

Illinois Report -2017
Midwest Cover Crop Council, Grand Rapids, MI
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Research:

University of Illinois Extension & Crop Sciences

Field-scale drainage research, U of I Dudley Smith Farm, Pana, IL. Comparing current nitrogen and crop management with cover crops and no nitrogen check evaluating their impacts on water quality & crop production. (Pittelkow, Christianson, Bhattarai)

Tillage and Cover Cropping Effects on Soils and Yields. Trial Comparing a rotation of 5 cover crops used in a system approach in a Corn/soybean rotation and in conventional and no-till production (NREC project 2013-3556) (Villamil & Nafziger)

- 1) To develop a comprehensive set of trials to look at effects of cover crops in both on-farm and REC sites,
- 2) To measure the effect of cover crops in scavenging N and sequestering nutrients in their biomass,
- 3) To evaluate the effect of cover crops on commercial crop stands and yields, and on economic returns, and
- 4) To evaluate the effect of tillage on crop and soil responses to cover crops.

Novel Microbial Weed Suppression Mechanisms in Conservation Tillage/Cover-Cropping Systems (NIFA-AFRI). (Yannarell)

- 1) Evaluate potential of pathogenic microbes to selectively suppress weed germination in association with cover crops and green manures;
- 2) Evaluate weed-suppressive effects of arbuscular mycorrhizal fungi; and
- 3) Assess the reliability, magnitude, and synergy of these microbial weed-suppression mechanisms.

Micro-managing soil health: leveraging plant-microbe interactions to improve the effectiveness of cover cropping strategies (Ceres Trust Organic Research Initiative). (Yannarell)

- 1) Identify key microbial players in weed suppression and nitrogen cycling,
- 2) Identify cover crop species that can foster and activate these players,
- 3) Identify critical time windows of optimal soil health that favor crop growth over weeds.

Evaluating Conservation Practices for Nutrient Loss Reduction. (Gentry & David)

Evaluating the impact on cover crops, wood chip bioreactors, in a strip-till/no-till corn – soybean – wheat rotation on nutrient loss through tile drainage.

Cover Crop and Nutrient Management Research/Demonstration fields (Northern Illinois):
(Solomon)

This is part of a 5 year project with a set of cover crop plots (15-17 different species or mixes) following wheat. Fields then go to corn follow by cereal rye ahead of soybeans. Evaluated for soil nutrient and nutrient tie-up, followed by corn and soybean yield.

Late-planted cover crops ahead of soybean production 2013-2017.

November 1 planted cereal rye, triticale, and annual ryegrass treatments influence on yield & SCN populations (Johanning)

Evaluation of legume cover crops in corn production in southern Illinois 2015-17.

Variety trial comparing Fixation Balansa Clover, Frosty Berseem Clover and Kentucky Pride Crimson Clover with Dixie Crimson Clover. Full evaluation of cover crop survivability, performance, and corn yield. (Johanning & Aly)

Southern Illinois University Carbondale - Dr. Karla Gage, Dr. John Schoonover, Dr. Karl Williard

Annual Ryegrass Trials (Gage)

Four varieties: Assist, Cold Snap, Fria, and King were fall planted at 2 locations.

- Glyphosate burndown trial, establishment trial (broadcast in standing crop vs. post-harvest), POST herbicide programs for any escape annual

Cereal Rye Trials (Gage)

- A field scale, replicated, multi-year trial has been established to evaluate the contribution of fall planted cereal rye to suppression of glyphosate-resistant waterhemp in the next year's no-till soybean crop.
- Evaluate the contribution of spring planted cereal rye to suppression of glyphosate-resistant waterhemp in the next year's no-till soybean crop including cover crop termination POST in soybean (living mulch).
- Burndown control of volunteer cereal rye following failed termination the previous year (what happens when your cover crop goes to seed?)

Establishment, Floral Resource, and Weed Suppression of Summer Cover Crops – 2016-2019

Crab Orchard National Wildlife Refuge – Service First Grant – Dept. of Interior.

