



# Do you grow soybeans? Are you interested in soil health?

**Introduction:** A great deal of research has been conducted on soil health including some recent work by UW Bean Team member, [Lindsay Malone](#). Our goal is to build off this research by focusing on cover crops and their relationship with soil health. For this project, soil samples that you collect and ship to us will be analyzed using three soil health measures that center on soil carbon and nitrogen stocks: total organic carbon (TOC), mineralizable carbon (Min C), and autoclave citrate extractable nitrogen (ACE-N). These measurements are relatively inexpensive and can be performed on dried soil samples. **Even if you don't utilize cover crops, you can still participate in this study as we're interested in data from all different types of soybean fields for our analysis.** For your efforts, you'll receive the results from your soil samples, and we'll discuss the meaning of the results generated from the entire dataset.

**Objective:** Connect the use of cover crops to three soil health measurements and soybean yield.

### What we need from you:

- Collect soil samples from up to 4 of your 2024 soybean fields and ship them back to us from your local post office (shipping with be prepaid).
- Fill out a 1-page survey form on the management history of each field.
- Report 2024 soybean yields from sampled fields.

### What you will receive:

- A sampling kit with detailed instructions and materials to collect soil samples and ship them back to us from your local post office (shipping with be prepaid).
- Confidentiality of your data.
- Extension materials from all the data generated for this study, which will help growers make informed decisions about soil health management on their farm.

Soil Health Measurement	Biological Relevance
Total organic carbon (TOC)	<ul style="list-style-type: none"> <li>• Carbon stored in soil organic matter (SOM).</li> <li>• The main source of energy for soil microbes.</li> </ul>
Mineralizable carbon (Min C)	<ul style="list-style-type: none"> <li>• Measure of active soil carbon pool.</li> <li>• Short-term soil organic carbon pool.</li> </ul>
Autoclave citrate extractable nitrogen (ACE-N)	<ul style="list-style-type: none"> <li>• Nitrogen present in proteins.</li> <li>• Measure of organically bound nitrogen pool.</li> </ul>

**We are recruiting growers with a variety of management practices from all over Wisconsin!  
Reach out for more information or to enroll in the study for 2024.**

Contact Mark Kendall  
Email: [mark.kendall@wisc.edu](mailto:mark.kendall@wisc.edu)  
Phone: 608-574-5972

Sampling instructions and the survey that will come with each sampling kit are shown below for your reference.

Funding provided by the soybean checkoff through the Wisconsin Soybean Marketing Board





## Thank you for participating in our “Cover Cropping in Soybean” study!

Please contact Mark Kendall at 608-574-5972 or [mark.kendall@wisc.edu](mailto:mark.kendall@wisc.edu) with any questions.

### Field selection:

- The purpose of this study is to measure the effects of cover crops on soybean yield and common soil health tests.
- Choose up to 4 fields that will be planted to soybean in 2024.
- Please sample fields that you have at least 5 years of previous management history.
- Here are the criteria that we will use to separate the fields:
  - No cover crops (or none in the last 5 years)
  - Short-term cover crop usage (any time in the last 1-4 years)
  - Long-term cover crop usage (5 consecutive years or more)
- You do not need to follow these cover cropping categories when you are selecting fields (examples: all 4 of the fields that you submit have no cover crop history or two fields have no cover crop history, and 2 fields have long term cover crop history).
- Perennial crops like alfalfa and overwintering cash crops like winter wheat should be considered in the cover crop categories for this study.

Example crop rotations in the long-term cover crop usage category:

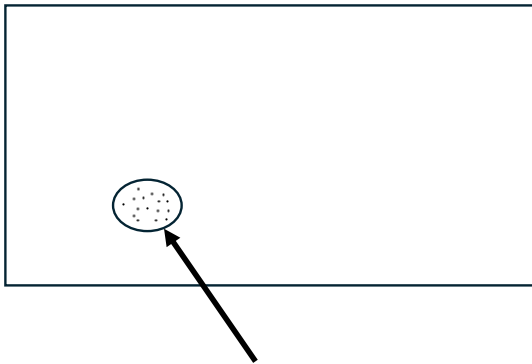
	2019		2020		2021		2022		2023		2024
#1	Wheat	CC	Corn	CC	Soybean		Wheat	CC	Corn	CC	Soybean
#2	Alfalfa		Alfalfa		Alfalfa		Corn silage	CC	Corn silage	CC	Soybean

