



**RESEARCH  
 PROTOCOLS**

**Spring Seeded Cereal Rye Cover Crop  
 Seeding Rate for Organic Soybeans**

**Objective:** Determine the effects of different seeding rates of a spring-seeded cereal rye cover crop on weed pressure and soybean performance when the rye is seeded as a companion crop near the date of planting soybeans. **Hypothesis:** Spring-seeding a cereal rye cover crop at a higher rate near the date of planting soybeans will result in greater cover crop biomass, fewer weeds, and similar soybean yields and stand counts compared to seeding at a lower rate.

**Farmer-Cooperator will:**

- ❖ Take photos throughout the project and keep in contact with PFI with updates and questions.
- ❖ **Establish treatments**
  - **Spring 2019**, establish 7 replications of the seeding rate treatments as shown below.
    - **Low rate:** Seed cereal rye cover crop at a rate of 2 million seeds/ac
    - **High rate:** Seed cereal rye cover crop at a rate of 2.5 million seeds/ac
  - Plant soybeans on the same date in all strips. Strips will be as wide as at least one combine pass and run the length of the field.
- ❖ **Take measurements**
  - **Summer 2019**
    - July: Conduct soybean stand counts from each strip (see next page for more detail).
    - Mid to late August: Collect aboveground biomass sampling of weeds and rye cover crop (see next page for more detail).
  - **Fall 2019**
    - Harvest soybeans and document yields from each strip individually using a weigh wagon or yield monitor.
- ❖ Turn in all info and data pertinent to this trial to Practical Farmers of Iowa by the end of the project.

Low rate	High rate												
REP 1		REP 2		REP 3		REP 4		REP 5		REP 6		REP 7	

**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 after all data is submitted at conclusion of the project in 2019.

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## Summer Data Collection Details

*July: Conduct soybean stand counts in each strip*

- Take stand counts from 3 random locations in each strip.
  - Count and record number of plants from within 1/1000 of an acre:

Row-width	Length of row to count from
30 in.	17 ft, 5 in.
15 in.	34 ft, 10 in.
10 in.	52 ft, 3 in.
7.5 in.	69 ft, 8 in.

- For narrow, drilled rows, consider using the hula hoop method.
  - Randomly toss hoop into strip and count the number of plants inside the circle.
  - Note diameter of hoop.

For more info, consult this website:

<https://fyi.extension.wisc.edu/discoveryfarms/2010/05/taking-a-stand-count/>

*Mid to late August: Collect aboveground biomass samples of cover crop & weeds in each strip*

- Randomly place 30-in. x 15-in. PVC square in the strip and center such that 1 soybean row and 4 cereal rye rows are included in the square.
  - Use shears to clip all aboveground, non-soybean plant material from within the square and place into a paper bag.
- Repeat the first step 2 more times for a total of 3 samples per strip. All samples from a single strip may be placed into the same bag (e.g., one paper bag per strip).
- Label paper bags with:
  - Rep & treatment (e.g. Rep 1 – Low, Rep 1 – High)
  - Number of quadrats in a bag (e.g., 2 quadrats)
  - Date of collection
  - Name
- Send paper bags to PFI office where samples will be separated into weed and cover crop biomass, then dried and weighed.