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

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Summary

Banker crops grown near strawberry plant have the capability of supporting natural enemies that can aid in chilli thrips suppression. Our findings indicate that strawberry plants that were grown near banker plants had significantly lower leave damage and had higher yields compared to those that were further away from the banker crops.

Introduction

To manage chilli thrips, strawberry growers in Florida relay on the use synthetic insecticides and predatory mite augmentation releases as part of their Integrated Pest Management (IPM) practices.

Here, we propose the use of banker plants as another avenue that can be integrated into the chilli thrips management toolbox. Banker crops cover two pillars of IPM, cultural control and biological control.

Banker crops are plants that are grown near agricultural crops that provide food resources, refugia, and substrate for reproduction for naturally occurring predators, thus increasing their population and longevity.

Therefore, banker crops facilitate early buildup of natural predators which can lead to suppression of early pest outbreaks. Not only do banker crops benefit naturally occurring predators, but also benefit predatory insects and mites used as augmentative biological control agents.

Banker crops can lead to season long suppression of thrips without having to conduct additional releases of biological control agents.

Methods

Five banker crops were used in this study, these included cowpea, buckwheat, sweet alyssum, ornamental pepper, and sunn hemp.

In October 2021, strawberries were planted in six plots, with each plot containing 12-15 plants with a buffer of 10 ft between them. The selected banker crops were planted alongside the strawberry plots with 1ft of space between the banker crops (Fig. 1)

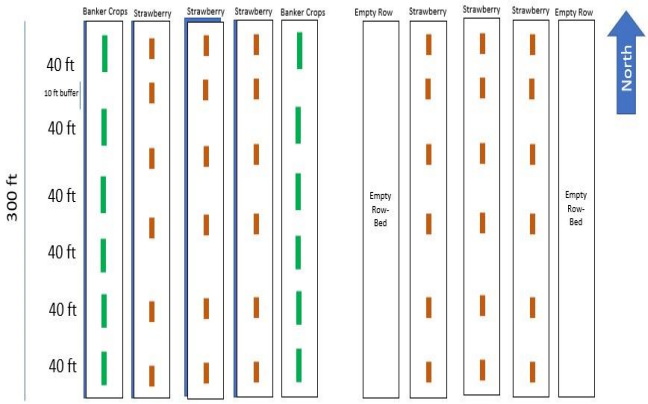

Figure 1: Plot map for banker crop study (green indicates rows with banker plants and brown indicates rows with strawberry plants)

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.

Additionally, five random plants at each sampling point were visually rated to assess the leaf damage index, during each sampling event. The leaf damage index (0-5 scale) used was derived from damage scale

used by Krishna Kumar on peppers infested with chilli thrips. Furthermore, marketable fruit yield data was collected twice a week.

Results

Damage rating

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

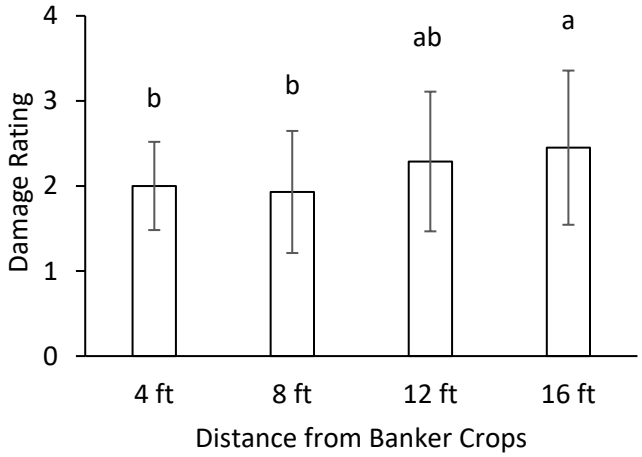

Figure 2. Mean damage rating of strawberry plants. Means followed by a common letter are not significantly different.

Yield

Strawberry plants closer to the banker plant strips had significantly higher yield compared to those that were further away from the banker plants (Fig. 3).

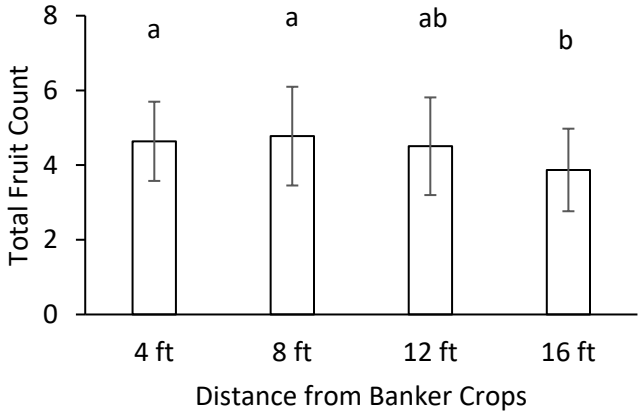

Figure 3. Mean fruit count of strawberry plants. Means followed by a common letter are not significantly different.

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