

## Using Compost as Mulch to Increase Soil Nutrient Levels, Microbial Activity, and Plant Growth

Mulching is one of the most widely used cultural practices in ornamental landscapes. Many types of mulch that are used in landscape plantings are largely wood and made by grinding waste wood, e.g. pallets. The wood mulch is dyed to improve its appearance and to resemble bark, but has a very high carbon to nitrogen (C:N) ratio.

Research conducted by Daniel Herms, John Lloyd, and Benjamin Stinner at the Ohio Agricultural Research and Development Center (Ohio State University) has shown that compost when used as mulch can have major effects on improving soil fertility and plant growth. Studies were performed comparing compost and ground wood used as mulch on ornamental plantings. Mulching with compost increased soil organic matter, microbial activity, nutrient availability, and tree growth. Increased microbial activity in soils has been linked to the suppression of many root diseases.

In comparison to wood mulch, the compost had a comparatively low C:N ratio and therefore serves as high quality organic fertilizer as it decomposes. In contrast, high C:N mulch derived from recycled wood induced nutrient deficiencies and decreased plant growth. The high carbon content of the mulch stimulated the growth of soil microbes, which competed more successfully than plants for the limited supply of nutrients resulting in Nitrogen immobilization.

Although the nitrogen-depleting effect of mulch diminishes over time as it decomposes this nitrogen immobilization by microbes will probably have a greater impact on herbaceous plants and newly transplanted woody plants than on well-established trees and shrubs with extensive root systems. Nevertheless, it may be best to reserve mulches with a high C:N ratio for use away from plants, such as on paths. Alternatively, these products can be blended with composted materials with a low C:N ratio, such as yard waste, animal manure or biosolids.

Soils in urban and suburban landscapes are often nutrient deficient with little organic matter because topsoil is often removed and soil profiles inverted during construction (Craul, 1994). Research results demonstrated that mulching with compost increases organic matter, microbial biomass, nutrient availability, and plant growth. The use of compost as mulch offers great potential for restoring ecological processes to degraded soils, while diverting a valuable natural resource from landfills.