Estimated Soil Organic Matter -- Field Method

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Introduction

Knowledge of soil organic matter (SOM) content is important in herbicide applications, pH maintenance, and general soil quality and productivity assessments. Information about broad ranges of SOM content is needed for determination of proper application rates of certain residual herbicides, for determination of potential N contributions to crops, and for general knowledge of changes in soil quality resulting from management practices that either favor soil erosion and accelerated SOM decomposition or increase cover and crop residues.

Any field method requires basic steps that are easy to follow by operators from a field office. Thus, some accuracy is normally sacrificed for simplicity and ease of operation. Typical field tests rely on visual observations or portable battery-operated field instruments, which are not as accurate as laboratory instruments and equipment.

This method is based on the principle that basic EDTA releases SOM, and this release is directly proportional to the color intensity of the extract. Thus, the darker the extract, the higher the SOM content. This field method can be used to estimate SOM for the revised wind erosion equation (RWEQ) so the soil erodible fraction (EF) can be calculated. For example, if the soil contains 1.7% SOM (1% organic carbon), the actual percentage of EF would be reduced by 4.66 percentage points. The formula, therefore, is important to estimate soil loss from erosion and how this loss is attenuated by SOM.

Basic EDTA Method

This method requires field standards of soils from the general area with varying but known SOM content. If these are not available, previously extracted standard samples in clear vials could be used. This method is based on visual color comparison of the sample to color obtained from a series of standards (usually three: high, medium, and low). Thus, estimation of SOM requires interpolation (between 1.0 and 1.5% SOM) or indications of less than (e.g., < 0.5% SOM) or greater than (e.g., > 2.0% SOM). In the case of the basic EDTA, the sensitivity of the analyses could be increased by filtering the extract and reading the transmittance at 520 nanometers with a small field spectrophotometer (which usually costs about $800).