PROCEEDINGS OF THE MONTHLY RESEARCH SEMINAR ON "PHEROMONES IN INTEGRATED PEST MANAGEMENT AND ITS APPLICATION IN FIELD CONDITIONS" HELD AT HIMALAYAN FOREST RESEARCH INSTITUTE, SHIMLA ON 26.102018

Himalayan Forest Research Institute (HFRI), Shimla organised the monthly seminar on "Pheromones in Integrated Pest Management and its Application in Field Conditions"on 26th October, 2018. At the outset, Dr. Ranjeet Singh, Group Coordinator Research welcomed the Director, HFRI; Prof. (Retd.) S.P. Bhardwaj; Dr. Sushma Bhardwaj, Entomologist; Head of Office, all Head of the Divisions, Officers, Scientists and Research staff and research scholars from Himachal Pradesh University, Shimla and apprised about the importance of the Pest Management in Forestry.

Dr. V.P. Tewari, Director, HFRI while introducing the concept of Forest Pest Management to the participants, said that the use of chemicals has been the principal method of pest control practiced by the farmers and field practitioners to minimize the damage to plants in agricultural ecosystem or agroforestry, nurseries and plantations. He told that the ability of pesticides to control pest is undeniable, but irrational and overuse of these pest control chemicals has led to several pesticides related problems such as mortality of parasites, predators & pollinators, environmental pollution, toxic residues in crops, quality of life, biomagnifications and disruption of ecological balance and this situation has created a crisis and there arises an urgent need to develop more environmental safe methods for pest management based on sound ecological principles. He asked Dr. Ranjeet Singh, Scientist-G and Head, Forest protection Division to make his presentation on the topic titled **"Pheromones in Integrated Pest Management and its application in field conditions"** and advised the participants to interact freely on the subject and give their views for the advancement of science in the field of pest management.

Dr. Ranjeet Singh presented an overview of topic given for the seminar and said that advances in biological sciences have opened up new vistas in pest management technology. Insects use many different chemicals for communication among themselves and these are called semiochemicals or infochemicals or Pheromones. The uses of such chemicals to attract the insects to particular lures,

attractant baited and unbaited traps and thereby reduce pest status to the tolerable level. Because these chemicals are use in ways that do not harm other organisms or humans or result in contamination of food chain, they can be used in an environmentally sound manner in pest management programs. More than 1000 pheromone indentified globally, nearly 200 pheromones are available for indirect pest control and about 20 pheromones have been registered for direct control of the insect pests. The pheromones of more than 20 insect pests have been fully optimized in India.

Prof. S.P. Bhardwaj (Retd.) appraised the researchers that the earliest methods to control the insect pests was the use of the synthetic chemicals and dependence on pesticides has increased substantially after the advent of green revolution in India to sustain the food production. The Unrealistic and injudicious use of synthetic pesticides for the pest several years has led to the outbreak of many insects and non insect pests and environmental degradation**.** Soon after, there has been a realization on the importance of non chemical approach for managing the pest. One of the best approach is the application of pheromones which interfere with the communication between the organisms. He also highlighted the importance of the topic and gave a brief overview about the research works carried out by UHF, Nauni on Pheromones.

Dr. Sushma Bhardwaj informed that the Pheromones are not only highly biodegradable and biologicllay active, but also show a high degree of species specificity. Owing to their high specificity and high potency, they are also well suited for monitoring of pest population.

Dr. Ranjeet Singh also explained in detail about the work undertaken at HFRI on the field applicability of aggregating pheromone as an eco-friendly component for the management of *Ips longifolia* , a polyphagous pest of coniferous forest. Ipsdienol ((*s*)-2-methyl-6mehtyleneocta-2,7-dien-4-0l) with Four types of pheromones traps viz. Fero-T™ ; Del-Ta™ ; Wot- T™ and Fligh-T™ and 4 level of dozes were evaluated in field. A pheromone dose of 4 mg / dispenser (rubber) in Fero-T™ was found to be optimum to attract significantly greater number of beetles. The research works undertaken by other organizations like Forest Research Institute, Dehradun, Tropical Forest Research institute, Jabalpur and Kerala forest Research Institute, Peechi on screening of Synthetic Pheromone, against teak borer (*Cossus cadambae*) and Teak defoliator (*Hyblaea purea)* and Investigation on isolation of kairomones to control, *Hoplocerambyx spinocornis* incidence on sal were also highlighted.

Outcome of the seminar:

Research needs Identified: During the discussion, Thrust Area of Research for the advancement of Pheromones application was identified as follows:

- Insect sex pheromones & production of pheromones traps
- Isolation & synthesis of pheromones
- Control release formulations
- Dispenser production
- Field application and evaluation of pheromones

While explaining the **formulation of road map on Pest management**, Dr. Ranjeet Singh advocated that it involve the following 5 components;

1. **Decision Process**:
   Integrated Pest Management (IPM) is a science-based, decision-making process that identifies and reduces risks from pests and pest management related strategies.
2. **Dynamic System**:
   Pest Management (PM) is a dynamic method that evolves over time, being periodically updated as the science and strategy of PM evolves, with continuous input from numerous PM experts, practitioners, and stakeholders.
3. **Best Practices**:
   PM practitioners must strive to implement best management practices, using tools and strategies that work in concert with each other to achieve the desired outcome while posing the least risks.
4. **Information exchange**:
   The goal is to increase nationwide communication and efficiency in PM practices through information exchanges among various stake holders
5. **Human health**:
   To improve the economic benefits of adopting IPM practices and to reduce risks to human health and the environment.

Networking of Research Options identified:

While dwelling on the networking issue, Dr. Ranjeet Singh emphasized that there must be a networking at national and global level by involving different Institutes to undertake research work by pooling their resources. Some of the organizations identified for the networking are as follows:

- Indian Institute of Chemical Technology (CSIR), Hyderabad
- Indian Council of Forestry Research & Education, Dehra Dun
- National Centre for Integrated Pest Management (ICAR), New Delhi
- Pest Control of India (Private Ltd.)
- State Forest Research Institute
- Natural Resources Institute (NRI) , United Kingdom

At the end, Dr. Singh said that Use of Pheromones in IPM is potential option, which can be explored and utilized to minimize the pesticide load on the precious earth and to save the ecosystem and their valuable services providing to human beings.

The programme ended with the vote of thanks by the Group Coordinator Research, HFRI, Shimla to the Chair and all other participants presented in the seminar.

Glimpses of the Seminar

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