

**T**hat brown layer of living and dead organic material at the top of the soil surface is called thatch. You can see it—and judge its depth—by taking and examining a core sample.

All turfgrass naturally produces a thatch layer that consists of dead and dying leaves, stems, stolons, rhizomes and roots. Its purpose is to insulate the grass plant against sudden temperature changes, to cushion against wear, to reduce excessive water evaporation, and

instance—slows establishment of a utilitarian lawn. The best way to “push” thatch formation is by programming your management to produce up to ½ inch of thatch as soon as possible, by using extra nitrogen and extra water, for instance.

But once a turf is established, thatch control should be a major management practice built into the overall maintenance program. Too many times, we fail to set up an ongoing program until the thatch has built up beyond optimum levels (½ inch).

In lawns with excessive thatch, the grass tends to produce long thin leaves with shallow roots. Here are other problems that excess thatch can cause:

**1) Increased insect and disease activity.** Rather than manage thatch, we tend to apply more insecticides and fungicides. The thatch also contributes to making these control products less effective because its organic matter reduces their activity. Also, chemical penetration through the thatch is restricted, reducing its chances of reaching pests and pathogens in the soil.

**2) Holding excessive moisture.** Besides increasing disease problems, excessive moisture will encourage a shallow root system that predisposes the turf to water stress during periods of high evapotranspiration. When a thatched turf dries out, it does not permit water to reach the underlying soil. Thatch can also act as a sponge that holds the water at the soil surface after an intense rain or irrigation.



**3) Limiting uptake of nitrogen.** Because thatch increases volatilization of some nitrogen fertilizers, less nitrogen reaches the grass's roots, where it is most needed.

**4) Low heat, drought and temperature tolerance.** Because the turf's crowns, rhizomes and roots are elevated above the soil surface, they are exposed to greater extremes. A restricted root system also results in reduced water absorption and increased drought stress. Winter desiccation injuries are particularly severe when a thatch is present.

**5) Scalping,** particularly during the heat stress periods of mid-summer.

Vigorous grasses that have rhizomes and stolons, such as bluegrass, bermudagrass and kikuyugrass, are greater thatch producers than are bunch-type grasses like perennial ryegrass, tall fescue and creeping red fescue.

Poor turf aeration and drainage reduce the activity of

# Thatch and its control

*Don't let the turfgrass thatch layer get beyond a half-inch, because that's when your insect, disease and drainage problems begin.*

to stabilize the soil and protect it against compaction.

Lignin makes up from 10 percent to 40 percent of the thatch, making it very resistant to chemical change or breakdown.

Too much or too little thatch can create a problem. Lawns or golf course fairways can safely handle ¼ to ½ inch of thatch, while the optimum amount of thatch on golf greens is ⅛ to ¼ inch.

Too little thatch—when you're establishing new turf, for





**A complete thatch prevention plan includes turfgrass aerification or dethatching.**

various micro-organisms which normally help break down the thatch. When temperatures are too low, or the turf is over-irrigated (keeping the rootzone cooler and poorly aerated) those same micro-organisms are less active.

No one has found a panacea for controlling thatch build-up.

Biologically, any management practices that control the grass's growth will discourage thatch build-up. To a degree, we can control or reduce the rate of thatch development with lower rates of nitrogen fertilizer, and by making sure that the turf is not over-irrigated.

Culturally, you can topdress, lime and cultivate to control thatch.

Topdressing provides good contact between the thatch and the soil, promoting thatch decomposition. Topdressing programs should depend on

the rate of thatch accumulation. Some golf greens need no topdressing because of low turfgrass vigor or conditions that result in rapid decomposition of organic residues. For greens in which a thatch layer continues to develop, a good rule of thumb has been to topdress when the thatch layer becomes "pencil thick," approximately  $\frac{1}{4}$  inch. The amount of topdressing soil required under these circumstances would be about 1/5th cu. yd. per 1000 sq. ft., which provides a layer of approximately  $\frac{1}{8}$  inch. Essentially pure sand can be applied at rates as low as 1/10th cu. yd. per 1000 sq. ft.

In addition, frequent, light lime applications neutralize acidic conditions, allowing more optimal micro-organism activity.

But even with the best management practices, excessive thatch can accumulate over time—especially on highly-maintained turf. You will probably have to resort to mechanical, regularly scheduled thatch control.

Dethatching with a vertical mower may be required one to three times a year. In some areas where thatch is more than one inch thick, several aerifications per year may be necessary. On some golf greens and bluegrass lawns, thatch is so thick that the grass plants are growing in their own matted thatch. In this case, the area may need six to eight aerifications per year until the problem is solved.

At Purdue University, researchers lifted 283 lbs. of cores per 1000 sq. ft. from a

sand rootzone with  $\frac{1}{2}$ -inch aerator tines. They lifted 357 lbs. of cores per 1000 sq. ft. from a silt loam rootzone. These figures project to about 6 to 8 tons per acre.

Renovation annually or at least every other year for common bermudagrass turf has been a standard practice for many years. The hybrid bermudas are even greater thatch producers that can't be properly managed without a dethatching and renovation program.

The real key to thatch management is a total management program rather than waiting until serious problems develop.

Unless a thatch control program is put into practice within

the first year after establishment, low thatch-producers like perennial ryegrass or turf-type tall fescues should be considered for most general turf areas. Common bermuda should be used instead of hybrid bermudas. Because, where the management level is moderate to low, a quality turf can seldom be maintained with grass species that are naturally high thatch-producers. **LM**

—The preceding information comes from Dr. William B. Davis, "Turf Managers' Handbook" by Drs. W.H. Daniel and R.P. Freeborg, Dr. A.J. Turgeon in his text "Turfgrass Management," and Dr. James B. Beard in his text "Turfgrass: Science and Culture."

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