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## Cover crops as a gateway to greater conservation in Iowa? Integrating crop models, field trials, economics and farmer perspectives



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
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## 1. Background

Scientists predict an increase in rainfall variability in the Midwest which will not only complicate agricultural management in the region but also will exacerbate watershed scale impairments (e.g., sediment and nutrient loss). In order to build more resilient production systems in light of climate change, farmers will increasingly need to implement conservation practices that are profitable while concurrently mitigating negative environmental impacts. Winter cover crops are known to promote many aspects of soil and water health yet estimates reveal that only 1-2% of the total acreage in Iowa are planted to cover crops. More information is needed to understand why some farmers are utilizing the practice and what barriers exist for others .

## 2. Methods

Four focus groups were conducted in four geographic regions with differing soil and climate conditions. Each focus group was structured the same, starting with a presentation of research on rye cover crops in corn-soybean rotations using data from a long-term USDA research site, on-farm trials collected by the Practical Farmers of Iowa and Iowa Learning Farms, as well as calibrated cropping systems model (APSIM) for each of the regions. Presentations were used to inform a semi-structured discussion, facilitated by the research team. Each focus group was recorded and transcribed verbatim and was analyzed using NVivo 10 software. Data were coded for emergent themes using a grounded theory approach to data analysis. Three researchers have coded the data to ensure intercoder reliability.



Photo Credit: Andrea Basche

## 3. Results

Diverse perspectives came out of each of the focus group discussions. In these discussions, farmers discussed both facilitators as well as barriers to cover crop use. Two emergent themes under facilitators include **innovative strategies** and **perceived benefits**. Two themes associated with barriers had to do with **farm-level challenges** as well as current limitations based on the predominant **cropping system** in the region, which is predominantly focused on corn and soybean production.

**Innovative Strategies:** Focus group participants who reported using cover crops described their use and management strategies as innovators. Producers considered cover crops to be an integral part of their leading-edge farming systems. Many of the farmers discussed the careful approaches they took to managing their farms and highlighted strategies that seem to facilitate their success which include:

- View farm as a whole system/long-term outlook
- Strong networks for support/innovations
- Integrated crop and livestock



Photo Credit Tim Smith, cover crop growing in soybean stubble

*I think the whole system is set up based on a growing season instead of a decade or a 100 years or even 1,000 years. I think the context is really what I'm trying to wrap my mind around, making decisions, not just for this growing season but, for decades in the future and maybe even like a thousand years.*  
—Southwest Iowa Farmer

**Perceived Benefits:** Farmer participants discussed a number of the perceived benefits of cover crops and many of those who had experience with the practice noted that cover crops helped mitigate some risks on their farms, while others were thinking about using cover crops because of potential benefits, which include:

- Manage weather related risks
- Protect soil health and suppress weeds
- Financial benefits
- Erosion prevention and water quality



Photo credit: Andrea Basche of sheet and rill erosion on Iowa corn field.

*The number one reason I do cover crops is for soil erosion. And then number two is for building the soil tilth. But I also don't want to give up yield. I don't necessarily think I'm going to increase yields by using cover crops but I want to make whatever management changes I have to make, [but] I definitely [don't want to] give up on yields and, you know, if we learn enough over the years we, hopefully, [are] going to increase them too.* — Southeast Iowa Farmer

Table 1. Key details on farmer focus group participants are included. A total of 29 farmers participated in the focus group discussion and most had done some experimentation with cover crops, however there was a range of experiences with cover crops.

Farmer Focus Group Participants Demographics	
Gender	28 male, 1 female
Age	20-60+, Most were 40-60 years old
Crop rotation / farming system	63% corn-soybean, 27% third/fourth crop and/or pasture; 50% have livestock
Familiarity with cover crops	92% planned to use a cover crop in 2014
Range of acres planted with cover crops	40-1,500 acres, median 300 acres

**Farm-level challenges:** Participants noted that many difficulties remain in order to successfully adopt cover crops. Some of the key challenges include:

- Potential costs/yield declines
- Timing of management (termination and establishment)
- Challenge with species (winter rye predominates)

*And now just the pinch [is] going into the economics... with low grain prices.... Some of these figures here are throwing that out there...People glaze over at them [the figures] and, unless you get the passion of the soil and the health of it...because that's where it [cover crops] really, you know, clicked with me...* —Northeast Iowa Farmer



Photo Credit Tim Smith, planting additional cover crop with a grain drill after crop harvest in the fall.

**Cropping system limitations:** One of the most intriguing outcomes of the analysis was a clear articulation by farmers that certain limitations to cover crop adoption stem from the current system of production and associated infrastructure. These limitations include:

- Predominant corn/soybean rotation (timing)
- Regulatory framework (voluntary v. mandatory policies and crop insurance requirements)
- Infrastructure (markets, equipment, seed)
- Costs of production (price of corn, cost of inputs, land, etc.)
- Conventional thinking (among landlords, neighbors, absentee landowners, etc.)

*It becomes pretty obvious pretty fast that if your traditional corn and soybean rotation is almost inhospitable to anything other than [that].*  
— Southwest Iowa Farmer



Photo Credit Andrea Basche



Photo Credit Andrea Basche, rye growth in soybean stubble