



MANAGEMENT OF WHITEFLY, *BEMISIA TABACI* (GENNADIUS) AND YELLOW VEIN MOSAIC IN OKRA THROUGH INSECTICIDES

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ABSTRACT

The experiment conducted on the management of whitefly and yellow vein mosaic virus in okra during summer 2012, revealed that significant reduction in whitefly population and yellow vein mosaic virus incidence and higher marketable yield of okra were recorded in all the treatments compared to untreated control. The seed treatment with Imidacloprid 600 FS @ 6 g/kg seed and roughing of infested plants at respective interval gave significantly higher protection against white fly, thereby reducing yellow vein mosaic virus incidence and provided highest marketable yield of okra. It was followed by spray of Imidacloprid 17.85 L at 200 ml/ha.

Key words: Whitefly, yellow vein mosaic virus, disease incidence and marketable yield

INTRODUCTION

Okra (*Abelmoschus esculentus* L. Moench) also known as lady's finger or Bhindi is an important vegetable crop grown extensively all over the country. In India, it is grown in an area of 3.25 lakh hectares with a production of 3.38 lakh tonnes (Kale, 2005). It is a popular vegetable crop due to its high nutritional and medicinal value. The crop is grown during summer as well as kharif season. The average production of okra remains low. One of the major factors responsible for low productivity is the losses caused by the insect pests. Of which, whitefly is most important which besides sucking the sap transmit yellow mosaic virus disease. The disease affected both the quality and production of marketable yield okra fruits.

Aphid, *Aphis gossypii* (Glover), leaf hopper, *Amrasca bigutulla bigutulla* (Ishida), white fly, *Bemisia tabaci* (Genn.) and okra fruit borer, *Earias vittella* are the important pests of okra, which causes significant losses in marketable yield (Sharma *et al.*, 2001; Pareek and Bhargava, 2003). Of these pests, whitefly, *Bemisia tabaci* (Genn.) is the major pest which besides sucking the sap transmits the yellow vein mosaic virus in okra which is serious problem. The disease incidence decrease the yield considerably (Vir, 1984). Earlier the efforts have been made for the effective control of whitefly and yellow vein mosaic virus by Borah *et al.*, 1996; Sidduraman *et al.*, 2001 in pulses.

Therefore it is essential to develop an effective management technology for the management of whitefly along with its impact on yellow vein mosaic virus disease in okra.

MATERIALS AND METHODS

Field trials were conducted during summer, 2012 at Rajasthan College of Agriculture, Udaipur in RBD with 4 replications. The okra variety Arka Anamika was sown at row to row and plant to plant spacing of 45 and 30 cm, respectively in plots each measuring 4.5 x 3.6 meter. There were six treatments and each treatment was replicated four times. The observation on whitefly population was recorded on 10 randomly selected plants at one day before and 30, 45 and 60 days after sowing. The disease incidence was recorded at 30, 45 and 60 days after sowing by counting total number of plants and disease plants by using following formulae:

$$\text{Disease incidence (\%)} = \frac{\text{Number of yellow mosaic infected plants}}{\text{Total number of plants}} \times 100$$

The marketable yield for each treatment replicated was recorded separately. The yield of all pickings was pooled together and yield per hectare was computed.

RESULT AND DISCUSSION

The data recorded on the population of whitefly and incidence of yellow vein mosaic virus in different treatments has been presented in Table 1. Significant reduction in whitefly population and incidence of yellow vein mosaic virus were recorded in all treatments over untreated control. The population of whitefly among different treatments ranged from 5.75 to 12.50; 3.50 to 8.25; 2.75 to 8.25 as against 10.75, 15.75 and 20.25 in untreated control. The significantly lowest population of whitefly was recorded

Table 1. Effect of different treatments on white fly population and Yellow vein mosaic disease of Okra – summer, 2012

