

SEMINAR- III

VEGETABLE IPM: SUCCESS STORIES IN BANGLADESH

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Extended Summary

Vegetables are essential in the human diet for proper growth and development. Although in Bangladesh the production of vegetable could not fulfill the optimum requirement of the country. Among the various constraints for low production of vegetables, severe infestation of insect pests and diseases are considered as the most important ones. According to an estimate, annual yield loss due to insect pest alone is 25 percent for vegetables. Farmers of our country are mostly depending on the toxic synthetic pesticides to combat with those pests attack. However, in many cases the increasing and indiscriminate uses of synthetic insecticides have totally failed to control the pests. It has been observed that in some crops especially in high valued vegetables, farmers are sometimes applying insecticide daily and so sometimes no waiting periods used before harvest. Consumers are inevitably exposed to high levels of pesticides and their residues in their diets. To get rid from this risky pest management system, some new avenues must have to be developed. One of the ways may be to develop eco-friendly, sustainable, socio-economically acceptable Integrated Pest Management or IPM packages. BARI scientists have already developed some effective IPM technologies, and some are in pipeline to control the devastating pests especially the insect pests of vegetables and fruits. Some of the IPM technology packages against those pests are discussed below briefly.

Brinjal

Brinjal is attacked by many insect pests. Among them shoot and fruit borer, jassid, epilachna beetle etc. are considered as the major insect pests. Brinjal shoot and fruit (BSFB), *Leucinodes orbonalis* Guen, is the most destructive pest of brinjal. The yield loss caused by this pest has been estimated more than 85% in Bangladesh. Unfortunately, even after repeated insecticide spraying the farmers could not control the pest properly as the field population became resistant to the commonly used pesticides. However, an effective and economic IPM package has already been developed. The measures are: i) prompt removal of pest-damaged shoots and fruits,

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ii) use of sex pheromone: to trap all male moths before they mate, iii) inundative release of bio-control agents like egg parasitoid, *Trichogramma sp.* (@ 1gm parasitized eggs/ha/week), and larval parasitoid *Bracon habetor* (@ 800-1200 adults/ha/week), iv) total reduction or less use of insecticides: to allow natural enemies to proliferate along with a community approach. The above IPM package is gaining popularity among the brinjal growers throughout the country due to its effectiveness, sustainability and less cost involvement.

Cucurbit crops

Cucurbit crops like bitter melon, sweet melon, cucumber, tassel melon, ash melon etc. are attacked by different insect pests but cucurbit fruit fly, epilachna beetle, fruit borers like *Spodoptera sp.* or pumpkin caterpillar are considered as the major pest. In Bangladesh, fruit fly is considered as the major problem for the farmers as they invade the crops in high populations and devastate the cucurbit crops. Due to its nature of damage it is very much difficult to control this pest with insecticide. However, it can be cost-effectively managed by the BARI developed IPM technology which comprises of sanitation and use of sex pheromone mass trapping along with community approach. In the cucurbit field infestation of some other pests like epilachna beetle, fruit borer like *Spodoptera sp.* or pumpkin caterpillars are frequently observed. For the control of borer pests, inundative releases of bio-control agents should be done. Bio-rationales like neem products, application of neem seed kernel extract can reduce jassid and whitefly and epilachna beetle infestation.

Tomato

The key constraints to tomato production relate to tomato leaf curl virus, particularly in summer production when total crop loss is possible because of the efficiency of the vector, *Besimbia tabaci*, transmission and susceptibility of currently available varieties. Other key constraint of tomato production is the attack of fruit borer, *Helicoverpa armigera*. Those pest problems can be efficiently and sustainably managed by cultivating two virus and white fly resistant tomato germplasm, viz. TLB182 and TLB111 and through inundative release of bio-control agents like egg parasitoid, *Trichogramma sp.*, and larval parasitoid *Bracon habetor*.

Cabbage /Cauliflower

Leaf eating lepidopterous pests like cabbage common cutworm and diamond back moths are the main constraints for cabbage production. Those devastating pests can be efficiently and sustainably controlled by hand picking and destruction of *Spodoptera* or DBM egg/larvae during initial stage, by artificial release of bio-control agents: weekly release of two parasitoids *Trichogramma sp.*, and *Bracon habetor* and by application of biopesticides like neem products.