
INTERNATIONAL JOURNAL OF CURRENT RESEARCH IN BIOLOGY AND MEDICINE

ISSN: 2455-944X

www.darshanpublishers.comVolume 3, Issue 12 - 2018

Original Research Article

DOI: <http://dx.doi.org/10.22192/ijcrbm.2018.03.12.006>

Evaluation of different insecticides used against whitefly at District Lodhran, Punjab - Pakistan

Maqbool Shah^{1*}, Ikram ul Haq¹, Syed Ismat Hussain², Muhammad Ashraf²,
Ghulam Ghouse³ and Saira Siraj⁴

Pest Warning & Quality Control of Pesticides, Lodhran¹, Multan², Dunya Pur³ and Kehrora Pacca⁴

*Corresponding author:

Abstract

A research trial was carried out to study the insecticidal management i.e. Pyriproxyfen 10.8% EC @ 1000mlha⁻¹, Buprofezin 25% WP @ 1500gha⁻¹, Acetamiprid 20% SL @ 312mlha⁻¹; Spirotetramate 240% SC @ 312 ml ha⁻¹; Flonicamid 50% WG @ 150gha⁻¹; Diafenthiuron 50% SC @ 500mlha⁻¹; Matrine 0.5% AS @ 1250 mlha⁻¹ of whitefly (*Bemisia tabaci*) during 2018. The present data showed statistically highly significant (P<0.01) mortality (%) was recorded by the spraying of Diafenthiuron (19.74) followed by Matrine (18.18) and Pyriproxyfen (15.00) after 24 hours. However after 48 hours of spraying maximum mortality was recorded by Buprofezin (41.51%) followed by Spirotetramate (35.71%) and Pyriproxyfen (30%). Significantly maximum mortality of whitefly was recorded by Pyriproxyfen (61.67%) followed by Buprofezin (53.77%) and Spirotetramate (51.19%) after 72 hours of application of insecticides, pest pressure was gradually increased in control with the passage of time. It is concluded that the growers are advised to spray pyriproxyfen, buprofezin and spirotetramate to regulate whitefly in standing cotton crop with the consultation of technical staff of Punjab Agriculture Department.

Keywords: Insecticides; evaluation; field; cotton; whitefly; Lodhran, Punjab-Pakistan

Introduction

Cotton as a fiber crop occupies a unique position in economy of Pakistan contributing about 68% of foreign exchange earnings, 1.5% of GDP and 7 % of value addition in agriculture, moreover, 66.5% in national oil production (Anonymous, 2013). *Gossypium hirsutum* L. has considered cash crop, spinal column of Pakistan and deliberated the 4th substantial producer in the world (Zeeshan *et al.*, 2010). *Gossypium barbadence* L. (white gold) is important economical crops and its substantial proportion is utilized by the local textile industry.

Cotton played an important role in improving the livelihoods of most of the farmers (Zaki, 2012). Sucking insect pests are Whitefly (*Bemisia tabaci*

Genn.), Thrips (*Thrips tabaci* Lind.), Jassid (*Amrasca devastans* Dist.) and Aphid (*Aphis gossypii* Glover) (Aslam *et al.*, 2004). The severe attack of these sucking pests causes yellowing of leaves that inhibits both the development and growth of the plant and eventually the plant dries up due to the loss of cell sap (Ghelani *et al.*, 2014). The use of synthetic insecticides is among the methods that provide rapid control and also an essential part of Integrated Pest Management to limit the insect pests attack on cotton crop (Gogi, *et al.*, 2006). Various studies were conducted regarding the comparative efficacy of different synthetic insecticides against these pests (Aslam *et al.*, 2004; Ghelani *et al.*, 2014; Saleem *et al.*, 2001; Shivanna *et al.*, 2011).

