Innovative Conservation Agriculture

Sara Berges

Allamakee Soil and Water Conservation District

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Innovative Conservation Agriculture

Abstract
This project aimed to promote the implementation of cover crops and no-till on acres that have had manure application with the goal of reducing the loss of nitrogen, phosphorus, and soil and improving soil health. Working with producers, the project set up demonstration sites and field days as well as small scale farmer-to-farmer meetings to create opportunities to share knowledge of first-hand experiences related to small grains, cover crops, and cropland conversion to pasture. The field days and meetings helped educate producers and landowners about the economics and erosion associated with cropping steep, marginal cropland with the goal of converting it to pasture or hayland. Work was also done to promote the addition of a small grain to a corn-soybean rotation and educate landowners and producers about how conservation provisions included in farm leases can help to encourage and facilitate conservation practice implementation.
A final report prepared for the Leopold Center for Sustainable Agriculture

Date: February 21, 2019

Project title: Innovative Conservation Agriculture

Grant number: XP2016-05

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Project duration: February 2016-January 2019
Year 1: Received – $25,753.22
Year 2: Received – $29,479.41
Year 3: Received – $27,331.20
Total - $82,563.83

Keywords: Small grain, cover crop, manure, cropland conversion

Jack Knight, Allamakee SWCD Chairman
# Table of Contents:

<table>
<thead>
<tr>
<th>Section</th>
<th>Pages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nontechnical Summary</td>
<td>2</td>
</tr>
<tr>
<td>Detailed Report</td>
<td>3</td>
</tr>
<tr>
<td>Design methods and materials</td>
<td>5</td>
</tr>
<tr>
<td>Data and discussion</td>
<td>6</td>
</tr>
<tr>
<td>Conclusions</td>
<td>7</td>
</tr>
<tr>
<td>Impact of the Results</td>
<td>8</td>
</tr>
<tr>
<td>Leveraged Funds</td>
<td>10</td>
</tr>
<tr>
<td>Evaluation</td>
<td>11</td>
</tr>
<tr>
<td>Budget</td>
<td>12</td>
</tr>
<tr>
<td>Page 15 – Appendix – Publications</td>
<td>16</td>
</tr>
</tbody>
</table>
Iowa’s landscape has transformed over time due to changes in production methods and commodity markets from more diverse rotations to more simplified corn or corn-soybean systems. However, barriers to new conservation practice implementation have also developed. There is a need for innovative practices and educational outreach to help break these barriers and create new opportunities to protect the land for long-term sustainability. In order for producers to be willing to try new practices, they need to gain an understanding of how these practices can work in their farming operations and be economically feasible. An overall goal of this project was to find early adopters of practices who would be willing to provide first-hand knowledge to other producers.

The objectives of this project were to:

- Promote the implementation of cover crops and no-till on acres that have had manure application with the goal of reducing the loss of nitrogen, phosphorus, and soil and improving soil health
- Educate producers and landowners about the economics and erosion associated with cropping steep, marginal cropland with the goal of converting it to pasture or hayland
- Promote the addition of a small grain to a corn-soybean rotation
- Educate landowners and producers about how conservation provisions included in farm leases can help to encourage and facilitate conservation practice implementation

Most producers are more willing to work towards overcoming the “that won’t work for me” mentality if there’s someone else locally who has been able to make the specific practice or system successful. Outreach efforts through direct mailings, newspaper articles, and direct calls have generated interest in the practices. Funds from a Regional Conservation Partnership Project (RCPP) through the United States Department of Agriculture (USDA) have been able to incentivize the implementation of these practices. Field data and anecdotal information was collected from participating producers to summarize results for further outreach efforts.

Many producers were able to successfully implement cover crops in conjunction with manure application, whether the cover crop was seeded before or after manure application. Cereal rye has proven to be a hardy enough cover crop to grow even when mixed in the manure tanker and seeded with liquid hog manure, a process called slurry-seeding. The biggest factor in the amount of cover crop biomass seemed to be seeding date rather than seeding method. However, seed that was drilled or broadcast with incorporation grew faster than sites that were simply broadcast. The delay in emergence on broadcast sites did impact biomass, likely providing similar results to a field that was seeded a week or two later. Broadcast sites were
even more dependent on timely rainfall to get started, whereas drilled seed could utilize soil moisture.

Producers have been slow to plant small grains due to concerns with selling prices and finding a buyer. Most local producers who have past experience with small grains is through using oats as a nurse crop for alfalfa production rather than oats strictly for grain production. The crop is managed very differently when planted for grain harvest. This knowledge gap creates an obstacle for implementation. Additional obstacles to overcome have been harvesting equipment and grain storage. One of the biggest hurdles has been overcoming the common perception that “you can’t grow high quality oats in Allamakee County.” While the weather has not been ideal for small grain production, our producers have still been getting good yields and test weights and have shown that it is possible to grow high quality small grains here.

The interest in converting cropland to pasture exceeded our expectations. At the start of the project, the coordinator gave several presentations and wrote several articles related to the economics of planting corn or corn/beans on steep and shallow soils. Economic evaluations showed considerable negative returns on most soils that were greater than 14% slope and/or shallow to bedrock. A field day in August 2017 showcased a site that had been converted to pasture with associated conservation practices. Producers continue to ask for planning and technical assistance in developing rotational grazing systems for converting crop ground.

Q: How can we overcome barriers to implementation of small grains, cover crops on acres with manure application, and cropland conversion to pasture?

A: The PI worked with producers to set up demonstration sites and field days as well as small-scale farmer-to-farmer meetings to create opportunities to share knowledge of first-hand experiences related to small grains, cover crops, and cropland conversion to pasture.

Detailed Report

A. Introduction

The Allamakee County Soil and Water Conservation District has a goal of addressing water quality and soil health concerns by targeting the implementation of specific conservation practices that have met hurdles to widespread adoption by producers. The project is needed because there are still concerns with soil erosion and nutrient loss with the predominant farming practices. With current crop prices, farmers are looking for new market opportunities. The common rotations and tillage practices are causing them to lose money in many areas. There is more interest in soil health and how improving the soil can help reduce input needs. However, many practices have barriers that need to be overcome for producers to be willing to try them.

Small grain production has many barriers including the fallacy that you cannot grow high enough quality small grains (food grade) to get good prices in this area. Most people in
recent years who have grown small grains have used oats as a nurse crop for hay, so it is managed very differently than a small grain grown for grain production. Many producers assume you must have special equipment to harvest the grain, although many soybean heads for combines have settings that can be changed to also harvest small grains. There is a lack of knowledge about management (fungicide, nutrient requirements, storage) and who to market the product to, but continued outreach and education can help overcome these hurdles.

While cover crops have become more common, there is a common mindset that cover crops will not work if you apply manure to the field, whether there are concerns about the cover crop surviving or aligning the timing of seeding the cover crop with manure application. Some producers are concerned the nutrients in the manure will cause the cover crop to grow too quickly in the spring and be difficult to kill. Tight profit margins are causing economic hardships and producers have concerns about spending money on cover crop seed if there is a chance it will fail. Cost-share options help alleviate some of these economic concerns.

Many producers know that some areas on their farms do not yield well but have not given much thought to the economic loss and soil/nutrient loss associated with continuing to crop those areas if alternate options are available. Cropland conversion to pasture is one option, however not everyone is set up to graze, not every site is suited for grazing, and rented cropland presents additional hurdles. There is also a high cost of setting up grazing systems, however many producers have been unaware that funds from the Environmental Quality Incentives Program (EQIP) could provide cost-share for pasture practices to help reduce the economic burden.

