

Default Question Block

Thank you for your interest in improving your farm's soil health through changes in management practices and strategies.

This evaluation tool will help you understand your strengths and weaknesses as a soil health manager. When you've finished, you will receive a personalized report that will show you how your management compares to national and local soil health superstars [pilot tool: this feature is still under development].

Questions are separated into 14 categories. Each category will be scored separately, and a total weighted score will also be calculated.

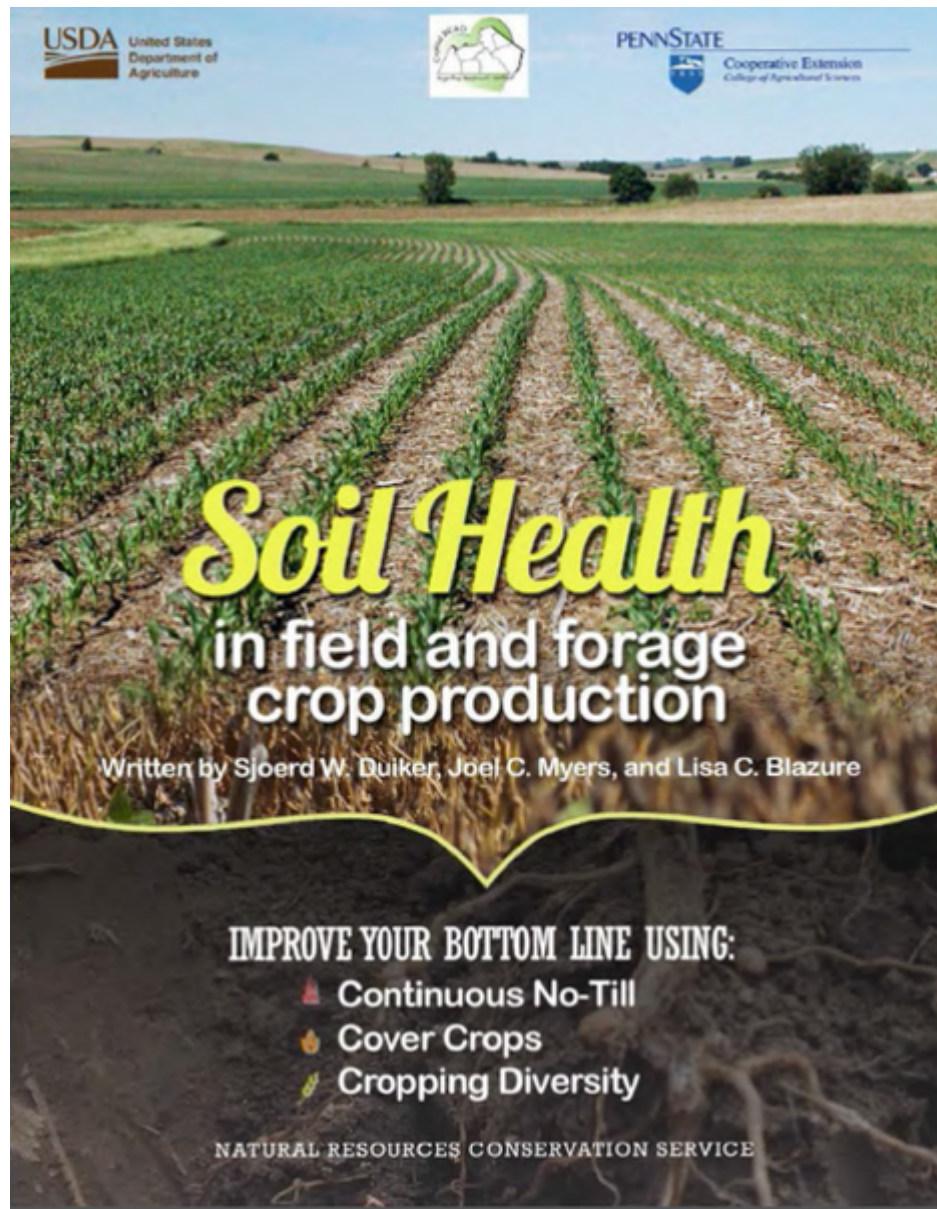
When answering these questions, keep in mind a set of fields that are managed similarly. You may need to answer the survey more than once if you have fields with significantly different management regimes.

