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Comparative Efficacy 0f Insecticides Against Sucking Insect Pests of Cotton

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Abstract

An experiment was conducted to evaluate the efficacy of Monocrotophos 40WSC, Endosulfan 35EC, Confidor 200SL, Polo 500SC and Cascade 10WDC against whitefly, jassid, and thrips on cotton at Ammanullah Agricultural Model Farm Mana More Tehsil Burewala, Vehari in 2007. All the test insecticides caused significant mortality of whitefly and thrips at 24 hours, 72 hours, and even 168 hours after spray. All insecticides showed significant mortality against jassid at 24 hours and 72 hours after spray. However all insecticides showed statistically same efficacy against jassid at 168 hours after spray. Confidor and Polo were highly effective while Cascade was least effective against sucking insect pests of cotton.

Key Words: efficacy, insecticides, jassid, thrips, whitefly

Introduction

Cotton (*Gossypium hirsutum* L.) is regarded as mainstay of Pakistan's economy because it is major source of foreign exchange and plays vital role in economic development of the country. Despite of all efforts, per acre yield of cotton in Pakistan is still low. Among various factors responsible for low yield of cotton, insect pests are the most important factors causing 30-40% yield losses in Pakistan (Haque, 1972). Ninety three insects and mites are reported to attack cotton crop in Pakistan (Yunus and Yousuf, 1979). The sucking insect pests including whitefly (*Bemisia tabaci* Genn.), thrips (*Thrips tabaci* Lind.), and jassid (*Amrasca biguttula biguttula* Ishida) are more injurious to the cotton which cause 40-50 percent damage in the crop (Naqvi, 1976). They cause damage by sucking the sap from the under surface of leaves. Control of insect pests with insecticides is widely practiced by growers because it is highly effective and rapid one. Previous investigations about the efficacy of different pesticides to control sucking insect pests have been conducted by various workers (Ahmad and Hussain, 1993; Tufail *et al*., 1995; Attaque and Ghaffar, 1996; Wahla *et al.,* 1997; Natwick, 1999; Saleem *et al.,* 2001; Aslam *et al.,* 2004; Khattak *et al.*, 2006; Shah *et al*., 2007). Present study was conducted to compare efficacy of different insecticides against sucking insect pests of cotton including jassid, whitefly, and thrips.

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Materials and Methods

During 2007, an experiment was conducted to test the efficacy of Monocrotophos 40WSC, Endosulfan 35EC, Confidor 200SL (imidacloprid), Polo 500SC (diafentrhiuron) and Cascade 10WDC (flufenoxuron) against sucking insect pests of cotton at a grower's field located at Amanullah Agricultural Model Farm Mana More, Tehsil Burewala District Vehari, Punjab, Pakistan. The cotton variety FVH-144 was sown on June 17, 2007 in RCBD with plot size 30 ft x 10 ft. having row to row distance of 25-30 cm. Plant to plant distance of 60-75 cm was maintained during thinning. There were six treatments including a control and each treatment was replicated three times (Table 1). The insecticides were applied on the crop in the form of spray with the help of knapsack hand sprayer having 20 liters capacity fitted with hollow cone nozzle. The control plots were sprayed with water only. All agronomic practices followed were uniform in whole cotton field under trial. Data regarding population of whitefly, jassid, and thrips were recorded in each plot 24 hours before application, 24 hours, 72 hours, and 168 hours after spray from 5 plants taken randomly by selecting a leaf from upper ⅓rd portion of first plant, a leaf from middle ⅓rd portion of second plant, and a leaf from lower ⅓rd portion of third plant and so on. The % mortality was corrected by using Abbot's (1925) formula. Data were subjected to analysis of variance using of SAS (1987). Significant differences in means were separated using Duncan's multiple range test ($P = 0.05$).

