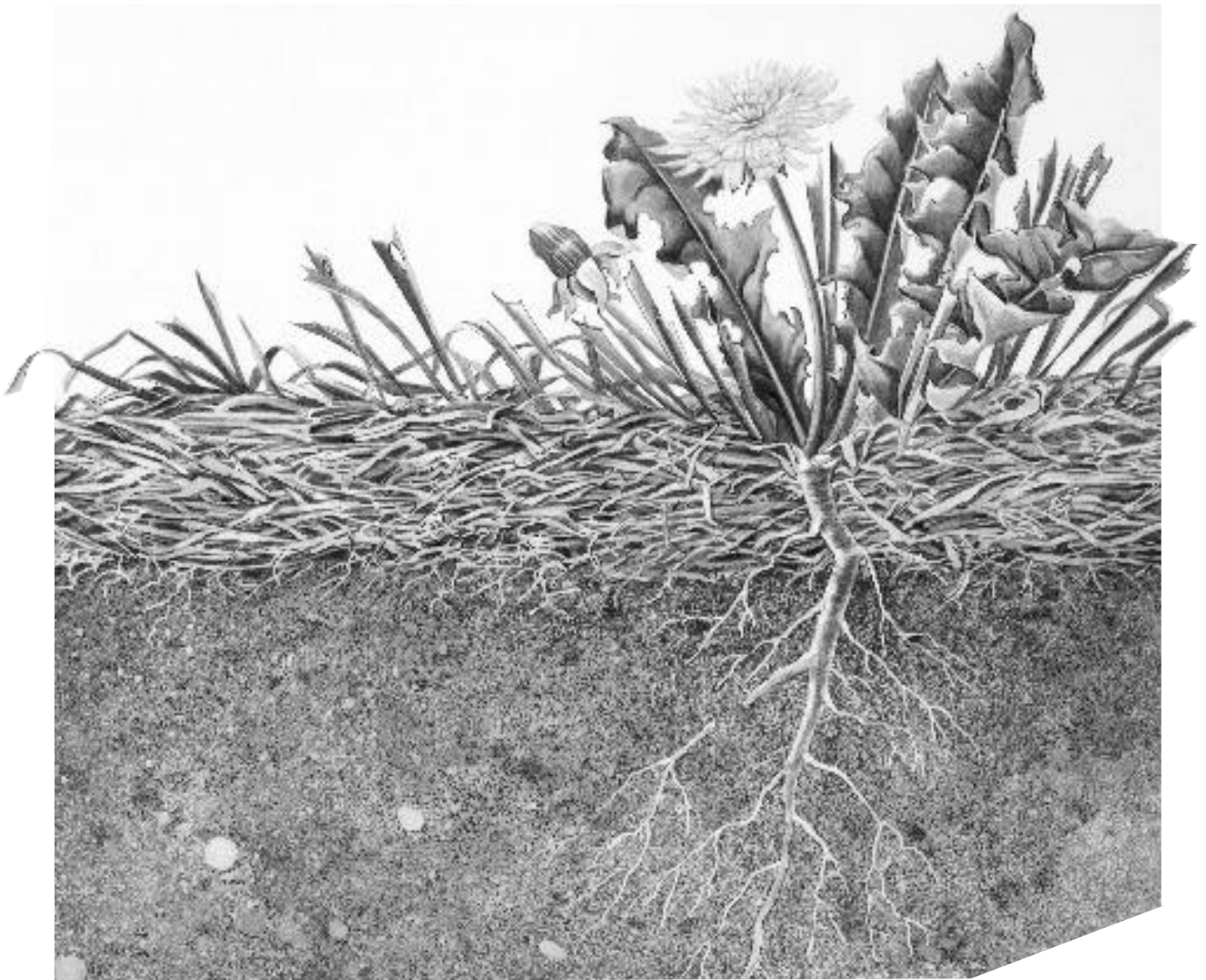


# Thatch prevention and control in home lawns

W. Michael Colt, William J. Johnston, and Susan M. Bell

Homeowners want healthy, vigorous, and attractive lawns throughout the growing season. However, as lawns age, excessive thatch may accumulate and reduce the health, vigor, and attractiveness of lawns.



