Objective: Determine the effect of seeding a cereal rye companion cover crop just prior to planting soybeans on weed pressure and soybean yield.

Hypothesis: Spring-seeded companion cover crop will reduce weed pressure and but will not reduce soybean yield compared to where no companion cover crop is seeded.

Farmer-Cooperator will:
- Follow Research Protocols in accordance with Project Design, Data to Collect, Photo List and Timeline detailed 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 and complete post-project survey by November 2020.

Practical Farmers of Iowa will:
- Help set up research 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 research honorarium to cooperator upon receipt of data.

Project Design:

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cereal rye</td>
<td>Cereal rye companion cover crop seeded just prior to planting soybeans.</td>
</tr>
<tr>
<td>No-cover</td>
<td>Control. No cover crop seeded.</td>
</tr>
</tbody>
</table>

- Apply these 2 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):
- Weed assessment
  - In late summer, count and record number of weeds in a 3-ft radius at seven random points along a 100-pace transect through the center of each strip.
- Soybean yield
  - Harvest and record grain yield and moisture from each strip.

Photo List (cooperator):
- Rye + soybeans emerging/growing (throughout spring).
  - Close ups of each species.
- Whole experiment
  - Photos depicting multiple strips next to each other.
- Cooperator collecting data.
- Cooperator in field trial.

Project Timeline:

<table>
<thead>
<tr>
<th>Spring</th>
<th>Summer</th>
<th>Fall</th>
</tr>
</thead>
<tbody>
<tr>
<td>Seed companion cover crop just prior to planting soybeans.</td>
<td>Hoe, cultivate all soybeans per usual organic weed control practices.</td>
<td>Harvest soybeans from all strips.</td>
</tr>
<tr>
<td>Plant soybeans to entire field.</td>
<td>This will eliminate rye/wheat companion from interrows but allow companion to remain in soybean rows.</td>
<td>Turn in data.</td>
</tr>
<tr>
<td>Take photos.</td>
<td>Conduct weed assessment.</td>
<td>Take post-project survey.</td>
</tr>
<tr>
<td></td>
<td>Take photos.</td>
<td></td>
</tr>
</tbody>
</table>

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