One of the most successful ways we have found to encourage producers to try new practices is to set up field days and small-scale farmer to farmer meetings to help showcase practices and allow farmers to learn from each other. While it is important to have “experts” present information to producers, it is also important to have local producers share their experience with a practice including any hurdles they had to overcome. It is also important to focus on economics. With current crop prices, economics is one of the biggest driving factors in a producer’s decision-making process. Non-farming landowners are often left out of the conservation planning process, but it is important to talk to them about how inclusion of conservation provisions in a farm lease can help protect the long-term productivity of a farm.

The objectives of the project were to:
- Promote the implementation of cover crops and no-till on acres that have had manure application with the goal of reducing nitrogen, phosphorus, and soil loss and improving soil health
- Educate producers and landowners about the economics and erosion associated with cropping steep, marginal cropland with the goal of converting it to pasture or hayland
- Promote the addition of a small grain to a corn-soybean system
• Educate landowners and producers about how conservation provisions included in farm leases can help to encourage and facilitate conservation practice implementation.

B. Project Design, Methods, and Materials

Information about different aspects of the project was not limited to Allamakee County. Through the Allamakee SWCD website, articles in farm press and newspapers, presentations, and newsletters; information has been provided to a much wider audience.

1. Demonstration sites and field days were set up to showcase different methods of manure application and cover crop seeding. When weather prevented designated demonstration sites from being established, a caravan-style field day was set up to drive between sites of producers who were already utilizing cover crops on fields with manure application. Biomass measurements were taken at the different demonstration/field day sites to compare cover crop growth under different methods of cover crop seeding and manure application. Funds from a Regional Conservation Partnership Program (RCPP)-EQIP project were used to help encourage producers to implement this practice.

   The biggest challenges with this practice are cold/wet weather and synchronizing the timing of crop harvest, seeding of cover crop, and application of manure. Cold/wet falls delay crop harvest and cover crop seeding. Wet weather prevents or delays manure application. These weather issues also caused problems with the establishment of demonstration sites. Producers were encouraged to find ways to seed their cover crop even if their manure application gets delayed. If weather and harvest delays prevent a fall-seeded cover crop from being planted, a spring planted oat cover crop could still provide some benefits and soil protection against spring rains. To provide information about the success of planting cover crops with manure, the Natural Resources Conservation Service (NRCS) Public Affairs Specialist helped to interview producers and develop “Conservation Showcases” as well as an article in Wallaces Farmer.

2. Economic evaluations of common steep/shallow soils were run to show economic loss/gain. The more marginal cropland soils always showed an economic loss because these soils have poor yields and are often on field edges where they may be shaded. Many producers were interested in converting cropland to pasture if they had additional pasture nearby. A few were interested in converting whole fields/farms to pasture. Once people found out that NRCS can help pay for fence/watering systems/etc. for grazing systems, word of mouth spread and generated a lot of interest. Many people were previously unaware that this was something for which they could receive cost-share.

3. A small grain workshop was held the first year of the project with presentations from Grain Millers, Practical Farmers of Iowa (PFI), and the Northeast Iowa RC&D.
Grain Millers provided a lot of practical information about how to grow “good” oats and PFI helped find a producer to present who has successfully added oats to his rotation and found several different markets for them. University variety trials and information from Grain Millers was utilized to help several local producers determine varieties, seeding rates, and other production information.

One local producer was willing to provide some economic and agronomic information regarding wheat production. He had high yields and decent test weight, but the biggest impact on the profitability of his wheat crop was being able to sell it for cover crop seed at a time when rye and wheat seed was in short supply. In addition to the economic information, the project coordinator collected cover crop biomass samples and photos for use in outreach materials. This data was used to develop an article for Wallaces Farmer (published January 2019) and to generate a “Conservation Showcase” article for the NRCS website. Both of these publications reach a much wider audience than the geographic boundary of this project.

A field day was held January 2019 to present results of the cover crop biomass sampling. Tom Cotter, a producer from Austin, Minnesota presented on his experience with cover crop mixes to encourage producers to consider adding more diversity to their cover crops, especially following small grain harvest.

4. The project coordinator presented information about how to include conservation in farm leases to many different groups locally and statewide. Allamakee ISU Extension holds lease meetings annually which generated some interest in updating conservation plans and looking at conservation practices. A presentation to an Annie’s group (through ISU) in Waukon and Tama County Women, Land, and Legacy group allowed the project coordinator an opportunity to present to women producers and landowners. Iowa Learning Farms invited the project coordinator to present a webinar on “how to include conservation in a farm lease” which was held June 2018.

C. Data and Discussion

There is interest among producers in doing something “different” than their old continuous corn or corn-soybean rotation, even if they aren’t ready to commit. As is often the case, they need to see that it works economically and from a management perspective, even if it already makes sense to them agronomically. There are many barriers to overcome and one of the first steps is finding early adopters to help figure out the specifics and share the information with other producers. Small farmer-to-farmer meetings allowed producers to share information about successes and hurdles and ask questions of each other.

Producers who started growing small grains found that there is a learning curve, as would be expected. They started with small, manageable areas ranging from 10-25 acres. Yields, quality and profitability varied quite a bit and were very weather
dependent and variety dependent. However, most of the producers who planted some small grains are continuing, so they saw the benefits either from reduced input costs, spreading labor throughout the year, providing a location for summer manure application, or general soil health improvements. Many commented that they appreciated having more options for cover crop species following their small grain and were able to get substantial amounts of fall growth, which is difficult in this region if planting cover crops following corn or soybean harvest.

Cover crop biomass generally followed the trend that the highest biomass was on fields seeded early (following small grain harvest or on corn silage fields) and the lowest biomass was on fields seeded late (around the October 21 seeding deadline for winter hardy species in Northeast Iowa when following cost-share guidelines). Many factors affect cover crop growth, but some of the biggest factors other than seeding date seemed to be temperature and moisture. All methods of seeding cover crops and manure application resulted in cover crop growth. Dry periods delayed cover crop germination and cold periods slowed growth.

In 2016, all site sampled were seeded to cereal rye or a combination of cereal rye and wheat. Cover crop biomass in fall 2016 ranged from 64-173 lbs/acre on drilled sites and averaged 29 lbs/ac on the broadcast site. Manure types were injected hog manure, bed-pack sheep manure, and injected dairy manure. These sites were all seeded around October 19, 2016 and sampled around a month later.

In 2017, all sampled sites were seeded to cereal rye. One producer tried three different combinations of cover crop seeding and manure application in early September after corn silage harvest. Biomass was sampled October 19, 2017 and ranged from 113 lbs/ac – 403 lbs/ac with the slurry seeded site having the lowest and the highest on the site that had hog manure injected first and rye cover crop seeded a few days later. Another producer broadcast rye 2 weeks later and had substantially lower biomass results, averaging 26-60 lbs/ac across the different fields. No sites that were seeded mid-October were sampled in 2017 or 2018 because they had very little fall growth.

