

**Midwest Cover Crop Council
State/Province Annual Report
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State/Province Name: Minnesota

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Research:

Project Title: Tools for Managing Pest and Environmental Risks to Organic Crops in the Upper Midwest

Project Description: The objective is to develop risk management tools to assist organic producers in finding alternative products, techniques or strategies for organic field crop production in Minnesota and surrounding states. Experiments relating to cover crops include: using cover crop mulches (oat, field pea, oilseed radish, berseem, and crimson clover) to suppress weeds in peas and flax; spring establishment of forages with companion cover crops (spring oats, spring wheat, spring barley, field pea, annual flax, winter wheat, and annual ryegrass); fall establishment of forages following companion cover crops (spring oats, spring wheat, spring barley, field pea, annual flax, winter wheat, and annual ryegrass); and winter establishment of forages in companion cover crops (spring oats, winter wheat, and winter rye).

Funding: USDA Risk Management Agency

Duration: September 2005 – September 2008

Potential Contribution: Develop framework for risk management in cover cropping practices. Improve the benefits of forage legumes to organic crop rotations while decreasing establishment risks. Develop recommendations for intercropping crops and legume forages to improve forage establishment, provide economic return and reduce grain loss to weeds. Manage forages to improve weed suppression and reduce soil moisture depletion.

Project Title: Integrated Weed and Soil Management Options of Organic Cropping Systems in Minnesota

Project Description: This research substantiates the biological and economic value of diversified crop rotations for sustainable organic crop production. Experiments relating to cover crops include evaluating hairy vetch ecotypes for winter hardiness in Minnesota and planting date effects on grass and legume establishment in organic corn.

Funding: USDA CSREES

Duration: August 2002 – May 2007

Potential Contribution: This research shows the challenges of seeding cover crops in regions that lack rainfall in the summer and fall. Cover crop seeding may cause an economic loss if covers are not successfully established. Research on cover crop establishment is in the process of being written up for a journal. This project also shows that seed of hairy vetch cover crops should be produced in the region in which they are intended to be used. If not, the hairy vetch

may not over winter and be available for incorporation the following spring. Research on hairy vetch adaptation will be continuing past the grant end date with another trial in 2008.

Other Research Projects:

<u>Title</u>	<u>Description</u>	<u>Principal Investigators</u>	<u>Funding Status</u>	<u>Timeline</u>
Keeping it Green and Growing	Aerial seeding winter rye on Olmstead Co farms in corn grain, soybean, and silage corn systems.	Andy Hart Elgin farmer	Funded through ESAP, already in 3 rd year	06-08
Winter Rye in Continuous Corn	Aerial seeding winter rye in continuous corn. Will compare rye establishment in strip-till and 30% residue.	Deb Allan John Baker	Funded through BWSR	08-10
Winter Rye BMPs to Reduce Sediment and Nutrients	Winter rye drilled after silage corn or aerially seeded in corn and beans, then either grazed or green chopped. Detailed research on two farms including mini-watersheds rainfall simulations; sediments and P)	Tyson Ochsner Mark Zumwinkle	In the mix for CWL funding	09-11
Aerially Seeded Rye Provides Continuous Living Cover in the Corn-Soybean Rotation to Improve MN Water Quality	Aerially seeded rye on 12 farms in Olmsted (6) and Fillmore (6) Counties w/ controls for yield. Economics.	Mark Zumwinkle Deb Allan	CIG applied June 1	08-10
Increasing the Profitability of Raising Livestock: Two Methods to Extend the Grazing Season	Aerially seeded rye and stockpiled legume hay for late fall and early spring grazing.	Jeff Duchene Fillmore Co SWCD	ESAP	08-10
Winter Rye in Corn Silage	Drilled winter rye in corn silage as a double crop on Fehr Dairy. Tile line instrumented for water	Tyson Ochsner John Baker Don Reicosky Erik Krueger	USDA ARS	06-08

	quality. Eddy covariance towers.	(PhD student)		
Cover Crops for Vegetable Systems	5-6 vegetable crops transplanted into no-till crimped winter rye, hairy vetch, and mustard in St Paul and Lamberton. Evaluate weed control and nitrogen	Craig Sheaffer, Milt Haar, Don Wyse, Paul Porter, Bud Markhart	NRI IPO	08-10
Rye varieties and roller-crimper for organic systems	5 state trial comparing 3-4 varieties across ND, IA, MN, WI, MI	Paul Porter, Carmen Fernholz, Milt Haar	SARE	08-11

Extension/Education:

These activities are not devoted solely to topics concerning cover crops, but cover crops usually are addressed in regard to the research projects.

Learning groups of farmers, researchers, and educators have been developed to promote transfer of information about organic agriculture production practices. These learning groups meet periodically to facilitate discussion and exchange of ideas about organic agriculture. We have 4 learning groups composed of 8 producers that meet 3 times yearly in locations across the state of Minnesota. We conduct winter workshops on organic production. 3 winter workshops with 35 attendees are conducted yearly in several locations across the state of Minnesota. We have on-farm demos relating to organic production. 3 on-farm demos with 35 attendees are conducted yearly in several locations across the state of Minnesota.

Communication:

Research results will be published in scientific journals and regional publications. See also Extension/Education.

Policy:

EQUIP Policy. NRCS employees have been working with the sugarbeet cooperatives and growers in the Red River Valley to encourage the use of cover crops to reduce wind erosion and lessen the physical damage caused by the wind. The NRCS conservation practice standard has criteria only for fall-planted cover crops. The growers, however, are reluctant to use fall-planted cover crops for two reasons: a) many of the common cover crop species are not reliably winter hardy, and so they may not provide protection in the spring; and b) when winter-hardy varieties are used, growers are concerned that the cover crop will use too much soil moisture, thereby reducing sugarbeet growth and development. Growers have been trying spring-planted cover crops, but since the NRCS conservation practice standard has no criteria for spring-planted cover crops, there is no consistency in seeding rate, seeding method, or timing of termination of cover crop.

Research was conducted to determine the effectiveness of different cover crop species, seeding dates, seeding rates, seeding methods of cover crops, as well as methods of planting sugarbeets into cover crops, and methods and timing of cover crop termination. Data collected from the research was used in the Wind Erosion Prediction System (WEPS) model for the cropping systems and management activities in this region. As a result of this research a policy was developed to support cost sharing for the use of cover crops in sugarbeet production in EQIP.

Legislative Hearing: We were successful in getting a hearing in the Minnesota Senate Agriculture Committee on 3rd crops. The presentation included a discussion of the use of cover crops in annual cropping systems. This is the first step in the development of new public funding for cover crop research in Minnesota.