

The science of cover crops in Iowa

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Iowa Cover Crop Working Group (ICCWG) is under the leadership of the Iowa Learning Farms program and includes core members from the following agencies and organizations: Practical Farmers of Iowa (PFI), Iowa State University Extension and Outreach (ISUEO), USDA-Agricultural Research Service-National Laboratory for Agriculture and the Environment (USDA-ARS-NLAE), Iowa Department of Agriculture and Land Stewardship (IDALS).

Long-term demonstration of cover crops on Iowa farmland: Management, soil health and water quality benefits

Funded by: State Soil Conservation Committee, IDALS, Leopold Center for Sustainable Agriculture

Time Frame: 2008-2019

The goal of the project is to evaluate the effect of winter cereal rye cover crop on cash crop yields in Iowa using strips to compare plots with and without rye within the same field. The project began with six sites established in 2008, with another six established in 2009. In 2017, five sites completed year 9 of the project and all have agreed to continue to reach ten years.

- The twelve initial sites were in Shelby, Adair, Butler, Greene, Grundy, Guthrie, Ida, Tama, Taylor, Washington (two Farmer Partners) and Webster counties.
- Cereal rye aboveground biomass is sampled at each site near the date of termination and corn/soybean yields is collected each fall.
- Bulk density and total nitrogen, total carbon, organic matter and pH soil samples and infiltration test data were collected in year one and year five.

Earthworms and cover crops: Unlocking the secrets of soil health through early biological indicators

Funded by: USDA-NRCS State Conservation Innovation Grant, Leopold Center for Sustainable Agriculture

Time Frame: Sept 2015 - Sept 2018

A common earthworm found in many Iowa crop fields, the nightcrawler (*Lumbricus terrestris*) is a deep-burrowing earthworm, building large vertical tunnels that can extend 5-6 feet in depth. While an introduced earthworm species and not present in all fields, it has numerous qualities that make it a beneficial biological indicator of soil health in agricultural systems. The goal of this project is to evaluate the presence and abundance of earthworm middens in replicated strip trials with and without cover crops (5 long-term rye on-farm sites, 1 long-term rye research site near Ames).

Demonstrating cover crop mixtures on Iowa farmland: Management, soil health and water quality benefits

Funded by: USDA-NRCS Conservation Innovation Grant, Iowa Learning Farms

Time Frame: Oct 2013-2018

The goal of the project is to evaluate management techniques that will increase growth and improve the overall environmental benefits of cover crops: improving soil health and reducing nutrient losses. The project established replicated plots at six regional farmer association research farms and was expanded in 2014 to include 9 farmer-partner sites to evaluate management of cover crop mixtures. Fall 2017 was the fifth and final year of seeding at four of the regional farmer association research farms (SW, NC, NE, and SE).

- The Association Research plots compare three treatments: no cover crop, single species cover crop, and a mixture cover crop. Each treatment is replicated four times at each site, for a total of 24 plots at each farm. The plots range from six to twelve rows wide and are all 50ft in length.
- The Farmer Partner plots demonstrated two treatments: no cover crop and a mixture cover crop (mixture is determined by the upcoming cash crop). Each treatment is replicated four times at each site, for a total of 8 plots at each farm (8-24 acres).
- Preceding the corn crop, the single species is oats and the mix contains hairy vetch, oats, and radish. Preceding the soybean crop, the single species is rye and the mix contains rapeseed, rye, and radish.
- Suction lysimeters were installed in each plot at five of the Association Farms. Every other week from early April-November pore water samples were collected and analyzed for nitrate concentration.

