



**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.

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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>