

## From the Director General's Desk



**G. Jayalakshmi, IAS**  
**Director General**

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India is the fastest growing major economy in the world. Since independence, India has made tremendous progress in agriculture in terms of yield. We are very proud that we have turned from insufficiency of food grains to self-sufficiency. Recently, we have celebrated 71<sup>st</sup> Independence Day; it is my pleasure to say that this year "All our Indian granaries are full". This year recorded more than 270 million tons of food grains. This is record high since independence.

To safeguard the country's agricultural economy from the exotic pests, every country has specified phytosanitary conditions during International trade to mitigate the pests. The trade in food grains, seeds, plants for propagation and various wood packaging materials pave a pathway for spread of pests across the continents. Various phytosanitary treatments like fumigation, cold treatment, Hot air treatment and irradiation are necessary to facilitate import and export of agricultural commodities.

Plant Biosecurity gains momentum after the trade liberalization under the WTO regime. NIPHM act as a nodal agency for organizing capacity building programme for officers of State/ Central / Agri. University/ ICAR and Forest Research Institutes. To promote safe trade, phytosanitary certificate is issued by the exporting NPPO after carefully fulfilling the inspection, sampling, testing and treatment if necessary. As India being signatory to IPPC is under the obligation to promote safe trade of agricultural commodities by issuing phytosanitary certificate for the commodities being exported.

It is high time to protect the entry, establishment and spread of exotic plant pests in India. The country need skilled and highly dedicated professionals in the area of plant biosecurity to safeguard our country's plant health. Recent years we have seen remarkable growth in the trading relationship with other countries. Scientific knowledge and modern phytosanitary treatments provide considerable opportunities to promote safe trade.

I strongly believe and hope that the officers of Directorate of Plant Protection Quarantine and Storage, State Agricultural / Horticultural Department, Scientists from ICAR and Forestry Institutions, Agricultural Extension Scientists can join hands with National Institute of Plant Health Management to safeguard our country from exotic pests.

  
**(G. Jayalakshmi, IAS)**  
**Director General**

## Invasive alien species in relation to plants as pests

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### Introduction

Plant species are being transported by human being, both intentionally and unintentionally, around the world for many years. This aided in the movement of plant species from its centres of origin to far-away countries. Most countries have benefitted from exchange or intentional / unintentional introduction of alien species. It is not always ended up with beneficial results and unfortunately paved the way for movement of associated pests to newer areas also. International trade in agricultural and horticultural sector plays a potentially important role in distributing plants and animals beyond the borders of their indigenous habitats. These pests may be introduced to new environments through shipments of food, plant products, wood and wood products, containers, pallets and other packaging materials. In recent years, the world has truly become a global village with reference to transport and communication. The exponential expansion of trade in agricultural material and the speed at which agricultural products moving around the globe pose an increased risk of introduction of exotic plant pests into new areas. It is very natural for the associated pests to step around the globe along with plant products to newer areas, but the unnatural events of record of invasive alien species in the recent times owing to human interference is happening at an alarming rate. The definition of alien species, invasive species and alien invasive species are as follows:

#### **Alien species:**

It is defined as “a species, subspecies or lower taxon, introduced outside its natural past or present distribution; includes any part, gametes, seeds, eggs, or propagules of such species that might survive and subsequently reproduce” (Source: Convention on Biological Diversity (CBD)).

#### **Invasive species:**

It is described as “animals, plants or other organisms introduced by man into places out of their natural range of distribution, where they become established and disperse, generating a negative impact on the local ecosystem and species.” (Source: International Union for Conservation of Nature (IUCN)).

#### **Invasive alien species:**

It is defined as “an alien species whose introduction and/or spread threaten biological diversity” (source: CBD). It is also called as alien invasive species.

Invasive Alien species occur in all taxonomic groups, including animals, plants, fungi and microorganisms, and can affect all types of ecosystems. In the absence of their natural predators and competitors, these pests can prosper in new environments and spread, affecting the entire ecosystems. Accidental or intentional introduction of plant pests into newer areas is curtailed to some extent through legal mechanism implemented by the National Plant Protection Organizations (NPPO). In India, the Directorate of Plant Protection, Quarantine and Storage under Ministry of Agriculture, is responsible for implementation of Destructive Insects and Pests Act, 1914 through Plant Quarantine (Regulation of Import into India) Order, 2003 to prevent entry, establishment and spread of exotic plant-pests into India to safeguard agriculture, horticulture and forest tree plants. Plant Quarantine Stations are established at various points of entry such as seaports, airports and land frontiers to implement the provisions of PQ Order, 2003.

### **Invasive Alien Species and International framework**

#### **Convention on Biological diversity (CBD):**

The CBD identified “Invasive Alien Species” (IAS) as a major factor in the loss of biodiversity based on their capacity to out-compete or prey on native species and subsequently cause a degradation of the biodiversity in the area of their introduction. The CBD is not a standard-setting organization and does not provide standards on how to regulate IAS. But, the Executive Secretary of CBD invited several international organizations to form an Inter-Agency Liaison Group on Invasive Alien Species (IALG-IAS). The IALG-IAS facilitates cooperation among relevant international organizations in supporting measures to “prevent the introduction of, control or eradicate those alien species which threaten ecosystems, habitats or species”. The members of this group meets regularly to share information on activities related to IAS and reflect on how best to create synergies.

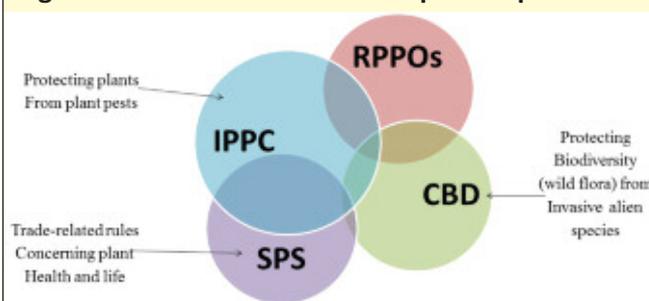
### World Trade Organization - Sanitary and Phytosanitary agreement (WTO-SPS):

The SPS Agreement does not specifically use the term “Invasive Alien Species”, but the establishment and/or spread of IAS falls under the definition of SPS measures. Annex A defines “SPS measures” as including “any measure applied to protect animal or plant or health and to prevent or limit other damage within the territory of the Member from risks arising from the entry, establishment or spread of pests. The terms “animal” and “plant” here include wild fauna and wild flora, and “pests” includes weeds. Since “other damage” may include environmental damage caused by pests, measures applied to protect and prevent from the entry, the establishment or spread of IAS falls under the definition of an SPS measure.

### International Plant Protection Convention:

The CBD's coverage of IAS corresponds to the work of two international standard-setting bodies recognized under the World Trade Organization's (WTO) Agreement on the Application of Sanitary and Phytosanitary Measures (SPS Agreement). This concerns the International Plant Protection Convention (IPPC) in relation to pests of plants and plant products and the World Organisation for Animal Health (OIE) in relation to animal diseases. Based on the IPPC's mission to protect both cultivated and wild plant resources, including aquatic ones, from the spread and introduction of plant pests, its coverage extends to the protection of the environment, which gives rise to considerable overlaps with CBD.

### Overlapping mandates of International and regional organizations on IAS in relation to pests of plants



Source: Lopian, 2005

### Invasive Species Specialist Group:

The Invasive Species Specialist Group (ISSG) of International Union for Conservation of Nature (IUCN) is a global network of scientific and policy experts on invasive species and was established in 1994. ISSG promotes and facilitates the exchange of information about the invasive species through Global Invasive Species Database (GISD) which is a database freely available online. GISD provides information and knowledge across the globe on invasive species, their ecology and spread, management and impacts and ensures the linkage between knowledge, practice and policy so that decision making is informed.

