

2008

Effect of Extended-Duration Row Covers on Muskmelons

Alicia Owens
Iowa State University

Laura C.H. Jesse
Iowa State University, ljesse@iastate.edu

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

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

Follow this and additional works at: http://lib.dr.iastate.edu/farms_reports



Part of the [Agricultural Science Commons](#), [Agriculture Commons](#), and the [Plant Pathology Commons](#)

Recommended Citation

Owens, Alicia; Jesse, Laura C.H.; Gleason, Mark L.; and Batzer, Jean C., "Effect of Extended-Duration Row Covers on Muskmelons" (2008). *Iowa State Research Farm Progress Reports*. 681.
http://lib.dr.iastate.edu/farms_reports/681

This report is brought to you for free and open access by Iowa State University Digital Repository. It has been accepted for inclusion in Iowa State Research Farm Progress Reports by an authorized administrator of Iowa State University Digital Repository. For more information, please contact digirep@iastate.edu.

Effect of Extended-Duration Row Covers on Muskmelons

Abstract

Row covers have traditionally been used to increase crop earliness, leading to earlier harvest dates and higher market prices. However, row covers can also provide added benefits in protecting against damage by certain insects. Cucurbit crops, especially muskmelon and cucumber, attract cucumber beetles, which vector bacterial wilt, causing significant crop losses.

Keywords

Plant Pathology

Disciplines

Agricultural Science | Agriculture | Plant Pathology

Effect of Extended-Duration Row Covers on Muskmelons

Alicia Owens, undergraduate research assistant
Laura Jesse, extension associate
ISU Plant Insect and Disease Clinic
Mark Gleason, professor/ext. plant pathologist
Jean Batzer, assistant scientist
Department of Plant Pathology

Introduction

Row covers have traditionally been used to increase crop earliness, leading to earlier harvest dates and higher market prices. However, row covers can also provide added benefits in protecting against damage by certain insects. Cucurbit crops, especially muskmelon and cucumber, attract cucumber beetles, which vector bacterial wilt, causing significant crop losses.

Row covers are usually deployed from transplant until anthesis (start of flowering), then removed to allow insect pollination. By using hives of bees to supplement pollination, it may be possible to extend row cover duration by ~10 days beyond anthesis. Extending row cover protection may shield muskmelon crops from the first emergence of wilt-vectoring cucumber beetles, leading to a healthier crop and a greater yield.

Materials and Methods

Thirty-ft-long rows of Athena muskmelon seedlings were planted into black plastic mulch at the ISU Horticulture Station, Ames, IA. Single-row treatments using polymer row covers (Agribon AG-30) on wire hoops, with edges buried in soil, were compared in a randomized complete block, including four replications (rows) of four treatments, as follows:

- 1) Rows covers removed at anthesis.
- 2) Row covers removed 10 days after anthesis. At anthesis, both ends of row covers were opened to allow pollination.

- 3) Row covers removed 10 days after anthesis. At anthesis, a bumblebee hive was inserted under one end of the row cover, and the end was re-sealed.
- 4) No row covers.

Striped and spotted cucumber beetle numbers were monitored weekly from transplanting (June 7) through the end of harvest (August 27) using yellow sticky cards. Beginning 10 days after anthesis, the percentage of healthy, wilted, or dead plants in each row was assessed weekly. The number and weight of marketable and cull melons harvested from each row was also recorded.

Results and Discussion

The results reaffirmed the benefits of row covers. All treatments with row cover produced a greater yield of marketable fruits than the no-row-cover treatment (Figure 1), which experienced considerable damage from high winds early in the season. Row-covered treatments produced harvestable melons sooner than the non-covered plants.

Wilting was caused almost exclusively by bacterial wilt. Treatments 2 and 3 (row covers remained for 10 days after anthesis) had a greater percentage of healthy (non-wilted) plants at the end of the season (Table 1). When row covers were removed at anthesis (Treatment 1) however, bacterial wilt subsequently increased, and the percentage of healthy plants was not different than the non-covered control by the end of the season. Row cover benefits were in part related to weather protection, because high winds caused severe damage to plants in the no-row-cover treatment early in the season.

Acknowledgements

Thanks to Hank Taber, Nick Howell, Alex Carlson, Abby Gaul, Laura Logsdon, and

Cheryl Tebben for bed preparation, crop planting, maintenance, and harvest.

Table 1. Mean percentage of healthy plants (no bacterial wilt symptoms).

Treatment	July 3	July 10	July 17	July 24	July 31	Aug. 7	Aug. 27
1. RC removed at anthesis onset	100 a*	98 a	82 b	62 b	50 b	42 b	8 b
2. RC removed 10 d after anthesis onset	100 a	100 a	98 a	95 a	95 a	95 a	82 a
3. RC removed 10 d after bees added	100 a	100 a	98 a	93 a	93 a	93 a	87 a
4. No RC	68 b	48 b	33 c	28 c	25 b	25 b	15 b

*Means in the same column that are followed by different letters differ ($P < 0.05$).

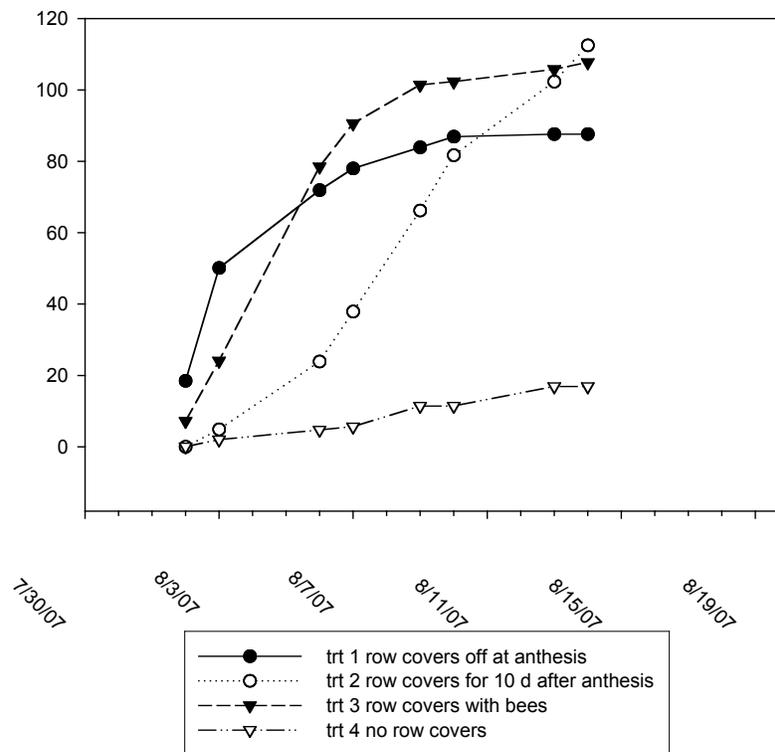


Figure 1. Cumulative weight (lb/subplot) of harvested fruit from each treatment.