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Standard Specification for Topsoil Used for Landscaping Purposes[1]

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[1] This specification is under the jurisdiction of ASTM Committee D-18 on Soil and Rock and is the direct responsibility of Subcommittee ~~D18.18~~ D18.22 on ~~Peats and Related Materials.~~ Soil as a Media for Plant Growth.

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1. Scope

1.1 This specification covers a physical evaluation of an inorganic soil containing a limited amount of organic material, relative to its use as a topsoil for horticultural purposes in construction. For classification, a full agricultural textural classification may be used.

1.2 The presence in the soil of the correct nutrients and pH status is necessary for healthy plant growth. This specification does not, however, cover a determination of the nutrients, nor their availability.[2]

NOTE 1—The nutrient content of topsoil is important and the ~~chemicals~~ nutrients usually evaluated are nitrogen, phosphate, and potassium. Nutrient deficiencies may be corrected using organic or inorganic fertilizers. Excess soluble salts should be examined as to their desirability. The acidity or alkalinity of the soil is also important. Excess acidity may be corrected by the application of ~~lime dust.~~ lime. Excess alkalinity may be corrected by the application of sulfur or other suitable acidifying compounds. The latter item, in addition to lowering pH, also could be considered as an aggregate when considering the particle size distribution.

1.3 The values stated in SI units are to be regarded as the standard.

1.4 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.*

2. Referenced Documents

2.1 *ASTM Standards:*

D 653 Terminology Relating to Soil, Rock, and Contained Fluids[3]

D 1140 Test Method for Amount of Material in Soils Finer than No. 200 (75 µm) Sieve[3]

D 2974 Test Methods for Moisture, Ash, and Organic Matter of Peat and Other Organic Materials[3]

D 3740 Practice for Minimum Requirements for Agencies Engaged in the Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction[3]

D 4753 Specification for Evaluating, Selecting, and Specifying Balances and Scales for Use in Soil, Rock, and Construction Materials Testing[3]

D 4972 Test Method for pH of Soils[3]

D 6026 Practice for Using Significant Digits in Geotechnical Data[4]

E 11 Specification for Wire-Cloth Sieves for Testing Purposes[5]

3. Terminology

3.1 *Definitions:*

~~3.1.1 For definitions of other terms used in this specification, refer to Terminology D 653.~~

3.2 *Description of Term Specific to This Standard:*

3.2.1 *topsoil*—usually the original surface layer of grassland or cultivated land. It does not generally include soil from peatlands or other special areas, such as land disturbed by industrial activity. Topsoil is usually a darker shade of brown, grey, or red than

[2] Nutrient testing procedures are found in: the state Agricultural Experiment Station recommendations from the state within which the landscape is located," Methods of Soil Analysis" Editor-in-Chief: C. A. Black, *Agronomy No. 9*, Vol 2, American Society of Agronomy, Inc., Madison, WI, and Hesse, P. R., *A Textbook of Soil Chemical Analysis*, Chemical Publishing Co., New York, NY, 1972.

[3] *Annual Book of ASTM Standards*, Vol 04.08.

[4] *Annual Book of ASTM Standards*, Vol 14.02.

[5] *Annual Book of ASTM Standards*, Vol 04.09.

the subsoil that lies immediately beneath it, because it contains organic matter intimately mixed with the mineral matter. Topsoil tends to be more friable and pervious than inorganic soils.

4. Significance and Use

4.1 When physically evaluating a soil, relative to its suitability to support plant growth (primarily grasses), tests must be made to determine the presence and the amount of organic matter, inorganic matter (sand, silt and clay), and deleterious materials.

4.2 Typical general ranges of soil content are presented in Table 1. Soils falling within these ranges will generally form a suitable topsoil. It must, however, be recognized that in some geographic regions, concurrence with the values of Table 1 would be most difficult. In such cases, locally acceptable specifications would need to be developed.

4.3 The quality of the result produced by this standard is dependent on the competence of the personnel performing it, and the suitability of the equipment and facilities used. Agencies that meet the criteria of Practice D 3740 are generally considered capable of competent and objective testing/sampling/inspection/etc. Users of this standard are cautioned that compliance with Practice D 3740 does not in itself assure reliable results. Reliable results depend on many factors; Practice D 3740 provides a means of evaluating some of those factors.

5. Apparatus

5.1 *Sieves and Containers*, in accordance with Test Method D 1140.

5.2 *Muffle Furnace*, capable of producing the required ashing temperature in accordance with Test Methods D 2974.

5.3 *Balances*—Balances sensitive to 0.01g for samples less than 100 g, sensitive to 0.1 g for samples between 100 g and 1000g, or sensitive to 1 g for samples over 1000 g.

6. Procedure

6.1 Select a representative sample of the topsoil as indicated in Test Method D 1140.

6.2 Oven-dry the sample at 105 ± 5°C and determine its mass.

6.3 Screen the sample over a No. ~~4 (4.75~~ 10 (2.00 mm) sieve and identify this deleterious material fraction as rock, gravel, slag, cinder, roots, sod, and the like.

6.4 Take a ~~specimen~~ sample of the fraction passing the No. ~~4 (4.75~~ 10 (2.00 mm) sieve and determine the percentage by mass of organic matter fractions by ashing at 440°C using the techniques described in Test Methods D 2974.

6.5 Take another ~~specimen~~ sample and test in accordance with Test Method D 1140 to find the percentage of the minus No. ~~4 (4.75~~ 10 (2.00 mm) sieve fraction that is retained on the No. 200 (75 µm) sieve. Take care to agitate the samples so that all organic matter be decanted away. This represents the sand content. Calculate the silt/clay content of the minus No. ~~4 (4.75~~ 10 (2.00 mm) sieve material as the difference between 100 and the sum of the sand and organic matter percentages.

7. Report

7.1 Report the percentages by mass of the following:

7.1.1 Deleterious materials.

7.1.2 Organic material.

7.1.3 Sand content, and

7.1.4 Silt and clay content.

8. Keywords

8.1 landscaping; organic material; plant growth; soil; topsoil

TABLE 1 Specification for Topsoil

Compositional Category	Percentage by Mass
Total Sample:	
Deleterious materials (rock, gravel, slag, cinder, roots, sod)	5 max
Material passing the No. 4 (4.75 mm) sieve:	
Organic material	2 to 20
Sand content	20 to 60
Silt and clay content	35 to 70
pH	5 to 7