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Comparative efficacy of some insecticides against army worm on mung bean crop in district Bhakkar-Punjab, Pakistan

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Abstract

The study was conducted to evaluate the effectiveness of T-1 (Flubendamide (Belt 48% SC) @ 87.5 mlha^{-1}, T-2 (Lufenuron (Match 5% EC) @ 500mlha^{-1}; T-3 (Chlorpyrifos (Brisban 40%EC) @ 2500mlha^{-1}, T-4 (Emamectin Benzoate+Lufenuron+Clofentezine (Emalu 4% EC) @1000mlha^{-1}; T-5 (Chlorantraniliprole+Thiomethoxam (Volume Flexy 300SC) @ 200mlha^{-1}) compared to T-6 (Control) for controlling Army Worm on mung bean crop (*Vigna radiata* L.) in District Bhakkar during Kharif-2015 with RCBD. All the chemicals showed statistically significant ($P<0.05$) impact on mung bean crop compared to control after one day after spraying but T-1; T-2; T-4 and T-5 showed maximum mortality after three days (100%, 100%, 98.92%, 95.01%) showed non-significant ($P>0.05$) effect with each other. However 100% mortality was recorded by T-1, T-2 and T-4; however, 96.25% mortality was recorded by T-5 compared to T-6 after 7 days. At the end it was concluded that new chemistry of insecticides showed maximum results after 3 and 7 days so that the farmers of this District were advised to use T-1, T-2, T-4 and T-5 treatments of insecticides for controlling Army Worm on mung bean crop (*Vigna radiata* L.) in District Bhakkar with the consultation of Plant Doctors of Pest Warning and Quality Control of Pesticides.

Keywords: mungbean; effectiveness; insecticides; Army Worm; new chemistry; Bhakkar-Punjab, Pakistan.

Introduction

Mung bean (*Vigna radiata* L.), commonly known as green gram, is an important conventional pulse crop of Pakistan including Asia. Mung bean is high in digestible protein and does not cause the flatulence that may other legume do. Its seeds contain 24.20% protein, 1.30% fat and 60.40% carbohydrates (Considine, 1982). It has an edge over other pulses because of its high nutritive value and digestibility. It is grown principally for its protein rich edible seeds (Haq, 1989). Because of its protein value, it is rightly called as poor man meat. Mung bean is an important pulse crop that can be grown twice a year (spring and autumn). Among the grain legumes, it is one of the important conventional pulse crops of Pakistan. It is a short duration, drought tolerant and fits well in every cropping system. In Pakistan it is grown annually on an area of 245.40 thousand hectare and total seed yield of 529.70 kg per hectare (Anonymous, 2005) its yield is very low compared to other countries. The production of mung is increased by 3.30% during 2013-2014. However the production of other pulses mash and Masoor (Lentil) decreased by 6.4% and 5.10%. The reason for decreased in production is decreased in area sown compared to corresponding period of last year (Anonymous, 2013). It maintains soil fertility through biological nitrogen fixation in soil and thus plays a vital role in further sustainable agriculture development (Kannaiyan, 1999). This crop also fixes atmospheric nitrogen (Malik, 1994). The ability of mung bean crop is to establish a symbiotic

partnership with specific bacteria, setting up the biological nitrogen fixation in root nodules that supply the plant's needs for nitrogen (Mehmood, 2008). It is a short duration crop therefore has less water requirement (delta of water) compared to summer crops. It is a drought resistant that can withstand adverse environmental conditions and hence successfully be grown in rain fed areas (Anjum et. al., 2006). Mung bean do best on fertile sandy loam soils with good internal drainage with a pH between 6.2 to 7.2 and plants can show severe iron chlorosis symptoms and certain micronutrient deficiencies on more alkaline soils. Mung bean is infested by different species of insect pests like whitefly; jassids, thrips and Armyworm are the major importance. These insect pests not only reduce the vigor of the plant by sucking the sap but also transmit diseases and affect photosynthesis process. However the farmers in Pakistan mostly used synthetic pesticides because of these quick knock down effects. The present study has been conducted to determine the comparative efficacy of insecticides to check the army worm mortality on mung bean. .

Materials and Methods

The trial was conducted to study the effectiveness of some insecticides for controlling army worm of mung bean crop under the department of Pest Warning and Quality Control of Pesticides, Bhakkar. The experiment was laid out in randomized complete block design with three replications. The treatments was used T-1 (Flubendamide (Belt 48% SC) @ 87.5 $mlha^{-1}$, T-2 (Lufenuron (Match 5% EC) @ 500$mlha^{-1}$; T3-(Chlorpyrifos (Brisban 40%EC) @ 2500$mlha^{-1}$, T-4 (Emamectin Benzoate+Lufenuron+Clofentezine (Emalu 4% EC) @1000$mlha^{-1}$; T-5 (Chlorantraniliprole+Thiomethoxam (Volume Flexy 300SC) @ 200$mlha^{-1}$) compared to T-6 (Control). Mungbean variety Azri-2006 was sown during 17/04/2015 with hand drill using seed rate 25$kgha^{-1}$). Di-ammonium Phosphate was used as source of Phosphorous; soil was well prepared with three ploughing and two planking before final layout. The plot size in this experiment was 10x10$meter^2$. Previous crop was wheat where trial was laid out. All the agronomic practices like thinning, hoeing, eradication of weeds and irrigations were kept constant in all treatments to avoid any biasness. The data was collected before and after 1, 2, 3 and 7 days after spraying of suitable insecticide. Mortality (%) data was recorded at 6 AM each days according to protocol of study by selecting five plants in each replication. Each plot was sprayed with pesticide using 100 liters of water with knap sac hand sprayer using hollow cone nozzle. The data was subjected to statistical analysis separately by using analysis of variance technique. The difference among treatment means was compared by using least significant difference (LSD) test at 5% probability level (Steel et. al., 1997).