In 2018, some sites were seeded to rye while others were seeded to diverse mixes. The rye sampling sites were seeded September 10 with manure injected prior to seeding. The biomass samples taken November 7, 2018 averaged 1136 lbs/acre. Biomass samples were also taken in October and November on two fields that had multi-species cover crops planted following small grain harvest (late July or early August). Those sites had over 2000 lbs/acre of fall biomass. In addition to the soil health benefits of seeding a diverse cover crop early, there was also the potential to graze the cover crop.

D. Conclusions

When comparing cover crop establishment, it became evident how important it is to get the cover crop seeded as early as possible, regardless of when manure would be applied. Economics play a big role in producers’ decisions. When comparing options
for land use, focus on economics rather than just yield. If a specific area has mediocre yield with high input costs, it does not profit to continue cropping it with corn or soybeans. Other options are available whether that is converting it to pasture or looking at crops that have reduced input costs, like small grains. Another option may be CRP. Removing the least productive areas from row-crop production might provide the most benefit for the profitability of the operation.

In order to encourage more producers to consider planting small grains, it was important to connect them with producers who have already had some success growing them. It was also important to help them identify potential markets. Producers were most willing to start with small areas, ranging from 10-25 acres to start. If wanting to sell to a food-grade market, it is usually required to have a semi-load which is around 15 acres of grain depending on yield.

The importance of farmer-to-farmer communication became very evident. Many producers want to hear information from other people who have experience with a practice rather than from agency personnel. There is also great importance in focusing on the economics of different practices. Producers need to see how it will fit in the economics of their operation in addition to the practice “how-to” aspects.

Many landowners are still unaware of how they can influence conservation on their farms. Continued education needs to be done to inform landowners about how important written leases are and how they can specify conservation practices in their leases.

It is important for producers to continue to see how they can seed cover crops on acres with manure application. The slurry-seeding method needs more testing locally to see if it can work more consistently and with an easier way to get the seed into the manure tank. Some producers who utilize a drag hose for manure application have shown interest in trying to see if they can seed cover crops with their drag hose, whether that would be through mixing it in the manure or putting an air seeder on the manure injector.

For small grains, more markets need to be developed on a local scale. Also, more local seed cleaners would reduce travel distance for producers who want to sell their grain as seed or food grade grain.

E. Impact of the Results
The project objectives were achieved. The producers who started using the different practices are continuing the practices. This indicates that they see some value in doing them. Some are receiving cost-share and others have chosen not to.

As the Iowa Nutrient Reduction Strategy has shown, we need more crop diversity in Iowa, whether through crop rotations or cover crops, to help reduce nutrients entering
our water bodies. Diversifying operations also helps producers bring more flexibility to their operations and mitigate market risk.

The results of this project are beneficial for producers throughout Iowa and the Midwest. For many producers, knowing that other local people are able to make something “different” work is a beneficial starting place. Producers have heard in recent years that “you can’t grow good quality small grains in Iowa” but our producers have shown that isn’t the case. It may not always be easy and there is a learning curve, but it’s not an insurmountable hurdle.

The same goes for utilizing manure on fields with cover crops. Many producers thought the cover crop would be smothered if the manure is surface applied or it would be killed if the manure is injected into a growing cover crop. We’ve shown how forgiving a rye cover crop can be with manure application. Farmers are often innovators and there is a lot of opportunity for innovation with manure and cover crops.

Outreach and Information Transfer
Publications (SEE APPENDIX 1)
Many articles were written with assistance from NRCS to publish in Wallaces Farmer or as a “Profiles in Soil Health” spotlight for the Iowa NRCS website. Four different Allamakee County producers were interviewed for the “Profiles in Soil Health” publications. Many articles were written for the local newspaper on various topics including cover crop mixes, fungicide application for small grains, economics of cropping steep/shallow soils, field day summaries, methods of establishing cover crops with manure, and potential cost-share options for the different practices. After connecting with a malting facility around Cascade, Iowa, a malting barley handout was developed for producers with assistance from Brook Wilke at Michigan State University.

Education and Outreach
District newsletters were mailed to around 2000 households annually and included an article about the project yearly. A booth was set up annually at the Allamakee County Fair to provide information about the project to attendees. Project newsletters were sent to around 100 producers/organizations annually.

In year 1, the project coordinator provided information about the project in many different venues. A presentation was given regarding the economics of cropland conversion to pasture at a Grassfed Beef workshop that had 25 attendees. A poster presentation was given at the Iowa Water Conference. A small grain workshop was held in Waukon with 26 attendees and presentations from Grain Millers, the Northeast Iowa RC&D, and Practical Farmers of Iowa and a farmer cooperator. Information about how to include conservation in farm leases was presented at the Allamakee County ISU Extension farm lease meeting.
In year 2 of the project, presentations about the project were given at the Driftless Symposium in La Crosse, Wisconsin and to participants in ISU’s Annie’s project. A presentation was given to the Tama County Women, Land, and Legacy group regarding how conservation can be included in a farm lease. In April, 18 producers attended a caravan-style cover crop field day was held where we drove between different cover crop sites. A pasture walk focusing on rotational grazing and cropland conversion to pasture was held in August with 32 people in attendance and presentations from an ISU Extension Agronomist and an ISU Beef Specialist. In addition, the Allamakee SWCD hosted a soil health workshop the same day as the pasture walk with 75 people in attendance. Many of the project-specific conservation practices were discussed regarding how they impact soil health.

In the third year of the project, a cover crop and manure field day was held in early April. Soil health practices were presented to youth at the Postville Elementary Career Fair. The project coordinator presented an Iowa Learning Farms webinar about including conservation in farm leases. In July, soil health meetings were held at four producer’s farms around the county. The project coordinator attended the Watershed Leaders Network workshop in Hannibal, Missouri to talk about ways to include conservation in farm leases. This workshop was attended by producers, NRCS staff, and staff of various conservation organizations from Minnesota, Wisconsin, Iowa, Missouri, and Illinois. The coordinator again presented at the local ISU lease meeting. Many of the attendees were landowners who had land coming out of CRP.

Cooperative Efforts and Student Support
Many partner organizations helped to make this project successful. NRCS provided office space and vehicle use but also provided technical assistance for conservation practices. ISU Extension staff spoke at field days and invited the project coordinator to speak at ISU hosted meetings, including Annie’s Project and the lease meetings. The Iowa Department of Agriculture and Land Stewardship provided secretarial assistance. The Iowa Soybean Association helped advertise field days and provided a speaker for the first cover crop field day. The Iowa Corn Growers Association helped advertise events and provided funds to advertise the second cover crop field day as well as food for the event. Practical Farmers of Iowa helped advertise the small grain workshop and presented at it.

F. Leveraged Funds
The Allamakee SWCD received funding for an RCPP project that started in September 2017 to continue for 5 years. This project provides some salary funds for the project coordinator to work an additional day a week to develop applications and contracts for the EQIP program through the NRCS. It also provides cost-share for practices that align with the goals of this Leopold Grant: small grains and cover crops following small grain harvest, cropland conversion to pasture and all associated practices (seeding, fencing, watering systems, heavy use area protection), and cover crops on acres with manure application.
G. Evaluation

The number of field day and workshop attendees was tracked. Surveys were provided to the producers at the small grain workshop, but only half of the attendees filled them out and few were fully filled out. Follow-up letters and newsletters were sent to all field day and workshop attendees to reinforce the information provided at the events.

We have been able to track the acres of implementation of specific conservation practices for those who received cost-share and for a few additional producers who worked directly with us. We have not been able to track additional implementation done by producers who came to workshops/field days or heard about practices through outreach efforts.

