



Western SARE Program

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SHADE CLOTH EXTENDS SEASON

Situation

As in many desert South-west climates, growing vegetable crops in Southern Utah's desert climate can be especially difficult because the weather can be so erratic and extreme. In the spring, daytime highs in the 80s can drop close to freezing at night, or a cold snap in late May could follow a full month of warm weather. Extending the season by finding cost-effective ways to moderate temperature extremes would be helpful to farmers.

In this Professional + Producer Grant, Rick Hefelbower, extension horticulturist in St. George, Utah, worked with Aviva Maller-O'Neil, an organic grower at the western entry to Zion National Park who grows nearly 100 varieties of organic vegetables and flowers on just over an acre. She uses drip irrigation and hand labor, except for a tractor borrowed in the spring.



Maller-O'Neil inspects crops grown under covers at her farm near the east entrance to Zion National Park in southern Utah.

Success extending Maller-O'Neil's season would enhance her CSA, especially in the short season between spring greens and summer vegetables, so she could provide customers a full bag of produce in the spring.



Greens thrive under the shade cloth.

Objectives

- Extend the growing season using row covers to moderate temperature fluctuations in the spring and reduce summer heat to extend the growing season into the fall
- Test the cover efficacy on two groups of crops: cool-season and warm-season
- Maintain notes on daily high and low temperatures, seeding dates,

germination dates, transplanting dates, irrigation and weeding schedules, harvest dates and yields

- Disseminate information to other producers through a field day

Actions

Cool-Season Crops

Cool-season crops include lettuce, salad mix, arugula, rapini, bok choy, broccoli, carrots, beets, spinach and

Producer + Professional Grant

Project Number: FW03-306
Title: Season Extension Experiment

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Western SARE, a USDA organization, funds grants for research and education that develop or promote some aspect of agricultural sustainability, which embraces

- *profitable farms and ranches*
- *a healthy environment*
- *strong families and communities.*

The Western Region, one of four SARE regions nationwide, is administered through Utah State University.

Western SARE:
<http://wsare.usu.edu>

National SARE:
www.sare.org

SHADE CLOTH EXTENDS SEASON

radish. Row covers were placed over the crops after planting in late winter, with row ends left open as controls.

As weeds flourish unseen under the covers, two rolls of agro-fabric, a transparent row cover, were laid over the crops, allowing observation of both crop and weed growth.

The plastic row cover and agro-fabric were also tested for extending the salad mix harvest into the summer.

Warm-Season Crops

Tomatoes, the main summer cash crop, were planted in the middle two weeks of May into plastic mulch, advertised to deter weeds and increase growth by 20%.



Covered and uncovered crops.



A view of Maller-O'Neil's farm from the ridge above.

Melons and eggplant were also planted into the plastic mulch.

Results

- The row covers promoted quicker growth, especially cool-season greens and lettuces, extending the season by two to three weeks in the spring.
- High temperatures, 105-115 degrees, caused the lettuces and greens to bolt, suggesting that no cover could help plants during such extreme heat.
- Tomato yields were higher in the mulched beds, but a leafhopper infestation spread curly top virus and most of the tomatoes died.
- The melons grew about twice as fast as those not mulched, but they died before ripening, probably victims of cucumber mosaic virus.
- The mulched eggplant began producing about two weeks ahead of



Shade cloth pulled back reveals healthy crops.

the control, although yields remained about the same for each. Given improved soil moisture and structure under the mulch, plus reduced weeding time and quicker growth, eggplant results were deemed a success.

Potential Benefits

- The three-week advantage on a two-month growing season means an increase in yields of about 30%.
- The agro-fabric, although five times more expensive than the plastic row cover, should last five times longer, and Maller-O'Neil observed that it is a superior product for extending the growing season.
- The cost of the row covers, and the initial labor to lay it, was high, but it reduced weeding, a major job on Maller-O'Neil's farm.