Efficacy study of Talstar 100 ec (Bifenthrin) insecticide on the fruit flies of mango in The Gambia

Introduction

The fruit fly species notably (the *B. invadens* and *C. cosyra*) attack a wide range of fruits, especially the family of the cucurbitaceous for the *Bactrocera invadens*. They attack wild fruits that belong to the same family of cucurbitacea and perhaps solanaceause plants for the *Ceratitis capitata*. After the discovery of *Bactrocera cucurbitae* in West Africa in 1999 by scientists in The Gambia, many other species are being recognized as major constraints to Agricultural production. Since then, *B. invadens and C. cosyra* are important in fruit tree production in this part of Africa. They are responsible of causing serious economic damage to fruit trees, excluding mango. *Bactrocera sp* has a direct threat to the external market (trade) in the Horticulture sector across the West Africa Region when effective and efficient control methods are not found. Currently, no suitable pesticide (s) is/are available for effective control of fruit flies in mangoes.

Objectives

The objectives of this study were aimed at obtaining data on efficacy of Talstar, with a view of contributing to the registration and harmonization process by the CSP that shall enhance the reduction of initial infestation of different species of fruit flies in mango orchards through application of Talstar 100 EC (Active substance: **Bifenthrin**) insecticide at the recommended rate of 0.5l/ha.

Materials and Methods

Talstar insecticide and three types of attractants were used (Dry and liquid attractants) for this study. The proposed application dose of 1l/ha was used. About 60% of the mango trees were Keith variety, the rest were harden & kent mixture. The experiment was located in Yundum (150m - 200m away from the village center) on a typical upland ecology of predominantly sandy

soils. The Methyl Eugenol:, Terpenyl Acetate: (Dry pheromone attractants), Torula (Liquid food attractant) were used.

Since the aim was to test the efficacy of Talstar 100 EC for reducing populations of adult fruit fly, the use of traps was essential in the trial for monitoring their population peaks during which spraying was necessary. Each plot contained three traps per type of attractant (M/Eugenol, T/Acetate and Torula) given a total of (9 traps X 3 Blocks) designed in Randomized Complete Block Design – Fisher). Each plot (block) layout was (100m x 60m). Block A – Treated, Block B – Treated, Block C – Control.

Placing the baits/traps:

Dry traps: The cylinder of attractant (Methyl Eugenol or Terpinyl) was taken out of its packaging and placed at the bottom of the trap. An insecticide (*DDVP*) strip was suspended in the basket attached to the underside of the trap cover.

Liquid traps: Four pellets of Torula were placed in water up to the lower three fourths of the bottom of the trap for this purpose. The insecticide (*DDVP*) strip is suspended in the basket glued in the upper part of the cage.

Placing the traps in the host tree:

The traps were suspended in the host trees (mango trees) on a main branch in the lower third of the foliage at an average distance of 1-2 meters from the centre of the tree depended on the diameter of the tree. The traps were not exposed to direct sunlight so all were placed on a southern exposure. The different traps entries were thoroughly clear to make it easier for the fruit flies to get into the traps without obstructions. The dry baits were placed 10 meters apart and 40 meters away from the liquid trap.

Numbering:

All the traps were numbered and names of the mango varieties noted

Changing the attractants:

Dry traps: The cylinders of Methyl Eugenol and Terpinyl Acetate were changed monthly.

Liquid traps: The water-soluble pellets of Torula were renewed weekly after carefully washing the trap and filling the lower third of the trap bottom with water.

Changing the insecticides:

The DDVP strips were changed once a month.

Collecting used attractants:

All spent attractants and insecticides were collected and removed after each time of renewal

Collection of insects

Insects were collected from the traps every 10 – 15 days after each application.

Application periods

Application of Talstar was done on two intervals: The first application was done with the first population peak (that was according to high number of fruit flies caught) and 21 days after the first application, the second interval was applied. Due to heavy rains two hours after 2nd application, application was repeated three days after the rains.

Results and Discussion

The fruit flies (*Bactrocera invadens*) were significantly affected in blocks were Talstar was applied, which showed Block B with the least number of insects caught (30.33) per tree, followed by Block A (33.18). These were significant differences between the

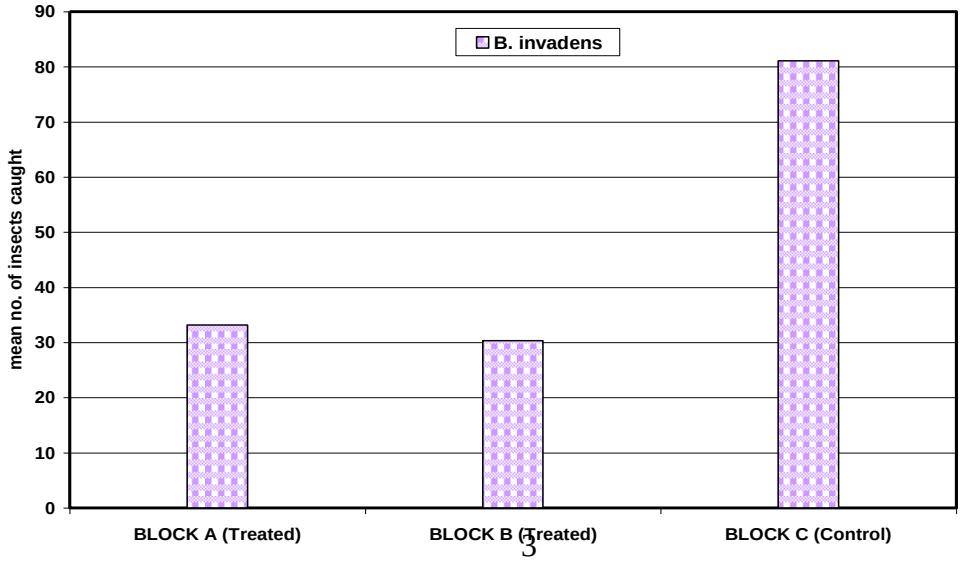

Fig. 1 The effect of Talstar insecticide on fruit fly (Bactrocera invadens) in mangoes in The Gambia

treated and untreated blocks and which showed the highest number of *B. invadens* caught (81.08) with the Methyl Eugenol attractant (see Fig 1).

Similarly, the same scenario was observed for *Ceratitis capitata*, although with slight difference in trend for the population dynamic, which naturally exhibited low population but there was high significant difference between treated and untreated Blocks.

Observations

There was no direct effect (ecological side effects) of Talstar nor phyto-toxicity observed on the foliage and only the red ants (non-target species) were affected. However, some producers regard red ants as alternative pest to mango, and therefore discomfort harvesting process thus their control was seen necessary. No environmental effects observed on the wild fauna such as the predatory birds, beneficial reptiles etc.

Conclusion

Talstar insecticide has demonstrated a significant result against the mango fruit flies in mango orchards. This result was perhaps important when the chemo-pheromones were placed for the monitoring of fruit fly population peaks prior to treatment.