**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:**

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>18 DBP</td>
<td>Terminate cereal rye cover crop 18 days before planting corn (18 DBP).</td>
</tr>
<tr>
<td>6 DAP</td>
<td>Terminate cereal rye cover crop 6 days after planting corn (6 DAP).</td>
</tr>
</tbody>
</table>

- 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:

<table>
<thead>
<tr>
<th>Fall 2019</th>
<th>Spring 2020</th>
<th>Summer 2020</th>
<th>Fall 2020</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fall 2020</td>
<td>Spring 2021</td>
<td>Summer 2021</td>
<td>Fall 2021</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Seed cereal rye cover crop in accordance with typical practice.</td>
<td>• Terminate cover crop at two treatment dates.</td>
<td>• Conduct corn stand counts from each strip.</td>
<td>• Harvest corn from each strip.</td>
</tr>
<tr>
<td></td>
<td>• Collect cover crop biomass samples just prior to each termination date.</td>
<td>• Apply balance of N fertilizer program at side-dress.</td>
<td>• Turn in data and photos.</td>
</tr>
<tr>
<td></td>
<td>• Plant corn to all strips on the same date. Apply 30-50 lb N/ac at planting.</td>
<td>• Be available to plan a date for Dr. Robertson’s team to collect stalk samples.</td>
<td>• Take post-project survey.</td>
</tr>
<tr>
<td></td>
<td>• Be available to plan a date for Dr. Robertson’s team to collect corn plant samples.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Take photos.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Contact: Stefan Gailans, Research and Field Crops Director, (515) 232-5661; stefan@practicalfarmers.org

The terms of this Research Protocols document are subject to the terms of the individual Research Cooperator’s Memorandum of Understanding agreement with PFI. To the extent these terms may differ or conflict, the Memorandum of Understanding shall control.