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Different Control Measures Against the Insect Pests of Bitter Gourd (*Momordica charantia* L.)

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Abstract: Different control measures, viz., M.Y. (Muhammad Yousuf) Strategy (Pressurized water spray), Cultural practice (Picking and burying of infested fruit) and Diptrex (trichlorfon) as cover and bait spray with Protein hydrolysate were tested for their effectiveness against the insect pests of bitter gourd (*Momordica charantia* L.). M.Y. Strategy gave better control of whitefly (*Bemisia tabaci*) as compared with Diptrex and Diptrex + Protein hydrolysate. In case of melon fruit fly (*Bactrocera cucurbitae*), Diptrex was the most effective followed by Diptrex + Protein Hydrolysate and cultural practice but the M.Y. Strategy showed no effect.

Key words: Bitter gourd, M.Y. Strategy, cultural practice, Diptrex, Protein hydrolysate, melon fruit fly and cotton whitefly

Introduction

Bitter gourd (*Momordica charantia* L.) is one of the valuable cucurbit vegetables which is used as fresh and dry food, pickles and its seed contains 32% oil (Tindall, 1978). It is a source of vitamins (B and C), minerals (Iron, Calcium and Phosphorus), protein and is highly effective in controlling the diabetes (Yuwai *et al.*, 1991). Bitter gourd is attacked by different insect pests. Among these, melon fruit fly (*Bactrocera cucurbitae*) is widely distributed in South Asian countries and causes major economic loss (Vijaysegaran, 1987). Another insect pest, cotton whitefly (*Bemisia tabaci*) despite sucking the cell sap, secretes honey dew which serves as medium for sooty mold development and checks the process of photosynthesis (Mustafa, 1995). Different control measures have been carried out to control these insect pests, by Hussain *et al.* (1985), Nasir *et al.* (1991), Talpur *et al.* (1994) and Mahmood *et al.* (1995). They all tested different insecticides and found that diptrex (trichlorfon) was the most effective against the melon fruit fly, *Bactrocera cucurbitae*, but non of them used it such combination as used in this experiment.

Yousuf (1995) developed and evaluated M.Y. Strategy on different field crops. Castle *et al.* (1996) and Fazal (1998) also used this measure in the form of sprinkler irrigation and latter as pressurized water spray on cotton but non of the worker used this strategy on vegetables especially on bitter gourd and found this treatment very effective in checking the population of whitefly. Present studies aimed at working out the relative effectiveness of insecticide and other control measures, so that an effective control measure with minimum or no use of insecticide could be achieved.

Materials and Methods

Insecticide, viz. Diptrex (trichlorfon) alone and with Protein

hydrolysate, M.Y. Strategy (Pressurized water spray) and cultural practice (Picking and burying of infested fruit) were tested against melon fruit fly (*Bactrocera cucurbitae*) and cotton whitefly (*Bemisia tabaci*) on bitter gourd. Diptrex was used as cover spray and bait spray (with Protein hydrolysate) for the comparative studies. The trials were laid out in the Randomized Complete Design Block (RCBD) having five treatments including a control with four replications in each. The insecticide was applied to the crop at an interval of ten days with the help of knapsack hand sprayer at the following dose rates.

Diptrex 80-SP at 1250 gm/ha

Diptrex + Protein hydrolysate at (30 gm + 300 ml)/ha

M.Y. Strategy with the help of solo power sprayer and cultural practice were applied at an interval of five days. The data regarding the whitefly population were taken from 3 leaves (old, middle and from tip) of each five randomly selected plants before and after 24, 48 and 72 hours of each application. Regarding the fruit fly, the data were taken from five randomly selected plants of each plot for fruit infestation/larval population after five and ten days of each application.

The data so obtained were subjected to the standard statistical analysis of variance and Duncan's Multiple Range Test as described by Steel and Torrie (1960).

Results and Discussion

The results of present research are given in Table 1 which reveals that all the treatments showed significantly better results over the untreated check. M.Y. Strategy (Pressurized water spray) prove to be the best as compared with Diptrex, Diptrex + Protein

Table 1: Average Cotton Whitefly Population per Leaf and Percentage Fruit Infestation by Melon Fruit Fly after Application of Different Control Measures

Treatment	Mean Population per Leaf/percentage Fruit Infestation							
	Cotton Whitefly				Melon Fruit Fly			
	Overall	First Application	Second Application	Third Application	Overall	First Application	Second Application	Third Application
T ₁ M.Y. Strategy	2.10 C	1.93 C	2.13 C	2.25 B	10.71 A	10.81 A	11.00 A	10.34 A
T ₂ Cultural Practice	3.98 A	3.35 B	4.32 A	4.28 A	3.59 B	3.96 B	3.86 B	2.85 B
T ₃ Diptrex 80-SP	2.58 B	2.43 BC	2.73 C	2.58 B	3.13 B	3.35 B	3.44 B	2.60 B
T ₄ Diptrex + Protein hydrolysate	3.28 B	3.42 B	3.64 B	2.78 B	3.33 B	4.19 B	2.46 C	3.35 B
T ₅ Control	4.58 A	4.61 A	4.37 A	4.75 A	11.16 A	11.86 A	10.84 A	10.79 A

Note: Any two means not sharing a common letter are significantly differ from one another

hydrolyzate and cultural practice by lowering the cotton whitefly (*Bemisia tabaci*) population upto 2.10, 2.58, 3.28 and 3.98 per leaf, respectively. In control the population was found to be 4.58 per leaf.

Similarly in case of melon fruit fly (*Bactrocera cucurbitae*) infestation, Diptrex showed the best results followed by Diptrex + Protein hydrolyzate and cultural practice by decreasing fruit infestation upto 3.13, 3.33 and 3.59 per cent, respectively. 11.16 percent fruit infestation was observed in the control. However, M.Y. Strategy was non effective. The results lead to conclusion that the tested control measures proved effective against the insect pests of bitter gourd except cultural practice in case of whitefly and M.Y. Strategy in case of melon fruit fly.

The results are similar to those of earlier workers, viz., Hussain *et al.* (1985), Nasir *et al.* (1991), Talpur *et al.* (1994), Mahmood *et al.* (1995) and Fazal (1998) who got effective control of these pests. All of them used different combinations of insecticides against the fruit fly and found that trichlorfon was the most effective in controlling the fruit fly.

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