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Research Paper :

Bio-efficacy of botanicals and chemical insecticides for the control of castor leaf miner (*Liriomyza trifolii* Burgess) under dry land condition

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ABSTRACT

Field experiments were conducted with eight treatments *viz.*, Carbaryl 50 WP 0.2 per cent, Endosulfan 35 EC 0.05 per cent, Triazophos 40 EC 0.05 per cent, Spinosad 45 SC 0.018 per cent, Fipronil 5 SC 0.01 per cent, Neem Seed Extract 5 per cent (w/v), *Bacillus thuringiensis* 0.1 per cent and Untreated control for the control of serpentine leaf miner (*Liriomyza trifolii* B.) on castor cultivar DCS-9 during *kharif* seasons of 2007-08 and 2008-09. The spray fluid @ 500 L ha^{-1} was used in each of the treatment. Two sprays of all the treatments except untreated control were applied 30 and 45 DAS. The treatment with 0.018 per cent Spinosad was the most effective in suppressing leaf miner incidence and produced good seed yield (883.28 kg ha^{-1}) followed by 0.05 per cent Triazophos (835.82 kg ha^{-1}). The other treatments were found relatively less effective for leaf miner control particularly under dry land condition.

Key words : Bio-efficacy, Botanicals, Insecticides, Castor leaf miner

Castor (*Ricinus communis* L.) is an important non-edible oilseed crop grown throughout the world (more than 30 countries). However, the production of castor seed is confined mainly to India, China and Brazil, whereas its consumption is higher in EU countries, USA and Japan. The total castor seed and castor oil production of the world is 13.27 lakh MT and 5.47 lakh MT, respectively. In India, it is grown on 7.13 lakh ha area under rain fed conditions which yields about 8.50 lakh MT of castor seeds and 3.36 lakh MT of castor oil.

The crop is infested by a number of insect pests (Rai, 1976), the most important ones are the defoliators *viz.*, leaf miner (*Liriomyza trifolii* B.), semiloopers (*Achoea janata* L.) and tobacco caterpillar (*Spodoptera litura* F.). The magnitude of the pest problem is quite high, mostly in rain fed area. The serpentine leaf miner is a polyphagous pest feeding on seventy nine host plants belonging to various vegetables, ornamentals and field crops (Srinivasan *et al.*, 1995). In India, it was first recorded on castor as a new host during rainy season 1991 (Lakshminarayana *et al.*, 1992). *Liriomyza trifolii* has high potential for the development of resistance to commonly used pesticides. Moreover, this pest is assuming importance on castor in recent years because of the wide host range, ability to survive and multiply over wide range of seasonal conditions and low sensitivity to common insecticides. Larva causes extensive damage to mesophyll tissues of leaves, which turn parchment-white and affect photosynthesis. It is thus, of utmost importance to undertake timely, effective and reliable management of this pest. Present investigation was therefore, undertaken with an objective to assess the efficacy of different insecticides and bio-pesticides in controlling the castor leaf miner.

MATERIALS AND METHODS

The field experiments were conducted at Zonal Agricultural Research Station, MPKV, Solapur- 413 002 (MS) during *kharif* 2007-2008 and 2008-09. The susceptible cultivar DCS-9 was selected for sowing. Similar cultural and agronomic practices were followed in all the plots. Total eight treatments including absolute control (Table 1) were considered for the evaluation. The sowing was done at 90 x 45 cm spacing in the gross plots of 5.40 x 6.00 m^2 with three replications. Two sprays were given at 30 and 45 DAS. The periodical observations on the incidence of leaf miner *i.e.* number of mines plant $^{-1}$ were recorded after both the sprays in top, middle and bottom leaves of five randomly selected plants in each plot. Seed yield (kg ha^{-1}) was recorded at harvest. The data were analyzed by following RBD (Panse and Sukhatme, 1967).

RESULTS AND DISCUSSION

Pooled and individual year data on leaf damage by leaf miner and seed yield as influenced by different treatments are given in Table 1. Results revealed that the leaf mines due to leaf miner after both the sprays were significantly influenced by the treatments studied. However, significantly highest damage (25.30 and 27.64