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MANAGEMENT OF SHOOT AND FRUIT BORER *EARIAS* SPP. IN OKRA

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ABSTRACT

Seven insecticides *viz.*, acephate 75 SP at 1500 gm/ha, novaluron 10 EC at 500 ml/ha, profenophos 50 EC at 1200 ml/ha, cartap hydrochloride 50 SP at 1000 g/ha, indoxcarb 14.5 SC at 500 ml/ha, triazophos 40 EC at 1000 ml/ha and endosulfan 35 EC at 1250 ml/ha as standard check were tested against okra fruit borer, *Earias* spp. during *Kharif*. Three applications of each insecticide were done at fortnightly interval. The three years pooled data revealed that all the insecticides were significantly superior over untreated check. Treatment consisting of three sprays of acephate 75 SP at 1500 g/ha recorded minimum fruit damage (13.96%) and maximum fruit yield (80.57 q/ha) however, it was at par with three spray of indoxcarb 14.5 SC at 500 ml/ha and endosulfan 35 EC at 1250 ml/ha (standard check). The maximum fruit damage (40.18%) and minimum fruit yield (30.58 q/ha) was recorded in untreated check. Maximum net profit was also recorded in acephate 75 SP at 1500 g/ha *i.e.* Rs. 47304.00/ha.

Key words: Okra, shoot & fruit borer, damage, population.

Okra, *Abelmoschus esculentus* (L.) Moench is one of the important vegetable crops, cultivated throughout India and other parts of the globe. It is extensively cultivated during both summer and *Kharif* season. Okra provides, protein, vitamins, A, B and C, calcium, potassium and other mineral matter essential dietary requirements for human being and its posses medicinal values. In India, the okra cultivated in 0.31 million hectares with the production of 3.65 million tones (FAO Report, 2007), Rajasthan, shares 4456.0 hectares with the production 11470.00 tones during 2005-06 (Anon., 2006). Production of okra is adversely affected by many species of insect pests, including jassid, *Amrasca biguttula biguttula* (Ishida), mite, *Tetranychus urticae* (Koch), aphid, *Aphis gossypii* (Glover), whitefly, *Bemisia tabaci* (Genn.), shoot and fruit borer, *Earias insulana* (Boisd) and other minor pests. Out of these, shoot and fruit borer is the most serious pest of the crop throughout the country (Pareek and Bhargava, 2003). Shoot and fruit borer enters into the shoot tips of the young plants, flower buds, flower and developing fruits and feed therein, resulting in the cessation of shoot growth and shedding of buds and flowers. Affected fruits are rendered unfit for human consumptions as well as for the procurement of seed (Bhutani and Verma, 1976). The infestation

Table 1: Efficacy of novel insecticides against fruit borer, *Earias* spp. in okra (Pooled data of 2005, 2006 and 2007)

S. No.	Treatments	Per cent fruit damage*	Yield q/ha	Net Profit (Rs./ha)
T_1	Acephate 75 SP at 1500 g/ha	13.96 (21.94)**a	80.57a	47304.00
T_2	Novaluron 10 EC at 500 ml/ha	19.86 (26.46)c	66.76b	30140.00
T_3	Profenphos 50 EC at 1200 ml/ha	24.51 (29.67)d	54.90c	20486.00
T_4	Cartap hydrochloride	31.34 (34.04)e	44.93d	10590.00
T_5	Indoxcarb 14.5 SC at 500 ml/ha	15.34 (23.06)ab	77.65a	40610.00
T_6	Trizophose 40 EC at 1000 ml/ha	25.46 (30.30)d	51.95cd	19110.00
T_7	Endosulfan 35 EC at 1250 ml/ha	17.69 (24.84)bc	74.47ab	42155.00
T_8	Untreated check	40.18 (39.34)f	30.58e	
	SEm ±	0.73	3.19	
	CD at 5%	2.19	9.66	

* Mean of three replications
** Figures within parentheses are angular transformed value of percentage
Mean followed by the same letter in column are not significantly different

due to fruit borer may reach upto on extent of 35 per cent in harvestable fruits of okra. While Srinivasana and Gowder (1959) recorded 40 to 50 per cent damage due to borer. Insecticides like endosulfan have been recommended all over the country against pests on different crops (Gupta and Bhargava 1987; Mathesawaran and Mahadevan, 1994).

MATERIALS AND METHODS

Field experiments were conducted during *Kharif* 2005 to 2007, at Agricultural Research Station, Durgapura, Jaipur (Rajasthan). The trials were laid out in randomized block design with three replications, each in $2 \times 2m^2$ plots and keeping 45 cm row to row and 30 cm plant to plant spacings. The okra variety Prabhani Kranti were sown the field on July during all the three years. All the agronomical practices recommended in the state package of practices were followed. Seven insecticides *viz*., acephate 75 SP at 1500 g/ha, novaluron 10 EC at 500 ml/ha, profenophos 50 EC at 1200 ml/ha, cartap hydrochloride 50 SP at 1000 g/ha, indoxcarb 14.5 SC at 500 ml/ha, triazophos 40 EC at 1000 ml/ha and endosulfan 35 EC at 1250 ml/ha as standard check. First spray was applied after fourth weeks of sowing and there after at fortnightly interval. The infestation of shoot and fruit borer were recorded on per cent infestation of fruits on weight basis at each picking starting from first picking till last picking of the fruits. The weight of healthy and infested fruits were taken separately and extent of infestation was worked out.

RESULTS AND DISCUSSION

Seven insecticides *viz.*, acephate 75 SP at 1500 g/ha, novaluron 10 EC at 500 ml/ha, profenophos 50 EC at 1200 ml/ha, cartap hydrochloride 50 SP at 1000 g/ha, indoxcarb 14.5 SC at 500 ml/ha, triazophos 40 EC at 1000 ml/ha and endosulfan 35 EC at 1250 ml/ha as standard check were tested against okra fruit borer, *Earias* sp. in okra during *Kharif* seasons. Three applications of each insecticide were done at fortnightly interval. The three years pooled data revealed that all the insecticides were found significantly superior over untreated check. Treatment consisting of three sprays of acephate 75 SP at 1500 g/ha (T-1) recorded minimum fruit damage (13.96%) and maximum marketable yield (80.57 q/ha), it was at par with (T-5) three spray of Indoxcarb 14.5 SC at 500 ml/ha and (T-7) Endosulfan 35 EC at 1250 ml/ha (standard check) both in terms of reduction in fruit borer damage and marketable yield. Dangi and Ameta (2005) observed that acephate 0.05 per cent was most effective on the basis of per cent shoot and fruit borer infestation and marketable yield. Similarly, Patil *et al.* (2004) and Singh and Kumar (2005) reported that indoxcarb 14.5 SC @ 75 g a.i./ha was most effective against the boll worm incidence. The maximum fruit damage (40.18%) and minimum fruit yield (30.58 q/ha) was recorded in untreated check. Maximum net profit was also recorded in case of Acephate 75 SP (T-1) at 1500 g/ha *i.e.* Rs. 47304.00/ha. The present findings are in agreement with those of Tomar (1998) and Das *et al.* (2001) who recorded the highest yield of okra up to 46.78 q/ha in acephate 75 SP treated plots.

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