Effect of Antagonistic Microbial Application on the Population Density of Black Thrips, *Caliothrips* BAGNALL and Yield of Mashbean, *Vigna mungo* L.

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Abstract

Four variables viz., Insecticide (Tamaron 600 SL @ 500 ml/acre, 1st application 25 days after sowing and 2nd four weeks after first application), cultural practice (Hoeing, 25 days after sowing), plant growth stimulator (Aspergopak applied before sowing during seed bed preparation) and Microbe (Trichopak applied before sowing during seed bed preparation) singly and in their all possible combinations were tested for their effectiveness on mashbean (*Vigna mungo* L.) against black thrips (*Caliothrips indicus* BAGNALL) and mashbean yield.

Insecticide alone or when applied with any other test combination did control the population of black thrips effectively. The Aspergopak and Trichopak did not show any role at least in controlling the black thrips population but it did increase the yield significantly and proved to be an effective plant growth regulator on one hand and increased the black thrips population in the mashbean field on other hand.

Key words : natsgonistic microbes, black thrips, mashbean yield

Introduction

Mashbean commonly known as black gram. It is popular due to its good nutritive value, high protein contents (24%), palatability and easy digestibility. It is attacked by a number of insect pests of which the black thrips, *Caliothrips indicus* (BAGNALL) is the most serious one. To minimize its losses, a number of pesticides are being used since long which now are summarized in to a series of problems. Therefore, scientists are searching alternates to keep the pest population below economic threshold level on one hand and to increase the crop production on the other. Of the various alternates the role of antagonistic microbes viz., *Arachniotus* sp. and *Trichoderma* sp. along with other major inputs per recommendations of Agriculture Department was not tested at least for mashbean.

Some partial contribution have been carried out by MUNDHE (1982), DHAMDHERE *et al.* (1983), YEIN (1983), CHHABRA *et al.* (1986), KOSHTA *et al.* (1988) and SUBBIAN *et al.*(1989) who controlled the *C. indicus* through various insecticides on various crops and reported an effective control.

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Aspergopak added to the soil along with chaffed wheat straw and reported an increase in yield of potato and wheat (AKHTAR, 1982 and AKHTAR and AQIL, 1986). An effective control of sucking pest complex on sunflower was obtained by applying three variables in combination i.e., Temik 10G, cultural practices and Aspergopak (KARAR, 1990).

In the present studies, four variables viz., Insecticide (Tamaron 600 SL @500 ml/acre), Cultural practice (Hoeing), Plant growth stimulator (Aspergopak), Microbe (Trichopak) singly and in their all possible combinations were tested for their effectiveness on mashbean (*Vigna mungo* L.) against black thrips (*Caliothrips indicus* BAGNALL) and yield components

Materials and Methods

Mashbean variety 88 was sown during autumn at the experimental area of Department of Agriculture Entomology, University of Agriculture, Faisalabad, following randomized complete block design with 16 treatments including check with 3 repeats in each case. The plot size was 1.98 x 7.03 meters, whereas plant to plant and row to row distance was 10 CM and 30 CM, respectively. Insecticide (Tamaron 600 SL @ 500 ml/acre) was applied twice ie., once 25 days after sowing and second four week after first application. Cultural practices i.e., hoeing was done once 25-28 days after sowing of mashbean. *Arachniotus* sp. and *Trichoderma herizianum* were applied after mixing with chaffed wheat straw @60-80 KG/ acre to soil before sowing during seed bed preparation. It was broadcasted uniformly and mixed thoroughly in the soil by ploughing twice or thrice. After ploughing chaffed wheat straw as such was used.

Three leaves were randomly selected from each of the six randomly chosen plants from each treatment at 10 days nterval to count the population of black thrips. Data on yield were recorded. The data were analyzed statistically.

