NCIPM

At a Glance

National Centre for Integrated Pest Management
(Indian Council of Agricultural Research)
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Integrated Pest Management (IPM) is a system approach that combines a wide array of crop production and protection practices to minimize the economic losses caused by the pests (insect pests, diseases, nematodes, weeds, rodents, birds etc.). It emphasizes on careful monitoring of pests and conservation of their natural enemies. ICAR established the National Centre for Integrated Pest Management (NCIPM) in February 1988 to cater to the emerging plant protection needs of agriculture in the country. The activities of NCIPM extend across and beyond different disciplines and agencies to establish partnerships with SAU’s, Government agencies, industries, NGO’s and farmers. Through their partnerships, NCIPM plans and conducts eco-friendly IPM research and development programmes, essentially required for sustainable agriculture.

NCIPM has made significant progress in achieving the goals of IPM and is now making essential and pragmatic efforts to develop computer based programmes for storage and retrieval of information on different aspects of IPM. Programmes have been developed for a number of crops for promoting environmentally sound IPM technologies. The Centre is striving for effective co-operation with All India Coordinated Crop Improvement Programmes; Crop Research Institutes; SAUs; DST, Environment and Biotechnology Depts of GOI; National Remote Sensing Agency; IMD; NIC and DPPQ&S; NGO’s and industries for implementation of its programmes.

**Mandate**

- To develop and promote integrated pest management (IPM) technologies for major crop pests so as to sustain higher crop yields with minimum ecological implications.
- To develop information base on all aspects of pest management and to advise on related national priorities and pest management policies.
- To establish linkages and collaborative programme with other national and international institutes in the area of IPM.
- To extend technical consultancies.

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*Prof America Singh, Director; Principal Scientist (Drn. M.D. Jewani, O.M. Bambawale, D.K. Garg, Mrs. Saroj Singh, G.L. Nigma, T.P.*
ONGOING PROGRAMMES

Development of area specific IPM modules & technologies for the major production systems of different agro-ecological zones

- Validation of Cotton IPM modules for different agro ecological regions
- Integrated Pest management at village level to produce cost effective, quality fiber (TMC)
- Validation and popularization of location specific IPM modules in Rice ecosystem
- Formulation and validation of location specific IPM packages in Pulses (Chickpea and Pigeon pea)
- Development and validation of adaptable IPM in selected Vegetable crops
- Development and validation of IPM strategies in protected cultivation of selected Vegetables
- Commercialization of bioagent mass-production technologies in intensive Cotton districts
- Pragmatic approach for the promotion of biological control of insect pests in IPM
- Utilization and promotion of microbials in the management of key insect pests and diseases of crop plants
- Development and validation of IPM technology for Mustard and Groundnut
- Validation of IPM strategies for organically grown crops

Development of databases on major pests and electronic networking

- Development of Pest Management Information System (PMIS) on important crops
- Exploration, documentation and mapping of ITKs in pest management in Rice Based Cropping System in Central High land and Eastern Plateau

Development of models for forewarning and forecasting of pests of national importance

- Monitoring, forecasting and geographical distribution maps of pests of major crops

Socio economic issues and impact analysis of IPM technology

- Promotion of IPM through farmers’ participatory approach in vegetable based cropping system
- Studies on adoption and socio-economic evaluation of IPM in rainfed cotton
- Pesticide use and sustainability of agriculture: Emerging issues and policy options
- Study of socio-economic aspects and impact assessment of IPM technology in rice, cotton & selected oilseed crops
- Socio-economic impact of IPM technology in Chickpea.

"Adoption of IPM technologies to reduce the cost of production, environmental and public health hazards due to excessive reliance on chemical pesticides"
Establishment of IPM Information Bank
- Preparation of IPM exhibits
- Preparation, organisation & updation of user-friendly softwares, information kiosks, videos on IPM and online facility for accessing IPM related information.

Human Resource Development in IPM (week to month long training programmes)
- National Training on IPM in important field crops
- Mass Production Technology of Biocontrol agents
- International training programme on IPM
- Crop specific IPM trainings

SIGNIFICANT ACHIEVEMENTS

Validated IPM Modules in Farmers’ Participatory Mode
- Rainfed Cotton
- Basmati Rice
- Chickpea, Pigeonpea
- Mustard, Groundnut
- Tomato, Cabbage, Brinjal & Okra
- Apple & Mango

(for details of modules please visit us at www.ncipm.org.in)

Experiences of NCIPM based on farmers’ participatory field trials in 10 crops at many locations
- Cost of Plant Protection reduced (1.8 to 77%)
- Use of chemical pesticides reduced (23 to 94.4%)
- Productivity increased (18.8% to 126.8%)
- Economic gains to farmers increased (4.6 to 699%)
- Biodiversity increased (Increase in natural enemy population)
- IPM acceptable to farmers (about 70% farmers of Shikohpur & Ashta continue to adopt IPM)

