



Biopesticides : A potential supplementary tool to chemical pesticides in BIPM

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Chemical pesticides are being used to control agricultural pests since many years. It remains as one of the most common and widely used pest control tactics, however there are worldwide opinions that the chemical pesticides failed to provide desired results in the management of crop pests. Chemical pesticides have damaged to our natural beneficiary ecosystems. Indiscriminate use of chemical pesticides has created many adverse effects on biodiversity of natural enemies of crop pests. The concept of IPM is the only viable option to overcome the problems created by toxic chemicals. Success of IPM mainly depends on reduction in consumption of chemical pesticides and increase in the procurements of 'biopesticides'.

Now-a-days, the biopesticides became a potential and important alternative to chemical pesticides. It is not a complete substitute to chemical pesticides, but should be used as its supplementary. It reduces dependence on costly chemicals; therefore there is a need to shift from intensive chemical to bio-intensive pest management (BIPM) strategy with a view to restore the viability, sustainability and health of agro-ecosystems. Though the use of biopesticides remained much behind (hardly 1%) than that of chemical pesticides, it is preferred by many farmers because of certain benefits. Even after that there is an increase in the demand for biopesticides. Genetic characterization of biocontrol agents involved in biopesticides opened up a new vista in agricultural biotechnology. The use of biotechnological tools paved way for better and novel genetically engineered biopesticides. Although the use of biopesticides in IPM has vast scope, but the present level of its production in India is not sufficient to cover even 2 % of total area under cultivation. There is a great need to upgrade the existing technology in the production and application of biopesticides to meet the growing demand. Extensive adoption of biopesticides has become a necessity at the present juncture as a measure of management of three R. i.e. Resistance, Resurgence and Residue caused by chemical pesticides. It is also necessary for minimizing detrimental effect to human health caused by chemical pesticides and for maximizing agricultural exports under WTO regime.

Registration of biopesticides is compulsory under the section of 5 of the Insecticides Act, 1968. Government of India has already included as many as 45 biopesticides in the schedule to the Insecticides Act, 1968 and 18 biopesticides have already been registered in the country. The enforcement of the act is the joint responsibility of central and state governments. Biopesticides based on microorganisms (Bacteria, fungi viruses and nematodes) and plants (especially *neem*) are widely used against various insect pests and included in BIPM programmes. It has been included in package of practices in many agro-ecosystems of the country. Government of India providing funds to the state governments for establishment of State Biocontrol Laboratories to sustain the availability of biopesticides/biocontrol agents and to boost the BIPM programme in the country. Availability of quality products is another issue for popularization of biopesticides among the farming community. In fact, there are many state pesticides testing laboratories in the country, none of them has the required facilities for quality analysis of biopesticides. It needs special attention.

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