

Report on 2013-14 Endowed Chair Activities

Rob Myers, Ph.D.

Summary

The opportunity to serve as an Endowed Chair in Agricultural Systems through the Minnesota Institute for Sustainable Agriculture was a great experience this past year. I learned a significant amount from my many meetings and conversations with individuals involved with the Green Lands Blue Waters organizations based in Minnesota and Iowa and working on cover crops and other living covers. I took the approach of trying to learn what barriers and opportunities those individuals felt existed for adoption of cover crops in the region, particularly in Minnesota. As can be expected, there was a wide range of perspectives on this, as noted in more detail below.

Besides spending a considerable amount of time in this information gathering, I also tried to focus on what could be done to catalyze further work on cover crops in the region. My two principal contributions in this area were identifying and communicating a set of business enterprise opportunities related to cover crops, and the development of a Minnesota cover crops symposium that was held in early April 2014.

In terms of business enterprises related to cover crops, I outlined 20 specific business opportunities related to cover crops, based on reviews of current and possible activities related to cover crop (see appendix 1). I communicated these both through a number of individual meetings and also through three invited presentations. Those presentations were as follows:

- Invited presentation on 9/26/13 to the Iowa Clean Water Alliance, a group of primarily ag retailers (mostly IA, some with business in southern MN) who meet quarterly at the Iowa Soybean Association to learn about new developments related to water quality. Some agency staff were also in attendance.
- Invited presentation on 11/21/13 at the Green Lands Blue Waters Conference in Minneapolis, MN. This was the first time I publicly presented in detail the 20 different business opportunities with cover crops.
- Invited presentation on 2/11/14 at the Agribusiness Association of Iowa annual conference in Des Moines, IA. This was a great opportunity to communicate about cover crop enterprise development with agriculture business leaders and managers working in the region.

The biggest deliverable I provided during my endowed chair work was the development of a Minnesota Cover Crops Symposium, which provide me not only a chance to speak to a Minnesota audience but much more importantly helped galvanize some collaboration between agriculture organizations in Minnesota around the topics of cover crops. Out of an initial brainstorming session with Don Baloun, Minnesota NRCS State Conservationist, we were able to build a partnership for this effort between Minnesota NRCS, Minnesota Department of Agriculture, and University of Minnesota Extension. We also had involvement from the

Minnesota Corn Growers, the Green Lands Blue Waters program, Minnesota Sustainable Farming Association, and of course MISA. As is detailed below, planning for this event was an extensive process (especially with snowstorm complications!), but the collaboration was at least as valuable as the event itself. It really got some key partners talking more about cover crops and the challenges and opportunities with cover crops going forward.

General Observations and Analysis from Meetings in Minnesota

After initial conversations with Richard Warner by phone, I determined it would be beneficial to have meetings with several current and potential partners of the Green Lands Blue Waters program in both Minnesota and Iowa. Richard was very helpful (as was Helene) in identifying several initial contacts to work with and the network of contacts enlarged from that point. Ultimately I had face-to-face meetings with a total of 42 individuals, normally one or two people at a time, and most of them people I had not previously met or communicated with (see appendix 2). I also made contact with several additional people through scheduled phone appointments when the timing of my trips did not coincide with their availability.

One of the notable things from visits with individuals in Minnesota and Iowa was a feeling that cover crop options are limited. Many mentioned feeling that cereal rye was the only viable option, and it was not good before corn, just before soybeans. In fact, research and farmer experience from other states would suggest there are additional options that CAN probably work in Minnesota in selected situations (more comments on this below).

Going forward, one suggestion is that there be more regular interaction between University of Minnesota extension and research staff with the relevant state and federal agencies. Better communication between these various groups on the topic of cover crops and soil health would help make sure everyone is as up to date as possible on relevant practices and policies, and where the challenges and opportunities are at.

Analysis of Cover Crop Challenges and Opportunities in Minnesota

My own professional work with cover crops goes back to 1991 when I first started a research project with several species of cover crops. I proceeded to work with cover crops in the field off and on over the next 20 years, more in demonstration and education activities than research but with occasional small research projects. However, my greater exposure to the cover crop activities in the U.S. has been through my involvement with SARE. Although I have that background in cover crops from a Missouri, regional, and national perspective, I tried to approach the situation with cover crops in Minnesota with a fresh set of eyes. In some cases the comments I heard in my many visits were in line with perspectives in other states, but there were also comments and perspectives unique to Minnesota, or at least the upper Midwest.

Foremost among the challenges identified in my meetings is the short window in spring before corn planting and in fall after corn and soybean harvest but before it gets too cold to establish a cover crop. Cereal rye is considered a viable option by most who have worked

with cover crops in Minnesota, due to its cold tolerance, vigor and hardiness, but it is better suited for use before soybeans than before corn. Generally people I met with felt there was a lack of other cover crop options. While it's true there are a lack of proven alternatives to winter rye for Minnesota, I would suggest there are several cover crop species and cultivar worthy of testing in Minnesota. Some require seeding into standing corn or soybeans to get an earlier enough start (with oilseed radishes and annual ryegrass being prime examples), but others may have fast enough fall growth to have merit, such as black oats (which would winterkill), faba beans, and others. More testing of a wider range of cover crop germplasm would be of real value for Minnesota.

Another issue I heard about from several people, related to the item above, is that the attempt to get an earlier start with selected cover crops (primarily cereal rye) in the fall through aerial seeding had not been consistently successful. In fact one MDA aerial seeding trial on several farms reportedly had poor cover crop establishment. My observation here is that cereal rye is generally more challenging to establish through aerial seeding than smaller seeded cover crops such as annual ryegrass and oilseed radish. The smaller seed species find their way into the crevices and cracks of the soil more easily, thus getting in better contact with soil moisture. Those two species in particular are also fast germinating.

