

## EFFICACY OF SOME INSECTICIDES AGAINST WHITEFLY (*BEMISIA TABACI*) INFESTING COTTON UNDER FIELD CONDITIONS

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### ABSTRACT

Fifteen insecticides, viz. Bifenthrin 10 EC @800g/ha, Clothianidin 50WDG@ 40g/ha, Diafenthiuron 50WP@ 500g/ha, Fipronil 5SC@1500ml/ha, Imidacloprid 17.8SL@100ml/ha, Phorate 10CG@10kg/ha, Pyriproxyfen 10EC@1250ml/ha, Spiromesifen 22.9SC@ 500ml/ha, Triazophos 40EC@1500ml/ha, *Verticilium lecanii* 1.15 WP@2.5kg/ha, Nimbecidine@2.5lt/ha, Achook@2.5lt/ha, Acetaphate 50%+Imidacloprid 1.8 % SP@1000ml/ha, Chlorpyrifos 50%+Cypermethrin 5% EC@1000ml/ha, Deltamethrin 1%+Triazophos 35%EC@1250ml/ha against untreated control were evaluated at their field recommended doses for their efficacy against whitefly (*Bemisia tabaci* Genn.) on cotton during 2016. The insecticides were applied at ETL of whitefly. All the test insecticides caused significant population reduction of whitefly up to 7 days after treatment. However, the most effective insecticides for whitefly, up to seven days was found to be imidacloprid followed by deltamethrin+triazaphos, achook, verticillium, chlorpyrifos+cypermethrin while rest of the insecticides were found to be equally effective. Fipronil remained least effective.

**KEYWORDS:** Insecticides, Untreated, Whitefly

### INTRODUCTION

Cotton is one of the major fiber crop grown in more than 80 countries of temperate and tropical regions. Sucking pests have become quite serious from seedling stage. Chavan *et al.* (2010) reported 28.13 per cent avoidable yield loss due to major sucking pests in cotton. Among these whitefly is the most deadly pest and reduces the crop yield to a great extent. Cotton growers in India depend heavily on synthetic pesticides to combat sucking pests. At least 2-3 sprays are directed against sucking pests. But due to continuous use of these conventional insecticides in cotton, *B. tabaci* has developed different level of resistance in it (Ahmad *et al.*, 2000). Resistance in whitefly against insecticides has increased the cost of production owing to increase in number of sprays. To overcome this problem discovery of substances with different mode of actions are needed. This study was carried out to find most effective insecticide against whitefly which is effective against at lower doses.

### MATERIAL AND METHODS

Field experiments were conducted at Cotton Farm, CCSHAU, Hisar during Kharif 2016 with sixteen treatments including untreated control each replicated thrice in randomized block design. With Cotton hybrid Bio 6588 BG II. The crop was maintained well by adapting standard agronomic practices as per the recommendations. The treatments Bifenthrin 10 EC @800g/ha, Clothianidin 50WDG@ 40g/ha, Diafenthiuron 50WP@ 500g/ha, Fipronil 5SC@1500ml/ha, Imidacloprid 17.8SL@100ml/ha, Phorate 10CG@10kg/ha, Pyriproxyfen 10EC@1250ml/ha, Spiromesifen 22.9SC@ 500ml/ha, Triazophos 40EC@1500ml/ha, *Verticilium lecanii* 1.15 WP@2.5kg/ha, Nimbecidine@2.5lt/ha,

Achook@2.5lt/ha, Acetaphate 50%+Imidacloprid 1.8 % SP@1000ml/ha, Clorpyriphos 50%+Cypermethrin 5% EC@1000ml/ha, Deltamethrin 1%+Triazophos 35%EC@1250ml/ha. All insecticides were applied as foliar spray using knapsack sprayer. First spray was done at ETL. Second spray was done 15 DAFS (days after first spray). Three sprays were given during the crop period. The population of whitefly was recorded from top, middle and bottom leaves of five randomly selected plants per plot.

