

On-farm cooperator trials 2010: effect of extended-duration row covers on muskmelon and winter squash on bacterial wilt and yield

Erika Saalau Rojas, Graduate Student
Jean C. Batzer, Assistant Scientist
Mark L. Gleason, Professor/Extension
Plant Pathologist
Department of Plant Pathology

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 (2 seeds per hill) in 150-foot long segments. At Growing Harmony Farm (Nevada, IA) and ZJ Farm (Solon, IA), ‘Strike’ and ‘Athena’ muskmelon, respectively, were transplanted into black plastic mulch. 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.

Striped and spotted cucumber beetle numbers were monitored weekly from transplant through the end of harvest, using yellow sticky cards. Beginning after row cover removal, 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.

Results and Discussion

At Growing Harmony Farm, extended-duration row covers provided an effective control against bacterial wilt (Table 1). The added protection from row covers increased yield when compared to the uncovered control.

No bacterial wilt was observed at Turtle Farm or ZJ Farm. The absence of bacterial wilt may be related to the low cucumber

beetle numbers and their appearance relatively late in the growing season.

Although treatments were not replicated, the data suggest that extended-duration row covers delayed and reduced the yield of butternut squash and muskmelon (Figure 1 and Table 2). No insect damage from squash vine borer or squash bug was observed on butternut.

Earliness and increase in harvest associated with row covers was not observed in two of the three trials. A possible reason is the absence of bacterial wilt and low pest

pressure. It has been observed that when weather conditions are favorable for plant development, row covers might promote vegetative growth, and delay pollination and fruit development.

Acknowledgements

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Table 1. Effect of row cover treatments on bacterial wilt incidence and total marketable yield (muskmelon; cv. Strike) at Growing Harmony Farm (Nevada, IA).

Treatments	Total wilt (%)	Total yield (lb)
No row cover	26	216.5
Row cover removed at anthesis	13	347.3
Row cover removed 10 days after anthesis	13	319.5

Table 2. Effect of row cover treatments on total marketable yield (muskmelon; cv. Athena) at ZJ Farm (Solon, IA).

Treatments	Total yield (lb)
No row cover	229.8
Row cover removed at anthesis	211.5
Row cover removed 10 days after anthesis	204.0

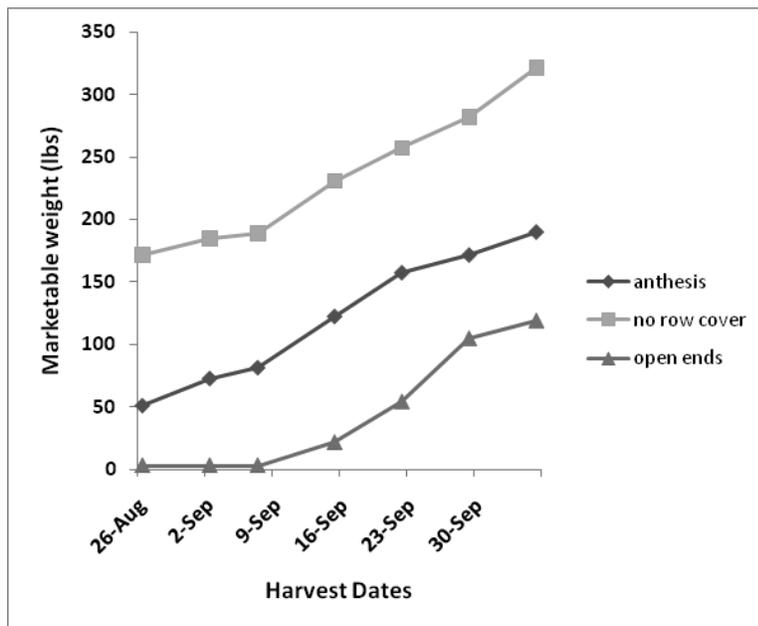


Figure 1. Cumulative weight of marketable fruit (butternut squash; cv. Betternut 401) for all three treatments at Turtle Farm (Grainger, IA).