LANDSCAPE GARDENS

USING COMPOST

Compost Research & Education Foundation

Description:

This work consists of incorporating compost within the plant-root zone in order to improve soil quality and plant growth. This specification applies to all types of plantings including trees, shrubs, vines, ground covers, and herbaceous plants.

Key Benefits/Return on Investment:

- Improves soil structure,
- Nutrient savings – minimum 75% (possibly for 2 years),
- Water savings – 25 - 50% annually,
- May reduce or eliminate lime/gypsum application, and
- Improves seed germination and transplant success.

Various research papers identify great benefits to amending planting beds with compost, and even better results are typically found when soil amending and mulching are used in conjunction.

Construction Requirements:

- Compost should be uniformly applied over the planting area at an average depth of 1 to 2 inches.
  - Lower compost application rates may be necessary for salt sensitive plants, where compost possessing higher salt levels are used, or where plants with low nutrient requirements are to be established.
  - May increase application rates (3-inch layer) where deeper (9–12 inches) incorporation is required, in sandy soils and where reduced water usage is desired. In these cases, a lower nutrient content compost is suggested (e.g., yard trimmings-based).
  - For native species not requiring much nutrition, use compost which are both stable (being stable to highly stable) and contain lower nitrogen contents.
- Incorporate uniformly to a depth of 6 inches using a rotary tiller or other appropriate equipment.
  - Avoid incorporation when soils are excessively wet or dry.
- Pre-plant fertilizer and pH adjusting agents (e.g., lime and sulfur) may be applied in conjunction with compost incorporation, but at a lower application rate.
- Rake soil surface smooth prior to planting.
- The soil surface should be reasonably free of large clods, roots, stones greater than 2 inches, and other material which will interfere with planting and subsequent site maintenance.
- Water thoroughly after planting and apply mulch.

Additional Information:

- Planting beds for woody ornamentals (trees and shrubs) typically prefer lower application rates of compost (and nutrients).
- Edible gardens (small fruits and vegetables), especially heavy feeders, prefer higher application rates of compost (and nutrients).

General:

Compost Analysis: All compost products have different characteristics. Before selecting a compost product, a compost analysis should be completed by a reputable laboratory* to determine the characteristics of the material, so that the right material can be used for the appropriate purpose. Once determined, the soil should be appropriately amended to a range suitable for the plant species to be established and results desired.

Soil Analysis: Before any soil preparation procedures ensue, a soil analysis should be completed by a reputable laboratory to determine any nutritional requirements, pH and organic matter adjustments necessary. Once determined, the soil should be appropriately amended to a range suitable for the turf species to be established.

Compost inclusion rates depend on soil conditions and quality, plant tolerances, and manufacturer's recommendations. The use of stable, nutrient-rich compost may eliminate (or greatly reduce) initial fertilizer requirements by the amount of available nutrients in the compost.

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LANDSCAPE GARDENS Using Compost

Compost Parameters:

Parameters[1,5]	Reported as (units of measure)	General Range
pH[2]	pH units	6.0 - 8.5
Soluble Salt Concentration[2] (electrical conductivity)	dS/m (mmhos/cm)	Maximum 10
Moisture Content	%, wet weight basis	30 – 60%
Organic Matter Content	%, dry weight basis	30 – 65%
Particle Size	% passing a selected mesh size, dry weight basis	95% pass through 3/8" screen or smaller
Stability Carbon Dioxide Evolution Rate	mg CO2-C per g OM per day	< 4
Maturity (Bioassay) Seed Emergence and Seedling Vigor	 %, relative to positive control %, relative to positive control	 Minimum 80% Minimum 80%
Physical Contaminants (man-made inerts)	%, dry weight basis	< 0.5% (0.25% film plastic)
Chemical Contaminants[3]	mg/kg (ppm)	Meet or exceed US EPA Class A standard, 40 CFR § 503.13, Tables 1 and 3 levels
Biological Contaminants[4] Indicator Organisms Fecal Coliform Bacteria, and/or Salmonella	 MPN per gram dry weight MPN per 4 grams dry weight	 Meet or exceed US EPA Class A standard, 40 CFR § 503.32(a) levels

References:

Alexander, R., Development of Suggested Compost Parameters & Compost Use Guidelines. Florida Department of Agriculture and Consumer Services, final report 5/23/1994.

Beeson, R, Enviro-Compo Utilization in Landscapes. University of Florida, IFAS, 1995.

Bilderback, TE & Powell, MA, Using Compost in Landscape Beds and Nursery Substrates, NC Cooperative. Extension Service, 9/1993.

Gouin, FR, Selecting Organic Soil Amendments for Landscaping. BioCycle 12-1993.

Smith, EM and Treaster, SA, Application of Composted Municipal Sludge in Landscapes. Department of Horticulture, The Ohio State University. 1989.

***The Seal of Testing Assurance (STA) Certified Compost Program provides a comprehensive history of compost analysis results from proficiency-tested laboratories, list of ingredients, and suggested directions for using that unique product.** **www.compostingcouncil.org/participants**

[1] Recommended test methodologies are provided in Test Methods for the Examination of Composting and Compost (TMECC, The Compost Research & Education Foundation).

[2] It should be noted that the pH and soluble salt content of the final amended soil is more relevant to the establishment and growth of a particular plant, than is the pH or soluble salt content of the specific compost used to amend the soil. The pH and soluble salt content of the compost is diluted when mixed with the native soil, so testing for these parameters in the amended soil is suggested. Each specific plant species requires a specific pH range. Each plant also has a salinity tolerance rating, and maximum tolerable quantities are known. Most ornamental plants and turf species can tolerate a soil/media soluble salt level of 2.5 dS/m and 4 dS/m, respectively. Seeds, young seedlings and salt sensitive species often prefer soluble salt levels at half the afore mentioned levels. When specifying the establishment of any plant or turf species, it is important to understand their pH and soluble salt requirements, and how they relate to existing soil conditions.

[3] US EPA Class A standard, 40 CFR § 503.13, Tables 1 and 3 levels = Arsenic 41ppm, Cadmium 39ppm, Copper 1,500ppm, Lead 300ppm, Mercury 17ppm, Molybdenum 75ppm, Nickel 420ppm, Selenium 100ppm, Zinc 2,800ppm.

[4] US EPA Class A standard, 40 CFR § 503.32(a) levels = Salmonella <3 MPN/4grams of total solids or Fecal Coliform <1000 MPN/gram of total solids.

[5] Landscape architects and project (field) engineers may modify the allowable compost specification ranges based on specific field conditions and plant requirements.

Developed for the CREF by R. Alexander Associates, Inc.