## STATISTICAL ANALYSIS

Average values of these observations were subjected to analysis of variance using single factor Randomized block design. Angular transformation of the data was done and then analysed using the statistical software, OPSTAT developed by CCSHAU, Hisar.

**Table 1: Mean Population of Whitefly/3 Leaves Before and After Application of Different Insecticides on Cotton**

Treatments	1DBS	7DAFS	7DASS	7DATS	Mean
Bifenthrin	8.5(16.97)	2.8(9.59)	3(9.92)	2.6(9.24)	2.8(9.62)
Clothianidin	8.4(16.90)	2.4(8.88)	2.5(9.06)	2.7(9.50)	2.5(9.15)
Diafenthiuron	8.4(16.84)	2.8(9.74)	3(10.07)	2.4(8.88)	2.7(9.50)
Fipronil	8.4(16.84)	4.8(9.29)	4.2(11.79)	3.2(10.25)	4(11.59)
Imidacloprid	8.5(16.97)	1.1(6.07)	1.5(7.10)	0.7(4.83)	1.1(5.94)
Phorate	8.5(16.97)	2.5(9.10)	3.8(11.35)	2.4(9.02)	2.9(9.74)
Pyriproxyfen	8.2(16.70)	2.5(9.14)	5.2(13.17)	2.6(9.25)	3.4(10.51)
Spiromesifen	8.4(16.84)	2.5(9.02)	2.4(9.03)	2.8(9.73)	2.5(9.14)
Triazophos	8.6(17.04)	2.4(9.14)	3.2(10.21)	2.2(8.64)	2.6(9.30)
Verticillium	8.4(16.84)	2.5(7.55)	2.6(9.37)	2.5(9.15)	2.2(8.61)
Nimbecidine	8.5(16.97)	1.4(5.61)	1.8(5.72)	2.6(9.39)	2.9(9.57)
Achook	8.4(16.84)	2.3(8.39)	1.9(6.72)	2.7(7.71)	2(8.12)
Acetaphate+imidacloprid	8.4(16.90)	2.1(8.60)	3.3(10.50)	2.5(9.15)	2.6(9.36)
Clorpyriphos+cypermethrin	8.5(16.97)	2.2(7.23)	1.9(7.98)	2.6(9.26)	2(8.15)
Deltamethrin+triazophos	8.4(16.84)	1.6(6.57)	1.4(6.79)	3(9.85)	1.9(7.76)
Unsprayed (control)	8.5(16.97)	5.4(17.04)	8.2(16.63)	5.8(17.45)	8.6(17.04)
C.D.(p=0.05)	(NS)	(2.44)	(3.00)	(1.98)	(1.95)
SE(d)	0.101	0.56	0.64	0.81	

\*figures in parentheses are angular transformed values, DBS-days before spray, DBFS- days before first spray, DBSS-days before second spray, DBTS-days before third spray

## RESULTS AND DISCUSSION

During 2016, the pre treatment population of whitefly was uniform and non significant among treatments with a range of 8.2 to 8.6 per three leaves. All the insecticidal treatments showed excellent performance in managing the whitefly population. The imidacloprid found to be most effective and recorded the lowest population of whitefly and was followed by deltamethrin+triazophos, achook, verticillium, chlorpyriphos+cypermethrin while rest of the insecticides were found to be equally effective. Fipronil remained least effective. Similar trend was also followed in subsequent sprays. The present investigation are in conformity with the results of Raghuraman and Gupta (2005) who reported that imidacloprid was proved effective against *B. tabaci* in cotton. Similarly, Kalyan *et al.* (2012) also reported that imidacloprid effectively managed the population of whiteflies. Amjad *et al.*(2009) reported that confidor (Imidacloprid) gave effective control of whitefly population.

## CONCLUSIONS

The overall results manifest that to get effective control of whitefly soon after its onset, imidacloprid proved to be the most effective against whitefly population among the tested insecticides followed by nimbecidine and combination of insecticides. Fipronil and pyriproxyfen were least effective for the control of population of whitefly amongst the tested insecticides.

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