Results and Discussion

The results (Table 1) reveal significant variations in almost all the test parameters recorded at various time intervals among treatments. The significantly highest per leaf population of black thrips were recorded (12.86) in T16 followed by T2 (9.96). T4 (9.30) T1 (9.15), T12 (9.06), T6 (8.87) and T8 (8.82), respectively. The lowest population of black thrips was (1.85) recorded in T15 and followed by T3, T7, T5, T11. T9, T13, T10, and T14 with 3.41, 3.45, 3.80, 3.91, 4.07, 4.29, 5.33 and 6.15 black thrips per leaf, respectively. It is evident that the application of insecticide reduced the population of black thrips when applied in combination with other test variables. However, Aspergopak and

Trichopak alone encouraged the black thrips population, whereas, hoeing did not affect the population of black thrips significantly.

The present findings are in partial agreement with those of MUNDHE (1982), DHAMDHERE *et al.* (1983), YEIN (1983), CHHABRA *et al.* (1986), KOSHTA *et al*.

Table 1. Effect of different treatments on fhe population of black thrips and yield of mashbean.

Treatments		Number of observations								
		1st	2nd	3rd	4th	5th	6th	7th	8th	Yield kg/plot
(T1)	I	1.11	5.99 CD	19.00 AB	12.44 AB	9.22 EF	5.99 BC	10.33 A	9.15 B	0.6667 C
(T2)	A	0.55	7.66 BC	18.22 ABC	11.44	23.11 ABCD	6.66 BC	2.11 B	9.96 B	0.6733 C
(T3)	A+I	0.00	0.33 F	9.77 CDE	7.99 ABCDE	5.217 F	0.33 E	0.00 B	3.41 DE	0.6733 C
(T4)	T	0.77	7.67 BC	14.66 ABCD	9.66 ABCD	23.0 ABCD	7.66 AB	1.66 B	9.30 B	0.9373 C
(T5)	T+I	0.00	0.44 F	10.66 BCDE	6.66 BCDE	8.44 F	0.44 E	0.00 B	3.80 DE	0.9683 C
(T6)	T+A	0.77	10.68 AB	12.99 ABCDE	13.22 A	12.33 DEF	10.66 A	1.44 B	8.87 BC	0.7038 C
(T7)	T+A+T	0.55	2.66 DEF	7.55 DE	5.44 CDE	5.33 F	2.66 CDE	0.00 B	3.45 DE	0.9700 C
(T8)	H	1.22	5.44 CDE	7.55 DE	8.22 ABCDE	32.22 A	5.44 CDE	1.67 B	8.82 BC	0.7289 C
(T9)	H+I	1.55	1.44 EF	8.99 DE	9.55 ABCD	5.55 F	1.44 DE	0.00 B	4.07 DE	1.2100 ABC
(T10)	H+A	1.11	2.77 DEF	8.77 DE	5.66 CDE	14.11 CDEF	2.77 CDEP	2.11 B	5.33 D	1.0570 BC
(T11)	H+A+I	1.33	3.22 DEF	8.33 DE	3.11 DE	8.22 F	3.22 CDE	0.00 B	3.92 DE	1.0140 BC
(T12)	H+T	0.00	1.55 EF	9.44 CDE	8.33 ABCDE	30.66 AB	2.88 CDE	10.55 A	9.06 B	0.9552 C
(T13)	H+T+I	1.22	0.33 F	7.99 DE	6.22 BCDE	14.00 CDEF	0.33 E	0.00 B	4.29 DE	1.5140 AB
(T14)	H+T+A	0.33	0.66 F	7.44 DE	5.99 BCDE	25.00 ABC	0.66 E	2.99 B	6.15 CD	1.0280 BC
(T15)	H+T+A+I	1.33	0.22 F	5.22 E	2.22 E	3.88 F	0.11 E	0.00 B	1.85 E	1.6030 A
(T16)	Check	1.33	11.47 A	19.89 A	13.44 A	20.00 BCDE	11.44 A	12.44 A	12.86 A	0.6643 C

Means sharing similar letters are not significantly different by DMR Test at P = 0.05.

Where: I = Insecticide, T = Trichopak, H = Hoeing, A = Aspergopak

(1988) and SUBBIAN *et al.* (1989) who reported an effective control of *C. indicus* by the application of insecticides on various crops.

