Objective: Determine if the N fertilizer rate for corn can be reduced after several years of repeated cover crop use.

Hypothesis: Owing to repeated use of cover crops over the past 6 years, reducing the N fertilizer rate will maintain corn yields and reduce input costs.

Farmer-Cooperator will:
- Take photos throughout the project and keep in contact with PFI with updates and questions.
- Fall 2018, seed cereal rye cover crop.
- Spring 2019, note height of cover crop at time of termination.
- Plant corn and establish at least 4 replications of treatments as shown in the diagram below.
  - 130 pre + 0 side
    - 130 lb N/ac applied prior to corn planting, no N applied at sidedress
  - 130 pre + 50 side
    - 130 lb N/ac applied prior to corn planting, 50 lb N/ac applied at sidedress
- Strips will be as wide as at least one combine pass and run the length of the field.
- Summer 2019, collect data and observations (see next page for more detail)
  - Take photos of trial progress.
  - June (prior to sidedress N application): collect soil samples for late-spring soil nitrate test from each strip.
  - September (physiological maturity of corn): collect corn stalk samples from each strip in corn field for nitrate analysis.
- Fall 2019, harvest corn from each strip individually.
- Turn in all info and data pertinent to this trial to Practical Farmers of Iowa by the end of the project

Practical Farmers of Iowa will:
- Help set up monitoring protocol, monitor progress of project and provide support when needed.
- Publish results in a PFI research report, on PFI website and potentially other outlets.
- Provide $550 honorarium when yield data is submitted at conclusion of the project in 2019.

Contact: Stefan Gallans, research and field crops director, (515) 232-5661; stefan@practicalfarmers.org
Summer Data Collection Details

*June: Late-Spring Soil Nitrate Test soil sampling (corn is 6-12 in. tall)*

- Collect soil cores to a depth of 12 in.
- One sample per strip.
  - Collect samples in sets of 8 cores.
    - The first core is collected in a corn row.
    - The second is collected 1/8 of the distance between any two rows after moving to another part of the sampling area.
    - The third is collected 1/4 of the distance between any two corn rows after moving to another part of the sampling area.
    - The process is continued until the eighth core is collected 7/8 of the distance between any two corn rows.
  - At least three sets (24 cores) should be collected to comprise one sample.

*September: Cornstalk nitrate testing (after physiological maturity of corn)*

- Consult these resources from Iowa State University for sample collection protocols
  - [Use of the End of Season Corn-Stalk-Nitrate-Test in Iowa Corn Production](https://store.extension.iastate.edu/product/Use-of-the-End-of-Season-Corn-Stalk-Nitrate-Test-in-Iowa-Corn-Production)
  - [End of Season Cornstalk Nitrate Testing Video](https://store.extension.iastate.edu/product/End-of-Season-Cornstalk-Nitrate-Testing-Video)