Evaluating planting techniques for the successful establishment of cover crop mixtures and single species in Iowa

Funded by: USDA-NRCS State of Iowa Conservation Innovation Grant; Leopold Center for Sustainable Agriculture

Time Frame: Oct 2013 - Sept 2016

The goal of the project was to evaluate planting techniques for the successful establishment of cover crop mixtures and single species in Iowa. The project created three two-year demonstration sites to assess different planting techniques in the Des Moines Loess soil region. This project collaborated with Hagie Manufacturing Company to test and evaluate three different seeding practices in on-farm demonstrations: 1) Seed delivered under cash crop canopy; 2) Seed broadcast above cash crop canopy; and 3) Seed soil incorporated after cash crop harvest.

Economic exploration of cover crop benefits to crop and livestock systems

Funded by: State Soil Conservation Committee, IDALS

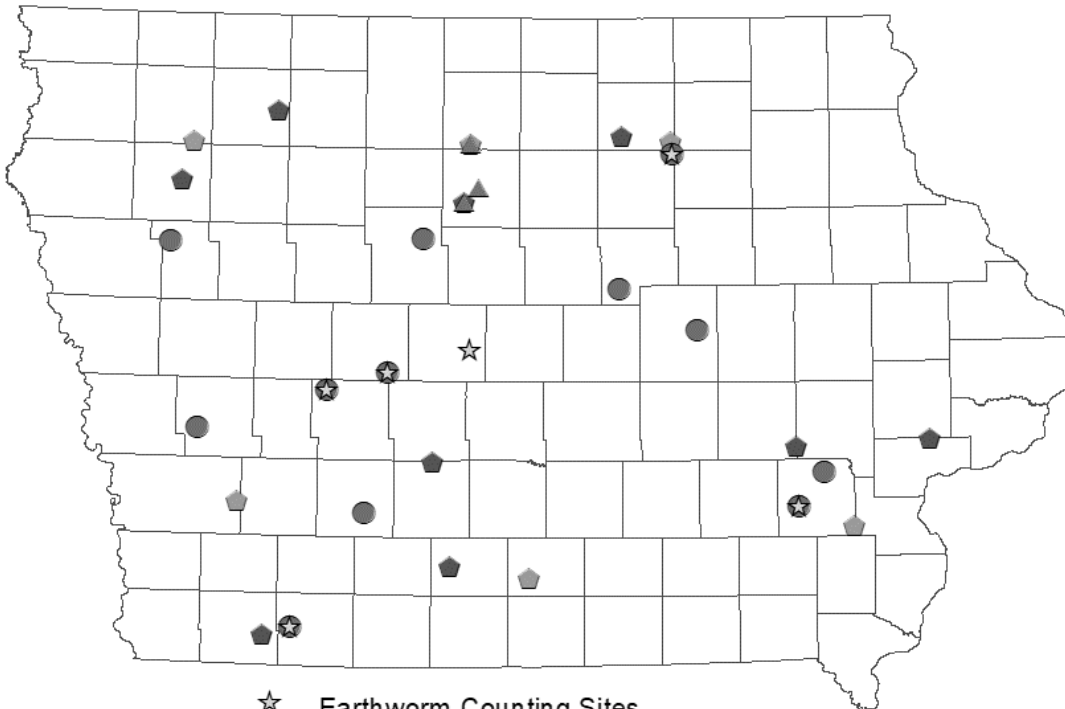
Time Frame: July 2014 - June 2016

The goals of this project were to estimate the economic value of reduced erosion from cover crop use and to evaluate the value of cover crops for grazing and forage in a livestock operation. Cover crop economics often consider just the additional input costs and yield impacts without considering the benefits of

reducing soil and nutrient loss. Livestock producers have the opportunity to gain additional benefits beyond the cropping system through adding additional feed and grazing potential.

Project result publications and additional cover crop resources are available, at field days, workshops, online and mailed by request: <https://www.iowalearningfarms.org/cover-crops>

IOWA COVER CROP WORKING GROUP RESEARCH AND DEMONSTRATION SITES



- ☆ Earthworm Counting Sites
- Long Term Rye Farmer Partners
- ▲ Seeding Techniques Sites
- ⬠ Mixtures Partner Association Farms
- ⬡ Mixtures Farmer Partners