

Potential of Banker Plants for Supporting Biological Control Agents of Chilli Thrips in Strawberry Fields, Part 1

Allan Busuulwa and Sriyanka Lahiri

Summary

Banker plants, cultivated in proximity to strawberry crops, possess the ability to foster natural predators that contribute to the control of chilli thrips. Our research reveals that strawberry plants grown adjacent to these banker plants exhibited notably reduced leaf damage and yielded higher produce in contrast to those located further from the banker plants.

Introduction

In Florida, strawberry growers rely on synthetic insecticides and the release of predatory mites to combat chilli thrips as part of their Integrated Pest Management (IPM) strategies.

In this context, we suggest the incorporation of banker plants as an innovative approach to enhancing chilli thrips management. Banker plants align with two fundamental principles of IPM: cultural control and biological control.

Banker plants are plants strategically cultivated near agricultural plants, offering nourishment, shelter, and breeding grounds for naturally occurring predators. This fosters the growth and sustains the existence of these natural enemies, aiding in pest population reduction.

Utilizing banker plants can result in prolonged suppression of thrips throughout the growing season, eliminating the need for additional releases of biological control agents.

Methods

Two banker plants (ornamental pepper and sweet alyssum) were selected following the 2021-2022

study. These plants were selected because they were able to produce flowers consistently throughout the growing season. Insecticide Radiant (spinetoram) was added as an industry standard.

We used a randomized complete block design to evaluate the potential of the banker plants to attract natural enemies that can suppress chilli thrip populations. Strawberries were planted in plots measuring 4 x 10 ft².

To offer a deeper understanding of the effect of banker crops, strawberry plots were established at 4, 8, 12, 16, 20 and 24 ft away from the banker plants, respectively (Fig. 1). Each treatment had a total of four replicates accompanied by strawberry beds at their respective distances.

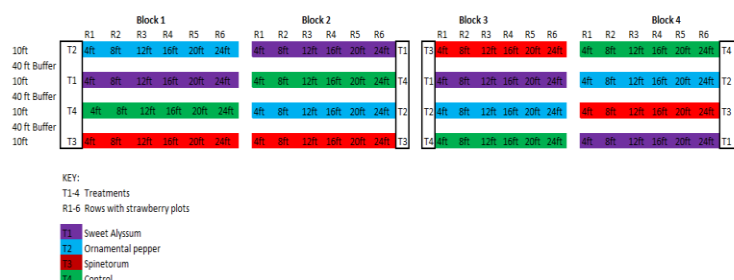


Figure 1: Plot map for banker crop study

Strawberry plants were sampled on a biweekly basis for count and species identification of thrips and beneficial insects at a minimum of 10 sampling points randomly selected throughout the row-beds.

Field sampling was done following sampling protocol of 2021-2022 field study. In each plot, eight young strawberry trifoliates were randomly collected, stored in separate Ziplock bags, and kept in the freezer until further processing in lab. Additionally, eight random plants from each plot were visually

rated to assess the leaf damage index, during each sampling event. The leaf damage index (0-5 scale) was used to assess chilli thrips damage on strawberries. Furthermore, marketable fruit yield data was collected.

Results

Damage rating

Strawberry plants closer to banker plants (8 ft) had a lower damage rating compared to plants further away from the banker plants (Fig. 2)

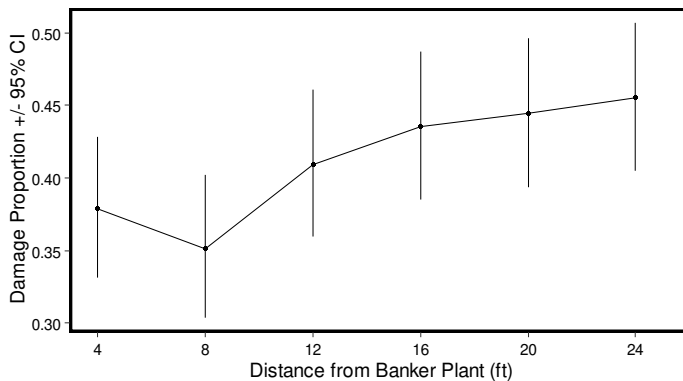


Figure 2. Mean damage rating of strawberry plants with increasing distance from banker plants.

In addition, number of chilli thrips was higher in the control and plots adjacent to sweet alyssum compared to ornamental pepper and spinetoram (Fig. 3).

