

AERATION: The Root of all "Good"

By Jim Gates, Jim Gates & Co., Inc.

Webster defines aeration as supplying or impregnating the soil with air. As turf managers, we know it is much more than that. Aeration is the process that allows respiration for the roots. Without proper aeration, soil oxygen is depleted and a build-up of carbon dioxide and other toxic gasses occurs. Adequate soil aeration is needed to create a healthy environment for the turfgrass roots and plant – and the beneficial microbes living in the soil.

Soil compaction is one of the most serious problems turf managers must deal with. When the soil porosity is reduced, irrigation is not as effective, organic matter decomposition is slowed, and the nutrients are not used effectively.

What causes the compaction? Running turf maintenance equipment on fields and foot traffic are the main causes of compaction. A black layer develops in the soil profile that the root system cannot penetrate. There are a number of mechanical methods available to remove the black layer. Slicing machines such as the Groundbreaker or the Vertiquake put a vertical slice in the ground and then heave the ground horizontally which fractures the soil in another direction creating the needed air space for gas exchange drainage and efficient use of nutrients. Slicing machines allow for soil penetration up to about ten inches, allowing the root system to develop deeper to provide a healthier turf.

Instead of using blades for deep tine aeration, other machines use solid or coring tines. The solid tines are capable of penetrating regularly maintained turf up to 16 inches with a $\frac{3}{4}$ inch to a 1 inch hole. Most of these machines have a kick to fracture the soil further and allow for better drainage and gas and nutrient exchange.

Coring tines are another option. These are especially useful when you are trying to change the soil profile. Cores can be pulled and the soil recycled. Topdressing, then sweeping the new materi-

als into the core holes makes for an enhanced way to change the soil profile.

For optimum results, the deep tine aeration should be done early spring and late fall. These methods are more aggressive than other methods including slicing and use of pencil tines.

The slicing aeration can be used in between the deep tine aeration to stimulate the root growth and encourage the roots to go deeper. This aids the turf in the time of drought when the moisture is far below the surface. The latest innovation to enhance root growth is a system that actually injects air into the soil with hollow tines that have air holes on each side of the tine. This is the way the soil is penetrated from the top and then fractured side to side giving the roots new directions to spread.

There are so many good mechanical devices on the market for aeration which truly enhance the root growth and lead to healthier turf. All you need is the time and money to do it. By having a healthier root system you reduce the need for chemicals and water.

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DID YOU KNOW?

A rhizome is an underground elongated stem (or shoot) with scale leaves and adventitious roots arising from the nodes.