

Cover Crop Variety Trial 2015-2016

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In a Nutshell

- Cereal rye, oats and other small grains grass species have been proven as effective cover crops in corn-soybean systems in Iowa.
- Cooperators screened popular grass, legume and brassica species for fall and spring groundcover in small, hand-seeded plots across the state.

Key findings

- Cereal rye remains the most consistent cover crop performer concerning fall groundcover, overwintering capability and spring groundcover across locations and time.
- Brassicas generally produced as much fall ground cover as the small grains grasses in the present iteration of the trial.
- Hairy vetch and radish performed better than in past iterations, likely due to exceptional growing conditions in the present iteration.

Project Timeline:
Fall 2015-Spring 2016

Background

This was the fifth year of trials screening cover crop varieties conducted by the Practical Farmers of Iowa Cooperators' Program. Reports of previous iterations of this trial are available on the Practical Farmers Web site (Carlson and Anderson, 2012; Carlson and Gailans, 2013; Gailans and Carlson, 2014; Gailans and Carlson, 2015). Predominant cover crops used by farmers in Iowa have tended to be small grain grasses like cereal rye, winter wheat and oats (Singer, 2008). But more recently, farmers have wondered if the cover crop portfolio in Iowa could be broadened with legume and brassica species.

The present iteration of this trial involved

Cooperators:

- **Jeremy Gustafson** - Boone County
- **Chad Ingels** - Fayette County
- **Clarke McGrath** - Crawford, Pottawattamie, Ringgold, Union counties
- **Mark Peterson** - Montgomery County
- **Myron Rees** - Washington County
- **Dave and Meg Schmidt** - Audubon County
- **Bil Schrader** - Winnebago County
- **Neal Williamsen** - Palo Alto County

Funding By:

Walton Family Foundation



Cover crop variety trial plots at Jeremy Gustafson's farm in Boone County. From right to left, plots in the foreground depict winter wheat, winter triticale, winter barley and rapeseed. Photo taken on April 14, 2016.

nine cooperators seeding cover crops into 16 fields across the state. Cooperators screened 13 cover crop entries – grasses, legumes, brassicas – to determine fall and spring groundcover provided by the cover crops. Entries were hand-seeded into standing corn and soybean crops to simulate aerial seeding.

Methods

Cover crop entries evaluated and seeding rates used at each location are presented in **Table 1**. Seeding rates mixes were chosen based on the Midwest Cover Crops Field Guide, Second Edition (MCCC, 2014) and common practices among local farmers.

Cover crops were hand-seeded by cooperators into a standing cash crop with two replications of randomized plots. Each

plot was 7.5-ft wide and 25-ft long. Cover crops were seeded when the first soybean leaves yellowed or when corn reached black layer (physiological maturity). Seeds were not incorporated into the soil. Cash crops were harvested using standard practices, and the cover crops were left undisturbed.

Cooperators determined ground cover of each cover crop using a pre-marked 16-ft rope placed diagonally across each cover crop entry's plot, and counting how many marks lay on top of cover crop biomass at 6-in. increments. These counts were used to calculate the percent coverage of the soil by the cover crop. A fall 2015 measurement was taken within a few days of the first predicted hard freeze, and a spring measurement was taken just prior to any field work preceding cash crop planting in 2016.

Table 1

**Cover crop entries, seeding rates and source of seed for the 2015-2016 iteration
of the cover crop variety trial.**

Cover Crop	Variety	Category	Seeding Rate (lb/ac)	Source
Cereal rye	VNS	Grass	60	Albert Lea Seed House, Albert Lea, MN
Oats	Saber	Grass	60	Albert Lea Seed House, Albert Lea, MN
Winter wheat	Expedition	Grass	60	Albert Lea Seed House, Albert Lea, MN
Winter triticale	Fridge	Grass	60	Albert Lea Seed House, Albert Lea, MN
Winter barley	P919	Grass	60	Green Cover Seeds, Bladen, NE
Annual ryegrass	Gulf	Grass	20	Albert Lea Seed House, Albert Lea, MN
Hairy vetch	VNS	Legume	20	Albert Lea Seed House, Albert Lea, MN
Brown mustard	Kodiak	Brassica	5	Albert Lea Seed House, Albert Lea, MN
Rapeseed	Dwarf Essex	Brassica	5	Albert Lea Seed House, Albert Lea, MN
Radish	NitroRadish™	Brassica	10	Albert Lea Seed House, Albert Lea, MN
Turnip	Purple Top	Brassica	5	Albert Lea Seed House, Albert Lea, MN
Field pennycress	Ruby Wild	Brassica	15	Arvegenix LLC, St. Louis, MO
Oats + pennycress*	--	Mix	30 + 7.5	--

* These entries were tested at the Gustafson (Boone) site only.



Radish (upper left); Rapeseed (upper right); Brown mustard (lower left); Turnips (lower right). Seeded on Sept. 6, 2015. Photos taken at Jeremy Gustafson's in Boone County on Nov. 4, 2015.

Results

2015-2016 Growing Conditions

Mean monthly temperature and total monthly rainfall for the period Sept. 1, 2015–Apr. 30, 2016, as well as the long-term averages, is provided from the nearest weather station to each location (Iowa Environmental Mesonet, 2016). Rainfall tended to be above normal in September, November and December 2015 at each location. Fall 2015 and Spring 2016 temperatures tended to be near the average across locations with a few exceptions: November 2015 and March 2016 were warmer than normal. Conditions at all locations appeared to be conducive to winter survival of cover crops that possessed that ability.

Cover crop performance

Cover crops were established in corn (7 fields) and soybeans (9 fields) in the fall of 2015. At most locations, both fall and spring groundcover assessments were conducted.

Average groundcover provided by the cover crops in the fall and spring across all locations is provided in **Figures 1 and 2**. Results for each individual location are provided in **Tables 2-17**. Cover crop entries from the current iteration of the trial that were also evaluated in past iterations are included to provide trends over time.

Small grains grasses, like cereal rye, tended to be the best performers in terms of providing both fall and spring groundcover in the present iteration. Cereal rye, winter wheat, winter triticale and winter barley generally provided equal amounts of spring and fall cover. Oats provided decent fall groundcover at most sites. Annual ryegrass tended to be less consistent than the small grains.

Brassica cover crops provided similar levels of fall groundcover as the small grains grasses. Brown mustard continues to show promise as a source of fall groundcover. Unlike in past iterations, radish performed better in Fall 2015 than in past fall seasons. This was likely due to warmer and wetter conditions than normal in Fall 2015 that provided exceptional growing conditions. Field pennycress generally provided more spring groundcover than fall groundcover (not even germinating in the fall at some locations). Field pennycress also overwintered more consistently than rapeseed (which can also overwinter) at most locations as was the case in past iterations. It should be noted that radish and field pennycress are seeded at higher rates than brown mustard, rapeseed and turnip (**Table 1**).

The lone legume studied, hairy vetch, consistently overwintered at locations and provided spring groundcover in greater amounts than previously observed in any past iterations. Generally, not much fall growth was observed across the locations. Like the performance of radish in the fall noted above, the performance of hairy vetch observed in present iteration is likely due to growing conditions more favorable than normal during 2015-2016. Using legume species, like hairy vetch, as cover crops in corn-soybean systems is typically challenging due to the limited amount of heat units remaining in the season for establishment when seeded in early to mid-September.

Cereal rye remains the most consistent performer concerning fall groundcover, overwintering capability and spring groundcover across locations and time.

