

Field Test for Determining the Kind of Organic Matter

Litter/Fibric/Hemic/Sapric

Rubbed Fiber Content: Depending upon the degree of decomposition, soil organic matter is classified into four categories (litter, fibric, hemic, and sapric). The degree of decomposition of organic materials is determined by the fiber content after rubbing. The rubbed fiber content is estimated in the field by first taking a moist sample (about the size of a marshmallow) and removing the live roots. Live roots do not count as soil organic matter and are not considered when determining the fiber content. The sample is then rubbed in the palm of one hand using the thumb of the other for about 10 times using firm pressure. The rubbing shreds and breaks up any decomposed organic matter that is still intact. After rubbing, the sample is compressed into a round mass and then pulled apart into two halves. The percent fiber content is estimated by examining the broken face using a hand lens (10 power or more).

- **Organic litter** is recently fallen leaves and/or needles with no observable evidence of decomposition. Litter layers are most common in woodland areas and occur as a surface layer of loose, fluffy leaves and/or needles that can be easily brushed aside with one's hand or blown from one area to another by a strong wind. Typically within a year of being deposited on the ground surface and following repeated episodes of wetting and drying, and snow cover; organic litter is transformed into an organic horizon (i.e., Oi) consisting of matted and slightly decomposed leaves, needles, and twigs. In soils with surface organic layers, depth measurements for soil profile descriptions start below the litter layer and at the top of the organic horizon that has observable evidence of decomposition. The thickness of the litter layer is documented by measuring its thickness and then recording as inches to zero (e.g., Litter +3 inches to 0).
- **Fibric material** is slightly decomposed organic material. Most often the original source of the organic matter (e.g., red maple) can be identified. Fibric material has a rubbed fiber content of 40 percent or more (by volume).
- **Hemic material** is partially decomposed (intermediate decomposition) organic material. It often has the look and feel of mature compost. Hemic material has a rubbed fiber content of 17 to 40 percent (by volume).
- **Sapric material** is highly decomposed organic material. It most often has a black or a very dark reddish black color with a massive or solid appearance. Sapric material has rubbed fiber content of less than 17 percent (by volume).

Nature of Material Extruded on Squeezing: This test 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. For this test, an undisturbed saturated clod of soil, about the size of a lemon, is removed from the side of the pit. If the soil is unsaturated, the face of the pit should be moistened with a spray bottle before the clod is removed.

- **Fibric:** When a saturated sample is squeezed the liquid expelled ranges from clear to brown and no organic solids ooze out from between the fingers.
- **Hemic:** When a saturated sample is squeezed, the liquid expelled ranges from dark brown to nearly black turbid and up to a third of the sample oozes out between the fingers.
- **Sapric:** When a saturated sample is squeezed, the liquid expelled is very dark to black (turbid) and greater than a third of the sample oozes out between the fingers.

Peat, Mucky Peat, and Muck

Peat, mucky peat, and muck are terms used to describe fibric, hemic, and sapric materials associated with wetness. Key factors to consider when making this determination are landscape position and presence of indicators of wetland hydrology. These terms should only be considered in areas where there is a high probability of soil saturation, flooding, and/or ponding. Soils with organic horizons comprised of peat, mucky peat, and muck are almost always found within depressions, swales, at the base of long slopes



(footslope and toeslope), or in low areas adjacent to water bodies. Organic surface horizons (Oi, Oe, and/or Oa horizons) associated with Histosols, histic epipedons, and soils that are gleyed in the upper part of the subsoil are almost always peat, mucky peat, and/or muck. In addition, these areas often have indicators of wetland hydrology (e.g., water-stained leaves).

- Peat is fibric material associated with wetness. Peat is slightly decomposed leaves and/or needles that were deposited within a wet area. When a saturated sample of peat is squeezed in one's hand, the liquid released ranges from clear to brown and no organic solids ooze out from between the fingers. Water-stained leaves are a strong indicator of peat. Peat, as used in soil science, should not be confused with the same term used by landscapers that commonly refers to peat moss.
- Mucky peat is hemic material associated with wetness. It often has the look and feel of mature compost. When a saturated sample of mucky peat is squeezed in one's hand, the liquid released ranges from dark brown to nearly black and up to a third of the sample oozes out between the fingers.
- Muck is sapric material associated with wetness. It most often has a black or a very dark reddish black color with a massive appearance. When a saturated sample of sapric material is squeezed in one's hand, the liquid released is very dark to black and greater than a third of the sample oozes out between the fingers. When air-dried, muck is light in weight and often remains as a mass that is moderately hard or hard to the touch.

Strength of Soil: For this test remove a clod (undisturbed piece) of soil, about the size of a lemon, from the side of the pit. The sample should be very moist but not saturated. If dripping wet, wrap the sample in a paper towel to remove excess water. When conducting this test, the soil sample should be squeezed but not repeatedly worked within one's hand.



- When squeezed in one's hand, the soil oozes out freely from between the fingers, similar to the feel of mashed potatoes, this is a strong indicator of well decomposed organic matter (sapric).
- Another form of the strength test is to clean the face of a test pit and probe the different horizons using one's index finger. The finger will easily penetrate an organic horizon but cannot be pushed into a mineral horizon.