

2016 MCCC Iowa report

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Summary of cover crop activities in Iowa for 2016

Cover crops were planted in Iowa on an estimated 591,880 acres in fall of the 2015-2016 winter (Practical Farmers of Iowa), nearly 2.5% of the annual row-crop acreage produced in the Iowa in 2015. The Iowa Department of Agriculture and Land Stewardship cost-shared 177,000 acres, USDA-NRCS EQIP contracted 92,000 acres, and USDA-NRCS CSP had an additional 217,000 acres contracted that included cover crop enhancements. Outreach efforts on cover crop in Iowa reached over 10,000 individuals through 188 activities, including on-farm meetings, Iowa State University Extension articles, and Practical Farmers of Iowa outreach activities. Other cover crop outputs included publication of six refereed scientific articles and two MS theses. For 2016, there were eight graduate students, two post-doctoral associates, and one research associate conducting research on cover crops with support from six funded grant proposals.

Grant Funding obtained in Iowa with cover crop research or outreach activities:

Berti, M., B. Johnson, D. Ripplinger, H. Kandel, A. Wick, A. Akyuz, J. Ransom, D. Franzen, R. Gesch, F. Forcella, A. Lenssen, K. Moore, S. Wells. 2015-2019, USDA AFRI Food Security CAP, Agricultural Production Systems – Cropping Systems. A5160. A novel management approach to increase productivity, resilience, and long-term sustainability in cropping systems in the northern Great Plains.

Lenssen, A.W., S. Carlson, M. Wiedenhoeft. 2013-2016. NCR-SARE Research & Education. Improving cover crop options for the Corn Belt.

Moore, K.J, D. Laird, K. Lamkey, A. Lenssen. 2013-2016. NC-SunGrant. Managing perennial cover crops for sustainable corn stover biomass removal.

Nair, A., D. Brainard, A. Shaw, C. Chase, C. Bregendahl. 2014-2017. NCR-SARE Research & Education. Cover crops and strip tillage to promote soil quality, environmental sustainability, food safety, and profitability in cucurbit cropping systems.

Nair, A., K. Delate, C. Bregendahl, G. Artz. 2014-2016. Leopold Center for Sustainable Agriculture. Quantifying nitrogen credits and impacts of cover crops on soil biology and health in vegetable cropping systems in Iowa. <http://www.leopold.iastate.edu/grants/e2014-16>

Robinson, A., L. Leandro, A. Lenssen, T. Kaspar, T. Moorman. 2015-2017, Iowa Nutrient Reduction Center. Cover crops influence yield and diseases of corn and soybean.

Refereed journal articles

Acharya, J., M.G. Bakker, T.B. Moorman, T.C. Kaspar, A.W. Lenssen, and A.E. Robertson. 2017. Time interval between cover crop termination and planting influences corn seedling disease, plant growth, and yield. *Plant Disease*: in press. <http://dx.doi.org/10.1094/PDIS-07-16-0975-RE>

Basche, A.D., Archontoulis, S., Kaspar, T.C., Jaynes, D.B., Parkin, T.B., Miguez, F. 2016. Simulating long-term impacts of cover crops and climate change on crop production and environmental outcomes in the midwestern United States. *Agriculture, Ecosystems and Environment*. 218:95-106. doi: 10.1016/j.agee.2015.11.011.

Basche, A.D., Kaspar, T.C., Archontoulis, S., Jaynes, D.B., Sauer, T.J., Parkin, T.B., Miguez, F. 2016. Soil water improvements with the long-term use of a winter rye cover crop. *Agricultural Water Management*. 172:40-50. doi: 10.1016/j.agwat.2016.04.006.

Martinez-Feria, R.A., R. Dietzel, M. Liebman, M.J. Helmers, S.V. Archontoulis. 2016. Rye cover crop effects on maize: a system-level analysis. *Field Crops Research* 196:145-159. doi.org/10.1016/j.fcr.2016.06.016.

Martinez-Feria, R., Kaspar, T.C., Wiedenhoeft, M.H. 2016. Seeding date affects fall growth of winter canola (*Brassica napus* L. 'Baldur') and its performance as a winter cover crop in central Iowa. *Crop, Forage & Turfgrass Management*. 2(1). doi: 10.2134/cftm2015.0181.

Pantoja, J.L., K.P. Woli, J.E. Sawyer, and D.W. Barker. 2016. Winter rye cover crop biomass production, degradation, and nitrogen recycling. *Agron. J.* 108:841-853. doi:10.2134/agronj2015.0336.

Proceedings

Theses and Dissertations

Improved cover crop options for the Corn Belt. Seth Appelgate. MS Crop Production & Physiology 2016.
Available for download at <http://lib.dr.iastate.edu/etd/15163/>

Rye cover crop biomass, nutrient composition and crop management practices to enhance corn yield.
Swetabh Patel. MS Soil Science 2016.

Graduate students with research projects on cover crops, Iowa State University and USDA-ARS NLAE.

