SOME CONSIDERATIONS ON THATCH AND WATERING

by DON TAYLOR, Assistant Professor, Dept. of Horticultural Science and
GEORGE BLAKE, Professor, Dept. of Soil Science, University of Minn.

The development of thatch is a normal consequence in intensively cultured turfgrass. Due to the nature of golf green culture, thatch development can be particularly rapid. Superintendents have devised several methods of controlling excessive thatch accumulations such as frequent, light vertical mowing; aerification; topdressing; light applications of lime; and reduced nitrogen application. Despite control efforts, seldom, if ever, is there a green with no thatch, nor in our opinion would that be a desirable situation. A small amount of thatch protects the soil surface and provides resiliency and increased tolerance for the turf. Realizing that we will mornally be working with some thatch on the greens, whether excessive or not, it is important to know some of the effects thatch may have on the water relations of a golf green.

Studies have shown that thatch contains very large pores as compared to soil, even after compaction. Due to these large pores, the water holding capacity of thatch is low. This can cause problems in cases where the majority of the root system is in the thatch layer and the grass plants are not able to extract significant amounts of water from the soil below the thatch. In such cases irrigation must be inordinately frequent and the thatch is excessive. Reduction of thatch or improvement of soil to encourage root development below the thatch layer is extremely important in order to sustain growth between irrigations. If, on the other hand, roots are down into the soil in sufficient quantity to extract water there, the lack of water holding capacity in the thatch should not present a critical problem. The amount of water available to the plants will then be determined by the water holding capacity of the soil and the depth of roots into the soil.

The effect of thatch on water infiltration may be different than its effect on water holding capacity. In the past it has generally been felt that thatch reduces the amount of water getting into the soil. Studies done at several Minnesota golf courses as well as laboratory studies at the University of Minnesota suggest two important aspects concerning thatch and water infiltration rate: 1) for a short period of time, dry thatch can reduce severely the rate of water infiltration, and 2) once the thatch is wet with water flowing through it, the thatch will not reduce the rate of water infiltration. In laboratory profiles of sand without thatch and with a thatch layer at the surface which had been allowed to dry, initial water infiltration rate was much different for the thatch-covered profiles

and the profiles without thatch (Fig. 1). After a short period of time during which water was constantly kept ponded on the surface of the profile, the infiltration rates changed until there was no difference between the thatch-covered profiles and those without thatch. The period of time during which thatch restricted water infiltration was always less than ten minutes. It appeared that this reduction was due to a hydrophobic quality of the thatch.

Infiltration rates, after establishing a constant rate, were measured at six golf greens, one athletic field and two turfgrass roof gardens with the surface thatch layer present. The surface thatch was then removed and the infiltration rate measured again. Removal of thatch did not significantly increase the steady-state infiltration rate at any of the sites. Evidence indicates that thatch, even thin layers of thatch, can have significant effects on the water relations of greens, particularly if the thatch dries out. Though the thatch-water relations are complex and much remains to be learned, the following suggestions seem appropriate.

(1) From the aspect of water relations, thatch is excessive whenever the majority of the plant roots are not growing through the thatch and down into the soil to an acceptable depth.

(2) A syringe irrigation cycle to wet the thatch prior to an expected thunderstorm or irrigation when the thatch is excessivley dry will probably increase the amount of water that gets into the soil.

(3) It is important to set the irrigation schedule to apply water long enough to wet the thatch. Once the thatch is thoroughly wet it will not restrict the rate water enters the soil.

(4) If the rate of water infiltration is excessively low even after the thatch is wet, alleviating soil compaction by aeration will probably improve water relations more than thatch reduction.

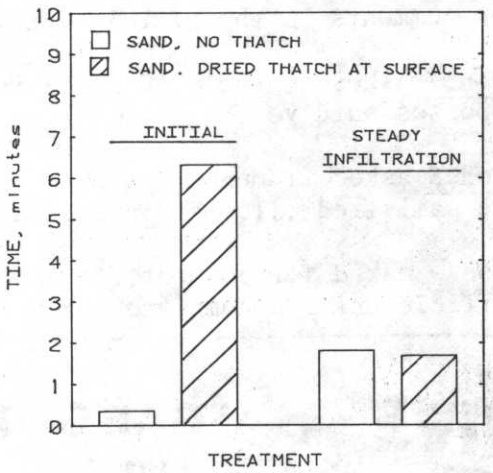

Figure 1. Time required for 2 cm of water to infiltrate laboratory sand profiles at initiation of irrigation and after the infiltration rate has become steady.