

ICT BASED PEST SURVEILLANCE & ADVISORY SYSTEM: A PATH BREAKING INITIATIVE

"Pest surveillance is the cornerstone for pest management through which epidemic situations can be avoided by detecting damage prior to establishment at a higher pest population."

Integrated pest management (IPM) has many components of crop protection. Levels of IPM could be for a given crop or for a cropping and production system. However, based on the status of harmful organisms (be it insect-pests, pathogens, nematodes, weeds, mites and rodents) that need a continuous watch kept over them. Realizing the scope of ICT in plant protection with multi-fold possibilities of centralization and decentralization, considering the roles and responsibilities of the stakeholders involved, the ICAR-National Research Centre for Integrated Pest Management (NCIPM) with its mandate of eliciting national pest scenario across crops vis-à-vis dissemination of IPM practices to the growers revolutionized the ICT-driven pest surveillance and incorporated into various programmes operational across India.

Why ICT for pest surveillance?

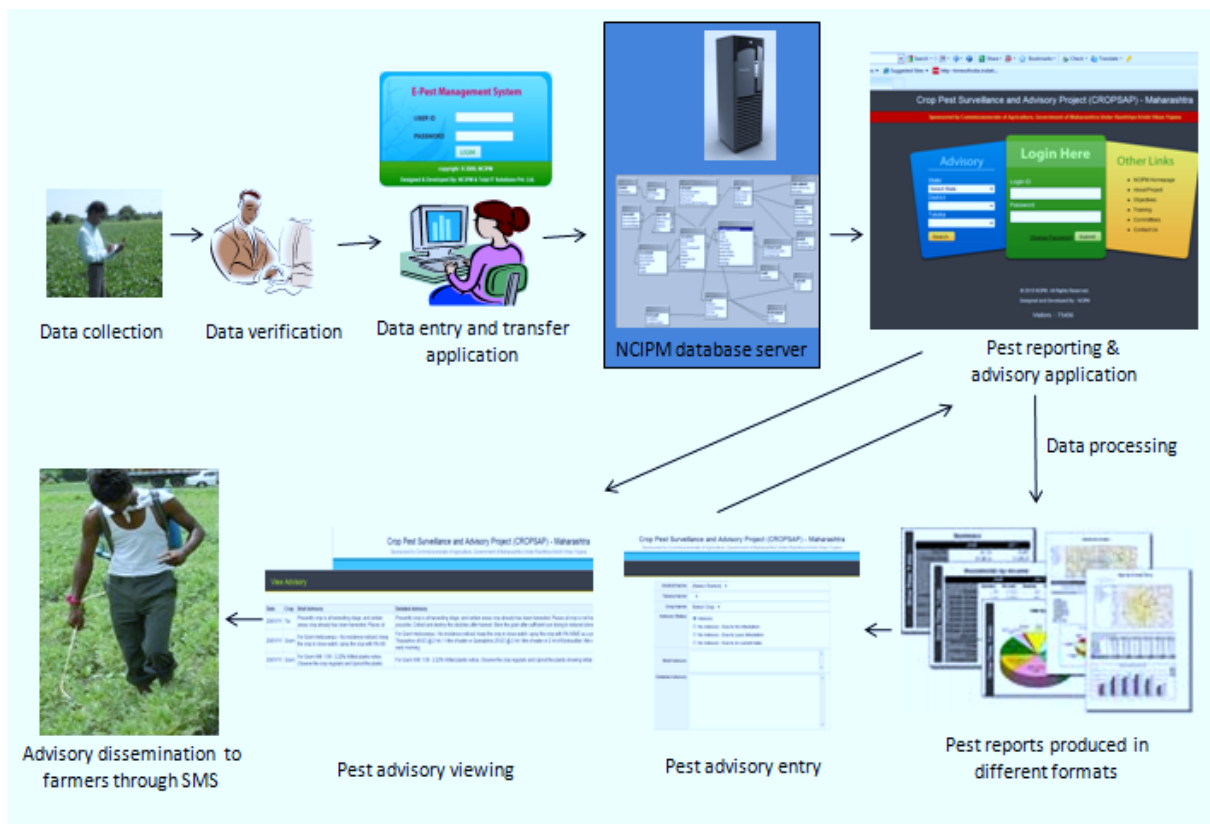
The ICT allows quick transfer of information. Its ready access and the knowledge base assist the plant protection workers in advising farmers appropriately so as to save the crop from pest damage and economic losses by judicious use of timely intervention and relevant pest management inputs. So to automate the process of pest monitoring and issuing timely advisories to the farmers, ICAR-NCIPM developed an ICT based pest surveillance and advisory system, also referred as e-pest surveillance and advisory system which was implemented in different states selected under various institute programmes for effective and regular pest monitoring in Soybean, Cotton, rice, pulses, vegetables and fruits by integrating the potential technical and administrative stakeholders of State and Central machinery involved in plant protection. Benefits of ICT based pest surveillance system as follows:

- Scientific surveillance of pest and diseases as a regular activity on large scale redefined lab to land concept in interactive mode.

