



RESEARCH PROTOCOLS

Effect of Planting Green on Corn Seedling Disease, Stalk Rot and Yield

Objective: Determine the effect of cereal rye cover crop termination date on corn disease pressure and corn yield. **Hypothesis:** Terminating the cover crop earlier (before planting corn) will reduce corn disease stress and improve corn yields compared to “planting green”: terminating the cover crop after planting corn.

Farmer-cooperator will:

- Agree to conduct trial for two consecutive years beginning Fall 2019 and ending Fall 2021.
- Follow Research Protocols in accordance with Project Design, Data to Collect and Timeline detailed below.
- Allow lab team from ISU (Dr. Alison Robertson, plant pathologist) to collect samples from site as detailed in Data to Collect below.
- Take photos throughout the project. Try to capture photos that depict the differences you observe among the treatments.
- Keep in contact with PFI with updates and questions.
- Turn in data by November 2020 and November 2021.

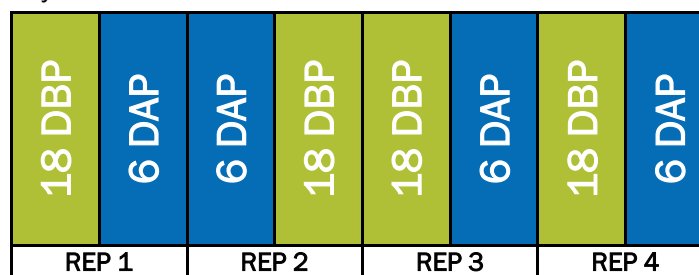
Practical Farmers of Iowa will:

- Help set up research protocol, monitor progress of project and provide support when needed.
- Connect cooperator with Dr. Robertson.
- Publish results in a PFI research report, on PFI website, and potentially other outlets.
- Provide \$550 research honorarium to cooperator upon receipt of data each year.
- Reimburse cooperator up to \$300 for cereal rye seed used in the experiment each year.

Project Design:

Treatment	Description
18 DBP	Terminate cereal rye cover crop 18 days before planting corn (18 DBP).
6 DAP	Terminate cereal rye cover crop 6 days after planting corn (6 DAP).

- Apply these two treatments in a randomized, replicated trial: at least four replications of randomized paired strips. 2 treatments x 4 replications = 8 strips total.
- Strips must be at least as wide as one combine pass and should run the length of the field.
 - Example layout:



Data to Collect (cooperator):

- Cover crop biomass
 - Just prior to each termination date, sample aboveground biomass of cover crop from each strip. This will result in two sampling dates: 4 samples for the first termination date and 4 samples for the second termination date. Send samples to PFI office to be dried and weighed.
- Corn stand counts
 - 3-4 weeks after planting corn, determine and record plant populations from each strip.
- Corn grain yield and moisture
 - Harvest and record grain yield and moisture from each strip.

Data to Collect (ISU – Dr. Alison Robertson’s lab team):

- Corn seedling disease severity, shoot height, shoot weight, radicle length and N content
 - At the V2-V3 corn stage, Dr. Robertson’s team will come to the site to collect samples from each strip.
- Soil temperature
 - Dr. Robertson’s team will install dataloggers in a few strips.
- Corn stalk rot incidence and nitrate concentration
 - At physiological maturity of corn, Dr. Robertson’s team will come to the site to collect samples from each strip.

Project Timeline:

Fall 2019 Fall 2020	Spring 2020 Spring 2021	Summer 2020 Summer 2021	Fall 2020 Fall 2021
<ul style="list-style-type: none"> • Seed cereal rye cover crop in accordance with typical practice. 	<ul style="list-style-type: none"> • Terminate cover crop at two treatment dates. • Collect cover crop biomass samples just prior to each termination date. • Plant corn to all strips on the same date. Apply 30-50 lb N/ac at planting. • Be available to plan a date for Dr. Robertson’s team to collect corn plant samples. • Take photos. 	<ul style="list-style-type: none"> • Conduct corn stand counts from each strip. • Apply balance of N fertilizer program at side-dress. • Be available to plan a date for Dr. Robertson’s team to collect stalk samples. 	<ul style="list-style-type: none"> • Harvest corn from each strip. • Turn in data and photos. • Take post-project survey.

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