ISSG published the list of “100 of the world's worst invasive alien species” in a booklet which illustrates the incredible variety of species that have the ability, not just to travel in ingenious ways, but also to establish, thrive and dominate in new places. [http://www.issg.org/worst100\\_species.html](http://www.issg.org/worst100_species.html)

### Invasive Alien Species introduced into India:

Many invasive alien species have entered into India through intentional or unintentional ways. The important invasive alien species which were introduced into India are as follows –

**Introduced Insect Pests** – Many insects have gained entry into India through accidental introduction and the problems caused by them in agricultural ecosystems are many fold. Herein, some of the introduced insects into India are detailed below -

#### *Hypothenemus hampei* (Ferrari, 1867) –Coffee berry borer

Coffee berry borer is the most serious pest of coffee in many of the major coffee-producing countries in the world. This beetle feeds on the cotyledons and has been known to attack 100% of berries in a heavy infestation. Since the time of its first report of occurrence in 1990 in Wayanad of Kerala, the coffee berry borer has spread in the major coffee growing areas in southern states which contribute to 88 Per cent (3, 88,000 hectares) of coffee growing areas in India. Annually more than Rs.20 crores is spent towards control measures.



### *Tuta absoluta* (Meyrick) - Tomato leaf miner

South American tomato pinworm (*Tuta absoluta* Lepidoptera: Gelechiidae) is the most serious threat for tomato production worldwide. In India, this destructive invasive pest was observed for the first time infesting tomato crop in Maharashtra, India during 2014. Later, it was also reported from Karnataka and Tamil Nadu. Plants are damaged by direct feeding on leaves, stems, buds, calyces, young fruit, or ripe fruit and by the invasion of secondary pathogens which enter through the wounds made by the pest. It can cause up to 90% loss of yield and fruit quality under greenhouses and field conditions.



### List of Introduced Insects into India

Table 1. List of introduced insect and invertebrate pests into India

Sl. No.	Common name	Scientific name	Country of origin / native	Year of introduction	Pathway of introduction	Nature of the pest
1	Coconut eriophid mite	<i>Aceria guerreronis</i> Keifer	Mexico	1998	Through coconuts	Invasive
2	Rugose spiralling whitefly	<i>Aleurodicus rugioperculatus</i> Martin	Central America	2016	Exact pathway not known	Invasive
3	Stem borer or longhorn beetle	<i>Aristobia reticulator</i> (Voet)	China or Myanmar	2017	Exact pathway not known	Invasive
4	Silver leaf whitefly	<i>Bemisia tabaci</i> (Gennadius, 1889) biotype B	Exact origin not known	1999	Exact pathway not known	Invasive
5	Sugarcane woolly aphid	<i>Ceratovacuna lanigera</i> Zehntner	Indonesia	1958	Cane setts from Java	-
6	Soft green scale	<i>Coccus viridis</i>	Africa	1889	Accidental introduction from Sri Lanka	-
7	Codling moth	<i>Cydia pomonella</i> Linnaeus	Palearctic region	Exact year not known	Introduced from neighbouring countries Pakistan and Afghanistan	-
8	Woolly apple aphid	<i>Eriosoma lanigerum</i> (Hausmann)	Eastern North America	1889	Apple root stock	Invasive
9	Subabul psyllid	<i>Heteropsylla cubana</i> Crawford	Central America	1988	Accidental introduction	Invasive
10	Coffee berry borer	<i>Hypothenemus hampei</i> Ferrari	North east Africa	1990	Accidental introduction from Sri Lanka	Invasive
11	Cottony cushion scale	<i>Icerya purchasi</i> (Maskell)	Australia	1921	Accidental introduction	Invasive
12	Eucalyptus gall wasp	<i>Leptocybe invasa</i> Fisher & La Salle	Australia	2006	Nurseries of Eucalyptus spp.	Invasive
13	Serpentine leaf miner	<i>Liriomyza trifolii</i> Burgess	North America	1991	Accidental introduction	Invasive
14	Giant African snail	<i>Lissachatina fulica</i> (Bowdich)	East African coastal regions	1847	Intentional introduction	Invasive
15	Litter beetle	<i>Luprops tristis</i>	Malaysia	1970-80	Through nursery /seedlings	-
16	Lantana bug	<i>Orthezia insignis</i> (Browne)	Neotropical region, probably Guyana	1915	Accidental introduction	Invasive
17	Papaya mealy bug	<i>Paracoccus marginatus</i> Williams & Granara de Willink, 1992	Mexico or Central America	2007	Accidental introduction	Invasive
18	Cotton mealy bug	<i>Phenacoccus solenopsis</i> Tinsley	USA	2005	Plant materials	Invasive
19	Madeira mealybug	<i>Phenacoccus madeirensis</i> Green, 1923	Neotropical origin	2012	Exact pathway not known	-
20	Solanum mealybug	<i>Phenacoccus solani</i> Ferris	South east Asian origin	2012	Exact pathway not known	-
21	Potato tuber moth	<i>Phthorimaea operculella</i> (Zeller)	South or North America	1937	Potatoes from Italy	Invasive
22	Diamond-back moth	<i>Plutella xylostella</i> (Linnaeus)	Europe, South Africa or East Asia	1914	Accidental introduction	Invasive
23	San Jose scale	<i>Quadraspidiotus perniciosus</i> Comstock	China	1911	Nursery stock of flowering plants (Cydonia japonica)	Invasive
24	Erythrina gall wasp	<i>Quadraspidiotus erythrinae</i> Kim	Africa	2006	Plant materials	Invasive
25	Defoliating tortoise beetle	<i>Trachynela tincticollis</i>	Australia	2000	Exchange of plant material	-
26	Tomato pin worm	<i>Tuta absoluta</i> (Meyrick)	South America	2014	Exact pathway not known	Invasive

**Introduced Pathogens** – In recent past, many plant pathogens introduced into India through various pathways and caused damage to various economically important crops. The important introduced pathogens are detailed below-

**Banana bunchy top virus (BBTV):**

Banana bunchy top virus (BBTV) is a deadly plant virus and it affects many areas of the world-wide banana industry. In India, the virus has devastated large plantations of cv. Virupakshi (AAB), an elite cultivar also known as “Hill Banana” in lower Pulney hills, Tamil Nadu State since 1940s. The area under cultivation of this banana cultivar has been reduced from 18,000 to 2,000 ha due to BBTV. BBTV is a major constraint to production in many countries wherever it occurs. Now the virus was wide spread in Tamil Nadu, Kerala, Assam and most probably all over India.

**Plasmopara halstedii (downy mildew of sunflower)**

*Plasmopara halstedii* was first noticed in 1985 in India and later it was reported in Marathwada region of Maharashtra in 1992, where sunflower is extensively grown. The heads of infected sunflower plants are reduced in size and face upward (horizontal head), bearing no or a limited number of seeds of poor viability. Sunflower downy mildew is seed transmitted in nature and has spread to major sunflower growing States such as Karnataka, Andhra Pradesh apart from Maharashtra.

