EVALUATION OF CROPPING SYSTEMS AND PESTICIDES AS STRATEGIES FOR MANAGING FLOWER THRIPS IN SNAP BEANS IN MWEA-TEBERE, CENTRAL KENYA

BY

MWANGI, FREDRICK GICHEHA

B Ed Science (Hons)

A thesis Submitted to the University of Nairobi, School of Biological Sciences, in Partial Fulfilment of the requirements for the award of Degree of Master of Science in Agricultural Entomology

AUGUST 2008

ABSTRACT

Field experiments were carried out in Mwea-Tebere, central Kenya with the objective of comparing the effectiveness of cropping systems and pesticides in suppressing flower thrips *Frankliniella occidentalis* Pergande and *Megalurothrips sjostedti* Trybom on Snap beans (*Phaseolus vulgaris* L) variety Samantha. The cropping systems treatments were Snap beans grown with maize (*Zea mays*) as margin crop, Snap beans grown with maize (*Zea mays*) as intercrop, untreated Snap beans or Snap beans sprayed with a pesticide Thiacloprid .The treatments were laid out in completely randomised design with four replicates. Flowers and pods were collected from ten randomly selected plants per plot for identifying and counting the number of thrips. The results indicate that there was significant difference ($P<0.5$) between the four treatments. The lowest number of *Megalurothrips sjostedti* and *Frankliniella occidentalis* adults thrips and larvae was recorded in those plots treated with *Z. mays* as intercrop ,while the highest number was in the Snap bean sole plots (untreated) in both plantings .In addition, Snap bean plots treated with *Z. mays* as a margin crop had moderate number of thrips. Thiacloprid treated plots had the lowest number of *M. sjostedti* but the number of *F. occidentalis* was marginally affected by this pesticide in the two plantings. In general, *M. sjostedti* population was higher than that of *F. occidentalis* in both plantings. Snap bean plots treated with *Z. mays* as intercrop showed the highest percentage of marketable pods whereas the untreated plots (Snap bean sole) had the highest number of severely damaged pods, which are least marketable. Thrips natural enemies were high in plots treated with *Z. mays* as intercrop, margin crop and sole crop but least in the Thiacloprid treated plots.

Treatments for the pesticide experiment were Azadirachtin 0.06% A.I, Azadirachtin 0.15% A.I and Thiacloprid. The treatments were laid out in a Complete Randomized Design with four replicates. The pesticides were applied after the emergence of flowers and twice per week thereafter. Thrips infestations were assessed before and after every application of the pesticides. Ten flowers were picked from ten randomly selected plants per plot for identifying and counting the number of thrips. There was significant differences ($P<0.5$) between the four pesticides. The lowest number of *Megalurothrips sjostedti* and *Frankliniella occidentalis* adult thrips and their larvae was recorded on plots treated with Chloropyriphos and Azadirachtin 0.15% A.I in both plantings while the highest number was in the Snap beans sole plots (untreated). In addition Snap bean plots treated with Azadirachtin 0.06% A.I had moderate number of thrips The Thiacloprid treated plots had the lowest number of *M. sjostedti,* but the number of *F. occidentalis* was slightly affected by this pesticide in the two plantings. In general, the population of *M. sjostedti* was higher than that of *F. occidentalis* in both plantings. Snap bean plots treated with Chloropyriphos and Azadirachtin 0.15A.I showed the highest percentage of marketable pods whereas Azadirachtin 0.06% A.I had the highest number of severely damaged pods, which are least marketable. Thrips natural enemies were high in the plots treated with Azadirachtin 0.15% A.I, Thiacloprids and Azadirachtin 0.06% A.I ,but least in Chloropyriphos treated plots. Overall, it can be deduced that smallholder farmers can manage flower thrips by intercropping (*Phaseolus vulgaris* L) Snap beans with maize (*Zea mays* L) or application of the pesticides, Chloropyriphos and Azadirachtin 0.15% A.I in their farms and reduce the use of synthetic pesticides which are expensive to the small holder farmer.