Figure 1

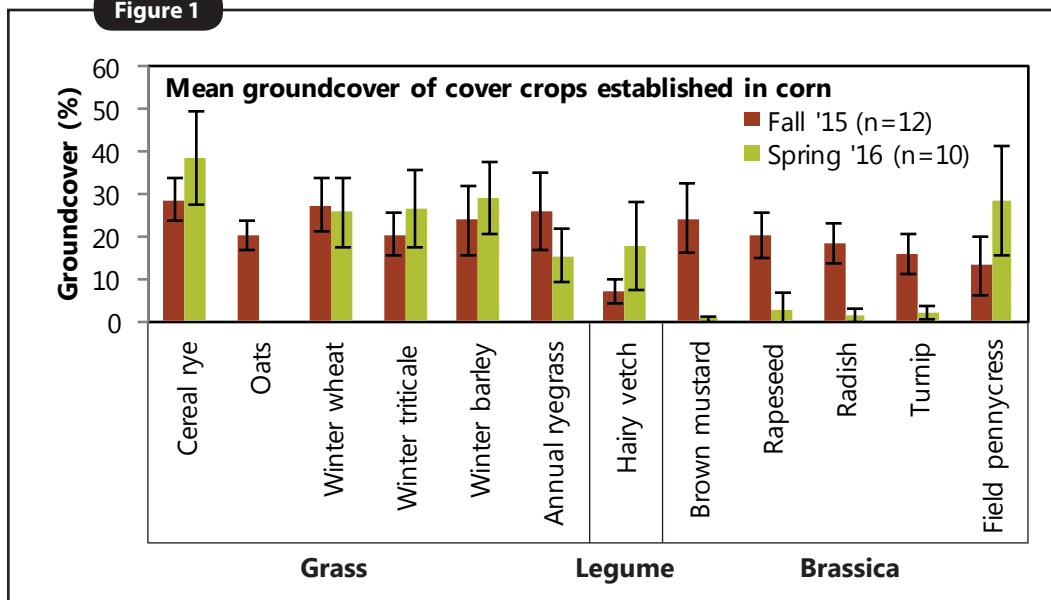


Figure 1. Average groundcover of cover crops in fall and spring across all sites where cover crops were established in standing corn in 2015. Error bars above and below columns represent 90% confidence intervals. By season, if error bars do not overlap, species can roughly be considered significantly different.

Figure 2

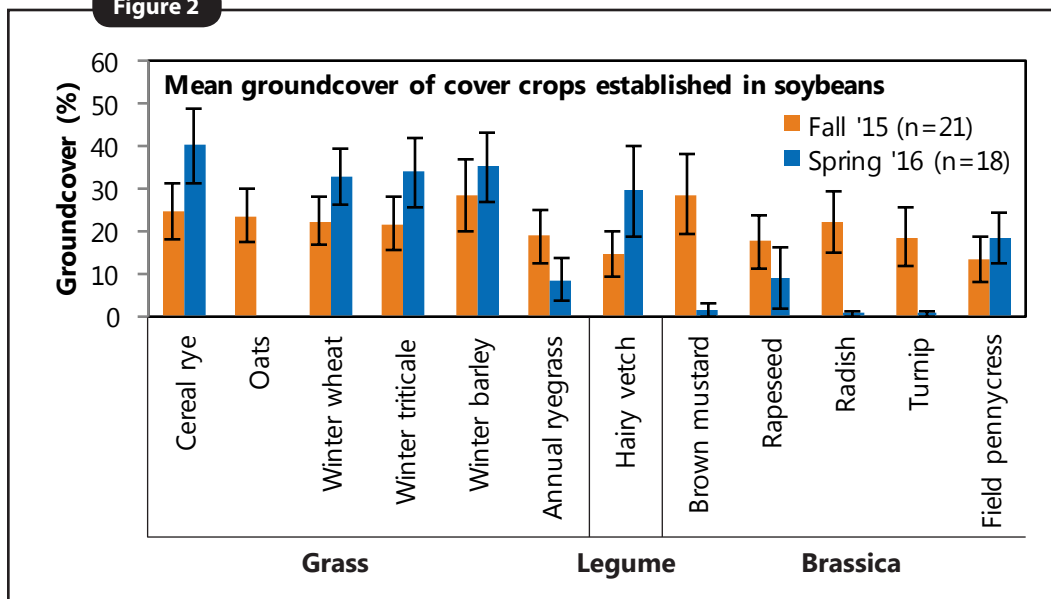
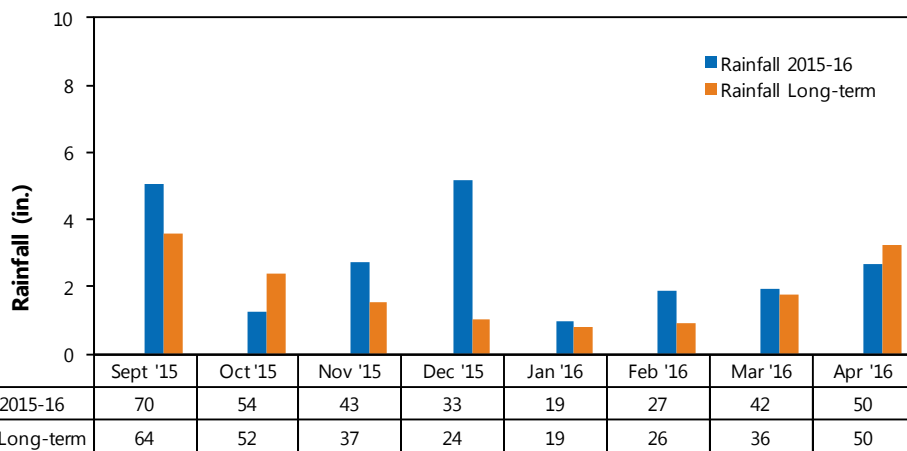


Figure 2. Average groundcover of cover crops in fall and spring across all sites where cover crops were established in standing soybeans in 2015. Error bars above and below columns represent 90% confidence intervals. By season, if error bars do not overlap, species can roughly be considered significantly different.

Jeremy Gustafson, Boone County

Standing crop, 2015: Soybeans
 Row spacing (in.): 30
 Seeding date: 9/6/2015
 Fall measurement: 11/13/2015
 Spring measurement: 4/13/2016
 Replications: 3



Mean monthly rainfall and temperature for the period September 2015–April 2016 and the 60-year averages at the Ames weather station (Iowa Environmental Mesonet, 2016).

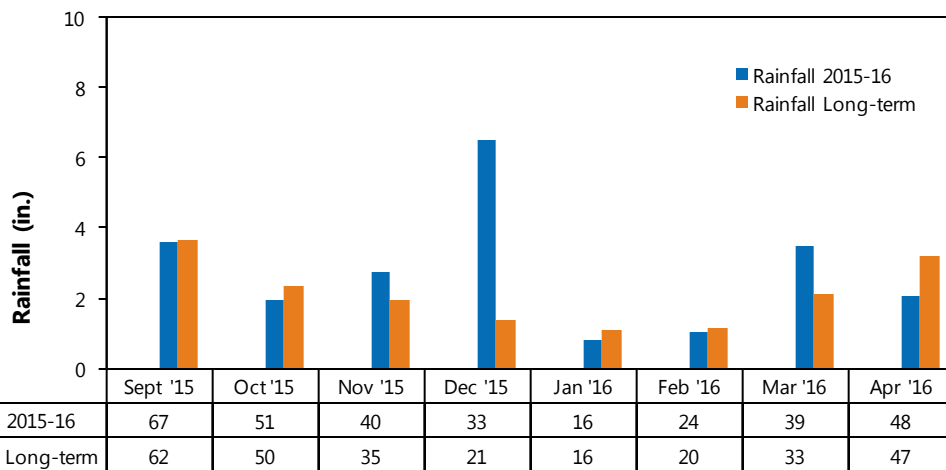
Table 2

Results for the Cover Crop Variety Trial at Jeremy Gustafson's soybean field in Boone County. The least significant difference (LSD) is provided for 2015-2016.