(Gage, Schoonover, Williard)

- Multiple cover crops evaluated
 - Water Quality
 - Pollinators
 - Weed Suppression

Extension & Outreach

- Many Cover Crop Field Days and programs throughout the state working with many organization including University of Illinois Extension, SIU, ISU, Local SWCD, NRCS, Illinois Stewardship Alliance, American Farmland Trust, IL Council on Best Management Practices (CBMP), SARE.
- Illinois Department of Agriculture hosted there annual Conservation Cropping Seminars held this past January in 3 locations (Rockford, IL, Jacksonville, IL, & Carbondale, IL).
- American Farmland Trust and the Illinois Sustainable Ag Partnership led a joint “Advance Soil Health Training” for Ag professionals across the state through over 15 field days and training programs throughout the state.

Illinois Sustainable Ag Partnership

- Coordination across several organizations – Illinois Central College, Illinois Corn, Zea Mays, American Farmland Trust, Soil Health Partnership
- Cover Crop and Soil Health Training for farmers and advisors
- Research and Demonstration plots – herbicide residual trials, planting date trials, species plots, water quality monitoring
- Network of Cover Crop Specialists across the state
- Illinois specific cover crop management guidance documents and resources

Illinois Cover Crop Training Initiative - 3 year report – Illinois Corn and CBMP funded by National Fish and Wildlife Foundation grant

- Seven regional **Cover Crop Specialists** worked across the state with farmers, ag retailers, agency staff and other farmer advisors searching for advice and information on the use and management of cover crops.
- The Specialists hosted or participated in more than **350 field days, trainings and meeting presentations** on cover crops and soil health reaching more than 15,200 people.
- **Technical information on the use and management of cover crops** was compiled and developed into documents and modules that were distributed through in person presentations, printed materials, an online cover crop resource site, video segments, and radio interviews. Topics include: Getting Started with Cover Crops, Key Management Decisions for Cover Crops, What to Expect When Aerially Seeding Cover Crops, Termination of Cover Crops, Herbicide Considerations When Planning for Cover Crops, Cover Crops and Grazing, and Weed Suppression with Cover Crops. Materials and media are available online at <http://illinoiscbmp.org/Practices/Cover-Crops/> .
- **Cover crop variety plots** across the state provided locations to host field days and serve as a local educational resource for others promoting cover crops
- **Cover crop research plots** included seeding timing and rate trials, herbicide residue trials, weed suppression trials and pest suppression trials.
- Four intensive **water quality monitoring sites** were established to compare the impacts of cover crop and soil health practices at a field scale.

Illinois Corn Cover Crop Seed and Application Cost Share Program – with funding from Walton Family Foundation and Beck’s Hybrids

- More than 90 participants resulting in over 8,000 acres of cover crops being planted in IL in 2016
- 1st-Time Cover Croppers program – a program that arranges aerial application of up to 40 acres of a winter-terminal (low risk) oats/radish cover crop mixture and provides technical assistance
- Experienced Cover Croppers program – a program that offers a discount on an overwintering cover crop mixture for farmers to grow cover crops on the same 40-acre field for multiple years.
- Cover Crop Coupon Program - a discount between \$150 and \$200, redeemable on the purchase of cover crop seed. Buyers must be a member of IL Corn to receive their coupon via mail. This program is a partnership with seven cover crop retailer across the Midwest.

Publications (peer-reviewed/Extension):

Lou, Y., A.S. Davis, and A.C. Yannarell. 2016. Interactions between allelochemicals and the microbial community affect weed suppression following cover crop residue incorporation into soil. *Plant and Soil* 399 (1): 357-371.

“Ten Ways” in this regional Extension publication: <http://go.aces.illinois.edu/TenWays>

Adoption of Cover Crops in Illinois

The combined efforts organizations in Illinois in promoting the use of cover crops, has resulted in a significant increase in the adoption of cover crops by farmers in Illinois.

- According to the Illinois 2016 National Agricultural Statistics Service (NASS) Survey, “total cover crop acres in the state nearly doubled between 2011 and 2015, with a 223% increase in the usage of cover crops on tile-drained ground and a 166% increase on non-tiled ground.”
- Illinois Corn tracks interest in and adoption of cover crops through an annual member survey. The responses of the more than 700 members who completed the survey showed that in 2013, 23% were using cover crops. By 2015, that percentage had increased to 35% and was up to 40% in the latest survey from 2016.

Contributors:

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