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Bioefficacy of Thiamethoxam (ACTARA 25WG) against sugarcane whitefly *Aleurolobus barodensis* Maskell

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ABSTRACT
The whitefly population was ranged between 39.97-43.20 in Lalapettai and 103.86 – 119.44 / 4cm^2 leaf area in Saptur. The cumulative reduction of whitefly population due to three applications of insecticides varied from 51.01 and 74.10 when compared to 62.41 and 63.96 per cent in standard checks imidacloprid and dimethoate respectively in Lalapettai and 52.54-78.98 per cent 14 DAT at the lowest (25 g a.i) and the highest (200 g a.i) doses respectively when compared to 63.05 and 68.21 in standard checks in Saptur. The order of efficacy of various treatments was thiamethoxam (200 > 100g) > dimethoate > imidacloprid > thiamethoxam (50 > 25g a.i./ha).

Key words : Sugarcane whitefly, Thiamethoxam, Bioefficacy

INTRODUCTION

Sugarcane is one of the important commercial crops in the tropics and serves as the main source of sugar in the world. Sugarcane is known to be attacked by about 228 insects and non-insect pests in India (David and Nandagopal , 1986). Sucking pest like whiteflies are the major constrain in the cane production. There are three species of whiteflies *viz*, *Aleurolobus barodensis* Maskell, *Neomaskellia bergii* Sign and *Neomaskellia andropogonis* Corbett attacking the sugarcane. Among them, *A. barodensis* is the important one. The leaves turn yellow and/or pinkish in case of severe infestation. It's attack in the early stages of crop growth results in a serious set back to the crop and at the later stages causes deterioration in the quality of juice. In addition, sooty mould develops on the honey-dew exuded by this insect, interfers with the photosynthetic activities of the leaves, render the tops of canes unfit as cattle feed. The losses by this pest to the tune of 15-20 per cent in cane yield and 1-2 units in sugar recovery and 41.9 per cent in sucrose content of juice have been reported by Gupta and Nagar (1951) and (Singh *et al.,* 1956). Earlier several contact insecticides *viz.,* BHC, lindane, toxaphane, chlordane, endrin, dieldrin, parathion, malathion and diazinon have been recommended for the control of this pest by different workers (Basheer, 1956; Khan and Krishnamurthy Rao, 1956; Singh e*t al.,* 1956; Siddiqi and Agarwal, 1957; Siddiqi and Saxena, 1960; Rajani, 1960; Rajani, 1961; Singh and Haq, 1968; Gupta and Shankar Singh, 1971). Systemic insecticides *viz.,* methyl demeton, phosphamidon, monocrotophos, thiometon, formothion and dimethoate which could be more effective than contact insecticides against nymphs and puparia (Chaudhary *et al.,* 1985).Hence an attempt has been made to evaluate new molecule of insecticide, thiamethoxam against this pest.

MATERIALS AND METHODS

Bioassay :

Ten cm length of whitefly infested leaf strips were cut and dipped in the corresponding insecticide solution and kept them in a beaker containing water which maintains the leaf as fresh for about 48hrs. The observations were made 48 hours after the treatment.

Field experiment :

Two field trials were conducted at Lalapettai, Karur district and Saptur, Madurai district in a completely randomized block design to assess the bioefficacy of thiamethoxam against whitefly. In the trials, imidacloprid and dimethoate were included as standard checks. Six month old sugarcane crop with natural infestation of the white flies were selected for the study. Insecticides were sprayed to run off point using a high volume sprayer. The spray fluid used was 1000 litres per ha. In all experiments an untreated check was included.

Pest assessment :

The incidence of whitefly was observed on five randomly selected canes in each plot. In each cane three consecutive leaves from top were selected and in each leaves three places of 4cm^2 area of leaf was observed for pest population. The whiteflies were pricked with a pin and those from which fluid oozed out were considered to be living.

RESULTS AND DISCUSSION

The bio assay results revealed that the population prior to the treatment ranged between 190.00 and 196.67 /10 cm length of leaf. Thiamethoxam effected population reduction by 71.05 - 87.63 per cent, when compared to 82.61 per cent and 85.75 per cent in standard checks imidacloprid and dimethoate respectively (Table 1).

In the field trials the population of whitefly prior to first application was 39.97-43.12 in Lalapettai and 103.86 – 119.44 / 4 cm^2 leaf area in Saptur. The cumulative effect observed by three applications of thiamethoxam was to the extent of 51.01—74.10 when compared to 62.41 and 63.96 per cent in standard checks imidacloprid and dimethoate respectively (Table 5) in Lalapettai and the cumulative effect was slightly higher in Saptur. However the trend was same as observed in Lalapettai and the effect was dose dependent; the extent being 31.39-52.36 per cent in 14 DAT at lowest (25 g a.i) and highest (200 g a.i) doses respectively. There was further increase in reduction after second application; the extent being 52.54-78.98 per cent in 14 DAT at the lowest (25 g a.i) and the highest (200 g a.i) doses respectively when compared to 63.05 and 68.21 in standard checks imidacloprid and dimethoate respectively (Table 9). The order of efficacy of various treatments was, thiamethoxam (200 > 100g) >

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