Name	Major Professor	Title
Appelgate, Seth	A. Lenssen & M. Wiedenhoef	Improved cover crop options for the Corn Belt
Bartel, Cynthia	A. Lenssen & K. Moore	Managing perennial cover crops for sustainable corn stover biomass production
Kruse, Raymond	Ajay Nair	Summer cover crops for fall vegetable production
Patel, Swetabh	A. Lenssen & K. Moore	
Patel, Swetabh	J. Sawyer	Rye cover crop biomass, nutrient composition and crop management practices to enhance corn yield
Schenck, Lara	T. Kaspar & A. Robinson	Winter rye cover crop effect on corn seedling pathogens
Sklenar, Tim	A. Lenssen	Cover crop termination timing and biomass removal: Impact on soybean systems
Tillman, Jennifer	Ajay Nair	Strip tillage systems in cucurbit production

Post-doctoral researchers and research associates with projects on cover crops at Iowa State University and USDA-ARS NLAE.

Name	Co-workers	Title
Ms. Jyotsna Acharya	A. Robinson	Investigating the causes of corn yield decreases following cereal rye winter cover crop
Dr. Matt Bakker	T. Kaspar & T. Moorman	Investigating the causes of corn yield decreases following cereal rye winter cover crop
Dr. Chumki Banik	D. Laird	Managing perennial cover crops for sustainable corn stover biomass production: Temporal variation in soil nitrate-N

Iowa State University Extension and Outreach Bulletins, Articles, and Blogs

Appelgate, S., A. Lenssen. 2016. Cover crop options and mixes for the Upper Midwest: Is a winter rye monoculture the only option? ISRF15-16,30.

http://farms.ag.iastate.edu/sites/default/files/CoverCropOptions_0.pdf

Archontoulis, S. 2016. Understanding rye cover crop effects on corn.

<http://crops.extension.iastate.edu/blog/sotirios-archontoulis/understanding-rye-cover-crop-effects-corn>

Delate, K., R. Johnson. 2016. Comparison of organic and conventional crops at the Neely-Kinyon long-term agroecological research site. ISRF15-12.

<http://farms.ag.iastate.edu/sites/default/files/ComparisonOrganicArm.pdf>

Fawcett, J. J. Sievers, L. Rossiter. 2016. On-Farm cover crop trials. ISRF15-29,31.

http://farms.ag.iastate.edu/sites/default/files/CoverCrops_2.pdf

Krzton-Presson, J., A. Nair. 2016. Effects of tillage and cover crops on muskmelon production and food safety. ISRF15-36. http://farms.ag.iastate.edu/sites/default/files/EffectsTillage_0.pdf

Licht, M., L. Juchems, J. Comito, M. Helmers, S. Carlson. 2016. Demonstrating cover crop mixtures on Iowa farmland: Management, soil health, and water quality benefits. ISRF15-35.

http://farms.ag.iastate.edu/sites/default/files/DemonstratingCoverCroMcN_0.pdf

Patel, S., J. Lundvall, J. Sawyer. 2016. Enhancing corn yield in a winter cereal rye cover cropping system. ISRF15-29,31. http://farms.ag.iastate.edu/sites/default/files/EnhancingCornYield_1.pdf

Pederson, C., M. Helmers, M. Soupir, A. Mallarino. 2016. Impact of liquid swine manure application and cover crops on nitrate in subsurface drainage water. ISRF15-13.

<http://farms.ag.iastate.edu/sites/default/files/ImpactLiquidManure.pdf>

March (2016) Stories Online – Iowa State University; press release also: “Iowa State University Researchers Gain Understanding of the Winter Rye-Cover Crops Yield Problem.

<http://www.cals.iastate.edu/news/releases/iowa-state-university-researchers-gain-understanding-winter-rye-cover-crops-yield>

Meeting Abstracts, Poster-Oral presentations at scientific meetings, and departmental seminars:

Acharya, J., Bakker, M.G., Kaspar, T.C., Moorman, T.B., Lenssen, A., Robertson, A. 2016. Effect of date of termination of a winter cereal rye cover crop (*Secale cereale*) on corn seedling disease. American Phytopathological Society Annual Meeting. 106:S1.1.

Bakker, M.G., Moorman, T.B., Kaspar, T.C., Manter, D.K. 2016. Winter rye cover crops as a host for corn seedling pathogens. American Phytopathological Society. 106:S1.2. doi: 10.1094/PHYTO-106-1-s1.1

Banik, C., C. Bartel, D.A. Laird, K.J. Moore, and A.W. Lenssen. 2016. Impact of a corn-living mulch cropping system on soil C- and N-dynamics. ASA Phoenix AZ

Bartel, C.A., A.W. Lenssen, K.J. Moore, D.A. Laird, S.V. Archontoulis. 2016. Perennial cover establishment in row crop systems for sustainable biofuels productions. University of Minnesota Production Agriculture Symposium, DuPont Plant Sciences Symposia Series. Minneapolis, MN.

