TURF INSTALLATION

USING COMPOST

Compost Research & Education Foundation

Description:
This work consists of incorporating compost within the root zone to improve soil quality and plant growth. This specification applies to all types of turf establishment methods including seeding, sprigging, sodding, and hydroseeding.

Key Benefits/Return on Investment:

- Enhances the rate of establishment and overall appearance,
- Nutrient savings – up to 50 - 100% of fertilization for the first year (some compost may supply 75% of the N & P for 2 years of turf growth),
- Water savings – 25 - 50% annually,
- May reduce or eliminate lime/gypsum application,
- Improves storm water capture, and
- May provide soil-borne disease suppression, reducing pesticide applications.

Various research and extensive practical experience illustrate great benefits with amending turf soils with compost.

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 when salt sensitive grass species are being established or where compost possessing higher salt levels are used.
  - Increased application rates (3-inch layer) may be used in sandy soils and where reduced water usage is desired, but in these cases, a lower nutrient content compost may be recommended (e.g., yard trimmings-based). Larger application rates may also be used if deeper soil incorporation (12-inch depth) is possible.
- 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, as necessary, but reduced nitrogen and phosphate application is suggested.
- Rake soil surface smooth prior to seeding, sprigging, sodding, or hydroseeding.
- 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.
- Where necessary, top-dress newly seeded and sprigged turf areas with a 1/4-inch layer of fine compost (3/8-inch screen, minus), then water to protect against hot, dry weather or drying winds. Use as a substitute for straw/hay or burlap cover.
- Water thoroughly after seeding, sprigging, or sodding.

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

Additional Information – Popular Turf Species – Tolerances and Requirements *(for mature grass, 1 year old)*

	Kentucky Bluegrass	Turf -Type Tall Fescue	Perennial Ryegrass	Bermudagrass	St. Augustine	Zoyzia
pH Range	6.3-7.0	6.0-6.8	6.3-7.0	6.0-6.9	6.0-6.9	6.0-6.9
Salt Tolerance	High	High	High	High	High	High
Water	Drought tolerant	Very drought tolerant	Moderately drought tolerant	Very drought tolerant	Drought tolerant	Very drought resistant
Nitrogen* (lbs/1,000 ft2/year)	Low 2 - 3 High 4 - 5	Low 2 – 3 High 3 - 5	Low 2.5 – 3.5 High 5	Low 4 – 4.5 High 6 - 8	Low 2 - 3 High 4 - 5	Low 1 - 3 High 2 - 3
Require de-thatching	Yes	No	No	Yes, 2x/year	Yes	Yes

* Low N rates=residential, high N rates=commercial/specialty turf. When using compost possessing a C:N ratio above 15:1, some of the N will be used to further stabilize carbon in the compost.

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 to determine any nutritional requirements, pH and organic matter adjustments necessary. Once determined, the soil should be amended to a range suitable for the turf species to be established.

Compost inclusion rates depend upon soil conditions and quality, plant tolerances, and manufacturer's recommendations. The use of stable, nutrient rich compost will reduce initial fertilizer requirements by the amount of available nutrients in the compost.

References:

Alexander, R.A., The Field Guide to Compost Use. The US Composting Council, 1996.

Landschoot, PJ., McNitt, AS. And Hoyland, BF, Evaluation of Compost Products as Soil Amendments for Turfgrasses. The Pennsylvania State University, Agronomy Department, July 1994.

Larsen, D. A., Field Trial Compost-Amended Soil (Manufactured-in-Place) Project 163-141 ROUTE 6, Windham & Chaplin, CT. University of Connecticut, January 1999.

Rawlinson, H., Royal Ordnance Munitions Factory, Chorley Transformed into the Village of Buckshaw. The Waste & Resources Action Programme funded report, January 2008.

***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 Note 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.