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Short Communication

Bio-efficacy of Synthetic Insecticides against White fly (*Bemisia tabaci*) infesting Bt Cotton

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Abstract

Cotton (Gossypiumspp.) popularly known as 'white gold' is one of the most ancient important cash crop of india. Aparts from its value as fibre, it has great potential to be used as edible oil, food for animals and other byproducts like particle board and boxes. White fly (Bemisia tabaci) is a major sucking pest on cotton crop, causing quantitative and qualitative losses to cotton. An experiment was conducted at agriculture research station ,sriGanganagar to evaluate the bio-efficacy of different insecticides against cotton White fly (B. tabaci). Maximum percent reduction was observed with Trizophos 40 EC (63.22%) followed by the Acetamiprid 20% SP (55.61%) and these were statistically at. par and significantly superior over rest of the treatment. The phytotoxic effect on crop could not be observed during the experimental period.

Keywords: Bio-efficacy, Synthetic, Insecticides against White fly, infesting, Cotton.

Introduction

Cotton is a commercial fibre crop and is cultivated on 76.1 lac hectares with a production of 28.5 lac tones; the productivity of the crop is only 374 kg lint per hectare[1]. It is grown across 68 countries in about 33.98 million hectare with a productivity of 622 kg/ha. Amongst various causes of low yield, lossess due to insect-pests are one of the important factor. Many insect-pests are encountered on cotton crop from germination to harvesting. Patil, reported yield losses about 30 -80% by insect-pests[2] and according to Choudhary, 184 insect-pests in India have been recorded on cotton[3] whereas through another report over 162 species of insect-pests have been reported[4]

Insect pest attack is one of the most important limiting factors in the successful cultivation of this crop. Mathews, about 1326 species of insects on cotton worldwide[5]. Out of them the whitefly, *Bemisia tabaci* (Hemiptera: Aleyrodidae) is widely distributed polyphagous pest in tropical and sub tropical regions of India cotton is high value fibre crop that face considerable economic losses due to consistent damage caused by whitefly.

To mange this insect pest various methods like cultural, mechanical, physical, biological and chemical are used as components of integrated pest management. Among them, the chemical control is most popular weapon because it gives faster results. For the management of whitefly a number or insecticides of different groups have been tested and considered under general recommendation. However, due to high pest incidence levels, the cotton crop is subjected to increased pesticide applications, which have detrimental effects on the existing parasitic and predatory fauna. The present investigations were, therefore, undertake to evaluate the efficacy of new molecules against whitefly infesting cotton.

Methodology

The experiment was conducted in Randomized Block design with 10 treatments including Control and three replication at the Agriculture Research Station, Sri Ganganagar (Raj.). The crop was raised in 10 m x 5 m plots with 100 cm row to row and 60 cm plant to plant distance. Total four sprays of each insecticide were given at 7-10 days interval depending upon climatic condition. The efficacy of various insecticides will be assessed by counting the living population of Whitefly on 5 randomly selected plants 24 hours before and after 1, 3, 5,10 days of treatment. The data was subjected to appropriate transformation and analysis statistically.

Results and Discussion

The efficacy of new molecules against the control of whitefly depicted in the table clearly indicate that Whitefly population was significantly low in all the plots treated with insecticides over untreated. Maximum percent reduction was observed with Trizophos 40 EC (63.22%) followed by the Acetamiprid 20% SP (55.61%) and these were statistically at. par and significantly superior over rest of the treatment. The phytotoxic effect on crop could not be observed during the experimental period.. In our experiment, ten chemicals were tested against Whitefly under field conditions, among these chemicals some were found effective against Whitefly while others were found to be less effective. The results of the present studies disfavoured the results of Latif *et al.* who determined that confidor was not much effective insecticides against whitfly[6].

Table-1
Testing bio-efficacy of new insecticides against the control of White fly

Treatment	Mean % reduction of White fly/ 3 leaves			
	1	**3**	**5**	**10**
Acephate 75% sp	53.61 (47.06)	43.44 (41.19)	39.13 (38.65)	24.25 (29.38)
Thiamethoxam 25% WG	54.43 (47.57)	48.66 (44.21)	45.07 (42.13)	36.07 (36.83)
Acetamiprid 20% sp	63.45 (52.84)	55.34 (48.05)	52.96 (46.67)	50.69 (45.37)
Diafenthiuron 50% WP	61.32 (51.57)	56.91 (48.97)	46.69 (43.07)	31.90 (34.32)
Calypso	40.87 (39.71)	38.25 (38.15)	36.20 (36.89)	32.67 (34.78)
Sulfoxaflor 24% SC	25.20 (29.98)	21.51 (27.51)	20.21 (26.59)	15.84 (23.24)
Trizophos 40 EC	69.27 (56.40)	62.96 (52.54)	61.14 (51.43)	59.51 (50.50)
Imidacloprid 17.8% SL	57.60 (49.38)	53.88 (44.78)	51.96 (46.11)	49.40 (44.63)
Pyriproxyfen 10 EC	34.31 (35.78)	28.74 (32.31)	23.70 (28.99)	22.00 (27.85)
Control	2.04 (7.95)	2.15 (8.25)	2.06 (7.95)	2.39 (8.74)
SEM	1.65	1.56	1.40	1.48
CD at 5%	4.92	4.64	4.16	4.41
CV%	6.87	6.98	6.59	7.65

Values in parentheses are angular transformed values.

The present findings can be compared with those of Afzal *et al.* (2002) who reported that Imicon 25 WP @ 200 gm/acre (imidacloprid) was found to be most effective for whitefly[7]. In the present study it was found that the treatment of Trizophos 40 EC (63.22%) followed by the Acetamiprid 20% SP (55.61%). Proved to be most effective, these were significantly superior to rest of all the treatments. The highest seed cotton yield was also recorded in the same treatment. The treatment module in the applied does not show any phytotoxic effect on cotton plants. During the experimentation period , the natural enemies were spiders, chrysopa, and wasp among the main predators of insect pests of cotton

Conclusion

The present study was undertaken with an aim to analyze efficacy of different insecticides against cotton whitefly. There were ten treatment including a control under three replications. Total four sprays were given during the crop season. The pooled data of four sprays depicted in table clearly indicate that whitefly population was significantly low in all the plots treated with insecticides over untreated. Maximum percent reduction was observed with Trizophos 40 EC (63.22%) followed by the Acetamiprid 20% SP (55.61%) and these were statistically at. par and significantly superior over rest of the treatment. The phytotoxic effect on crop could not be observed during the experimental period.

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