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Research Article

EFFICACY OF INSECTICIDES USED FOR CONTROLLING WHITEFLY IN COTTON

IRSHAD AHMAD¹, KHALID BHUTTA², MUHAMMAD ASHRAF³, MAQSOOD AHMAD⁴, MAZHER FARID IQBAL⁵, MUZZAMMIL HUSSAIN⁶, RAO KHURRAM SHAHZAD⁷ AND QURBAN ALI RANA⁸

^{1,2,3}Assistant Director Agriculture (Plant Protection) Pest Warning & Quality Control of Pesticides, Layyah, Muzafargarh², Multan³

⁴Agricultural Officer (PP) Pest Warning & Quality Control of Pesticides Sialkot.

⁵Research Officer Adaptive Research Station, Sialkot

⁶Senior Subject Matter Specialist (Agronomy) Adaptive Research Farm, Gujranwala

⁷Research Officer/Economic Investigator, Directorate General Agriculture (Ext. & A. R.) Punjab-Lahore.

⁸Agricultural Officer (Ext.) Daroghawala, Lahore

Corresponding Author: mazherfareed2004@gmail.com

Abstract

A field study was conducted to evaluate newly introduced insecticides viz. Imidacloprid 20% SL @ 625mlha⁻¹, Buprofezin 25% WP @ 1500gmha⁻¹, Pyriproxyfen 10.8 % EC @ 1000mlha⁻¹, Acetamiprid 20% SL @ 375mlha⁻¹ and Diafenthiuron 50% SC @ 500mlha⁻¹ used for controlling whitefly in cotton compared to control at District Layyah during kharif 2013. The result showed that pyriproxyfen (61.54%) showed maximum mortality followed by imidacloprid (58.79%); acetamiprid (58.24%) after 24 hours of spraying. Pyriproxyfen (77.39%) showed maximum mortality followed by diafenthiuron (75.62%); imidacloprid (75.27%) and acetamiprid (74.91%) after 48 hours. However Pyriproxyfen (80.14%) showed maximum mortality followed by imidacloprid (78.94%); acetamepid (78.77); diafenthiuron (78.60%) and buprofezin (76.37%) with relative humidity ranged (65-75%) with zero rainfall. However the farmers of this area were advised to use pyriproxyfen for controlling this pest because this insecticide was most effective and economical.

Keywords: Efficacy; Imidacloprid; Buprofezin; Pyriproxyfen; Acetamiprid; Diafenthiuron; whitefly; Layyah

Introduction

Cotton (*Gossypium hirsutum* L.) is cash crop popularly known as silver fiber and a back bone of Pakistan and considered the 4th largest producer and third largest consumer throughout the world (Zeeshan *et al.*, 2010). However the growth of agriculture is expected 1.2% compared to 0.6% during 2010 (Anonymous, 2011). Due to huge pest complex recorded in cotton crop, maximum quantity of pesticides were sprayed to break out the life cycle large number of pest compared to other crops in the world. The crop was lost upto 30-40% by the attack of Insect Pest (Huque, 1972). However newly introduced insecticides found most effective against pests than conventional insecticides (Razaq, 2005). Bollworm and sucking pest of cotton caused loss upto 20-40%

(Ahmad, 2000). However modes of action of newly introduced insecticides were important for the management of its attack (Roe, 2005). These insecticides having fast and quick action and comparatively cheaper among conventional insecticides (Razaq, 2005) and proved less persistence and toxic (Anjan *et al.*, 2009). Cotton whiteflies *Bemisia tabaci* (Genn.) family Aleyrodidae, order Hemiptera caused huge damage to crop by sucking the cell sap from the leaf (Ali and Aheer, 2007). Whitefly attack on cotton started from early phase up to maturity (Aslam *et al.*, 2001; Tayyab *et al.*, 2005). Haphazard use of insecticides without any specific pattern developed resistance against insect-pests (Udikeri, 2009; Bashir *et*

al., 2001). Crop protection by using toxic chemicals was desirable and unavoidable part of Integrated Pest Management (IPM) (Mohyuddin *et al.*, 1997). The studies reported that about 10 billion rupees were consumed by importing pesticides in Pakistan, out of which 70-80% were sprayed to insect-pests. Therefore the study was planned to evaluate the efficacy of newly introduced insecticide used for controlling whitefly in cotton at District Layyah.