Bemisia tabaci belongs to Aleyrodidae family and Hemiptera order caused substantial detriment to crop by its sucking behavior (Ali and Aheer, 2007). *B. tabaci* damage started at initial stage of growing cotton crop up to maturity (Aslam *et al.*, 2001; Tayyab *et al.*, 2005). Erratic application of chemicals created resistance (Udikeri, 2009; Bashir *et al.*, 2001) however Plant protection measures using poisonous chemicals were desirable but unavoidable part of IPM (Mohyuddin *et al.*, 1997). Insecticides having fast and quick action and comparatively cheaper among conventional insecticides (Razaq, 2005) and proved less persistence and toxic (Anjan *et al.*, 2009) however maximum quantity of pesticides were sprayed to control insects. Newly introduced insecticides were found effective than conventional ones (Razaq, 2005). However bollworm and sucking pest of cotton caused loss up to 20-40% (Ahmad, 2000). Therefore the present study was intended to appraise the usefulness of newly introduced insecticide used for scheming whitefly in cotton crop at District Lodhran.

Materials and Methods

A research investigation was carried out to evaluate the efficacy of different insecticides i.e. Pyriproxyfen 10.8% EC @ 1000mlha⁻¹, Buprofezin 25% WP @ 1500gha⁻¹, Acetamiprid 20% SL @ 312mlha⁻¹; Spirotetramate 240% SC @ 312 mlha⁻¹; Flonicamid 50% WG @ 150gha⁻¹; Diafenthiuron 50% SC @ 500mlha⁻¹; Matrine 0.5% AS @ 1250 mlha⁻¹ compared to control at Mouza Miranpur Tehsil and District Lodhran during kharif 2018. This research trial was laid out by RCBD with three replications (Ahmad *et al.*, 2014). Each plot was separated by using sticks and scheduled pesticides were sprayed on each treatment keeping 300 lha⁻¹ water. All the other practices like fertilizer irrigation applications were constant and uniform during whole season. Mortality (%) data were recorded before and 24; 48 and 72 hours after spraying of each pesticide. Twenty leaves were selected from twenty randomly selected plants from each treatment with three replications and take their average (Picture-1).



Picture-1 showing collection of data of whitefly at District Lodhran

However leaves were selected from top; middle and lower portion of the randomly selected plants and population of insects were counted. The data were statistically analysed by ANOVA and significant treatment means were separated using the least significant difference (LSD) at P 0.05 level (Steel and Torrie, 1997).

Results and Discussion

Figure-1 showed that statistically highly significant ($P < 0.01$) control was recorded by the spraying of Pyriproxyfen (4.6/leaf); Buprofezin (4.9/leaf); Spirotetramate (4.1/leaf) and acetamiprid (5.5/leaf).