*Thatch more than one-half inch thick can cause a droughty, disease-prone, and pest-infested lawn.*

## What is thatch?

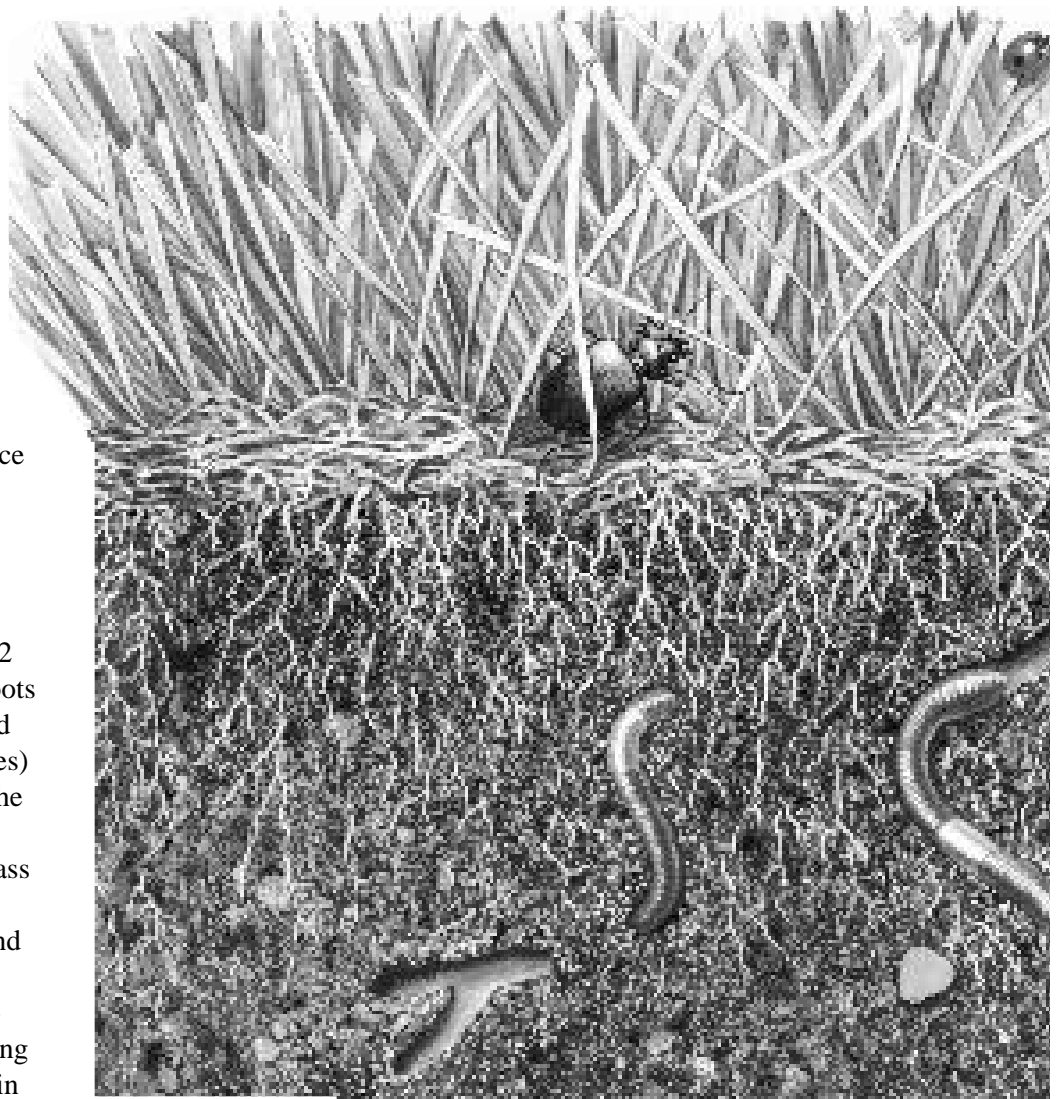
Thatch is an accumulation of dead and partly decomposed leaves, stems, and roots above the soil surface but below the green leaves. The majority of thatch accumulation results from stems. Leaf clippings usually break down before they can accumulate as thatch. The most vigorously growing grasses tend to produce the most thatch.

## Why worry about thatch?

When thatch is more than 1/2 inch deep, most of the grass roots (and underground stems, called rhizomes, in some grass species) grow in the thatch and not in the soil. Because thatch has little water-holding capacity, the grass will be more susceptible to drought. Thatch offers roots and grass crowns little protection from temperature extremes, so summer heat and winter freezing are more likely to kill grasses in thatchy lawns. In addition, an increase in thatch will promote the incidence of diseases such as Pythium blight and the overwintering of certain insects such as sod webworm and adult billbugs. Finally, the effectiveness of certain pesticides and the efficiency of fertilizers are greatly hampered when thatch is excessive.