Bartel, C.A., A.W. Lenssen, K.J. Moore, D.A. Laird, and S.V. Archontoulis. 2016. Living mulch establishment in row crop systems for sustainable biofuels production. ASA Phoenix AZ

Bartel, C.A., A.W. Lenssen, K.J. Moore, D.A. Laird, S.V. Archontoulis. 2016. Perennial cover crop establishment for sustainable corn stover biomass production. The Inaugural Soil Health Conference, Ames, IA.

Pantoja, J.L., J.E. Sawyer, K.P. Woli, and D.W. Barker. 2016. Use of winter rye (*Secale cereale* L.) cover crop for nitrogen recycling in a corn-based cropping system. In proc. 21st Century Watershed Technology Conference and Workshop, Quito Ecuador, 3-9 Dec. 2016. ASABE, St. Joseph, MI.

Patel, S., J.E. Sawyer, and J.P. Lundvall. 2016. Root and shoot biomass and nutrient composition in a winter rye cover crop. In Annual Meetings Abstract (on-line), ASA, Madison, WI.

Popular Press articles

High Plains/Midwest Ag Journal (April 2016): http://www.hpj.com/crops/iowa-state-university-researchers-gain-understanding-of-the-winter-rye/article_346f8e21-30d6-5038-86d7-4eb90b73a427.html?mode=jqm

Field Days

Practical Farmers of Iowa Cover Crop Work in 2016

1. Publications

Newspaper and trade publications

Secured **10** articles in print publications;

1. "Learn from on-farm trials" Stefan Gailans. Wallaces Farmer. January 2016.
<http://magissues.farmprogress.com/wal/wf01jan16/wal048.pdf>
2. "5 Cover Crops Questions Answered" Nick Ohde. Wallaces Farmer. February 2016.
<http://magissues.farmprogress.com/wal/wf11nov15/wal078.pdf>
3. "Rolling cover crops" Stefan Gailans. Wallaces Farmer. March 2016.
<http://magissues.farmprogress.com/wal/wf03mar16/wal057.pdf>
4. "When to terminate rye before beans?" Nick Ohde. Wallaces Farmer. April 2016.
<http://magissues.farmprogress.com/wal/wf04apr16/wal022.pdf>
<http://magissues.farmprogress.com/wal/wf04apr16/wal023.pdf>
5. "You're never too old to try covers" Nick Ohde. Wallaces Farmer. May 2016.
<http://magissues.farmprogress.com/wal/wf05may16/wal042.pdf>
<http://magissues.farmprogress.com/wal/wf05may16/wal043.pdf>
6. "Serve up covers for cattle feed." Nick Ohde. Wallaces Farmer. June 2016.
<http://magissues.farmprogress.com/wal/wf06jun16/wal036.pdf>
<http://magissues.farmprogress.com/wal/wf06jun16/wal037.pdf>
7. "Tool terminates cover crops" Stefan Gailans. Wallaces Farmer. August 2016.
<http://magissues.farmprogress.com/wal/wf08aug16/wal050.pdf>
<http://magissues.farmprogress.com/wal/wf08aug16/wal051.pdf>
8. "Cereal Rye King of Covers" Wallaces Farmer. October 2016.
<http://magissues.farmprogress.com/WAL/WF10Oct16/wal021.pdf>
9. "Finding Cash in Cover Crops" Sarah Carlson. Wallaces Farmer. December 2016.
10. "Turning Cover Crops into Cash" Stefan Gailans. Wallaces Farmer Online. December 20, 2016.
<http://www.wallacesfarmer.com/farm-operations/turning-cover-crops-cash>

Practical Farmers research reports

Published **9** reports from on-farm research trials where farmers compared the ecological and economic resilience of cover crop systems to a control on their farms.

1. "Winter Cereal Rye Cover Crop Effect on Soil" Iowa Learning Farms and Practical Farmers Research Report. Stefan Gailans. June 2016. <http://practicalfarmers.org/farmer-knowledge/research-reports/2016/winter-cereal-rye-cover-crop-effect-soil/>
2. "Winter Cereal Rye Cover Crop Effect on Cash Crop Yield: Year 7" Iowa Learning Farms and Practical Farmers Research Report. Stefan Gailans. June 2016. <http://practicalfarmers.org/farmer-knowledge/research-reports/2016/winter-cereal-rye-cover-crop-effect-cash-crop-yield-2/>
3. "Cover Crop Variety Trial 2015-2016" Practical Farmers Research Report. Stefan Gailans. July 2016.

