Pest Surveillance for protection against crop pests: Maharashtra reaps good harvest of soybeans and cotton besting pests

Background and Objectives

Pests can suck your crops if you are not vigilant and cause losses running into millions. However, if you are vigilant, you can best the pests, save your crops and harvest excellent yields.

Agriculture in Maharashtra is predominantly rain-fed (83%). Cotton and Soybean are the two major Kharif crops covering as much as 62 lakh hectares. Soybeans farmers of Maharashtra have been devastated many times in the past by outbreak of caterpillar pests (Spodoptera Litura, Helicoverpa Armigera and other leaf eating pests). There was a severe caterpillar pest attack on soybean crop in Marathwada and Vidarbha regions of the State during 2008-09. Crops over an area of 14.64 lakh hectares were infested by these lethal pests with level of infestation exceeding 50% in as large an area as 10.44 lakh hectares. Estimated losses due to this pest attack were as high as Rs. 1400 Crores. Such a huge loss resulted in a national outcry. A team of experts, tasked to study this disaster, found out that lack of information about pest appearance and consequential absence of early warning system coupled with

paucity of manpower to tackle pest management were responsible for the losses and recommended institutionalization of a pest surveillance system to take care of the same.

Learning from the disaster of 2008-09, Crop Pest Surveillance and Advisory Project (CROPSAP) was designed for all cotton-soybean growing districts of the State. CROPSAP project included:

- Developing and adopting a scientific approach to pest surveillance, monitoring the pests continuously and putting in place an early warning system of pest outbreaks.
- Building an on-line Pest Monitoring System for major pests of soybean and cotton (Tur and Gram crops were also identified for monitoring later).
- Building an institutional arrangement of visits by trained pest scouts for locating emergence of pests at very early stage, working with the farmers of the area.
- Creating awareness among the farmers about Integrated Crop Management (ICM) practices more specially IPM in soybean and cotton crops.
- Guiding the farmers for management of major pests through appropriate advisories.

Intervention

CROPSAP, conceived by the Department of Agriculture, Government of Maharashtra, is under implementation in the State since 2009-10 and the project is being implemented through funding from RKVY. The project funds gathering of data about emergence of pests by undertaking scientific surveillance of crop pests and diseases and issuing real time advisories to farmers for taking appropriate pest management strategies.

A Steering Committee headed by the Commissioner of Agriculture is responsible for coordination and monitoring of the project implementation. Work relating to field surveillance is being undertaken through a team of Pest Scouts and Pest

Monitors and on line management of data for watching pest situation and issuing appropriate advisories through a team of Data Entry Operators.

Pest scouts collect data on pest/disease incidence from a mix of fixed and random plots in selected representative villages every week. Each Pest Scout collects data from 8 villages (covering approximately 12000 ha) by recording data from 4 plots (2 fixed plots and 2 random plots) on Mondays, Tuesdays, Thursdays and Fridays. The observations recorded on data sheets are passed on to Pest Monitors who get this data transmitted to the computer system with the help of the Data Entry Operators.

Pest Monitors also conduct surprise checks and random compilation of data collected by the scouts under their control (10 scouts per Monitor). Data recorded on Mondays and Tuesdays are transmitted to the system on Wednesdays and that collected on Thursdays and Fridays are fed on Saturdays. The data is analysed on real time basis and necessary advisories are transmitted on Thursdays and Mondays. While the pest data could be viewed/ updated by user Department, the advisories, issued based on the data analyzed, is available for all to see on the webpage. Software developed for this purpose has advance features of reporting systems- current, temporal and temporal cum spatial pest scenarios and location of hotspots through GIS maps generated for any point of time.

Taluka level advisories are transmitted by the system through SMS text messages from Sub-Divisional Agriculture Officer to the mobile numbers of the registered farmers of concerned Taluka. Copies of the advisories are also prominently exhibited in village Panchayat offices in the form of Jumbo Xerox on notice board and used by the field staff of the Agriculture Department for dissemination.

