

## Envirothon Training – Soils

**What are important functions of soils?** Soils act as a medium for plant growth; provide a home for organisms; partition water flow (between infiltration and runoff); provide a foundation for buildings, roads, etc; can be used as building material for earthen dams and for road construction.

**How do soils form?** Soil formation is a function of the 5 soil forming factors: parent material; climate; organisms; relief; and time.

**What gives soil its color?** There are 2 main soil coloring agents: Organic matter and iron (different iron oxides). Organic matter will darken the soil color. Iron gives soil the yellow to brown to red colors, when it is oxidized and gray color when it is reduced depending on which iron oxides are present and the soil drainage.

**How do you recognize soil drainage class?** As a general rule, the wetter the soil the more the organic matter accumulates. Organic matter makes a soil darker – so the wetter the soil, the higher the organic matter content, the darker the soil. Poorly and very poorly drained soils can be dark from organic matter.

Also, in poorly and very poorly drained soils the iron is reduced (a chemical reaction). Reduced iron results in gray colors – so poorly and very poorly drained soils that don't have a large accumulation of organic matter are generally gray from iron reduction.

Soils with better drainage (excessively drained, well drained, moderately well drained) have brighter colors because the iron in the soils is oxidized. Oxidized iron can give “rusty” colors – red to orange to yellow. Rust on a nail or your car or on farm equipment is just oxidized iron.

**What are soil horizons?** Soil horizons are distinct layers in the soil that differ in physical and/or chemical make. They are generally horizontal (parallel to the earth's surface) and have observable difference in color, texture, structure and/or wetness indicators.

**How do we designate soil horizons?** Major soil horizons are designated by capital letters. Starting from the top, the surface layer is an “A” horizon. A horizons are generally darker than the layer(s) below due to an accumulation of organic matter.

Some soils have an “E” horizon. E horizons are generally lighter in color than the A due to leaching. E horizons, where present, are the zone of maximum leaching in a soil where material (organic matter, clay, iron oxides etc;) has been removed.

Many soils have a “B” horizon. The B horizon is a zone of accumulation or alteration. If a soil has an E horizon as described above, it must have a corresponding B horizon. Material leached from an E horizon accumulates in the corresponding B.

In our area we have 2 major types of B horizon. An accumulation of clay is designated as a “Bt” horizon. The Bt horizon can occur anywhere within a depth of 6 feet from the surface. The “t” stands for translocated clay. The other type of B horizon is a “Bh”. Myakka fine sand, the Florida State Soil, has a

Bh horizon. The “h” stands for humus, or an accumulation of organic matter with aluminum (and sometimes iron).

The last major horizon designation is the “C” horizon. The C horizon is below the zone of maximum soil development and represents the parent material that the soil formed from.

Below are 2 soil profiles with their horizon designations.

On the left is the Florida State Soil, Myakka fine sand. Compare the horizon designations to the descriptions above (A, E, Bh, C). Based on the explanation of soil color and drainage above what drainage class would this soil best fit into? (Answer; based on the gray and dark colors above it looks poorly drained)

On the right is the Alabama State Soil, Bama fine sandy loam. Compare the horizon designations to the descriptions above (A, E, Bt, C). Based on the explanation of soil color and drainage above what drainage class would this soil best fit into? (Based on the bright color of the subsoil, which is due to oxidized iron, it is well drained).

There is a soil named Leon that is the north Florida equivalent of Myakka. It has the same drainage class (poorly drained) the same sandy textures and is listed below as one of the major soils that occur in the North Florida flatwoods