Results and Discussion

Whitefly

All tested insecticides caused significant mortality of whitefly even at 168 hours after spray. Polo,

Confidor and Enosulfan were statistically equally and highly effective with mortality of 90.03%, 87.82% and 82.79% respectively, followed by Cascade and Monocrotophos with mortality of 53.49% and 49.64% respectively, at 24 hours after spray. Confidor, with mortality of 91.70% which was significantly (P=0.05) better than Polo, Endosulfan, Monocrotophos and Cascade with mortality of 68.02%, 67.61%, 62.74%, and 61.69%, respectively against whitefly at 72 hours after spray. Confidor and Polo were highly effective with mortality of 73.01 and 69.73% respectively, followed by Endosulfan, Cascade and Monocrotophos with mortality of 64.55%, 48.48%, and 41.74%, respectively 168 hours after spray. These findings are in accordance with that of Mohan & Katiyar (2000) who found that Confidor significantly suppressed whitefly population in cotton. Mustafa (2000) found that both Confidor and Polo resulted almost 72.6% mortality of whitefly. Khattak *et al.* (2004) found that Confidor and polo showed significant reduction in the whitefly population at 24 hours, 72 hours and even 120 hours after spray.

Jassid

Confidor, Monocrotophos, Polo and Endosulfan were statistically equally effective with mortality of 96.50%, 95.09%, 90.16% and 79.58%, respectively at 24 hours after spray. Cascade was least effective with 55.87% mortality. Confidor, Monocrotophos and Polo showed statistically same mortality of 98.32%, 91.61%, and 90.60%, respectively at 72 hours after spray. Cascade and Endosulfan were less effective with mortality of 77.20% and 67.72%, respectively. The efficacy of all insecticides was statistically same at 168 hours after spray. Our findings were supported by Mustafa (1996) and Hameed *et al.* (1997) who investigated that Confidor was highly effective against jassid. Yazdani *et al.* (2000) found better control of jassid by Confidor. Khattok *et al.* (2004) found that Confidor 200 SL was significantly more effective against jassid than Polo at 24 hours and 72 hours after spray.

Thrips

Polo, Monocrotophos, Endosulfan and Confidor were equally effective with mortality of 96.52%, 90.08%, 94.51% and, 87.00% respectively, followed by cascade with mortality of 74.47%. at 24 hours after spray. Polo and confidor showed better results with mortality of 97.46% and 96.12%, respectively at 72 hours after spray, followed by Monocrotophos, Endosulfan, and Cascade with statistically same mortality of 87.39%, 84.22% and 82.24% respectively. Confidor with 91.01% mortality was highly effective followed by Polo, Monocrotophos, Endosulfan, and Cascade with mortality of 88.56%, 86.25%, 82.60% and 79.24%, respectively at 168 hours after spray The results of present studies are in accordance with Wahla *et al.* (1997) who investigated that Confidor effectively controlled cotton Thrips. Our findings demonstrated that Confidor 200SL was highly effective against whitefly, jassid and thrips. These results agree with the investigations carried out by various scientists (Afzal *et al.,* 2001; Tayyib *et al.,* 2005; Shah *et al*., 2007). They found that Confidor was very effective against sucking insect pests of cotton. These insecticides can be recommended to the growers to manage the population of the sucking insect pests of cotton below economic threshold.

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Table 1. Insecticides used against sucking insect pests of cotton

S. No.	Insecticides used	Dose ml/acre
1.	Monocrotophos 40WSC	500
2.	Endusulfan 35EC	1000
3.	Confidor 200SL	250
4.	Polo 500 SC	250
5.	Cascade 10WDC	400
6.	Control	Nil

Table 2. Mortality %age of Jassid, Whitefly, and Thrips

Insecticides used	Time of mortality after spray								
	24 Hours			72 Hours			168 Hours		
	Jassid	Whitefly	Thrips	Jassid	Whitefly	Thrips	Jassid	Whitefly	Thrips
Moncrotophos	95.09a	49.64b	90.08a	91.61a	62.74b	87.39b	71.99a	41.74c	86.25bc
Endusulfan	79.58a	82.79a	94.51a	67.72c	67.61b	84.22b	71.99a	64.55b	82.60bc
Confidor	96.50a	87.82a	87.00a	98.32a	91.70a	96.12a	87.81a	73.01a	91.01a
Polo	90.16a	90.03a	96.52a	90.60a	68.02b	97.46a	91.05a	69.73ab	88.56ab
Cascade	55.87b	53.49b	72.47b	77.20b	61.69b	82.24b	95.50a	48.48bc	79.24c

Means with same letter are not significantly different from each other according to Duncan's Multiple Range Test at $P = 0.05$