<http://practicalfarmers.org/farmer-knowledge/research-reports/2016/cover-crop-variety-trial-2015-2016/>

4. "Winter Triticale Seeding Rate" Practical Farmers Research Report. Stefan Gailans. October 2016. <http://www.practicalfarmers.org/blog/2016/10/20/research-report-winter-triticale-seeding-rate/>
5. "Nitrogen Rate Comparison in Corn Following Green Manure Cover Crop Mixes" Practical Farmers Research Report. Stefan Gailans. November 2016. <http://www.practicalfarmers.org/blog/2016/11/21/research-report-n-rate-comparison-corn-following-green-manure-cover-crop-mixes/>
6. "Summer Annual Forage Established After Cereal Rye + Hairy Vetch Cover Crop" Practical Farmers Research Report. Stefan Gailans. October 2016. <http://www.practicalfarmers.org/blog/2016/10/26/research-report-summer-annual-forage-established-cereal-rye-hairy-vetch-cover-crop/>
7. "Cover Crop Termination Date Ahead of Corn" Practical Farmers Research Report. Stefan Gailans. December 2016. <http://www.practicalfarmers.org/blog/2016/12/05/research-report-cereal-rye-cover-crop-termination-date-ahead-corn/>
8. "Cereal Rye Cover Crop Termination Date Ahead of Soybeans, 2016 Update" Practical Farmers Research Report. Stefan Gailans. November 2016. <http://www.practicalfarmers.org/blog/2016/11/30/research-report-cereal-rye-cover-crop-termination-date-ahead-soybeans-2016-update/>
9. "Oat Cover Crop vs. Straw Mulch for Garlic Production" Practical Farmers Research Report. Liz Kolbe. November 2016. <http://www.practicalfarmers.org/farmer-knowledge/research-reports/2016/oat-cover-crop-vs-straw-mulch-garlic-production/>
10. "Economic Benefits of Utilizing Cover Crops as Forage. Meghan Filbert. November 2016. <http://practicalfarmers.org/farmer-knowledge/research-reports/2016/economic-benefits-utilizing-cover-crops-forage/>

PFI Newsletter

Published **5** newsletter articles on cover crops;

1. "The Art and Science of Cover Crops" Nick Ohde. The Practical Farmer. Vol. 32. No. 1. Winter 2016.
2. "Covering Mahaska County" Stefan Gailans. The Practical Farmer. Vol. 32. No. 2. Spring 2016.
3. "Roller-Crimping Cover Crops" Stefan Gailans. The Practical Farmer. Vol. 32. No. 3. Summer 2016.
4. "Grazing Cover Crops" Meghan Filbert. The Practical Farmer. Vol. 32. No. 4. Autumn 2016.
5. "Conservation-Minded Rental Agreements" Stefan Gailans. Vol. 32. No. 4. Autumn 2016.

Practical Farmers blog

Published **48** blog posts related to cover crops;

1. "Reach of Cooperator Research" Practical Farmers Blog. Stefan Gailans. December 7, 2016.

<http://www.practicalfarmers.org/blog/2016/12/07/reach-cooperator-research/>

2. "RESEARCH REPORT: Cover Crop Termination Date Ahead of Corn" Practical Farmers Blog. Stefan Gailans. December 5, 2016. <http://www.practicalfarmers.org/blog/2016/12/05/research-report-cereal-rye-cover-crop-termination-date-ahead-corn/>
3. "RESEARCH REPORT: Cereal Rye Cover Crop Termination Date Ahead of Soybeans, 2016 Update" Practical Farmers Blog. Stefan Gailans. November 30, 2016. <http://www.practicalfarmers.org/blog/2016/11/30/research-report-cereal-rye-cover-crop-termination-date-ahead-soybeans-2016-update/>
4. "RESEARCH REPORT: N Rate Comparison in Corn Following Green Manure Cover Crop Mixes" Practical Farmers Blog. Stefan Gailans. November 21, 2016. <http://www.practicalfarmers.org/blog/2016/11/21/research-report-n-rate-comparison-corn-following-green-manure-cover-crop-mixes/>
5. "RESEARCH REPORT: Summer Annual Forage Established After Cereal Rye + Hairy Vetch Cover Crop" Practical Farmers Blog. Stefan Gailans. October 26, 2016. <http://www.practicalfarmers.org/blog/2016/10/26/research-report-summer-annual-forage-established-cereal-rye-hairy-vetch-cover-crop/>
6. "Can Farmers Make a Living while Caring for the Land, Soil, and Water?" Practical Farmers Blog. Sally Worley. October 21, 2016. <http://www.practicalfarmers.org/blog/2016/10/21/can-farmers-make-living-caring-land-soil-water/#more-23693>
7. "RESEARCH REPORT: Winter Triticale Seeding Rate" Practical Farmers Blog. Stefan Gailans. October 20, 2016. <http://www.practicalfarmers.org/blog/2016/10/20/research-report-winter-triticale-seeding-rate/>
8. "Busting Myths about Cover Crops, Small grains and Wetlands" Practical Farmers Blog. Sally Worley. October 14, 2016. <http://www.practicalfarmers.org/blog/2016/10/14/busting-myths-cover-crops-small-grains-wetlands/>
9. "RESEARCH REPORT: Fungicide and Plant Growth Regulator Effect on Cereal Rye Production" Practical Farmers of Iowa. Stefan Gailans. October 10, 2016. <http://www.practicalfarmers.org/blog/2016/10/10/research-report-fungicide-plant-growth-regulator-effect-cereal-rye-production/>
10. "Guest Post: Early Senescing Soybeans or SDS?" Practical Farmers Blog. Stefan Gailans. September 16, 2016. <http://practicalfarmers.org/blog/2016/09/16/guest-post-early-senesceing-soybeans-sds/>
11. "Farmers respond to "cover crop roots plugging tile lines" Practical Farmers Blog. Sarah Carlson. August 24, 2016. <http://practicalfarmers.org/blog/2016/08/24/farmers-respond-cover-crop-roots-plugging-tile-lines/>
12. "One Stop Cover Crop Service Boone and Story County Iowa" Practical Farmers Blog. Sarah Carlson. August 19, 2016. <http://practicalfarmers.org/blog/2016/08/19/one-stop-cover-crop-service/>

