TURFGRASS CULTURAL PRACTICES REPORT

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Leaf Mulch Studies

Since 1990 three studies have been conducted at the Hancock Turfgrass Research Center (HTRC) that examine the feasibility of mulching leaf litter into existing turfgrass canopies. The first study examined different leaf rates (50 and 100 lbs. dry leaves / 1000 sq. ft.) and the timing of nitrogen fertility. The objectives were to determine if there were any negative effects of mulching tree leaves into the existing turfgrass canopy with a lawn mower and if the nitrogen fertility would enhance leaf litter decomposition. The study ended in 1996 concluding that there were no negative effects of mulching the leaves into the turf at the rates applied and that the nitrogen treatments did not aid in the degradation of the leaf litter. The second study was initiated in October, 1991 to examine the effects of mulching different leaf types (oak and maple) at a rate of 100 lbs. dry leaves per 1000 sq. ft. into a Midnight Kentucky bluegrass turf using a rotary push-mower. This study was concluded in the fall of 1998. Objectives included were to determine if the different leaf types would have an effect on soil pH and or turfgrass quality. Turfgrass quality increased on plots that had maple leaf treatments due to the fact that fewer broadleaf weed growth was observed in these plots. No differences were observed regarding soil pH for the duration of the field experiment. Soil cores taken in the fall of 1998 concluded that there was an increase in the amount of organic matter in plots that had oak and maple leaves mulched into them compared to the check plot (Table 1). Tissue analysis of clippings collected in October of 1998 also found that the grass plants that came from plots having leaves mulched into them also had a greater percentage of carbon and nitrogen. However, the carbon nitrogen ratio was not affected.

Table 1. % of Organic Matter in the Thatch Layer and the % of Carbon and Nitrogen in the Turfgrass Clippings of Poa pratensis cv. Midnight from October of 1998

	% Organic Matter	% C in turf tissue	% N in turf tissue	C/N Ratio
Control	7.5 b	1.7 b	0.13 b	13
Oak leaves	8.9 a	2.1 b	0.16 a	13
Maple Leaves	8.4 a	2.1 b	0.16 a	13
LSD at (0.05)	0.7 *	0.1 *	0.01 *	N.S.

* Significant at 0.01 probability level.
Means in columns followed by the same letter are not statistically different at the 5% level using the LSD mean separation test.

The previous studies led us to conclude that there were more benefits than negatives for turf managers and homeowners that mulch tree leaves into their existing sites. The question became "Could there be an expanded roll for turfgrass in the leaf litter collection process"? With decreasing landfill space many states have looked to farm fields as a means of alleviating their leaf litter disposal. Truckloads of leaves were taken to farms and the leaves were tilled into the soil. However, it was found that this activity had the potential to increase the C/N ratio to 50 to 1. When the C/N ration goes above 30 to 1 nitrogen inputs are required to put the system in balance to make nitrogen available to the plant for uptake. It was also determined that some loading of heavy metals was taking place due to the collection process of the leaf litter and automobile parts were being reported by farmers who partook in the exercise. With that in mind our third leaf mulching study was initiated in October of 1995. The objective was to determine if low maintenance turfgrass sites could take heavy loads of deciduous leaves and maintain their usefulness. The study consisted of mulching a mix of deciduous leafs into an existing sunny seed mix turf (Kentucky bluegrass, perennial rye, and fine fescue). Excessive dry leaf rates of 150, 300 and 450 lbs. per 1000 sq. ft. were mulched in with the aid of a mulching mower. Two mower deck heights (1.5 and 3 inches) were included in the study to determine if deck height had a significant impact on the degradation of the leaf

occurs. The mineral nutrient reduces the amount of excudate and decreases the possibility of infection at injured sights.

Twice annually since 1996 soil cores have been removed from the plots to measure physical properties of the soil. All calculations utilized to determine the physical properties were obtained using 1993 USGA specifications. As to be expected, the 80:20 mix has displayed a greater hydraulic conductivity than the 80:10:10 which has retained a greater infiltration rate than the native soil greens. This trend was also displayed in regards to total porosity and one of its components air filled porosity. Regarding the second component of total porosity, i.e. capillary porosity, the greater the amount of fines in the mix, the greater the water holing capacity. With use of the SAS program there have not been statistically significant changes in any of the physical properties over time. There have also been no statistically significant differences regarding lightweight green rolling pertaining to soil physical properties.

Green Speed Perception Survey

Eddie Stimpson introduced the Stimp meter in 1937. Its intended use was to provide uniformity in speed from green to green on individual golf courses. Mr. Stimpson states in his article, Introducing the Stimp, "To the greenskeeper who is harassed by two groups of members, half of whom want the greens faster and half of whom want them slower, it would be of some comfort to know that he was maintaining the standard conditions as measured by the Stimp Meter and was determined by the USGA." Fast forward to the 70's when improved technology allowed for thinner manufacturing of bedknives and the USGA gave a Stimp Meter to each of its member clubs. Golfers increased their demands for faster green speeds and began expect uniformity of green speed from golf course to golf course. This unrealistic demand expedited the tighter mowing heights and increased the stress on the golf course superintendent and his/her putting turf.

Relentless pressure remains on the superintendent to maintain fast green speeds, but what change in green speed can a golfer detect given today's low cutting heights? Surely a golfer can determine the difference in green speed between a green that Stimps 6' and one that Stimps at 7'. However, does that detectable difference in green speed exist when comparing a green that Stimps at 9' and one that Stimps at 10'? In an effort to answer these questions six pair of greens where maintained at three different mowing heights (3/16", 5/32", and 1/8") in preparation for an MTF Field Day Survey. One pair at each mowing height was managed to create a one-foot difference in green speed while the other pair was maintained to produce a half a foot difference in green speed.

Results indicate that regardless of mowing height a distance of one foot was detectable while differences in green speed of 8" or less were not detectable to our survey group. How could the turf manager utilize this data? Years of data verify that lightweight green rolling increases green speed by a foot on the day the green is rolled. However, the day after rolling there is generally a 6" difference that remains between the rolled and non-rolled greens (Table 6). Given this knowledge one superintendent might decide to roll his greens everyday in order to keep his green-speed at a maximum. However, another superintendent might decide to roll her greens every other day because the majority of the membership can not tell that the greens are 6" slower on days they are not rolled.

In closing the author's would like to quote the editor of *Golfdom: the Business Journal of Golf*, which published the 1937 article Introducing the Stimp. He wrote of the Stimp Meter, "As for its use in actual play, we have the definite idea that it's out – not only because of the mechanical phase but because the player actually couldn't make enough use of what he has learned about green speed to warrant use of the device. However, there may be something to the device as an instrument for greenkeepers who might want to answer arguments about the speed and uniformity of their greens." The editor then closed with the following insightful comment, "We toss Stimpson's interesting contribution into the lists for the arguments it will provide." Thanks!

Irrigation Timing, Turfgrass Species, Fertility Study

In this cooperative study with David Gilstrap, Kentucky bluegrass, tall fescue, and perennial ryegrass were subjected to three different irrigation regimes: none, 1/10 inch daily in early afternoon, and 1 inch per week at 5:00 a.m. A nitrogen-timing component was also included in the study. Nitrogen was applied as urea in all treatments except one in which it was applied as corn gluten meal. Data collection includes color and quality ratings, broad leaf weed counts, wilt ratings, and surface temperatures, which