



Research Note :

USE OF PHEROMONE TRAPS FOR ECO FRIENDLY MANAGEMENT OF FRUIT FLY IN PARWAL—A SUCCESS STORY

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ABSTRACT : Proper and prolonged humid conditions and sandy soil due to nearby land of river Ganga in Hastinapur block of Meerut district favours the cultivation of cucurbits. Thus, growing of Parwal has been proved as a best alternate to replace mono culture of sugarcane crop in the area where majority of farmers having small land holdings. Fruit fly is a serious pest not only of cucurbits but other vegetable and fruit crops also causing huge losses to farmers in Meerut district. In spite of using hazardous pesticides, farmers are bound to bear about 25 – 30 % yield loss every year due to the attack of fruit fly. Various front line demonstrations of cue lure containing pheromone traps were laid out by KVK Hastinapur, Meerut at the fields of parwal growers of the area during three consecutive years (2012 – 2014) to introduce and promote the eco friendly management technology of fruit flies by installation of 5 traps/ acre covering 30 acre area. The technology was found feasible, cheaper as well as easy to adopt at farmer's field. An average of 23.35 per cent increased yield was observed resulting ₹ 27182.5 average increased income per hectare comparing with plots under farmer's practice where traps were not installed.

Keywords : Pointed gourd, fruit fly, pheromone.

Parwal, *Trichosanthus dioica* (Roxb.), locally known as Parwal, is extensively cultivated in several areas of India. The Bengal and Assam region of India is the primary centre of its origin (Singh *et al.*, 3). This perennial cucurbit is a dioecious tropical vine producing small fleshy fruits used as a vegetable. Several biotic factors limit the production and productivity of cucurbits, among which cucurbit fruit fly (*Bactrocera cucurbitae* Coquillett) has been the most prominent pest over the last several decades. In India, the loss in fruit yield ranges from 1 to 31 % with a mean of 16 % (Verghese *et al.*, 5). Fruit fly is one of the major insect pests of vegetable and fruit crops not only in Uttar Pradesh but throughout India inflicting economic losses to the extent of ₹ 5000 crores per year. In early stages of the crop growth, female flies lay their eggs in small groups just beneath the skin of fruit. The eggs hatch into larvae (maggots), which most often feed on the inside of the fruit, resulting in a soft, mushy mess. The infested fruits become unfit for consumption due to loss of quality and lose their market value. The extent of losses varies between 30 to 100%, depending on the cucurbit species and the season. The management strategies employed for the control of fruit fly by farmers of the district are mostly concentrated on application of synthetic insecticides. Further,

indiscriminate use of insecticides has led to problems of resistance to insecticides, pest resurgence, harmful pesticide residues and environmental pollution. Since, the maggots damage the fruits internally; it is difficult to control this pest with insecticides.

The use of pheromone traps for the management of fruit fly has proved to be success in reducing the pest population for the past few years, apart from being eco-friendly. Pheromones are a class of semiochemicals that insects and other animals release to communicate with other individuals of the same species. The pheromone, 'cuelure' is used in cucurbits, which mimics the scent of female flies, attracts the male flies and traps them in large numbers resulting in check of population growth early in the season.

Intervention of Krishi Vigyan Kendra, Meerut

Krishi Vigyan Kendra, Meerut is working under the jurisdiction of Sardar Vallabhbhai Patel University of Agriculture and Technology, located in block Hastinapur, Meerut, where cultivation of cucurbits, particularly Parwal, is grown over a large area of 600 – 700 acre. Proper and prolonged humid condition and sandy soil due to nearby land of river Ganga favours the cultivation of cucurbits. Thus, growing of Parwal has been proved as a best alternate to replace mono culture of sugarcane crop in the area where majorities of farmers having small land holdings. KVK, Meerut is

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also focusing to provide technical guidance to the Parwal farmers so that some area of sugarcane crop may be replaced by horticultural cash crops in the district.

Fruit fly is a serious pest not only of cucurbits but other vegetable and fruit crops causing huge losses to farmers in Meerut district. As per local farmer's feedback, in spite of using hazardous pesticides, they are bound to bear about 25 – 30 % yield loss every year



programme and distributed among 10 farmers for installation @ 5 traps/ acre in Parwal crop during the first fortnight of June month. Lure was replaced once after two months during the month of August. The demonstrations continued for three consecutive years covering 30 acre area.

Field visits were conducted prior to the programme and progressive farmers were selected and trained about the technology to ensure maximum



due to the attack of fruit fly. Keeping above facts in view, several control tactics have been tested at university level through various trials conducted in collaboration with Krishi Vigyan Kendra and recommended the use of cue lure based pheromone traps as a best tool to enhance the productivity of cucurbitaceous crops in the district. Performance of traps to catch fruit flies have been particularly widely studied and documented, and vary between zones, predominant hosts and fly species (Agarwal and Kumar, 2; .Kumar *et al.*, 2; Verghese, 4).

Role of KVK Hastinapur in dissemination of technology

Various front line demonstrations of cue lure containing pheromone traps were laid out by KVK Hastinapur, Meerut at the fields of parwal growers of

impact of the programme. During the demonstration programme, scientists frequently visited farmers field to ensure the proper installation of traps in field, cleaning of traps at right interval, recharging of lures and not to spray any pesticide for the management of fruit flies. Scientists of KVK popularized the demonstrated technology through other extension activities i.e. Off/On campus training programmes, stalls at kisan mela, kisan goshies, exposure visits and by conducting special campaigns for popularization of Eco friendly traps in the area so that maximum number of cucurbits growers of the area may be benefitted.

Results of FLD Programme

The technology was found feasible, cheaper as well as easy to adopt at farmer's field. Performance of "cue lure" traps was well appreciated by farmer in terms of increased yield. Farmers were also satisfied

Table 1 : Economics of using Cue lure traps for the management of fruit fly in Parwal.

Economics of Demonstration (₹/ha)					Economics of Farmer Practice (Rs/ha)				
Yield (q/ha)	Gross Cost (₹)	Gross Return (₹)	Net Return (₹)	BCR	Yield (q/ha)	Gross Cost (₹)	Gross Return (₹)	Net Return (₹)	BCR
103.97	37550	155955	118405	1:4.15	84.31	35250	126472.5	91222.5	1:3.58

the area during the year 2012 - 2014 to introduce and promote the eco friendly management technology of fruit flies. The traps and lure (Cue lure) were procured from PCI, under the front line demonstrations

with the proper shape and size of the fruits due to management of fruit flies resulting better market demand of their produce. Scientists analyzed the economics of using pheromone traps for the eco

friendly management of fruit fly in Parwal on the basis of data obtained from three consecutive years (Table 1).



An average of 23.35 per cent increased yield was observed resulting ₹ 27182.5 average increased income per hectare comparing with plots under farmer's practice where traps were not installed. Farmers were also appreciating the technology due to relief from labour arrangement for unnecessary spraying. Results were eye opener for the farmers. Now, the cucurbits growers of the area are well aware with the technology and directly purchasing and installing the traps well in advance for the management of fruit flies not only in Parwal but also in other cucurbitaceous crops i.e. cucumber, bottle gourd and pointed gourds grown in area. Scientists of Krishi Vigyan Kendra are now planning to move in other vegetable belts of cucurbits in the district to further disseminate the technology.

Future Aspect

Since the technique employed is male annihilation technique, the population of the pest will automatically decline 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 Meerut 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 1.5cm diameter. The wooden blocks should be placed almost at the same level of the windows. The use less 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 centre are now popularizing the home made traps among cucurbits growers for maximum adoption of the



technology at lowest cost.

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