**Table 2: List of introduced plant pathogens and nematodes into India**

Sl. No.	Common name	Scientific name	Country of origin/native	Year of introduction	Pathway of introduction	Nature of the pest
1	Bunchy top of banana	<i>Banana bunchy top virus</i>	Fiji	1940	Plant materials from Sri Lanka	Invasive
2	Powdery mildew of cucurbits	<i>Erysiphe cichoracearum DC.</i>	Exact origin not known	1910	Accidental introduction from Sri Lanka	-
3	Coffee Rust	<i>Hemileia vastatrix</i> Berkeley & Broome	Southern Ethiopia	1879	Sri Lanka	-
4	Paddy blast	<i>Magnaporthe oryzae</i> B.C. Couch [teleomorph] B.C. Couch	Southeast Asia	1918	Accidental introduction	-
5	Powdery mildew of Rubber	<i>Oidium heveae</i> Steinm.	Malaya	1938	Accidental introduction	-
6	Downy mildew of Maize	<i>Peronosclerospora philippinensis</i> (W. Weston) C.G. Shaw, 1978	Philippines	1912	Accidental introduction from Java	-
7	Phytophthora blight	<i>Phytophthora infestans</i> (Mont.) de Bary	North America	1883	Introduced from Europe	Invasive
8	Black shank of Tobacco	<i>Phytophthora nicotianae</i> Breda de Haan	Indonesia	1938	Accidental introduction	-
9	Downy mildew of sunflower	<i>Plasmopara halstedii</i> (Farl.) Berl. & De Toni	North America	1985	Introduced from USA	Invasive
10	Grapevine downy mildew	<i>Plasmopara viticola</i> (Berk. & M.A. Curtis) Berl. & de Toni	North America	1910	Grapevine from Europe	Invasive
11	Wart disease of potato	<i>Synchytrium endobioticum</i> (Schilb.) Percival	Andean zone of South America	1953	Introduced from Netherlands	Invasive
12	Flag smut of wheat	<i>Urocystis agropyri</i> (Preuss) A.A. Fisch. Waldh. 1867	Australia	1906	Accidental introduction	Invasive
13	Onion smut	<i>Urocystis cepulae</i> Frost	Exact origin not known	1958	Accidental introduction from Europe	-
14	Apple Scab	<i>Venturia inaequalis</i>	Central Asia	1978	Accidental introduction	-
15	Black rot of crucifers	<i>Xanthomonas campestris</i> pv. <i>campestris</i> (Pammel 1895) Dowson 1939	Exact origin not known	1910	Accidental introduction from Java	-
16	Bacterial leaf blight of paddy	<i>Xanthomonas oryzae</i> pv. <i>oryzae</i>	Asia	1959	Accidental introduction from Philippines	Invasive
<b>Nematodes</b>						
17	Yellow potato cyst nematode	<i>Globodera rostochiensis</i> (Wollenweber, 1923) Behrens, 1975	Andes region of South America	1961	Potato from Europe	Invasive
18	White potato cyst nematode	<i>Globodera pallida</i> (Stone, 1973) Behrens, 1975	Andes region of South America	1961	Potato from Europe	Invasive

**Introduced Weeds** – Biological invasions by exotic plant species constitute one of the leading threats to natural ecosystem and biodiversity. Many plants which brought as ornamental plants became invasive in nature and potentially affecting the natural flora of the country. The important introduced weeds are detailed below-

### ***Chromolaena odorata* (Siam Weed):**

It is a fast-growing perennial shrub, native to South America and Central America. It is capable of establishing in a wide variety of agro-ecological conditions. It has been introduced into the tropical regions of Asia (including India), Africa and the Pacific during 19th century. It forms dense stands which prevents the establishment of other plant species. It is an aggressive competitor and it is a serious problem in pastures, forests, orchards and commercial plantations in South and Northeast India.

### ***Eichhornia crassipes* (water hyacinth)**

It is one of the world's worst aquatic weeds. Originally from South America, it was introduced intentionally as an ornamental plant into India in the year 1895. Due to fast propagation capacity, it dramatically reduces biological diversity in aquatic ecosystems. It forms thick mats that cover rice paddies, clog irrigation channels, impede navigation, disturb fishing, sweep away buildings during floods and foster breeding by disease-transmitting mosquitoes. It is estimated that 20-25% of total utilizable water in India is infested with Water Hyacinth.

**Table 3: List of introduced weeds into India**

Sl. No.	Common name	Scientific name	Country of origin/native	Year of introduction	Pathway of introduction	Nature of the pest
1	Black wattle	<i>Acacia mearnsii</i> De Wild.	South eastern Australia	19 <sup>th</sup> century	Intentional introduction	Invasive
2	Billy goat weed	<i>Ageratum conyzoides</i> L.	Central America & Caribbean	1860	Intentional introduction as ornamental plant	Invasive
3	Alligator weed	<i>Alternanthera philoxeroides</i> (Mart.) Griseb.	South America	1960	Accidental introduction	Invasive
4	Perennial ragweed	<i>Ambrosia psilostachya</i> DC.	North America (western USA)	2012	Exact pathway not known	Invasive
5	Mexican poppy	<i>Argemone mexicana</i> L. (1753)	Mexico	Within historic 6times (250 years ago)	Intentional introduction	Invasive
6	Siam weed	<i>Chromolaena odorata</i> (L.) R.M. King & H. Rob.	Central and South America	19 <sup>th</sup> century	Intentional introduction	Invasive
7	Water hyacinth	<i>Eichhornia crassipes</i> (Mart.) Solms 1883	South America	1895	Intentional introduction as an ornamental plant	Invasive
8	Lantana	<i>Lantana camara</i> L.	Central & South America	1809	Intentional introduction	Invasive
9	Mile-a-minute weed, bitter vine	<i>Mikania micrantha</i> Kunth	Central and South America	1918	Intentional introduction	Invasive
10	Sensitive plant, Touch-me-not	<i>Mimosa pudica</i> L.	South and Central America	19 <sup>th</sup> century	Intentional introduction	Invasive
11	Parthenium weed	<i>Parthenium hysterophorus</i> L.	North America (Mexico)	1951	Bulk import of Wheat from USA	Invasive
12	Littleseed canarygrass	<i>Phalaris minor</i> Retz. (1783)	Mediterranean region	1961	Food grains from Mexico	Invasive
13	Mesquite	<i>Prosopis juliflora</i> (Sw.) DC.	Mexico, Central and northern South America	1870s	Mexico and Caribbean Islands	Invasive
14	Kariba weed	<i>Salvinia molesta</i> D.S. Mitch.	Brazil	1955	Intentional introduction	Invasive

### **Emerging pest threats**

India is still free from many devastating pests which are invasive in nature. The exotic pests can come through in any one of the following ways:

- i. International trade of agricultural materials: exchange of germplasm and commercial imports
- ii. Through natural ways such as air, land and water
- iii. Ill-intentional introductions by smuggling of infected / infested materials

Though plant quarantine regulations are operative in India, the entry of pests through natural border, illegal import of infested / infected materials or accidental introduction always pose a threat. Few examples of exotic/alien pests which are invasive in nature: Cotton Boll Weevil (*Anthonomus grandis*), Coconut Hispine Beetle (*Brontispa lonigissima*), Asian long-horn beetle (*Anoplophora glabripennis*), pinewood nematode (*Bursaphelenchus xylophilus*), wheat blast (*Magnaporthe oryzae* pathotype *Triticum*). Prevention is the most effective strategy against the introduction and establishment of invasive alien species into India.

### **Need for Invasive Pest Incursion management**

In India, Implementation of legal mechanism i.e. Plant Quarantine (Regulation of Import into India) Order, 2003, is in place to regulate the imported plants and plant materials and the commodities are inspected, sampled and tested at the port of entry. If quarantine pests are intercepted, the consignments are subjected to approve quarantine treatments and if treatment is not an option then the consignments are either deported or destroyed. The weak link between Plant Quarantine & Customs, unregulated import of seeds/plants/bulbs as accompanied baggage in small quantity go unnoticed at airports, has resulted in incursion of many economically important plant pests. When a new or exotic pest is reported for the first time, less attention is given to contain and eradicate the pest. However, when the same pest assumes an epidemic form, measures are initiated to control the pest to minimize the damage/loss.

There is a dire need to create legislation to deal with exotic plant pests as regulatory system which can deal the management of pest incursion effectively. A nationally coordinated system of surveillance, inspection, testing, diagnosis and control using entry and post entry measures are required to prevent the establishment and spread of exotic plant pests that may have harmful effect on plants, human, animals and environment. These activities are responsibilities of Central Government, State/ Union Territory, Research Institutes, Agricultural Universities, Private/ Public sectors, Farmers and Public.

Past experiences indicate lack of pro-activeness to combat the invasions of invasive alien pests on emergency basis, leading to entry and establishment of a number of invasive weeds and plant pests in recent years. There is a need to establish Emergency Plant Pest Incursion Management Protocols to combat further invasion of alien species into India that are likely to find their pathway through increased trade.

