Chlorpyrifos Alternative for Lesser Peach Tree Borer Control in Peach Orchards

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Introduction

South Carolina is the number 2 producer of peaches in the United States behind California. The years, average value of peach production in SC is $92,234,800, according to reports from NASS. One of the top insect pests in commercial peach production is the lesser peach tree borer. For years, the industry standard for chemical control of lesser peach tree borer (LPTB) has been the use of Chlorpyrifos. In recent years, the EPA has made changes to regulations and restrictions on this product which has affected the availability and use of the chemical control for growers. In addition to regulatory changes, when there is continued use of an organophosphate chemical control there is concern for resistance build up in crops as well as concern over toxicity to beneficial insects and humans. Alternative control options such as mating disruption are now available for commercial use but have not been widely used in South Carolina.

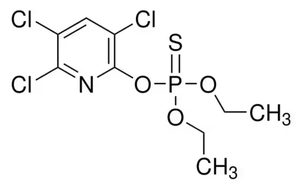

Figure 1. Chlorpyrifos; the conventional organophosphate insecticide used to kill LPTB

Figure 2. *"ISOMATE pheromones disrupt mating via competitive (following a false plume) and non-competitive (masking, desensitization, and sensory imbalance) mechanisms, preventing male moths from finding female moths, thus preventing mating, subsequent egg-laying, and larval feeding"* - https://cbc-agro.com/

Hypothesis

Mating disruption can be used as an effective alternative to control lesser peach tree borer in commercial peach tree orchards in South Carolina.

Objective

Compare lesser peach tree borer population and damage in commercial peach orchards treated with *Isomate* mating disruption vs the standard chlorpyrifos application.

Material and Methods

- *Isomate* mating disruption ties were applied throughout 19 peach tree blocks, totaling 275 acres, in place of conventional chemical treatment of chlorpyrifos for control of peach tree borer (Greater and Lesser) at a rate of 1 per tree during the 2023 and 2024 peach season in SC
- Delta traps with pheromone lures for both great and lesser peach tree borer were placed at 31 different sites throughout the treated orchards, 1 conventionally treated orchard and 3 organic control orchards, totaling 70 traps
- Traps were monitored weekly from April-September for number of GPTB and LPTB present
- Pheromone lures were changed every 4 weeks

Figure 4. Sarah and the farm crew in the trial orchards.

Figure 5. Isomate tie applied to peach tree.

Results

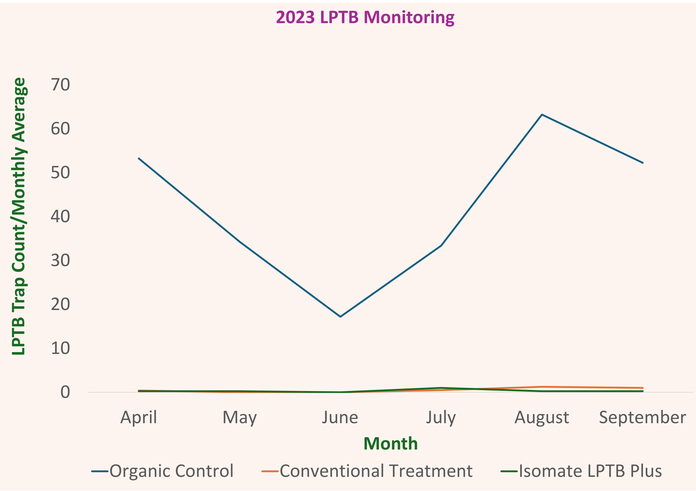

Figure 6. No significant difference in conventional chemical control vs mating disruption.

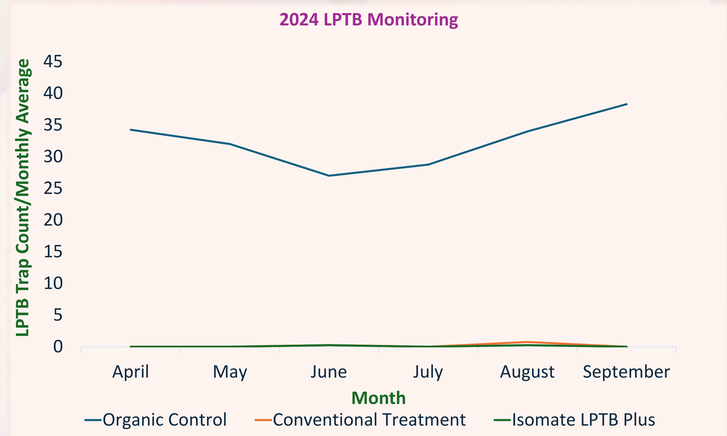

Figure 7. No significant difference in conventional chemical control vs mating disruption.

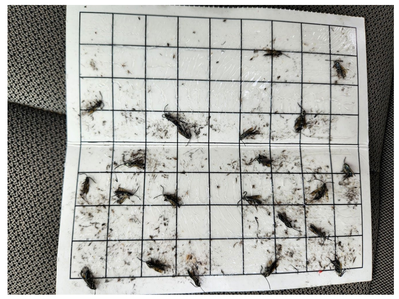

Figure 8. LPTB collected from delta traps in organic control orchard.

Conclusions

After two seasons we now have a better idea of the efficacy of using mating disruption in place of standard chemical treatments to control the LPTB populations in commercial peach orchards in South Carolina. Based on the results from 2023 and 2024 trap monitoring, we can conclude that mating disruption is just as effective as chemical treatments of chlorpyrifos and there is no significant difference in LPTB populations between conventional and alternative treatments. Mating disruption is a viable option for LPTB control in commercial orchards.

Future Direction and Objectives

- Repeat treatment in year 3 (2025)
- Additional monitoring in orchards both adjacent and non-adjacent to areas treated with *Isomate* (15 additional sites)
- Observe for maintained efficacy in orchards adjacent to non-treated/organic orchards.
- Determine how mating disruption may impact neighboring orchards using conventional chemical treatments.

Collaborators