## What causes thatch?

Thatch accumulates when the rate of shoot-leaf production exceeds the rate of shoot-leaf decomposition by microbes. Grass species and even specific cultivars differ in the rate of thatch formation. Some grass species and cultivars thatch faster than others because of their vigorous growth habits; others



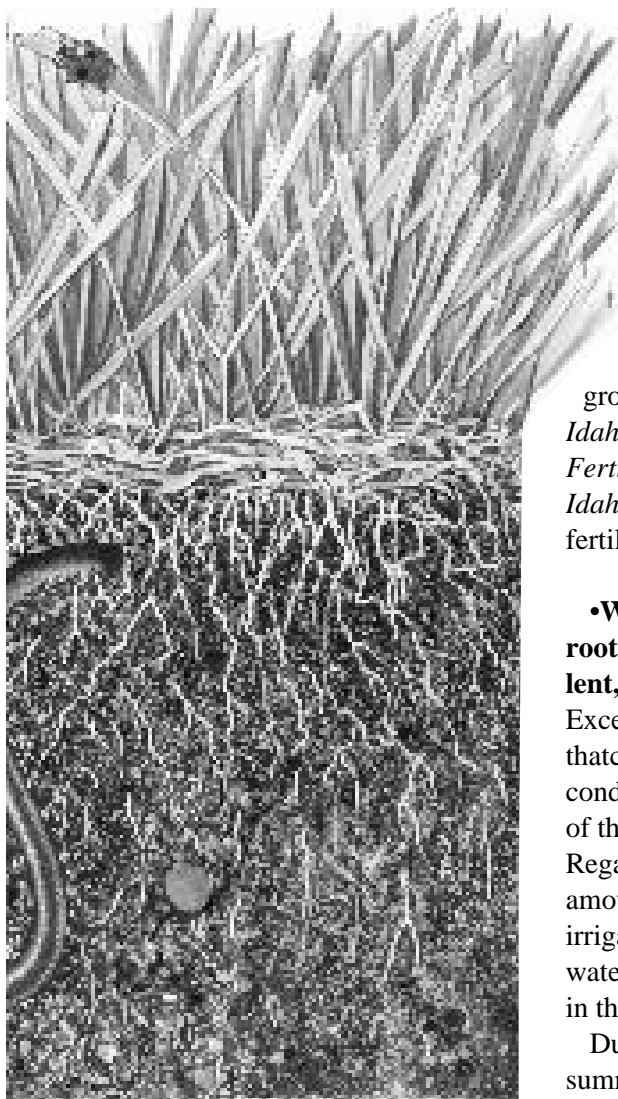
thatch faster because their plant tissue resists decomposition. Bunch-type grasses such as perennial ryegrass, tall fescue, and fine-leaf fescue cultivars do not produce as much thatch as the stoloniferous bentgrasses or the rhizomatous Kentucky bluegrasses. Still, fast-growing bentgrasses and Kentucky bluegrasses can produce attractive lawns when thatch development is prevented or controlled.

## Thatch prevention

Thatch may develop over a period of several years before noticeable damage occurs. Good cultural practices, starting when the lawn is new, will not prevent thatch indefinitely, but can retard its formation.

- **Make moderate, well-timed fertilizer applications to maintain adequate vigor without excessive growth.** Excessive fertilization, especially with nitrogen fertilizers at the wrong time of the year, such as early spring, may cause excessive shoot growth. Three to 4 pounds of actual nitrogen per 1,000 square feet of lawn per year is adequate for a Kentucky bluegrass-red fescue lawn. If you leave clippings on the lawn, your turf will need approximately 25 percent less nitrogen per year. Besides nitrogen, your lawn may need three other fertilizer elements—phosphorus, potassium, and sulfur.

Apply fertilizer in small amounts of 1/2 to 1 pound nitrogen per



*A limited thatch layer serves as a mulch, allows movement of air and water, and promotes beneficial biological activity.*

1,000 square feet rather than in larger amounts less frequently. Three-fourths of the total fertilizer amount should be applied in the fall (September to early November) and the balance during late spring (mid-May to mid-June), after the flush of spring growth. (See CIS 911, *Northern Idaho Lawns*, and CIS 846, *Fertilizing Lawns in Southern Idaho*, for additional details about fertilization.)

**•Water to encourage deep rooting without causing succulent, unnecessary top growth.**

Excessive irrigation can promote thatch by creating waterlogged conditions that inhibit breakdown of the thatch by microorganisms. Regardless of the season, the amount of water to apply at each irrigation will depend on the water-holding capacity of the soil in the rooting depth.

