Soil Types and Native Plant Communities

-by Dennis "Whitey" Lueck (September 2001)

Natural forces have created in the maritime Northwest a mosaic of different soils which determine in large part what kinds of plants will naturally grow on a particular site. The specific soil types vary from extremely well-drained sandy loams to very poorly-drained clays.

Soil scientists identify hundreds of types of soils. However, for the purposes of those undertaking a natural landscaping project, most of these soil types in the maritime Northwest can be grouped into three main classes based on their depth and their drainage characteristics:

Class A soils are well-drained and deep, and generally occur on valley bottoms in the vicinity of larger creeks and rivers. These soils consist of particles that were brought by fast-moving floodwaters from elsewhere, and can contain a high percentage of silt and sand.

Class B soils tend to be fairly well-drained, due in part to topography, but they are shallower than Class A soils. They occur on the middle and upper slopes of hills, and they typically developed on-site from the disintegration of bedrock.

Class C soils are poorly-drained and usually occur on flatlands in the vicinity of slow-moving creeks, on the gentle lower slopes of hills, and in low-lying areas of the surrounding hills. These soils are composed mostly of clay particles that were brought by slow-moving floodwaters from elsewhere.

The above soil categories give only a rough idea of the soil type to expect at a particular site because changes in grade, construction activities, and installation of drainage systems can significantly alter a soil's characteristics. Before selecting plant species, examine the soil at the proposed planting site to determine its depth and other qualities.

If you are interested in more detail regarding a site's native soil, consult the Soil Survey for your county (published by the Soil Conservation Service) or contact your nearest county Extension office. With a little practice, you can learn to distinguish different soil types by just looking at a site's topography, its apparent drainage, and the existing natural vegetation in the vicinity.

Soil Class and Relationship to Topography, Drainage, and Native Plant Communities

Soil Class	Topography	Drainage	Natural Vegetation
A	Flat to gently rolling.	Good (seldom any standing water in winter, except during an actual flood).	Most trees are vigorous and luxuriant; bigleaf maple and Douglas-fir are common, with cottonwood, ash, and alder adjacent to larger watercourses.
B	Moderately steep to very steep hills.	Fair (better on undisturbed, wooded sites with an intact humus layer; poorer on sites subjected to extensive construction activity and grade changes).	Tree vigor may vary; Douglas-fir and Oregon white oak common, as well as bigleaf maple.
C	Flat or gently sloped.	Poor (standing water common in winter).	Oregon ash and Douglas hawthorn common; if treeless, tufted hairgrass (where dry in summer) or true marsh plants (where wet in summer) may predominate.

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Soil Amendments and Mulches for a Native Landscape

The successful cultivation of most ornamental plants and food plants often requires tilling of the soil, addition of large quantities of organic matter, installation of drainage, and use of nutrient supplements. However, such measures are usually unnecessary for the establishment or care of a native plant community. Properly sited native plants will be suited to existing soil conditions, and plants in a functioning native ecosystem get the nutrients they need from leaves, twigs, and other plant matter that falls to the ground and decomposes.

A thick mulch (6-10 inches) of leaves or coarse wood chips can sometimes be useful during the initial establishment of a native landscape. Such a mulch helps conserve moisture, prevent weeds, and provide access to care for the plantings. Conventional mulches of compost or finely shredded bark, however, create ideal growing conditions for weeds and should be avoided.

Native Plant Selection and Soil Type

For information about which native plants are best suited for your site's soil, examine nearby natural areas on similar soils, or consult a guide to the planting of appropriate native species in our ecoregion. [See also "Appropriate Native Plants for Restoring Willamette Valley Landscapes" on page 44-45, "Native Plant Associations for the Landscape" on page 46-47, and "Resources on Native Plants of the Northwest and Natural Landscaping / Habitat Restoration" on page 48-49]. Remember to take into consideration seasonal differences in soil moisture levels. On better-drained soils, plants such as Douglas-fir, western red cedar, and bigleaf maple can tolerate high moisture levels in winter (and even occasional, brief flooding), but these same plants still depend on the soil drying out somewhat in the summertime. On poorly-drained soils, plants such as Oregon ash and tufted hairgrass tolerate standing water for months at a time during the dormant season, but they are also tolerant of the brick-hard, cracking, extremely dry summertime soils. The Douglas-fir, red cedar, and bigleaf maple you see growing on sand or silt loams near the river will not tolerate being planted on poorly-drained clay soils that have standing water in the winter and then dry out and crack in the summertime. Always use nature as your guide.

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