



Plastic Mulch Effects on Tomato Spotted Wilt Virus

Overview

In 2022, the USU Extension Integrated Pest Management (IPM) program conducted a trial at the IPM Demonstration Farm in Logan, Utah to determine whether black mulch, silver mulch, or bare soil effects the presence of western flower thrips (WFT; *Frankliniella occidentalis*). WFT can vector Tomato spotted wilt virus (TSWV). This trial was inspired by, and replicated components from, [Benjamin Scow's 2021 USU research thesis](#) titled Management Strategies for Tomato Spotted Wilt Virus in Utah Tomatoes.

Materials and Methods

In this trial, we planted three, 20-foot rows of drip-irrigated tomato for each treatment (black mulch, silver mulch, and bare soil), spaced at 5 feet apart. We chose four tomato varieties (Early Girl, DX 52 -12, Oregon Spring, and Arkansas Traveler) that were planted at two different dates in mid and late May. We hand-weeded the rows throughout the season, and maintained the plants as needed (but did not prune or stake them).

We installed yellow sticky traps to determine the presence of WFT. Two traps per treatment were used and inspected on July 7 and July 28 and 1 trap per treatment on August 18. To determine the WFT count, we inspected only the south-facing side of the trap. It was divided into six sections, each being assigned a rating (1-5) based on the number of thrips within that section. The ratings were then averaged for each trap.

Results

The results showed that traps in the bare soil and black plastic had significantly more thrips present than traps in the silver mulch. This coincides with expected results that the shine of the mulch will deflect thrips. In the bare soil treatment, we found two tomato plants with visual symptoms of TSWV (target spots and a calico pattern on ripe fruit) that was confirmed using ImmunoStrip tests. One plant was found with symptoms in the silver mulch treatment, and this plant was on the edge of the row where thrips likely had migrated from other rows.

Our trial showed that silver plastic mulch successfully deterred thrips and potential spread of TSWV. When used correctly, plastic mulches can provide numerous other benefits for commercial tomato production. It can help reduce evaporation in the soil, evenly distribute and maintain soil temperatures, prevent erosion, control weeds, and evidently deter pests.

Figs. 1 & 2. Diagrams of treatment layout and thrips counting method on yellow sticky traps

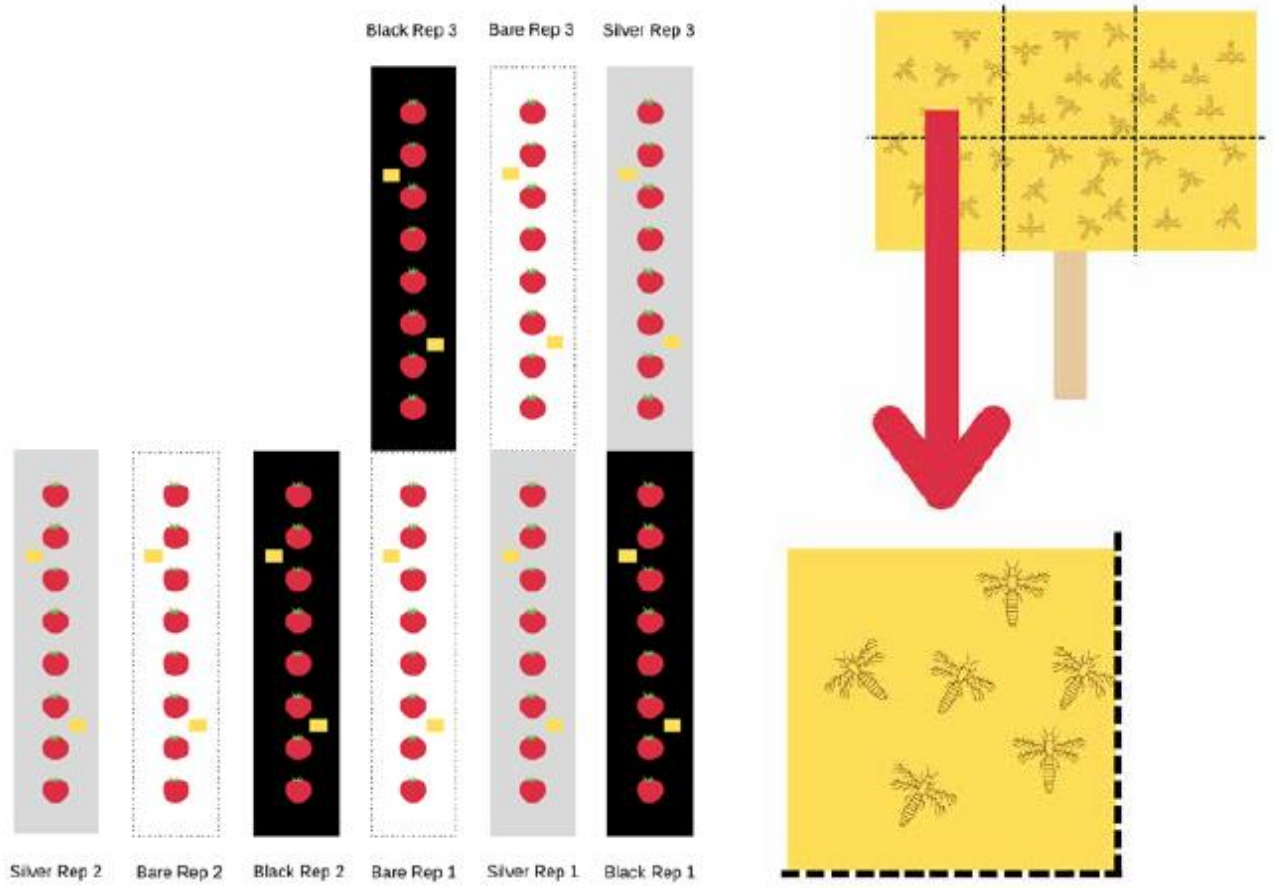


Fig. 3. Average rating of thrips counts by treatment and date