<table>
<thead>
<tr>
<th>Practice</th>
<th>Year 1</th>
<th>Year 2</th>
<th>Year 3</th>
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<tr>
<td></td>
<td>Goal</td>
<td>Actual</td>
<td>Goal</td>
<td>Actual</td>
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<tr>
<td>Cover crops on manure applied acres</td>
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<tr>
<td>Cropland conversion to pasture/hay</td>
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<tr>
<td>Cover crop as part of small grain rotation</td>
<td>10</td>
<td>10</td>
<td>18</td>
<td>25.9</td>
</tr>
<tr>
<td>Adding small-grain to a rotation</td>
<td>18</td>
<td>30</td>
<td>45</td>
<td>25.9</td>
</tr>
</tbody>
</table>

Several landowners worked with us to update their conservation plans, but not many chose to include them in their leases at this time. However, the first step was getting them to have a written lease. The ISU lease templates were provided to interested landowners. With many acres of expiring CRP not being eligible to be re-enrolled, many landowners were interested in developing written leases with their new tenants.
Appendix 2: Publications

https://www.nrcs.usda.gov/wps/portal/nrcs/ia/newsroom/stories/ross+weymiller/

NRCS Profiles in Soil Health: Early Maturity Soybeans Improve Fall Cover Crop Growth. February 2018.  

https://www.nrcs.usda.gov/wps/portal/nrcs/ia/newsroom/stories/matt+byrnes/

https://www.nrcs.usda.gov/wps/portal/nrcs/ia/newsroom/stories/d40e6512-e111-4403-b1cd-c644b09b9b0b/

https://www.farmprogress.com/cover-crops/using-cover-crops-along-manure

Wallaces Farmer. Add Small Grains to Your Rotation. Dec. 26, 2018  
https://www.farmprogress.com/conservation/add-small-grains-your-rotation?fbclid=IwAR2znblseMXOWMepcyvJPnfH6VIlilq4IFNxovzEo3M9CmPhXr3WBfMIcynE
Project Goals
This project focuses on education and outreach regarding several practices that would provide substantial conservation benefits to Allamakee County, but have some economic and knowledge hurdles to overcome to encourage increased implementation. This work was funded in part by the Leopold Center for Sustainable Agriculture. Established by the 1987 Iowa Groundwater Protection Act, the Leopold Center supports the development of profitable farming systems that conserve natural resources. The four focus areas of this project are:

1. Promoting the addition of small grains to corn-soybean rotations.
2. Promoting use of cover crops and no-till on acres that have manure applied.
3. Promoting conversion of marginal cropland to pasture or hay production.
4. Educating landowners and producers about how conservation provisions included in farm leases can help encourage and facilitate conservation practice implementation.

Project Coordinator
Sara Berges is the coordinator for this project. She has worked for the Allamakee SWCD for 7 years. She will be organizing events, working on conservation plans, and providing education and outreach materials. Please contact her by stopping by the office, emailing her at sara.berges@ia.nacdnnet.net, or calling 563-568-2246 ext. 3.

Events to watch for in 2017

- April—Cover crop and manure field day
- Summer—Cropland conversion to pasture field day
- August—possible small grain workshop if there is enough interest
- Fall—Set up manure and cover crop demonstration site(s). Let Sara know if interested in participating.
**Funding Conservation Practices**

**March 17 is the deadline for second round EQIP** applications for FY2017 funding. Several practices have received higher rates than normal for FY17 including many associated with pasture management and some forestry practices. However, conservation plans need to be developed before an application can be ranked, so come in ASAP if you want to sign up.

**RCPP Project Approved**

We will be receiving Regional Conservation Partnership Program (RCPP) funding which will provide EQIP funds at a higher rate for FY2018 and will follow regular EQIP deadlines. It will likely have a first-round application deadline in fall 2017 for contracts that will be approved for work in 2018. Please stop by this spring or summer to begin the planning process.

**Manure and Cover Crops**

Cover crops have the potential to provide many benefits for improving soil health, scavenging nutrients, protecting against erosion, and providing livestock feed. They can be used after soybeans or corn, but especially make sense to use on silage ground. Silage ground has minimal surface residue to protect the ground overwinter and from spring rains. Planting cover crops soon after taking silage allows sufficient time for abundant fall cover crop growth, assuming adequate moisture. When taking silage, it is important to make sure to return the nutrients removed in the crop. Manure as a fertilizer source can be used in conjunction with cover crops. The cover crops can help to capture manure nutrients to minimize nutrient losses. There will be a field day this spring to showcase different farmers who are utilizing cover crops and manure on their farms using different seeding and manure application methods. This event will likely be towards the beginning of April. Postcards will be sent out as the event nears and information will be printed in the Waukon Standard, the Allamakee SWCD website, and other local resources.

There are many different methods for applying manure with cover crops. One method developed by Michigan State University is called slurry seeding. It involves mixing the cover crop seed directly into a manure tank equipped with an agitator and applying the slurry of manure and seed with a low-disturbance tillage tool (rear-mounted rolling tine aerator). This method allows for the manure and cover crop to be applied in a single pass, resulting in time and fuel savings. The spacing between the tines in the Michigan State setup was 7.5”. This system applies the manure at a shallow depth, which is necessary for cover crop growth. Many manure applicators locally have too wide of a spacing to work with this method or apply the manure too deep for the cover crop to grow. However, if anyone has a manure applicator that could attempt this, please contact the Allamakee SWCD because we have funds to help set up a trial plot.

One issue people have when considering manure on cover crop acres is that producers want to apply manure later in the season, when the soil has cooled to minimize nitrification and leaching loss, and cover crops have to be seeded by October 21 to receive cost-share. One way to make these issues work is to inject manure into a growing cover crop. The cover crop can be seeded immediately after crop harvest, especially after silage harvest, and the manure injected later. Iowa State
University has done some research on this method in the past and found that the injection bands have reduced growth, but that it does not reduce the overall aboveground biomass.

Cover crops can be broadcast or drilled after manure application. This method has greater potential for nutrient loss while the cover crop is getting established when compared to applying manure to an established stand. However, this can work for solid, liquid, or slurry manure application as long as the cover crop is seeded early enough to allow for some fall growth. Surface applied solid manure can even work with this method if the manure is applied in a thin layer. Broadcast cover crop and surface applied manure can be incorporated using a shallow tillage tool. Rye is fairly forgiving of seeding depth and tends to work best for this method.

EQIP Rate for winter-hardy single species cover crop is $41.39/acre and the rate for multiple species cover crop is $48.60/acre. Funding will also be available for cover crop use with manure through the RCPP project for FY18 (to be planted fall of 2018). If you are considering this option, please stop into the NRCS office this summer or early fall to discuss options.

**Adding Small Grains to a Corn-Soybean System**

There are many benefits to adding small grains to a rotation. They have lower input costs due to reduced fertilizer, herbicide, and pesticide costs when compared to corn or soybeans. Planting small grains also helps to diversify farm income and spread out labor throughout the year. By adding diversity to the cropping system, there is the potential to increase soil health. Small grains can be used for feed on the farm, sold locally for feed, sold to a miller (such as Grain Millers), or used as cover crop seed.

