

# Soil Health and Water Quality

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In both the environmental and agricultural realms, there has been a lot of discussion regarding soil health as of late. What is soil health? On the Natural Resources Conservation Service Website soil health is defined as the continual capacity of soil to function as a vital living ecosystem that sustains plants, animals, and humans. Okay, so what does that mean exactly? How do we know if a soil is healthy? If a soil is determined not to be healthy, how can we make it better? If it almost sounds like I am talking about soil as a living thing, I am. A soil is just not a combination of sand, silt and clay particles. Besides the particle composition of soil, there is the living component of soil made up of billions of micro-organisms. It is these micro-organisms that are the building blocks of soil health and the living ecosystem mentioned in the above definition. Their health and numbers increase with organic matter which is their food source. Therefore, one of the primary goals of soil health is to raise the organic matter content of the soil.

What is soil capable of controlling; when it comes to water it controls run-off, infiltration and percolation. For nutrients, the soil controls the storage, uptake and availability of nutrients that are essential for plant growth. This management of water and nutrients that soil performs helps to filter and absorb pollutants.

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How can we improve soil health? One way is to minimize tillage. No-till is optimum, but not always practical. Every tillage pass made across a field destroys soil structure, thus reducing the soils ability to infiltrate water. The less tillage the better for soil health. Another way to improve soil health is to plant cover crops. Cover crops are a way to keep the soil covered after the primary crop is harvested. This helps to reduce erosion but, more importantly for groundwater quality, these cover crops continue to live and grow until freeze up and uptake nutrients left over from the primary crop. A practical example would be a corn crop that had more nitrogen than needed for the growing season. Instead of this excess nitrogen leaching away it is utilized by the cover crop. Other ways to improve soil health are better crop rotations including perennials and any management that increases the soils organic matter.

From a source water protection perspective, this momentum to implement soil health principals is encouraging to the ongoing efforts to keep nitrates out of groundwater. The use of cover crops seems to increase every growing season. Another positive of soil health is not only are the practices better for the environment but more and more farmers are discussing how they are becoming more profitable by utilizing soil health principals. Most SWCD's are staffed with an individual that focus on soil health or there is a soil health specialist within the region. The SWCD's are also heavily advocating cover crops with several field days across southcentral and southeast Minnesota. The University of Minnesota has just recently hired their first State Soil Health Specialist. Hopefully, all this discussion regarding soil health will lead to an increase in the number of acres being farmed using soil health principals and a reduction in the amount of nitrogen reaching our groundwater.