13. "Field day recap: From a Soil Conservation to a Soil Regeneration Mindset" Practical Farmers Blog. Stefan Gailans. August 4, 2016. <http://practicalfarmers.org/blog/2016/08/04/field-day-recap-soil-conservation-soil-regeneration-mindset/>
14. "Why I Grow Small Grains: Paul Ackley" Practical Farmers Blog. Nick Ohde. July 29, 2016. <http://practicalfarmers.org/blog/2016/07/29/grow-small-grains-paul-ackley/>
15. "Show me the Money! Can cover crops pay?" Practical Farmers Blog. Sarah Carlson. July 27, 2016. <http://practicalfarmers.org/blog/2016/07/27/show-money-can-cover-crops-pay/>
16. "Cover crops: Affordable or not?" Practical Farmers Blog. Sarah Carlson. July 22, 2016. <http://practicalfarmers.org/blog/2016/07/22/cover-crops-affordable-not/>
17. "Why I Grow Small Grains: Nathan Anderson" Practical Farmers Blog. Nick Ohde. July 22, 2016. <http://practicalfarmers.org/blog/2016/07/22/grow-small-grains-nathan-anderson/>
18. "Latest and Greatest Cover Crops Research by Practical Farmers" Practical Farmers Blog. Stefan Gailans. July 19, 2016. <http://practicalfarmers.org/blog/2016/07/19/latest-greatest-cover-crop-research-practical-farmers/>
19. "Field Day Recap: Conservation Practices on a Century Farm" Practical Farmers Blog. Stefan Gailans. July 18, 2016. <http://practicalfarmers.org/blog/2016/07/18/field-day-recap-conservation-practices-century-farm/>
20. "RESEARCH REPORT: Cover Crop Variety Trial 2015-2016" Practical Farmers Blog. Stefan Gailans. July 13, 2016. <http://practicalfarmers.org/blog/2016/07/13/research-report-cover-crop-variety-trial-2015-2016/>
21. "Research: Interseeding Cover Crops to Corn in NW Iowa" Practical Farmers Blog. Stefan Gailans. July 7, 2016. <http://practicalfarmers.org/blog/2016/07/07/research-interseeding-cover-crops-corn-nw-iowa/>
22. "Field Day Recap: Managed Grazing to Improve Pasture and Cropland" Practical Farmers Blog. Nick Ohde. June 30, 2016. <http://practicalfarmers.org/blog/2016/06/30/field-day-recap-managed-grazing/>
23. "Is an oat cover crop the market we need to diversify the landscape?" Practical Farmers Blog. Sarah Carlson. June 26, 2016. <http://practicalfarmers.org/blog/2016/06/26/sowing-oats-fall-cover-crop/>
24. "Field Day Recap: Effects of a Custom-Made Roller-Crimper on Rye Cover" Practical Farmers Blog. Stefan Gailans. June 22, 2016. <http://practicalfarmers.org/blog/2016/06/22/rolling-2016-field-day-season-churdan/>
25. "Spring Observations by John Gilbert, part 2" Practical Farmers Blog. Stefan Gailans. June 15, 2016. <http://practicalfarmers.org/blog/2016/06/15/spring-observations-by-john-gilbert-part-2/>
26. "Winter Rye Cover Crop Effect on Cash Crop Yield, Year 7 update" Practical Farmers Blog. Stefan