Results and Discussion

Population of Larvae

From the table-1 showed that numerical count of army worm larvae were recorded 32.33; 30.00; 24.33; 30.67; 26.67 and 22.00 from all six treatments before spraying all the insecticides. One day after spraying these insecticides showed statistically non significant effect (P>0.05) with each other with reduction in larval population (12.00; 8.67; 19.00; 15.33; 13.00) from T-1, T-2, T-3, T-4 and T-5 compared to T6 (control) in which larval population was significantly increased. The data showed that reduction in population was recorded 3.00; 3.00; 5.67 and 4.67 in four treatments which were statistically non significant effect (P>0.05) to each other compared to control (29.33) two days after spraying insecticides. After three days total count of armyworm larvae showed statistically non significant effect (P>0.05) to each other in T-1 (0.00); T-2 (0.00); T-4 (0.33); T-5 (1.33) compared to T-6 (29.33) and T-3 (25.33).

Table: 1 showed numerical count of Armyworm Larvae on mung bean crop.

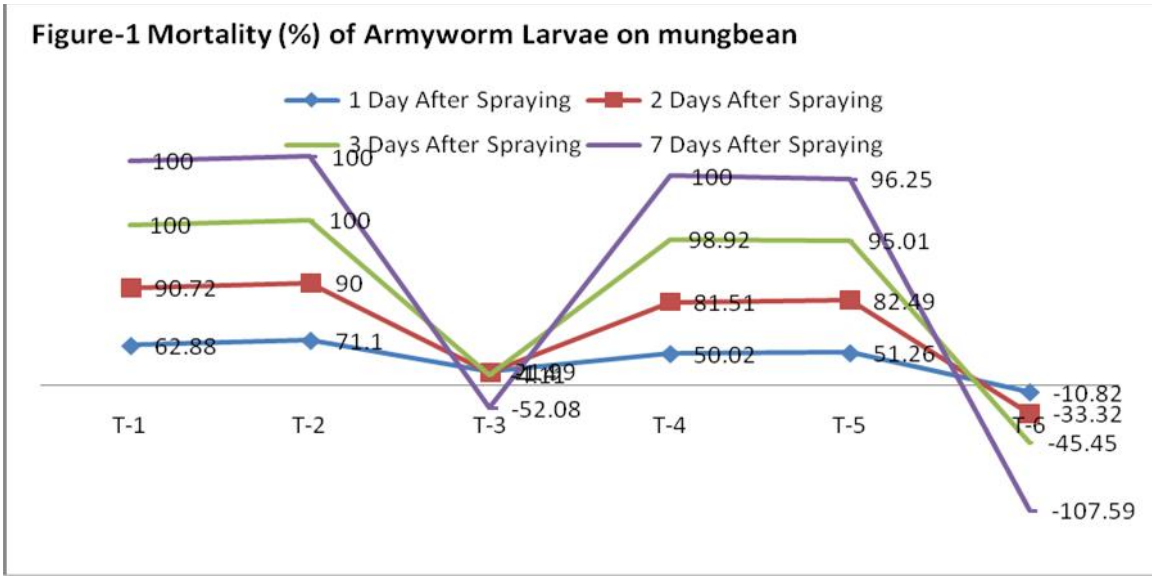
Treatments	Population Before Spraying	One day after spraying	Two days after spraying	Three days after spraying	Seven days after spraying
T-1	32.33a	12.00bc	3.00b	0.00b	0.00c
T-2	30.00a	8.67c	3.00b	0.00b	0.00c
T-3	24.33a	19.00ab	24.67a	25.33a	37.00b
T-4	30.67a	15.33bc	5.67b	0.33b	0.00c
T-5	26.67a	13.00bc	4.67b	1.33b	1.00c
T-6	22.00a	24.67a	29.33a	32.00a	45.67a
LSD at 0.05		2.68	2.38	2.33	1.46

Same letter means statistically non-significant to each other

After seven days the count of armyworm larvae were recorded in T-1 (0.00); T-2 (0.00); T-4 (0.00) and T-5 (1.00) which were non-significant (P>0.05) to each other but showed highly significant (P<0.05) result in all other rest of the treatments. However in T-3 after one day the attack was recorded low and with the passage of time the attack was increased rapidly. Bhatti et. al., (2013) told that bifenthrin showed potentiation with emamectin and flubendamide which revealed that some pyrethroids can result in potentiating mixtures with new chemistry insecticides for army worm control under multiple pest problem scenarios.