Cover Crop	2015-16		2014-15		2013-14		2012-13	
	Fall	Spring	Fall	Spring	Fall	Spring	Fall	Spring
	Groundcover (%)							
Cereal rye	45.8	72.9	57.8	56.3	43.8	60.9	78.1	73.4
Oats	42.7	0.0	51.6	0.0	39.0	0.0	--	--
Winter wheat	28.1	53.1	--	--	--	--	--	--
Winter triticale	35.4	54.2	--	--	--	--	74.5	60.4
Winter barley	62.5	61.5	--	--	--	--	62.5	43.8
Annual ryegrass	26.0	30.2	28.1	1.6	17.2	0.0	--	--
Hairy vetch	17.7	64.6	17.2	15.6	15.6	0.0	45.3	34.4
Brown mustard	66.7	5.2	78.2	0.0	67.2	0.0	--	--
Rapeseed	42.7	44.8	42.2	0.0	35.9	0.0	--	--
Radish	60.4	0.0	23.4	0.0	40.7	0.0	--	--
Turnip	47.9	1.0	--	--	--	--	--	--
Field pennycress	10.4	38.5	34.4	39.1	--	--	--	--
Oats + pennycress	19.8	15.6	--	--	--	--	--	--
LSD ($P \leq 0.05$)	37.3	32.7	--	--	--	--	--	--

Chad Ingels, Fayette County

Standing crop, 2015: Soybeans
 Seeding date: 9/23/2015
 Fall measurement: 11/18/2015
 Spring measurement: 4/15/2016
 Replications: 2



Mean monthly rainfall and temperature for the period September 2015–April 2016 and the 60-year averages at the Fayette weather station (Iowa Environmental Mesonet, 2016).

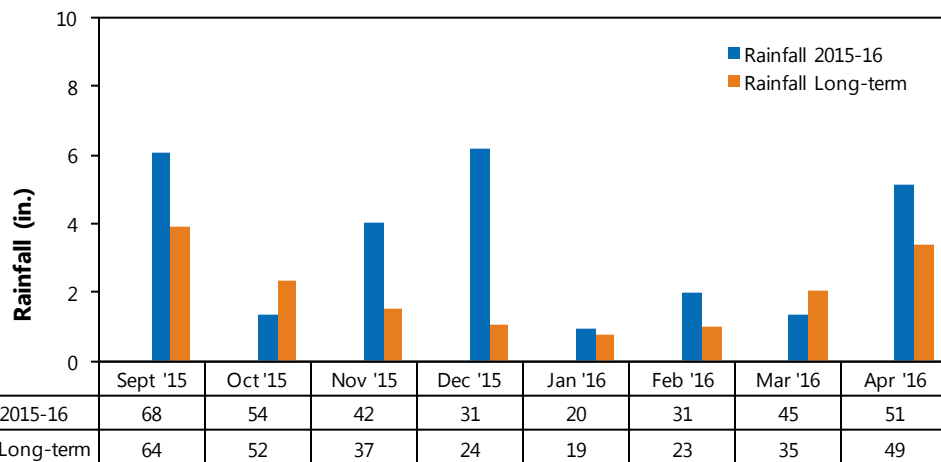
Table 3

Results for the Cover Crop Variety Trial at Chad Ingels's soybean field in Fayette County. The least significant difference (LSD) is provided for 2015-2016.

Cover Crop	2015-16		2013-14	
	Fall	Spring	Fall	Spring
	Groundcover (%)			
Cereal rye	18.8	48.4	--	62.5
Oats	20.3	0.0	--	0.0
Winter wheat	15.6	40.6	--	--
Winter triticale	20.3	46.9	--	--
Winter barley	40.6	56.3	--	--
Annual ryegrass	14.0	3.1	--	0.0
Hairy vetch	14.1	29.7	--	0.0
Brown mustard	12.5	0.0	--	0.0
Rapeseed	7.8	3.1	--	0.0
Radish	9.4	0.0	--	0.0
Turnip	7.8	0.0	--	--
Field pennycress	0.0	0.0	--	--
LSD ($P \leq 0.05$)	18.6	18.6	--	--

Clarke McGrath, Crawford County

Standing crop, 2015: Corn
 Seeding date: 9/25/2015
 Fall measurement: 11/13/2015
 Spring measurement: 4/11/2016
 Replications: 2



Mean monthly rainfall and temperature for the period September 2015–April 2016 and the 60-year averages at the Harlan weather station (Iowa Environmental Mesonet, 2016).

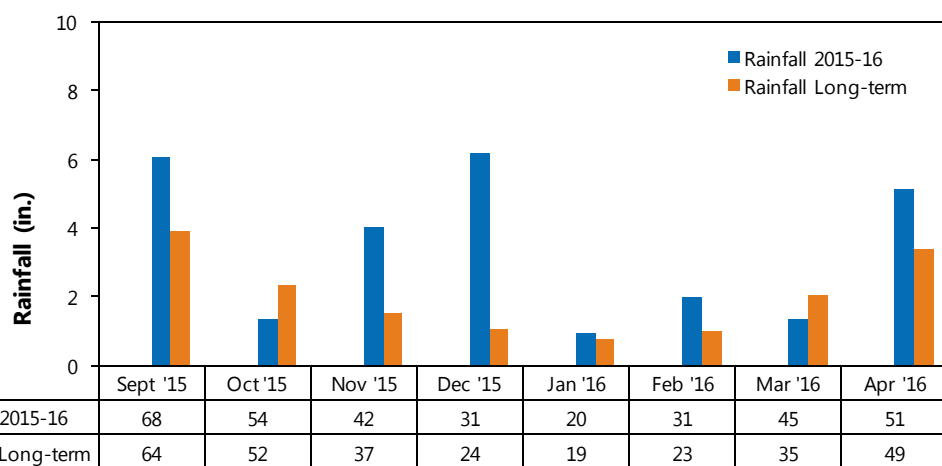
Table 4

Results for the Cover Crop Variety Trial at Clarke McGrath's corn field in Crawford County. The least significant difference (LSD) is provided for 2015-2016.

Cover Crop	2015-16		2014-15		2013-14	
	Fall	Spring	Fall	Spring	Fall	Spring
	Groundcover (%)					
Cereal rye	34.4	45.3	37.5	31.3	4.7	4.7
Oats	20.3	0.0	10.9	0.0	0.0	0.0
Winter wheat	28.1	29.7	--	--	--	--
Winter triticale	18.8	25.0	--	--	--	--
Winter barley	15.6	34.4	--	--	--	--
Annual ryegrass	39.1	23.4	20.3	1.6	0.0	0.0
Hairy vetch	3.1	40.6	6.3	4.7	0.0	0.0
Brown mustard	39.1	0.0	34.4	0.0	9.4	0.0
Rapeseed	34.4	0.0	7.8	0.0	10.9	0.0
Radish	15.6	4.7	14.1	0.0	0.0	0.0
Turnip	28.1	3.1	--	--	--	--
Field pennycress	14.0	39.1	20.3	35.9	--	--
LSD ($P \leq 0.05$)	34.2	26.3	--	--	--	--

Clarke McGrath, Crawford County

Standing crop, 2015: Soybeans
 Row spacing (in.): 15
 Seeding date: 9/25/2015
 Fall measurement: 11/13/2015
 Spring measurement: 4/11/2016
 Replications: 2



Mean monthly rainfall and temperature for the period September 2015–April 2016 and the 60-year averages at the Harlan weather station (Iowa Environmental Mesonet, 2016).