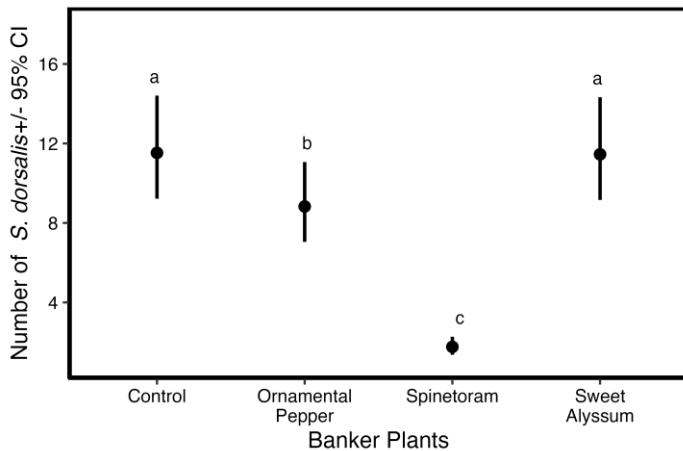


Figure 3. Mean number of chilli thrips on strawberry plants adjacent to banker crops. Means with same letter are not significantly different.

It is important to mention that we did see an increase in the number of chilli thrips in plots that were 16 ft away from the banker plants. Plots treated with spinetoram and those adjacent to ornamental pepper had relatively lower

number of chilli thrips compared to other treatments (Fig. 4)

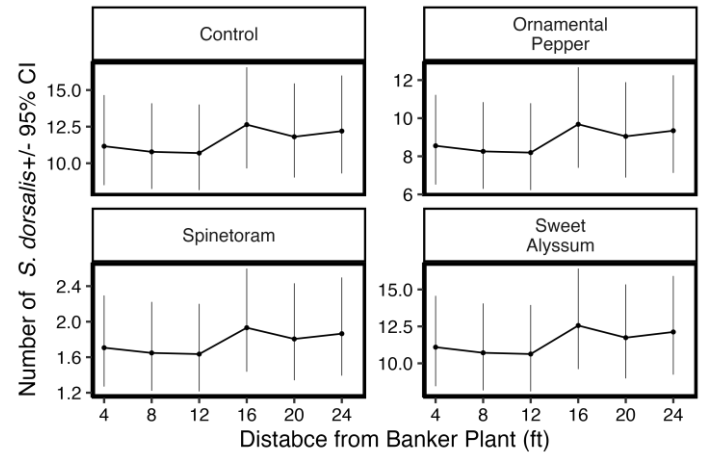


Figure 4. Mean number of chilli thrips on strawberry plants with increasing distance from banker plants.

Yield

Strawberry plants closer to the banker plant strips had higher yield compared to those that were further away from the banker plants (Fig. 5).

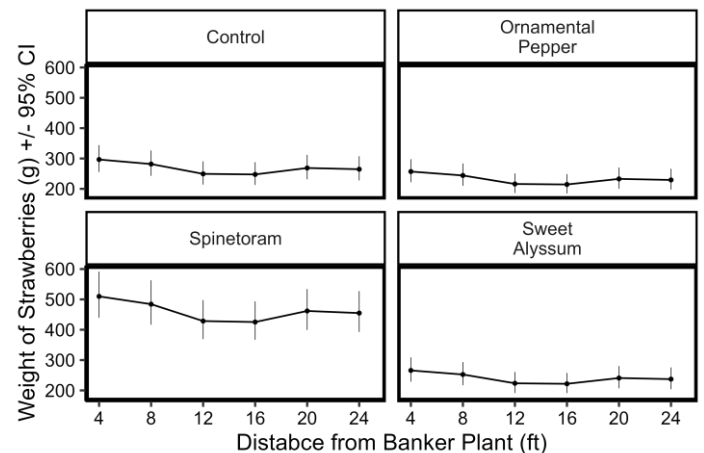


Figure 3. Mean fruit weight of strawberry plants with increasing distance from banker plants.

Takeaways

- Strawberry adjacent to ornamental pepper had lower chilli thrips infestation compared to sweet alyssum.
- Suppression of chilli thrips by either banker crop diminished beyond a distance of 16 ft.

Contact

Dr. Lahiri Sriyanka
 UF/IFAS Gulf Coast Research and Education Center
 P: 813-419-6584
 E: lahiris@ufl.edu