

## Effect of some pesticides on foraging activities of different species of honey bees in mustard (*Brassica juncea* L.)

RAM SINGH<sup>1</sup>, R.K. PAL<sup>1</sup> AND R.A. KATIYAR\*

Department of Seed Science and Technology, C.S.A. University of Agriculture and Technology, KANPUR (U.P.) INDIA

### ABSTRACT

The visiting of four species of honey bees viz., *Apis dorsata*, *Apis florea*, *Apis cerana indica* and *Apis mellifera* were recorded on mustard crop. The observations on visiting of honey bees showed that the Neem products, Achook was found least toxic to honey bees due to their higher visits i.e. 3.05, 4.40, 4.42 and 6.35 and 6.70 per three minutes per sq. m area just after 24, 48, 72 hours and after 5 days of application followed by Bioneem i.e. 2.10, 3.15, 3.71, 5.70 and 6.37 visits, respectively. Nimbicidine also provided 1.37, 2.40, 3.10, 5.40 and 5.70 visits of honey bees per three minutes in one square meter area in comparison to rest of the treatments. While maximum visits were recorded in untreated plot i.e. 7.11, 7.55, 7.72 8.33 and 8.40 visits. Thus, Achook and Bioneem were found safer to honey bees and recommended to the farmers for the control of aphids (*Lipaphis erysimi*) in mustard crop.

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**Key words :** *Brassica juncea*, Honey bees, Bioneem, Imidacloprid

### INTRODUCTION

Flowering Brassicas are not only visited by a large number of insects pollinators especially honey bees for nectar and pollen but they also attract insects which feed upon flowers and developing seeds causing serious economic losses. Consequently, the insecticides are to be applied for crop protection which severely harm to the pollinating species (Mayer, 1980). Indian mustard (*Brassica juncea*), an important oilseed crop, constitute approximately 80 per cent of total production of rapeseed and mustard in India (Yadav *et al.*, 1985). Mustard aphid attacks this crop at the time of flowering and pod formation, so it requires application of insecticides to combat the pest. But the impact of these insecticides on the flowering activity of wild honey bee pollinators which mostly from neighboring wild habitats or hives on the contaminated crops have not received much attention. Thus, the present studies were therefore, undertaken with a view to find out the adverse effects of some insecticides on foraging activity of honey bees, *Apis dorsata*, *Apis florea*, *Apis cerana indica* and *Apis mellifera* visitors to *Brassica juncea* var. Varuna.

### MATERIALS AND METHODS

This study was carried out at C.S.A. University of Agriculture and Technology, Kanpur. To evaluate the

impact of insecticides, their commercial formulations were sprayed with the help of Maruti foot sprayer on the field plots of 5x3 m size of Indian mustard (*Brassica juncea* L var. Varuna) during its peak flowering period. The spray was made between 10.00- 12.00 h during the maximum activity period of honey bees. Each spray was replicated thrice and the observations on the number of foraging of bees were recorded by visual count just after 24 hrs, 48 hrs, 72 hrs and 5 days of insecticidal application in 1 sq. m area for 3 minutes in treated and control plots between 10.00-12.00 hrs. The population of bees recorded on the basis of visual counts as adopted by Swaminathan and Bharadwaj (1982).

### RESULTS AND DISCUSSION

When the insecticides were applied on the flowering stage of crop, the floral tips retained relatively less amount of insecticidal deposits than leaves and stems. Thus, the foraging bees coming in contact with floral parts may receive sub lethal amount of toxicants. Visual observations on foraging honey bees immediately after application of insecticides revealed a temporary decline in the forging activity in treated fields but the data were not consistent to document a decline pattern. This may be attributed to the wind charged with smell of drifting and evaporating of insecticides all over the fields.

\* Author for correspondence.

<sup>1</sup>Department of Agronomy, C.S.A. University of Agriculture and Technology, KANPUR (U.P.) INDIA