LONG TERM TOPDRESSING STUDY

The long term topdressing study was initiated in 1986 and discontinued in the spring of 1996. Some data were collected in the spring to conclude the study. Topdressing materials utilized were straight sand; 80% sand, 20% peat; and 60% sand, 20% peat, 20% soil. Treatments were applied at the rates of 3 cubic feet of material per 1000 sq. ft. every three weeks; 12 cubic feet of material applied in the spring and fall; 12 cubic feet of sand applied in the spring and fall after operating an aerifier having ½ inch tines and 2 inch by 2 inch spacing; and a check plot that received no topdressing material. Plot size was 4 ft. x 12 ft. The final topdressing application took late summer of 1995. Data in Table 13 reports root weights and some soil physical properties.

It is interesting that plots which received topdressing every 3 weeks had higher root weights in the 1-3 inch depth compared to the untreated check and the plot which was aerified spring and fall, then topdressed. We know from earlier cultivation research that when removing the soil cores on relatively uncompacted greens that root weights can sometimes be decreased. The plots were aerified in the fall, but not in the spring of 1996. The check plot had by far the poorest rooting, likely a result of the heavy thatch that developed. Since the check received no cultivation or topdressing, it is not surprising a significant thatch layer developed. Grass roots will grow where there is the least resistance to root penetration, a perfect condition in the thatch layer. The check plot had the least rooting in the 3-6 inch depth as well.

The air-filled pores represent the largest pores in the soil, or macropores. Topdressed plots had the highest amount of macropores in contrast to the check plot which had the lowest air-filled pores, as would be expected. The underlying soil is a loamy sand to sandy loam while the topdressing materials ranged from straight sand to a loamy sand. As topdressing accumulated to a depth of about 2 inches in 10 years, less of the underlying soil would be included in the soil samples that were collected to a depth of 3 inches. One of the objectives of topdressing is often to change the soil in the root zone of older greens. These data substantiate that soil conditions can be changed with a long-term topdressing program. Total pore space values reflected the same trend. It was surprising that the plots that were aerified and topdressed tended to have lower pore space values than plots which were topdressed only. Bulk density numbers were consistent with treatment. Sand topdressed plots had the highest bulk densities. This is expected since sand is the heaviest soil component. Again, the aerified plots had a higher bulk density than expected, but this is consistent with the lower pore spaces observed for these plots. There is no ready explanation for this result. The check plot had a high bulk density since there had been no topdressing or cultivation treatments to impact on pore space.

Table 11.

Long Term Topdressing Study - 1996

Initiated 1986. Sampled May 21

Topdressing material & frequency	Root weight, grams 1-3"	Root weight, grams 3-6" depth	Air Filled Pores %	Total Pores %	Bulk Density gm/cc
Sand every 3 weeks	1.69 a	.42 a	27.2 ab	49.3 ab	1.34 b
Sand spring & fall	1.39 ab	.32 ab	22.6 abc	46.9 bc	1.35 ab
80 sand : 20 peat every three weeks	1.34 ab	.31 ab	24.0 ab	50.4 a	1.27 c
80 sand : 20 peat spring & fall	1.63 a	.41 a	29.2 a	50.2 a	1.26 c
60 sand : 20 peat: 20 soil; every three weeks	1.19 abc	.30 b	22.5 abc	50.4 a	1.26 c
60 sand : 20 peat: 20 soil; spring & fall	1.28 ab	.28 b	21.2 bc	49.2 ab	1.27 c
Check Plot no topdressing	0.58 c	.15 c	16.1 c	44.9 c	1.41 a
Sand; aerified spring & fall	0.79 bc	.29 b	23.4 ab	47.3 bc	1.40 a
Probability	.02	.00	.05	.00	.00
LSD @ .05	.063	.119	7.16	2.67	.055

*Both topdressing frequencies totaled 24 cubic feet per year.

MANAGEMENT OF SOD GROWING ON SUBSOIL

The project to evaluate management practices to maintain sod grown on compacted subsoils was initiated during summer, 1996. There are nine blocks in this study with three irrigation treatments and three replications. Kentucky bluegrass sod was laid on these plots in 1995. Treatments include nitrogen rates of 0, 2, 4, and 6 lbs. per 1000 sq. ft. annually; core cultivation treatments applied 0, 1, or 3 times annually; organic nitrogen or urea as the nitrogen source; and composted yard waste as a source of organic matter. The 3 irrigation treatments are none, daily, or irrigation on the appearance of wilt. Limited data were collected in 1996. The most obvious result is the rather rapid loss of turf color when no nitrogen was applied. This was expected as the subsoil has essentially no organic matter that could serve as a source of nitrogen for the sod.

A companion study on native soil was established in 1996 as well. This project is being supported by the TruGreen/ChemLawn Corporation. The objective is to evaluate the effect of various lawn care management practices on the biological life of the soil. An initial report on this is presented elsewhere in these proceedings (Ravenscroft). Both of these studies will continue for several years to determine the long-term effects of turf maintenance practices.