

2012

On-farm Cooperator Trials 2011: Effect of Extended-duration Row Covers on Muskmelon and Winter Squash on Bacterial Wilt and Yield

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Recommended Citation

Batzer, Jean C.; Kearney, Heather; and Gleason, Mark L., "On-farm Cooperator Trials 2011: Effect of Extended-duration Row Covers on Muskmelon and Winter Squash on Bacterial Wilt and Yield" (2012). *Iowa State Research Farm Progress Reports*. 39.

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

Keywords

RFRA1111, Plant Pathology and Microbiology

Disciplines

Agriculture | Plant Pathology

On-farm Cooperator Trials 2011: Effect of Extended-duration Row Covers on Muskmelon and Winter Squash on Bacterial Wilt and Yield

RFR-A1111

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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-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 feet (2 seeds/hill) in 150-ft long segments. At Growing Harmony Farm (Nevada, IA) and ZJ

Farm (Solon, IA), Strike and Athena muskmelon, respectively, were transplanted into 30-ft rows of 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

Row covers removed at anthesis provided slightly earlier muskmelon harvests and higher yields than other treatments (Figure 1) for both Growing Harmony and ZJ Farms. A late frost resulted in loss of muskmelon seedlings that were not protected by row covers (Table 1). No conclusions can be drawn regarding management of disease because of the low levels of bacterial wilt and cucumber beetle pressure.

At Turtle Farm, poor seed germination, a delayed planting date, and extremely high temperatures in August may have prevented meaningful comparisons of the poor squash harvest, totaling 1.5 to 43 pounds.

Acknowledgements

Thanks to Angela Tedesco, Gary Guthrie, and Susan Jutz who made this research possible.

Table 1. Effect of row cover treatments on early transplant loss and bacterial wilt incidence in muskmelons at Growing Harmony (GH) and ZJ Farms (ZJ).

| Treatments | Frost death (percent) | | Total wilt (percent) | |
|--|-----------------------|----|----------------------|----|
| | GH | ZJ | GH | ZJ |
| No row cover | 10 | 13 | 0 | 0 |
| Row cover removed at anthesis | 0 | 0 | 3 | 0 |
| Row cover removed 10 days after anthesis | 0 | 0 | 0 | 0 |

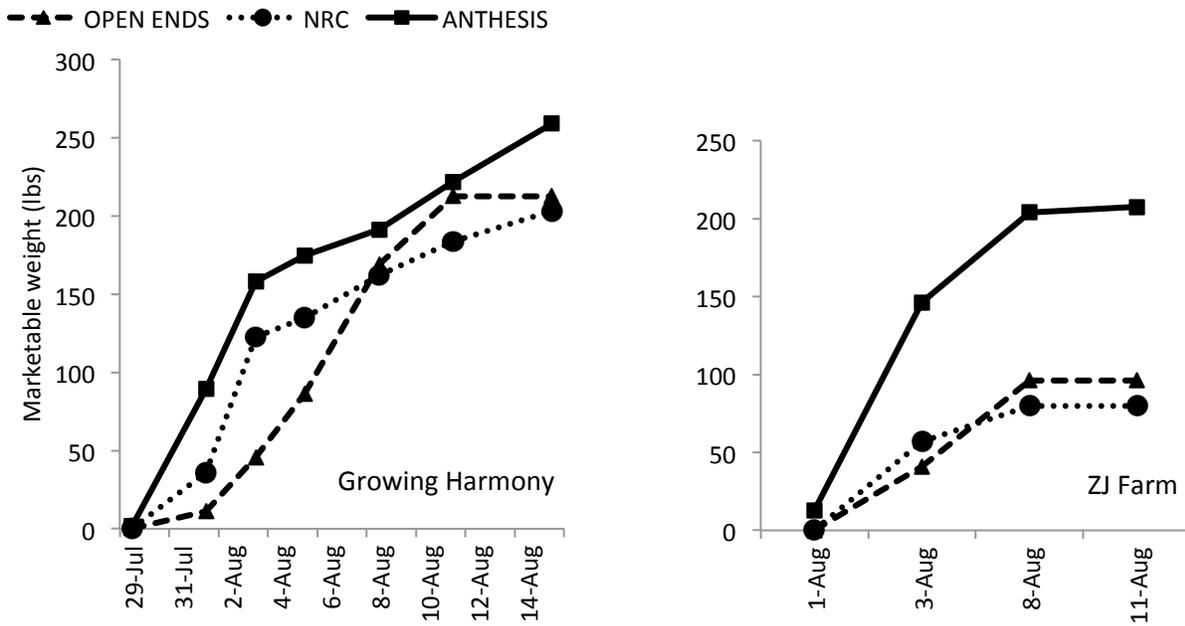


Figure 1. Cumulative muskmelon yield at each harvest from 30-ft plots with three row cover treatments at two cooperator farms.