- Gailans. June 7, 2016. <http://practicalfarmers.org/blog/2016/06/07/winter-rye-cover-crop-effect-cash-crop-yield-year-7-update/>
27. "Get the Dirt on Soil Ecology with Dr. Jill Clapperton" Practical Farmers Blog. Stefan Gailans. June 2, 2016. <http://practicalfarmers.org/blog/2016/06/02/get-dirt-soil-ecology-dr-jill-clapperton/>
 28. "Six cover crop farmers' videos & pics of closing the seed trench" Practical Farmers Blog. Sarah Carlson. May 17, 2016. <http://practicalfarmers.org/blog/2016/05/17/close-seed-trench/>
 29. "First time with cover crop rye to corn?" Practical Farmers Blog. Sarah Carlson. March 31, 2016. <http://practicalfarmers.org/blog/2016/03/31/first-time-with-cover-crop-rye-to-corn/>
 30. "Cover Crop Lunch & Learn: Winterset Pizza Ranch 3/29/2016" Practical Farmers Blog. Sarah Carlson. March 24, 2016. <http://practicalfarmers.org/blog/2016/03/24/cover-crop-lunch-learn-winterset-pizza-ranch-32916/>
 31. "Does a cereal rye cover crop affect soil health?" Practical Farmers Blog. Stefan Gailans. March 21, 2016. <http://practicalfarmers.org/blog/2016/03/21/does-a-cereal-rye-cover-crop-affect-soil-health/>
 32. "Rolling Cover Crops" Practical Farmers Blog. Stefan Gailans. March 17, 2016. <http://practicalfarmers.org/blog/2016/03/17/rolling-cover-crops/>
 33. "Cover crops are springing in March" Practical Farmers Blog. Stefan Gailans. March 10, 2016. <http://practicalfarmers.org/blog/2016/03/10/cover-crops-are-springing-in-march/>
 34. "If biodiversity is the goal..." Practical Farmers Blog. Stefan Gailans. February 24, 2016. <http://practicalfarmers.org/blog/2016/02/24/if-biodiversity-is-the-goal/>
 35. "5 Cover Crops Questions Answered" Practical Farmers Blog. Nick Ohde. February 17, 2016. <http://practicalfarmers.org/blog/2016/02/17/5-cover-crops-questions-answered/>
 36. "PFI CONFERENCE RECAP: Interseeding Cover Crops with Corn" Practical Farmers Blog. Stefan Gailans. February 16, 2016. <http://practicalfarmers.org/blog/2016/02/16/pfi-conference-recap-interseeding-cover-crops-with-corn/>
 37. "PFI CONFERENCE RECAP: Rolling Cover Crops with Modified Equipment." Practical Farmers Blog. Stefan Gailans. February 10, 2016. <http://practicalfarmers.org/blog/2016/02/10/pfi-conference-recap-rolling-cover-crops-with-modified-equipment/>
 38. "Reach of Cooperator Research" Practical Farmers Blog. Stefan Gailans. December 7, 2016. <http://www.practicalfarmers.org/blog/2016/12/07/reach-cooperator-research/>
 39. "RESEARCH REPORT: Cover Crop Termination Date Ahead of Corn" Practical Farmers Blog. Stefan Gailans. December 5, 2016. <http://www.practicalfarmers.org/blog/2016/12/05/research-report-cereal-rye-cover-crop-termination-date-ahead-corn/>
 40. "RESEARCH REPORT: Cereal Rye Cover Crop Termination Date Ahead of Soybeans, 2016 Update" Practical Farmers Blog. Stefan Gailans. November 30, 2016. <http://www.practicalfarmers.org/blog/2016/11/30/research-report-cereal-rye-cover-crop->

[termination-date-ahead-soybeans-2016-update/](#)

41. "Field Day Recap: Grazing Cereal Rye in the Fall (new research report included)" Practical Farmers Blog. Meghan Filbert. November 23, 2016. <http://www.practicalfarmers.org/blog/2016/11/23/field-day-recap-grazing-cereal-rye-fall-new-research-report-included/>
42. "RESEARCH REPORT: N Rate Comparison in Corn Following Green Manure Cover Crop Mixes" Practical Farmers Blog. Stefan Gailans. November 21, 2016. <http://www.practicalfarmers.org/blog/2016/11/21/research-report-n-rate-comparison-corn-following-green-manure-cover-crop-mixes/>
43. "RESEARCH REPORT: Summer Annual Forage Established After Cereal Rye + Hairy Vetch Cover Crop" Practical Farmers Blog. Stefan Gailans. October 26, 2016. <http://www.practicalfarmers.org/blog/2016/10/26/research-report-summer-annual-forage-established-cereal-rye-hairy-vetch-cover-crop/>
44. "Can Farmers Make a Living while Caring for the Land, Soil, and Water?" Practical Farmers Blog. Sally Worley. October 21, 2016. <http://www.practicalfarmers.org/blog/2016/10/21/can-farmers-make-living-caring-land-soil-water/#more-23693>
45. "RESEARCH REPORT: Winter Triticale Seeding Rate" Practical Farmers Blog. Stefan Gailans. October 20, 2016. <http://www.practicalfarmers.org/blog/2016/10/20/research-report-winter-triticale-seeding-rate/>
46. "Busting Myths about Cover Crops, Small grains and Wetlands" Practical Farmers Blog. Sally Worley. October 14, 2016. <http://www.practicalfarmers.org/blog/2016/10/14/busting-myths-cover-crops-small-grains-wetlands/>
47. "RESEARCH REPORT: Fungicide and Plant Growth Regulator Effect on Cereal Rye Production" Practical Farmers of Iowa. Stefan Gailans. October 10, 2016. <http://www.practicalfarmers.org/blog/2016/10/10/research-report-fungicide-plant-growth-regulator-effect-cereal-rye-production/>

Other publication materials

1. "Herbicide Use May Restrict Options for Cover Crops" Practical Farmers of Iowa Fact Sheet. May 2016. <http://practicalfarmers.org/app/uploads/2016/05/Herbicide-Use-and-Cover-Crops-PFI.pdf>
2. Cover Crop Business Directory 2016. Practical Farmers of Iowa. August 2016. <http://practicalfarmers.org/app/uploads/2016/08/PFI-Cover-Crop-Business-Directory-2016-Online.pdf>
3. "Corn Herbicides: Restrictions When Planting, Grazing or Feeding Cover Crops" Practical Farmers of Iowa Fact Sheet. November 2016. http://practicalfarmers.org/app/uploads/2016/11/PFI-Corn-Herbicides_V2.pdf