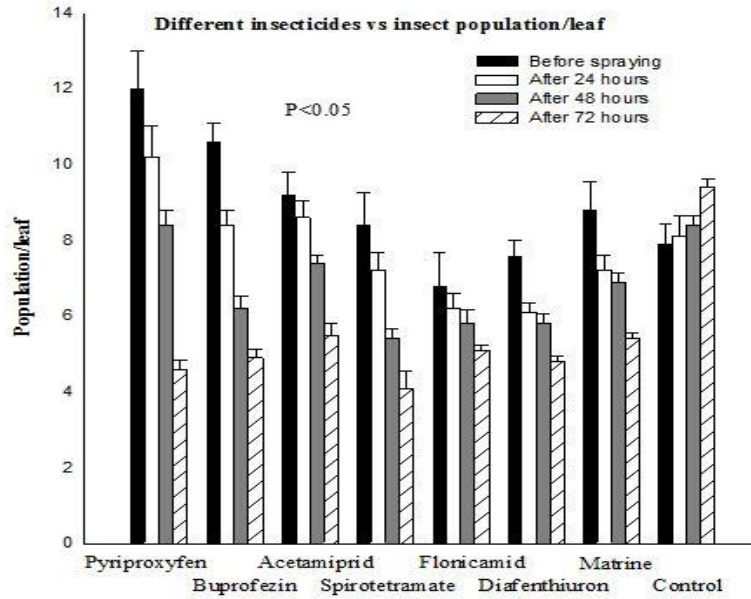


Figure-1 showing insecticides vs number of whitefly per leaf

Figure-2 showed that statistically highly significant ($P < 0.01$) mortality (%) was recorded by spraying of Diafenthiuron (19.74) followed by Matrine (18.18) and Pyriproxyfen (15.00) after 24 hours. After 48 hours of spraying maximum mortality was recorded by Buprofezin (41.51%) followed by Spirotetramate (35.71%) and Pyriproxyfen (30%). However significantly maximum mortality of whitefly was recorded by Pyriproxyfen (61.67%) followed by Buprofezin (53.77%) and Spirotetramate (51.19%)

after 72 hours of application of insecticides however pest pressure was gradually increased in control with the passage of time. Strong positive correlation ($R^2 = 0.7112$) was recorded compared to control treatment in the studied area at Lodhran. These results were in line with Ahmad *et al.*, (2014) who reported Pyriproxyfen best insecticide for controlling this pest in his field experiment. These results were contradictory to Tayyib *et al.*, (2005).

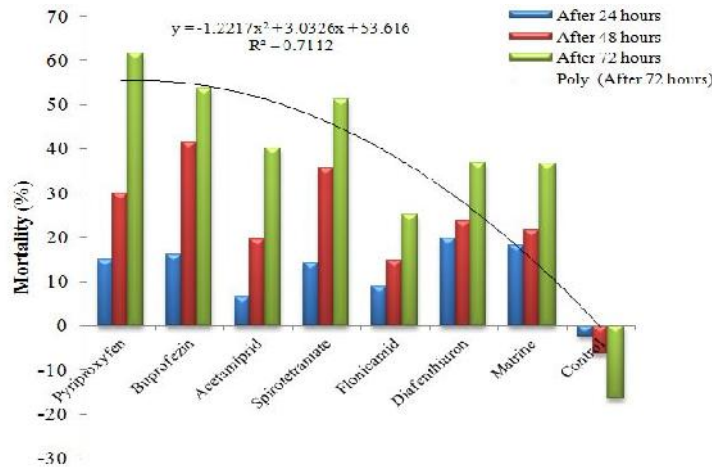


Figure-2 showing correlation of insecticides vs mortality (%) of whitefly

Conclusion

The growers of this region are advised to use pyriproxyfen, buprofezin and spirotetramate for the best management of this sucking pest (whitefly) in cotton crop with the consultation of plant doctors of Pest Warning and Quality Control of Pesticides, Punjab-Pakistan.

