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SOIL TECH NOTES

Types of Organic Matter (SOM)

PROBLEM: "I keep hearing things about different kinds of organic matter. My soil is not very dark, does that mean I don't have organic matter? Guy told me his soil test showed increasing levels of organic matter. What does that mean?"

DIFFERENCES IN SOM CAUSED BY:

- Age of the carbon, size of the carbon fractions, and total content of the organic matter present will cause differences. All Illinois soils contain organic matter! Naturally occurring dark prairie soils contain more organic matter than light colored timber soils.
- Organic matter can range in age from 1000's of year old that was produced by the prairie plants that once covered Illinois to organic material only a few months old that was just laid down by recent cover crops.
- Stability of the organic matter in the soil is dependent upon carbon content, microbial content in the soil, moisture conditions of the soil, tillage completed, crops being currently grown in the field, pH of the soil, etc.
- One form primarily responsible for changes in soil test information is the Active Fraction, or that fraction recently produced that is actively undergoing decomposition in the soil. It can add points to a CEC test. This carbon is readily used up by the microbes and must be constantly produced to keep these soil tests high.

POSSIBLE WAYS TO INCREASE SOM:

- Need to maintain or increase the level of all forms of organic matter in the soil if possible.
- Cover crops do an excellent job of adding organic carbon to the soil above and below ground.
- Reduce or minimize tillage which can cause oxygen to be mixed with the soil and oxidize or "burn off" the organic matter that is already present.

"All" Soil Organic Matter Types:

- **Humus** - Old carbon - long term SOM- (100->1000 Years) - Illinois from native prairie - gives soil brown to black color
- **Recalcitrant OM** - Humus or lignin - containing material that few soil organisms can decompose
- **Humified OM** - fulvic acid (Humic Acid fraction) - very stable

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“All” Soil Organic Matter Types: *(Continued)*

- **Active** - short tem SOM - composed of plant sugars, polysaccharides, glomalin - consumed by microbes for energy - ave. time to decomposition is 1 - 3 years
- **Living** - organisms such as bacteria, fungi, nematodes, protozoa, earthworms, arthropods, and living roots
- **Fresh** - dead plant material, organic material, detrisus, surface residue, etc. that have only begun to show signs of decay
- **Decomposing** - Active Fraction OM that can be used as food by microorganisms
- **Root exudates** - soluble sugars, amino acids, and other compounds secreted by roots
- **Particulate OM (POM) or Light Fraction (LF) OM** - “Intermediate” fraction of OM with turnover time of 20 to 40 years. Composed of root fragments. Precise size and weight requirements.