4. "Soybean Herbicides: Restrictions When Planting, Grazing or Feed Cover Crops" Practical Farmers of Iowa Fact Sheet. November 2016. <http://practicalfarmers.org/app/uploads/2016/11/PFI-Soybean-Herbicides.pdf>

2. On-farm research projects

- In 2016, worked with 25 PFI farmers who conducted 29 on-farm research trials related to cover crops.
- Particularly noteworthy were the two trials in 2016 that confirmed findings from 2015: Delaying cereal rye cover crop termination until within one day of soybean planting had no adverse effect on soybean yield and reduced weed pressure.
- Cereal rye and other small grains species tended to be the best performers in our 2015-16 cover crop variety trial that also included brassica and legume species.
- Spring, Summer, Fall 2016 Practical Farmers of Iowa, Iowa Learning Farms and Iowa State University Farmer Association Farms evaluated a pure cover crop and a cover crop mix's effect on cover crop growth, nitrate in shallow groundwater and cash crop yield at six regional research farms in Iowa. The project began in 2013 and concluded in 2016. Pure cover crops typically out-performed the mixes in terms of biomass production. Nitrate in shallow groundwater was reduced by the cover crops (pure or mix) compared to where no cover crop was seeded. No significant effects on cash crop yield were observed.
- Fall 2016 Practical Farmers of Iowa, Iowa Learning Farms, and Hagie Manufacturing concluded a project that began in 2014 on three farms comparing cover crop seeding methods and cover crop selection on cover crop growth and commodity crop yield. Seeding methods compared include broadcasting into standing commodity crop with a modified high-clearance sprayer vs. drilling after commodity crop harvest. Cover crop selections compared include pure stands vs. mixes. Seeding the cover crops into standing commodity crops with the modified high-clearance sprayer consistently resulted in increased biomass production compared to when the cover crops were drilled following commodity crop harvest. Regardless of seeding method, the pure cover crop stands produced more biomass than the mixes. Commodity crop yield generally was not affected by cover crop seeding method or selection.

3. Outreach

Field Days/Workshops/Conferences/Meetings

Organized and held **75 cover crop field days, workshops, conference sessions, webinars, meetings, and presentations** at different locations around Iowa plus **6 days at two major farm shows in Iowa** with a total number of **9538** people attending or watching.

Event Date	Event Name/Description	Location	Number of Attendees
1/22/2016	Practical Farmers of Iowa Conference Session: "Living Plants as Solar Collectors"	Ames	37
1/23/2016	Practical Farmers of Iowa Conference Session: "Interseeding Cover Crops with Bryce Irlbeck and Dr. M Scott Wells"	Ames	72

1/23/2016	Practical Farmers of Iowa Conference Session: "Rolling Cover Crops with Modified Equipment"	Ames	56
1/23/2016	Practical Farmers of Iowa Conference Session: "Top 10 Cover Crop Species for Iowa: 2016 Edition"	Ames	70
1/23/2016	Practical Farmers of Iowa Conference Session: "We Learn More by Accident Than We Do on Purpose"	Ames	42
1/30/2016	IFBF Young Farmers Conference	Des Moines	100
2/3-4/2016	Iowa Power Farming Show	Des Moines	100
2/5/2016	PASA Annual Conference-Growing Your Own Data	State College, PA	20
2/5/2016	PASA Annual Conference-Advancing CC Through On-Farm Research	State College, PA	20
2/11/2016	Land Stewardship Project Soil Health Meeting	Lewiston, MN	65
2/12/2016	SW IA Cover Cropper Experts Meeting	Stanton	10
2/23/2016	ILF/PFI Cover Crops Field Day	Sutherland	47
2/24/2016	ILF/PFI Cover Crops Field Day	Ventura	57
2/24/2016	Midwest Cover Crops Council Panel Discussion	Madison, WI	120
2/25/2016	ILF/PFI Cover Crops Field Day	Waterloo	65
3/1/2016	ILF/PFI Cover Crops Field Day	Iowa City	80
3/2/2016	ILF/PFI Cover Crops Field Day	Oskaloosa	43
3/2/2016	National Wildlife Federation Cover Crop Champions	Chicago, IL	20
3/3/2016	Gary's Feed Store Workshop	Manchester	15
3/3/2016	ILF/PFI Cover Crops Field Day	Lewis	58
3/8/2016	SW IA Cover Cropper Experts Meeting	Stanton	10
3/8/2016	ADM/Unilever Sustainable Soy	Atlantic	25
3/8/2016	Heartland Coop Cover Crop Presentation	Stanhope	12
3/9/2016	ADM/Unilever Sustainable Soy	Ankeny	40
3/9/2016	ADM/Unilever Sustainable Soy	Albia	15
3/9/2016	Ames Rotary	Ames	30
3/22/2016	University of Minnesota Production Ag Symposium	St. Paul, MN	300
3/22/2016	Water Quality Initiative	Ames	30
3/29/2016	Badger Creek Watershed Workshop	Winterset	20
3/30/2016	Benton Co. Cover Crop Workshop	Vinton	45
3/30/2016	Elk Run Field Day	Breda	45
4/1/2016	Penn State Cropping Systems Symposium	College Station, PA	60
4/4/2016	ISU Agronomy Class	Ames	50
4/4/2016	ISU Agronomy Class	Ames	30
4/4/2016	ISU Agronomy Class	Ames	36

