Composts
To Improve Turfgrass Performance

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Composts are used as soil amendments during turfgrass establishment, as topdressing on established turf, and as low analysis fertilizers. In heavy clay soils, a good quality compost will increase permeability to air and water, enhance aggregation of soil particles, reduce surface crusting and compaction, and provide nutrients. In sandy soils, the organic matter in compost will increase water holding capacity and nutrient retention. The effects of good quality composts on turf include, faster establishment, improved density and color, increased rooting and less need for fertilizer and irrigation.

Not all composts are alike. Composts are made from many different sources, including municipal wastes (garbage), leaves and grass clippings, sewage sludges, animal manures, paper mill by-products, and food wastes, just to name a few. The influence of a particular compost on turf depends on the source and how it is produced, its chemical and physical properties, and how it is applied.

Organic matter

When using composts as organic matter supplements, keep in mind that not all of the product is organic. In fact, some composts contain less than 50 percent by weight of organic matter. Organic matter content can be determined by a lab test, but the most common procedure employed by labs will consider everything that is combustible as organic matter (including wood chips, bark, leaves and possibly even garbage.) Hence, a lab test might not tell you everything about the quality of the organic matter.

Although it is impossible to determine how much organic matter is present simply by looking at the product, a visual examination can tell you if the compost contains mostly well-graded humus-like material or if it is mostly undecomposed material, such as wood.

Moisture content

The moisture content of a compost is important where an even application and uniform mixing with soil is desired. Composts with moisture contents between 30 and 50 percent are usually ideal for handling surface applications, and soil incorporation.

Wet composts (greater than 60 percent moisture content) tend to form clumps that are difficult to break apart. Thus, they do not spread evenly when applied as topdressings. Rototilling wet material into soil results in poor mixing and a less-than-desirable establishment. Wet composts are also heavy and difficult to handle.

A dry compost (less than 20 percent moisture content) is easy to handle and spreads easily, but may produce a lot of dust. On windy days, the dust can leave a film on windows or siding. Dust can be inhaled or get into the eyes of the applicator. Dry composts that are high in organic matter content tend to "float" on the surface while attempting to incorporate them into the soil. In this case, the equipment operator might have to spend more time and effort working the material into the soil.

pH range

The pH of most composts is between 6.0 and 8.0, a range favorable for turf root growth. A few composts, however, fall outside of this range. The pH of a compost may be detrimental when very high (greater than 8.5) or very low (less than 5.5).

Extremes in pH can result in reduced availability of some plant nutrients and/or toxicity problems. In an establishment study at Penn State, we noticed seedling inhibition following incorporation of a two-inch layer of poultry manure compost (pH of 9.1) into a clay loam soil. It is likely that the high pH and presence of ammonium in the compost caused ammonia toxicity and subsequent death of the seedlings. Fortunately, most soils are buffered against rapid and drastic changes in pH and even composts, with extremes in pH, might not alter the overall soil pH a great deal. To be on the safe side, however, try using materials with a pH as near to neutral (7.0) as possible.

Nutrients

When compared with fertilizers, composts generally contain low amounts of plant nutrients. Whereas a small amount of quick-release ammonium nitrogen is present in some composts, most nitrogen is in the organic form and is slowly available to turf. Studies with composted sewage sludges show that only about 10 percent of the total nitrogen is available to plants during the first growing season. This means that large amounts of compost must be applied to supply all or most of the turf's nutritional requirements.

Little is known about the nitrogen release characteristics of other composts. Other nutrients, such as phosphorus, potassium, calcium and magnesium can be present in significant quantities in composts. Some composts, however, may contain very low concentrations of one or more of these nutrients. Thus, fertilizer supplements may be required.

Many questions remain concerning the availability of nutrients from composts.

In most cases, composts are applied to the soil surface at a rate between a one-inch layer (about 2.2 cu. yds./1000 sq. ft.) and a two-inch layer (about 4.4 cu.yds./1000 sq. ft.) then incorporated into the soil to a depth of four to six inches. In order to get maximum performance from your application, make sure the compost is thoroughly mixed with the soil and is not forming a layer at the soil surface. Depending on the material, this may require several passes with rototilling equipment. The lower rate (one inch layer) would be better for fertile soils and the higher rate (two-inch layer) for sandy soils, clay soils or sub soils low in organic matter). We have found that if more than two inches are used, it can be difficult to mix the material four to six inches into the soil. On heavy soils, it is helpful to rototill the soil first, then apply the compost and incorporate.

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RESEARCH SUMMARIES

Bluegrass Nematode Damage

Plant Disease
Disease Notes
Pratylenchus fallax on Turfgrass in Ontario
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Surveys in 1995 and 1997 of golf courses throughout southern Ontario for plant parasitic nematodes revealed evidence of *Pratylenchus* spp. in 13 out of 14 samples taken from fairways. The species in the surveys was identified as *Pratylechus fallax* Seinhorst.

Bluegrass (*Poa pratensis*) was the main type of grass on the fairways surveyed. *P. fallax* might cause signficant damage to turfgrass by directly destroying the roots and the wounded roots might become vulnerable to secondary infection by soilborne pathogens.

Plant Disease is published by the American Phytopathological Society, St. Paul, MN.