

Whole Cycle Tuesday

Takeaway

Core aeration opens the soil so oxygen can enter, carbon dioxide can escape, and roots can grow more freely. Following aeration with compost topdressing helps turn those temporary openings into an opportunity for lasting soil improvement.

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*"Nature does not hurry,
yet everything is
accomplished."*

— Lao Tzu

Letting Turf Breathe: Air Exchange and Core Aeration

Healthy turf depends as much on what happens below the surface as what we see above it. Turfgrass roots and beneficial soil organisms require oxygen for respiration, while carbon dioxide produced by roots and microbes must escape from the soil. This movement of oxygen into the soil and carbon dioxide back into the atmosphere is known as soil air exchange.

Compacted soil limits this exchange by reducing the pore space between soil particles. When those pores are compressed or remain filled with water, oxygen moves through the soil slower. The result can be shallow roots, reduced nutrient uptake, slower biological activity, poor water infiltration, and turf that is less capable of tolerating heat, drought, traffic, and disease pressure.

Core aeration improves these conditions by physically removing small plugs of soil and thatch. The open channels allow oxygen to enter the root zone while giving accumulated carbon dioxide a pathway to escape. They also improve water infiltration and create space for roots to expand into the surrounding soil. Unlike solid-tine aeration, removing cores provides the added benefit of temporarily reducing soil density.

Aeration can also help manage thatch—the layer of partially decomposed stems, roots, and organic material between the turf and soil. A moderate amount of thatch can protect the surface, but too much may restrict water and air movement. Bringing soil cores to the surface introduces soil microorganisms into the thatch layer, where they can help break down its organic components.

The benefits depend on timing and conditions. Core aeration is generally most effective when turf is actively growing and can recover quickly. Cool-season grasses are commonly aerated in late summer or early fall, although spring aeration may also be appropriate. The soil should be moist enough for the equipment to pull clean cores, but not so wet that traffic causes additional compaction.

Compost topdressing can make aeration even more valuable. Applying a thin, even layer of mature, screened compost after aeration allows some of the material to enter the open holes and reach the root zone. Core aeration provides immediate physical relief, while compost topdressing helps support longer-term soil improvement. Together, they address both sides of healthy turf management: creating space for air, water, and roots while improving the soil that surrounds them.

