NORTH CENTRAL SARE Sustainable Agriculture Research & Education

Profile from the Field

Contact: Marie Flanagan, NCR SARE Communications Specialist
120 BAE, Univ. of Minnesota | 1390 Eckles Ave. | St. Paul, MN 55108
ph. 612.625.7027 | f. 612.626.3132 | mart1817@umn.edu

Green Tools: Improving Sustainability by Integrating New In-Row Cultivation Equipment and Competitive Cultivars

Project Titles: Green Tools: Improving Sustainability by Integrating New In-Row Cultivation Equipment and Competitive Cultivars
Coordinators: Sam Hithchcock Tilton
Location: Michigan State University
SARE Grants: $11,994

Duration: 2016-2018

To read the full project reports, go to www.sare.org/projects and search for project number GNC16-223.

Several states across the North Central region including Illinois, Indiana, Iowa, Michigan, Minnesota, Missouri, Ohio, and Wisconsin are commonly referred to as the "cornbelt" due to the vast amounts of corn they produce, but did you know that Michigan, Minnesota, and Wisconsin are among the top ten vegetable-producing states in the country (USDA-NASS 2018)? Michigan State University (MSU) graduate student, Sam Hitchcock Tilton, says often the greatest expense in vegetable production is weed control, especially within the crop row. He says in-row tools can substantially reduce hand-weeding costs for vegetable growers, and he's been learning about new tools with MSU associate professor Daniel Brainard.

"Newer in-row weeding tools from Europe have become available," said Hitchcock Tilton. "These tools are widely used in Europe. But there is little documented experience of these tools in the U.S. We wanted to trial these new in-row tools and some old ones to see how they can best be used, whether they work better in combination, and their overall promise for growers."

In 2016, Hitchcock Tilton received an $11,994 NCR-SARE Graduate Student grant to test a variety of in-row cultivation tools on eight cultivars of carrots. "We chose to trial the tools in carrots – a slow-growing, tender and popular crop, hoping that carrots would provide a good reflection of the strengths and weaknesses of each tool," explained Hitchcock Tilton.

With support from SARE, Sam Hitchcock Tilton is working to generate useful, farm tested, and detailed observations on the best methods and tools for managing in-row weeds at Michigan State University.

Working with MSU's Dan Brainard, Hitchcock Tilton tested torsion weeders, flex tine cultivators, finger weeders, and disc hillers. He found that in-row tools reduced handweeding costs for both small and large vegetable growers, and that combining hilling discs with finger weeders resulted in the least amount of hand-weeding.

He says for these tools to work it was essential that the crop was larger than the weeds and that the seedbed had been well-prepared. Regarding the carrot cultivars, he said that although they did discover that certain cultivars of carrots were more cultivation tolerant, their results were not conclusive enough to make recommendations to growers regarding carrot cultivars. In addition to field trials, Hitchcock Tilton demonstrated the in-row weeding tools to farmers through field days, print magazines, and a podcast appearance. A series of online videos demonstrating the tools in the field can be viewed online at www.northcentralsare.org/In-Row-Mechanical-Weed-Control-Videos.

"The MSU researchers brought a pair of finger weeders to my farm, and the clamps so that they would attach to my tractor," recalled a vegetable grower from Michigan. "These finger weeders really were able to remove weeds in the row in many of my established crops, and I look forward to trying them in a lot of other applications."
There will be another Midwest Mechanical Weed Control Field Day in Atlanta, Illinois on September 26, 2018. Email Hitchcock Tilton for more info at hitchc32@msu.edu.

For more information on Tilton's NCR-SARE Farmer Rancher grant project, visit the SARE project reporting website. Simply search by the project number, GNC16-223, at www.mysare.sare.org, or contact the NCR-SARE office.