References

- Ahmad, M., Aslam, M., and Aulakh, M. A. 2000. Comparative efficacy of some insecticides against cotton whitefly (*Bemisia tabaci*) (Genn.). Pak. J. Agri. Sci., 37(3-4): 183-185.
- Ahmad, I., Bhutta, K. Ashraf, M., Ahmad, M., Iqbal, M.F., Hussain, M., Shahzad, R.K. and Rana, Q. A. 2014. Efficacy of insecticides used for controlling whitefly in cotton. Int. J. Curr.Res.Chem.Pharma.sci. 1(8):01-03.
- Ali, A. and Aheer, G. M. 2007. Varietal resistance against sucking insect pests of cotton under Bahawalpur ecological conditions. J. Agric. Res., 45(3): 1-5.
- Anjan, B., Suhrid, R. B., and Pritam, G. 2009. New pesticides molecules formulation technology and uses. Present status and future challenges. J. Plant Protect. Sci., 1(1): 9-15.
- Anonymous, "Economic Survey Pakistan 2012-13", Ministry of Food and Agriculture, Islamabad, Pakistan, pp. 17-33.
- Aslam, M., M. Razaq, S.A. Shah, and F. Ahmad. 2004. "Comparative efficacy of different insecticides against sucking pests of cotton", J. Res. Sci., 15:53-58.
- Aslam, M., Khan, A. H., Rasheed, T., and Khan, I. H. 2001. Monitoring whitefly (*B. tabaci*) (Genn.) on cotton. Pak. J. Zool Sci., 33(4): 261-264.
- Bashir, M.H., Afzal, M., Sabri, M. A., and Raza, A. M. 2001. Relationship between sucking insect pests and physio-morphic plant characters towards resistance/susceptibility in some new cotton genotypes of cotton. J. Pak. Entom., 23: 75-78.
- Ghelani, M. K., B.B. Kabaria and S.K. Chhodavadia. 2014. "Field efficacy of various insecticides against major sucking pests of Bt cotton" J. Biopest, 7:27-32.
- Gogi, M. D., R.M. Sarfraz, L.M. Dossdall, M.J. Arif, A.B. Keddie and M. Ashfaq. 2006. "Effectiveness of two insect growth regulators against *Bemisia tabaci* (Gennadius) (Homoptera: Aleyrodidae) and *Helicoverpa armigera* (Hubner) (Lepidoptera: densities, of arthropod predators in cotton in Pakistan", Pest Manage. Sci., 62:982-990.
- Mohyuddin, A.I., Jilani, G., Khan, A.G., Humza, A.I. and Mehmood, Z. (1997). Integrated Pest Management of major cotton pests by conservation, redistribution and augmentation of natural enemies, Pak. J. Zool., 29(3):293-298.
- Razaq, M., Suhail, A., Aslam, M., Arif, M. J. Saleem, M. A., and Khan, M. H. A. 2005. Evaluation of new chemistry and conventional insecticides against *Helicoverpa armigera* (Hubner) on Cotton at Multan (Pakistan). J. Pak. Entom., 27(1): 71-73.
- Saleem, M. A., K. Mustafa and R. Hussain. 2001. "Comparative efficacy of some insecticides against some sucking insect pests of CIM-443 cotton", Pak. Entomol., 23:91-92.
- Shivanna, B.K., B. G. Naik, R. Nagaraja, M.K. Basavaraja, C.M. K. Swamy and C. Karegowda. 2011. "Bio-efficacy of new insecticides against sucking insect pests of transgenic cotton", I.J.S.N., 2:79-83.
- Steel, R.G.D. and J.H. Torrie, 1997. Principles and Procedures of Statistics with Special Reference to the Biological Sciences, Mc Graw Hill Book Co. Inc. New York, pp: 481.
- Tayyib, M., Sohail, A., Shazia, Murtaza, F., and Jamil, F. F. 2005. Efficacy of some new chemistry insecticides for controlling sucking insect-pests and mites on cotton. J. Pak. Entom. 27(1): 63-66.
- Udikeri, S.S. 2009. Management of sucking pests in cotton with new insecticides. Karnataka J. Agric. Sci. 22(4):798-802.

Ali, A.A.A. (2012). The pink boll worm, side effect on some sucking pests and their associated predators. Egypt. J. of Appl. Sci., 27(12B): 194-207.

Zeeshan A., Khan, T. M., and Noorka, I. R. 2010. Detail analysis to determine gene action for lint (%) and fiber traits in upland cotton. Int. J. Agric. Appl. Sci. 2(1):11-14.

Access this Article in Online	
	Website: www.darshanpublishers.com
	Subject: Agricultural Sciences
Quick Response Code	

How to cite this article:

Maqbool Shah, Ikram ul Haq, Syed Ismat Hussain, Muhammad Ashraf, Ghulam Ghouse and Saira Siraj. (2018). Evaluation of different insecticides used against whitefly at District Lodhran, Punjab - Pakistan. Int. J. Curr. Res. Biol. Med. 3(12): 42-46.

DOI: <http://dx.doi.org/10.22192/ijrbm.2018.03.12.006>