Chapter No. VII

Suggestions

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CHAPTER VII

SUGGESTIONS

More emphasis on investigation of molecular mechanisms of resistance: -

Management of resistance in *H. armigera* require exact understanding of underlying mechanisms of resistance although many mechanisms of resistance have been put forth, there is still a convergent need of more efforts on this fronts. Particularly mechanisms of molecular level should be thoroughly investigated. Because studies related to molecular mechanism of resistance are bit scanty in this pest. There is also a comprehensive need of co-relating the mechanism of resistance in other pests with that of *H. armigera*.

There is a clear paradigm shift from pest resistance to host plant resistance, this shift is some what ambiguous because merely shifting from pest resistance to host plant resistance will not serve any good to resistance management in *Helicoverpa armigera*, the deliema of BT cotton should be an eye opener. Unless the pattern of resistance at molecular level are documented, even the host plant resistance will fall pray to the hunger of survival.

Scenario after BT has set the target and i.e. more investigation of molecular mechanisms of resistance.

Moreover resistance pattern of Indian isolates should be focussed because *H. armigera* shows variation in mechanism of resistance geographically too.
Awareness among farmers:-

Another dimension of resistance and its allied aspects is the role of farmers. Because they are the people who are battling on the front, a clear understanding of resistance, its causes, consequences will be indispensable in combating the phenomenon of resistance. Farmers being ignorant, illiterate, innocent and downtrodden, need to be educate, uplift and awared. They should be convinced through any instrument be it administration, NGO's social workers, reformers or whatever, that blindly and ferociously using pesticide by them has contributed the most as far as damage to their economy is concerned. Hence designing and formulating the comprehensive strategies, effective implementation of awareness plans among farmers and effective process designing to educate them, is a real need of the hour and should be the priority area. This need become more intensive when we make a survey at ground level and found to our disappointment that all what has been done in the name of awareness, education and upliftment is something in less or no magnitude as compare to the real need.

Although there is some mechanism placed to check all the above listed problems the ever increasing failure is evident from the reports and experiments in this regard.

Integrated Pest Management (IPM) :- To tackle resistance of H. armigera different models of IPM have been developed all of them failed at ground level for one or the other reason. Some failed due to geographic and migrational aspects of insects some due to their non viability, some due to their non cost effectiveness.
There is a need to put some comprehensive efforts in this regard practical models need to evolved keeping in view the ground realities. Some groups should be dedicated to achieve this mammoth task.

**Flow of Information**

The enigma of information is yet another aspect need to look upon. The flow of information from researchers to farmers is as poor in this IT age as it was in the past. All mechanisms to fill this bridge has come up with no or little success, an effective process need to be design. So that the knowledge may beat ignorance. What researchers find in their laboratory should be conveyed to the farmers and what farmers feel in their field should reach to the researchers. Both of them are required to come out from their compartments. So that effective and viable approaches to resistance management should be chalked out.

**Biological control**

Although it does come under IPM the focus has to be shifted whole heartedly. Synthetic insecticide had came into existance just 50 years ago, whereas agricultural civilization is nearly 4.5 million years old. Hence it is obvious that insects and related problems are as old as human beings. There was a classical balance between predators and pray. Both enjoy their co-existance.

Now there is a need to atleast try to achieve that marvalous equilibrium once again and hence putting more emphasis on biological control.
designing effective biological control strategies, finding new predators and protecting their life is must.

The lobbying by billion dollar synthetic pesticide industry is definitely having some rolls in hindering research and development in this dimension and even though the best biological control method (the NPV virus) has been developed for *H. armigera*. It is still to find a large scale popularity among farmer community despite of its cost effectiveness, viability and a 100% mortality rate.

There is an urgent need to spread the benefit of biological control among the farmers community at large, particularly with reference to management of *H. armigera* by NPV and other techniques.

Researcher should be encouraged and more funds should be allocated to carry our research on biological predation behaviour and effective process evolution for the pest.

Last but not least, there is a need of paradigm shift in our world view regarding insect, resistance, management and control. We should convince ourself that life is next impossible to eradicate as it is impossible to create. Hence we should look out for co-existence. The harmonious nature gives myriad examples of co-existence around us. These examples can be seen right from bacteria to the highest forms of life. Most minimum of the minimum lost is much better than endangering, and in many cases ensuring, permanent damage to nature, our lives and lives of generations to come.