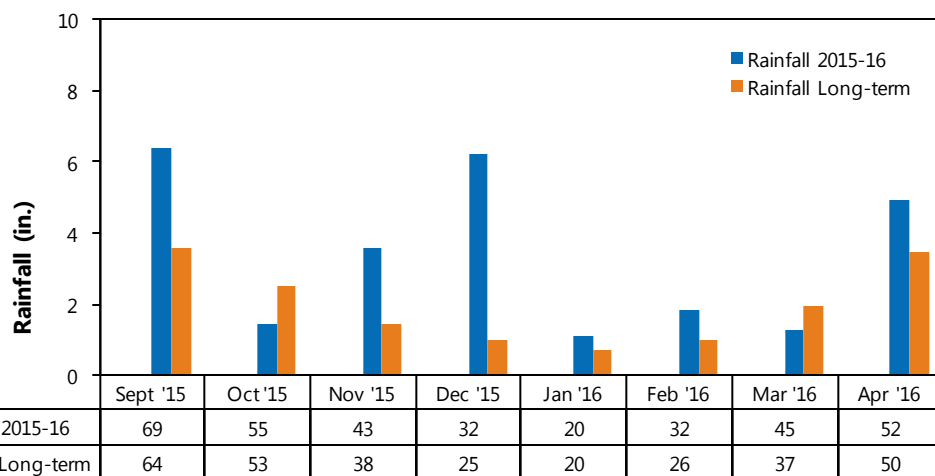
Table 5

Results for the Cover Crop Variety Trial at Clarke McGrath's soybean field in Crawford County. The least significant difference (LSD) is provided for 2015-2016.

Cover Crop	2015-16		2014-15		2013-14	
	Fall	Spring	Fall	Spring	Fall	Spring
	Groundcover (%)					
Cereal rye	12.5	31.3	18.8	35.9	14.1	3.1
Oats	12.5	0.0	4.7	0.0	7.8	0.0
Winter wheat	23.4	23.4	--	--	--	--
Winter triticale	17.2	23.4	--	--	--	--
Winter barley	6.3	25.0	--	--	--	--
Annual ryegrass	26.6	9.4	0.0	1.6	0.0	0.0
Hairy vetch	6.3	12.5	0.0	6.3	0.0	0.0
Brown mustard	6.3	0.0	29.7	0.0	15.6	0.0
Rapeseed	14.1	3.1	0.0	0.0	17.2	0.0
Radish	21.9	3.1	7.8	0.0	6.3	0.0
Turnip	12.5	0.0	--	--	--	--
Field pennycress	18.8	26.6	0.0	46.9	--	--
LSD ($P \leq 0.05$)	34.6	15.2	--	--	--	--

Clarke McGrath, Pottawattamie County

Standing crop, 2015: Corn
 Row spacing (in.): 30
 Seeding date: 9/25/2015
 Fall measurement: 11/13/2015
 Spring measurement: 4/13/2016
 Replications: 2



Mean monthly rainfall and temperature for the period September 2015–April 2016 and the 60-year averages at the Oakland weather station (Iowa Environmental Mesonet, 2016).

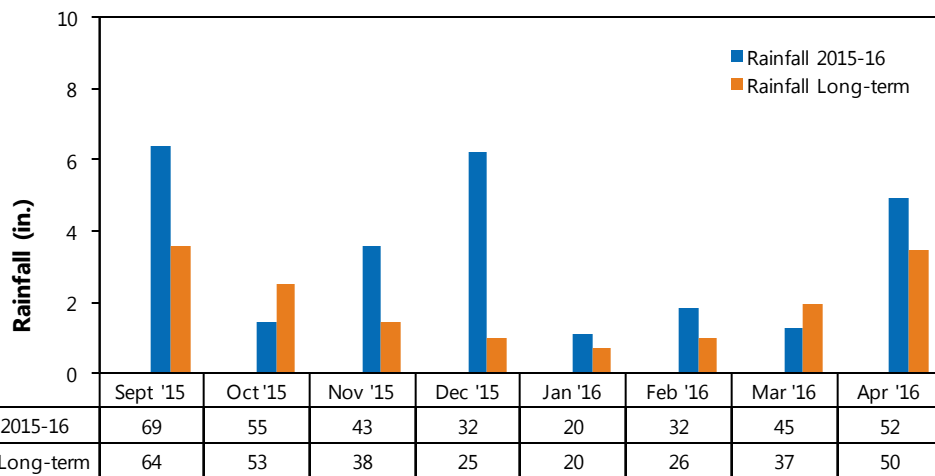
Table 6

Results for the Cover Crop Variety Trial at Clarke McGrath's corn field in Pottawattamie County. The least significant difference (LSD) is provided for 2015-2016.

Cover Crop	2015-16		2014-15		2013-14	
	Fall	Spring	Fall	Spring	Fall	Spring
	Groundcover (%)					
Cereal rye	32.8	51.6	10.9	10.9	9.4	0.0
Oats	17.2	0.0	15.6	0.0	3.1	0.0
Winter wheat	28.1	39.1	--	--	--	--
Winter triticale	12.5	34.4	--	--	--	--
Winter barley	14.1	39.1	--	--	--	--
Annual ryegrass	35.9	25.0	0.0	0.0	0.0	0.0
Hairy vetch	3.1	4.7	0.0	0.0	0.0	0.0
Brown mustard	17.2	0.0	6.3	0.0	6.3	0.0
Rapeseed	15.6	0.0	0.0	0.0	1.6	0.0
Radish	12.5	0.0	1.6	0.0	4.7	0.0
Turnip	14.0	0.0	--	--	--	--
Field pennycress	21.9	57.8	0.0	12.5	--	--
LSD ($P \leq 0.05$)	16.9	20.7	--	--	--	--

Clarke McGrath, Pottawattamie County

Standing crop, 2015: Soybeans
 Row spacing (in.): 15
 Seeding date: 9/25/2015
 Fall measurement: 11/13/2015
 Spring measurement: 4/13/2016
 Replications: 2



Mean monthly rainfall and temperature for the period September 2015–April 2016 and the 60-year averages at the Oakland weather station (Iowa Environmental Mesonet, 2016).