4/5/2016	Whiterock Field Day	Coon Rapids	29
4/13/2016	ILF/PFI Cover Crops Field Day	Kanawha	60
4/14/2016	Mt. Pleasant Grassroots Grazing	Mt. Pleasant	50
4/21/2016	Water Quality Initiative	Carroll	3
4/26/2016	Cover Crop Presentation for John Deere Employees	Des Moines	75
5/24/2016	Iowa Crop Loss Committee	Johnston	15
6/15/2016	ILF/PFI Cover Crops Field Day	Gravity	10
6/15/2016	PFI Field Day	Churdan	110
6/20/2016	PFI Field Day	Polk City	80
6/25/2016	PFI Field Day	Cherokee	39
6/28/2016	PFI Field Day	Bloomington	75
6/30/2016	PFI Field Day	Knoxville	50
7/13/2016	PFI Field Day	Slater	75
7/20/2016	Cover Crops & Soil Health at the Grundy County Fair	Grundy Center	55
7/25/2016	Ragbrai Stop	Stanton	150
7/26/2016	WFAN Cover Crops	Toledo	25
7/27/2016	PFI Field Day	Hastings	52
8/11/2016	Truman, MN Coop	Truman, MN	45
8/25/2016	Summit Ag	Davenport	25
8/30-9/1/2016	Iowa Farm Progress Show Booth	Boone	1000
9/8/2016	RCCP Headwaters of N. Raccoon	Rembrandt	55
9/8/20016	Summit Ag	Dubuque	30
9/13/2016	Mississippi River Cities and Towns Initiative	Natchez, MS	35
9/22/2016	Summit Ag	Burlington	30
10/20/2016	One Water Listening Session	Ankeny	40
10/27/2016	Cong. Young & Sec. Northey	Adair	5
11/8/2016	ILF/PFI Cover Crops Field Day	Independence	25
11/10/2016	ILF/PFI Cover Crops Field Day	Lytton	35
11/15/2016	ILF/PFI Cover Crops Field Day	Dayton	35
11/16/2016	ILF/PFI Cover Crops Field Day	Nashua	30
11/17/2016	Albert Lea Seedhouse Open House	Albert Lea, MN	75
11/17/2016	ILF/PFI Cover Crops Field Day	Cedar Falls	32
11/29/2016	Green Lands, Blue Waters Conference	Columbia, MO	15
12/1/2016	SW IA Cover Cropper Experts Meeting	Stanton	8
12/13/2016	UW Discovery Farm Conference	Wisconsin Dells, WI	200

Webinars

1. "Herbicide Restriction Considerations for Using Cover Crops as Forage" Farminar. February 9, 2016. 16 participants. 68 archived views. <http://practicalfarmers.org/farmer-knowledge/farminar-archive/alternatives-to-cereal-rye-and-the-benefits-of-grazing-covers/>

2. "What a Small Grain Crop Can Afford You: Diverse Covers for Grazing" Farminar. January 19, 2016. 24 participants. 184 archived views. <http://practicalfarmers.org/farmer-knowledge/farminar-archive/what-a-small-grain-crop-can-afford-you-diverse-covers-for-grazing-january-19-2016/>
3. "Graze and Bale: Cover Crops as Forage" Farminar. December 6, 2016. 24 participants. 62 archived views. <http://www.practicalfarmers.org/farmer-knowledge/farminar-archive/graze-bale-cover-crops-forage/>
4. "Getting More from Cover Crops" Farminar. December 13, 2016. 35 participants. 39 archived views. <http://www.practicalfarmers.org/farmer-knowledge/farminar-archive/getting-cover-crops/>
5. "Managing Cover Crops, Don't Forget the Agronomic Basics." *In partnership with the American Society of Agronomy*. February 4, 2016. 1414 total views. <http://agronomy.peachnewmedia.com/store/seminar/seminar.php?seminar=53828>
6. "So Why Do You Want to Grow Cover Crops?" *In partnership with the American Society of Agronomy*. February 11, 2016. Total views 1497. <http://agronomy.peachnewmedia.com/store/seminar/seminar.php?seminar=53830>
7. "Show Me the Money, Can Cover Crops Pay?" *In partnership with the American Society of Agronomy*. February 18, 2016. 1657 total views. <http://agronomy.peachnewmedia.com/store/seminar/seminar.php?seminar=53831>