HOME GROUNDS FACT SHEET

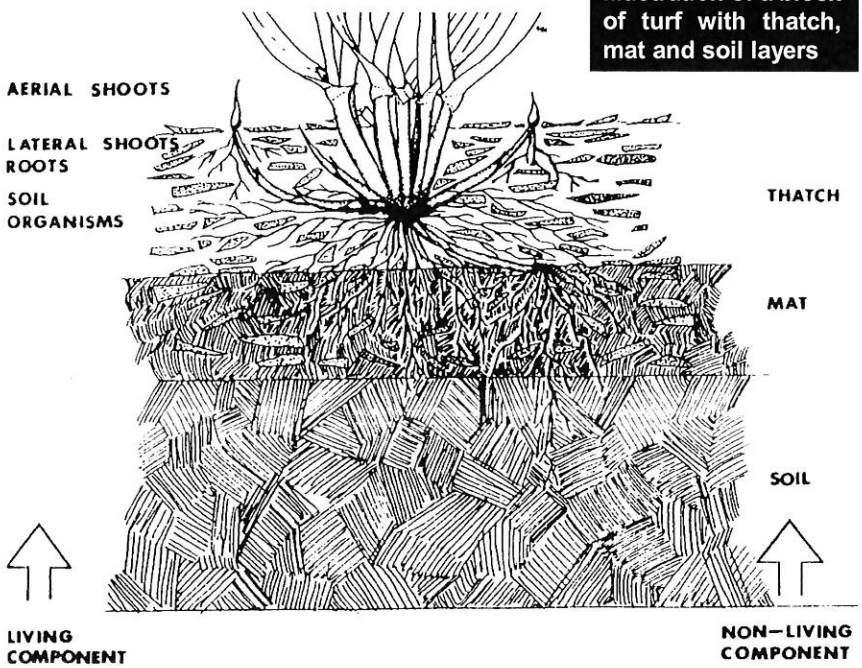
Cornell University
Cooperative Extension
Nassau County

Nassau County
Horticulture Program
East Meadow Farm
832 Merrick Avenue
East Meadow, NY 11554
Phone: 516-565-5265

Thatch

Thatch is defined as a dense layer of stems, stolons, roots and rhizomes. Thatch is NOT caused by grass clippings mulched on the lawn. Thatch build-up can be a chronic problem with turf. The degree to which this problem affects turf depends largely on the physical and chemical characteristics of the soil, on the management practices of the soil and turf, on the age of the turf, and the type of grasses making up the turfstand.

Illustration of a block of turf with thatch, mat and soil layers



Turgeon, A.J., *Turfgrass Management,* 4th Ed., (c) 1996, p. 127.
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Causes:

Build-up of thatch is associated with conditions that allow the accumulation of dead organic material to exceed the rate that microbes in the soil can decompose it. Such conditions may include the relative newness of a turf stand where microbial populations have not yet had a chance to establish themselves. High soil acidity, similarly, limits degradation because the acidity inhibits soil micro-organisms, and earthworms.

Excess water in the soil from poor drainage or irrigation will cause a decrease in oxygen leading to a shift away from the most efficient breakdown of organic material. Additionally, irrigation throughout the summer extends the growing season of the turf.

Another predisposition for thatch can be the use of newer varieties of turfgrass selected for greater vigor, i.e., more rapid production of stems, roots and rhizomes. Finally, remember that fertilizer application stimulates plant growth, increasing the rate of organic matter production. Microbes may not be able to increase their decomposition rate to match.

Problems:

The combination of each or all the above, high vigor turf, poor site characteristics, and improper management can lead to thatch build-up.

Once thatch begins to accumulate it can form a nearly impenetrable barrier with seriously reduced air and water flow from the surface to the roots. Additionally, the dense thatch layer provides a safe haven for pests and diseases to live and overwinter. Fungal diseases, which are particularly troubling to Long Island, overwinter much more successfully in a cozy bed of thatch, protected from the environment and microbial antagonists. Excessive thatch also prevents applied fertilizers, top-dressings, and control agents for insects and disease from reaching the soil. When very severe, excessive thatch will even inhibit penetration of new roots.

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Benefits:

A moderate amount (less than 3/4 of an inch) of thatch is not without benefit. Thatch acts as insulation/ protection against high soil temperatures in the summer and frost in winter, reduces the ability of weeds to thrive, acts as a barrier to erosion and water loss, and provides a cushion against compaction caused by heavy use.

Monitoring:

In order to accurately assess the level of thatch in your turf you can use a shovel to cut a slit in the turf, and leaving the shovel in the ground, push gently to one side. Examine the interface between green tissue and loose roots. The thatch layer is a dense, brown, spongy layer at the base of the green tissue. If your thatch layer is less than 3/4 of an inch, there is no problem. Between 3/4 of an inch and two inches of thatch calls for a review of management practices and an analysis of soil pH. Greater than two inches of thatch indicates that the level of growth is outstripping the level of decomposition and that action should be taken to avoid future problems. A less invasive assessment of thatch buildup can be determined by the sponginess of the turf underfoot—the spongier the turf, the greater the thatch layer. When done barefoot, the latter test is more fun.

Management:

There are several weapons in the thatch war. The single most important is proper management. Know the history of your site—when was it established and, more importantly, what is the soil pH? (For instructions on taking a sample for a soil pH test, see Home Grounds Fact Sheet A-1-0.) Earthworms are the greatest sources of aeration known to man and aeration is critical to reestablishing air and water movement through dense thatch. Earthworms will not tolerate low pH or a number of common pesticides. Microbial degradation will be most efficient at pH 6.3-7.0 soil. Follow the recommendations on your soil test results to keep your soil in the proper range.

Mechanical core aerators are also available from rental agencies specializing in garden machinery. Removal of four inch deep cores by such a machine provides breaks in the thatch barrier and improves water and air movement. Dethatching machines are also available but they do not greatly improve penetration of water and air and do a lot of damage to the turf. We do not recommend their use. Proper fertilization and deep, infrequent watering will also help to promote deep rooting and increase organic matter degradation.

The best times for thatch renovation projects are spring and fall during periods when the turf is actively growing and will recover quickly from aeration. However, opening spaces in the turf in spring will allow more crabgrass to germinate. Grasses that have a creeping growth habit such as bluegrass, bentgrass or zoysia are more prone to thatch problems. Zoysia should be aerated in late June.