

# Winter Cereal Rye Cover Crop Effect on Cash Crop Yield

Year 6

Iowa Learning Farms and Practical Farmers of Iowa



## Summary

Farmers reported that in 42 of 46 trials, properly managed cover crops had little or no negative effect on corn and soybean yield (and actually increased soybean yield in 4 trials).

## Cooperators

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Devan Green, Conrad  
Rick Juchems, Plainfield  
Rob Davis & Darwin Pierce,  
Whiterock Conservancy, Coon Rapids  
Mark Pokorny, Clutier  
George Schaefer, Kalona  
Jerry Sindt, Holstein  
Rob Stout, West Chester  
Gary & Dave Nelson, Fort Dodge  
Kelly Tobin, New Market

## Project Timeline

2008-2014 (6th year report)

This project was funded by the State Soil Conservation Committee, the Iowa Department of Agriculture and Land Stewardship and the Leopold Center for Sustainable Agriculture. Additional outreach and education funding came from a NCR-SARE grant, Walton Family Foundation and the Iowa Learning Farms.

## Methods

Six sites on cooperator farms across Iowa were established in the fall of 2008; five more sites were established in the fall of 2009 with two previous sites dropping out of the study; 10 sites were then maintained from 2009-2012. In 2013, seven sites participated, and in 2014, six sites participated in the study resulting in a total of 46 site-years over the course of the study (2009-2014). All cooperators were employing corn-soybean rotations. Cooperators established replicated strips the length of their field and maintained those strips across the duration of the trial. Each replication had one strip with cover crops and one without cover crops, and each site-year contained at least two replications. Cooperator farm location, cover crop management, and cash crop grown for the 2014 growing season is provided in Table 1.

Table 1. Farm location, cover crop management, and cash crop for the 2014 growing season.

Location	Cover Crop planting date	Cover crop planting method	Cover crop seeding rate	Cover crop termination method	Cash crop	Planting date
Plainfield (NE Iowa)	10/22/13	Drilled	50 lb/ac	Cultivated & herbicide	Corn	5/8/14
Coon Rapids (West central Iowa)	10/21/13	Drilled	60 lb/ac	Herbicide	Corn	5/6/14
Clutier (East central Iowa)	10/14/13	Drilled	112 lb/ac	Cultivated	Corn	5/2/14
Kalona (SE Iowa)	11/1/13	Drilled	84 lb/ac	Cultivated & herbicide	Corn	5/10/14
West Chester (SE Iowa)	9/26/13	Aerial	90 lb/ac	Herbicide	Corn	5/9/14
New Market (SW Iowa)	10/10/13	Drilled	56 lb/ac	Herbicide	Corn	5/15/14

## Results

### Cover crop biomass

Above-ground cover crop biomass was determined at most locations at the time of cover crop termination in 2014 (Table 2). In previous years, above-ground cover crop biomass at locations ranged from 110.0 lb/ac to 2,406.5 lb/ac prior to planting corn and from 153.5 lb/ac to 2,475.4 lb/ac prior to planting soybeans. Low amounts of cover crop biomass in 2014 were likely due to cool spring temperatures.

Table 2. Mean cover crop aboveground biomass at four locations samples prior to termination in 2014.

Location	Cover crop biomass (lb/ac)	Sampling date
Plainfield (NE Iowa)	97.2	5/7/14
Coon Rapids (West central Iowa)	93.2	4/23/14
Clutier (East central Iowa)	72.7	4/23/14
New Market (SW Iowa)	169.3	4/11/14

## Corn yields 2014

Mean yields at participating locations in 2014 are provided in Figure 1. At each location, corn yields were equivalent regardless of cover crop treatment as determined by statistical analysis (t-test). At five of the six locations, corn yields were near or above 200 bu/ac.