CC=cover crop

### Collecting samples:

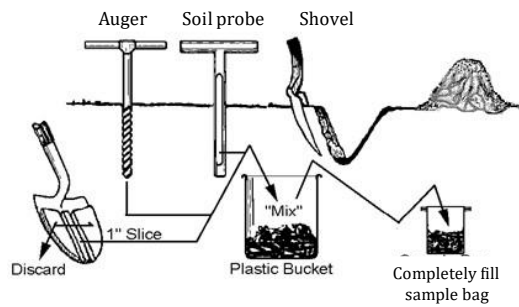
- Collect samples between arrival of this kit and June 1<sup>st</sup>.
- Select a small area within each field that is representative of the field, away from the headlands (Fig. 1).
- Label each sample bag with the field ID and the GPS coordinates from the sample location. To get GPS coordinates, drop a pin at your location in a smartphone maps app.
- Take samples at the 0-6 inch soil depth. Fill the bag with soil (about 20 cores with a 1/2 inch diameter probe). If you don't have a soil probe, use a shovel or trowel (Fig. 2).
- Keep the soil samples cool but **NOT** frozen.
- Ship them to us ASAP from your local post office, using the prepaid USPS box and shipping label included.

Fig. 1- Sampling a field



Choose a small area to sample away from the headlands that is representative of the field

Fig. 2- Methods for soil sampling



Included in this packet are field history surveys for each of the four fields (if you choose to sample four fields). Please fill out as much of this information as you are able. If you cannot answer a question at this time (like soybean yield), I will contact you after harvest to gather the information. Yield maps are not required; an average field yield will be sufficient. If history for multiple fields is identical, feel free to note that at the top of the sheet under field ID instead of filling out multiple forms completely. If you would prefer to fill out this form electronically, let Mark know and he will email the survey to you. Please make sure that the field ID and GPS coordinates are on each bag and survey form.

Reach out to Mark Kendall at 608-574-5972 or [mark.kendall@wisc.edu](mailto:mark.kendall@wisc.edu) with any questions or concerns. If you do not have time to complete the forms before sending us the soil samples, forms can be mailed to:

UW Bean Team  
 C/O Mark Kendall  
 N695 Hopkins Rd.  
 Arlington, WI 53911

**Thank you for your time and participation!**



Field ID:

GPS Coordinates Lat:

Long:

**2024 Soybean Management (Mark will contact you in fall for unknown information)**

Planting date:

Row spacing:

Variety:

Tillage:

Fertilizer(s):

Herbicide passes (circle all that apply):  PRE  POST  2<sup>nd</sup> POST

Yield (bu/ac):

**Historical field management:**

Crop rotation:					
	2019	2020	2021	2022	2023

How do you terminate cover crops/perennial crops? (check all that apply)

Herbicide  Winterkill  Roller crimper  Tillage  Other \_\_\_\_\_

When do you typically terminate overwintering cover crops?

Early in spring  At or close to planting  After planting (green plant)

Tile drainage in field:  yes  no

**Cover crops (includes overwintering crops like wheat & alfalfa)- check one box**

- No cover crops in the last 5 years (or never).
- Cover crops at least once in the last 5 years.
- At least 5 consecutive years of cover crops.

**Cover crop species-** check all that apply for the last 5 years

- Grass cover crops alone (example: rye, wheat, oats, barley)
- Legume cover crops alone (example: clover, alfalfa)
- Brassica cover crops alone (example: radish, turnip)
- Mixtures

**Tillage-** check all that apply for the last 5 years

- No-till
- Minimum till (strip till, vertical till)
- Conventional till (field cultivator, chisel plow, moldboard plow, speed till, disk)

**Manure**

- No manure in the last 5 years
- Manure at least once in last 5 years (check all that apply for the last 5 years)

Species:  Dairy  Beef  Swine  Sheep

Other \_\_\_\_\_

Type:  Liquid  Solid

**Residue management-** last 5 years

- I don't remove previous crop residue.
- I have removed or harvested previous crop residue at least once in the last 5 years.