

Utilizing Reflective Mulch for Management of Chilli Thrips in Strawberries

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Summary

Chilli thrips infestation was lower in strawberry cultivars grown on white and metalized reflective mulches compared to black plastic mulch.

Marketable fruit yield was significantly higher in cultivars grown on white reflective mulch compared to black plastic mulch.

Objective

The objective of this proposal was to determine differences in chilli thrips infestation and fruit yield in 'Florida Brilliance', Sweet Sensation® 'Florida127', Medallion™ and Pearl™ strawberry cultivars planted on white and metalized reflective mulches vs. black plastic mulch.

Methods

Field trials were conducted at the University of Florida, Gulf Coast Research and Education Center for the 2022-2023 strawberry field season. In September 2022, twelve strawberry beds (91cm X 81cm X 25cm) were prepared, and mulches were laid. Four replicates of three main treatments and four sub-plot treatments were evaluated in a randomized split plot design. The main treatments were black plastic mulch, white mulch, and metalized mulch (Can-Block XSB v-TIF silver; Imaflex, Inc., Thomasville, NC) and the sub-plot treatments were 'Florida Brilliance', Sweet Sensation® 'Florida127', Florida Medallion™ and Pearl™. Strawberry plots were maintained following the local crop production protocol. No synthetic insecticide was applied during the experiment, except DiPel for worms.

Each of the twelve beds were divided randomly into equal-length sections of black, white, and

metalized mulch. Out of the twelve strawberry beds, three adjacent beds were considered as a single replication and sampling was initiated only in the middle rows. During the season, 48 plots with a plot size of 18 strawberry plants per plot were used to evaluate four cultivars on three mulch types across four beds. On October 11, 2022, transplants of 'Florida Brilliance', Sweet Sensation® 'Florida127', Medallion™ and Pearl™ were planted in their respective plots.

From each plot, eight randomly selected young leaves were collected once every two weeks throughout the season. Marketable fruit yield was collected weekly and weighed in grams on the same day of collection. Additionally, five random plants at each sampling point were visually rated to evaluate the leaf damage index (0-4 scale). The tissue samples were brought to the lab and washed with 70% ethanol to count chilli thrips adults and larvae.

Results

Mulch type had a significant effect on chilli thrips number and yield.

Chilli thrips number:

White and metalized reflective mulches significantly reduced chilli thrips population compared to black plastic mulch (Fig. 1). While comparing the cultivars grown on black plastic mulch, white and metalized reflective mulches reduced chilli thrips population by ~ 3 times. However, chilli thrips population did not differ significantly among cultivars grown on black, white, and metalized reflective mulches (Fig. 2).

Yield

Marketable fruit yield was significantly higher on strawberry cultivars grown on white reflective mulch than black plastic mulch (Fig. 3). However, between white and metalized reflective mulches, there was no significant difference in marketable yield production. Similarly, black plastic mulch and metalized reflective mulch did not differ significantly in yield production. Among cultivars grown on black plastic mulch, no significant difference in marketable yield production was observed (Fig. 4). While comparing cultivars grown on white reflective mulch, Brilliance produced significantly higher yield compared to Medallion and Sensation (Fig. 4).

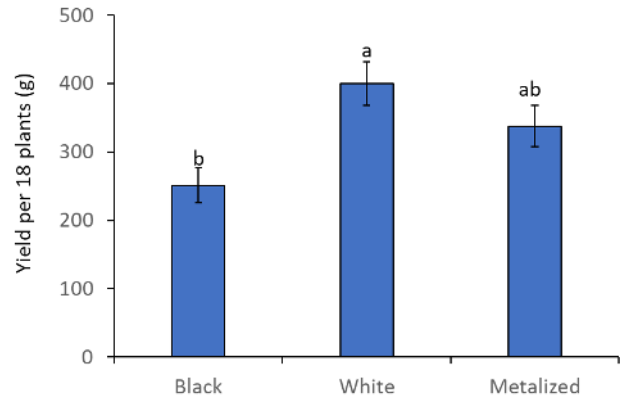


Figure 3. Mean (\pm SE) marketable fruit yield of strawberry cultivars (combined) grown on black, white, and metalized mulch.

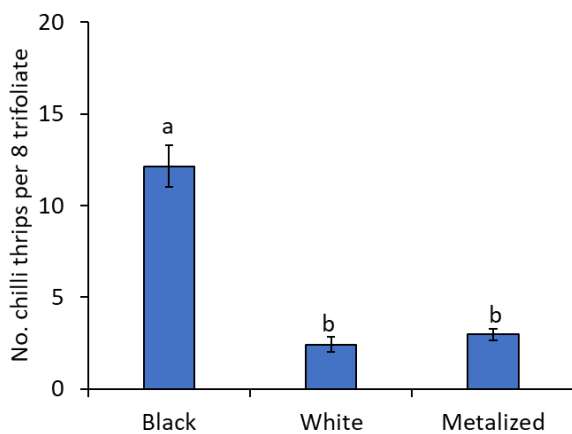


Figure 1. Mean (\pm SE) number of chilli thrips on strawberry cultivars (combined) grown on black, white, and metalized mulch.

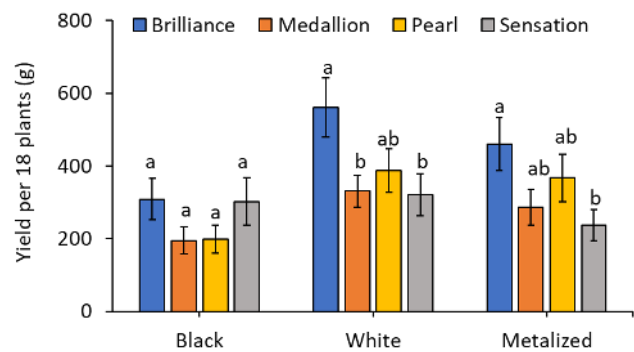


Figure 4. Mean (\pm SE) marketable fruit yield of four strawberry cultivars grown on black, white, and metalized mulch.

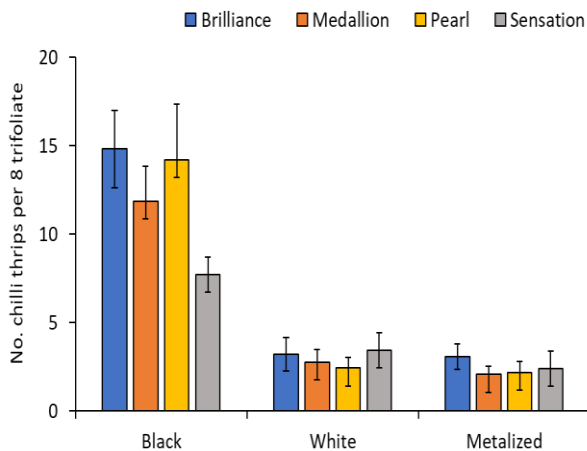


Figure 2. Mean (\pm SE) number of chilli thrips on four strawberry cultivars grown on black, white, and metalized mulch.

Takeaways

- White reflective mulch is highly effective in suppressing chilli thrips infestation and provides a boost to fruit production.
- Depending on the cultivar, both white and metalized mulches are good tools for managing chilli thrips in strawberry fields.

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