In general, the above two issues (short post-harvest season and aerial seeding challenges) were cited, generally in a pessimistic way, by University of Minnesota agronomists who had held initial enthusiasm for cover crops that had subsequently cooled. However, it's clear there ARE many ways cover crops can be used in Minnesota. Cover crops are an immediate fit for situations where there is corn harvested for silage (allowing earlier planting of cover crops) or for seed corn operations (thinner plant canopy and earlier harvest allowing easier broadcast establishment of covers). After canning crops or after small grains is another set of options for getting cover crops established early. In fact, some corn and soybean farmers in other states are adding wheat back to their rotation to make it easier to get cover crops integrated into their cropping system. They see yield benefits to corn and soybeans from adding both the third crop in the rotation (Matt Liebman at Iowa State has extensive data on this - <http://www.leopold.iastate.edu/news/10-11-2012/benefits-of-longer-rotations>) as well as from adding the cover crops. I also learned how sugar beet growers had become enthusiastic users of spring cover crops (mainly oats).

Given the number of livestock operations in Minnesota, there is also merit in exploring more fully the opportunity to graze cover crops, whether it be cereal rye planted after corn or other cover crops planted after early harvested cash crops. Data from other states shows that covers like annual ryegrass and cereal rye can produce a considerable amount of short-term forage, providing a significant economic return on the cost of the cover crop seeding.
http://agebb.missouri.edu/news/queries/showall.idc?story_num=6614

To summarize, some real needs for further research with cover crops in Minnesota are:

- 1) Testing of a wider range of cover crop germplasm, both different species and additional varieties, for adaption to relevant cropping systems in Minnesota. The ARS National Plant Germplasm System has a good diversity of accessions for many cover crop species, and among these are undoubtedly some that would fare better in Minnesota than currently used varieties.

- 2) Evaluate how appropriate cover crop species, such as oilseed radish or hardier types of annual ryegrass, can be best established through aerial seeding or highboy spreaders in August into standing corn and soybeans.
- 3) Test the potential of the Penn State Interseeder system that plants a cover crop such as annual ryegrass BEFORE the canopy closes in corn, allowing it to get established and to apply nitrogen and herbicide in the same pass. <http://extension.psu.edu/plants/crops/soil-management/cover-crops/interseeder-applicator>
- 4) Demonstrate the use of cover crops in a wider variety of cropping system applications in Minnesota - after small grains, silage corn, seed corn, and canning crops, for example.
- 5) Document the feed value of cover crops used for fall and/or spring grazing under Minnesota conditions.

Business Opportunities with Cover Crops

Today's commodity crop farmers rely on a variety of agricultural businesses to support and service their operations, ranging from seed and equipment companies to agriculture cooperatives and retailers who provide and apply fertilizer and pesticides. The engagement of each of these ag industry sectors with cover crops will be pivotal to gaining widespread adoption of cover crops going forward. Fortunately, there are many ways these agricultural companies can and in some cases already are making money from cover crops. As part of my endowed chair activities I attempted to engage with a few of these companies and communicate with some industry audiences about ways they could develop new business enterprises around cover crops (specific list of enterprises shown in appendix 1).

Seed companies are the industry segment most actively engaged with cover crops to date, although for the most part, the companies involved with cover crop seed sales are mid-sized forage seed companies or small start-up farmer-owned cover crop seed enterprises. These smaller companies are playing a big role in not only distributing seed but also providing educational information about cover crops to farmers. Going forward, there is the prospect that one or more of the larger commodity seed companies (Dupont Pioneer for example) will get involved with cover crop seed sales. There is also a need for the larger commodity seed companies to look at their breeding and marketing strategies with crops like corn and soybeans and see what needs to change to make it easier for their farmer clients who want to use cover crops (such as providing them with earlier maturing soybean varieties or corn varieties that can be planted later in spring).

In the equipment area, so far it's been primarily the smaller equipment companies that have been innovating with cover crop equipment, but already we are seeing mid-sized companies like Hagie Equipment get involved. Hagie Equipment is a major player in the highboy equipment business for high clearance spray and fertilizer equipment. In visiting their factory in the fall of 2013, I saw two different prototype pieces of equipment they were working on for high clearance cover crop seeding, which will be very helpful in Minnesota for getting an earlier start with cover crop establishment. In visiting with a team of their engineers and agronomists, we discussed what would be most helpful to farmers and where there are

opportunities for their company. I think they and other small and mid-sized companies will continue to be the early innovators with new equipment geared to cover crop users.

This new high clearance equipment for seeding cover crops will also be of value to farm supply coops and other ag retailers. In the SARE/CTIC 2013-14 national cover crop survey, we found that many farmers would like to have their ag retailer plant their cover crop. This is a natural fit for ag retailers as they have equipment sitting idle in August and September and an underutilized labor force at that time of the year. Ag retailers also have a big potential role to play in advising farmers on cover crop seed choices, planting and termination, and helping them adjust their nutrient management plans. The SARE/CTIC survey also found that farmers want ag retailers to help track the changes in soil health they are achieving through adjusted management practices, including use of cover crops.

Another business area I learned more about during my endowed chair project is the business of farmland management companies. I had a chance to visit Hertz Farm Management and talk to one of their senior managers at their Iowa headquarters (they have additional offices and land under management in multiple states, including Minnesota). I learned that they are starting to get more questions from land owners about conservation practices and they have the potential to help bridge the conservation interests of owners with practices that can be implemented by the farmer tenants or renters. Hertz manages over 500,000 acres of corn and soybean land; they and other land management companies obviously have the ability to make a major impact on whether farmers are using cover crops. They can also play a key role in helping landowners and farmers navigate the various cost-share programs for planting cover crops that are offered through federal and state agencies.

Concluding Thoughts

Ultimately, there is both a great opportunity and the need for more cover crop adoption in Minnesota and the Upper Midwest. The potential benefits have been well documented, both for individual farmers and landowners and for large area impacts on lakes and rivers. The great thing with the current movement on cover crops and soil health is not only that there are so many potential benefits, but this is an area of activity where all the various players in agriculture can work together in a mutually beneficial way. This extends to the need for further cooperation between relevant public sector programs and institutions and better engagement with the private sector to catalyze more adoption of cover crops and other living covers.