Iowa State University has conducted research for many years comparing the economics and yields of three different cropping systems: a conventional 2-year corn-soybean rotation; a 3-year corn, soybean, small grain/red clover rotation; and a 4-year corn, soybean, small grain/alfalfa (x2) rotation. The 3 and 4-year systems essentially replaced fossil fuel energy with human labor and knowledge. But, how did the diversified rotations (focusing on the 3-year rotation) compare economically with the 2-year rotation? Even though corn and soybeans were grown less often in the 3-year rotation, their yields were often a bit higher. In order to understand the actual economic value of adding a small grain to the CB rotation, the entire 3-year rotation must be evaluated. The revenue was less the small grain year, but the net return over the 3-year rotation ended up being similar to the CB rotation. The small grain year not only had reduced input costs for that year.
but also reduced input costs for the subsequent corn year. This was due to red clover supplying some of the nitrogen and the small grain breaking up pest and weed cycles leading to reduced herbicide/pesticide needs.

There are obvious hurdles for many producers such as the knowledge of how to grow a high-quality small-grain product that could be marketed as food grade, when/where to apply fungicides, availability of equipment, and availability of storage. If the product needs to be cleaned for a food-grade market, there are few businesses around that provide this service. There are still some producers who have old seed cleaners, however they may not have the time to utilize them for other producers. The only way to overcome some of these hurdles is to have farmers actually grow more small grains here, even on small 10-15 acre plots to start with in order to gain more knowledge about how to grow a high-quality product. Also, producers need to work together to know what equipment is available locally for custom work and to glean information from producers who have been successful at growing and marketing small grains. A workshop was held in August 2016 where presenters talked about how to successfully grow and market small grains. If there is enough interest, we will work to have another workshop this year. Let Sara know if you would be interested in attending and any specific topics you’d like to learn more about.

EQIP Funds are available for adding small grains to a rotation. However, we don’t currently know what the cost-share rate will be for the RCPP project. The current rate for EQIP cost-share is $4.37 per acre, however, we are trying to secure a higher rate for the RCPP funds.

**Cropland Economics: Pasture and Other Alternative Land Uses**

If we look at the production value (or yield) of each acre of crop ground, are there acres that consistently operate at a loss? Yield maps can help identify these areas. It is not surprising to producers that there are many fields and many soil types in Allamakee County that do not produce a profit. In this part of the state, many soils are steep and shallow and literally do not pay to plant to corn or soybeans due to consistently low yields, especially on rented fields. The soil itself can be the limiting factor in the potential yield. Additional fertilizer or increased plant population will not be able to exceed the soil’s capacity for yield and will simply result in increased economic loss. Soil tests are very important in helping producers determine where fertilizer is most needed and areas that have sufficient nutrient values. Now is the time to evaluate input costs and may be the time to consider alternative land uses for those “unprofitable” acres.

Using available ISU Extension publications (Estimated Costs of Crop Production in Iowa – 2016, File A1-20; fertilizer rates from A General Guide for Crop Nutrient and Limestone Recommendations in Iowa, PM1566), crop budgets were created to look at the potential...
profitability of continuous corn production on many "marginal" soils in Allamakee County. We compared common soil types that are frequently cropped. Obviously there were several assumptions and generalizations that were included in the evaluation such as using the CRP soil rental rate as a surrogate for cropland rental rate, using yield data from the NRCS Soil Survey, and using ISU cost estimates in place of actual production costs. An estimate for the average calendar year corn price of $3.41 was taken from ISU publication A2-11.

<table>
<thead>
<tr>
<th>Soil Type</th>
<th>Soil Map Unit</th>
<th>Corn Yield</th>
<th>CRP payment</th>
<th>Break-even corn price</th>
<th>Profit/loss per acre</th>
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<tbody>
<tr>
<td>Fayette silt loam</td>
<td>163D2</td>
<td>187</td>
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<td>Village silt loam</td>
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<td>Dubuque silt loam</td>
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<td>Nordness silt loam</td>
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<td>Paintcreek silt loam</td>
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<td>100</td>
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</tbody>
</table>

1 From ISU publication "Iowa Cash Corn and Soybean Prices – A2-11, January 2017"
2 From NRCS Soil Survey
3 Calculated using ISU publication “Estimated Costs of Crop Production in Iowa – 2016, File A1-20"

Fayette (163D2) is one of the most common soil types in Allamakee County and is often considered one of our "better" soil types, but our analysis still shows a potential loss. When we look at the shallower soils like Dubuque (703D2) and Paintcreek (912D2), the losses are even more substantial. The steeper soils (E, F, and G) slopes have even lower yields.

One alternative could be converting part of the field (or all of it) to pasture or hayland. The federal EQIP program can help provide financial assistance to cover some of the costs. Many of the pasture practices received a higher-than-normal EQIP payment rate this year. Keep in mind, however, that fencing and some other practices have a 20 year maintenance length. If you have interest in cropland conversion through EQIP, contact the NRCS/SWCD office to start the planning process. This process includes evaluating a Pasture Condition Score; designing water tanks, pipelines, and heavy use areas; and using a Forage Balance Worksheet. Funds would be available for work to be completed during the 2018 crop year.

Another alternative land use is CRP. It likely would result in an economic benefit on those acres because there would be a known soil rental rate that would be consistent for the length of the contract. However, there are currently limited practices available for CRP and very limited acres nationwide. Another alternative land use would be planting a small grain crop on those acres due to lower input costs and many other added benefits. Currently, most agricultural markets are not very profitable, but diversifying operations allows a producer to spread out risk and take advantage of different markets.

Including Conservation in Farm Leases: Understanding the Value of Conservation

Many farm leases are still hand-shake, verbal leases. Written leases are encouraged because they allow both parties to write down the terms of the agreement. This reduces the likelihood of confusion later because none of us have perfect memories. In addition, many landowners have several renters and many tenants rent from several landowners. Written leases also protect both parties should something happen to either party during the lease term.

The economic value of cropland is largely based on its ability to produce a crop. Good conservation practices help to protect against erosion, improve soil health and fertility, and help to ensure that the land will be able to continue producing a crop long-term. The benefits of
conservation practices are fairly evident for the landowner; their investment will be protected. It doesn’t take too many years of large rainfall events like we’ve been getting the past few summers to highlight areas that would benefit from additional conservation. Many of the soils in Allamakee County are steep and shallow, making them challenging to farm. The reality is that measures need to be taken to protect these soils, such as waterways, headlands, no-till, cover crops, terraces, buffers and many other practices. Past farming practices have left us with soils that have already lost much of the topsoil. We cannot change how farms were managed in the past, but we can choose to utilize practices that minimize soil loss and help build soil fertility and soil health.

Good conservation can not only protect the soils we are left with, but also has the potential to build them up (over time). Many practices, such as no-till and cover crops, take several years to have much impact on soil health. Year-to-year leases can make it difficult to focus on protecting the long-term productivity of the land through practices like hay strips or buffer strips that take several years to recover some of the costs of establishment. Therefore, longer term leases have the potential to encourage these practices. By improving the quality of the soils, the tenant also benefits because crop yield and quality generally improves due to soils having greater water holding capacity, improved organic matter, and reduced erosion.