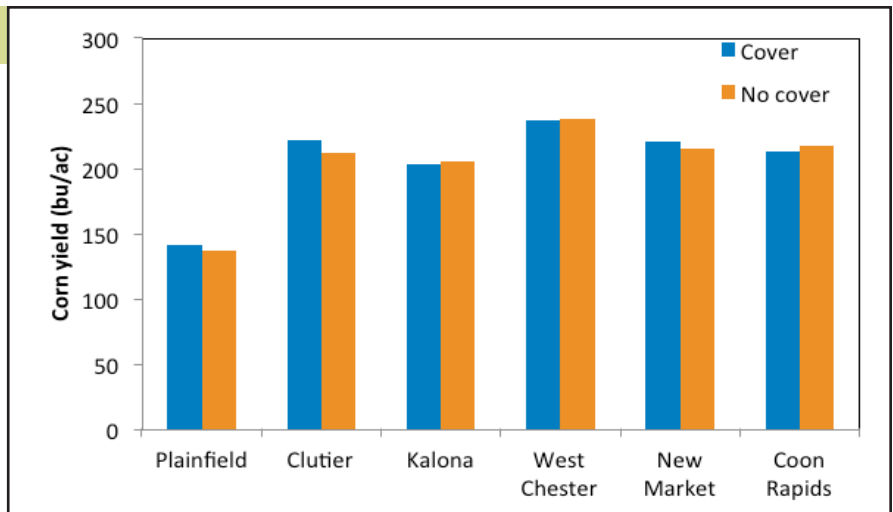


Figure 1. Mean corn yields at participating locations in 2014.

## Cover crop effect on cash crop yield trends

Over the course of this project, 28 site-years have been dedicated to determining the effect of the cover crop on corn yields and 18 site-years have been dedicated to determining the effect of the cover crop on soybean yields. In the majority of cases, corn yield was not affected by the cover crop (Figure 2).

It should be noted that the instances in which corn yield was reduced by the cover crop occurred only in the first two growing seasons of the trial (2009 and 2010). Farmer inexperience with terminating cover crops or adjusting the planter to plant into the cover crop residues could have contributed to the yield losses in these instances.

As with corn, soybean yield was also mostly not affected by the cover crop (Figure 3). In four cases, soybean yields were actually improved by the cover crop. After six years of this study, farmers have reported no effect of the cover crop on corn and soybean yield in the majority of cases.

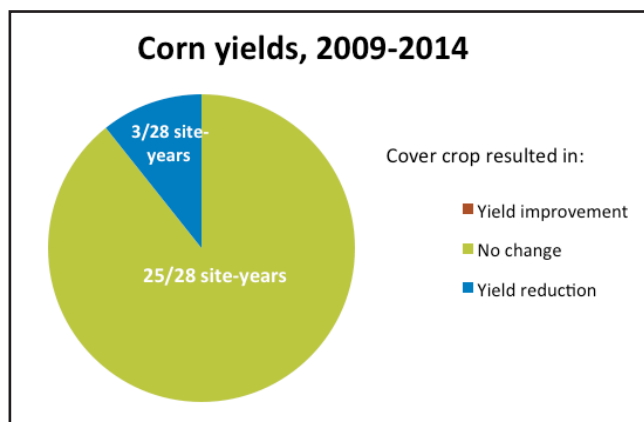


Figure 2. Trends with respect to cover crop effect on corn yields at 28 site-years from 2009 to 2014.

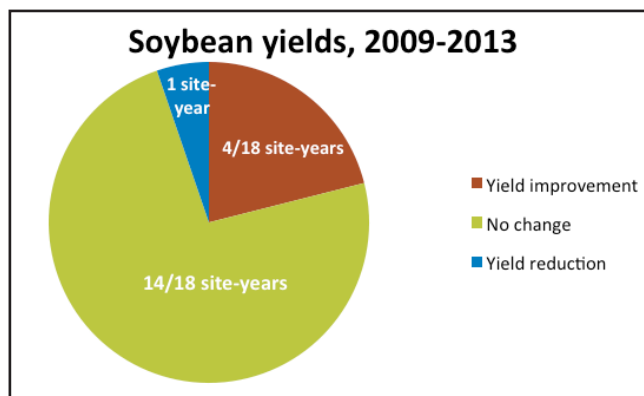


Figure 3. Trends with respect to cover crop effect on soybean yields at 18 site-years from 2009 to 2013.

For more detailed information on the project and Year 5 report, see "Winter Cereal Rye Cover Crop Effect on Cash Crop Yield – Year 5" on these websites:

ILF: <http://www.extension.iastate.edu/ilf/content/cover-crop-research>

PFI: <http://practicalfarmers.org/farmer-knowledge/research-reports/2014/winter-cereal-rye-cover-crop-effect-cash-crop-yield/>



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