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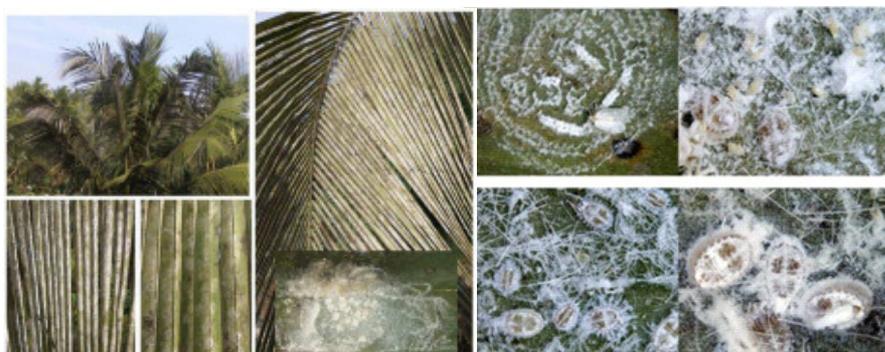
**Around the World: Pest alert: Invasion of Rugose Spiralling Whitefly (RSW) *Aleurodicus rugioperculatus* Martin in Coconut and banana**

In the recent past, two invasive whiteflies viz., the spiraling whitefly *Aleurodicus dispersus* Russell and the solanum whitefly *Aleurothrixus trachoides* (Back) invaded India in 1995 and 2014, respectively. Recently, Rugose Spiralling Whitefly (RSW) pest has been found infesting the coconut palm (*Cocos nucifera* L.) for the first time during August-September, 2016 at Pollachi taluk, Coimbatore district in Tamil Nadu (Source: ). Later, it was found to infest banana plants in Kerala. Subsequently, the pest was reported to feed on banana, custard apple, citrus and several ornamental plants in Tamil Nadu, Andhra Pradesh and Kerala. In India, the pest is likely to cause severe yield loss on coconut, banana and several other economically important plants.

RSW was first reported from coconut during 2004 at Belize and it had threatened coconut palms in Florida during 2009. It is believed to have originated from Central America and its incidence limited to Belize, Mexico, Guatemala and Florida in Central and North America (Evans, 2008). Based on records from 2009 to 2015, RSW has been identified on at least 118 host plants which includes edible plants, ornamentals, palms, fruits and weeds of both native and non-native species (Mannion 2010; Stocks 2012; Francis et al. 2016). Therefore, it is the first record of its presence in India as well as in the Oriental region.

**Nature of damage**

The immature and adult whitefly by their sucking feeding habit, siphon out coconut sap by selective feeding on the undersurfaces of the leaflets. Extensive feeding of the insect leads to the excretion of honey dew excrement, which encourages growth of the fungus *Capnodium* sp. and affecting the photosynthetic efficiency of the plant.



**Workshop on area wide Fruit Fly Management in Mango fields at Uttar Pradesh**

Workshop cum training programme was organized in collaboration with NIPHM by the Department of Horticulture and Food Processing at Barabanki and Faisabad for mango growing farmers of Uttar Pradesh on 6<sup>th</sup> & 07<sup>th</sup> April, 2017 which are the major mango growing belt of UP. The programme at Barabanki was organized at Vikas Bhawan, Barabanki and the same was organized at Sohawal village in Faisabad District. Around 180 farmers attended the training programme. Mr. Mariadoss, Assistant Director and Dr. C S Gupta, ASO (PP), NIPHM explained the importance and damages caused by fruit flies, benefit of continuous trapping of fruit flies from flowering to harvest, how prepare low cost bottles trap, preparation of Methyl Eugenol and Cue Lures by farmers themselves, installation of fruit fly traps in mango orchard and vegetable gardens etc. Practical field demonstration on the preparation of low cost bottle trap and lures were done. A trap was placed in a mango garden at Sohawal village and farmers practically experienced the placing of traps in mango garden and trapping of fruit flies. Fruit flies were trapped in the bottle trap that was placed in the mango garden. All the farmers were got benefitted out of this training and emphasis on reduction in production cost while using low cost bottle trap by farmers were given and all the farmers and Dept. of Horticulture and Food Processing officials appreciated and thanked the efforts of NIPHM in extending this low cost technology to the farmers.



### Inauguration of NPV production unit and Fumigation Laboratory at NIPHM

Nuclear Polyhedrosis viruses like Ha NPV, SINPV are increasingly being used as alternatives to chemicals. These viruses are highly specific and do not affect beneficial insects like parasitoids and predators and are safe to fish, birds, animals and man. Considering the usefulness of NPV in the management of important polyphagous pests, NIPHM has established the facility of NPV production unit against polyphagous pests like *Helicoverpa armigera* and *Spodoptera litura*. Further, DAC entrusted to NIPHM to find out the alternatives of Mbr Fumigation. In view of this, fumigation lab was established at NIPHM campus. The NPV production unit and Fumigation Laboratory was inaugurated by Shri. Shobhana K. Pattanayak, IAS, Secretary, Ministry of Agriculture, Cooperation & Farmers Welfare on 20.04.2017.



### Nematode Awareness workshop for Kadiyam Nursery Growers at Andhra Pradesh

In order to create awareness among the nursery growers about the nematode menace, one day workshop was organized at Kadiyam, Rajmundary, Andhra Pradesh on 15<sup>th</sup> April, 2017, which is covering 10,000 ha area for raising nurseries of all the horticulture and agriculture planting materials with 500 stakeholders association. The President nursery Kadiyam has requested and submitted letter of request to NIPHM to organize training programmes for nursery growers in Kadiyam, Andhra Pradesh. The President of the Kadiyam nursery growers Mr. Pulla Anjaneyalu chaired the workshop. More than 155 nursery growers were participated in the workshop along with Horticulture officials from East and West Godavari districts of Andhra Pradesh, Quarantine officials, extension officers and progressive farmers. The nursery growers of guava who are engaged in import of seedlings informed a heavy loss in their business due to these quarantine nematodes. During the workshop, participants were sensitized about the restriction of quarantine nematodes as a precautionary measure. The outcome of the field visits and workshop will be used to formulate a suitable action plan for management of this quarantine nematode in guava and other nematode diseases in Telangana and Andhra Pradesh.



### Expert team visit of Project Coordinator, All India Coordinated Research Project (AICRP) on Nematodes to the Telangana and Andhra Pradesh States

As per direction of the Assistant Director, Plant Protection & Biosecurity, Government of India, a detailed survey of the quarantine nematode infested guava production area was carried out by Dr. R.K. Walia, Project Coordinator, AICRP on Nematode, IARI, New Delhi, Dr. (Smt.) K. Poornima, Prof. (Nematology), TNAU, Coimbatore and Dr. B. S. Sunanda, NIPHM. The survey was conducted during 12<sup>th</sup> to 16<sup>th</sup> April, 2017. During the survey, guava orchards in Telangana and Andhra Pradesh were visited and interaction meetings were held with farmers of both the states on the issue of an invasive nematode infestation.

### Workshop on Nematode Management in Poly houses

Protected (Poly house) cultivation being a state sponsored programme to encourage export of horticultural produce, many farmers are engaged in this venture. However, within two years of launch of this programme, production under these poly houses started declining due to nematode infestation unnoticed by the growers.

In order to rejuvenate these poly houses and encourage the new farmers, Department of Horticulture, Telangana state in collaboration with National Institute of Plant Health Management (NIPHM), Hyderabad had organized a joint workshop on “Nematode Management in Poly-houses” at Centre of Excellence for Vegetables Jeedimetala, Ranga Reddy District on 29<sup>th</sup> June, 2017. Dr. Sunanda B. S., ASO (Nematology), NIPHM was invited as a lead speaker to talk in the workshop. The workshop was inaugurated by Director Horticulture. During the workshop participants learnt about diagnosis, detection and management of nematode diseases under protected cultivation. Farmers were also sensitized about the restriction of quarantine nematodes as a precautionary measure and soil testing for nematode infestation before the establishment of the new poly houses. Around 105 farmers from ten districts of Telangana state and 15 Horticultural Officers from Department participated in the workshop.



