On-farm cooperator trials 2012: effect of extended-duration row covers on muskmelon and winter squash on bacterial wilt and yield

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Introduction

Susceptible cucurbit crops are difficult to grow in Iowa because of bacterial wilt, caused by *Erwinia tracheiphila.* Striped and spotted cucumber beetles transmit bacterial wilt. Other insect pests such as squash vine borer and squash bugs may also have an economic impact on yield, particularly in squash.

Row covers are used to increase crop earliness and protect against insect pests. Row covers are usually deployed from transplant until anthesis (start of flowering), then removed to allow insect pollination. By opening the ends of the row covers at anthesis to enable pollination it may be possible to extend row cover duration by ~10 days beyond anthesis. Extending row cover protection may shield cucurbit crops from the first emergence of wilt-vectoring cucumber beetles, leading to a healthier crop and a greater yield. With cooperators Angela Tedesco (Turtle Farm), Gary Guthrie (Growing Harmony Farm), and Susan Jutz (ZJ Farm) we tested this strategy with butternut squash in 150-foot-long row covers and muskmelon in 30-foot long row covers in non-replicated trials.

Materials and Methods

At Turtle Farm (Grainger, IA), 'Betternut 401' winter squash was transplanted every two feet (4 seeds per hill) in 150-foot long segments. At ZJ Farm (Solon, IA) and Growing Harmony Farm (Nevada, IA) 'Athena' muskmelon, were transplanted into 30 ft rows of black plastic mulch on May 17 and 18, respectively. At each farm, single-row treatments using polymer row covers (Agribon AG-30) on wire hoops, with edges buried in soil were compared as follows:

A) Rows covers removed at anthesis.
B) Row covers removed 10 days after anthesis. At anthesis, both ends of row covers were opened to allow pollination.
C) No row covers.

Beginning after row cover removal (June 7 and 12 for treatments A and B,respectively), the number of healthy, wilted, or dead plants in each row was assessed weekly. The number and weight of squash and muskmelon harvested from each row were also recorded. Wilt data was recorded within one week of first harvest.

Results and Discussion

Performance of the no-row-cover treatment was highly variable across farms. At ZJ Farms the yields from treatments A and C were comparable. Opening row cover ends for treatment B did not appear to help fruit set and heavy insect pressure and high temperatures later in the season prevented the later-forming melons from thriving (Figure 1). Although bacterial wilt was higher in treatments A and C (40% in both treatments) than treatment B (7%), this did not correlate to yield.

No bacterial wilt was observed at Growing Harmony Farm. Melon harvests

were higher in treatment A and similar in treatments B & C, but did not differ significantly among treatments.

At Turtle Farm poor germination of squash seed prompted re-seeding. However, row covers dramatically affected yield (Figure 1). Heavier than usual squash bug and cucumber beetle insect pressures killed plants with no row covers (treatment C) and the ten days of extended protection of the row covers greater benefited yield (Figure 1).

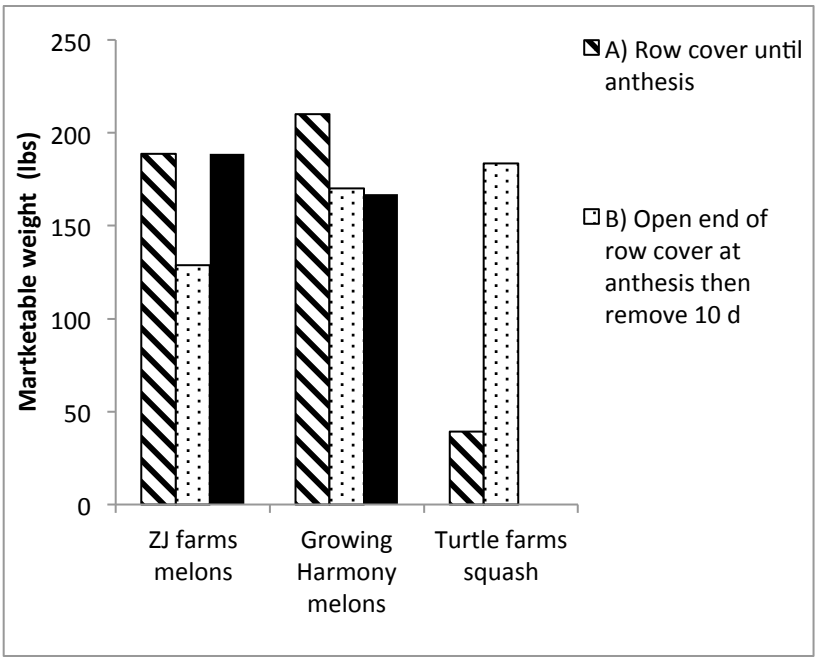

Figure 1. Total yield in pounds from three Iowa farms using row cover treatments with either muskmelon or butternut squash.

In conclusion, although treatment with no row covers can result in good yields, chances of crop failure are higher than when row covers are used.

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