- Regular surveys helped in early identification and detection of pest & disease to combat them.
- Location specific and timely advisories based on scientific observations sent to the farmers through SMS, helped in judicious use of Biological and chemical pesticides.
- By understanding the ETL concept farmers started adopting appropriate plant protection measures instead of calendar based spraying.
- Increased awareness among farmers and field functionaries about pest surveillance helped to keep the pest population below ETL level.

Structure of ICT based pest surveillance and advisory System

The structure of the system was designed as three-tier architecture based that consists of three components: data capture application; online pest reporting and advisory application; a centralised database. System was developed using SQL 2008, ASP.net, Android Studio and XML technologies.



ICT-based pest surveillance programmes

ICT-based pest surveillance and advisory system has been successfully implemented in the following programmes in various states of the country since 2009.

- Crop Pest Surveillance and Advisory Project (CROPSAP) - Maharashtra
- Horticulture Pest Surveillance and Advisory Project (HORTISAP) - Maharashtra
- National Information System for Pest Management (NISPM) in Bt Cotton
- Implementation of ICT based Pest Surveillance in Malawi under TAP Africa
- Increasing Chickpea and Pigeonpea Production through Intensive Application of IPM (NFSM)
- National Initiative on Climate Resilient Agriculture (NICRA)
- ICT based Pest Surveillance and Management through Advisory System for Rice in Tripura (NEH)
- ICT based Surveillance and Advisory Services for Selected Hort. Crops in Haryana



CROPSAP-Maharashtra at a glance

Severe pest attack on soybean during 2008-09 in Marathwada and Vidarbha regions of Maharashtra, and the reasons for the outbreak implicating the lack of scientific and systematic pest monitoring and management led to the innovative use of ICT in the field of plant protection for implementation of IPM on an area-wide basis in India. It was strongly felt that pre-emptive actions are a must for averting pest outbreaks given the changing pest scenario associated with diversifying cropping systems, cultivation practices and the felt effects of high variability in seasonal weather. Considering the increased area under soybean on equivalent scale with cotton at Maharashtra, and the common pest status of *Spodoptera litura* on cotton as well as soybean, the program was initiated for both the crops followed by inclusion of pigeonpea and the *Rabi* crop of chickpea since 2009. Rice grown as *Kharif* crop was also included under

the surveillance crop-based pest management advisory from 2011. Creation of awareness among farmers of Maharashtra across all target crops under pest surveillance was continuously aimed vis-à-vis issuing of real time pest management advisories through tools of ICT. The Department of Agriculture (DA), Maharashtra is the CROPSAP implementation authority with the funding through Rashtriya Krishi Vikas Yojana (RKVY) by Central Government till 2012 followed by Government of Maharashtra from 2013 till date.

Objectives

- Implementation ICT-based pest surveillance and advisory
- Awareness creation among farmers on IPM
- Integrated pest management by issuing appropriate advisories and ensuring timely availability of critical inputs

Stakeholders

- Commissionerate of Agriculture, Pune
- ICAR-National Research Centre for Integrated Pest Management New Delhi
- ICAR- Central Institute of Cotton Research, Nagpur
- ICAR-Central Research Institute for Dryland Agriculture, Hyderabad
- ICAR-Indian Institute of Soybean Research, Indore
- ICAR-Central Rice Research Institute, Cuttack
- Mahatma Phule Krishi Vidyapeeth, Rahuri
- Dr. Balasaheb Sawant Konkan Krishi Vidyapeeth, Dapoli
- Dr. Panjabrao Deshmukh Krishi Vidyapeeth, Akola
- Vasantnao Naik Marathwada Krishi Vidyapeeth, Parabhani

Area of operation

30,000 villages from 28 Districts of Maharashtra

Target crops

Soybean, Cotton, Pigeonpea, Chickpea, Rice

Prime Minister's Award for Excellence in Public Administration 2012-13

Crop Pest Surveillance and Advisory Project (CROPSAP), Maharashtra was awarded 'Prime Minister's Award for Excellence in Public Administration' for the year 2012-13.



E-Governance Gold Medal

Crop Pest Surveillance and Advisory Project (CROPSAP), Maharashtra was also given National e-Governance awards-2012: Gold medal for exemplary use of ICT-based solutions, at the 15th National



Conference on e-Governance held during 9-10 Feb 2012 at Bhubaneswar, Odisha.

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