### Soil analysis for nematode infestation, a new initiative by NIPHM

With increasing awareness about nematode diseases, farmers are voluntarily visiting NIPHM regularly to get their soils analyzed for plant parasitic nematodes infestation and recommendations for management. This is the first time, when Andhra Pradesh and Telangana states farmers are getting motivated to get their soil tested for nematode infestation. The initiative is taken by NIPHM to issue reports of soil analysis for nematode infestation which is helpful for many farmers and for the last three months more than 100 farmers had their soil tested for nematode infestation and got recommendations in respective cases.



Soil Samples Analysed for Nematode Infestation at Nematology unit, NIPHM

### 1<sup>st</sup> Steering committee meeting on “Crop Pest Surveillance and Advisory Project (CROPSAP)”

NIPHM is involved in collaboration with different State Governments. In this regard, activities are being undertaken with Department of Agriculture, Government of Maharashtra since last 4 years. A meeting with Commissioner of Agriculture, Maharashtra was attended by Dr. K. Vijaya lakshmi, Director (PHM) and Dr. O. P. Sharma, JD (A&AM) on 04<sup>th</sup> & 05<sup>th</sup> May, 2017 at Pune, Maharashtra and submitted a proposal for Rs. 13.25 lakhs to organize training to pest monitors and to establish on-farm production units at divisional level in Maharashtra State.

The proposal was considered and Rs.13.25 lakhs was sanctioned to NIPHM to organize training and other activities under Crop Pest Surveillance and Advisory Project (CROPSAP). The training programmes are scheduled in the month of August, 2017.

## Capacity Building

### Quarantine Pests: Detection & Identification

A 21 days training programme on “Quarantine Pests: Detection and Identification” was organized from 4<sup>th</sup> to 24<sup>th</sup>, April, 2017. The programme includes a sub module “Quarantine pathogens: Seed health testing methods and molecular diagnostic techniques” with duration of five days from 17<sup>th</sup> to 21<sup>st</sup>, April, 2017. The 21 days training was attended by 22 participants while five day module was attended by 17 participants from various States of the country.

The participants learnt about the concepts of quarantine, quarantine pests, regulated pests, economic impact of introduced pests in India, important insects of quarantine significance to India. They were also exposed to the looming threats to Agriculture, Horticulture, Plantation crops and Forest Trees, methods and protocols and online tools for identification of insect pests. The participants received hands-on experience in collection and preservation of insect & disease specimens, procedures to be followed for dispatching the specimens for identification to diagnostic centers and seed health testing methods.



### Pest Surveillance

Pest surveillance provides insights into the health status of a country's agriculture and strengthens preparedness for preventive actions both in addressing the problems due to domestic pests of serious concern as well as in protection of native agricultural biodiversity from the incursion threats of exotic pests. NIPHM organized 8 day duration programme on Pest Surveillance from 24<sup>th</sup> April to 1<sup>st</sup> May, 2017 and trained 18 participants representing Sikkim, Madhya Pradesh, Odisha, Assam, Maharashtra, Gujarat, Chhattisgarh, Tamil Nadu, Karnataka, Punjab and Kerala. The participants learnt tools required for surveillance of target pests and the procedures for establishment of Pest Free Areas to gain Market Access. The participants learnt about various lures and traps for carrying out fruit fly surveillance for monitoring as well as for area-wide control.

### Orientation for PSC Issuing Authority

An orientation programme for Phytosanitary Certificate Issuing Authorities was organized from 1<sup>st</sup> to 5<sup>th</sup> May, 2017 and fifteen officials from Gujarat State were trained. The participants learnt international regulations and obligations under IPPC to promote safe agricultural trade, the role and responsibilities of NPPO and PSC issuing authorities. They were also introduced to on-line PQIS software for inspection & sampling, testing for regulated pests of concern to importing countries, importing country's regulations. The importance of PFA/ALPP in export promotion and role of phytosanitary treatments for mitigating the pest risks as per the Standard Operating Procedures for Phytosanitary Certification were explained.



### Forced Hot Air Treatment

The wood packaging material is one of the most threatening pathways for incursion of timber pests across the globe. Forced Hot Air Treatment (FHAT) is one of the approved treatments for packaging material under ISPM -15. NIPHM is the only Institute in India to offer a specialized training programme on FHAT for industry stakeholders. A training programme was conducted from 15<sup>th</sup> to 19<sup>th</sup>, May, 2017 and 37 participants from the States of Gujarat, Maharashtra, Tamil Nadu, Haryana, Karnataka, Kerala, Telangana, Uttar Pradesh, Madhya Pradesh and New Delhi were trained. The topics covered included critical requirements for establishing FHAT facilities, calibration of sensors, placement of sensor, identification of coolest point, safety



## Capacity Building

precautions, conducting the treatments, use of appropriate mark and record keeping in accordance with ISPM – 15 and NSPM – 9. The participants also learnt the pests associated with wood packaging materials.

### Stored Grain Pest Management for FCI and CWC officials

An exclusive programme of 5 days duration was organized for officers of Food Corporation of India (FCI) and Central Warehousing Corporation (CWC) from 22<sup>nd</sup> to 25<sup>th</sup>, May, 2017. Sixteen participants from Kerala, Punjab, Maharashtra, Bihar, Karnataka, Rajasthan, Odisha, Telangana, Madhya Pradesh and Haryana States were trained. The participants learnt the importance of stored grain pest management in the context of national food security and global grain trade. The trainees also learnt methods of detection and identification of various stored grain insect pests by employing appropriate identification tools, use of pheromones and traps. The significance of Systems Approach in managing the food grains was explained. Participants gained practical experience in conducting phosphine fumigation as per NSPM-22.



### Plant Biosecurity and Incursion Management

Rapid globalization and advancements in transport, travel and tourism coupled with liberalization of trade pose increased risk of introduction of exotic and invasive pests into the country. Alien plant pests which gained entry into India are causing significant economic damage to agricultural production. The training programme on Plant Biosecurity and Incursion Management was organized from 5<sup>th</sup> to 26<sup>th</sup>, June, 2017 (21 Days). This training programme includes 2 sub modules viz., Fundamentals of Plant Biosecurity from 5<sup>th</sup> to 9<sup>th</sup> June, 17 (05 Days) and Pest Risk Analysis from 12<sup>th</sup> -16<sup>th</sup> June, 17 (05 Days). The programme enabled the participants to improve their skills in understanding and carrying out Pest Risk Analysis, emergency response in the event of new pest reports, use of Pest Risk Analysis to analyze the cost-effectiveness of eradication / containment programme, delimitation of infested area and identification of buffer zones and the

measures needed for initiating eradication. The participants also learnt basic detection and diagnostic skills to identify pests of concern to India. The 21 days programme was attended by 11 participants from the States of Madhya Pradesh, Telangana, Gujarat, Haryana and Tamil Nadu. One participant from Tamil Nadu attended the sub module Fundamentals of Plant Biosecurity.



### Pest Risk Analysis

A training programmes on 'Pest Risk Analysis' was conducted during 12<sup>th</sup> to 16<sup>th</sup> June, 2017. A total of twelve participants from the States of Madhya Pradesh, Kerala, Assam, Tamil Nadu and Andhra Pradesh were trained. The participants learnt the importance of International conventions and National regulations, SPS obligations for regulating the trade, based on pest risk analysis. The concept of risk and risk analysis, PRA process for assessing the likelihood of pests being associated with the pathway, transport and its direct and indirect impact in the event of pest establishment, spread and the risk management options to minimize such events were elaborated. The participants also learnt the importance of PRA for market access for new commodities in the international trade through mock exercises.