Treatment	Particulars	White fly population 10 plant at			Disease incidence (%)			Marketable yield (q/ha)
		30 DAS	45 DAS	60 DAS	30 DAS	45 DAS	60 DAS	
T ₁	Seed treatment with Imidacloprid 600 FS at 6 gm/kg	2.50 (5.75)*	2.00 (3.50)	1.80 (2.75)	8.62 (2.25)**	12.48 (4.67)	8.95 (2.42)	251.85
T ₂	Seed treatment with Thiamethoxam 70 WS at 6 gm/kg	2.60 (6.25)	2.69 (6.75)	2.96 (8.25)	15.06 (6.75)	5.29 (9.72)	22.75 (14.96)	229.15
T ₃	Imidacloprid 200 SL spray at 15 DAS at 200 ml/ha	3.24 (10.0)	2.40 (5.25)	2.24 (4.50)	13.18 (5.20)	5.29 (4.40)	11.09 (3.70)	242.10
T ₄	Fipronil 80 WG spray at 15 DAS at 200 ml/ha	3.57 (12.25)	2.69 (6.75)	2.06 (3.75)	15.02 (6.72)	20.17 (11.90)	22.26 (14.36)	235.10
T ₅	Thiamethoxam 25 WS spray at 15 DAS at 500 ml/ha	3.61 (12.50)	2.96 (8.25)	2.50 (5.75)	15.78 (7.40)	20.63 (12.42)	25.66 (18.75)	214.80
T ₆	Untreated Control	3.35 (10.75)	4.03 (15.75)	4.55 (20.25)	15.78 (7.40)	25.63 (18.72)	35.87 (34.35)	160.55
	S. Em.±	0.03	0.03	0.025	0.14	0.17	0.37	4.911
	C.D. at 5%	0.09	0.90	0.074	0.43	0.51	1.083	14.592
	C.D. at 1%	0.12	1.2	0.10	0.59	0.71	1.48	19.992

* Values in parenthesis are retransformed population. ** Values in parenthesis are retransformed percent.

in seed treatment with Imidacloprid at 6 g/kg seed. It was followed spray of Imidacloprid 17.8 SL at 15 days after sowing. Similarly, the lowest incidence of yellow vein mosaic virus with a mean of 2.25, 4.67 and 2.42 percent was recorded at 30, 45 and 60 DAS in case of seed treatment with Imidacloprid 600 FS at 6 g/kg seed. It was followed by spray of Imidacloprid 200 SL spray @ 200 ml/ha at 15 days after sowing which exhibited 5.20, 4.40 and 3.70 percent yellow vein mosaic virus at 30, 45 and 60 days after sowing, respectively. the highest incidence with a mean of 7.40, 18.72 and 34.35 percent was recorded in untreated control.

The remaining treatments viz., seed treatment with Thiamethoxam 70 WS at 6 g/kg seed and Fipronil 80 WG sprayed at 15 DAS @ 500 ml/ha were found moderately effective. While, Thiamethoxam 25 WS sprayed at 15 DAS @ 500 ml/ha was found least effective among all the treatments both in terms of whitefly infestation and incidence of yellow vein mosaic virus.

The highest marketable yield of 251.85 q/ha was recorded in case of seed treatment with Imidacloprid 600 FS @ 6 g/kg seed. It was found at par to spray of Imidacloprid 17.8 SL @ 200 ml/ha.

In the present investigation, it was found that seed treatment with Imidacloprid @ 6 g/kg seed and roughing yellow vein mosaic virus infected/plant at respective stage was found most effective, where lowest incidence of both whitefly and incidence of yellow vein mosaic virus was recorded. Spray of Imidacloprid 17.8 SL at 15 days after sowing was the next effective treatment in reducing whitefly and yellow vein mosaic virus incidence in okra.

The present finding is in close conformity with the findings of Ameta and Sharma, 2005a in cotton; Ameta and Sharma, 2005b in cotton; Ameta *et al.*, 2005 seed in mustard, Ameta, *et al.* (2006) in pearl millet and Biswas and Bhunia *et al.* (2009) in moong bean

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