

### Sheep Grazing Cover Crop for Better Brassica Yield

#### Objectives:

1. Determine if grazing sheep on a cover crop prior to a brassica crop affects yield, compared to brassicas following an un-grazed cover crop.
2. Compare soil carbon and nitrogen in the grazed and un-grazed plots.

#### 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 October 2018

#### 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.*
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#### RESEARCH PROTOCOL

#### Example Plot Layout

Rep 1		Rep 2		Rep 3	
Brassica	Brassica	Brassica	Brassica	Brassica	Brassica
Cover	Cover + Graze	Cover + Graze	Cover	Cover	Cover + Graze

#### Field Layout:

- treatment plot lengths will be determined by fencing and space available.
- Three replications are preferred.
- Sheep must be off the field 90 days prior to crop harvest.

#### Soil Sampling:

Soil samples will be taken **4 times** during the project, from each plot (see Timeline).

For each sampling period, each plot has it's own soil sample bag. You should submit 6 bags for at each sampling period. Take soil cores to a 6-inch depth in each plot and aggregate the cores in the plot's bag to provide a representative soil sample that fills the bag to the "fill to this line" line. (When brassica are present, take soil samples within the row.) LABEL BAGS CLEARLY.

**Log into the Midwest Laboratories website and click "Submit Sample". "Sample Type" is "Agriculture" and "Soil". On the next page, select "S1AN Soil Testing Package" from the Blue "Soil Packages" drop-down. Don't order any individual tests. Do fill out all the information.** This test will

provide: (Organic Matter, Available Phosphorus (P1 Weak Bray and P2 Strong Bray), Exchangeable Potassium, Magnesium, Calcium and Hydrogen, Soil pH, Buffer Index, Cation Exchange Capacity, Percent Base Saturation of Cation Elements plus carryover Nitrogen as Nitrate).

**Mail the soil samples to Midwest Laboratories: 13611 B St. Omaha, NE, 68144.** These samples aren't as sensitive as plant material (obviously), but please send them promptly after taking them (within a couple days).

### **Timeline:**

#### March/April 2018:

- Take soil samples and send to lab for analysis;
- Plant cover crop

#### May 2018:

- Prior to grazing, take a biomass sample of the cover crop (3 quadrats per plot in a paper sack. Mail to PFI office for drying and weighing (or hand-off at field day).
- Graze sheep in treatment plots. Sheep must be moved around control plots; not through!

#### Late summer 2018:

- Take another biomass sample (3 quadrats/plot in 1 paper bag).
- Terminate cover crop.
- Take soil samples and send the lab for analysis. Do not include plant material in the soil sample.
- Transplant brassica crop to treatment and control plots.

#### September 2018:

- Take soil samples and send to lab for analysis. LET'S THINK ABOUT IF THIS MAKES SENSE HERE... we could only sample 3 times...

#### October/November 2018:

- Harvest brassica crop and record data. Turn in data to PFI.
- Take soil samples and send to lab for analysis.

### **Transplanting and In-field practices:**

Each farmer can decide their own in field practices, but should record what was done and when. Practices should be consistent for both varieties and all plots.

### **Harvest and Data Collection:**

- See **excel workbook** for pick sheets and data collection required for cover crop, grazing, and brassica crop.
- Harvest **brassica crop** from plots as mature. **Record weight and count** by plot.

### **Take photos of sheep grazing cover and brassica crop in the field.**

### **Data Analysis**

Data analysis will be done at PFI by Liz Kolbe and presented in a Research Report at the Cooperators' Meeting.