PRACTICAL farmers of Iowa
working together, always learning

Field Crops Research Protocols

Cereal Rye Cover Crop Seeding Date and Rate Comparison

Objective: Determine the effect of the seeding date and seeding rate of a cereal rye cover crop on groundcover, biomass production, soil health and corn yield.

Farmer-cooperator will:

- Take photos throughout the project and keep in contact with PFI with updates and questions.

Establish treatments

- **Fall 2018**: Drill-seed cereal rye cover crop into soybean residue on two separate dates (directly following soybean harvest vs. 10-14 days after harvest) and at two separate rates (28 vs. 55 lb/ac). ***See diagram below for experimental design and how to arrange treatments in the field.***
    - This design results in 4 replications of 4 possible date x rate combinations:
        - Early seeding (~Oct. 15) x 28 lb/ac
        - Early seeding (~Oct. 15) x 55 lb/ac
        - Late seeding (~Nov. 5) x 28 lb/ac
        - Late seeding (~Nov. 5) x 55 lb/ac
    - Strips will be as wide as at least one combine pass and run the length of the field.

28 lb/ac	55 lb/ac	55 lb/ac	28 lb/ac	28 lb/ac	55 lb/ac	28 lb/ac	55 lb/ac	55 lb/ac	28 lb/ac	55 lb/ac	28 lb/ac	28 lb/ac	55 lb/ac	28 lb/ac	55 lb/ac
~Nov. 5		~Oct. 15		~Oct. 15		~Nov. 5		~Nov. 5		~Oct. 15		~Oct. 15		~Nov. 5	
REP 1				REP 2				REP 3				REP 4			

Measurements

- **Fall 2018:** Assess cover crop groundcover just prior to hard freeze and onset of winter dormancy.
    - At three random locations within each treatment strip: lay a 16-ft length of tape measure diagonally across drilled rows of cereal rye. At every 6-in. interval, note whether there is a green plant beneath the tape (1) or not (0). This will result in 32, 1/0 readings. Summing up the 1s and dividing by 32 results in an estimate of % groundcover.
- **Spring 2019:** Sample aboveground biomass of cover crop just prior to termination.
    - At three random locations within each treatment strip: clip cover crop shoot material at soil level from a 0.25-m^2 PVC square. Samples will be dried and weighed before being sent to a lab for C and N analysis.
- **Spring 2019:** Corn seedling disease assessment in May/June.
    - This will be conducted at select locations by Dr. Alison Robertson, ISU Plant Pathology.

Measurements, cont.

- **Spring 2019:** Soil health assessment in late May or early June prior to any side-dress N application.
    - Collect 10 soil cores to a 6-in. depth from each treatment strip to make for one representative soil sample from each strip. Samples will be sent to AgSource Labs in Ellsworth, IA for the Solvita test (CO2-C flush following rewetting of dried soil) and Haney test soil health score.
- **Summer 2019:** Corn stalk disease assessment at maturity.
    - This will be conducted at select locations by Dr. Alison Robertson, ISU Plant Pathology.
- **Fall 2019:** Corn yields.
    - Farmers will harvest each treatment strip individually to determine grain yield and moisture. This can be accomplished with a weigh wagon or on-board yield monitor.
- Turn in all data to Practical Farmers of Iowa at the end of the year.

Practical Farmers of Iowa will:

- Help set up monitoring protocol, monitor progress of project and provide support when needed.
- Coordinate procurement of cereal rye cover crop seed in order to ensure a similar variety is used across farms for this multi-site project.
    - ***To be decided***: Purchase up to $310 worth of cereal rye seed OR reimburse farmer-cooperator up to $310 for cereal rye seed purchased for use in this project.
- Publish results in a PFI research report, on PFI website, and potentially other outlets.
- Provide $550 research honorarium to cooperator upon receipt of all data collected.

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