

Thatch Management



Core cultivation offers less turf disturbance than vertical mowing or renovation.

By Karl Danneberger

Thatch is a natural by-product of highly maintained turfgrass systems. These systems would include intensively managed homelawns and golf courses. The definition of thatch is a tightly intermingled layer of living stems, leaves, and roots that develops between the zone of green vegetation and the soil surface (1). The degree of thatch accumulation is related to the turfgrass cultivar's growth rate, the amount of nitrogen used, and the use of

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certain pesticides (4,6).

A slight amount of thatch is considered advantageous because it provides resiliency, increases wear tolerance, and insulates the soil against temperature extremes (1). In situations of minimal thatch accumulation (less than 1/2 inch), preventative cultural practices such as light, frequent applications of nitrogen; light, frequent vertical mowing; topdressing; and core cultivation with the cores reincorporated back into the thatch layer will help maintain an acceptable level of thatch. However, in situations of excessive thatch accumulation (greater than 1 inch), detrimental plant responses such as increased disease incidence, localized dry spots, poor response to fertilization, susceptibility to injury from temperature extremes and proneness to scalping are associated with it [1]. Under these conditions, maximum effort should be made to reduce the thatch layer.

Four major means of managing thatch are 1) complete removal of the thatch layer and the associated turfgrass community followed by reseeding or resodding the area, 2) heavy applications of soil topdressing, 3) vertical mowing, and 4) core cultivation with the cores reincorporated. The complete removal of the thatch layer and establishment of a new turf, to say the least, is a very effective method for controlling thatch but not very feasible for many homeowners or golf course superintendents. Topdressing, the application of a soil mix to a turf surface, is an excellent method for controlling thatch and is well adapted to golf course greens and tees but is not very practical for the majority of homelawns and golf course fairways. Vertical mowing and core cultivation with the cores reincorporated back into the thatch layer are the most widespread and practical means for managing thatch.

Vertical mowing

Vertical mowers are composed of either fixed or free swinging blades that operate in a vertical plane. For thatch control, the blades are set so they just barely

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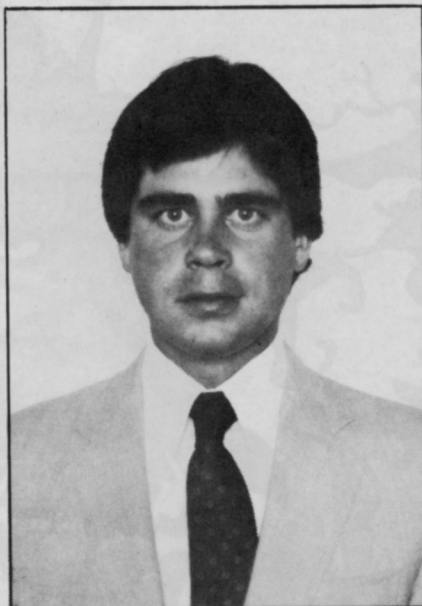
touch the soil surface. Vertical mowing is currently the most popular method for controlling thatch. However, vertical mowing is a very intensive operation that results in disruption of aesthetic qualities of the turf, and in golf course situations, disrupts the playing surface. Vertical mowing will cause severe stress to the turfgrass community.

Research at the University of Illinois showed that in some instances of excessive thatch accumulation, the thatch layer becomes the primary growing medium for the turfgrass community (4). The crown of the turfgrass plant is no longer in contact with the soil surface but elevated into the thatch. Subsequent development of rhizomes and stolons, along with the majority of roots, occurs within the thatch layer. Under this type of situation, vertical mowing will not only remove the thatch and a large portion of the turfgrass community but inflict severe damage to the remaining turf.

If vertical mowing is to be used, care should be taken. Vertical mowing should be done when environmental conditions favor rapid recovery and in golf course situations when play is minimal.

Core cultivation

Core cultivation or coring is the physical removal of soil cores by



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means of hollow tines or spoons. The size of the core depends on the tine or spoon used which may vary from 1/4 to 3/4 inch in diameter and may exceed 3 inches in length. Aerification is a term sometimes used to describe coring. This term is misleading because although a hole is left from coring, compaction or a reduction in air space occurs around and beneath the coring hole (3).

