spot of Tomato, Guava fruitfly trap were sought through phone calls/visitors by farmers.

f. World Food Day 2021 was organised and celebrated at NIPHM.



g. **Visit to District Horticulture Department Zakerabad:** NIPHM faculty has visited District Horticulture Department Zakerabad to impart hand on training on farm production of biofertilizers and Biopesticides to one hundred seventy five farmers attended the programme.





h. **Survey of poly houses for the incidence of different pest complex in different crops grown in Rangareddy District:** The faculty visited Pamena, Chenvelli, Ikkareddiguda eleven poly houses and collected data on different pest complex.



Survey of polyhouse: Detection of insect pests in Gerbera



Interaction with the farmers regarding marketing, packing and storage practices

Faculty achievements (Publications / trainings / webinar-seminar / Awards etc)

Webinar/Seminar

- i. Er. M Udaya Bhanu, SO(PHE) has delivered expert talk on” Spraying techniques and safety precautions”in training programme on ICM in vegetables and post harvest technology organized by KVK, Amadalavasa, Srikakulam on 12th Oct 2021.
- ii. Dr. Vidhu Kampurath, JD(PHE) attended the FAD11(BIS) meeting as regular member and contributed.
- iii. Dr. Vidhu Kampurath, JD(PHE) attended webinar on “ Drones for public good mass awareness programme: Inaugural session- drones for increasing farmers income. Talk by Hon. Union minister Jyothiraditya Scindia and other experts conducted by FICCI.

- iv. Dr. Vidhu Kampurath, JD(PHE) attended webinar on “ Challenges and solutions in pest management strategies in agriculture” conducted by ISAS on 9th Oct 2021.
- v. Er Govind Kumar Maurya was invited for a Guest lecture by KVK, Gadchiroli, Maharashtra to engage the expertise lecture on ‘Nozzles, calibration and spraying techniques’.

Other activities:

- i. All divisional staff attended the World Food day meeting.
- ii. As part of Foundation day, divisional staff conducted games as committee members and also participated in games.
- iii. Division received new tractor operated orchard sprayer, tests need to be done.
- iv. As the Coordinator for Input Dealer Course (Gujrath State), 38 batches of training programmes are running under NIPHM regularly monitoring the class activities from different NTI and monitoring charges from 30 NTIs were collected by Er. Sk Haneefa Begum as nodal officer for gujarat state.



Glimpses of training programme

- v. The Division equipment tally has been enriched with purchasing of different sprayers like tractor operated orchard sprayer, electrostatic sprayer, fogging machine, solar battery operated sprayer, rocker sprayer etc.
- vi. All the officers attended vigilance awareness week valedictory session.
- vii. A suitable plan of action for effective usage of the STP water is being worked out, instead of using only for watering the plants.
- viii. For effective usage of the solar plant, division has taken the responsibility of its regular monitoring.
- ix. As per instructions from Ministry, new training module on drone pilots has been prepared and submitted by divisional staff.
- x. Installation process of automatic irrigation system at polyhouse and open field to be completed under supervision of Er. Govind Kumar Maurya by the M/s. Navriti Innovation.
- xi. Monitoring and supervision of neem tree spraying by PHM at the institute for all neem trees in view of the recent drying issue of the neem trees, by divisional staffs.
- xii. Students trainees from PHM division visited PHE workshop and acquainted with PP machinery.
- xiii. All the officers attended Swatchha Pakwada activities and compilation report is done.
- xiv. Monitoring and supervision activities of Swatchha pakwada programme as committee member by Er. M Udaya Bhanu.
- xv. A Memorandum of Understanding was signed between NIPHM and one of the leading drone company, M/s marut Drone Tech for training the drone spraying to all stakeholders. The initial work will be mostly concentrated on training aspects, however, experiments for variable rate application, crop monitoring etc are also envisaged under the agreement.



Success Stories

First Pesticides Testing Laboratory in Tamil Nadu awarded NABL Accreditation for Pesticide Formulation Analysis

The Pesticides Testing Laboratory, Coimbatore working under the Department of Agriculture and Farmers Welfare, Government of Tamil Nadu has been awarded NABL Accreditation in the field of testing Chlorpyrifos 20% EC and Imidacloprid 17.8% SL in accordance to the standard, ISO/ IEC 17025: 2017 General Requirements for Competence of Testing and Calibration Laboratories in order to maintain the quality of analysis. The analysts of laboratory have undergone various necessary trainings at PMD, NIPHM, Hyderabad and acquired adequate analytical competency and to sustain the quality system management.