In the present study the maximum yield of mashbean (1.60 KG/plot) obtained from T15 and it was followed by T13 (1.51), T9 (1.21), T10 (1.05), T14 (1.02) and T11 (1.01), respectively, whereas minimum yield was obtained from T14 check (0.66 KG/ plot) which indicated almost similar response to that of T1, T2, T6, T8, T3, T4, T12, T5 and T7 having yield of 0.66, 0.66, 0.70, 0.72, 0.74, 0.93, 0.95, 0.96 and 0.97 KG, respectively.

It is clear from the data that the application of Aspergopak and Trichopak when applied alone or in combination with other test variables encouraged the population of black thrips on one hand and increased the mashbean yield on the other. These findings can be compared with those of AKHTAR (1982) and AKHTAR and AQIL (1986) and KARAR (1990) who reported that the addition of stimulatory microbes to the soil along with chaffed wheat straw increase the yield of wheat, potato and sunflower, respectively.

The other test variable i.e., insecticide when applied alone did not give any increase in the mashbean yield, however, when it is applied in combination whit other test variables, it give a significant increase in the mashbean yield. Cultural practices when combined whit other test variables gave a significant increase in the mashbean yield. These results are quite comparable whit those of SINGH and BAJPAI (1986) who got increased yield of mashbean with cultural practices when combined with other test variables.

The Aspergopak and Trichopak did not show any role in controlling the black thrips of mashbean but it did increased the yield significantly and proved to be an effective plant growth regulator. However, due to vigorous growth it also increased the black thrips population.

Keeping all the results in view, it can be safely said that the combination of all the four test variables i.e., 1 + h + t + a (T15) resulted in highest yield on one hand and controlled the black thrips population on the other. However, Aspergopak proved to be an effective plant growth stimulator rather a pest control practice.

References

AKHTAR, C.M. 1982. Effect of addition of stimulatory microbes to the soil along with chaffed wheat straw amended with 2 percent nitrogen and potassium on the yield of wheat, in normal sown crop. Proc. Symposium on world food day 1982, 1-14.

AKHTAR, C.M. and AQIL, T. 1986. Biological control of Earcockle of wheat. J. Agri. Res., 24, 327.

CHHABRA, K.S., KOONER, B.S. and SHARMA, A.K. 1986. Check flower drop in

summer mungbean by controlling thrips. Indian Farming, 36, 25-26.

DHAMDHERE, S.V., DEOLE, J.Y., SINGH, O.P. and MISRA, U.S. 1983. Chemical control of thrips infesting lucern. Indian J. Agri. Sci., 53, 486-487.

KARAR, H. 1990. Comparative effect of different pests control practices on the population of sucking pests and yield of sunflower. M.Sc. (Hons.). Agri. Thesis, Dept. Agri. Entomol., Univ. Agri., Faisalabad.

KOSHTA, V. K., AGRAWAL, B.B. and BHOWMICK, A.K. 1988. Efficiency of insecticides against the major pests of Lathyrus in Chhattisgash under Utera situation. Indian J. Pulses Res., 1, 68-69.

MUNDHE, D.R. 1982. Studies on seasonal incidence, screening of soybean cultivars chemical control against thrips (*Caliothrips indicus* BABNALL). J. Maharashtra Agri. Uni. 7, 88.

SINGH, B. K. and BAIPAI, R. E. 1989. Effect of weeding time on yield of urdbean. Indian J. Pulses Res., 2, 175-176.

SUBBIAN, P., AOKARA, N. and PALANIAOOAN, S. P. 1989. Response of black gram to growth regulators. J. Maharashtra Agri. Uni., 14, 372-373.

YEIN, B.R. 1983. Efficacy of certain insecticides against *Bemisia tabaci* (GEN.) and *Pagria signata* (MOTSCH) on black gram. J. Res., Assam Agri. Univ., 4, 45-49.

(Accepted 19 August, 1999)