

Avoidable losses due to *Lipaphis erysimi* (Kalt.) in mustard

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A field experiments was conducted to estimate the avoidable losses caused by *Lipaphis erysimi* in mustard sprayed with fungal biopesticides alone and in combination with synthetic insecticides. The percentage of avoidable yield losses in mustard seed were found varying from 11 to 68 %. Acephate 0.05 % recorded lowest yield loss of 11 % followed by *Verticillium lecanii* @ 1.0 kg/ha + imidacloprid 0.0025 per cent (14 %) and *V. lecanii* @ 1.0 kg/ha + acephate 0.025 per cent (20 %). Higher avoidable loss (38 to 55 %) observed in the treatment of *V. lecanii* @ 2.0 kg/ha, *Beauveria bassiana* @ 2.5 kg/ha and azadirachtin 0.000375 %.

Key words : *Verticillium lecanii*, *Beauveria bassiana*, Avoidable losses, *Lipaphis erysimi*, Mustard.

INTRODUCTION

Indian mustard (*Brassica juncea* L.) is one of most important oilseed crops in India. This crop is infested with various insect-pests, and aphid, *Lipaphis erysimi* (Kalt.) is one of them. The estimated loss in yield due to the pest has been reported in the range of 35 to 73 % (Baral *et al.*, 1986) and up to 95 % (Ahmed and Rahman, 1994). However, no information is available about the avoidable losses to mustard by *L. erysimi* in Gujarat. The present studies were conducted to estimate the extent of avoidable yield losses due to *L. erysimi* in mustard sprayed with fungal bio-pesticides and synthetic insecticides under field condition.

MATERIALS AND METHODS

A Field experiment was conducted at Farm of Agronomy, Junagadh Agricultural University, Junagadh during Rabi 2004-05 and 2005-06. The experiment was laid out in a randomized block design with three replications and ten treatments, including the control. The seeds of mustard variety, GM-2 were sown on first November during both the years in plots measured 5.0 x 2.70 m. Agronomical and cultural practices were followed as per recommendations. The fungal biopesticides used in the experiments were, *V. lecanii* @ 2.0 kg/ha and *B. bassiana* @ 2.5 kg / ha. These biopesticides were used alone and in combination with half doses of synthetic insecticides, imidacloprid 0.0025 and acephate 0.025 %. Imidacloprid 0.005, acephate 0.05 and azadirachtin 0.000375 % were used alone in addition to above

treatments to compare the avoidable loss in individual treatments. First spray was done when aphid population crossed the economic threshold level (ETL=1.5 aphid index/plant). Second application was given at 15 days after first application. Aphid population was recorded on randomly selected 10 plants of each plot prior to 24 hours and after 1, 3, 5, 7 and 10 days of insecticide application by adopting 0 to 5 indexing. The seed yield was recorded from net plot area and converted in quintals per hectare. Data so obtained were statistically analyzed. The avoidable loss in individual treatment was computed by using following formula (Pradhan, 1969).

$$\text{Percentage avoidables loss} = \frac{T - C}{T} \times 100$$

RESULTS AND DISCUSSION

The aphid population was recorded significantly minimum in the treatment of imidacloprid 0.005 % and it was at par with the acephate 0.05 % (Table 1). The treatmentb of *V. lecanii* @ 1.0 kg/ ha + Imidacloprid 0.0025 %, *V. lecanii* @ 1.0 kg/ ha + acephate 0.025 %, *B. bassiana* @ 1.25 kg/ha + imidacloprid 0.0025 % and *B. bassiana* @ 1.25 kg/ha + acephate 0.025 % were found moderately effective in reducing the aphid population below the ETL. Whereas, treatments of *B. bassiana* @ 2.5 kg/ha, *V. lecanii* 2.0 kg/ha and azadirachtin 0.000375 % were found least effective to reduce the aphid population.

The yield data indicated that all the treatments were significantly superior (4.60 to 9.04 q/ha) to untreated control (2.86 q/ha). The treatment of imidacloprid 0.005 % gave the highest seed yield (9.04 q/ha) and was at par

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