Open communication between landowners and tenants can ensure that the land is being managed the way both parties would like. Obviously there are some practices that not all tenants are set up to do (like no-till), but they can work together to reach an agreement for the common goal of protecting the land. There are several cost-share options (federal EQIP, state cost-share, state buffer initiative, CRP, etc.) for conservation practice installation. Landowners may be willing to reduce rent or have longer leases for tenants who they feel are taking good care of their land. Conservation provisions can even be included in farm leases. One of the easiest ways to do this is to update the NRCS conservation plan, attach it to the farm lease, and include a provision making the plan part of the lease document. For more information on how conservation can be included in a farm leases, please contact Sara at the SWCD office.

For project news, application deadlines, and Allamakee SWCD/NRCS news, visit our website at: Allamakeeswcd.org

Reminders:

- FY17 EQIP deadline for applications is March 17
- Contact the office this spring/summer if interested in the special RCPP funding to get the planning process started
- Contact Sara if interested in participating in the manure and cover crop trials
- Contact Sara if interested in attending a small grain workshop—one will be set up if there is enough interest
Manure and Cover Crops: Working Together to Improve Soil Health

There are 5 main principles for improving soil health:

1. Keep the soil covered as much as possible
2. Disturb the soil as little as possible (tillage or chemicals)
3. Keep plants growing throughout the year to feed the soil
4. Diversify as much as possible using crop rotation and cover crops
5. Integrate livestock into the operation

Cover crops combined with no-till and manure meet all of the principles. Manure is a valuable fertilizer source that adds much more than just N, P, and K to the soil. It helps jumpstart soil biology and adds carbon in varying amounts, depending on the manure source. Increased levels of organic carbon help increase water holding capacity, porosity, aggregate stability and infiltration. Combining cover crops with manure application helps to reduce nitrogen leaching and improve many soil health indicators. Liquid manure application alone has been shown to have little impact on the soil organic carbon levels and other soil qualities due to the easily decomposable organic carbon. However, combining it with cover crops has been shown to improve aggregate stability and increase microbial biomass. While some soil health properties show signs of improvement with one year of cover crop use, many properties take many years of continued use to be impacted. Some producers may feel that it is difficult to time manure application along with cover crop planting, but many local producers have found ways to make it work.

Cover Crop and Manure Demonstration Sites

Ross and Dave Weymiller worked with the Allamakee SWCD to set up 4 demonstration sites to showcase manure application and cover crop seeding methods. Sites ranged in size from 5 acres to 20 acres and were all seeded with 1 bu/acre of cereal rye. Hog manure was injected either before or after cover crop seeding, depending on the trial site. Corn silage was harvested the first week of September, 2017. Sites were seeded between September 8 and September 12 with manure application in the same time frame.

The four sites were:
1) Manure injected before cover crop seeding
2) Slurry-seeding—seed mixed in manure tank and applied with the manure
3) Manure injected after cover crop seeding
4) Manure injected, field vertical tilled, and then cover crop seed drilled.
Slurry seeding is an uncommon method that we wanted to test to see how it would work for people who do not have a drill or who wanted to minimize the number of passes across a field. The Weymiller’s tank has an agitation auger, which helped mix the seed in. Many people have said that they think hog manure is too “hot” to work with cover crops, but this slurry-seeding trial showed that is not the case. The seed grew, but the seed dispersal was not consistent. It’s thought that the seed either floated or sank in the tank and the slope of the ground caused the seeding to be heavy in spots and very light in others. It may help to pour the seed in when the tank is half full rather than full to help it mix in better.

Above-ground biomass samples were taken on October 19. This date was chosen because the standard seeding deadline is October 21 if you receive cost-share for cover crops. Photos of each site were taken on the same day. We wanted to compare these results to what other producers have tried in the area. Matt Byrnes broadcast 66 lbs./ac of cereal rye on September 25 on silage acres with his pelletized lime. He surface applied 10,000 gallons of dairy manure 2 days later. The photos below show the four Weymiller sites with the Byrnes site at the bottom. Biomass samples were also taken on October 19 at the Byrnes site.

1. Inject manure then drill seed
2. Slurry-seed
3. Drill seed then inject manure
4. Inject manure, VT, drill seed
5. Byrnes: broadcast seed then surface apply manure
Data Results

Although the slurry-seeding had mixed results, it still had higher biomass on October 19 than broadcasting the seed. Keep in mind that the slurry-seeding was done 2 weeks before Byrnes broadcast his cover crop. Other sites that were seeded on or after October 21 had very little (to no) fall growth. This shows the importance of early seeding. The growing degree days were calculated for cover crops for several different dates to show the potential for fall growth last fall.

We encourage producers to get cover crops seeded as early as possible. If you are waiting for soils to cool before applying manure, you can still go ahead and seed cover crops. Several local producers have injected manure into growing cover crops or surface applied manure to growing cover crops and been very successful. If you harvest corn silage, we strongly recommend that you plant cover crops. Silage ground is left bare much earlier in the growing season. This early harvest creates the opportunity to plant more diverse cover crops if you’d like to try something other than just cereal rye. You could plant brassicas like radishes or turnips to
help break up compaction or red clover or Austrian Winter peas to provide nitrogen. However, winter-kill species need to be planted by September 9 if receiving cost-share.

**Field Day Follow-up**

Weymillers hosted a field day on April 9. Project Coordinator, Sara Berges, presented on the results of the demonstration sites. The NRCS Area Agronomist, Neil Sass, talked about the benefits of including cover crops on acres that have manure application as well as results of a study showing how seeding date, seeding rate, and termination date can affect the amount of cover crop growth. His data showed that if you are able to get a cover crop seeded by early October (and are NOT receiving cost-share), you can likely back down the seeding rate. However, if you get it seeded late, you may want to let it grow longer in the spring to get the most out of it. Thank you to the Weymillers and other producers who were willing to talk about their cover crop experiences.

There was a lot of good discussion at the field day and many interesting questions.

**Q1. If you apply manure to cereal rye, but then plan to harvest it for grain (seed), is it likely that there will be lodging issues?**

It depends on the amount of manure applied, the timing of manure application, the existing soil nitrogen level, and the variety of rye planted. Excess N will increase the potential for lodging, but some varieties are more susceptible than others and we would suggest reading the variety trials from the University of Minnesota or other sources. Rye is less prone to lodging than oats.

**Q2. Can you follow rye with alfalfa? Are there issues with rye reseeding?**

Alfalfa can be seeded in August following rye harvest. There will likely be volunteer rye, so you will probably need to spray with glyphosate. Light tillage may also be necessary to ensure a proper seedbed, although no-till seeding can work. Rye straw will likely need to be baled if no-till seeding. If you don’t plan to plant something following rye harvest, some producers who harvest rye gain/seed allow the rye to reseed to serve as their cover crop for the fall.

**Q3. Do you need to change your herbicide program for fields that will have cover crop?**

Read the labels on your herbicides to determine the crop rotation restrictions. If you plan to use the cover crop as forage/feed, the restrictions will be even more limiting than just looking at the potential for carryover injury. Two factors affect the potential for carryover injury; the length of herbicide persistence and the sensitivity of the cover crop to the potential herbicide residue.

**Q4. If broadcasting cover crop after corn harvest, how do you ensure good seed-to-soil contact?**

If there is a lot of residue, the seed will not make good seed-to-soil contact and some amount of incorporation would likely be needed. Another alternative on corn ground would be to interseed ryegrass, turnips, buckwheat or other winter-kill species at V4-V6.

Ryegrass seeded using rotary hoes and an air seeder and ryegrass/turnip/radish broadcast with side-dressed urea.
Q5. What are other ideas for getting cover crops seeded on manure ground?