Appendix 1

DEVELOPING NEW BUSINESSES AROUND COVER CROPS

Developed by Rob Myers¹

Business Opportunities for Ag Retailers

- 1) Sell cover crop seed to their farm customers
- 2) Provide management advice on cover crops, including adjustments in fertility management
- 3) Seed cover crops with high clearance rigs or other equipment
- 4) Provide cover crop termination service
- 5) Offer soil health testing service, including impact of cover crops on soil health

Business Opportunities for Seed Companies

- 6) Sell cover crop seed both wholesale and retail
- 7) Procure cover crop seed supplies
- 8) Advise farmers on seed choices
- 9) Evaluate new germplasm and species, developing and releasing new varieties for specific regions and uses

Business Opportunities for Equipment Companies

- 10) High clearance seeding equipment
- 11) Planters that can precisely plant multiple seed types
- 12) More and better options for minimizing trips over the field for cover crop seeding
- 13) Fall incorporation tools (manure, fertilizer) that minimize cover crop disturbance
- 14) Cover crop termination equipment
- 15) Tools to improve success of cash crop planting into cover crop residue

¹ This information was publicly presented by Rob Myers for the first time at the Green Lands Blue Waters Conference in Minneapolis, MN, on November 21, 2013. This list of 20 business opportunities was developed during the MISA Endowed Chair work by Myers during 2013, and is based in part on interviews and meetings conducted by Myers with industry and organization leaders in Minnesota and Iowa.

16) Wild and crazy ideas that might be the future – robots?

Business Opportunities for Farmland Managers and Information Providers

17) Advising farmland owners on options and benefits with cover crops

18) Better connect conservation-minded landowners with conservation-oriented farmers

19) Assist landowners with methods of accomplishing conservation plantings, such as helping them line up companies that can plant cover crop seed for them

20) Help landowners and farmers match the conservation approach to their land resource, navigating the “jungle” of federal and state conservation programs and information

Appendix 2

Individuals I had meetings with as part of endowed chair project

Minnesota

Richard Warner, GLBW
Grace Wilson, GLBW
Helene Murray, MISA
Paul Porter, U of MN Agronomy
Miriam Gieske, U of MN Agronomy
Craig Sheaffer, U of MN Agronomy
Don Wyse, U of MN Agronomy
Nick Jordan, U of MN Agronomy
Joan Stockinger, Coop. Development Services
Linda Meske, Rural Advantage
Jill Sackett, U of MN Extension
Tom Ehrhardt, Albert Lea Seed
Mike Schmidt, U of MN Extension
Matt Wohlmann, MDA
Dave Frederickson, MDA
Warren Formo, MWARC
Nancy Ehkle, U of MN Agronomy
John Baker, ARS
Deborah Allen, U of MN Soils Dept.
George Boody, LSP
Don Baloun, NRCS
Mark Zumwinkel, MDA
Carissa Spencer, NRCS
Seth Naeve, U of MN Agronomy
Bill Lazaraus, U of MN Ag Econ.
John Mesko, MN SFA
Adam Birr, MN Corn Growers

Iowa

Sarah Carlson, PFI
Tom Kasper, ARS
Eileen Bader, The Nature Conservancy
Roger Wolf, Iowa Soybean Association
Todd Sutphin, Iowa Soybean Association
Heath Ellison, Iowa Soybean Association
Harry Ahrenholtz, Iowa Clean Water Alliance
Tim Couser, producer involved in Dupont project
John Maxwell, producer involved in Dupont project
Andy Heggenstaller, Dupont Pioneer
Bill Holstine, Hertz Farm Management
Mark Rasmusson, Leopold Center
Rachel Halbach, Hagie Equipment
Mike Meyer, Hagie Equipment
Amber Kolhaas, Hagie Equipment

Other people I held phone interviews with:

Adam Birr, Minnesota Corn Growers
Doug Peterson, MN Farmers Union
Matt Leavitt, Albert Lea Seed
Bill Bond, MN Crop Retailers Assoc.
Scotty Wells, U of MN Agronomy
Steve Taff, U of MN Ag Econ.
Ray Gaesser, Iowa Producer and ASA Pres.
Leigh Adcock, Women, Food and Ag Network

Appendix 3

Details on meetings held in Minnesota and Iowa during the project

Notes from meetings during the week of May 6-10, 2013

Minnesota meetings

Richard Warner (and Grace Wilson)

Talked about several topics, including Value Chain Analysis with Grace Wilson, geographic information systems work, and the Foresver Green initiative related to possible new state funding. Suggested possible meetings with George Boody (LSP), Leopold Center, Greg Johnson, Waseca, MN and IA Farmers Unions, Jennifer Filipiak with Illinois Stewardship Alliance. Said they've had support from the Northwest Area Foundation and the Walton Foundation (Maura McDonald in DC). We talked about working with the Midwest Cover Crops Council to put up a director of companies that could assist farmers and landowners with cover crops services; since MCCC doesn't have a staff or much ongoing funding, would probably have to be at least partially a self-service type thing where a company could submit their information for posting. Richard said George Boody and staff have done soil health workshops via video to six sites using NRCS assistance. Mentioned the perennial lands book. We talked about the potential value of finding out how Maryland had been so successful in getting cover crops on a large acreage (concerns with Chesapeake Bay a big part of it).

Helene Murray and Kate Seager

In Iowa, Leigh Adcock is a good contact for Women, Food, and Ag Network (talked to her by phone). LSP has good contacts with landowners in SE MN. For cover crop profitability, could talk to Rob King (spoke to Rob briefly by phone but timing of my visits never worked out for when he was in the office). Matt Leavitt at Albert Lea Seed is a grad of agronomy (I spoke to him by phone early on and then arranged for him to speak at the cover crop symposium). We reviewed who does cover crop work in the Agronomy Dept., I later managed to visit with all of those.

