

Post Rock Extension District Column

Week of February 8-12, 2021

By Sandra L. Wick

K-State Research and Extension-Post Rock District
Crop Production Agent

Do you know the health of your soil?

How many farmers know about the health and condition of their soil? Considering that the soil is the foundation of the entire farming operation, it is not surprising that our most successful farmers, those who consistently produce high yields, are focused on growing the soil!

All farmers know or have heard many times the importance of growing the soil, improving soil health, and increasing soil organic matter. Soil management practices can have a significant effect on organic matter levels in the soil. Soil organic matter affects both the chemical and physical properties of the soil and its overall health. The composition and breakdown rate of soil organic matter affects the diversity and biological activity of soil organisms, plant nutrient availability, soil structure and porosity, water infiltration rate, and water holding capacity. Building organic matter in a soil system is a function of numerous factors: 1) organic matter inputs (above-ground residues and roots), 2) climate (rainfall and temperature), 3) physical and chemical properties of the soil, and 4) land use and management.

Building soil organic matter through appropriate farming practices may take several years, especially in dryland areas where limited moisture reduces biomass production and soil biological activity. Identifying soil management practices that promote soil organic matter formation and moisture retention, and that ensure productivity and profitability for farmers in the short-term can be very difficult.

Contrary to the two points above, it is not impossible to build soil organic matter, although it might be difficult and require some change in farming practices over several years. Cover crops, use of manure, and no-till are good starting points for anyone interested in building soil organic matter. In taking steps to build soil organic matter, don't forget that regardless of the practice used, green growing material does not build organic matter, but brown dead material does.

Increasing the organic matter in the soil can increase both the amount of water the soil can absorb, and the amount of water available to the plant. It has been estimated that for every 1 percent increase in organic matter in the soil, the plant-available water in the soil increases by 25,000 gallons per acre. Increased microbial activity in the soil also enhances the plants ability to absorb needed nutrients.

Changes in management practices can improve soil health, and ultimately productivity and profitability.

Distribution of soil organic matter by soil depth is important for various reasons. The soil organic matter in the upper inches of soil is important to crops for soil aggregation, porosity, microbial biomass and activity and nutrient availability. Surface organic matter can be easily lost to erosion, but is also more easily increased by reducing tillage, keeping more crop residue on the surface and applying organic inputs. Crop residue retention is important to soil organic matter especially in eroding cropland along with controlling wind and water erosion.

Diversity of crop rotations can also have a significant effect on increasing soil organic matter levels. Crop productivity and soil organic matter are related; as one increases the other one is likely to increase as well. Increasing crop productivity is likely to increase root growth with a likely increase in soil microbial biomass and therefore an increase in soil organic matter.

In summary, it may be time to start thinking about “growing your soil” as well as your crop. You can start evaluating your soil by monitoring soil organic matter. More important may be to reduce soil organic matter loss through erosion control. If erosion is controlled, practices that increase root biomass are certainly at the top of the list as well.

If you have any questions regarding soil health management, contact me at any of our Post Rock Extension District Offices in Beloit, Lincoln, Mankato, Osborne or Smith Center.

(References: K-State Research and Extension; UNL G2283-*Soil Management for Increased Soil Organic Matter*.)

Post Rock Extension District of K-State Research and Extension serves Jewell, Lincoln, Mitchell, Osborne, and Smith counties. Sandra may be contacted at swick@ksu.edu or by calling Smith Center, 282-6823, Beloit 738-3597, Lincoln 524-4432, Mankato 378-3174, or Osborne 346-2521. Join us on Facebook at “Post Rock Extension”. Also remember our website is www.postrock.ksu.edu and my twitter account is @PRDcrops.