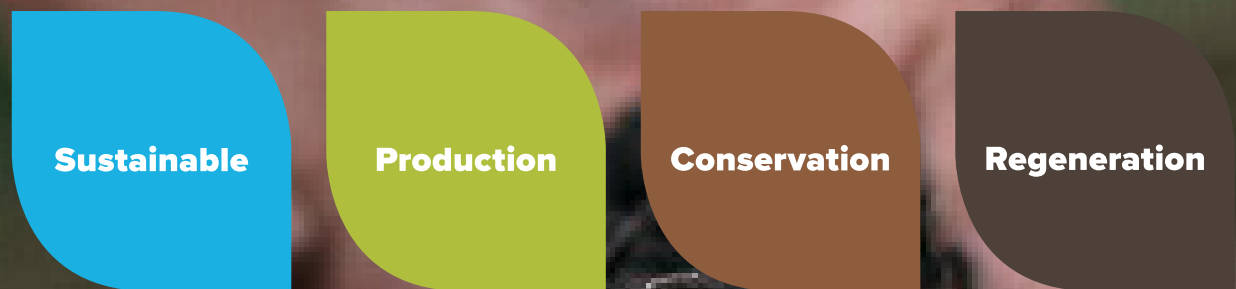




**Promoting Improved Soil Health**  
[sdsoilhealthcoalition.org](http://sdsoilhealthcoalition.org)



South Dakota  
Soil Health Coalition

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Images and Information courtesy of USDA-NRCS SD,  
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## The Five Principles Of Soil Health



**Soil Cover:** *Keep plant residues on the soil surface.*

Look down, what percentage of your soil is protected by residue? Erosion needs to be minimized before you can start building soil health.



**Limited Disturbance:** *Minimize tillage as much as possible.*

You will start building soil aggregates, pore spaces, soil biology, and organic matter.



**Living Roots:** *Keep plants growing throughout the year to feed the soil.*

Cover crops can add carbon to the soil, provide a great food source for micro-organisms. Start small to find the best fit for your operation.



**Diversity:** *Diversify as much as possible with 3 or more crops and cover crops whenever possible.*

Try to mimic nature by including cool and warm season grasses and broad leaf plants. Three or more crops in rotation benefits the soil food web, improves infiltration, nutrient cycling, reduces disease and pests, and aids in weed suppression.



**Integrating Livestock:**

Fall/winter grazing of cover crops increases livestock's plane of nutrition at a time when pasture forage quality can be low, increases the soil biological activity on the cropland, and improves nutrient cycling. Proper grassland management improves soil health.

## Soil Health Benefits

Builds organic matter which retains and cycles nitrogen and sequesters carbon; which in turn reduces fertilizer and fuel costs.

Stabilizes soil aggregates which improves resistance to erosion by wind and water.

Improves water infiltration and retention which helps to better manage the effects of flood or drought and improves trafficability on cropland fields.

Enhances wildlife habitat and balances the biological community above and below ground.

Healthy soils filter and clean water that moves through it, for improved water quality.

### South Dakota Soil Health Coalition Membership Form

Name: \_\_\_\_\_ Business/Operation Name: \_\_\_\_\_

Address: \_\_\_\_\_ City: \_\_\_\_\_ State: \_\_\_\_\_ Zip: \_\_\_\_\_

Phone: \_\_\_\_\_ Fax: \_\_\_\_\_

Email: \_\_\_\_\_ Website: \_\_\_\_\_

1-year membership \$25 \_\_\_\_\_ Please make checks payable to South Dakota Soil Health Coalition  
Preferred Method of Correspondence: \_\_\_\_\_  
\_\_\_\_\_ Paper Copy \_\_\_\_\_ Electronic Copy

Mail To: South Dakota Soil Health Coalition  
43968 139th Street | Webster, SD 57274  
Privacy Statement: The SD Soil Health Coalition does not share contact information with other entities.





