8-22-2002

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UNH News Bureau
(603) 862-1566

August 22, 2002

DURHAM, N.H. -- The tomato, second only to sweet corn in local retail value, is a favorite of New Hampshire farmers, who must grapple with a short growing season and escalating land prices to make a profit.

Now, they can grow more tomatoes on the same amount of land, thanks to an innovative project at the University of New Hampshire that "sheds a little light" on the subject.

In a recent study, Brent Loy, professor of plant biology, and Amy Ouellette, UNH Cooperative Extension agriculture educator, demonstrated how reflective mulch can be used to provide more sunlight to growing tomatoes. This increases photosynthesis, leading to better development and maturity.

The study results were "absolutely phenomenal" in terms of crop yield, according to Loy.

"Our highest plot yields of marketable tomatoes were more than double what a good grower would expect to achieve -- more than I have seen reported, even compared to regions with longer growing seasons and more ideal conditions for growing tomatoes," he says.

Many tomato growers in the Northeast use a trellis system to support the plants. This system produces fruit in better condition, says Ouellette, but trellised plants create a vertical canopy that intercepts sunlight inefficiently. Depending on the time of day, one side of the plant receives only diffuse sky light for a period of time, and as a consequence, less efficient photosynthesis occurs on the shaded side.
"We thought that if we used a reflective mulch between the rows, we could increase a trellised tomato plant's capacity for photosynthesis and its productivity," Loy says.

Polyethylene mulch provides many other well-known benefits to crops, he adds. It holds in moisture and warmth, suppresses weeds, and acts as a barrier to prevent spread of soil-borne diseases.

In large-scale replicated plots at UNH's Woodman Horticulture Farm, the scientists tested an innovative mulch with a white reflective top co-extruded on an opaque black bottom to discourage weed growth. By using this mulch between the rows, they were able to increase the sunlight into shaded areas of the plant by as much as 63 percent. Boosting the available light made it possible to grow the plants more closely together.

"Crop productivity is directly related to spacing of plants," says Ouellette, who developed this project as a master's thesis. "You want to grow as many plants as possible per acre, but the more densely planted a row is, the less yield you see per plant. Farmers typically plant tomatoes about 18 inches apart. The white interrow mulch allowed us to grow plants more closely together -- only 12 inches apart -- without losing productivity."

"We have a lot of farmers in this state who want try new things; that makes our work more worthwhile," Loy says. "UNH Cooperative Extension does a great job taking our research to them, and these innovative growers are able to adapt these new technologies to work in an actual farming situation."

(Contributing writer -- Dolores Jalbert, UNH Publications)

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