**WVWRAM Soil Tips and References from Jared Beard, state soil scientist NRCS**

The following soil parameters are measured during WVWRAM:

1. Upper 8 cm (3 inches) of soil profile:
   1. Distinguish mineral soil from organic soil material (peat, mucky peat, muck).
   2. Distinguish mineral soil textures from mucky modified mineral textures. Typically, mucky modified mineral soil is black, feels slightly greasy but has a mineral soil feel overall and few to no fibers after rubbing. It will ribbon and is not as light as organic soils. (note that mucky modified will express itself differently from high to low elevations).
   3. Distinguish soil textures with > 28% clay: use the soil texture flowchart and textural triangle. Jared Beard notes that these are guides and not gospel. Soil textures with greater than 28% clay include: clay loam, silty clay loam, ½ of the sandy clay loam, silty clay, sandy clay, and clay.
2. Organic soil recognition:
   1. Histosol: at least 40 cm (16 in) of the upper 80 cm (32 inches) of organic soil material measured from the soil surface.
   2. Histic epipedon: at least 20 cm (8 inches) of organic soil material starting at the soil surface.
3. Clues to the water regime (frequency of ponding or saturation) provided by the soil, for example:
   1. Organic material accumulation indicates seasonal or continuous saturation
   2. Redox concentrations indicate alternate wetting and drying of soil
4. Soil pH
5. Soil stressors

**Determining the texture of soil materials high in organic carbon.**

***(excerpt from Eastern Mountains and Piedmont Regional Supplement)***

Material high in organic carbon could fall into three categories: organic, mucky mineral, or mineral. In lieu of laboratory data, the following estimation method can be used for soil material that is wet or nearly saturated with water. This method may be inconclusive with loamy or clayey textured mineral soils. Gently rub the wet soil material between forefinger and thumb. If upon the first or second rub the material feels gritty, it is mineral soil material. If after the second rub the material feels greasy, it is either mucky mineral or organic soil material. Gently rub the material two or three more times. If after these additional rubs it feels gritty or plastic, it is mucky mineral soil material; if it still feels greasy, it is organic soil material. If the material is organic soil material a further division should be made, as follows.

Organic soil materials are classified as sapric, hemic, or fibric based on the percentage of visible fibers observable with a hand lens in an undisturbed state and after rubbing between thumb and fingers 10 times (Table 5). If there is a conflict between unrubbed and rubbed fiber content, rubbed content is used. *Live roots are not considered*. In saturated organic materials, the terms sapric, hemic, and fibric correspond to the textures muck, mucky peat, and peat, respectively (Table 5). The terms muck, mucky peat, and peat should only be used for organic accumulations associated with wetness.

Table 5. Proportion of sample consisting of fibers visible with a hand lens.

|  |  |  |  |
| --- | --- | --- | --- |
| Unrubbed | Rubbed | Horizon Descriptor | Soil Texture  (Saturated Organic Soils) |
| <33% | <17% | Sapric | Muck |
| 33-67% | 17-40% | Hemic | Mucky peat |
| >67% | >40% | Fibric | Peat |

Adapted from USDA Natural Resources Conservation Service (1999).

Another field method for determining the degree of decomposition for organic materials is a system modified from a method originally developed by L. von Post and described in detail in ASTM standard D 5715-00 ([http://www.astm.org/).](http://www.astm.org/)) This method is based on a visual examination of the color of the water that is expelled and the soil material remaining in the hand after a saturated sample is squeezed (Table 6). If a conflict occurs between results for sapric, hemic, or fibric material using percent visible fiber (Table 5) and degree of humification (Table 6), then percent visible fiber should be used.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Degree of Humification | Nature of Material Extruded on Squeezing | Nature of Plant Structure in Residue | | Horizon Descriptor |
| H1 | Clear, colorless water; no organic solids squeezed out | Unaltered, fibrous, undecomposed | | Fibric (Peat) |
| H2 | Yellowish water; no organic solids squeezed out | Almost unaltered, fibrous | |
| H3 | Brown, turbid water; no organic solids squeezed out | Easily identifiable | |
| H4 | Dark brown, turbid water; no organic solids squeezed out | Visibly altered but identifiable | | Hemic (Mucky peat) |
| H5 | Turbid water and some organic solids squeezed out | Recognizable but vague, difficult to identify | |
| H6 | Turbid water; 1/3 of sample squeezed out | Indistinct, pasty | |
| H7 | Very turbid water; 1/2 of sample squeezed out  Thick and pasty; 2/3 of sample squeezed out | Faintly recognizable; few remains identifiable, mostly amorphous | |  |
| H8 | Very indistinct | Sapric (Muck) | |
| H9 | No free water; nearly all of sample squeezed out | No identifiable remains |
| H10 | No free water; all of sample squeezed out | Completely amorphous |

Table 6. Determination of degree of decomposition of organic materials.

