Topsoil Suitable for Landscape Use

Fact Sheet FS901

Cooperative Extension

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Construction activities often remove, bury or damage the existing soil. Bringing in new soil may appear to be the only practical way to establish landscape plantings and to garden on difficult sites. In many instances, however, it is easier and less expensive to improve the existing soil than to buy topsoil. A poor quality soil can be greatly improved by mixing in an adequate amount of organic matter. This can be accomplished by applying a one to three inch layer of compost and using vigorous deep tillage to mix it with the existing soil.

When it is necessary to bring in a topsoil, be sure to evaluate the soil quality before having it transported and dumped at the site. The most important soil qualities to consider are soil texture, organic matter content, pH and soluble salts.

Naturally occurring soils vary widely in quality. It should be noted that there is no official or legal definition for what is commonly referred to as topsoil.

A practical definition for topsoil is the top six to ten inches of soil or the depth to which the soil is plowed or cultivated. Topsoil usually differs from the underlying soil by having higher organic matter content, a darker color, better tilth, and higher biological activity in the form of earthworms, bacteria, and fungi. The topsoil is usually less compact than the underlying subsoil and is usually better for the growth of plants.

A soil test is the most reliable way to evaluate topsoil quality. If soil fertility levels are low, fertilizers can be applied as needed. However, it is not easy to improve a soil with undesirable physical properties. The physical condition of a soil depends largely on its soil texture. This refers to the percent sand, silt, and clay content. Topsoils with highly desirable textures have sand, silt and clay contents within the following ranges:

- Sand 40 to 65%
- Silt 25 to 60%
- Clay 5 to 20%

Examples of soil textural classes with desirable textures include: sandy loams, silt loams, and loams. Soil texture can be estimated by feel with trained hands or determined by submitting a sample to a soil testing laboratory for mechanical analysis. When soils of very different texture are layered one over the other, the movement of water through the soil profile can be restricted. Therefore, when adding topsoil of a different texture to an existing soil, mix the two for best results.

Soil organic matter content should be determined by a soil testing laboratory. Organic matter contents typical for sandy loam soils range from 1.25 to 3.0% and for silt loam or loam soils from 2.5 to 5.0. If soil organic matter content is low it can be enhanced by the addition of composted organic matter. An organic matter content up to 10% is suitable in an amended soil.

When buying topsoil, consider the desired pH range of the types of landscape plants to be grown. Certain acid loving plants will not grow well when the soil pH is greater than 6.0.

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Soils with a pH value less than 4.5 or greater than 7.0 should be avoided. Topsoils with pH values near 5.0 can be amended with lime if a higher soil pH is desired. It is more difficult and expensive, however, to lower soil pH if it is higher than desired.

Soil salinity should be determined by a soil testing laboratory. Salinity is evaluated by measuring the electrical conductivity of the soil. A good topsoil should have less than 0.5 mmhos/cm for a soluble salts test performed using a 1:2 soil:water ratio.

If the topsoil is to be used for vegetable gardening, the soil should also be tested for lead. Fact sheet 336, *Lead Contaminated Soil: Minimizing Health Risks* is available from Rutgers Cooperative Extension.

Finally, before you purchase topsoil, visually inspect the stockpiled soil. It should be free of large stones and foreign materials such as broken glass, paint chips, and plastic. Also, gravel content should be less than 10%.

In most instances, a minimum of a four-inch layer of topsoil should be applied over the soil existing at the site. The existing soil should be loosened by tillage before application of the new topsoil.

Attributes of a Suitable Topsoil

- Organic matter content between 1.5 to 10%
- Soil pH 4.5 to 5.9 for acid loving plants
- Soil pH 6.0 to 6.8 for most plants
- Soluble salts less than 0.5 mmhos/cm
- Soil textures: sandy loam, silt loam or loam
- Gravel content less than 10%
- Free of broken glass, paint chips, plastic
- Uncontaminated with lead

Photo Captions

Page 1: (l-r): Deep digging to correct soil compaction; problem of soil compaction; topsoil.

Photo credits: Page 1 (l-r): Joseph Heckman.

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