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Eco-Friendly Management of Fruit Fly in Bittergourd in Tripura – A Success Story

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Abstract

The melon fruit fly, *Bactrocera cucurbitae* (Coquillett) (Diptera: Tephritidae) is distributed widely in the country and it has been reported to damage 81 host plants and is a major pest of cucurbitaceous vegetables, particularly the bitter gourd (*Momordica charantia*), muskmelon (*Cucumis melo*), snap melon (*C. melo* var. *momordica*), and snake gourd (*Trichosanthes anguina*). The extent of losses varies between 30 to 100%, depending on the cucurbit species and the season. Its abundance increases when the temperatures fall below 32 °C, and the relative humidity ranges between 60 to 70%. It prefers to infest young, green, soft-skinned fruits. Keeping in view the importance of the pest and crop, KVK-Khowai has demonstrated and assessed a technology with pheromone traps to keep the population below economic threshold level and found effective to minimize pesticides use, improve the quality of crop and to get good yield.

Background Information

The farmers of RC Ghat Village of Khowai district have shifted their traditional rice-maize system to vegetable crops. The area under vegetable crops is increasing day by day. During winter and rainy season, cucurbits are cultivated in majority of area under vegetables crops. The major cucurbits grown by farmers are cucumber, bottle gourd, bitter gourd, sponge gourd, etc. The farmers sell the cucurbits in local as well as distant mandis/ markets like Teliamura, Moharcherra, Khowai, etc. Throughout the year fruit fly is a major threat that adversely affects the yield as well as quality of cucurbits. Farmers usually use various insecticides to control this insect, which is not only harmful to the mankind but also affect the environment adversely. The Krishi Vigyan Kendra-Khowai introduced pheromone traps for the management of fruit fly in cucurbits especially in bittergourd. The KVK has assessed and demonstrated this technology during the year 2020-21 under NCIPM, New Delhi NEH project to find out its efficacy in Tripura conditions and also organized awareness programmes, training and field demonstrations.

Interventions of KVK

KVK, Khowai has conducted trials of pheromone traps during the year 2020-21 at fields of 22 farmers in cucurbits especially in bitter gourd. Subsequently, for up-scaling the technology in the district, 32 demonstrations covering two development blocks of Khowai district including RC Ghat village were laid out. The farmers were also educated about the technology during on and off-campus training programmes conducted on production and protection of vegetable crops.

Success Points

Due to intervention of KVK, Khowai, the farmers have adopted this innovation especially by those who are cultivating cucurbits during rainy/ winter season. The adoption of this innovation resulted in reduction of losses by about 50 percent and the yields of the different crops increased from 20-25 percent. Further, the quality of produce has also improved. The net returns of the farmers have also increased as they are not spraying expensive insecticides frequently.

Outcomes

The results of trials and demonstration conducted on pheromone traps in the village were encouraging and farmers have started demanding these pheromone traps from KVK, Khowai on payment basis. The other farmers are also purchasing pheromone traps from various sources including private dealers. This technology has reduced pesticide use and saved money of farmers. This technology was adopted by about 40 percent cucurbit growers of the village for the management of fruit fly due to its obvious monetary benefit.

Table 1: Economics of using pheromone traps for the management of fruit fly in bitter gourd

Economics of Demonstration					Economics of Farmer Practice				
Yield (q/ha)	Gross Cost (Rs.)	Gross Return (Rs.)	Net Return (Rs.)	BCR	Yield (q/ha)	Gross Cost (Rs.)	Gross Return (Rs.)	Net Return (Rs.)	BCR
134	64724	201000	136276	1:3.10	69	56724	103500	46776	1:1.82



Figure 1: Symptoms of fruit fly infestation in various cucurbitaceous crops



Figure 2: Installation of pheromone traps in bittergourd

Conclusion

Since the technique employed is male annihilation technique, the population of the pest will be automatically declined in future. This will be highly beneficial for the farming community which were otherwise employing blanket application of insecticides and getting poor yield due to heavy fruit fly attack in the district. Further, the farmers are now being trained to lower the cost of the technology by making homemade traps. Used mineral water or soft drinks bottles may be utilized with four windows of 1.5 cm diameter. The wooden blocks should be placed almost at the same level of the windows. The use of plastic water/ soft drinks bottles are also performing well and lowering the cost of technology. Farmers may purchase only lures to be recharged in the home made traps. Scientists of the KVK are now popularizing the home made traps among cucurbits growers for maximum adoption of the technology at lowest cost.