During the warmer part of the summer, a lawn requires about 1/4 inch of water per day. The amount to apply per watering and the frequency of watering depend on the soil type and rooting depth. On deep loam, clay loam, and clay soils, apply 2 inches of water at each irrigation and irrigate weekly. Sandy-type soils would need about 1 inch of water every three or four days. Shallow soils and coarse sandy or gravely

soils hold less water, so you would apply less water at more frequent intervals.

In spring and fall, the daily water needs of turf are much less than in summer, so adjust your irrigations accordingly.

**• Regularly cut grass at the recommended height to maintain vigor.**

The frequency of mowing depends upon the rate of grass growth, the kind of grass, and the use of the turf (table 1). As a general rule, schedule mowing to remove not more than one-third of the grass at any one time. This will likely require mowing twice weekly in the springtime and at least weekly at other times.

Infrequent mowing of tall grass increases thatch accumulation in many grasses. However, grass clippings need not always be removed. Research has shown that grass clippings are a valuable source of nutrients and that they do *not* contribute to thatch if the lawn is mowed at the proper intervals and cutting heights to produce fine clippings. Refer to CIS 1016, *Don't Bag It! Recycle Your Grass Clippings*, for more details.

**Thatch control**

**Core aeration**

Soil compaction is caused by continued foot and equipment

	Mower height (inches)	Maximum grass height before mowing (to remove 1/3 of the grass blade) (inches)
Kentucky bluegrass	1.0 - 2.0	1.5 - 3.0
Perennial ryegrass	1.0 - 2.0	1.5 - 3.0
Tall fescue	2.0 - 3.0	3.0 - 4.5
Fine-leaf fescues	1.0 - 2.0	1.5 - 3.0

traffic. Compaction destroys the soil structure by pressing soil particles closer together and adversely affects oxygen levels and water movement. As a consequence, turfgrasses soon become susceptible to drought, disease, and insect damage. In addition, weed invasion often occurs because some weeds, knotweed for example, survive better than grasses on compacted soils.

Core aeration involves using a machine that punches a hollow tine into the soil, removing 1/4- to 1/2-inch diameter soil cores that are approximately 2 to 4 inches in length. The soil cores are deposited on the surface of the turf and are pulverized and distributed by the next mowing operation. Mixing soil with thatch improves moisture and temperature relations. This, plus the improved aeration, increases microbial activity and aids in thatch decomposition. Adequate irrigation and fertilization also increase thatch decomposition.

Core aeration should not be looked upon as a method of removing large amounts of thatch, however. Rather, it is most effective as a means of preventing thatch from developing. Homeowners who have lawns receiving high rates of nitrogen fertilizer and water should seriously consider core aeration at least once per year.

Three kinds of aerifiers are available. Be sure that the type you choose has hollow tines (or spoons) so that it removes a soil core; spiking the soil with solid

tines does little to relieve compaction and must be done more frequently.

### **Power raking**

Examine the lawn closely regardless of how healthy it appears. Cut and lift several plugs 2 or 3 inches deep. Examine the profiles of the plugs. If thatch is present, it will appear as a distinct layer of stringy, fibrous, or feltlike mat. When about 1/2 inch of thatch develops in bluegrass, it should be removed mechanically by power raking, or vertical mowing. Thinner thatch layers may be removed by vigorous hand raking.

Lawns with a serious thatch problem may require a severe power raking each year until thatch depth is less than 1/2 inch. When treatment is necessary, at least three to four weeks of good growing weather should follow in order for the lawn to recover. Applying a light rate of fertilizer following power raking will help the grass recover from injury.

Early fall is the best time to power rake a lawn in southern Idaho. Lawns can be power raked in the spring; however, competition from annual grasses such as crabgrass will be much greater while the turfgrass is recovering. Spring power raking is acceptable in cool-season areas of Idaho where competition from summer annual weeds like crabgrass is much less. If you power rake a lawn containing annual weedy grasses in spring, be sure to follow with an application of a good preemergence herbicide for annual weedy grasses.

### **Miracle products**

Research at several universities has shown that "miracle dethatching agents," which can easily be applied on a lawn, are usually ineffective in breaking down thatch.

### **Further readings**

Don't Bag It: Recycle Your Grass Clippings CIS 1016, 50¢

Fertilizing Lawns in Southern Idaho CIS 846, 35¢

Northern Idaho Fertilizer Guide: Northern Idaho Lawns CIS 911, 35¢

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