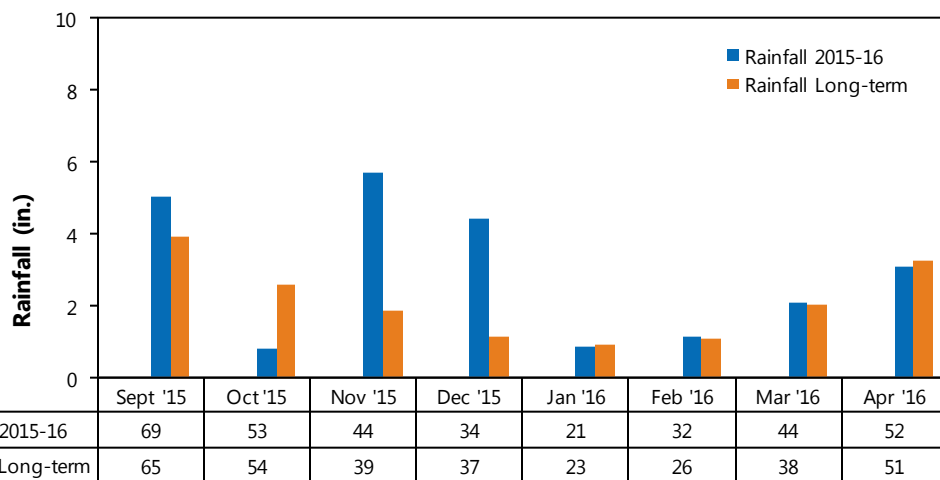
Table 7

Results for the Cover Crop Variety Trial at Clarke McGrath's soybean field in Pottawattamie County. The least significant difference (LSD) is provided for 2015-2016.

Cover Crop	2015-16		2014-15		2013-14	
	Fall	Spring	Fall	Spring	Fall	Spring
	Groundcover (%)					
Cereal rye	18.8	14.1	15.6	21.9	7.8	0.0
Oats	12.5	0.0	25.0	0.0	1.6	0.0
Winter wheat	7.8	7.8	--	--	--	--
Winter triticale	7.8	10.9	--	--	--	--
Winter barley	4.7	4.7	--	--	--	--
Annual ryegrass	10.9	6.3	0.0	1.6	0.0	0.0
Hairy vetch	1.6	3.1	3.1	3.1	0.0	0.0
Brown mustard	7.8	0.0	28.1	0.0	0.0	0.0
Rapeseed	4.7	0.0	0.0	0.0	0.0	0.0
Radish	6.3	0.0	12.5	0.0	0.0	0.0
Turnip	3.1	0.0	--	--	--	--
Field pennycress	14.1	20.3	3.1	26.6	--	--
LSD ($P \leq 0.05$)	12.2	15.7	--	--	--	--

Clarke McGrath, Ringgold County

Standing crop, 2015: Soybeans
 Row spacing (in.): 15
 Seeding date: 9/23/2015
 Fall measurement: 11/14/2015
 Spring measurement: 4/29/2016
 Replications: 2



Mean monthly rainfall and temperature for the period September 2015–April 2016 and the 60-year averages at the Mt. Ayr weather station (Iowa Environmental Mesonet, 2016).

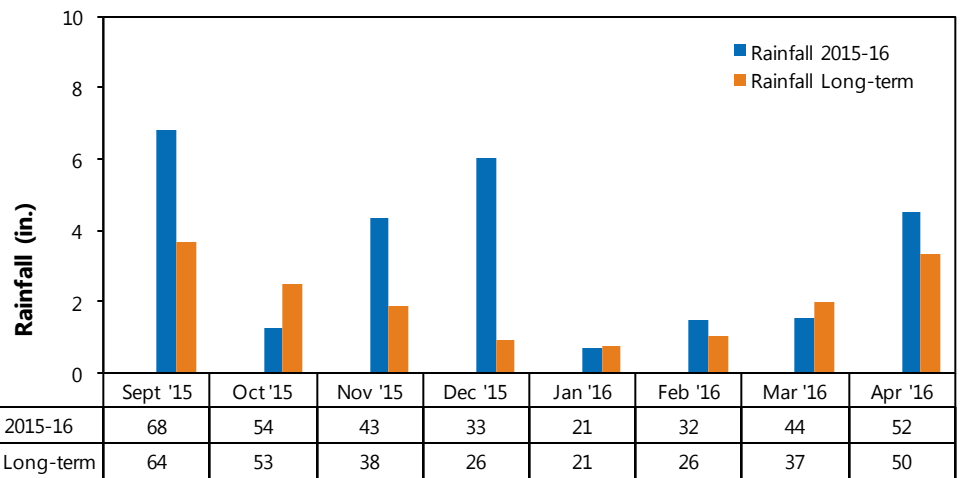
Table 8

Results for the Cover Crop Variety Trial at Clarke McGrath's soybean field in Ringgold County. The least significant difference (LSD) is provided for 2015-2016.

Cover Crop	2015-16		2014-15		2013-14	
	Fall	Spring	Fall	Spring	Fall	Spring
	Groundcover (%)					
Cereal rye	34.4	35.9	40.6	21.9	43.8	98.4
Oats	18.8	0.0	9.4	0.0	21.9	0.0
Winter wheat	29.7	40.6	--	--	--	--
Winter triticale	18.8	37.5	--	--	--	--
Winter barley	25.0	32.8	--	--	--	--
Annual ryegrass	29.7	0.0	4.7	3.1	31.3	0.0
Hairy vetch	9.4	9.4	1.6	1.6	10.9	0.0
Brown mustard	29.7	0.0	20.3	0.0	40.6	0.0
Rapeseed	23.4	0.0	4.7	0.0	20.3	0.0
Radish	23.4	0.0	10.9	0.0	35.9	0.0
Turnip	17.2	0.0	--	--	--	--
Field pennycress	37.5	18.8	3.1	37.5	--	--
LSD ($P \leq 0.05$)	25.8	21.6	--	--	--	--

Clarke McGrath, Union County

Standing crop, 2015: Corn
 Row spacing (in.): 30
 Seeding date: 9/23/2015
 Fall measurement: 11/19/2015
 Spring measurement: 4/26/2016
 Replications: 2



Mean monthly rainfall and temperature for the period September 2015–April 2016 and the 60-year averages at the Creston weather station (Iowa Environmental Mesonet, 2016).

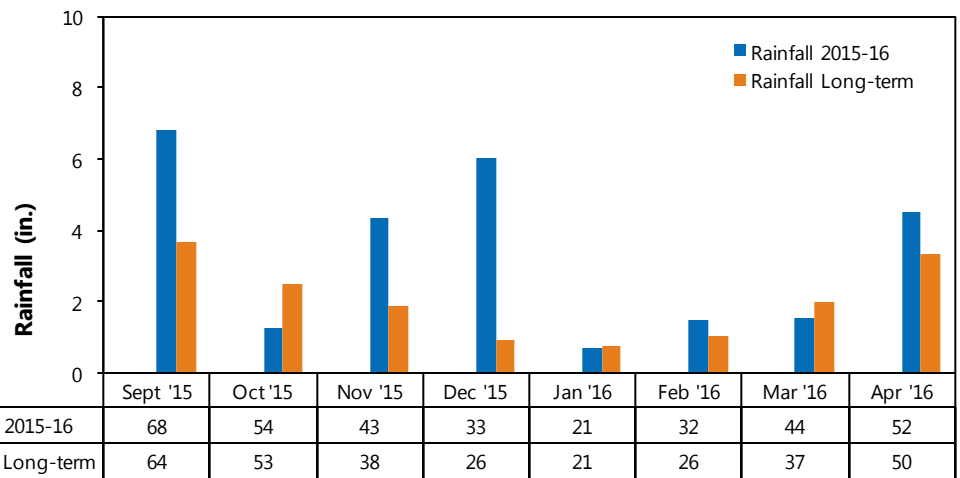
Table 9

Results for the Cover Crop Variety Trial at Clarke McGrath's corn field in Union County. The least significant difference (LSD) is provided for 2015-2016.