MORTALITY (%)

Figure-1 showed that maximum mortality was recorded by T-2 (71.10%) followed by T-1 (62.88%); T-5 (51.26%) and T-4 (50.02%) after one day of spraying the insecticides. After two days of spraying the insecticides maximum mortality was recorded by T-1 (90.72%) followed by T-5 (82.49%) and T-4 (81.51%) respectively. Maximum mortality was recorded by T-1 (100%); T-2 (100%); T-4 (98.92%) and T-5 (95.01%) after three days after application of insecticides. However after seven days maximum mortality was recorded by T-1 (100%); T-2 (100%); T-4 (100%) and T-5 (96.25%) compared to all other treatments in the studied area. These results were in accordance to Deka et. al., 1998; Sachan et al., 1994; and Ujagir et. al., 1997. The results of chlorpyrifos were contradictory to Abbas et. al., 2011 and Aslam et. al., (2004) who reported that this insecticide was effective against this pest. These results were in accordance to some extant with the findings of Mambiri and Amadalo (1998) who found that the insecticides performed well in reducing the infestation of army worm in mung bean crop.



Conclusion

At the end it was concluded that new chemistry insecticides showed maximum results after 3 and 7 days so that the farmers are advised to use T-1, T-2, T-4 and T-5 for controlling Army worm on mung bean crop in District Bhakkar with the consultation of Plant Doctors of Pest Warning and Quality Control of Pesticides.

References

Abbas, G., Jabar Zaman Khan Khattak, Zafar Abbas, M. Aslam, M. Bakhsh Khokhar and Asmat Ullah Malik. 2011. Efficacy Of Insecticides Against Army Worm on mung bean (*Vigna radiata* L.) under arid climate. Sci. Int. 23(4):327-330.

Anonymous, 2005. Economic Survey of Pakistan. Govt. of Pakistan. Economic Advisor's wing Financial Division, Islamabad.

Anonymous, 2013. Economic Survey of Pakistan. Govt. of Pakistan. Economic Advisor's wing Financial Division, Islamabad pp-30.

Anjum, M. S., Ahmed, Z. I. and Rauf, C. A. 2006. Effect of Rhizobium Inoculation and Nitrogen Fertilizer on Yield and Yield Components of Mung bean. Int. J. Agric. Bio. 8(2):238-240.

Aslam, M., Razaq, M., Rana, S., and Faheem, M. 2004. Efficacy of different insecticides against bollworms on cotton. J. Res. Sci. 15(1):17-22.

Bhatti, S. S., Ahmad, M, Yousaf, K., Naeem, M. 2013. Pyrethroids and new chemistry insecticides mixtures against *spodoptera litura* (Noctuidae: Lepidoptera) under laboratory conditions. Asian J. Agri. Bio., 1(2):45-50.

Considine, M. 1982. Food and food production Encyclopedia van Nostard Book Co. pp-173.

Deka, N., Borah, D.C. and Das, PK. 1998. Insecticidal control against major insect pest of mung bean (*Vigna radiata*) Ann. Bio. Ludhiana., 14(2):195-198.

Haq, A. 1989. Studies on the yield and related morphological characters of some new mungbean genotypes in irrigated environment. M.Sc. Thesis. Deptt. Agronomy, Univ. agri. Faisalabad.

Kannaiyan, S. 1999. Bio-resource technology for sustainable agriculture. Asso. Publishing Company. New Delhi. pp: 422.

Mahmood, A. Athar, M. 2008. Cross inoculation studies: Response of Vigna mungo to inoculation with Rhizobia from tree legumes growing under arid Environment. Int. J. Environ. Sci. Technol. 5:135-139.

Malik, B.A. 1994. Grain legumes crop production. Nazir, S. Bashir, E & Bantel, R (Eds.). National Book Found. Islamabad, pp. 277-326.

Masood, K. K., D. Salahu, K. Liaqatullah and S.,S.Ghulam. 2004. Efficacy of various insecticides on the damage and incidence of armyworm on mung and beneficial fauna. Pak Ento. 26 (1):66-79.

Mambiri, A.M. and Amadalo, B.A. 1988. Field Evaluation of some chemicals for their efficacy against armyworm on mung bean in Kenya. Insect Sci. Appli. (2):287-295.

Steel, R. G. D., Torrie, J. H. and Dickey, D. A. 1997. Principles and Procedures of Statistics. A Biometrical Approach, 3rd Ed. McGraw Hill Book Co., New York, 172-177.

Sachan, J.N., Yadava, C.P., Ahmad R., and Katti, G. 1994. Insect Pest Management, Dhaliwal, G. S. and R. Arora (Eds) Common Wealth Publishers, New Delhi, India.

Ujagir, R. and Chaudary, P. S. 1997. Field efficacy of certain insecticides against major insect pests of mung bean. Ann. Plant Prot. Sci. 5(1):34-39.