### Rodent Pest Management

NIPHM organized a five days refresher training on 'Rodent Pest Management' to state agriculture officers, agriculture extension functionaries from 5<sup>th</sup> to 09<sup>th</sup> June, 2017. A total 15 from states of Tamil Nadu, Andhra Pradesh, Telangana, Chhattisgarh, Himachal Pradesh, Haryana were attended the

## Capacity Building

training. Participants were trained in several basic concepts on rodent management with hands on practical related to eco-safe, nonchemical management based on village mapping, seasonal calendar, rodent breeding profile in agriculture and horticulture crops.



### Certificate Course on Urban Integrated Pest Management

NIPHM organized a 15-days certificate course on 'Urban Integrated Pest Management' to private Pest Control Operators from 03<sup>rd</sup> to 17<sup>th</sup> April, 2017 on consultancy basis. A total of 10 pest control operators participated in the training programme. Survey and Inspection procedures for developing pest management strategies were taught to the participants. Importance and thrust was given on pest management chemicals in households, their safe and judicious use. Integrated management of insects, rodents, birds and other pests in urban environs were taught to the trainees for better management of pest in urban environment.

### Integrated Soil Nutrient and Weed Management

A training programme on 'Integrated Soil Nutrient and Weed Management (ISNWM)' was organized from 05<sup>th</sup> to 11<sup>th</sup> April, 2017. Total 16 officers from different states participated in the programme and learned the concept of AESA, living soil, rhizosphere, ecological engineering, integrated nutrient and weed management strategies. They were also exposed to field exercise on identification of weeds, insect pests and diseases.



### Rhizosphere Engineering

A training programme on 'Rhizosphere Engineering' was organized from 08<sup>th</sup> to 12<sup>th</sup> April, 2017. Total 11 officers from J&K, Tamil Nadu, Assam, Himachal Pradesh and Telangana have participated in the training programme. Trainees were imparted knowledge and skills in improved practices and utilization of soil inoculants for Rhizosphere improvement, judicious use of agrochemicals, on farm production of bio-fertilizers and bio-pesticides, EPN etc.



### Training on "On-farm production of bio-control agents and microbial bio-pesticides to promote AESA based PHM in conjunction with ecological engineering for pest management" for the farmers of Tamil Nadu

Training programme was conducted for 30 farmers from Madurai District, Tamil Nadu. They were trained in On-farm production of Bio-control agents and Microbial Bio-pesticides to promote AESA based PHM in conjunction with Ecological Engineering for Pest Management from 18<sup>th</sup> to 20<sup>th</sup> April, 2017. Farmers were trained on various bio-intensive approaches in plant health management like AESA, EE, on-farm mass production techniques of bio-control agents and microbial bio-pesticides, vermicomposting, seed treatment with microbial bio-pesticides (bio-priming), fruit fly trap and lure preparation, rodent pest management, pesticide application techniques etc. These techniques can easily be adopted with minimal facilities at low cost at farmer's level.



### Good Agricultural practices

A training programme on 'Good Agricultural practices (GAP)' was organized from 24<sup>th</sup> to 28<sup>th</sup> April, 2017 in which total 20 officers from Kerala, Assam, J&K, Calicut, Odisha,

## Capacity Building

Telangana and A.P. have participated. The participants have undergone training on various aspects of GAP, Soil health, INM, IWM and IPM practices under GAP, handling, storage & transportation of agricultural produce etc. Participants were taken to field exposure visits to farmer's field practicing non-pesticide management of pests etc.



### Field Diagnosis and Management of Plant Parasitic Nematodes in Horticultural Crops

Plant parasitic nematodes (PPNs) are one of the most important pests which are difficult to manage in agri-horticultural crops. Changing climate and agricultural practices are leading to resurgence of nematode problems in newer crops and geographical localities. Due to the absence of any synthetic chemical nematicides, and inadequacy of the present management approaches, there is an urgent need to organize awareness training programme and develop environmentally viable, economical nematode management options using modern biological tools and techniques. Hence, a training programme is organized on "Field Diagnosis and Management of Plant Parasitic Nematodes in Horticultural Crops". In this training total 12 participants from Maharashtra state have participated. Participants were trained on theoretical and hands on training on a wide range of basic and applied topics related to plant parasitic nematodes and entomopathogenic nematodes, nematode management in poly-houses and open fields, detection and identification of Quarantine nematodes and their control measures. Field visits and poly house visits were conducted for diagnosis of nematode diseases. Participants were also trained on Use of Entomopathogenic nematodes as good bio control agents in Insect pest management.



### Training on "On-farm production of bio-control agents and microbial bio-pesticides to promote AESA based PHM in conjunction with ecological engineering for pest management" for the farmers of Maharashtra

Three days training programme was organized for farmers of Maharashtra State on 'On-farm production of bio-control agents and microbial bio-pesticides'. A total of 30 farmers were trained on the mass production techniques of predators and parasitoids (*Trichogramma* sp., *Bracon* sp., *Chelonus blackburnii*, reduviid bugs, coccinellids, *Chrysoperla* sp. etc.), bio-pesticides (*Trichoderma*, *Pseudomonas*, NPV, EPF, EPN etc.) and bio-fertilizers and were made aware of the new concepts of pest management i.e., AESA based PHM in conjunction with Ecological engineering for pest management in the training programme. They were also trained in vermicompost preparation, rodent pest management, fruit fly trap and lure preparation and pesticide application techniques.



### Refresher training programme to Agri-entrepreneurs in 'On farm production of Biocontrol agents and microbial biopesticides'

In collaboration with MANAGE, a Refresher Training Programme was conducted to Agri entrepreneurs for 4 days in "on farm production of biocontrol agents and Microbial bio-pesticides" from 15<sup>th</sup> to 18<sup>th</sup> May, 2017 to expand their agribusinesses and enter into new areas of entrepreneurship. In these training programmes, a total of 26 participants were given hands-on experience on mass production of various parasitoids (*Trichogramma*, *Brcon*, *Chelonus blackburnii* etc.), predators (reduviids, coccinellids, *Chrysoperla* etc.) and microbial bio-pesticides (*Trichoderma*, *Pseudomonas*) and bio-fertilizers. They were also trained on vermicompost preparation, seed treatment with microbial bio-pesticides (bio-priming), pesticide application techniques, rodent pest management, fruit fly trap and lure preparation. In addition they were taken to

## Capacity Building

exposure visits viz. bee keeping unit at NIRD and department of ornithology with an aim to promote bee keeping in Agriculture and management of non-insect pests of Agriculture crops.



### **NIPHM banner training programme on AESA & Ecological Engineering based IPM & allied subjects**

A special NIPHM's Banner Training Programme on AESA & Ecological engineering based IPM and allied subjects were conducted from 22<sup>nd</sup> to 26<sup>th</sup> May, 2017. A total of 16 participants from Andhra Pradesh, Punjab, Himachal Pradesh, Haryana, Assam, Jharkhand, Maharashtra, Karnataka and Gujarat were attended the training. The participants were trained on Ecological engineering, AESA and were given hands on training on on-farm mass production techniques of bio control agents and microbial pesticides. Classes were arranged on farmer's field school approach and group dynamics, Integrated Rodent Pest management. Case studies and success stories, Fruit fly lures and trap preparation, integrated nutrient management for sustainable agriculture, Computer applications for online resources for plant health management, Introduction to



Plant Quarantine, Residue analysis in food chain, Quality analysis of Bio-pesticides and Principles of Pesticide Application Techniques.