Cover Crop	2015-16		2014-15		2013-14	
	Fall	Spring	Fall	Spring	Fall	Spring
	Groundcover (%)					
Cereal rye	32.8	28.1	4.7	15.6	32.8	12.5
Oats	21.9	0.0	9.4	0.0	9.4	0.0
Winter wheat	26.6	20.3	--	--	--	--
Winter triticale	23.4	20.3	--	--	--	--
Winter barley	18.8	25.0	--	--	--	--
Annual ryegrass	26.6	9.4	0.0	0.0	6.3	0.0
Hairy vetch	7.8	9.4	0.0	0.0	7.8	0.0
Brown mustard	31.3	0.0	3.1	0.0	64.1	0.0
Rapeseed	20.3	0.0	0.0	0.0	23.4	0.0
Radish	15.6	0.0	0.0	0.0	29.7	0.0
Turnip	14.1	1.6	--	--	--	--
Field pennycress	34.4	32.8	0.0	15.6	--	--
LSD ($P \leq 0.05$)	24.3	17.3	--	--	--	--

Clarke McGrath, Union County

Standing crop, 2015: Soybeans
 Row spacing (in.): 15
 Seeding date: 9/23/2015
 Fall measurement: 11/19/2015
 Spring measurement: 4/26/2016
 Replications: 2



Mean monthly rainfall and temperature for the period September 2015–April 2016 and the 60-year averages at the Creston weather station (Iowa Environmental Mesonet, 2016).

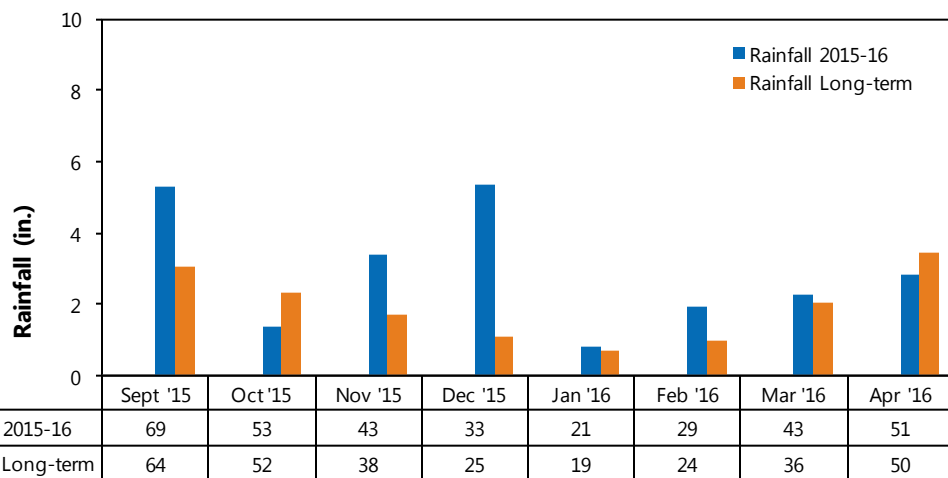
Table 10

Results for the Cover Crop Variety Trial at Clarke McGrath's soybean field in Union County. The least significant difference (LSD) is provided for 2015-2016.

Cover Crop	2015-16		2014-15		2013-14	
	Fall	Spring	Fall	Spring	Fall	Spring
	Groundcover (%)					
Cereal rye	34.4	42.2	40.6	25.0	29.7	65.6
Oats	31.3	0.0	26.6	0.0	14.1	0.0
Winter wheat	29.7	31.3	--	--	--	--
Winter triticale	18.8	23.4	--	--	--	--
Winter barley	18.8	20.3	--	--	--	--
Annual ryegrass	28.1	10.9	14.1	0.0	1.6	0.0
Hairy vetch	4.7	10.9	9.4	1.6	6.3	0.0
Brown mustard	29.7	0.0	23.4	0.0	70.3	0.0
Rapeseed	23.4	0.0	10.9	0.0	26.6	0.0
Radish	20.3	0.0	7.8	0.0	26.6	0.0
Turnip	17.2	3.1	--	--	--	--
Field pennycress	18.8	14.1	17.2	31.3	--	--
LSD ($P \leq 0.05$)	44.2	32.6	--	--	--	--

Sean McCoy, Polk County

Standing crop, 2015: Corn
 Row spacing (in.): 30
 Seeding date: 9/17/2015
 Fall measurement: 11/19/2015
 Spring measurement: None
 Replications: 2
 Comments: Plots worked up in spring before measurements could be conducted.



Mean monthly rainfall and temperature for the period September 2015–April 2016 and the 60-year averages at the Ankeny weather station (Iowa Environmental Mesonet, 2016).

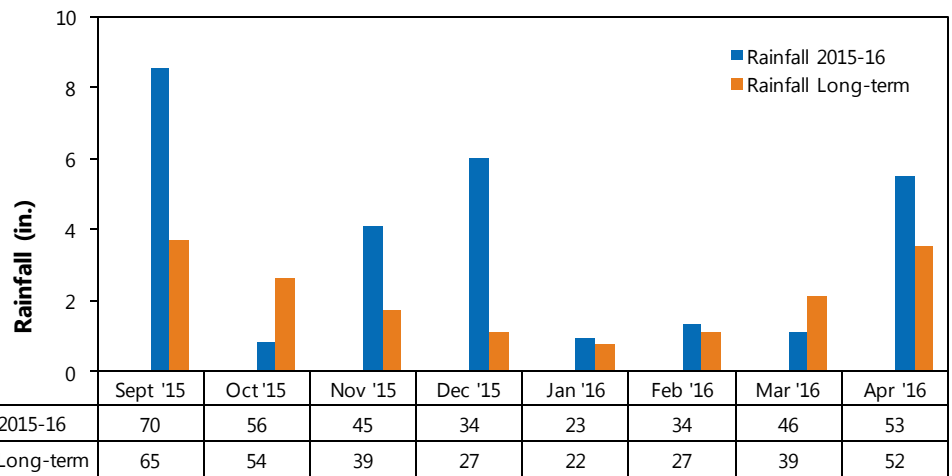
Table 11

Results for the Cover Crop Variety Trial at Sean McCoy's corn field in Polk County. The least significant difference (LSD) is provided for 2015-2016.

Cover Crop	2015-16	
	Fall	Spring
	Groundcover (%)	
Cereal rye	29.7	--
Oats	25.0	--
Winter wheat	32.8	--
Winter triticale	37.5	--
Winter barley	29.7	--
Annual ryegrass	9.4	--
Hairy vetch	31.3	--
Brown mustard	12.5	--
Rapeseed	12.5	--
Radish	4.7	--
Turnip	18.8	--
Field pennycress	26.6	--
LSD ($P \leq 0.05$)	46.5	--

Mark Peterson, Montgomery County

Standing crop, 2015: Corn
 Row spacing (in.): 38
 Seeding date: 9/17/2015
 Fall measurement: 11/19/2015
 Spring measurement: None
 Replications: 2



Mean monthly rainfall and temperature for the period September 2015–April 2016 and the 60-year averages at the Red Oak weather station (Iowa Environmental Mesonet, 2016).