Miriam Gieske

Worked on tillage radishes under Don Wyse. Looked at seeding rate, date, impact on corn and oat yield. Also looked at two species of brassicas that were winter hardy, one of them being dwarf essex rapeseed. For her study they planted the brassicas into oat stubble or soybean stubble that had been mowed down. Was trying to understand why radishes didn't increase available N the following June. Radishes are good at taking up available N in fall. Her research suggests it's best to use seeding rate of less than 5 pounds per acre with radishes. No impact on corn yield, positive or negative. Oat yields was reduced in one situation but that was because the oats lodged (more N available?). She said Mark Zumwinkle with MN Ag Dept would be good to talk to about aerial seeding.

Paul Porter

He has mainly worked on cereal rye, but not much in last few years due to international travel. Mainly rye after corn and before soybeans. Felt rye could be particularly targeted to corn silage acres but not a lot of those in MN. Felt over-seeding into standing crop would help but hadn't really worked on that. Had done some work at Lamberton, including nitrate monitoring. Would like to see more species that work in MN.

Commented on hairy vetch being a weed in small grain fields. Mentioned Farm Fest in MN as big farmer event (first week August?). Said Gary Freyeresen has done some cereal rye modeling, looking at heat units in fall and spring. Said Winfield Solutions is a large input supplier that used be Cenex Land O' Lakes.

Craig Sheaffer

First pieces of news was that he had just found out all his cover crops (several species) at Rosemount had died during late April snow storm - most were green and growing earlier in April. Presumed the soil temps had gotten too cold for the actively growing covers.

Said his alfalfa was also killed at Rosemount but they had some survival at other locations (and I think he had some covers survive elsewhere). Of all the agronomy staff, Craig seemed to feel there were more viable options than just cereal rye, but he admitted he'd like to see more variety development for cover crop use. Was interested in how fall planting methods and management might affect winter survival. (had a short visit so that's about all we got over).

Don Wyse

Talked quite a while about the Forever Green initiative and where funding support for cover crops will come from, along with some general policy change discussion. He likes the idea of getting industry more engaged on cover crops. Seemed to feel cover crops are a hard sell with some audiences. Commented on situations in the past where the rye or other covers failed. Did not talk too much about specific cover crops - Don was more interested in talking about general problems he had seen affecting attitudes/adoption and how to overcome barriers (especially finding more funding). Felt state funding would be key for people at University of Minnesota.

Nick Jordan

Of the agronomy faculty, Nick was perhaps the most optimistic about cover crops. Had a few current and recent cover crop trials. We talked some about the fit of cover crops as part of the overall farm landscape and general conservation approaches.

Joan Stockinger, Cooperative Development Services

Joan wanted to talk a lot about her concept for Stewardship Farmland Management companies that would be a way of forming new companies to advise landowners on conservation approaches when working with tenants or renters, or in some cases to handle sign-ups for NRCS programs, arranging conservation contractors, etc. She talked about how this could create convenience, peace of mind and address environmental values of landowners. We talked a bit about existing farmland management companies such as Hertz. She said another big one is Farmers National in Omaha. She also mentioned a smaller firm named Fairland in southern MN that has about 6-8 farmland

managers and tens of thousands of acres under management. Another suggested point of contact is Jamie Ridgely with Agren in Des Moines (former NRCS staffer) has an absentee landlord center; program to certify conservation operators. She also suggested checking with Drake Law School on their farmland leading models or templates.

Linda Meschke, Rural Advantage and Jill Sackett, Minnesota Extension

Jill said aerial applicator rates for broadcasting cover crop seed were running \$25-35 per acre in IA. We talked about cover crop impact on cash crops under dry conditions and she mentioned ND having some data on evaporative losses for conventional vs. cover crops - this might have been John Stika with ARS at Dickinson. We talked about highboy sprayers for broadcasting cc seed - she said Matt Van Tilburg was an Ohio farmer who had done that for about \$10,000 in retrofitting costs. She said Don Baloun, the MN NRCS State Conservationist, wants his agency to work more with private industry so would be interested in what I am working on for Endowed Chair activities. As far as local companies, they mentioned AgCo, headquartered in Jackson, MN, as one to possibly connect with on cover crops.

Jill said she's had a lot of farmers come to meetings but not many using cover crops with the exception of farmers growing sweet corn and peas. Said some farmers had put cc seed on with manure. She threw out the idea of broadcasting a cover crop at the same time urea is being broadcast. Linda mentioned how sugar beets had been a success story on cover crops, with farmers associated with the Southern MN Sugarbeet Cooperative planting about 40,000 acres of cover crops out of maybe 400,000 acres of sugar beets. This is mostly oats, and it's driven by water quality and the fact the oats help reduce sand blasting of sugarbeet seedlings. Farmers got cost share of \$57 per acre for cc planting (was this the sugarbeets or other?). Some other names they mentioned: Jim Clang? - Kasser and Associates - used to be with MN PCA, in Michigan now, but had developed a water quality index? Andy Hart - works in SE MN. Carissa Spencer - new NRCS state agronomist. Jill is working on a list of seed suppliers and pilots. MN may get legislative funding for water quality certification. They mentioned MN Farm Bureau might be worth talking to, and maybe MN commodity groups. Aaron Birr handles MN Corn Growers research. Said corn group probably more interested in cover crops than MN Soybean Association, but both groups want to avoid having farmers accused of causing water quality problems.

Jill suggested checking out NAAA - www.agaviation.org We talked about the possibility of doing a webinar for that audience. Linda said that the MN ag dept. has to certify that pilots have received appropriate training for pesticides - we talked about adding cover crops to that training. She mentioned Greg Buzicky with MN ag dept being involved with the certification.

Tom Ehrhardt, Albert Lea Seed

He said their cover crop seed sales have really increased over the last few years, in fact last fall they had trouble finding sources of a few things. Cereal rye is their big seller but sell a lot of legumes, too. They pre-inoculate all the legumes they send out. Need more farmers growing cover crop seed. He said they'd like to seek more guidance on rates and

uses to help farmers. Matt Leavitt their main cover crop person but he was out. Tom took me on a tour of their seed facilities. Feels cover crops are a growth industry.