  **National Accreditation Board for
Testing and Calibration Laboratories**

CERTIFICATE OF ACCREDITATION

PESTICIDES TESTING LABORATORY, COIMBATORE

has been assessed and accredited in accordance with the standard

ISO/IEC 17025:2017

**"General Requirements for the Competence of Testing &
Calibration Laboratories"**

for its facilities at

LAB COMPLEX, 285, THADAGAM ROAD, GCT POST, COIMBATORE, TAMIL NADU, INDIA

in the field of

TESTING

Certificate Number: TC-9931
Issue Date: 04/10/2021 Valid Until: 03/10/2023

This certificate remains valid for the Scope of Accreditation as specified in the annexure subject to continued satisfactory compliance to the above standard & the relevant requirements of NABL.
(To see the scope of accreditation of this laboratory, you may also visit NABL website www.nabl-india.org)

Name of Legal Identity : STATE PESTICIDE TESTING LABORATORY

Signed for and on behalf of NABL




N. Venkateswaran
Chief Executive Officer

वर्ष 2020-21 हेतु राजभाषा कार्यान्वयन समिति की द्वितीय बैठक संपन्न

राजभाषा कार्यान्वयन समिति (राकास) की द्वितीय बैठक वर्ष 2020-21 हेतु दिनांक 02-11-2021 को डॉ. सागर हनुमान सिंह, भा.डा.से., महानिदेशक, एनआईपीएचएम की अध्यक्षता में हुई। बैठक में महानिदेशक के समक्ष जुलाई-सितंबर, 2021 की तिमाही हिंदी प्रगति रिपोर्ट प्रस्तुत किया गया। उन्होंने उक्त रिपोर्ट की समीक्षा करते हुए संस्थान में आगे भी राजभाषा अधिनियम की धारा 3(3) का अनुपालन शत-प्रतिशत किये जाने के निदेश दिये। एनआईपीएचएम के सभी प्रौद्योगिकी वीडियो या किसानों से संबंधित अन्य प्रौद्योगिकी वीडियो एवं अन्य दिशा-निर्देशों का भी हिंदी में अनुवाद किया जाए। महानिदेशक ने निदेश दिया कि संस्थान के प्रत्येक कर्मचारी एवं अधिकारी पत्रों एवं फाइलों पर अधिक से अधिक हिंदी में टिप्पणी अवश्य लिखें, जिससे कि कार्यालयीन कामकाज में हिंदी को बढ़ावा दिया जा सके। एनआईपीएचएम के वार्षिक प्रतिवेदन 2020-21 एवं वार्षिक लेखा 2020-21 का हिंदी में अनुवाद किया गया।

एनआईपीएचएम में प्राज्ञ एवं प्रबोध प्रशिक्षण पाठ्यक्रम परीक्षाओं का आयोजन :

वर्ष 2021 के दौरान जनवरी से मई, 2021 अवधि के दौरान एनआईपीएचएम के 06 प्रतिभागी प्रबोध पाठ्यक्रम प्रशिक्षण हेतु एवं 03 प्रतिभागी प्रबोध पाठ्यक्रम प्रशिक्षण हेतु कुल 09 कर्मचारियों एवं अधिकारियों को हिंदी प्रशिक्षण केन्द्रीय हिंदी प्रशिक्षण उप संस्थान (सीएचटीआई), सिकंदराबाद द्वारा ऑनलाइन के माध्यम से प्राज्ञ प्रशिक्षण पाठ्यक्रम का आयोजन किया गया था। उक्त पाठ्यक्रम प्रशिक्षणों की परीक्षाओं का आयोजन राष्ट्रीय वनस्पति स्वास्थ्य प्रबंधन संस्थान, राजेंद्रनगर-हैदराबाद में किया गया।





(परीक्षा केंद्र के रूप एनआईपीएचएम में प्रज्ञा एवं प्रबोध प्रशिक्षण परीक्षाओं का आयोजन)



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