Objective: Determine which spinach variety provides the best yield and quality, primarily resistance to bolting, during early-season production in Iowa.

Hypothesis: Farao performed well in 2019, and will be the variety we measure against for consistent production and quality.

Farmer-Cooperator will:
- Follow Research Protocols for study
- Take photos throughout the project
- Keep in contact with PFI with updates and questions
- Turn in all data 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 cooperator payment at conclusion of project year.

Project Design:
- Each farm will set up a randomized, replicated trial with four replications of the three varieties.
- Each farm will run two successions of the trial.
- 3 varieties x 4 replications = 12 plots
  - Space, Bloomsdale, Kolibri
  - Some farms are direct seeding; others are transplanting with a paperpot transplanter.

Example layout for one succession:

<table>
<thead>
<tr>
<th>Rep1</th>
<th>Rep2</th>
<th>Rep3</th>
<th>Rep4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Space</td>
<td>Kolibri</td>
<td>Bloomsdale</td>
<td>Space</td>
</tr>
<tr>
<td>Bloomsdale</td>
<td>Space</td>
<td>Kolibri</td>
<td>Bloomsdale</td>
</tr>
<tr>
<td>Kolibri</td>
<td>Bloomsdale</td>
<td>Space</td>
<td>Kolibri</td>
</tr>
</tbody>
</table>

Data to Collect (see excel workbook):
- Harvest should occur early in the morning. Score plot for bolting and flavor. Weigh harvest in field, by plot, prior to washing.
- Loft: Either in the field or in the packing house, score each plot for loft (how well it fills a bag filled to equal weight). Score as “much loft, some loft, or no loft”.
- Record weight and count harvested by plot.
- Take photos of varieties in the field and in the packinghouse.
- See excel workbook on google site for harvest sheets, scoring, and data entry.
**Project Timeline:**

<table>
<thead>
<tr>
<th>Month</th>
<th>Tasks</th>
</tr>
</thead>
</table>
| April | • Review research protocol  
|       | • Complete MOU and pre-project survey  
|       | • ~April 1: Direct seed or transplant Succession 1 to field in randomized trial design.  
|       | • ~April 15: Direct seed or transplant Succession 2 to field in randomized trial design.  
|       | • Take photos: Early-season field-shot of trial |
| June - July | • ~June 1: Begin harvesting spinach; record yield and quality data by plot.  
|          | • Take photos!  
|          |   o Spinach at harvest (in bins, etc)  
|          |   o Representation photos of bolting, other issues, etc.  
|          |   o Farmer harvesting  
|          |   o Farmer measuring or entering data!  
|          | • Enter data and photos to PFI’s google site:  
|          |   [https://sites.google.com/practicalfarmers.org/research/home](https://sites.google.com/practicalfarmers.org/research/home)  
|          | • Complete post-project survey. |

**Contact:** Liz Kolbe, Horticulture and Habitat Programs Manager, (515) 232-5661; [liz@practicalfarmers.org](mailto:liz@practicalfarmers.org)