Projected Tangible Impact of IPM adoption at National Level in Basmati Rice (Pusa Basmati-1):

<table>
<thead>
<tr>
<th>Estimated area under rice variety Pusa Basmati-1</th>
<th>0.6 m ha</th>
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<tbody>
<tr>
<td>Cost of validated IPM tactics* (including cost of all inputs) (Rs. 19994/ha)</td>
<td>Rs. 1199 Crores</td>
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<tr>
<td>Cost of Farmers’ Practice (non-IPM) (Rs. 23085/ha)</td>
<td>Rs. 1385 Crores</td>
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<tr>
<td>Net Returns in IPM (Rs. 35,569/ha)</td>
<td>Rs. 2134 Crores</td>
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<tr>
<td>Net returns in Farmers’ Practice (non-IPM) (Rs. 22,628/ha)</td>
<td>Rs. 1358 Crores</td>
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<tr>
<td>Projected net returns due to IPM adoption in the entire area (Over non-IPM)</td>
<td>Rs. 704 Crores</td>
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Based on mean data for 2000-2002
Pest Forewarning and Distribution Maps
A thumb rule was developed to predict the *H. armigera* attack in Deccan region. The rule has been field validated using historical data for this region and used for forewarning pest outbreaks. Forecasting models were also developed for potato aphids (*Myzus persicae*) at Pantnagar (Uttaranchal), Deesa (Gujarat) and Kalyani (W.B.), which predicts aphid population at least two weeks in advance.

Geographical pest distribution maps of Rice and Cotton have been developed using Geographic Information Systems (GIS) identifying the hotspots of key pests.

Development of Softwares and Databases
In the process of preparing databases on various aspects of plant protection in the country, NCIPM has also developed pest decision-making soft wares. Some of the softwares developed by NCIPM are as follows:

- Pest Management Information System – a Generic Software for Basmati Rice & Mustard
- **Pesticide Advisor-Version 2005.1.0**
- Online databases at NCIPM website (www.ncipm.org.in)
- Data on Area, Production and Productivity of important crops in India, Pesticides use
- Data on Fertilizer use and pattern in India
- Plant Protection Recommendations for different crops in India
- Biopesticides Registered for use in the Country
- List of Banned Pesticides in India
- List of Restricted Pesticides in India
- List of Restricted plantspecies covered under New Seed Policy (1989)
- List of Prohibited /Restricted plant species (Scheduled-II of PFS Order, 1989)
- Important NationalPests
- Integrated Pest Management Package of practices for different crops
- Database of Pest Resistance in India
- Information base for *Helicoverpa armigera*

**Action Domains**

- Formulate and Implement a National IPM Policy: (Targets, Mechanisms, Supports, Labeling of IPM Products and Provisions for Premium Price, Production and Marketing of Biopesticides, Phasing out hazardous chemicals etc.)
- Develop and operationalize the **Roadmap for IPM Movement** in the country (IPM R&D, Education, Popularization etc.)
Facilities Available
The Centre has well-established computer cell with latest computer hardware and software to cater to the need for scientific work. All the computers in the Centre are interlinked with LAN as well as with IARI hub. The centre has prepared and launched its homepage with online databases (http://www.ncipm.org.in). Online database on Area, Production, Productivity of various crops, Fertilizer and Pesticide Consumption were developed as a part of NCIPM homepage.

The information provided in the website is regularly being updated. A fully developed Geographic Information System (GIS) lab has been created with digitizer, plotter and necessary accessories and is being used to create pest distribution maps. The computer cell is engaged in development of user-friendly pest decision-making software to popularize and promote IPM on country level.

NCIPM Library
The library of the Centre now has 1683 books and regularly subscribes about 2 International and 30 National journals on IPM and plant protection. The library is unique as it has the latest publications in the field of plant protection. The library is being managed by a computer software developed by the centre. CD-ROM of CABI and AGRICOLA are also available for reference in library. Seventeen bulletins, folders, and pictorial guides in English, Hindi, Punjabi and Marathi were published by the centre.

Diagnostic Laboratory
The diagnostic lab of the Centre is engaged in pragmatic approach for production of bio-agents (Trichogramma chilonis, T japonicum and Chrysoperla carnea). It is substantially able to meet the requirement of bioagents needed for the IPM validation programmes of the Centre. Further to it, training programmes are being conducted to encourage entrepreneurs to come forward for making bioagents available locally to the farmers. This will help in removing one of the bottlenecks of timely and local availability of quality bio-agents.