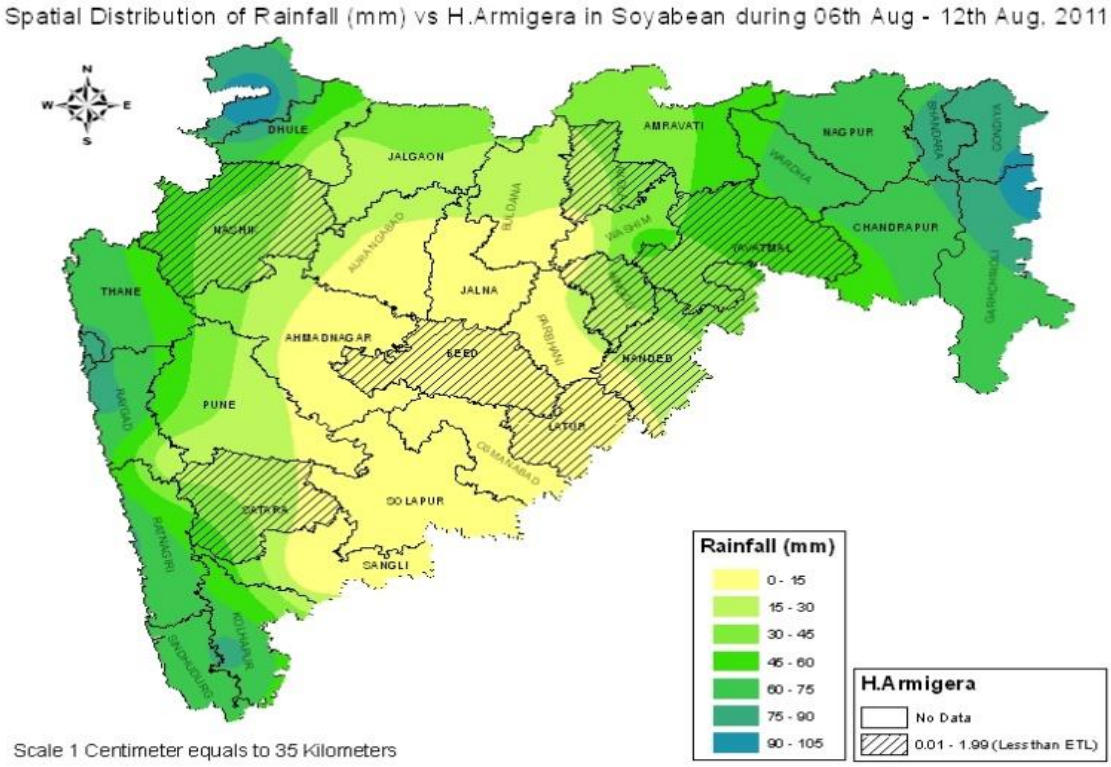
The process involves regular (weekly) monitoring of standing crops for selected major pests/ diseases and direct feeding of the data generated for expert analysis at National Centre of Integrated Pest Management (NCIPM). The results of this analysis are also passed on to farmers and other stakeholders in the form of advisories on real time basis using mobile/ internet connectivity for taking appropriate remedial measures.

Scope of the scheme was subsequently expanded to four crops which are more prone to pest attacks viz. Cotton, Soybean, Pigeon pea and Chick pea in 2010-11 and 29 of the 33 districts of the State were covered (30000 villages). During 2010-11, the scheme covered a total cropped area of 92.67 lakh hectares, 25.95 lakh ha of soya bean, 39.51 lakh ha of cotton, 13.70 lakh ha of pigeon pea and 13.32 lakh ha of chickpea.

The entire cost of CROPSAP is incurred under RKVY and an amount of Rs 43.05 Crores has been incurred for taking up this scheme in the State until December 2011. Central Research Institute for Dry-land Agriculture (CRIDA), Hyderabad correlates weather parameters with pest infestations reported for understanding and analysing the effect of weather parameters with pest population dynamics on GIS maps. Long term data collected through the project will

help in developing pest forecasting models of major crop pests in Maharashtra.

CORRELATING WEATHER PARAMETERS WITH PEST DYNAMICS



Mapping of H. Armigera infestation with Rainfall.

Outcome

During the first season of project implementation, as many as 13517 advisories were issued and 31.93 lakh SMSs were sent to the farmers, while during 2010-11, 55,602 advisories were issued and over 1.12 crore SMSs were sent to the farmers. So far, 2.40 lakh farmers have been registered for SMS service from 30,000 villages across the state. The farmers are also given 50% subsidy on purchase of pesticides as per the dosages advised.

Regular survey has helped in early identification and detection of pest problems to combat the pest situation. Location specific and timely advisories based on scientific observations helped in judicious use of biological and chemical pesticides. By understanding the Economic Threshold Level (ETL) concept, farmers started adopting appropriate need based plant protection measures instead of calendar based spraying. This ultimately helped in judicious use of pesticides and increased awareness among farmers and field functionaries about pest surveillance, monitoring and pest management. It helped in keeping the pest population below ETL level. Success of the project has also been borne out by increased crop yields. The yield of the four crops under pest surveillance has increased to the tune of 38% and it has made substantial contribution resulting in an additional income of Rs. 3992.30 crores to the farmers.

In future the project is also expected to help in developing pest forecasting models. Pest disease free areas identified could get an added advantage of value addition for exports. Realising its potential for preventing crop losses due to pest/ diseases, the scheme has been adopted for implementation by other states like Odisha and Gujarat.