### **Production Protocol for Bio-control agents Microbial Bio-pesticides and Quality analysis of Microbial Bio-pesticides"**

A 21 days training programme on "Production protocol for biocontrol agents and quality analysis & quality management of microbial bio-pesticides" was conducted from 1<sup>st</sup> to 21<sup>st</sup> June, 2017 to create a pool of master trainers with enhanced skills in the area of production of superior BCAs and their quality management. Participants were trained in laboratory and on-farm production of biocontrol agents and microbial bio-pesticides viz. Trichoderma, Pseudomonas, and Trichogramma, Chelonus, Goniozus, Bracon, Reduviids, Coccinellids, Entomopathogenic Nematodes (EPN), Entomopathogenic Fungus (EPF's), Nuclear Polyhedrosis Viruses (NPV) and Vesicular Arbuscular Mycorrhiza (VAM). Additionally they were imparted hands-on training on the techniques & methods required for registration and quality management of microbial bio-pesticides. The trainees were also taken to various national and international institutes like Indian Institute of Oil seeds Research, Indian Institute of Rice Research, ICRISAT, State Bio-fertilizer unit and Commercial bio-production unit. A total of 38 participants from Maharashtra, Gujarat, Himachal Pradesh, West Bengal, Karnataka, Andhra Pradesh, Kerala, Telangana, Jammu & Kashmir, Uttar Pradesh and Madhya Pradesh were trained.



## Capacity Building

### Laboratory Quality System Management and Internal Audit as per ISO/IEC 17025-2005

This program was organized with an aim to provide knowledge in testing and calibration under General Requirements for the Competence of testing and calibration Laboratories as per ISO/IEC 17025:2005, during 03<sup>rd</sup> to 08<sup>th</sup> April, 2017 with 18 participants. It enables the laboratory personnel to effectively conduct Internal Audits and Management Reviews of the laboratory to assess compliance. This will help the laboratories to prepare in securing accreditation with NABL under ISO/IEC 17025.



### Pesticide Residue Analysis

This program was conducted during 17<sup>th</sup> April to 16<sup>th</sup> May, 2017 with 15 participants to build the capacity in Pesticide Residue Analysts working in various Pesticide Residue Testing Laboratories. The program covers basic requirements for setting up of pesticide residue analysis lab, classification of pesticides, purification of solvents and reagents, chromatography, sampling protocols for field samples, market samples, sample preparation, extraction, clean-up of the extracts and estimation besides confirmations using different analytical methods viz., Association of Official Analytical Chemists (AOAC International), QuEChERS, Environmental Protection agency (US-EPA), USA and Laboratory Developed Methods (in house methods), identification and quantification, theory



and practicals on preparation and storage of pesticide standard solutions and demonstration on handling various equipment like HPLC, LC-PDA, GC-ECD/NPD, GC-MS/MS, LC-MS/MS etc.

### Inspection, Sampling & Prosecution Procedures under Insecticide Act, 1968

This program aimed to focus on Insecticide Act, 1968 and Insecticide Rules, 1971 in building the capacity in Analysts and Insecticide Inspectors who involved in process of getting samples analyzed from Pesticide Testing Laboratories. Two programs were conducted during 17<sup>th</sup> to 22<sup>nd</sup> April, 2017 with 22 participants and 26-06-2017 to 01-07-2017 with 10 participants.



### Calibration of Glassware and Laboratory Equipment for Pesticide Formulation Analysis (PFA) Laboratories

To carry out analysis following standardized methods for calibration of various kinds of glassware using laboratory equipment in Analysts, this program was conducted during 20-27 April, 2017 with 10 participants. The participants were provided training in introduction to the laboratory organizing and management, calibration of electronic balance, pH meter, conductivity meter oven and water bath, calibration of glassware followed by practical sessions in handling equipments i.e. GC, HPLC, UV Vis Spectrophotometer, FTIR Spectrophotometer and trouble shooting.

### Refresher Programme on Analysis of New Molecules of Pesticide formulations

This program was conducted during 12<sup>th</sup> - 21<sup>st</sup> June, 2017 with 4 participants and the aim was to understand the techniques in analysis of newly introduced pesticide formulations and also to upgrade their analytical skills using modern Analytical Instruments. The trainees were learnt the concepts of theory as well as practical aspects on Spectroscopy, Chromatography, Instrumentation, maintenance and trouble-shooting etc.

## Capacity Building

### Quality Analysis and Quality Management of Microbial Biopesticides:

This program was conducted during 12<sup>th</sup> to 21<sup>st</sup> June, 2017 with 41 participants. The participants were trained in registered bio-pesticides under Insecticide Act, 1968, quality control parameters, requirements for establishment of microbial biopesticide lab, its NABL accreditation as per ISO 17025, preparation and maintenance of pure cultures of fungus and bacteria, identification of pathogenic contaminants, Media required for Microbial quality control, quality control parameters for Antagonistic fungi and bacteria and Entomopathogenic fungi, Bacillus thuringiensis-Bioassay and estimation of LC50 values-Probit analysis, spore count etc. followed by practical sessions.

### Training on Appropriate pesticide Application Techniques and Farm Level Storage Structures

Training on Appropriate pesticide Application Techniques and Farm Level Storage Structures was organized from 03<sup>rd</sup> to 10<sup>th</sup> April, 2017. The main purpose of training on pesticide application technique is to achieve maximum efficacy with minimum side effects on non-target organisms. The knowledge on farm level storage structures enhances the knowledge of farmers to safely store the produce and also to sell it when there is a better market price. In this programme, 24 participants from 8 states have participated. The participants gained knowledge on use of spraying techniques and farm level storage practices. Institutional visits to IGMRI and FCI, Cherlapally were also organized to show different storage structures, method of storage and construction specifications of godowns.



### Training on Safe and Judicious Use of Chemical Fertilizers and Chemical Pesticides

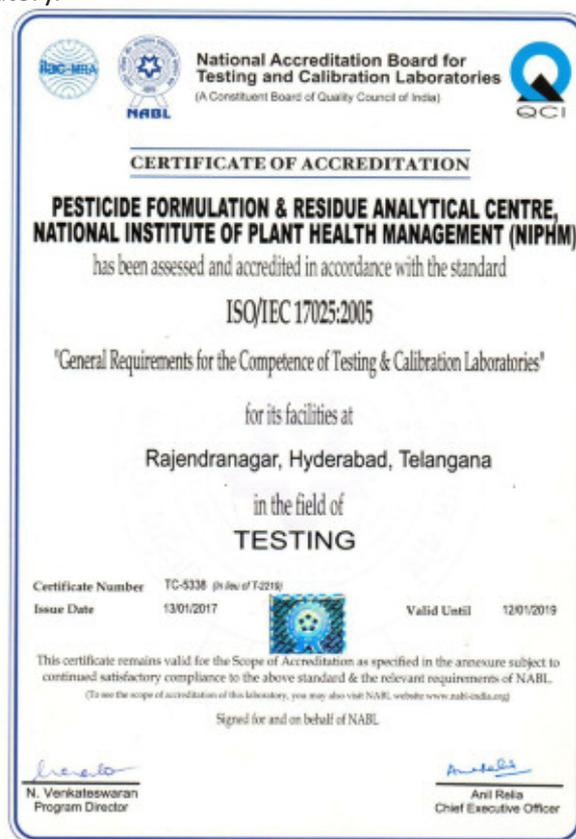
Training on Safe and Judicious Use of Chemical Fertilizers and Chemical Pesticides was organized from 20<sup>th</sup> to 27<sup>th</sup> June, 2017. This programme imparts knowledge and skill to use the chemicals safely and judiciously. Participants of the programme were trained on various aspects like selection of spraying techniques, dose requirements, pesticide formulation & their properties, quality control of pesticides, judicious use of rodenticides, safe use of

pesticides, precautions to be taken while spraying and storage of pesticides. Practical sessions were organized on application techniques, selection of suitable nozzles, calibration of the sprayers, and their operation. Total 14 participants from 8 states attended the training programme.



### Renewal of Pesticide Formulation and Residue Analytical Centre Accreditation

The Pesticide Formulation and Residue Analysis Laboratory, PMD is renewed Accreditation with NABL in the field of testing in accordance with the standard, ISO-17025:2005 under General requirements for the competence of testing and calibration laboratories in order to maintain the laboratory.