Note that these questions all ask about your *practices* as a farmer. They do not evaluate actual *soil health condition*. Other tools are available to help you estimate your fields' soil health.

Your responses are anonymous. Collected data will be stripped of any personal identifying information, aggregated, and may be used in reports or publications.

The content of this tool is heavily based on the publication, "Soil Health in field and forage crop production," by Sjoerd Duiker, Joel C. Myers, and

Lisa C. Blazure. The project team also includes Nevin Dawson and Travis Martin.



Please choose the most appropriate response.

- ☐ I am a farmer using this tool for the first time
- ☐ I am a farmer and used this tool before but did not complete it
- ☐ I am a farmer and have completed this tool before
- ☐ I am not a farmer

Tillage practices

Continuous no-till is the planting of all crops without the use of any prior tillage. Soil health is like the hub of a wheel, while continuous no-till is the rim.



How often is the field tilled?

- ☐ Continuous no-till
- ☐ Once every 5-8 years
- ☐ Once every 3-4 years
- ☐ Every other year
- ☐ Every year

What depth is your tillage?

Shallow											Deep	
0	2	3	5	6	8	10	11	13	14	16		

Tillage depth in inches

What is your level of soil disturbance? Examples are listed below.

None		Vertical tillage				Straight shank chisel plow/disk				Moldboard plow	
0	10	20	30	40	50	60	70	80	90	100	

Surface Disturbance percentage

Spoke 1: Diversify Crop Rotations

Crop rotation is the 'repetitive growing of an ordered succession of crops on the same land over multiple years.' The most important reason diverse crop rotations are important is that yields improve.

How many primary crops are included in a single rotation?

- ☐ 1 crop
- ☐ 2 crops
- ☐ 3 crops
- ☐ 4 crops
- ☐ 5 crops
- ☐ 6 crops
- ☐ More than 6 crops

Are perennials included in your rotation?

- ☐ Yes
- ☐ No

Are any of your primary crops legumes?

- ☐ Yes
- ☐ No

Spoke 2: Plant Cover Crops

Primarily grown for noncommercial purposes at times when soil would otherwise be without living vegetation, cover crops are used to provide soil erosion protection; absorb, retain, and recycle nutrients; fix atmospheric nitrogen; provide weed control; and provide forage,

How often do you currently plant cover crops?

- ☐ Every year
- ☐ Every other year
- ☐ Every three years or more
- ☐ Never

How do you establish your cover crops?

- ☐ Drill or interseeder
- ☐ Broadcast with incorporation or manure
- ☐ Highboy with drop tubes
- ☐ Broadcast or aerial without incorporation

Spoke 3: Diversify Cover Crops

The third spoke is cover crop diversity. Mixing different cover crops and planting them together allows better use of water, light, and nutrients, often resulting in greater biomass production and better resource utilization.

No questions are displayed for Spoke 3 because you indicated that you do not plant cover crops.

How many species of cover crops do you plant in a field at the same time?

☐ One cover crop species



☐



2-3 cover crop species

☐

4 or more cover crop species



Are both grass and broadleaf species included in your typical cover crop mixes?

☐

Yes

☐

No

Spoke 4: Maximize Living Roots and Spoke 5: Grow Living Plants

Roots nourish microbes by providing a food source or by releasing nutritious compounds into the soil. It is estimated that plants release from 10-40 percent of the carbon fixed by photosynthesis through the roots. This carbon increases soil organic matter. Living plants harvest sunlight and fix carbon dioxide from the air, producing different carbohydrates, and release oxygen. The carbohydrates are used to make plant cells and tissue. Because plants stand at the foundation of the soil food web, providing the energy source for most living organisms that cannot capture sun light, it is beneficial to have them growing in the field continually to keep the soil food web active.

No questions are displayed for Spokes 4 and 5 because you indicated that you do not plant cover crops.

How many weeks are there between fall harvest and winter cover crop planting?

- ☐ Less than 1 week
- ☐ 1-2 weeks
- ☐ 3-4 weeks
- ☐ More than 4 weeks

How many weeks are there between cover crop termination and spring planting?

- ☐ Less than 1 week
- ☐ 1-2 weeks
- ☐ 3-4 weeks
- ☐ More than 4 weeks

Spoke 6: Manage Carbon

Carbon in the soil is of particular interest because it has such a profound effect on soil health. A soil with high organic matter content is a good indicator of soil productivity. It is important to have living roots in the soil year-round and return organic materials such as crop residues and manure to the soil. It is also important to limit soil disturbance because research has shown that large amounts of carbon dioxide are released when the soil is disturbed. The greater the volume of soil disturbed, the greater the carbon lost from the soil.

