

Original Research Article

EVALUATION OF INTEGRATED PEST MANAGEMENT IN BITTERGOURD

Abstract

Gourds are being cultivated in 310 ha in Tiruvallur district. Among gourds bitter gourd alone is cultivated in 125 hectares. Bitter gourds are attacked by several insect pests and among them the fruit fly is the most destructive insect pests. The present study was conducted to demonstrate the Integrated Pest Management practices in bitter gourd against major insect pests in Tiruvallur District. The demonstration was conducted at farmers' fields in ten farmers field of four blocks viz., R.K.Pet, Thiruthani, Ekadu of Tiruvallur district during 2020-2021. Technological gap between recommended practice and actual farmers practice was observed. The front line demonstration was consisted of IPM (field sanitation, Installation of fruitfly traps and spraying of neem oil 3%) and Non – IPM practices. Results indicated average of 92.50 q/ha of fruit yield and obtained a Net income of Rs.106450/- with 10.77% increase in yield over farmers practice. Reduction in cost of cultivation due to less investment for plant protection aspects has been recorded.

Keywords: *Integrated pest management,, bitter gourd, marketable yield, net profit.*

Introduction

Bitter gourd (*Momordica charantia L.*) is a popular vegetable crop among cucurbits grown in India. In terms of nutritive value, bitter gourd ranks first among cucurbits, being rich in iron, phosphorus and ascorbic acid (Awasthi & Jaiswal, 1986). Insect pests are a major constraint for increasing the production and productivity of this crop. The crop loss due to melon fly varied from 30 - 100% depending upon the season. (Panday *et al.*, 2009). The extent of losses varies between 30 to 100%, depending on the cucurbit species and the season. Melon fruit flies (Diptera: Tephritidae: Dacinae) are economically important pests of the cucurbits and are geographically distributed throughout the tropics and subtropics of the world, especially in most countries of South East Asia. The melon fly, *Bactrocera cucurbitae* (Coquillett) (Diptera: Tephritidae) prefers tender fruits to lay eggs 2 to 4 mm deep in the fruit pulp. The maggots feed inside the developing fruit leading to rotting and premature fall. The crop loss due to melon fly varied from 30 - 100% depending upon the season. (Panday *et al.*, 2009). 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%. Keeping in view the importance of the pest and crop, melon fruit fly management could be done using integrated pest management strategies. Gourds are being cultivated in 310 ha in Tiruvallur district and bitter gourd alone in 125 hectares. Farmers cultivate hybrid bitter gourds in Kadambathur, Thiruvalangadu, Thiruthani and Ekadu blocks. Hence it was proposed to popularize Integrated Pest management module through frontline demonstrations for effective management of pests in Bitter gourd in Tiruvallur district.

Materials and methods

For the popularization of Integrated Pest management for Fruit fly in Bitter gourd module in Tiruvallur District, it was proposed to conduct field level demonstrations in ten places during the year 2019-2020 and 2020-2021. Ten farmers were selected from four blocks viz., R.K.Pet, Thiruthani, Ekadu of Tiruvallur district. On campus and off campus trainings were given to farmers as well as extension personnel on various improved crop production technologies and integrated pest management practices. The farmers were also facilitated with technical pamphlets on cultivation aspects and pest management in Bitter gourds. Demonstrations were made on seed treatment, Methyl eugenol traps for fruit flies and yellow sticky traps for sucking pest monitoring. Technology intervention viz, Expose of the pupae by ploughing, supply of *Pseudomonas fluorescens* @ 10 g / kg seed for seed treatment, Yellow sticky traps @ 12 nos/ ha for sucking pest management, Methyl eugenol Fruit fly traps @ 12 / no/ ha for fruit fly management, Spray of Neem oil @ 3.0 % as need based, Collection and destruction of the damaged fruits. Observation on number of branches/vine was recorded in situ from five randomly sampled and tagged plants per plot. Matured fruits were harvested at 3 days interval for assessment of number of fruits per plant, average fruit weight, and marketable yield. Fruit yield per hectare was obtained through conversion of the net plot yield. The data on percent fruit damage was calculated on the basis of total number of healthy fruit and infested ones. Economic parameters such as cost of cultivation, net return and benefit cost ratio (BCR) were calculated by considering all inputs and outputs.

Results and discussion

Demonstration fields practicing Integrated Pest Management technologies were periodically visited, observed and critical parameters *viz.*, fruit fly and sucking pest incidence, Yield(kg/ha) and BCR were recorded. Integrated Pest Management with recommended dose of fertilizers significantly increased the vine length, number of branches/vine and average fruit weight as compared to farmers practice (Table 1). Plant growth in farmers' field was reduced due to imbalance use fertilizers and indiscriminate use of pesticides and average of 23.3 fruit per plant was recorded in IPM plots against farmers field with 17.4 fruits per plant.. Maximum of 23.48% of fruit incidence was recorded in farmers' field during 2019-2020 and 19.25% during 2020-2021 due to indiscriminate use of pesticides. Reduction in fruit fly incidence of 48.04% and 45.45% reduction farmers' practice during 2019-2020 and 2020-2021 respectively was observed in IPM demonstration plots. Average yield of 10.03 tonnes per hectare was recorded with 25.58% and 10.77% increase in yield over farmers' plot during the year 2019-2020 and 2020-2021 respectively (Table 2). Quality produce was harvested with 25.64 %and 23.34% increase in net returns and benefit cost ratio of 3.04 to 3.80 in IPM demonstration plots during 2019-2020 and 2020-2021 respectively. Similarly, Ranganath *et al.* 2015 and Kumar *et al.* 2019 reported that minimum fruit fly incidence was observed in integrated pest management module. Mr. Mahendran, Reddiyur village, Thiruthani block practicing bitter gourd cultivation has achieved a maximum 98.50 q/ha of fruit yield and obtained a Net income of Rs.111450/- with 18 % increase in yield over farmers practice. Reduction in cost of cultivation due to less investment for plant protection aspects has been recorded. The Yield parameters, pest incidence and economics assessed in varieties from ten trials is detailed below

Table: 1 : Effect of IPM practice on growth and yield parameters of Bitter gourd

Year/Season	Treatments	No.of branches/vine	No. of fruits per plant	Fruit weight(g)/plant
2019-2020	Farmers Practice	7.56	19.20	37.05
	IPM Demonstration Plot	10.60	25.81	63.03
2020-2021	Farmers Practice	7.24	15.55	41.43
	IPM Demonstration plot	9.84	20.78	65.36

Table: 2 : Effect of IPM practice on Yield and Economic Parameters in Bittergourd

Year	Treatments	Average Yield (t/ha)	Percent fruit damage	Net returns (Rs/.ha)	B:C Ratio
2019-2020	Farmers Practice	8.60	23.48	77600	2.33
	IPM Demonstration plot	10.80	12.20	97500	3.80
2020-2021	Farmers Practice	8.35	19.25	86300	2.48
	IPM Demonstration plot	9.25	10.50	106450	3.04

Conclusion:

Severe incidence of fruit fly and sucking pests incidence was observed in farmers practice even after multiple spray of insecticides (18-22 %). Integrated pest management practices has been observed as the best alternate for quality produce production with good Benefit cost ratio. Farmers are willing to install Methyl Eugenol traps for fruit fly management and yellow sticky traps for sucking pest monitoring and management.

References

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