

Midwest Cover Crop Council  
State/Province Report

State/Province Name: Wisconsin

Contact Information

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Research

**Kura clover living mulch for corn production** (Ken Albrecht and current graduate students Bob Berkevich and Nate Bard and former graduate students Rob Zemenchik, Rich Affeldt, Tessa Milofsky and Agustina Sabalzaray)

Through 11 years of research, we've developed a system that allows consistent high yield production of corn grain or corn silage in kura clover living mulch. We are currently quantifying the N fertilizer replacement value of kura clover for corn production. We are testing whether corn can be grown continuously or if a kura clover "recovery" year will be needed after 1, 2, or 3 years of corn. We are exploring the possibility of growing corn for silage in a mixture of reed canarygrass and kura clover—a mixture that shows promise as a permanent silage or pasture crop. We are testing mechanical and thermal suppression of kura clover to replace herbicidal suppression. We have a number of refereed publications available but no "fact sheets" or "how to" manuals have been developed yet.

We are looking for collaboration on soil physical factors affected by living mulch, nitrogen cycling in the system, soil biology (including insects, earthworms, microfauna, and disease causing organisms). We also need to study economics of this system, including costs associated with establishment. We need to develop a relationship with maize breeders to identify hybrids with superior performance in living mulch. And we will be looking for collaboration on alternative kura clover establishment strategies. A 0 to 10% yield loss is often observed when growing corn in living mulch and we need to explore reasons for this in multiple environments. We will also look for daring individuals to put this system on farm.

Funding is from USDA-CSREES Hatch through a North Central Region Multistate Project. Hatch funding will terminate September 30, 2008. A small SARE grant also provided some funding. Research will continue through a new NC Multistate Project in preparation.

**Environmental impacts of kura clover living mulch** (Tyson Ochsner, USDA-ARS; Mahdi Al-Kaisi, Iowa State University; Ken Albrecht)

Collaborative research is in progress on effects of kura clover living mulch on nitrate leaching. Research is being planned to measure the effect of kura clover living mulch on water and nutrient runoff and soil erosion from corn fields in the Driftless Region. Six acres of kura clover were established in August 2007 on a field with 8% slope. Treatments and measurements will be initiated in 2009 or 2010. We are eager to discuss research design and collaboration. Funding is USDA-ARS and USDA-CSREES Hatch. Hatch Funding ends September 30, but this work will be included in the new NC Multistate Project that is being developed.

**Companion crops for forage legume establishment** (Ken Albrecht and former graduate student Mark Sulc)

We aren't currently doing research in this area, but have in the past accumulated data on oat, ryegrass, barley, oat-pea and barley-pea mixtures as companion crops for slow-establishing perennial legumes. The purpose of our companion crop research was: develop quick ground cover to minimize opportunity for soil erosion, provide greater yield during the year of legume establishment, manage the system to optimize forage quality for livestock that will be utilizing the first year forage, and minimize competition to the legume seedling. We have a number of refereed publications and fact sheets available for anyone interested.

**Organic management systems for processing vegetables** (Jed Colquhoun and graduate student Heidi Kraiss)

Work focuses on weed and fertility management in processing snap bean and sweet corn. She has studied effects of incorporating cover cropping on organic nitrogen fertilizer demands in sweet corn. She is also comparing oat cultivars for their effectiveness at controlling weeds in fresh market vegetables. We will be mowing the oats just prior to planting and will rely on possible physical as well as allelopathic properties of the oats for weed control.

**Cover cropping strategies for commercial vegetable rotations** (A.J. Bussan and graduate student Mike Copas)

We have four projects ongoing looking at alternative cover crop strategies in an intensive vegetable rotation. Two of the projects focus on establishing perennial forage cover crops under snap bean that will serve as a nitrogen source for sequential crops. The cover crops were established in the first snap bean year and maintained through the following season of sweet corn and finally plowed down prior to potato planting in the third rotation year. The other two projects look at spring planted annual cover crops prior to snap bean. The projects will determine what stage of cover crop development will provide the most nitrogen for a subsequent snap bean crop, as well as cover crop residue management techniques that will minimize interference with the harvested snap bean crop.