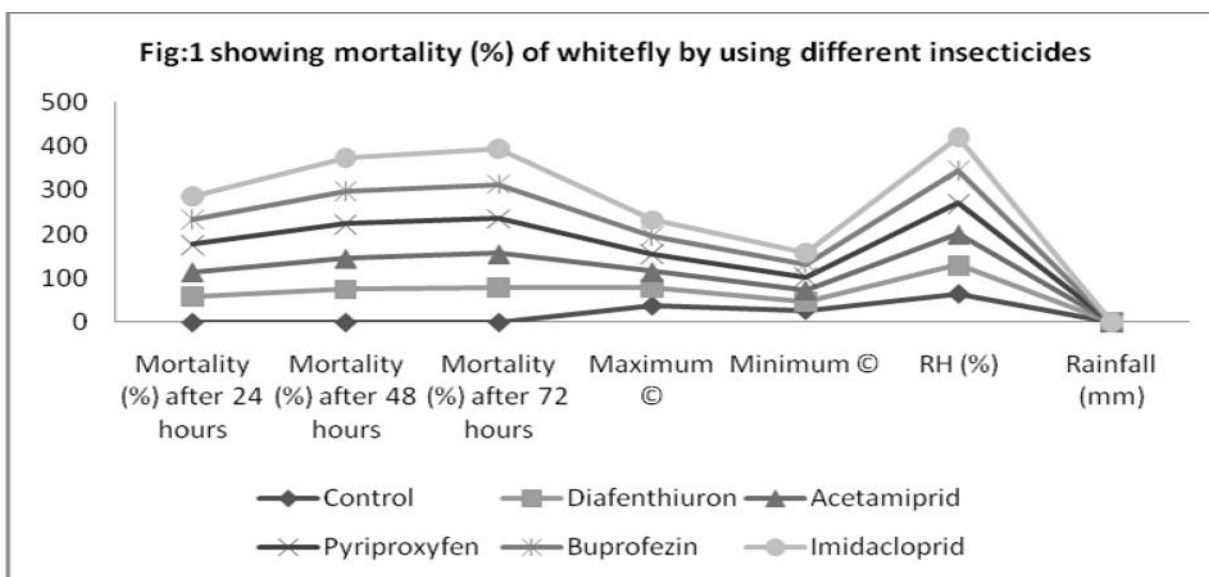
Materials and Methods

A field study was conducted to evaluate newly introduced insecticides viz. Imidacloprid 20% SL @ 625mlha⁻¹, Buprofezin 25% WP @ 1500gmha⁻¹, Pyriproxyfen 10.8 % EC @1000mlha⁻¹, Acetamiprid 20% SL @ 375mlha⁻¹ and Diafenthiuron 50% SC @ 500mlha⁻¹ used for controlling whitefly in cotton compared to control at District Layyah during kharif 2013. Cotton variety Bt- 886 was sown on 1st April 2013 in Tehsil Karor District Layyah. Experiment was laid out by Randomized Complete Block Design (RCBD) with four replications having RxR and PxP distance was maintained at 70cm and 25-30cm respectively. The said pesticides were sprayed by using knapsack hand sprayer with hollow cone nozzle keeping 100 lha⁻¹ of water. All the agronomic and plant protections measure were kept constant to avoid any biasness. Mortality (%) data was recorded after 24; 48 and 72 hours after spraying. Twenty leaves were selected from four randomly selected plants from each treatment having four replications. Three leaves were

selected from top; middle and lower portion of the randomly selected plant.

Results and Discussion

Fig. 1 showed that the result showed that pyriproxyfen (61.54%) showed maximum mortality followed by imidacloprid (58.79%); acetamiprid (58.24%) after 24 hours of spraying. Pyriproxyfen (77.39%) showed maximum mortality followed by diafenthiuraon (75.62%); imidacloprid (75.27%) and acetamiprid (74.91%) after 48 hours. However Pyriproxyfen (80.14%) showed maximum mortality followed by imidacloprid (78.94%); acetameprid (78.77); diafenthiuron (78.60%) and buprofezin (76.37%) with relative humidity ranged (65-75%) with zero rainfall. These results were supported by Asi *et al.*, (2008); Aslam *et al.*, (2004); Tayyib *et al.*, (2005); Mohan and Katiyar, (2000); Ali *et al.*, (2005) who reported that Imidacloprid and acetamiprid was most effective against sucking insect-pest of cotton espacially whitefly. They also suggested that Movento and Imidacloprid were proved to be highly efficient against sucking pests of cotton. These results were highly compatible with Hameed *et al.*, (1997). These results were contradictory to Saleem and Khan (2001) and Tayyib *et al.*, (2005) who reported that Imidacloprid gave good control against whitefly. However these results were also in accordance to Arif *et al.*, (2004); Ali *et al.*, (2005); Ahmad *et al.*, (2000) and Udikeri, (2009) who reported that newly introduced insecticides were most effective against sucking insect-pests of cotton crop



Conclusion

At the end it was concluded that all the insecticides were involved for controlling whitefly in cotton. However the farmers of this area were advised to use pyriproxyfen for controlling this pest because this insecticide was most effective and economical.

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