## What Kind Of Soil Do You Want?

Soils consist of four important components: water, mineral solids, air, and organic matter. Having a complete understanding of the soils that surround us not only means accounting for these components but also the living portion or biology of the soil. This biology drives the system as a whole and increases the ability of the soil to function properly and efficiently. Other factors which affect soil function include structure, as well as nutrient, pH, and organic matter content. Soil Health can be described as the continued capacity of soil to function as a living ecosystem that sustains plants, animals, and humans.

Soils under different types of management experience different levels of health. This in turn affects their ability to sustain the plants and animals which grow and rely on them. Given the choice, would you prefer to have healthy high functioning soils, or soils which require high levels of inputs and other workload in order to achieve your goals?

## How Is Healthy Soil Supposed To Function?

The function of the soil is to store and cycle water and nutrients for the growth and maintenance of plants. When we reduce the capacity of the soil to store nutrients and water by affecting one of the components or factors listed above, we decrease soil health and therefore function. Over time this can result in chronic issues with compaction, poor water infiltration, salinity, and lack of nutrient availability, just to name a few examples. In order to fix issues like this, an effort must be made to increase the function of the entire soil system.

The five principles of soil health displayed on the next page include steps you can take today to begin building your soil health. Only when you have achieved 100% health can you be confident you have also reached 100% of your soils potential to function.

## The South Dakota Soil Health Coalition

The South Dakota Soil Health Coalition is a producer led, non-profit, membership organization that was created in the spring of 2015. The Coalition is governed by a nine-member board of farmers and ranchers from across the state and includes several staff members. Staff and board members strive to carry out the Coalition's mission to "Promote Improved Soil Health" through education and outreach.

## The Importance of Partnerships

The South Dakota Soil Health Coalition partners with organizations such as the South Dakota USDA Natural Resources Conservation Service, South Dakota Association of Conservation Districts, South Dakota No-Till Association, South Dakota Grassland Coalition, South Dakota State University Extension, South Dakota Department of Environment and Natural Resources, South Dakota Department of Agriculture, USDA Agricultural Research Service, local Conservation Districts and many others in order to achieve our mission of "Promoting Improved Soil Health".

These partnerships are extremely important as they allow the Coalition to distribute the latest and most accurate technical information regarding soil health and the efforts being made by organizations across the state to improve it. The Coalition's most important partnership however is with the farmers, ranchers, and others who live and work across the state of South Dakota. This continued partnership will allow for the protection and enhancement of this resource for many generations to come.



A Collective Effort To Increase Sustainable Ag Production  
Through Diversification & Improved Soil Health

## What Lives in the Soil? SOIL BIOLOGY

**Nematodes**, are often first thought of as pests to agricultural crops, but most nematodes are beneficial. Nematodes eat bacteria, fungi, protozoa, pest nematodes, and insect larva. Nematodes excrete nitrogen and micronutrients in a form that is plant available.

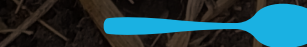
**Bacteria** are the smallest of the microbes as well as the most abundant. They utilize simple sugars from the plants and digest food sources like dead plant cells and cellulose.

**Fungi** is divided into two main groups; one group breaks down organic material and the other (Mycorrhizae) connects to plant roots scavenging nutrients and water for the plants. Both types aid in breaking down complex plant residue like corn stalks. Glomalin, a biotic glue produced by Mycorrhizal Fungi, is essential when forming soil aggregates and good soil structure.

**Protozoa**, single celled organisms are known as the grazers of microbes. They move freely in the water around plant roots and soil aggregates. They feed on bacteria, fungi and algae. As they eat these other microbes, they excrete nitrogen and micro nutrients in a form that is immediately available to the plants.



## FUN FACTS



A teaspoon of healthy soil contains anywhere from 100 million to 1 billion individual bacteria.



The soil microbes in the top foot of one acre alone can weigh more than two cows. The biological life in healthy soil can outweigh the life above it!

Photo Credit: USDA-ARS, Electron & Confocal Microscopy Unit, Beltsville, MD USA & Cindy Zenk

## Learning and Networking Opportunities

To help the coalition accomplish its mission, we host and sponsor trainings, tours, and educational events.

Field Walks  
and Tours  
(Year-Round)

Soil Health  
School  
(Annually)

Workshops  
(Winter)

Mentoring  
Network

Event  
Speakers

Email list