



**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	Low rate	High rate	Low rate	High rate	Low rate	High rate	Low rate	High rate	Low rate	High rate	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.