



Northern New York Agricultural Development Program News

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Winter Salad Crops for Northern NY? NNYADP Research Testing Heated Growing Methods

Can farmers grow salad greens through the winter in Northern New York? Northern New York Agricultural Development Program (NNYADP)-funded trials at the Cornell University Willsboro Research Farm in Willsboro, NY, are evaluating winter lettuce production methods.

A team of Cornell University researchers and extension specialists is investigating the use of prototype, low-wattage heating strips to warm the soil to enhance lettuce production during the winter months in Clinton, Essex, Franklin, Jefferson, Lewis and St. Lawrence counties.

With consumers willing to pay up to \$12 per pound for lettuce-based salad mixes year-round, this research promises a high payoff value if the use of heat proves to be successful and cost-effective under the regional growing constraints.

Cornell University Cooperative Extension Vegetable Specialist Judson Reid says, "This research in Northern New York is the first attempt at developing a system for heating the greens-growing environment inside high tunnels using heating strips primarily designed for in-floor radiant heat."

Amy Ivy, Cornell Cooperative Extension Horticulture Educator for Clinton and Essex counties, says, "While spinach can be grown and harvested year-round in Northern New York with a minimal addition of heat largely in January and early February, lettuce crops are more cold-sensitive. Our question is can growers cost-effectively add heat to grow the salad greens year-round without sacrificing profitability."

Ivy notes, "There is great demand by consumers and by regional restaurants clamoring for local greens."

Cornell University Research Associate Michael H. Davis explains that "on clear, sunny days during the winter, temperatures inside a high tunnel can be 20 to 40 or more degrees

warmer than the outside air, and, as a result, lettuce plants can be grown and harvested. The key to high tunnel winter lettuce production is helping the cold-sensitive lettuce plants survive frigid nighttime temperatures."

To warm the lettuce production beds during the night, either 8- or 15-watt electrical heat strips – prototypes not yet commercially available - were buried 8 inches below the soil surface in the 30-foot by 96-foot LedgeWood pipe-frame high tunnels at the Willsboro farm.

To retain the heat around the lettuce plants, the production beds were blanketed with a double layer of rowcovers supported by wire hoops that straddled the growing beds and kept the insulating layers from touching the plants.

Black Seeded Simpson head lettuce plants were seeded indoors at the Carriage House Garden Center in Willsboro on January 1, 2012, and the seedlings were transplanted to the tunnels on February 6. *Five Star* baby lettuce mix seed from Johnny's Selected Seeds was planted directly into the high tunnel growing beds on February 8.

Reid says, "It is notable that on nights when the outdoor temperature dropped into the teens and single digits, the soil temperature at 1.5-inch depth in the heated lettuce beds with rowcovers never dropped below 40 degrees Fahrenheit, and the air temperature never dropped below 32 degrees Fahrenheit. In contrast, the air temperature 8 inches above the uncovered and unheated beds dropped into the low teens during the night of 2/12/2012."

The initial trial results provided insight on issues with the placement and width of the heat strips, the benefit of combining the heat strips with the use of low rowcovers, and the proximity of the lettuce plants to the high tunnel exterior.

"Low rowcovers were the big winners in this experiment as they markedly increased germination rates and lettuce production, even on growing beds that did not have heat strips in the soil," Davis says. "On heated beds with low rowcovers, direct-seeded Five Star lettuce mix emerged three days ahead of the unheated beds with low rowcovers, and eight days ahead of the unheated and uncovered controls."

"For direct-seeded lettuce, the days to germination and emergence is critical for maximizing the productivity of the high tunnel, and accelerated germination rates could be a significant benefit of the heat strip technology," Reid adds.

Lettuce was harvested from all the treatment beds on March 30, 2012.

Ivy, who works with growers in Northern New York, cautions, "While the heat strips provided a modest boost to lettuce production in the high tunnel, it is not clear that the heat strips make economic sense, and several problems with the heat strips need to be resolved."

The NNYADP-funded project provided two day-long programs for growers on winter

crops production. Growers at those workshops indicated interest in winter production of fresh and storage crops, including greens, root vegetables, colored carrots, parsley root and celeriac.

A field trip to the Carriage House Garden Center provided growers the opportunity to see two tunnels planted in greens and two tunnels being readied for tomato and pepper production. Participants toured three styles of tunnels at the Willsboro Research Farm.

“Northern New York market growers have a keen interest in seeing a variety of tunnel structure options – from inexpensive, simple structures to elaborate, high-tech tunnels - for extending the growing, and thus selling, seasons,” Ivy says. “The Natural Resource Conservation Service funded at least eight new high tunnels in Northern New York in 2012. Growers appreciate the opportunities made possible by the Northern New York Agricultural Development Program to help them enhance their productivity and profitability through the use of tunnels.”

The Cornell University Agricultural Experiment Station provided additional funding for the winter greens production project. The complete report is online under Horticulture: Vegetables on the NNYADP website at www.nnyagdev.org.

The Northern New York Agricultural Development Program is a farmer-driven research, outreach, and technical assistance program serving New York’s six northernmost counties. Learn more about horticultural crop production in Northern New York at www.nnyagdev.org or contact your local Cornell Cooperative Extension office for more information. -30-



Northern New York Agricultural Development Program Winter Greens Trials: Salad greens covered in the high tunnel at yjthe Cornell University Willsboro Farm; photo: Michael H. Davis.



Northern New York Agricultural Development Program Winter Greens Trials:
Winter-grown lettuce ready for harvest in the high tunnel at the Cornell University
Willsboro Farm in Willsboro, NY; photo: Michael H. Davis.