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RELATIVE TOXICITY OF DIFFERENT INSECTICIDES AGAINST WHITEFLY, *Bemisia tabaci* (Genn.) AND BLACK THRIPS, *Caliothrips indicus* ON NM-92 MUNG BEAN, *Vigna radiata* (L.)

Muhammad Afzal, Tanveer Ahmad and M. Hamid Bashir
Department of Agri. Entomology, University of Agriculture, Faisalabad.

The efficacy of four different insecticides viz., Imicon (imidacloprid) 25 WP @ 200 gm/acre. Pride (buprofezin) 25 WP @ 600 gm/acre. Digital (fenpropathrin) 20 EC @ 250 rnl/acre and Taophos (quinalphos) 25 EC @ 250 ml/acre, was tested against whitefly, *Bemisia tabaci* (Genn.) and Black thrips, *Caliothrips indicus* on Mung bean. *Vigna radiata* (L.), All the insecticides; tested, were found to be effective against whitefly and some were effective against black thrips. On numerical basis. however, a spray of Irnicon 25 WP @ 200 gm/acre was found to be most effective both for whitetly and black thrips.

INTRODUCTION

Mung bean. *Vigna radiata* (L.) commonly known as green gram, is an important pulse crop of many Asian countries including Pakistan, It is a rich source of vegetable protein. Seeds of rnung bean contain 22-24% protein (Nazir, 1994). Losses to mung bean crop due to insect pests are very high and have become a limiting factor in decreasing the production of this crop, The magnitude of insect pest losses to bean crop have been. estimated by workers like Panchabhavi and Khadam (1990), Rao *et al.* (1990). Bashir *et al.* (1991) and Sharma *et al.* (1991). Sucking pests are the major cause of yield loss in mung bean, Direct damage by large population of whiteflies, *Bemisia tabaci* (Genn.) is common in India (Sehgal and Ujagir, 1987). In order to arrest the bean damage due to insects and mites, the insecticides are mainly relied upon to keep the pest population below the economic threshold level (Chhabra and Kooner, 1985). The present study was planned to investigate the relative toxicity of different insecticides in order to find an effective and economic control of these insect pests.

MATERIALS AND METHODS

The relative toxicity of four insecticides was studied against whitefly and black thrips in the field. The trials were carried out at research area of the Department of Agronomy, University of Agriculture, Faisalabad, following the Randomized Complete Block Design (RCBD) with five treatments including an untreated check. Each treatment was replicated three times.

T I = lmicon 25 WP (imidacloprid) @ 200 gm/acre
T2 = Pride 25 WP (buprofezin) @ 600 gm/acre
T3 = Taophos 25 EC (quinalphos) @ 250 ml/acre
T4 = Digital 20 EC (fenpropathrin) @ 250 ml/acre
T5 = Untreated check

Mung bean variety NM-92, was sown and sprayed over twice with different insecticides after a gap of 15 days between them. The data on the population of whitefly and black thrips from each plot were recorded early in the morning, 24 hours before spray and then 24, 48, 72 hours and one week after each insecticides treatment from 15 plants/plot selected at random; taking alternatively upper leaf from first plant, middle from second and lower from third plant. The population data were, however, finally presented in the form of mean values separately for each repeat of the various test treatments. The significance of the difference between treatment means for various parameters was found out through the DMR test after Steel and Torrie, (1980).

RESULTS AND DISCUSSION

In overall perusal of the mean values for the population of whitefly and black thrips from one treatment to another revealed a highly significant variation in them after each spray as well as in that of their overall estimate. The mean values for the overall population of whitefly and black thrips in T_1 to T_4 where different insecticides were applied to the crop, were found to be significantly lower to those in T_5 kept as a check. Similarly the mean values for the individual mean population of the target pest-insects after 2 sprays (Table-I) in T_1 to T_4 where the different insecticides were applied to the crop were also found to be very significantly lower to those in T_5 kept as a check. The lower mean values in the treatments from T_1 to T_4 compared with those in T_5, the check, would in all cases retlect on their killing potential against whitefly and black thrips. Imicon after first application with the mean population of 2.58 whitefly/leaf proved to be the best followed by Digital with 3.25 whitetly/leaf. After second spray, Imicon gave the same results with 2.58 whitefly/leaf, but at this stage Pride with 4.08 whitefly/leaf proved quite effective. The overall average of two sprays revealed Imicon with 2,58 whitetly/leaf as the best treatment followed by Digital with 3.99 whitetly/leaf. On numerical basis, Taophos with 5.66 whitefly/leaf found to be least effective (Table 1). A scanning of data (Table-2) revealed that Imicon after first application with mean population of 2.33 black thrips/ leaf proved to be the best followed by Taophos with 2.67 black thrips/leaf. After second spray, Imicon showed the same results with 3.50 black thrips/leaf followed by Digital with 6.25 black

thrips/leaf The overall of two sprays revealed Imicon with 2.75 black thrips/leaf as the best treatment followed by Digital with 4.79 black thrips/leaf. On overall basis lower mean values for the whitefly and black thrips in T_1 (which involve a spray of Imicon 25 WP @ 200 gm/acre) would suggest this insecticide to be more toxic to the pests compared with the others against it. Similar results were obtained by Forer (1990), Getting and Anderson (1991), Marcano and Gonzalez (1993), Cubillo *et al.* (1994) who reported that imidacloprid was most effective against whitefly. Whereas Afzal *et al.* (2000) reported that Nuvacron 40 WSC@ 400 ml/acre is more effective against whitefly followed by Pride 25 WP@ 600 g/acre compared with other insecticides in trial.

Table I. A multiple comparison of the mean values for the population of whitefly (leaf') on mung variety NM-92 after being sprayed over with different insecticides at University of Agriculture, Faisalabad.

Treatment	Insecticides	Dose	Mean population of whitefly		
			Overall	Individual spray	
				1st	2nd
T,	Control	–	10.54 a	9.08 a	12.00 a
T,	Taonhos 25EC	Z50 ml/acre	5.66 b	4.83 b	6.50 b
Te	Pride 25WP	600 g/acre	4.50 c	497 b	40tj
r.	Digital 20EC	250 ml/acre	3.99 c	3.25 c	4.7 c
T[	Imicon 25WP	200 g/acre	2.58 d	2.58 c	2.58 c

Table 2. A multiple comparison of the mean values for the population of black thrips (leaf') on mung variety NM-92 after being sprayed over with different insecticides at University of Agriculture, Faisalabad.

Treatment	Insecticides	Dose	Mean population of black thrips		
			Overall	Individual spray	
				1st	2nd
To	Control	–	9.54 a	6.92 a	12.17 a
T,	Pride 25WP	600 g/acre	7.21 b	4.33 b	10.08 b
T,	Taophos 25EC	250 ml/acre	5.45c	2.67 c	8.25 c
T~	Digital20EC	250 ml/acre	4.79 d	3.33 be	6.25 d
T[	Imicon 25WP	200 g/acre	2.75 e	2.33 c	3.50 e

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