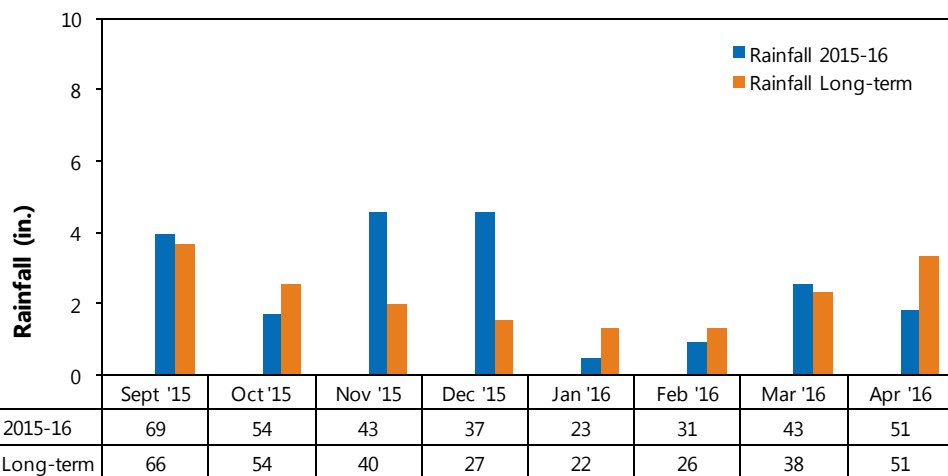
Table 12

Results for the Cover Crop Variety Trial at Mark Peterson's corn field in Montgomery County. The least significant difference (LSD) is provided for 2015-2016.

Cover Crop	2015-16		2014-15		2013-14	
	Fall	Spring	Fall	Spring	Fall	Spring
	Groundcover (%)					
Cereal rye	21.9	--	37.5	--	35.9	100
Oats	20.3	--	10.9	--	12.5	0.0
Winter wheat	32.8	--	--	--	--	--
Winter triticale	28.1	--	--	--	--	--
Winter barley	37.5	--	--	--	--	--
Annual ryegrass	42.2	--	9.4	--	1.6	0.0
Hairy vetch	3.1	--	6.3	--	9.4	0.0
Brown mustard	34.4	--	17.2	--	4.7	0.0
Rapeseed	28.1	--	10.9	--	1.6	0.0
Radish	29.7	--	6.3	--	1.6	0.0
Turnip	20.3	--	--	--	--	--
Field pennycress	3.1	--	6.3	--	--	--
LSD ($P \leq 0.05$)	63.9	--	--	--	--	--

Myron Rees, Washington County

Standing crop, 2015: Corn
 Row spacing (in.): 30
 Seeding date: 9/14/2015
 Fall measurement: 11/10/2015
 Spring measurement: 4/22/2016
 Replications: 2



Mean monthly rainfall and temperature for the period September 2015–April 2016 and the 60-year averages at the Crawfordsville weather station (Iowa Environmental Mesonet, 2016).

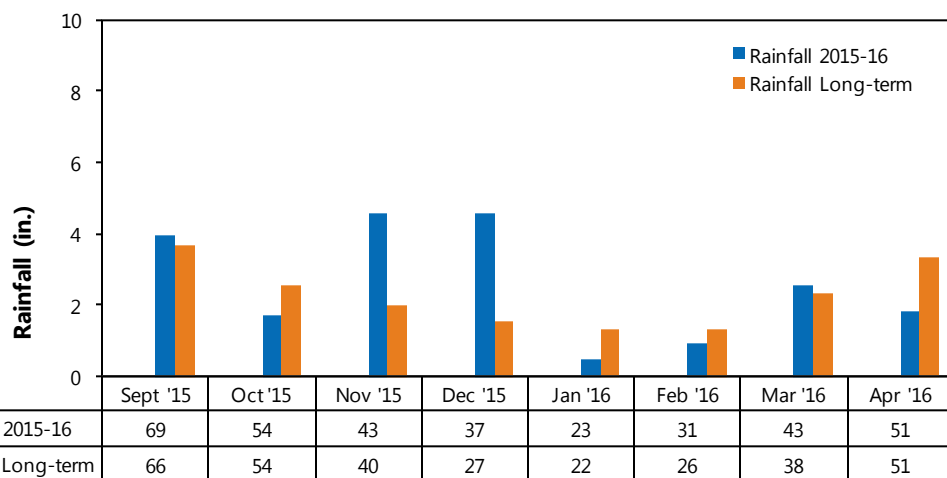
Table 13

Results for the Cover Crop Variety Trial at Myron Rees's corn field in Washington County. The least significant difference (LSD) is provided for 2015-2016.

Cover Crop	2015-16	
	Fall	Spring
	Groundcover (%)	
Cereal rye	31.3	54.7
Oats	29.7	0.0
Winter wheat	40.6	35.9
Winter triticale	32.8	48.4
Winter barley	45.3	42.2
Annual ryegrass	6.3	0.0
Hairy vetch	10.9	34.4
Brown mustard	18.8	0.0
Rapeseed	10.9	1.6
Radish	25.0	0.0
Turnip	6.3	0.0
Field pennycress	0.0	9.4
LSD ($P \leq 0.05$)	21.4	27.0

Myron Rees, Washington County

Standing crop, 2015: Soybeans
 Row spacing (in.): 30
 Seeding date: 9/14/2015
 Fall measurement: 11/10/2015
 Spring measurement: 4/22/2016
 Replications: 2



Mean monthly rainfall and temperature for the period September 2015–April 2016 and the 60-year averages at the Crawfordville weather station (Iowa Environmental Mesonet, 2016).

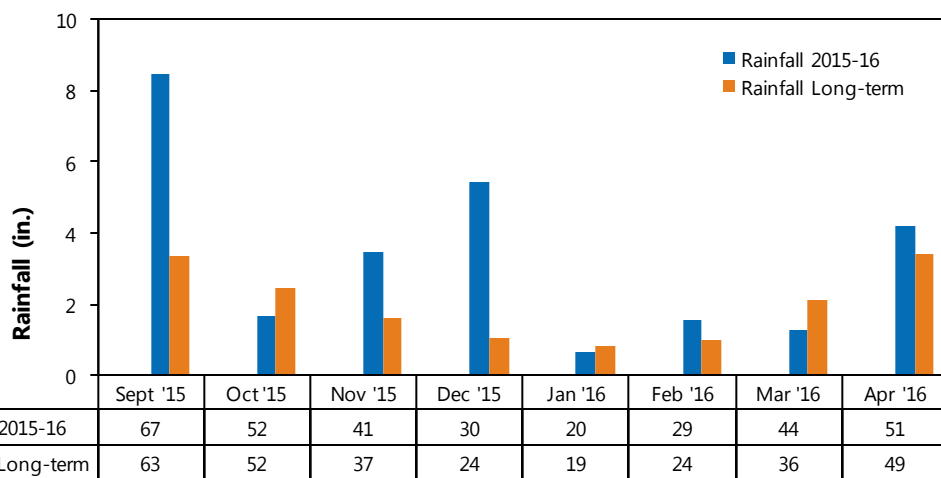
Table 14

Results for the Cover Crop Variety Trial at Myron Rees's soybean field in Washington County. The least significant difference (LSD) is provided for 2015-2016.

Cover Crop	2015-16		2014-15		2013-14	
	Fall	Spring	Fall	Spring	Fall	Spring
	Groundcover (%)					
Cereal rye	14.1	56.3	--	20.3	50.0	48.4
Oats	0.0	0.0	--	0.0	0.0	0.0
Winter wheat	17.2	39.1	--	--	--	--
Winter triticale	21.9	57.8	--	--	28.6	41.1
Winter barley	28.1	45.3	--	--	50.0	21.9
Annual ryegrass	3.1	0.0	--	--	--	--
Hairy vetch	28.1	64.1	--	0.0	29.7	--
Brown mustard	51.6	4.7	--	0.0	--	--
Rapeseed	17.2	6.3	--	0.0	--	--
Radish	25.0	0.0	--	0.0	--	--
Turnip	15.6	0.0	--	--	--	--
Field pennycress	0.0	23.4	--	--	--	--
LSD ($P \leq 0.05$)	44.2	30.7	--	--	--	--

**Dave & Meg Schmidt,
Audubon County**

Standing crop, 2015: Soybeans
 Row spacing (in.): 30
 Seeding date: 9/16/2015
 Fall measurement: 10/28/2015
 Spring measurement: 5/2/2016
 Replications: 3
 Comments: Residual herbicide activity
 may have affected covers.



