

Managing Thatch

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Prevention is key to limiting build-up



When thatch build-up is more than the maximum .5-inch depth that is acceptable for lawns, it must be physically removed. A dethatcher will cut through the layer of organic material and tear it loose to promote healthy turf.

Photo courtesy of JRCO.

Thatch is the layer of dead and decaying organic matter between soil and turfgrass plants. Too much thatch is detrimental to lawns and other sites, and although it does serve a purpose on athletic fields, it's important to control the thatch depth on lawns. Excessive thatch forms when plant growth exceeds the ability of microorganisms to break down the organic matter before

it accumulates. The stem nodes, crowns, fibers of vascular tissues and roots are the most resistant to decay and make up the bulk of the thatch. A thin layer of thatch does provide insulation from temperature extremes and changes in soil moisture, but too much thatch interferes with water infiltration and can harbor pest and diseases. Mower scalping is also a problem of thatch, which happens when the mower's wheels sink into the thatch, and some fungicides and insecticides become bound in thatch, reducing effectiveness and preventing movement in the soil below.

Understanding thatch

Thatch is a greater concern in warm-season grasses, such as bermudagrass and zoysiagrass. Bermudagrass is a high producer of thatch, primarily because of its rhizomes, which build up over time and cut off the flow of water and applied nutrients to the roots. Cool-season grasses, such as Kentucky bluegrass, creeping red fescue and creeping bentgrass, are also susceptible to thatch.

A half-century ago, grass clippings were believed to be a major component of thatch, and it was thought that removing clippings reduced thatch development. A study at the University of Rhode Island determined that thatch was primarily composed of tissue containing lignin, a component of the cell wall, and included rhizomes, stolons and stems, as well as roots. These findings were confirmed in other studies, and the approach to managing thatch took a new direction.

Acidic soil can contribute to thatch build-up, as soils with a pH of 5.5 or lower inhibit the microorganisms that decompose thatch, as well as soils containing large amounts of clay or sand. Compacted soils and soils with poor structure also have lower microbial activity and are subject to the build-up of thatch.

Dr. Aaron Patton, assistant professor of horticulture at the University of Arkansas, provides turfgrass expertise on athletic fields, lawns, golf courses and other turf sites. "A thatch depth that's unacceptable for lawns may not be unacceptable for athletic fields," Patton said, pointing out that a .5 inch depth is considered the maximum depth acceptable for lawns.

Overwatering, particularly in poorly drained soils, overfertilization and improper pH balance all contribute to excessive thatch formation, and while these issues can be managed by specific cultural practices, they represent challenges to the turf manager.



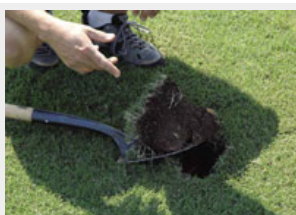
The zoysiagrass soil profile on the left illustrates less than .5 inch thatch, while the profile on right illustrates 2 inches of thatch.

Photo courtesy of Dr. Aaron Patton, UA.

Patton said, “We need to core aerify to reduce soil compaction, and that reduces thatch development.” He also cited the need to avoid light, frequent irrigation, and said that overfertilization should be avoided, but fertilization is needed to promote recovery from use. Soil testing to determine needed amendments to adjust pH levels can help with thatch control. He also noted that while a turf manager in the Midwest might core aerate twice a year for effective management, one in Florida may need to be core aerate five or six times a year, and cited the importance of the size and spacing of tines in core aerification equipment. Turf usually responds better when the tine spacing is closer together and the penetration into the turf is deeper.

Managing thatch

According to Patton and UA Program Technician Jon Trappe, prevention is the best tool to limit thatch build-up on lawns. Proper irrigation and avoiding excessive nitrogen applications are key elements in preventing thatch. Deep and infrequent irrigation can help promote proper root growth and a favorable environment for microorganisms. Regular mowing can help prevent thatch, and while clippings do not cause thatch, both Patton and Trappe encourage the removal of excessive clippings. While turfgrass species vary in pH needs for optimum growth—most perform best in a range of 5.8 to 7—correcting out-of-range pH levels can also help.



An easy method to find the level of thatch is demonstrated by simply using a shovel to check.

Photo courtesy of Dr. John Boyd, UA.

A thatch management program should be a combination of prevention practices and physical removal. Prevention techniques include core aerating to alleviate compaction and improve air movement in the soil to increase microbial activity, fertilizing to encourage turf growth, and using fungicides and insecticides only when needed. When thatch layers exceed the maximum depth acceptable, then it must be physically removed. Removing thatch through vertical mowing is a common method, and Patton and Trappe encourage vertical mowing operations in the early summer when warm-season grasses are growing rapidly.

A dethatcher cuts through dead and living organic material, tearing it loose and depositing it on the surface of the lawn. This will promote healthy growth of the turf, as it forces buds to grow near the base of the grass stems, which prevents the grass plants from being dead underneath. It allows new grass to vigorously grow in thick.

Core aerating and topdressing are also standard procedures that help control thatch. Core aerating will remove plugs of thatch and soil, leaving small holes that allow air, water, fertilizers and pesticides to penetrate. The plugs break apart and disappear into the lawn within a week or two after aerating, and the aerification holes fill with actively-growing roots about a week after aeration, which means the turf is receiving additional oxygen, moisture and nutrients from the soil. It provides a favorable environment for microbial activity, which accelerates decomposition of the thatch.

Topdressing brings soil microbes and moisture in contact with the thatch, which also increases decomposition. Light, frequent topdressing has been shown to be effective in reducing thatch, although thick applications of topdressing or sand will only make the problem worse by causing a layered effect.

The overall quality of a lawn deteriorates when thatch build-up occurs, and a lawn under stressed conditions becomes unresponsive to fertilizer applications and irrigation, and is easily damaged. Keep your clients' lawns in good condition with a good thatch management program.

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