Additional contacts made by phone

Doug Petersen, MN Farmers Union - Spoke to Doug by phone while in MN. He said if there was some information developed related to cover crop opportunities or programs he would be happy to share that information through their farmer communications. Said their organization feels cover crops are valuable but didn't mention any specific activities.

Ray Gaesser, incoming national president, American Soybean Association (and an Iowa farmer using cover crops) - talked to him about his cover crops use - mainly cereal rye

Matt Leavitt, Albert Lea Seed - talked with him about the work Albert Lea is doing to sell cover crop seed and what he was observing about farmers buying cover crops in Minnesota. Said they were selling a variety of things but primarily cereal rye and some oats. They sell out of state and a wider variety of cover crops being sold in those markets.

Iowa meetings in May

Sarah Carlson, Practical Farmers of Iowa

She showed me the reports they had from on-farm trials with cover crops and also a brochure listing companies in Iowa that could potentially assist farmers with cover crop seed, areal broadcasting, or spray (termination) services. This brochure is along the lines of information I was thinking would be good to have for people in MN (I later found out Jill Sackett was thinking about developing a similar list). Mentioned Jen Filipiak with IL Stewardship. Wes Sharp is an aerial applicator involved with cover crops. Vandeis has four coops in IA - Heartland, Farmers Coop, New Coop, and North Central (latter is one of better ones at promoting cover crops). Iowa Institute for Cooperatives works with all of them. Andy Heggenstaller works for Pioneer Dupont on project with cover crops - they have found cover crops keep the stover cleaner, lower ash content, saves money. Hertz Farm Management in Nevada is big farmland management co. in area.

Tom Kasper, ARS National Laboratory for Agriculture and the Environment (Ames)
Went on a tour of Tom's cover crop research plots at the ISU agronomy farm. Due to the cool wet spring, he still had cereal rye cover growing that he was intending to plant corn into. We saw and discussed several of his research trials, including work with monitoring cover crop impact on nitrates in tile lines. Tom felt cereal rye is most reliable cover crop for central IA and north, but would like to see other options. Said the rye works very well with soybeans but some consistent yield depression with corn, starting to wonder if fungi invading decaying rye tissue subsequently affects the corn - seeing some evidence of that in the greenhouse but don't know in field yet.

Eileen Bader, TNC

Met with Eileen to discuss activities of The Nature Conservancy related to cover crops and environmental programs, and her impressions on cover crop challenges in Iowa. She described how they have been particularly focused on the Boone watershed and getting

farmers signed up for practices in that watershed, as well as general education of farmers in that area. She felt cover crops have a real potential to reduce nitrates in the water and help with sediment issues. For her part of the challenge of increasing cover crop adoption was getting further communication programs for farmers, making sure that have the information they need. She also thought reaching out to women landowners could be very valuable and said they had done a few programs specifically for that audience. She indicated that 50% of the women landowners who participate in conservation meeting/workshop take some followup action, such as talking to their tenant or engaging with a conservation official (not sure if that was her data or someone else's). I asked how they identified women landowners and she said it was mainly because she was based with an SWCD office and they had that information. She also suggested talking to Jen Filipiak - Illinois Stewardship Alliance.

Roger Wolf and Todd Sutphin - Iowa Soybean Association

Roger and Todd gave me an overview of what they do in the environmental services division of the Iowa Soybean Association and I reviewed the SARE cover crops survey results with them. They described their efforts to promote cover crops for watershed protection, particularly nitrogen in water reductions. They said their board and member farmers are getting more interested in cover crops. Agreed broadcasting of cover crop seed into standing corn and beans was direction for expanded acreage. They have a pending grant from the state NRCS CIG that would fund 20 farmers doing on-farm trials. Heath Ellison is their main person working on cover crops but he was ill the day I was there and not able to meet. Iowa Soybean does have an on-farm network with replicated strip trials (they have worked on design with Cover Crop Specialties - private consulting firm, Hans Kok); they also test water samples supplied voluntarily by farmers. Suggested Ray Gaessner, incoming national president of the American Soybean Association and a farmer in SW Iowa as a contact: he plants cover crops on over 1000 acres, farms about 6000 acres. Also suggested Tim Couser, young farmer near Nevada, IA, looking at cover crops where corn stover is being used for ethanol for the Dupont cellulosic facility (I later met with Tim out at his farm); Dupont-Pioneer is coordinating some of this work. Regarding input suppliers, they said the Agricultural Clean Water Alliance, an NGO representing 12 major ag retailers that probably cover 20% of Iowa acres, is good to work with - the alliance has a president who is a retired manager of a farm input supply company. I asked about Hertz farm management company and Roger said that Bill Holstine, based in their Nevada, IA, office, would be a good contact. We talked a bit about policies related to cover crops and they were glad to hear about the upcoming changes on crop insurance I have been working on as part of the task force related to cover crops. They suggested that NRCS have a conservation activity plan for cover crops.

August meetings

Monday, August 5th - Iowa Soybean Association

I had a followup meeting at the Iowa Soybean Association, this time with Roger Wolf, Heath Ellison, and Todd Sutphin of IA Soybean, and Harry Ahrenholtz, president of the Agriculture Clean Water Alliance.

Their ACWA is comprised primarily of ag retailers (fertilizer and herbicide dealers) on water quality issues, with a focus on how to reduce nutrient loss from farms. The ag retailers represent watersheds from roughly half of the state. They have learning forums on a regular basis with speakers. Would like to get CCAs more involved. Mentioned Heartland - David Coppice. We discussed the issue of how to give crop advisors the incentive to talk about soil health and cover crops.

Roger commented that lost nutrients from farms represent a lost opportunity to impact crop yields.

Talked about Poet and Dupont cellulosic ethanol plants. Dupont has an agronomist working with farmers some on cover crops - Andy Heggenstaller. Roger suggested talking with a young farmer named Tim Couser whose family operation is connected to the Dupont cellulosic project and is trying cover crops (I did follow up and meet with both Andy and Tim).