Mean monthly rainfall and temperature for the period September 2015–April 2016 and the 60-year averages at the Fayette weather station (Iowa Environmental Mesonet, 2016).

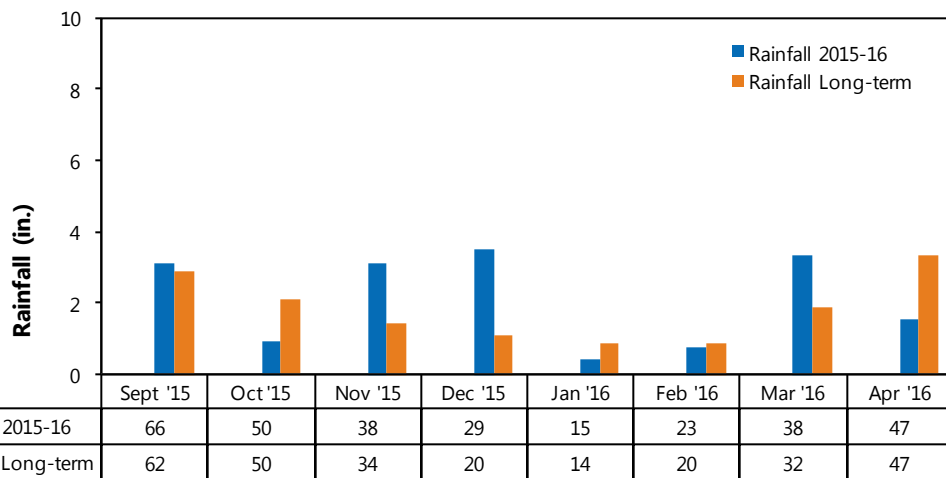
Table 15

**Results for the Cover Crop Variety Trial at
Dave & Meg Schmidt's soybean field in Audubon County. The least
significant difference (LSD) is provided for 2015-2016.**

Cover Crop	2015-16		2013-14	
	Fall	Spring	Fall	Spring
	Groundcover (%)			
Cereal rye	0.0	14.6	54.7	53.1
Oats	10.4	0.0	46.9	0.0
Winter wheat	2.1	20.8	--	--
Winter triticale	2.1	15.6	--	--
Winter barley	8.1	26.0	--	--
Annual ryegrass	0.0	0.0	6.3	0.0
Hairy vetch	5.2	26.0	23.4	0.0
Brown mustard	7.3	0.0	37.5	0.0
Rapeseed	0.0	0.0	6.3	0.0
Radish	4.2	0.0	15.6	0.0
Turnip	0.0	0.0	--	--
Field pennycress	0.0	2.1	--	--
LSD ($P \leq 0.05$)	13.6	33.2	--	--

Bil Schrader, Winnebago County

Standing crop, 2015: Soybeans
 Row spacing (in.): 30
 Seeding date: 9/17/2015
 Fall measurement: 11/6/2015
 Spring measurement: None
 Replications: 1
 Comments: Plots worked up in spring before measurements could be conducted.



Mean monthly rainfall and temperature for the period September 2015–April 2016 and the 60-year averages at the Forest City weather station (Iowa Environmental Mesonet, 2016).

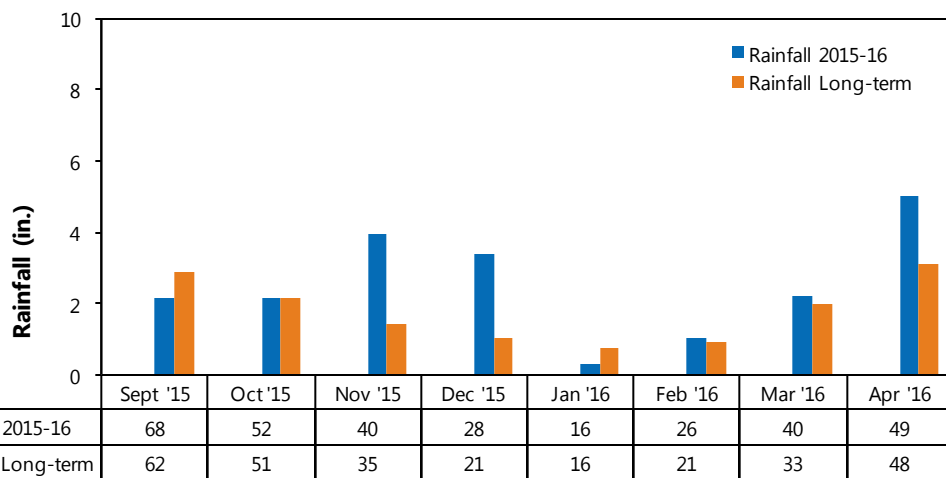
Table 16

Results for the Cover Crop Variety Trial at Bil Schrader's soybean field in Winnebago County. The least significant difference (LSD) is provided for 2015-2016.

Cover Crop	2015-16	
	Fall	Spring
	Groundcover (%)	
Cereal rye	53.3	--
Oats	65.6	--
Winter wheat	65.6	--
Winter triticale	56.3	--
Winter barley	78.1	--
Annual ryegrass	68.8	--
Hairy vetch	43.8	--
Brown mustard	75.0	--
Rapeseed	50.0	--
Radish	40.6	--
Turnip	59.4	--
Field pennycress	12.5	--
LSD ($P \leq 0.05$)	NA	--

Neal Williamsen, Palo Alto County

Standing crop, 2015: Corn
 Row spacing (in.): 30
 Seeding date: 9/24/2015
 Fall measurement: 10/29/2015
 Spring measurement: 4/18/2016
 Replications: 2



Mean monthly rainfall and temperature for the period September 2015–April 2016 and the 60-year averages at the Emmetsburg weather station (Iowa Environmental Mesonet, 2016).

Table 17

Results for the Cover Crop Variety Trial at Neal Williamsen's corn field in Palo Alto County. The least significant difference (LSD) is provided for 2015-2016.

Cover Crop	2015-16	
	Fall	Spring
	Groundcover (%)	
Cereal rye	17.2	12.5
Oats	10.9	0.0
Winter wheat	7.8	3.1
Winter triticale	6.3	4.7
Winter barley	10.9	4.7
Annual ryegrass	4.7	18.8
Hairy vetch	12.5	0.0
Brown mustard	4.7	1.6
Rapeseed	10.9	10.9
Radish	12.5	0.0
Turnip	12.5	0.0
Field pennycress	12.5	0.0
LSD ($P \leq 0.05$)	12.5	3.1

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- Singer, J. 2008. Corn belt assessment of cover crop management and preferences. *Agron. J.* 100:1670-1672

PFI Cooperators' Program

PFI's Cooperators' Program gives farmers practical answers to questions they have about on-farm challenges through research, record-keeping, and demonstration projects. The Cooperators' Program began in 1987 with farmers looking to save money through more judicious use of inputs. If you are interested in conducting an on-farm trial contact Stefan Gailans @ 515-232-5661 or stefan@practicalfarmers.org.