Proposal to Change the Tier Criteria and Fix the Control Section Depth for Organic Soils Proposal

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Background:

The current version of Keys to Soil Taxonomy has a floating depth to the bottom of the surface tier and consequently the bottom of the series control section for organic soils based on the bulk density and fiber origin of the upper tier.

Excerpt from the Soil Taxonomy, 1975-

“For practical reasons an arbitrary control section has been established for taxonomy of Histosols. It is either 130 cm (51 in.) or 160 cm (63 in.) thick, depending on the kind of material, provided that no lithic or paralithic contact, thick layer of water, or frozen soil occurs within those limits. The thicker control section is used if the surface layer to a depth of 60 cm (24 in.) has three-fourths or more fibers derived from Sphagnum or from Hypnum or other mosses or has a bulk density <0.1. Layers of water may be thin or thick, from a few centimeters to many meters...

The control section has been divided somewhat arbitrarily into three tiers, the surface, subsurface, and bottom tiers.”

There was some slight modification of the verbiage relating to the organic soil control section and tiers, such as rewording some parts or reorganizing paragraphs, but for the most part the concepts remain the same in the 12th ed.

Excerpt from the current Keys to Taxonomy, 2014, 12th ed –

“Surface Tier

The surface tier of a Histosol or Histel extends from the soil surface to a depth of 60 cm if either (1) the materials within that depth are fibric and three-fourths or more of the fiber volume is derived from Sphagnum or other mosses or (2) the materials have a bulk density of less than 0.1 g/cm3. Otherwise, the surface tier extends from the soil surface to a depth of 30 cm...”

Issue:

These floating depths adds confusion to the depth of series control section and depth of all three tiers. There is no real well defined reasoning to these changes in depths and was (and still remains) identified as arbitrary depths. The surface tier depths are also dependent on being derived from Sphagnum or other mosses and bulk density. Organic material origin can be variable throughout an organic soil because the vegetation usually changes over the history of a
bog due to climate and hydrology variations over time. In addition, bulk density cannot be derived in the field and amounts of less than 0.1 g/cm³ can be difficult to consistently estimate

Proposal:

To remove the concepts of subsurface tiers and use fixed depths for taxonomic criteria. There would be 2 layers, a surface tier, the active rooting section (60 cm) that would be used to determine reaction class rather than the entire control section. The lower tier from 60 to 130 cm to represent the remaining control section.

Change surface tier to be fixed at the upper 60 cm regardless of fiber content. This would also fix the histisol control section at 130 cm.

Change all references of 'subsurface tier' to 100 cm in Chapter 10 Histosols (pg167, BC, BD) (pg171, 172, BBAA, BBAB, BBCB, BBCC, BBBA, BBBB)

Excerpt from Soil Taxonomy, A Basic System of Soil Classification, Agriculture Handbook No. 436