Some ideas are setting up an air seeder on a vertical till machine or somehow seeding with a dragline. If anyone has something they’d like to try, contact Sara Berges at the SWCD and we’ll do what we can to help you set up a trial.

Small Grains, Manure, and Cover Crops

There are many benefits to adding small grains to a corn-soybean rotation. There are reduced input costs, many soil health benefits, and decreased weed/pest pressure. There can be a yield drag with continuous corn or corn-soybean systems. Studies have found that by diversifying rotations, you can help counteract this yield decline. Iowa State University has found similar results in a multi-year study comparing 2 year (corn-soybean), 3 year (corn-soybean-oat/red clover), and 4 year (corn-soybean-oat/alfalfa-alfalfa) rotations.

If you are looking for somewhere to summer apply manure, small grains might provide this location. Small grain harvest usually occurs in July, opening up the opportunity for manure application when other fields are still growing corn or soybeans. This can help to manage manure storage issues that arise late in the season. It is advised that you plant a cover crop before or after manure application to help reduce the potential for nutrient leaching and to capture the nutrients for the subsequent crop.

If you’d like to get the most benefit out of cover crops, then following small grains is ideal. This opens up the opportunity to plant a variety of cover crop species. If you are waiting to plant cover crops until after corn or soybean harvest, there are very few species that are winter hardy and will get enough fall growth to reap much benefit. But, planting cover crops in August increases the plant selection options, allowing you to target different cover crop benefits. The alternative to planting a cover crop after small grain harvest is to underseed red clover at the same time as planting a spring small grain like oats or overseeding the clover into an existing winter cereal grain like rye. When the grain crop is harvested, the clover takes off and has the rest of the growing season to fix nitrogen. If you are receiving cost-share for cover crop following small grain, you will either need to seed the cover crop after small grain harvest or interseed additional cover crop species into (underseeded) red clover.

Cover Crop Mixes

If you want to plant cover crop mixes, you have the greatest growth potential after small grain harvest or on silage ground. Early seeding increases the available species options and maximizes the benefits of the cover crops. The first step when coming up with a mix is to establish your goals for the cover crop. Do you want to increase organic matter, reduce erosion, fix nitrogen, suppress weeds, break up compaction, or provide supplemental grazing? Most people who have tried cover crops have planted cereal rye. But, if you are planting earlier, you can plant brassicas like radishes and turnips to help break up compaction, legumes like red clover or hairy vetch to fix nitrogen, or sorghum-sudangrass for additional grazing options. There are tools available online to help develop mixes or we can work with you to customize a seeding plan to meet your goals.
Cropland Conversion to Pasture

One of the soil health principles is to integrate livestock into the operation. Pasture obviously has less soil erosion than cropland, simply because it is covered year-round. Even the best managed row-crop field will have more erosion than pasture. If possible as part of a farm operation, steep and shallow soils should be left in pasture or converted back to pasture simply because corn yields are substantially lower than ridge ground and the erosion potential is very high. Obviously this won’t work for everyone, but if you already have nearby pasture and a watering source can be accessed (either by directly accessing a stream or pond or by installing waterline), then it may be something to consider. If you set up a fairly intensive rotational grazing system, moving more often than once a week, you can increase the carrying capacity of the acres, improve soil health, and improve pasture vigor. You may want to consider seeding one paddock (or more) to warm-season natives to help get through the summer slump.

Photo: Jason Johnson, USDA-NRCS

RCPP-EQIP Funds

The Allamakee SWCD has a special project through the USDA to provide higher EQIP cost-share rates for specific practices. Those include cover crops on acres with manure application and adding small grains to a rotation to be followed by cover crops. You are not required to plant cover crops following the small grain, but the cost-share rate for the cover crop is much higher than the small grain payment. There were funds for cropland conversion to pasture (and all associated practices), but those funds have been spent during the first year of the project due to unexpectedly high interest. While the RCPP-EQIP project funds are no longer available for cropland conversion to pasture, standard EQIP can be applied. If you have any interest in any of these practices, please stop in soon to start the planning process. The next application cut-off will likely be in the fall, but planning needs to occur before applying for funds.

Important Information

- EQIP signup deadline for practices installed next year (2019) will be this fall. Plan ahead.
- Small grain—if enough interest, we can try to set up a workshop. Contact the office.
- Cover crop with manure—if you’d like to work with us to set up a demonstration site, contact the office.

Project Coordinator: Sara Berges
Phone: 563-568-2246 ext. 3
Email: sara.berges@ia.nacdn.net
Leopold Center Grant Ends—RCPP Continues

Outreach and research efforts for this project have been funded for the past 3 years from a grant from the Leopold Center for Sustainable Agriculture. That grant ends in January, 2019. It has funded several field days/workshops, speakers, newsletters, mailings, demonstration sites, displays, and salary for the project coordinator. Funds for SWCDs tend to be limited and this Leopold Center grant has provided vital funding for the coordinator and all outreach and education efforts.

The project will continue with funds from a Regional Conservation Partnership Program (RCPP) project. Conservation practice cost-share and coordinator salary will be provided by this RCPP funding. Additional funding sources will be sought for future field days and outreach events.

Small Grains and Cover Crops Help Improve Soil Health

A Wisconsin farmer is improving soil health and fertility on cropland he farms across the state border near Waukon, Iowa. He added winter wheat to his rotation, followed by a diverse cover crop.

Adam Kramer, who owns and operates Black Sand Granary in Prairie du Chien, said he hopes to break up pest cycles, improve soil health, and reduce input costs by adding a small grain to his corn-soybean rotation.

In October 2017, Kramer planted about 110 pounds per acre of soft red winter wheat on 70 acres following soybean harvest. Soil tests he conducted in 2015 when he started farming the property indicated the farm was deficient in many categories, including a compaction layer at six inches.

"The yields on the farm weren't very good, certainly not profitable," said Kramer. "I had an idea that farming in these conditions would require something different than the common rotation and practices. There is more work to do, but we are on track to build something sustainable."
Because he applied fertilizer at higher rates to build soil fertility, Kramer used a growth regulator on the wheat to help reduce the potential for lodging due to higher nitrogen application rates. Other options for decreasing lodging include using varieties with stronger straw or shorter stems. Kramer also applied a fungicide to help protect against rusts and Fusarium head blight, also known as scab.

He harvested the wheat on July 23, 2018, with an average yield between 95-100 bu./ac. and an average weight of about 56 lbs./bu. Kramer sold a portion of the wheat to ADM in Boscobel, Wisconsin and kept some for cover crop seed.

Growing small grains may not be highly lucrative in today’s market, however, reduced input costs can improve net returns. “If you grow food-grade small grains, you may be able to get a better grain price,” said LuAnn Rolling, District Conservationist in Allamakee County for USDA’s Natural Resources Conservation Service (NRCS). “If you grow food-grade, organic grains you will receive an even higher price.”

The biggest Iowa-based buyer of food-grade oats and other small grains in the area is Grain Millers in St. Ansgar. “There are people growing food-grade small grains in Allamakee County and throughout Iowa, but there are limited options for buyers,” said Rolling.

She said, however, that small grains can impact net returns beyond market prices. “Studies have found that diversifying rotations can improve corn and soybean yields in the following years, which then improves the profitability of the entire rotation,” said Rolling.