## Swachhta Pakhwada Celebrations at NIPHM (16-31 May 2017)

National Institute of Plant Health Management (NIPHM) has observed “Swachhta Pakhwada” from 16<sup>th</sup> to 31<sup>st</sup> May, 2017. The fortnight-long Programme was flagged off by Ms. G Jayalakshmi, IAS, Director General, NIPHM by administering of “Swachhta Pledge” to the officers and staff of the Institute on 16<sup>th</sup> May 2017 at 9.30 AM.



During the fortnight, various activities like Lectures, Awareness Programmes on different Waste Management Techniques/Procedures, Special drives for identification of old records/furniture machinery etc. and cleaning activities have been organized at NIPHM office, residential quarters and at two villages for the benefit of all the officers/staff of NIPHM and farmers.

During the first week of the Swachhta Pakwada (16<sup>th</sup> to 23<sup>rd</sup> May, 2017), NIPHM has organized three lectures on different topics like 'New initiatives on composting/ Organic Waste Management’, “Implementation of Paperless Office” and “Protocols for disposal of e-waste” delivered by experts/resource persons from ICRISAT and National Informatics Centre, Hyderabad. NIPHM has also conducted special cleaning drives across its campus, residential quarters and hostels and has cleaned up the entire premises.



During the second week of the Swachhta Pakwada (24<sup>th</sup> to 31<sup>st</sup> May, 2017), NIPHM has organized two Awareness programmes in two villages (1. Amdapur 2. Medipally, Moinabad Mandal, Telangana) on different topics like “Proper disposal of Insecticide Containers” & “Demonstration of farm equipment developed by NIPHM” and “Household pests & Rodent Management” for the benefit of farmers. NIPHM has also organized Awareness programme on “Kitchen, House hold Waste Management” for the benefit of residents of NIPHM Residential Quarters wherein Officials from Greater Hyderabad Municipal Corporation (GHMC) have demonstrated the methods of segregation, collection of biodegradable and non-biodegradable items. Further special drives were conducted for weeding of old records, equipment/machinery etc, apart from continuation of cleaning activities across its premises for the second week also. Plantation of trees in NIPHM campus, essay writing & painting

The Valedictory Programme on the fortnight long celebrations of Swachhta Pakhwda at NIPHM was organised on 31.05.2017 in which the Registrar, NIPHM thanked Ms. G Jayalakshmi, IAS, Director General, NIPHM for her keen interest for cleanliness, tremendous support & guidance extended due to which the programme was taken up as a mission with lot of enthusiasm & zeal by all the staff members and not treated as a routine activity.

Speaking on the occasion, Ms. G Jayalakshmi, IAS, Director General, NIPHM has urged to continue the spirit of cleanliness in the same way as done during the past fortnight and has appreciated the efforts of senior officers, registrar and other staff who coordinated with the resource persons and contributed for the success of all the events undertaken during this Swachhta Pakhwada.



### 3<sup>rd</sup> International Yoga Day Celebrations at NIPHM

International Day of Yoga was celebrated for the first time on 21-6-2016 at NIPHM. Since then, every day morning from 7.30 a.m. to 8.30 a.m. yoga sessions are being taken regularly. NIPHM staff members along with trainees attending trainings at NIPHM are participating in the sessions. There is a positive feedback and lot of appreciation has been received for it. This year also, National Institute of Plant Health Management (NIPHM) has celebrated the 3<sup>rd</sup> International Day of Yoga on 21-6-2017.

A one hour Yoga session was organised in the Institute's Sports and Recreation Centre. Ms. G. Jayalakshmi, IAS, Director General, NIPHM, Dr. Ch. Sreenivasa Rao, Director (PM), Dr. J. Alice R.P. Sujeetha, Director (PB), Dr. Om Prakash Sharma, JD (A&AM), Ms. D. Chanchala Devi, Registrar and other staff members, trainees participated in the Yoga session.

Director General, NIPHM speaking on the occasion has explained about the importance of 'Yoga' in our daily life and expressed her opinion that all employees will become physical fit by practicing yoga daily and they shall sustain this practice on a daily basis. All the participants have actively practiced yoga `asanas` demonstrated by the yoga instructor.

Director General, NIPHM speaking on the occasion has explained about the importance of 'Yoga' in our daily life and expressed her opinion that all employees will become physical fit by practicing yoga daily and they shall sustain this practice on a daily basis.



All the participants have actively practiced yoga `asanas` demonstrated by the yoga instructor.



Fire Mock Drill was organised at NIPHM on 16.06.2017 to create the awareness among the staff



Welcome to NIPHM

Dr. J. Alice R. P. Sujeetha, Professor & Head, Indian Institute of Food Processing Technology, Thanjavur, Tamil Nadu joined as a Director, Plant Biosecurity Division, National Institute of Plant Health Management (NIPHM), Rajendra Nagar on 21<sup>st</sup> April, 2017.



### राजभाषा कार्यान्वयन समिति की प्रथम बैठक एवं हिंदी कार्यशाला आयोजित

राजभाषा कार्यान्वयन समिति (राकास) की प्रथम बैठक वर्ष 2017-18 हेतु दिनांक 30-06-2017 को श्रीमती जी.जयालक्ष्मी, भा.प्र.से., महानिदेशक, एनआईपीएचएम की अध्यक्षता में हुई। बैठक में महानिदेशक के समक्ष जनवरी-मार्च, २०१७ की तिमाही हिंदी प्रगति रिपोर्ट प्रस्तुत किया गया। उन्होंने उक्त रिपोर्ट की समीक्षा करते हुए संस्थान में राजभाषा अधिनियम की धारा 3(3) के पूर्णतः अनुपालन किये जाने के निदेश दिये। बैठक में सूचित किया गया कि ट्राइकोग्रमा विडियो का हिंदी अनुवाद कर दिया गया है। इस संबंध में, उन्होंने इस विडियो को एनआईपीएचएम वेबसाइट पर अपलोड करने के निदेश दिये।

महानिदेशक ने निदेश दिये कि किसानों से संबंधित अन्य प्रौद्योगिकी वीडियो एवं आईपीएम पैकेज के चावल एवं गेहू का हिन्दी में अनुवाद किया जाए। उन्होंने निदेश दिया कि संस्थान के प्रत्येक कर्मचारियों एवं अधिकारियों को पत्रों एवं फाइलों पर अपना हस्ताक्षर हिंदी में करना चाहिए, जिससे की संस्थान के कार्यालयीन कामकाज में राजभाषा हिंदी को बढ़ावा दिया जा सके। बैठक में सूचित किया गया कि लगभग 100 से अधिक शब्दों/वाक्यों की सूची तैयार कर संस्थान के कर्मचारियों में परिचालित कर दिया गया है, जिसका इस्तेमाल वे सरकारी कामकाज में कर सके। पादप जैवसुरक्षा प्रभाग के प्रशिक्षण मैनुअल 'पादपस्वच्छता' एवं पीडकनाशी प्रबंधन प्रभाग के प्रशिक्षण मैनुअल कीटनाशक अधिनियम 1968 एवं नियमावली 1971 संबंधी प्रवर्तन (ENFORCEMENT) का हिंदी में अनुवाद कर दिया गया है। महानिदेशक ने निदेश दिया कि संस्थान के वार्षिक प्रशिक्षण कैलेंडर 2017-2018 का हिन्दी में अनुवाद किया जाए।

इस संस्थान में दिनांक 02-05-2017 से 30-05-2017 तक कर्मचारियों एवं अधिकारियों के लिए 20 कार्यदिवसीय पारंगत प्रशिक्षण पाठ्यक्रम का सफलतापूर्वक आयोजन किया गया। इस प्रशिक्षण पाठ्यक्रम के वक्ता श्री जयशंकर प्रसाद तिवारी, सहायक निदेशक (राजभाषा), केन्द्रीय हिन्दी प्रशिक्षण उप संस्थान, हैदराबाद ने पारंगत प्रशिक्षण प्रदान करते हुए राजभाषा हिन्दी के नीति, नियम एवं यूनिकोड के इस्तेमाल के बारे में विस्तारपूर्वक जानकारी दीं।

### Book Post

To,

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