Asked about equipment manufacturers and they mentioned Hagie Equipment (Clarion, IA - I followed up with them in a number of ways, leading to a meeting I had with four of their managers and a tour of their factory and new prototype high clearance cover crops seeder) and John Deere - contact Pauli Bradley. Said JD's high clearance equipment plant just down the road in Ankeny (I later drove past it). Also mentioned AgCo in Jackson, MN - they have a presence in Iowa and seem to want to be innovative.

I asked Harry about any trade publications the ag retailers would likely get. He said "Ag Professional" and "Crop Life." Also mentioned the "Winfield answer plot" near Story City, IA. Commented on cover crop effect on rootworms (not sure if this was in connect to the Winfield plot or not). They also mentioned Joel Brinkmeyer as the CEO of the Agribusiness Association of Iowa, based in Des Moines. (I subsequently met Joel after the presentation I gave in September at Iowa Soybean Association - he then invited me to give a presentation on cover crops at their annual agribusiness meeting). The Agribusiness Association of Iowa puts out an "Agribusiness Report" that reaches a lot of ag industry people in Iowa, and something called "Take 5" that's a weekly blurb.

(Also met later that day with Jim Gulliford, Executive Director of the Soil and Water Conservation Society on the topic of cover crops, but that was more on SARE business and was not counted on my endowed chair timesheet.)

Tuesday, August 6th

First meeting was with **Mike Schmitt**, Association Dean of Extension. Mike outlined a few relevant programs in Minnesota:

1) Ag water certification program - federal - MN first to adopt; they do cost share for nutrient BMP's, had a million \$ from NRCS and another million in state funds for 3-4 piloted watersheds. Said **Matt Wohlman** was involved from state department of ag (I later met with Matt). Also mentioned Brad Redlin from MDA fertilizer/pesticide

division being involved. Farmers agree to keep open records in return for being protected from regulation for 10 years.

2) Nutrient reduction task force - MPCA leads a multiagency effort tied to Gulf Hypoxia. In MN they are trying to reduce N loading by 40%.

3) MN Department of Agriculture has a nutrient management task force that has been meeting for about 2 years. Primarily focused on groundwater. Question being debated about whether regulation is needed. Currently moving to public input phase.

Mike mentioned the following possible contacts in commodity groups:

- **Adam Birr**, research director with MN Corn Growers, formerly with MDA, has a PhD in soil science (since then I've had a few phone conversations with Adam).

- Paul Meints, research coordinator with MN Soybean Association, has PhD from Oregon State, just started in June. Also, Mike Youngberg is another good contact. They are based at Mankato.

- Kevin Paap - President of Minnesota Farm Bureau, Chris Radatz is the executive director.

- **Warren Formo** - Executive Director of the Minnesota Ag Water Resource Center, funded by commodity groups (mainly corn and soy). They have several scientists working for them (I later met with Warren and have follow-up contact by phone and email - he has agreed to participate in and help promote the Minnesota Cover Crops Symposium).

- **Bill Bond** - MN Crop Production Retailers - based in Twin Cities (Eden Prairie). Was not able to meet with Bill face-to-face due to scheduling issues but have talked to him twice by phone - he has agreed to participate in and help promote the Minnesota Cover Crops Symposium).

Richard Warner. Richard said the upcoming GLBW conference will pull together many of the GLBW partners. We discussed the conference at some length. Richard also updated me on their work on a practical document on value chains. He suggested I take a look at the Minnesota Ag Water Quality Certification program. Mentioned **Matt Leavitt** from Albert Lea Seed (I followed up with Matt by phone, having met previously with his boss, Tom Ehrhardt, in a face-to-face back in May, and have arranged for Matt to speak at the Minnesota Cover Crops Symposium).

Nancy Ehlke. She suggested I meet at some point with some of the agronomy extension faculty who aren't necessarily working with cover crops. Jeff Coulter doing work on alfalfa in corn rotation. Dave Nicolai in Farmington another potential contact. **Scotty Wells** will be starting as a new faculty member on Dec 1st, working on forages and cropping systems and may have interest in cover crops. Was at NC State and did something with rye for PhD. (We have arranged for Scotty to be involved in helping facilitate a session at the Minnesota Cover Crops Symposium).

She mentioned Dave Torgenson with MN wheat growers , based in Red Lake Falls. Involved with regional project that involves covers with corn and soybeans in NW Minnesota. Email for him is torgenso@gvtel.com Also in the NW part of MN, they had Larry Smith as an agronomist but he is retiring this winter. Gregg Johnson doing some work on conservation in SE MN.

John Baker and Deborah Allan. At Deborah's suggestion, I visited with John and Deborah together. They had previously participated in a demonstration project that tried flying cover crops onto about 15-20 farms. Had very mixed results in terms of establishment. Farmers were trying cereal rye. John was doing a project with kura clover as a perennial living cover. Hard to find the seed (said something about using a modified potato digger - to dig up clover plants?). So far they were trying spring seeding. He said Ken Albrecht at U of WI has been working with Kura for awhile. Commented you need irrigation or timely rains to keep the kura alive. Idea is to establish the kura early, then plant corn into it after kura is established. In MN they are using strip till to plant the corn. After planting corn, they have tried mowing or spraying glyphosate on the kura clover to slow it up. At Iowa State, Jeremy Singer has done some work on perennial covers. Ken Moore has tried K. bluegrass for corn. They mentioned Donna Rasmussen in Philmore County had done some work to promote aerial seeding through SWCD.

Don Wyse. Went out with Don to tour his research and demonstration plots on the St. Paul campus farm, and talked further about the Forever Green Initiative and what he is trying to do to promote cropping system diversification. Given the time of year, I didn't get to see much in the way of cover crop plantings but it was interesting to see the variety of alternative crops being tested. I was particularly impressed by the progress being made with the perennial wheat cultivars, which had good vigor and an upright nature suitable for machine harvesting.