For thatch management, an important part of coring is the reincorporation of the cores back

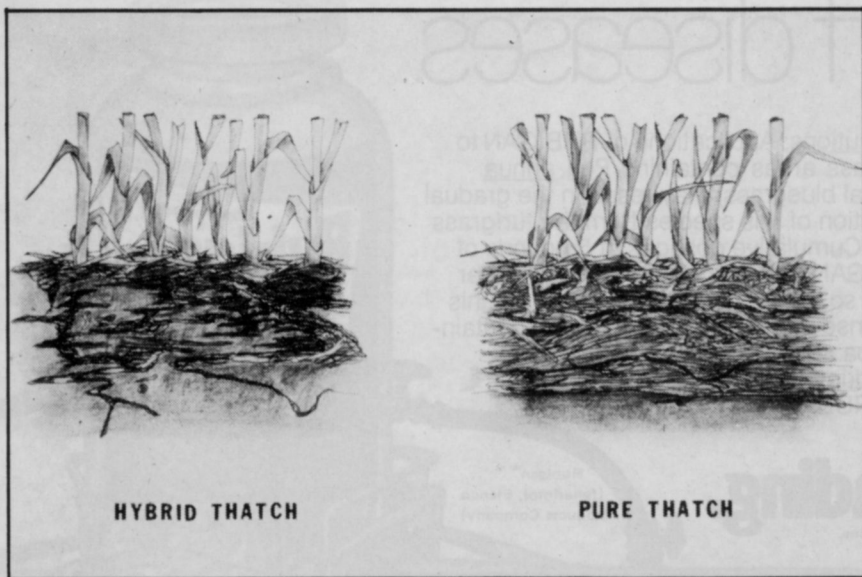
into the thatch layer. Reincorporation of the cores integrates the thatch and soil providing a more favorable environment for thatch reducing microflora. Also, research has shown a favorable change in the physical and chemical properties of the thatch layer with the addition of soil (2). Reincorporation is accomplished by breaking up the cores by means of a vertical mower (in this instance the blades are set so they break the cores but have minimal contact with the turf surface), then dragging the cores into the thatch layer with a mat.

A problem in terminology arises when trying to describe a thatch-soil mix because by definition thatch is void of soil. Various researchers have coined terms such as mat, hybrid thatch, and thatch-like derivative to describe the integration of thatch and soil.

Coring has the additional benefits of providing a favorable environment for root growth and improving the general health of the turfgrass community surrounding the coring hole.

Coring or vertical mowing may encourage weed invasion by opening up the turf to weed seed germination. Cultural practices such as fertilizing should be done as soon as possible to encourage fill-in and recovery of the turf.

In conclusion, thatch management should be an integral part of any turfgrass manager's program. The method used should be carefully selected and implemented properly.



Core cultivation creates a hybrid thatch which provides more favorable physical and chemical properties. In an older, thatchy turf, a large portion of the root system is in the thatch and vertical mowing can cause severe stress.

LITERATURE CITED

1. Beard, J.B., 1973. Turfgrass: Science and culture. Prentice-Hall, Inc., Englewood Cliffs, N.J. 658 pp.
2. Danneberger, T.K. 1979. Edaphic properties of thatch and thatch-like derivatives in turf. M.S. Thesis. Univ. of Illinois. Urbana, IL 79 pp.
3. Petrovic, A.M., J.E. Siebert, and P.E. Rieke. 1982. Soil bulk density analysis in three dimensions by computed tomographic scanning. Soil Sci. Soc. Am 46: 445-449.
4. Randell, R.J., J.D. Butler, and T.D. Hughes. 1972. The effect of pesticides on thatch accumulation and earthworm populations in Kentucky bluegrass turf. Hortscience 7: 64-65.
5. Turgeon, A.J., K.A. Hurto, and L.A. Spomer. 1977. Thatch as a turfgrass growing medium. Illinois Research 19(3): 3-4.
6. Turgeon, A.J., R.P. Freeborg, and W.N. Bruce. 1975. Thatch development and other effects of preemergence herbicides in Kentucky bluegrass turf. Agron J. 67: 563-565.