**No-tillage organic soybean production in winter rye** (Josh Posner and graduate student Emily Bernstein; Dave Stoltenberg and Janet Hedtcke; and J. and T. Miller Organic Family Farms)

The goal of this research is to increase our understanding of the agronomic, environmental, and economic risks associated with the use of fall-planted rye as a mulch in no-tillage, organic soybean cropping systems. Specific objectives are to determine the effects of plowdown rye versus roller-crimped rye on soybean establishment, development, and yield, weed suppression, soil moisture availability, soil loss, and profitability. Integration of fall-applied dairy manure into these organic soybean systems is also being assessed.

Funding is from a Wisconsin Distinguished Graduate Fellowship, University of Wisconsin-Madison Graduate School, and USDA-ARS. Project duration is fall 2006 to fall 2009.

## Extension/Education

Albrecht, K.A. and A. Sabalzaray. Maize silage production in kura clover living mulch. European Grassland Federation Conference on Sustainable Grassland Productivity. Badajoz, Spain. (200 attendees) (Invited speaker)

Albrecht, K.A. 2007. Corn silage and grain production in kura clover living mulch. Sustaining Productive Soils Workshop, Yakama Nation Environmental Management Program, Toppenish, WA. (150 attendees) (Keynote speaker)

Albrecht, K.A. 2007. Living mulches: Refinement and application. Sustaining Productive Soils Workshop, Yakama Nation Environmental Management Program, Toppenish, WA. (150 attendees) (Keynote speaker)

Albrecht, K.A. 2007. Experiences with kura clover living mulch cropping systems. Kura Clover Living Mulch Systems Workshop. Ames, IA. (30 attendees)

Albrecht, K.A. and N.A. Bard. 2007. Opportunities for organic corn production in kura clover living mulch. Organic Agriculture Field Day. Arlington, WI. (50 attendees)

Bernstein, E. 2007. No-tillage organic soybean production in winter rye. Organic Agriculture Field Day. Arlington, WI. (50 attendees)

Bernstein, E. 2008. No-tillage organic soybean production in winter rye for improved weed management in South Central Wisconsin. MOSES Organic Farming Conference. La Crosse, WI. (2400 attendees)

Bussan, A.J. 2007. Alternative systems for processing vegetables. Wisconsin Fertilizer, Agrilime and Pest Management Conference. Madison, WI. (60 attendees)

Bussan, A.J. 2007. Organic sweet corn production. Annual Fresh Market Produce and Bedding Plant Workshop. Cashton, WI. (60 attendees)

Bussan, A.J. 2007. Alternative management systems for potato. UW Extension and WPVGA Potato Grower Education Conference. Stevens Point, WI. (90 attendees)

Bussan, A.J. 2007. Cover cropping tools for processing vegetables. Central Wisconsin Processing Crops Meeting. Hancock, WI. (40 attendees)

Bussan, A.J. 2007. Opportunities in organic vegetable production. Central Wisconsin Processing Crops Meeting. Hancock, WI. (40 attendees)

Bussan, A.J. 2007. Alternative systems for processing vegetables. Pea and Sweet Corn Meeting. Lomira, WI. (75 attendees)

## Communication

### Policy

Last June I met with Iowa Department of Agriculture and Land Stewardship and Wisconsin Department of Natural Resources water quality staff regarding use of kura clover living mulch to reduce soil erosion and nitrate movement into the surface water of the Upper Mississippi River Valley. I presented a summary of results and we collectively discussed what remains to be done in order to make kura clover living mulch a viable tool for agricultural production. Both agencies expressed the urgent need to work out remaining limitations to wide-scale adoption of this living mulch system for corn production in the Upper Mississippi Valley.