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Thatch Management for Home Lawns

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Thatch is the intermingled layer of living and dead grass stems, roots, rhizomes, and stolons that develops between the live green vegetation of your lawn and the soil surface. The thatch layer is composed of plant parts at various stages of decomposition.

Grass clippings are not considered part of thatch because they are 85 percent water and easily decomposed by soil microorganisms.

Grasses that spread by rhizomes and stolons are prone to forming thatch layers. Rhizomes and stolons are horizontally growing stems that form new plants at nodes. Stolons are found above the soil surface, while rhizomes are found underground. Most lawn turfgrasses in the southern United States are perennial grasses that spread in this manner and, therefore, form thatch.

A moderate thatch layer, between 1/4- and 1/2-inch thick, is beneficial because:

- it makes a lawn more tolerant to traffic,
- it decreases soil compaction,
- it protects grass crowns (growing points) from temperature extremes,
- it acts as a "mulch" to decrease water loss from the soil surface.

Thatch decay is beneficial because it returns nutrients to the turf environment. However, an excessive thatch layer greater than 1/2 inch can lead to serious problems.

Grass species vary significantly in their rate of thatch production. Some new grass varieties have especially vigorous growth characteristics that can lead to quick thatch accumulation.

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Why Does Thatch Accumulate?

Thatch accumulation occurs when the production of plant parts (stems, rhizomes, and stolons) is faster than the rate of thatch decomposition by the soil microorganisms. There is a balance between thatch production and decomposition that can be achieved through proper lawn maintenance techniques.

Thatch production is greatly affected by maintenance practices such as fertilization and mowing. Excessive fertilization, especially using a soluble nitrogen source such as urea, leads to the rapid production of plant parts that add to thatch. Fertility programs for your specific turf type should be based on a recent soil test or the recommendations of the Texas Agricultural Extension Service. These fertility recommendations are designed to meet the nutritional requirements of the grass without stimulating excessive growth. Also follow Extension recommendations for mowing height and frequency for your specific turfgrass. Extreme mowing heights greater than 3 inches should be avoided in most southern lawns.

Thatch decomposition is greatly affected by soil microorganism activity. The factors influencing soil microorganism activity are soil pH, soil moisture, available nutrients, and the use of fungicides or pesticides that damage beneficial microorganism populations.

Soil pH that is too acidic (below 6) or too basic (above 8) reduces microorganism activity. A soil that is too wet from poor drainage or excessive irrigation leads to microorganism death from anaerobic (without oxygen) conditions. Fungicides and pesticides can kill some soil microorganisms and should be used sparingly in a home lawn.

The keys to proper lawn maintenance are to create a good environment for soil microorganism activity, have adequate lawn quality and growth

using fertility recommendations, and employ some mechanical practices to remove excessive thatch if and when it occurs.

Thatch Problems

Excessive thatch accumulation (greater than 1/2-inch thick) creates problems that affect the quality of your lawn. Problems include reduced water, nutrient and air infiltration into the soil (which leads to reduced rooting and decreased drought resistance), and increased disease and insect damage. A lawn with an excessive thatch layer declines in quality and is much harder to manage. The turf is less responsive to fertilizer applications and much more water is required to wet the soil profile.

How to Check for Thatch

A lawn that has too much thatch feels spongy and tends to scalp when mowed. To estimate thatch thickness, use a soil probe, spade or knife to remove a small section of turf and the underlying soil. Figure 1 illustrates the thatch layer. Measure the thatch layer with a ruler. If the estimated thatch thickness is greater than 1/2 inch, mechanical dethatching practices need to be used soon to reduce thatch levels.

How to Control Thatch

Thatch control is a preventive and curative process. Thatch prevention can be achieved through proper fertilization, pesticide use, and mowing at proper height and frequency. Avoid applying nitrogen at a rate exceeding 1 pound per thousand square feet. Use pesticides sparingly. Maintain a soil pH near 7 with adequate (but not excessive) soil moisture to encourage thatch decomposition.

Topdressing, or the addition of a thin layer of soil to the lawn surface, aids microorganism activity. The topdressing material should closely match the existing soil of your lawn. When topdressing with compost, do not apply too much material or you will increase thatch. The addition of these organic materials adds to the already decomposing organic thatch layer and can increase your thatch problems. The amount of soil topdressing to be applied should not

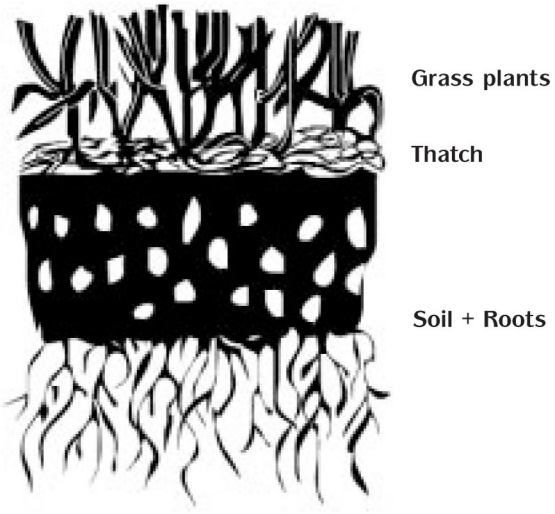

Figure 1. Thatch thickness should not exceed 1/2 inch.

exceed 1/8 inch per application. If you add too much topdressing material at any one time, you may create a layering problem that prevents water movement into the soil. Light, frequent topdressing throughout the year is recommended to help maintain a healthy environment for soil microorganism activity and to avoid serious layering problems.

Curative practices like dethatching and core aeration are designed to remove excess thatch that has built up in your lawn. Machines specifically designed for thatch removal, such as vertical mowers, core aerators and power rakes, may be rented from most tool and equipment rental companies. The best time to remove thatch is in early spring.

If a vertical mower is used, be sure that the blades penetrate through the thatch layer into the soil surface. Vertical mowing should be done in two or three directions.

Core aeration is the process of pulling soil plugs out of the ground. Ideally, eight or nine plugs, measuring 2 to 3 inches long and 1/2 to 3/4 inch in diameter, should be removed per square foot. This may require making several passes across the lawn. Plugs can be removed or left on the lawn.

Various products on the market claim to control thatch by adding bacteria or enzymes to the soil. These products have not been proven effective through research and cannot be recommended for use.

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