ABSTRACT

Diaphorina citri Kuwayama, the Asian citrus psyllid (ACP), is a vector for the bacteria Candidatus Liberibacter asiaticus that causes Huanglongbing (HLB), a deadly disease in citrus trees. Different experiments have been used to determine the means of catching the ACP but there are currently no known effective ACP trapping systems. The objective of this experiment was to evaluate the effectiveness of the different concentrations of pheromones on the trapping efficiency of adult ACP and determine which pheromone had the highest success on ACP trapings. No significant difference was found between any of the treatments and the control traps had the highest number of males and females. In an examination of other insects found on the traps, thrips were the most abundant in all of the treatments.

INTRODUCTION

Diaphorina citri Kuwayama, the Asian citrus psyllid (ACP), (Fig. 1) was first introduced to the United States in Florida in 1998 and has since spread throughout various parts of the country (Manounou 2008). The Asian citrus psyllid is one of two vectors known to transmit the bacteria, Candidatus Liberibacter asiaticus, which causes citrus greening disease, Huanglongbing (HLB) (Halbert and Manjunath 2004). This disease causes citrus to produce inedible, bitter, lopsided fruit. Infected trees ultimately become severely ill and eventually die. (Fig. 2) There is no known cure for HLB and detection of HLB is difficult, as it may take up to two years for symptoms to become noticeable (Halbert and Manjunath 2004). Since its introduction into the U.S., ACP has severely impacted Florida’s citrus production (Citrus Research Board 2014). In 2008, ACP was detected in California and in 2012 the first case of HLB was found in the state. Currently, there are no known efficient ACP trapping systems (Manounou 2008). Research has shown that ACP best responds to a type of green known as “Green 1” this has proven to attract more ACP per sticky trap than other colors (Manounou 2008). Sticky traps of this color combined with various pheromones attached to them were used for this experiment. The objective of this experiment was to determine if different pheromones increased the effectiveness of the “Green 1” traps.

METHODOLOGY

Site Selection:
Five sites, all containing trees of orange and orange tree relatives within a square mile were selected at random throughout Los Angeles County (Fig. 3-5). Each site required eight citrus trees of the same species or closely related species; the tested trees were placed apart by a minimum of 10 meters. All tested trees were free from any insecticide for the duration of the experiment. For this experiment, Valencia, Navel, and Mandarin orange tree varieties were utilized.

RESULTS & DISCUSSION

On average, the control trap caught the highest number of female ACP, 3.34 ± 1.22 (Mean ± SE) and males 2.80 ± 1.00 while the Ms1HC trap caught the lowest number of female ACP, 0.72 ± 0.21 and males 0.48 ± 0.16. (Fig. 9). In a comparison of the pheromone traps, no significant difference was found between any of the treatments for females (F=1.7389, df=7,187, p=0.102) or males (F=1.9096, df=7,188, p=0.701). As shown in other previous experiments the greenish yellow sticky card is an effective agent in attracting ACP (Manounou), however, according to the data the pheromones are not a result. It could be possible that the pheromones could have deterred the ACP from landing on the sticky card and that varying ACP densities within locations could have impacted the results.

Figure 9, ACP gender bar graph

In a comparison of other insect orders caught on the traps, thrips were the most abundant insects within the sites and the control treatment also attracted the most thrips. It is likely that the different pheromones affect each insect differently for example, treatments Ms1A and Ms1HC attracted the most Diptera and Ms1CO attracted the most Hymenoptera (Fig. 10). The experiment can improve in various ways for example, different types of pheromones could be used based on the ACP’s attractiveness to the female ACP (Sharari, 2013), ergo packets of female ACP pheromones could be used. Future experiments should be conducted with increased sampling period and using more trees per site.

LITERATURE CITED


Selinov, Mamoudou, and Cogbill, Derek. 2009. Detection and Monitoring Traps for the Asian Citrus Psyllid, Diaphorina citri. University of Florida Entomology

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