Wednesday, August 7th

George Boody, Land Stewardship Project. Last fall they had conservation/cc meetings at 7 locations, delivered content by webinar. Gabe Brown and others talked. They went to the field and got soil samples. NRCS had about 100 staff participate. They have been doing a cover crop demonstration program on 10 farmers in the Chippewa watershed; want to reach women landowners in that watershed, many of whom were involved with farm when husband was alive. Mentioned soil health webpage on LSP site. One of their staff doing some cover crops work is Andy Markan for LSP in western MN. Looking at cc in corn and grazing options. Caroline Van Shale? also involved - she coordinated one of the locations for the sessions above. He mentioned Sharon Weyers, an ARS scientist based at Morris, MN, doing some cover crop research and connected to the Chippewa watershed project. The Chippewa watershed is 1.8 million acres, a lot of it is corn and soybean. One thing being worked on is grazing networks that try to enhance grazing practices. Thousand Hills Cattle Co. is a grass fed operation that buys from a number of producers, probably around 50. Rob King did a study on them looking at carbon markets and efficiency.

We talked a little about the challenge of promoting cover crops and conservation when agreements are one-year rentals.

Talked about the Farm Beginnings program - starts with "farm dreams." Cover crops are introduced to trainees. Use network of farmers and hold field days, which is one place the beginning farmers hear about cover crops. They try to promote diversified farming, get away from corn on corn. They also go over a monitoring tool box. They also have a course that involves more detailed mentoring and more detailed business plan, including record keeping. They set them up with a savings account that is matched up to a certain level to help them build up the funds to get started in farming.

Don Baloun, NRCS. I asked Betsy Wieland to join me in this meeting so we could talk a little about SARE-NRCS interactions, but we spent most of our time with Don on cover crops. Was a great discussion, of all the NRCS State Conservationists I have met with (about 10), Don seems the most enthusiastic about cover crops. He talked about how he had just devoted about \$1 million in EQIP funds to a special sign-up on cover crops. We talked quite a bit about how to get ag retailers more involved in helping farmers with cover crops. When I told Don that I was working on that for my endowed chair project, he said he really wanted to see more happen in that area but the ag retailers lacked knowledge of cover crops. I brought up the idea of a special one-day program on cover crops aimed at ag retailers, and he really liked the idea. We kicked it around with Betsy for awhile and fleshed out a few basics, including doing it during the winter and getting MDA involved (which happened on my next trip).

Mark Zumwinkle, Minnesota Department of Agriculture. Mark said he had been involved with some demonstration efforts on aerial seeding of cover crops but they hadn't worked consistently (I think it was same project as Deborah Allen and John Baker but he was a little vague). Said he had lost enthusiasm for aerial seeding of cover crops. He felt use of cover crops should be focused on specialty crops. Didn't sound like he was doing much with cover crops recently.

Drove down to central Iowa later that day.

Thursday, August 8th

Tim Couser, Iowa farmer. I met with Tim on his farm based on the recommendation of Roger Wolf from Iowa Soybean Association. Tim showed me the cover crop seed he had in the shed ready to overseed into corn a little later in the month. Tim and his dad are part of the cellulosic ethanol project run by Dupont to gather corn stover, initially with a few farmers at a pilot scale, with full production planned starting fall of 2014. Tim said he and the other farmers have been encouraged to try cover crops by Andy Hegenstaller from Dupont (who I met with on my next trip to that area).

Bill Holstine, Hertz Farm Management (Nevada, IA). Bill said they have about 500,000 acres of farmland under their management in a few Midwest states, including some in Minnesota. Based on their website they have about 10 or so people involved in managing farms along with other support staff. Bill said he supported use of cover crops and

conservation practices but they hadn't really focused on it as a business. He said some land owners were getting more interested in conservation and they tried to respect that when working with those clients.

Mark Rasmussen, Director of the ISU Leopold Center. I met with Mark since they are a GLBW partner in Iowa. Mark's background is in animal microbiology type research, although he grew up on a farm. He seemed mildly interested in cover crops but didn't know much about them, so it was a chance to educate him a little. I also talked with him about the broader goals of the GLBW partnership. Again, he seemed somewhat interested but not too aware or knowledgeable about the work with perennial covers. Would be good to get him out to some field tours or meetings where he could hear from farmers on these practices, I think.

September Meetings

September 17

Bill Lazaraus - Ag Econ. Had a short meeting. I wanted to get his thoughts on who in Minnesota would know about landowner issues or connects with farmland management companies. I met with Bill after initially contacting **Steve Taff**, who Mike Schmitt had put me in touch with. Steve said he didn't work much in that area so referred me to Bill, but Bill ended up saying he wasn't too connected to landowner managers, either.

Seth Naeve - Agronomy. Talked about cover crops in relation to soybean management in Minnesota. He said he thinks cover crops have value but hasn't seen them used much with soybeans in the state, other than some cereal rye. Mentioned Dave Nicolai (phone 651-480-7706) from extension runs a crop and pest management short course. Said Paul Mients, the research program manager for MN Soybean Association, is a good contact. paul@mns soybean.com 888-896-9678. He thought one good place for cover crops was after pea harvest or after sweet corn. Wasn't so sure about getting cover crops growing after regular soybeans with short window, but was open to new approaches or if different cover crops species could be implemented that fit better for Minnesota corn-soy conditions. Mentioned Dean Richards, a farmer in SE MN near St. Charles. Has beef cattle and uses rye for forage.

Met with **Richard Warner**. We mainly talked about plans for the upcoming GLBW conference, and he asked me to give a presentation on cover crops and the work I am doing with the endowed chair on opportunities for ag businesses to work with cover crops. He also mentioned a few possible contacts:

- Byron Kirwan - IL NRCS economist (I had met Byron back in July at a CTIC event)
- MN Farmers Union owns farm supply coop(s)
- AGREN is a consulting firm doing some work on conservation management for landowners

Met with **Helene Murray**. who suggested the following contacts:

- **John Mesko** - MN Sustainable Farming Association having a Midwest Soil health Summit - Feb 19-20 in MN his cell is 763-260-0209 - farms up by Alexandria (I've since talked with John a few times by phone and in person at the GLBW conference)

- Julie Grossman was hired in horticulture to work on food systems projects, coming from NC State (I later had a chance to visit in person with Julie at the national cover crops conference).

