



**RESEARCH  
 PROTOCOLS**

**Nitrogen Rate for Corn After Repeated  
 Use of Cover Crops**

**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 cornstalk 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

130 pre + 0 side	130 pre + 50 side	130 pre + 0 side	130 pre + 50 side	130 pre + 0 side	130 pre + 50 side	130 pre + 0 side	130 pre + 50 side
REP 1		REP 2		REP 3		REP 4	

**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 Gailans, research and field crops director, (515) 232-5661; [stefan@practicalfarmers.org](mailto: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
  - <https://store.extension.iastate.edu/product/Use-of-the-End-of-Season-Corn-Stalk-Nitrate-Test-in-Iowa-Corn-Production>
  - <https://store.extension.iastate.edu/product/End-of-Season-Cornstalk-Nitrate-Testing-Video>