



Improving Soils for Different Turf Uses

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IMPROVEMENT of soils for turf depends on early anticipation of problems and diagnosis of a condition before it starts, with economic considerations. Unfortunate for the turf grower, soils do not often cooperate and give the conditions that are optimum for turf production. Beautiful turf is expected from every piece of land regardless of its composition. The following conditions are commonly found in soils used for growing turf, but they are not in any specific order.

1. High acidity and poor fertility
2. Compaction
3. Droughtiness
4. Poor texture and structure
5. Low organic matter contents
6. Salinity and salt buildup
7. Poor drainage

Problems that result because of these factors do necessarily overlap. For example, compaction immediately includes poor drainage and may be a sign of poor texture or lack of soil structure.

Compaction is Typical in Cultured Turfgrass

Under turf culture, soils are quite susceptible to compaction. What can be done with a soil to reduce this condition before it starts? In golf course green construction, compaction is minimized by using a sandy-loam soil. Normal programs call for making soil with mixtures of from 4 to 5 parts sand to 1 part of soil. Sometimes organic materials, such as peat moss, are mixed into the top few inches or incorporated into the total mixture. In a few cases, golf green construction is enhanced by having naturally occurring, sandy-loam soils already on the location.

About the only practical

method of avoiding unfavorable soil conditions in golf fairway, park, and playground construction is to choose and limit the type of soil materials brought in.

Lawn Topsoil Diverse

The home lawn is our intermediate consideration. Total remaking of the soil is usually not practical, but something more than just the control of soils brought in is desired. The diversity of topsoil materials is so great that the homeowner sometimes ends up with a less favorable material than he had originally.

In order to alter an unfavorable clay soil, at least 30% to 50% sand must be incorporated into the top 4 to 6 inches of soil. A second approach is to mix organic materials into the soil. Wood shavings, sawdust, bagasse, mill ash, manure, or compost all alter the nature of clay. A minimum of a 1-inch layer cut into 4 to 5 inches of soil is necessary to show any improvement. With the exception of compost and manure, additional nitrogen must be added to soil to compensate for nitrogen used in the decomposition of organic material.

Droughtiness is most commonly found in sandy soils. Here, added organic material increases the water-holding capacity and promotes soil structure development. Golf green construction and irrigation control minimizes this problem.

In both sandy soils and heavy clay soils, the addition of organic material offers the most convenient method of improvement. Poor texture, poor structure,

compaction, droughtiness, low levels of organic matter, and in many cases poor internal drainage are minimized.

Prevent Salt Buildup

Salt problems may occur because of brackish irrigation water, sea water intrusion, and from fertilizer salts in a few cases.

If salty water is used for irrigation, enough water movement through the soil must be provided to prevent a salt buildup. Some bermudagrass varieties may tolerate as many as 120 to 175 grains of salt in irrigation water. Plant ground covers such as dichondra (*Dichondra repens*) tolerate little or no salt.

Subterranean sea water intrusion causes some problems in coastal areas. Generally, sufficient quantities of good water supplied to keep the salt from percolating up through the soil helps in porous soils. In extreme cases, excavation and the construction of a coarse coral underlayer is necessary. When new soil is placed over this barrier the capillary rise of salty water is prevented, and the soil is flushed free of salt.

Poor drainage can be helped by altering the soil with sand or organic matter as described earlier. In many cases, layering of different types of soil may cause poor drainage. This frequently results from the topdressing procedures used in turf production.

Soil improvement for turfgrass production can be achieved, but the underlying problems must be anticipated and diagnosed before a profitable operation can become reality.