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Thatch Management for Warm Season Turf

By Dr. Gil Landry

Thatch is a layer of living and dead organic matter that develops between the soil surface and the top green segment of a grass plant. Living roots, stems and shoots grow into and through the thatch layer.

Thatch Happens

The thatch layer accumulates when decomposition occurs at a slower rate than the growth rate of the shoots, crowns, lateral stems and roots of the plant. Different grasses, and different varieties within turf species, produce thatch in varying quantities. Faster growing grasses produce more thatch, as do those with a higher lignin content, because lignin resists decomposition.

Turf management programs geared to promoting dense, rapid growth can intensify thatch production. Frequent high nitrogen fertilization can force excessive growth. Excessive irrigation levels may reduce oxygen movement into the thatch level, thus limiting decomposition activity. Too high or too low pH levels and the use of certain pesticides may suppress the activity of microbial organisms necessary for decomposition.

Mowing heights and frequency can also influence thatch production. When no more than 1/3 of the grass blade is

removed at any one mowing, the clippings created are primarily leaf tissue, which is 85 to 95 percent water. These small clippings filter into the turf and decompose quickly, contributing nitrogen and other nutrients to the soil. Mowing that removes more of the grass blade will contain more of the stem portion of the plant. These grass clippings are larger, slower to decompose and less likely to work down into the turf.

Thatch — Good or Bad?

In moderation, thatch is a good thing. Levels ranging from 1/4 to 1/2 of an inch retain moisture, protect grass roots and delicate young plants from excessive heat or cold and shield them from drying winds. On sports turf fields, thatch provides a cushion that both protects plant crowns from wear damage and creates a softer, safer playing surface for athletes.

Too much thatch causes problems. It harbors insects and disease organisms. Excess thatch makes plants more susceptible to heat and cold stress. Root development is restricted, decreasing drought tolerance. The thatch forms a barrier that reduces the penetration of water, fertilizers and pesticides. Turf growth becomes “puffy” and uneven, and the plants are more susceptible to scalping. Wear tolerance is reduced and players begin slipping.

Practical Solutions

Core aeration does have a role in reducing thatch but, by itself, shows limited results. Aeration reduces compaction and increases air, water and nutrient penetration — which improve growing conditions. A minimal amount of soil is brought to the surface whether the cores are removed or dragged in. This provides a light topdressing to aid thatch decomposition.

Testing shows that vertical mowing produces limited thatch reduction. Often this procedure is used annually even when thatch buildup has not reached an unacceptable level because turf managers have traditionally included it in the turf care program. Acceptable thatch levels vary by grass variety, cultural practices and turf use. If thatch levels are between 1/4 and 1/2 of an inch and turf is showing no signs of stress, vertical mowing is probably unnecessary.

Thatch levels also will vary across a sports turf field depending on the amount of play and other traffic each area receives. Non-traffic sections of the field may have significant thatch buildup, while heavy-use areas show little or no thatch. Consider vertical mowing only in those parts of the field where thatch buildup is too great.

The timing of vertical mowing is critical to turf performance. It is generally safest to vertical mow when the turf is actively growing. In the South, vertical mowing often is done while the turf is dormant. This frequently increases green-up, which is generally good. However, sometimes early green-up ends up being killed back by low temperatures. Also, green-up should not be encouraged if irrigation is not available.

Some research on overseeded bermudagrass golf putting greens showed that vertical mowing performed too early in the season may damage bermudagrass more than the overseeding. Vertical mowing later in the season — when the warm season grasses are strong, well-established and growing vigorously — is showing better success in test comparisons. Vertical mowing twice during the season generally is more effective than once.

Topdressing is the most effective means of thatch reduction. Topdressing helps to smooth out rough surfaces and helps decompose the thatch. One or two applications of topdressing per year, at the standard rate of 1/4 of an inch, speed thatch decomposition by increasing the contact between soil particles and thatch.



Core aeration prior to topdressing (the most effective means of thatch reduction) increases air and water penetration and allows topdressing materials to filter into the openings created.

Core aeration prior to topdressing increases air and water penetration and allows topdressing materials to filter into the openings created, further increasing the degree of contact of the topdressing material with the thatch.

In extreme thatch situations, it may be most efficient to strip away the sod and thatch layer and reestablish grass in the affected area.

The most effective thatch reduction programs incorporate concentrated thatch reduction efforts with such balanced cultural practices as fertilization levels matched to turf needs, proper mowing techniques and timing, and adequate, but not excessive, irrigation.

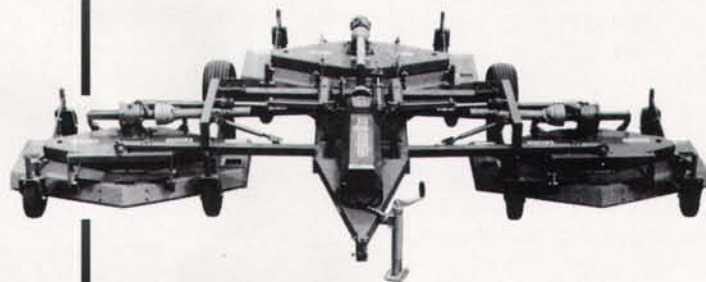
Well-managed field use, including good communication between the sports turf manager and field users and user groups, can limit excessive turf wear and the need for overly aggressive cultural practices.

Finally, remember that thatch does not develop overnight, and it also can't be removed overnight. □

As extension turfgrass specialist with the University of Georgia, Dr. Gil Landry provides leadership in the development of statewide educational programs in turfgrass management. He's a past president of the national Sports Turf Managers Association, co-chair of the Public Relations Committee, and recipient of STMA's highest award, the Harry C. Gill Memorial Award: STMA Groundskeeper of the Year.

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