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Jean C. Batzer
Iowa State University, jbatzer@iastate.edu

Mark L. Gleason
Iowa State University, mgleason@iastate.edu

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Abstract
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 assquash vine borer and squash bugs may also have an economic impact on yield, particularly in squash.

Keywords
RFR A1228, Plant Pathology and Microbiology

Disciplines
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On-farm Cooperator Trials: Effect of Extended-duration Row Covers on Muskmelon and Winter Squash on Bacterial Wilt and Yield

RFR-A1228

Jean Batzer, assistant scientist
Mark Gleason, professor/extension plant pathologist
Department of Plant Pathology and Microbiology

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 approximately 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-ft-long row covers and muskmelon in 30-ft long row covers in non-replicated trials.

Materials and Methods

At Turtle Farm (Granger, IA), Betternut 401 winter squash was transplanted every two ft (4 seeds/hill) in 150-ft 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 seem to help fruit set. 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 B, although no statistics were done for these non-replicated trials.

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 greatly benefited yield (Figure 1).

In conclusion, although good yields can be obtained without row covers, chances of crop failure are also higher than when row covers are used.

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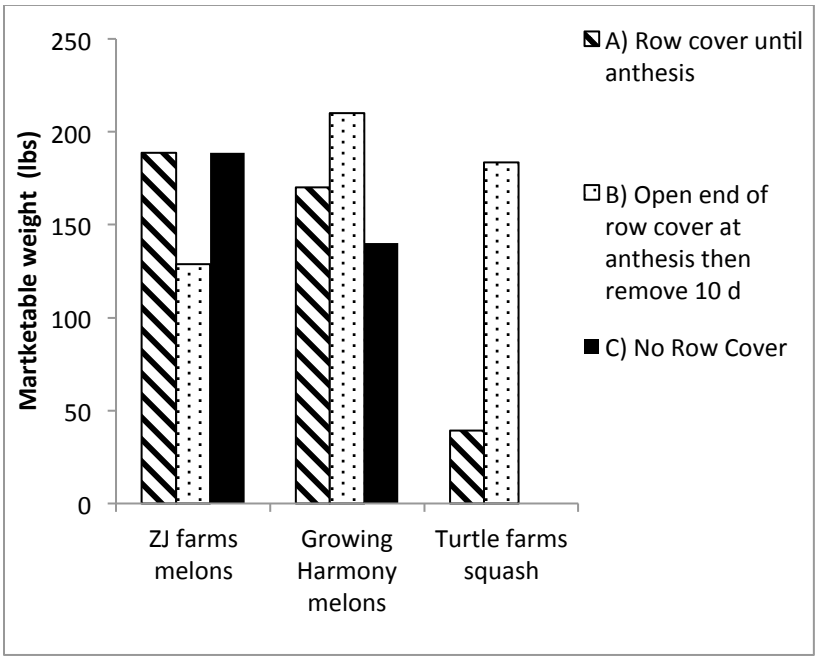

Figure 1. Total yield in pounds from three Iowa farms using row-cover treatments with either muskmelon or butternut squash.