How does your current average soil organic matter percentage compare to what it was five years ago?

- ☐ Decreased or unknown
- ☐ Stayed the same
- ☐ Increased more than 0.25%
- ☐ Increased more than 0.50%
- ☐ Increased more than 0.75%
- ☐ Increased more than 1.00%
- ☐ Increased more than 1.25%
- ☐ Increased more than 1.50%
- ☐ Increased more than 1.75%
- ☐ Increased more than 2.00%

Do you add any of the following sources of organic matter? If you add more than one source, select the topmost applicable option from the list below.

- ☐ Solid manure (stacks like solid; not poultry)
- ☐ Compost
- ☐ Slurry manure (contains particles)
- ☐ Poultry manure
- ☐ Liquid manure (no particles)

☐ Other

☐ No

Do you remove primary crop residue from the field?

☐ Always

☐ Most of the time

☐ About half the time

☐ Sometimes

☐ Never

Spoke 7: Use Interseeding

Interseeding, sometimes referred to as 'relay cropping', is the establishment of a (cover) crop in a primary crop that is already growing.

Do you interseed cover crops?

☐ Yes, interseeder

☐ Yes, aerial or broadcast

☐ No

Do you interseed annuals into perennial forages?

☐ Yes

☐ No

Spoke 8: Plant Green

This practice refers to no-till planting primary crops into actively growing cover crops. This practice can be used when planting a crop such as corn or soybeans into a cover crop. It contrasts with planting into a cover crop that was killed one or two weeks before planting. Research has

shown that by planting green, cover crop biomass can easily be doubled because cover crop growth is at its peak.

Do you plant into living cover crops?

- ☐ Always
- ☐ Most of the time
- ☐ About half the time
- ☐ Sometimes
- ☐ Never

Spoke 9: Enhance Soil Armor

Soil armor may be broken down into two separate categories. First is passive armor; this is the dead plant residue that remains on the soil surface following crop harvest or crop termination. Second is active armor; typically represented by an actively growing economic or cover crop. Maximizing soil armor will weatherize cropping systems against the effects of drought, excess rainfall, and extremes in temperature. Maximizing soil armor is accomplished by leaving all crop residue remaining after grain harvest. The residue needs to be either left standing or be spread evenly over the surface of the field for success.

What is the percent residue remaining after planting?

- ☐ Less than 10%
- ☐ 10 - 30%
- ☐ 31 - 60%
- ☐ More than 60%

Is the residue spread evenly over the field?

- ☐ Yes

☐ No

Spoke 10: Manage Nutrients

Adequate soil fertility is important to manage soil health for optimal crop production and environmental protection. Both nutrient excesses and nutrient deficiencies can have a negative impact on soil microbes and in turn on plant health and crop yield.

Do you routinely test your soil (once every three years)?

☐ Yes

☐ No

Do you implement the soil test recommendations?

☐ Most of the time

☐ About half the time

☐ Rarely

Do you have a written plan for managing nutrients?

☐ Yes

☐ No

Does your field have excessive phosphorus levels?

☐ Yes

☐ No

Do you apply less fertilizer nitrogen after a legume or when using manure?

☐ Yes

☐ No

Spoke 11: Manage Manure

Manure is a good source of nutrients, organic matter, and microbes. Nutrients applied to living plants are less likely to leave the field. Manure may be applied just prior to cover crop establishment.

Do you use manure on your field?

☐ Yes

☐ No

Do you follow manure application rates as recommended by your manure or nutrient management plan?

☐ Most of the time

☐ About half the time

☐ Rarely

How often is manure applied to the field?

☐ Once or twice a year

☐ Once every 2-3 years

☐ Every 4 years or more

When you apply manure, how often is it on a perennial forage or growing cover crop?

☐ Regularly

☐ About half the time

☐ Rarely

Spoke 12: Manage Pests

Managing pests is a challenging part of continuous no-till systems. Crop diversity and soil health improvement increases the number of beneficial organisms and helps keep pests in check. Insecticides commonly used in crop and forage production can also harm populations of natural enemies.

Do you use pesticides?