- Minnesota Agri-Growth Council - possible contact on ag retailers in state -Perry Aasness is exec director 651-905-8900

Matt Wohlman - MDA Assistant Commissioner. I had a great meeting with Matt, and while there, he introduced me to Dave Frederickson and I got to talk with Dave for several minutes about cover crops. Dave seemed eager to get more going on cover crops in his department to help with nutrient management issues.

With Matt, I first talked with him about the idea of a Minnesota-specific cover crops one-day symposium this winter put on with NRCS support and asked him if his department would be interested in participating. He replied emphatically yes. After we talked further, he said he thought they could use the symposium to possibly launch a new initiative on cover crops, such as providing matching cost share dollars from state funds for cover crops and/or setting up department funded demonstrations on cover crops.

Joan Stockinger. This was my second meeting with Joan. She updated me on her latest efforts to promote the idea of getting some new people involved in advising landowners on managing their farms in a conservation-oriented fashion. She admitted to some frustration in trying to get people interested in the idea. She's hoping people will develop new businesses as conservation farmland managers, which would be great in my opinion. We talked about some of the farmland management companies and she told me more about AGREN, which Richard W. had mentioned.

September 18

Warren Formo - MAWRC. Had a good long visit with Warren. He told me about the work of his organization and how it was funded by all the commodity organizations (though primarily corn and soy). Said they are trying to implement water quality testing on several farm sites where improved conservation practices have been put in place. He thought a couple of the sites were using cover crops or were going to start using them. He liked the idea of a Minnesota cover crops symposium and said he could help promote it to the commodity people.

Separate Trip to Iowa for Invited Presentation

September 26

I gave an invited presentation at a meeting of the Agriculture Clean Water Alliance, hosted by the Iowa Soybean Association at their facility. About 50 people were in attendance, with at least half the group being managers or owners of ag retail outlets in Iowa, some selling product up into southern Minnesota I was told. Other people in attendance were from Iowa state agencies, NRCS, Iowa State U., and the Iowa Soybean Association. I had been asked to give the presentation following an August meeting with Roger Wolf (Iowa Soy) and Harry Ahrenholtz (ACWA). My presentation was on trends with cover crops in the Corn Belt and opportunities for ag retailers to develop new business income around cover crops. I had several ag retailers come up to speak to me afterwards, and the Executive Director of the Agribusiness Association of Iowa asked me to give a similar talk at their annual conference. This event was exactly the type of outreach and connections with ag retail reps I hoped to achieve during the endowed chair work.

September 27

Drove up to Clarion, Iowa, to spend about two hours meeting with Hagie Equipment staff and tour a cover crops test plot and their factory, including a look at one of their prototype high clearance cover crop seeders. **Rachel Halbach**, their senior agronomist, gave me the tours, and we talked about the opportunity to get more ag retailers providing the service of seeding cover crops with high clearance equipment. Rachel and I then met up with three of their other managers, discussing prospects for them to sell their equipment to ag retailers and large farmers. I was surprised to hear that over half of their expensive high clearance spray and fertilizer rigs were being sold directly to farmers. Other managers who met with us were **Amber Kolhaas**, their brand manager, **Mike Meyer**, senior engineer working on the new cover crop seeding equipment, and one of their product managers (who's name I don't have in my notes). The Hagie folks agreed to bring information on their cover crop prototype equipment to the national cover crops conference and exhibit there.

October Meetings

October 11

Following a SARE meeting I had up in central Iowa, I spent a half day with Dr. **Andy Hegenstaller** from **Dupont Pioneer**. Andy is an ISU agronomy grad who is coordinating field research and some technology assistance for Dupont Pioneer, particularly in conjunction with their new cellulosic ethanol plant near Nevada, IA. We started out by meeting for over an hour at Panera during which time he told me about the overall cellulosic ethanol project and his efforts to implement a sustainability protocol with the farmers providing corn stover in the project. He also shared data on some strip

trials he had implemented. One key step Andy hoped most of the farmers would take is to plant cover crops, and he has been working with the pilot project farmers, starting in the fall of 2012, to get them to try cover crops. We then went out to where the cellulosic ethanol facility is under construction, next to an existing grain ethanol plant. There was a field there Andy showed me that had reportedly 50% of the stover removed (it looked like more than that to me). Andy said it has been a challenge to get the custom stover removal crews to limit the removal to 50%. Their biggest tool is that if the crews bring in stover with too much dirt on it, they get docked. It was a very windy day, and I noticed that with half (or over) of the stover removed, the remaining corn stover was really blowing around, leaving large bare areas in the field, a striking reason for planting cover crops. Andy then took me out to meet up with one of the farmers involved in the pilot project, a young farmer named **John Maxwell** (on a different trip I had visited Tim Couser, another young farmer involved in the project as noted earlier). We visited three different fields that John had seeded to various mixes of cover crops, both corn and soybean fields, all with aerial seeding about a month before. We also visited a neighbor's operation where tillage radishes had been planted on a "prevented planting" field in August, and John took us over to see his new liquid manure application machine that he had modified to reduce the disturbance of cover crop residue while the manure was being applied.

November 20-21

I participated in the 2013 **Green Lands Blue Waters conference** (my first one) and gave a presentation on "New farm business opportunities associated with cover crops." Although there were not many ag industry people at the conference, it was a good chance to share the information about cover crop business opportunities (see Appendix 1) with a variety of ag educators and other people working on conservation partnership type projects. I also appreciated the chance to reconnect at the conference with some of the individuals I had met with earlier in the year about the endowed chair project, and meet many additional GLBW partners and learn about what they are doing to develop and promote use of living covers. I felt it was a great conference overall and benefitted from both the networking opportunity and the information presented. I was also impressed by the group of people involved with GLBW, a very dedicated group with a lot of great ideas on how to move forward with living covers.