In addition to the grain, Kramer sold the straw to add to his profits. “When removing straw, it is important to be aware of the nutrients contained in the straw and apply fertilizer rates accordingly,” said Rolling. “Cover crops are especially important on fields where residue was removed to help protect soil from erosion."

Less than a week after harvesting his wheat, Kramer seeded a cover crop mix of turnips, radishes, Austrian winter peas, sunflowers, red clover, soybeans, oats, and spring barley. “The period after small grain harvest is a great opportunity to plant a mix that will accomplish a wide range of goals,” said Neil Sass, Area Resource Soil Scientist for NRCS in West Union. "The mix Kramer used is great for capturing carbon but also for adding pore space to break up compaction. Pollinators, beneficial insects, and wildlife also seem to appreciate the plant diversity that was introduced."

In early October 2018 – about two months after planting – Sass and staff from the Allamakee Soil and Water Conservation District (SWCD) sampled aboveground biomass of the cover crop mix, then dried and weighed it. Dry biomass samples ranged from 1,510 to 4,600 lbs./ac., with an average of 2,580 lbs./ac. “The biomass levels are similar to what we often see in mid-May with a winter-hardy grass like cereal rye,” said Sass. “These are good biomass levels; a lot of carbon has been captured.”

Allowing livestock to graze cover crops adds additional benefits. Although Kramer had good biomass, his farm is not currently set up for grazing. Early-seeded cover crops can produce
substantial amounts of biomass which can provide good forage. Producers should be careful, though, when selecting mixes to plant species with balanced nutrients and graze them at appropriate heights. It is also important to know herbicide restrictions from previous crops.

“If you plan to graze cover crops in the fall, treat it like a prescribed grazing system and keep the animals out of the field in wet conditions and remove them when there are still several inches of aboveground biomass remaining,” said Rolling.

Now is the time to start planning for next fall’s cover crop. There may be financial assistance available for conservation crop rotations and cover crops through your local NRCS/SWCD office. The next signup deadline for the Environmental Quality Incentives Program (EQIP) is March 15, 2019.

Producers in Allamakee and Clayton Counties can apply for EQIP funds through a RCPP project by adding a small grain to a rotation and following it with a diverse cover crop. If you plan to plant cover crops following small grains or on silage ground, try planting a diverse mix to take advantage of the longer growing season. Your local NRCS/SWCD staff are available to help you determine what mix would meet your goals.

Potential Opportunity For Growing Malting Barley in the Next Few Years

While you are thinking about growing small grains, consider adding one option to your list: malting barley. There is a small malting facility that will soon be completed around Cascade, Iowa. They are just getting started in the malting process but have talked to several breweries about contracting with them in the future. Many small, local breweries like to use locally produced ingredients for their beers, if possible. Malting barley must meet high quality criteria but pays a premium price. We are working with the malting barley experts at Michigan State University Extension to provide you with information about how to grow high-quality barley in Iowa.

Cover Crop Biomass Comparison Following Small Grains and Corn Silage

In order to get large amounts of fall growth from a cover crop it needs to be seeded early. Some producers have experimented with interseeding at V4-V6 but have had inconsistent results. Likewise, aerial seeding cover crops into standing crops in August/September has been unreliable. The biggest opportunity for early seeding cover crops in our area is following small grains or corn silage. Biomass samples were taken at several different producers’ fields this fall to give you an idea of potential biomass levels.

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<th>Mix</th>
<th>purple top turnip, radish, Austrian winter peas, oats, soybeans, sunflower, red clover, barley</th>
<th>BMR forage sorghum, proso millet, radish, purple top turnip, flax, cowpeas, field peas, oats, sunflower, buckwheat</th>
<th>Cereal rye, radish</th>
</tr>
</thead>
<tbody>
<tr>
<td>Previous Crop</td>
<td>Wheat</td>
<td>Oats</td>
<td>Corn silage</td>
</tr>
<tr>
<td>Date seeded</td>
<td>7/27/2018</td>
<td>8/9/18</td>
<td>9/10/18</td>
</tr>
<tr>
<td>Date sampled</td>
<td>10/2/2018</td>
<td>11/8/18</td>
<td>11/7/18</td>
</tr>
<tr>
<td>Avg. Biomass</td>
<td>2,581 lbs./ac</td>
<td>2,075 lbs./ac</td>
<td>1,136 lbs./ac</td>
</tr>
</tbody>
</table>

Grazing opportunity
This amount of biomass has the potential to provide a great forage source for livestock if
fencing and water sources are available. Grazing a cover crop can be a great way to defray the cost of seeding the cover crop. One local producer seeded a winter-kill cover crop mix of lentils, cowpeas, rapeseed, turnips, radish, and oats on September 20 and was able to graze 40 head of cattle for much of the month of November. When comparing the cost per head per day of grazing cover crops (including cost of seed/seeding/tillage) to buying/feeding hay, the producer estimated a cost of $0.77/hd/day to graze the cover crop and $2.81/hd/day to feed hay (assuming $150/ton to buy hay). In order to have some spring grazing potential, a mix with winter-hardy species should be planted. If you are interested in planting diverse cover crop mixes, stop by your local NRCS/SWCD to discuss options.

Manure and cover crops
Due to the wet fall and short cover crop planting window, we were not able to conduct field trials comparing different cover crop seeding and manure application methods. However, several producers are still successfully implementing both practices together. Experience from local producers has shown that cereal rye is a hardy cover crop that can survive and thrive with manure application. You don't have to wait for the manure applicator before you can plant your cover crop. It can be seeded before injecting or surface-applying manure as long as surface-applied it isn't too thick. Last year we showed that it can even grow when dumped into the manure tank and applied with the manure, a process called slurry-seeding.

By planting a cover crop on acres that have manure application, you are reducing the potential for nutrient leaching/loss and soil erosion. By combining cover crops with manure application, you can help improve aggregate stability and increase microbial biomass. Funds are available through RCPP-EQIP to provide a higher cost-share rate for cover crops seeded on fields with manure application. The next signup deadline is March 15, 2019.

Soil Health Specialists Will Present at FREE February 13 Soil Health Workshop
Mark your calendars and plan to attend the upcoming soil health workshop on Wednesday, February 13 at the Wilder Business Center on the campus of Northeast Iowa Community College in Calmar. Registration for the event will be from 8:30 a.m.—9:00 a.m. with presentations from 9:00 a.m.—3:00 p.m. There is no fee to attend the event and lunch will be provided, however we do request that you RSVP to Brianne Wild at the Allamakee SWCD by emailing Brianne.Wild@ia.nacdnet.net or calling 563-568-2246 ext. 3 by January 31.

Doug Peterson, the Iowa/Missouri Regional Soil Health Specialist with NRCS will present on some of the basics of soil health using examples from his own farm and his years with NRCS. Jack Boyer, who operates a farm near Reinbeck, Iowa will talk about some on-farm soil health trials he has conducted including planting 60" corn rows to increase sunlight to interseeded cover crops. Ray Archuleta, one of the nation's premier conservation agronomists and soil health experts, will provide a dynamic presentation on advanced soil health principles. The day will conclude with a panel discussion, so bring your questions.

Project Coordinator: Sara Berges  sara.berges@ia.nacdnet.net  563-568-2246 ext. 3

All programs and services of the Allamakee County SWCD are offered on a nondiscriminatory basis without regard to race, color, national origin, religion, sex, age, marital status or disability.