- ☐ Yes
- ☐ No

Do you use scouting and thresholds to determine when and if to apply insecticides?

- ☐ Yes
- ☐ No

Spoke 13: Avoid Compaction

One of the great benefits of using continuous no-till is that the soil supports weight better and is less sensitive to compaction. This is due to high organic matter content near the soil surface, high microbial and earthworm activity, and a firm soil matrix that is perforated by biopores for water infiltration and percolation, gaseous exchange, and habitat provision for soil organisms and roots.

Do you avoid operating equipment when soil moisture conditions are too wet?

- ☐ Always
- ☐ Sometimes
- ☐ Rarely

Do you use flotation tires at **recommended** low pressures on your heavy equipment (for example, tractors, grain carts, and manure spreaders)?

- ☐ Yes
- ☐ No

Do you choose cover crop species based on specific field compaction problems?

- ☐ Always
- ☐ Sometimes
- ☐ Rarely

Spoke 14: Integrate Crops and Livestock

The trend in agriculture has been to separate crop and livestock production. Farmers who include animals as part of the farm operation are more likely to adopt cover crops for manure and compaction management, and as a possible feed for ruminant animals. Further, manure from ruminant animals is a great soil amendment to improve soil health in cropland. More intensive crop rotations are possible with livestock on the farm because crops can be grazed or harvested early for green chop, silage, or hay.

Do you graze livestock on your cropland or forage fields?

- ☐ Yes
- ☐ No

What is your level of grazing management?

- ☐ Rotational or mob grazing
- ☐ Continuous grazing

Do you avoid grazing cropland when it's wet?

- ☐ Always
- ☐ Sometimes
- ☐ Rarely

Report

An overall score has been calculated as well as individual scores for your tillage practices and each of the 14 soil health spokes. Remember that this is a subjective rating only intended to show you areas for improvement. More interpretation and recommendations will be added in later versions of the tool.

Note that these scores will be lost once you leave this page. Please print this page to save these scores for your records.

Tillage
10 / 10 points

Spoke 1: Diversify Crop Rotations
0 / 10 points

Spoke 2: Plant Cover Crops
0 / 10 points

Spoke 3: Diversify Cover Crops
0 / 10 points

Spoke 4: Maximize Living Roots/Spoke 5: Grow Living Plants
0 / 10 points

Spoke 6: Manage Carbon

0 / 10 points

Spoke 7: Use Interseeding

0 / 10 points

Spoke 8: Plant Green

0 / 10 points

Spoke 9: Enhance Soil Armor

0 / 10 points

Spoke 10: Manage Nutrients

0 / 10

Spoke 11: Manage Manure

0 / 10

Spoke 12: Manage Pests

0 / 10

Spoke 13: Avoid Compaction

0 / 10

Spoke 14: Integrate Crops and Livestock

0 / 10 points

Overall Score

7 / 100

This is a pilot version of the tool. The project team values your feedback, and will use it to improve the tool as we prepare to release the final version widely. Please let us know your thoughts below. Thank you for your help!

How helpful is this tool in evaluating your level of management for soil health?

- ☐ Very helpful
- ☐ Somewhat helpful
- ☐ Neither helpful nor unhelpful
- ☐ Unhelpful
- ☐ Very unhelpful

How much time did it take you to complete this tool?

- ☐ Too much
- ☐ Just right
- ☐ I was willing to spend more time

How would you feel about entering the following data as part of the tool?

	No problem	Reluctant	Only if it's required	Would not enter
Crops/livestock	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Acreage	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Years farming	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Soil health training received	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Location: county, state	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Location: farm address	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Phone number	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Email address	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Age	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Gender	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Race and ethnicity	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

How likely are you to use this tool again in the future, for example, 1-3 years from now?

- ☐ Very likely
- ☐ Somewhat likely
- ☐ Not sure

- ☐ Unlikely
- ☐ Very unlikely

How likely are you to recommend this tool to another farmer?

- ☐ Very likely
- ☐ Somewhat likely
- ☐ Not sure
- ☐ Unlikely
- ☐ Very unlikely

Please share any thoughts, comments, or recommendations.

Optional: enter your email address to receive updates about this tool and other soil health programs. It will not be sold or shared.

Thank you for your input! Please look for announcements about updated versions of this tool in early 2018. Clicking the ">>" button below will generate a report of your responses.