Impact of Integrated Management Practices of Fruit fly In Bitter gourd

Abstract

Bitter gourd is cultivated in 125 hectares out of 310 ha occupied by gourds in. Tiruvallur district in TamilNadu, India. Fruit fly is the most destructive insect pests attacking bittergourd. The present study was conducted to demonstrate the Integrated Pest Management practices in bitter gourd against major insect pests in 10 farmers' fields located in four blocks *viz.*, R.K.Pet, Thiruthani, Ekadu of Tiruvallur distirct during 2020-2021. Technological gap between recommended practices and actual farmers' practice was assessed. The front-line demonstration included IPM practices (field sanitation, Installation of fruit fly traps and spraying of neem oil 3%) and Non –IPM practices. Results indicated average fruit yield of 92.50 q/ha, an increase of 10.77% increase in yield over farmers practice as well as a net income of Rs.106450/-. 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. Melon fruit flies 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. Crop losses due to melon fly, *Bactrocera cucurbitae* (Coquillett) (Diptera: Tephritidae) varied from 30 - 100% depending upon the cucurbit species and season"(Panday *et al.,* 2009). Keeping in view the importance of the pest and crop, melon fruit fly is the right candidate for integrated pest management strategies.

Gourds are cultivated in 310 ha in Tiruvallur district with bitter gourd alone occupying 125 hectares. Farmers cultivate hybrid bitter gourds in Kadambathur, Thiruvalangadu, Thiruthani and Ekadu blocks [6-10]. 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 locations during the year 2019-2020 and 2020-2021. Ten farmers were selected from four blocks *viz.*, R.K.Pet, Thiruthani, Ekadu of Tiruvallur distirct. 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 technology interventions *viz*, exposure of the pupae by ploughing, supply of *Pseudomonas fluorescens* @ 10 g / kg seed for seed treatment, yellow sticky traps @ 12 numbers/ ha for sucking pest management, Methyl eugenol Fruit fly traps @ 12 / no/ ha for fruit fly management, need-based spraying of 3%vNeem oil , collection and destruction of the damaged fruits. Observations on number of branches/vines was recorded *in situ* from five tagged and randomly chosen 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". [11] 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

Plants in the plots that had Integrated Pest Management practices with recommended dose of fertilizers significantly increased the vine length, number of branches/vine and average fruit weight as compared to those in the plots with farmers' practice (Table 1). Plant growth in farmers' fields was reduced due to imbalanced use fertilizers and indiscriminate use of pesticides . An average of 23.3 fruit per plant was recorded in IPM plots against 17.4 fruits per plant in farmers' field. Maximum of 23.48% and 19.25% of fruit incidence were recorded in farmers' fields during 2019-2020 and 2020-2021 respectively.. Reductions in fruit fly incidence by 48.04% and 45.45% was observed in IPM demonstration plots compared to those in farmers' practice during 2019-2020 and 2020-2021 respectively. Average yield of 10.03, tonnes per hectare in IPM plots was recorded which was 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. Earlier workers (Ranganath *et al.*, 2015 ;Kumar *et al.*,2019) have 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 was observed in farmers practice even after multiple spray of insecticides (18-22 %). Integrated pest management practices have 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.

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