

## **Impact of Striped Cucumber Beetles on Rindworm Damage in Commercial Watermelon Crops.**

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Watermelons are highly susceptible to surface blemishes and scarring, which can severely diminish their market value. The insects responsible for this damage are collectively referred to as “rindworm”. These pests, typically found on the underside or concealed areas of the watermelon, cause superficial scars that, while cosmetic, significantly affect consumer acceptance and marketability. The resulting irregular patterns lead to entire shipments being rejected, highlighting the importance of effective rindworm management for crop quality preservation. Despite their economic importance to cucurbit growers, there are virtually no published studies on this pest complex, even basic information such as identity of the species causing rind damage. This study focuses specifically on the role of striped cucumber beetles (*Acalymma vittatum*). Over a 15-week period, we conducted weekly scouting on 16 commercial watermelon farms to assess the extent of damage and determine the contribution of striped cucumber beetles to rind scarring, as well as potential roles from other pest groups (e.g., wireworm). We used ImageJ software to quantify the extent of rind damage on individual melons and compared this value to the economic tolerance for rind blemishes by wholesale retailers. In addition to correlating weekly beetle counts with rind damage, we assessed the impacts of seasonality (i.e., early- vs. late-season fruits), spatial positioning within the field (i.e., edge vs. core; fruits developing on soil vs. plastic), and location on the fruit (i.e., exposed vs. concealed). Our results show a marked increase in cucumber beetle populations beginning in week 9, aligning with their life cycle. During the early part of the season, beetles feed extensively on

leaves and stems, mate, and lay eggs in the soil. The larvae hatch within 5-8 days, feeding on roots for 14-20 days and then a subsequent generation emerges in July/August, corresponding with watermelon fruit maturity. Additionally, we observed a temperature increase from 67°F to 80°F over the season, contributing to heightened beetle activity. Overall, our study illustrates the complexity of rindworm management for cucurbit growers in the Midwestern U.S. and provides baseline data to help alleviate their impact on commercial producers.

### **Optimizing parasitism of aphids using companion plants in high tunnels.**

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Aphids, particularly *Macrosiphum euphorbiae*, represent a significant threat to tomato plants grown in high tunnels. There are many natural enemies of aphids, like parasitoids, that provide some pest regulation. However, recruiting these natural enemies into the high tunnel from the outside can be a challenge. One tool that is becoming increasingly popular among high tunnel growers is companion planting using select plants attractive to natural enemies. Sweet alyssum (*Lobularia maritima*) is a popular companion plant known to attract various parasitoids because of the abundant nectar and pollen it provides. What is less known is how sweet alyssum should be distributed in a high tunnel to maximize its benefits. The objective of this study was to determine how the distance between sweet alyssum and a focal crop can influence the efficiency of aphid parasitism. We established 12 treatments in high tunnels where sentinel *M. euphorbiae* colonies were released onto tomato of varying distances to plots of sweet alyssum. These treatments were repeated across multiple high tunnels to reach 3 replicates in a trial that was repeated twice for a grand total of 6 replicates. In each treatment, 10 aphids were placed on a single leaflet of a tomato leaf and the stalk of the leaf was covered in Tanglefoot to prevent aphid walk-off and predator infiltration. Sentinels were collected 3 days later and transferred to an incubator where they were kept alive for an additional 3 days. We then dissected the aphids to determine the presence and rate of parasitism across our treatments. We predict a negative relationship between aphid parasitism rate and distance to sweet alyssum, specifically that aphid colonies closest to sweet alyssum plants will have higher rates of parasitism. This study will provide needed information on effective companion planting to support the adoption of this sustainable tool for pest management in high tunnels.

### **Essential Oils: Are They Essential for German Cockroach Control?**

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Traditional pest management practices rely heavily on synthetic insecticides, but due to their toxicity, there is concern surrounding potential hazards to humans, pets, and the environment. Consequently, there is a growing demand for natural products that are