STOP #6

SITE PREPARATION FOR SODDING

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Roots from sod laid on compacted soil have difficulty penetrating into the soil. Consequently, the sod is slow to establish and tends to be highly susceptible to stress, particularly moisture stress. Soil cultivation can relieve some of the compaction problem but effective cultivation techniques are time-consuming and costly. The main objective of this study is to demonstrate the effects of cultivation technique on the rooting of newly sodded turf.

The technique used in this study involved placing a 1' x 1' sod in a rooting box and allowing it to grow on a treated plot for a specific length of time. The rooting box was then lifted, and the force of extraction recorded. Previous studies have shown that there was a direct correlation between the lifting force and root development, i.e. the greater the lifting force the greater the root development.

TABLE 6. True lifting forces of the rooting boxes of three extractions.

TREATMENTS	MEAN FORCE* (Kg)		
	1st Extraction (1 month growth)	2nd Extraction (2 months growth)	3rd Extraction (10 months growth)
Check	20:59 b**	38.55 c	79.87 b
Compacted	20.29 b	37.95 c	64.61 c
Hollow tine coring	27.85 ab	49.72 b	90.53 ab
Solid tine coring	35.13 a	56.90 ab	97.45 a
Rototilling	34.02 a	60.41 a	84.67 b

* Soil moisture between 10-11% weight in all the extractions.
** Any two means with the same letter are not significantly different at p=.05 by Duncan Multiple Range Test.

The rooting study was established on August 12, 1987, on a sandy loam subsoil at the Hancock Turfgrass Research Center. The study had five treatments and four replications. Treatments consisted of a check (CK), compacted (CO), hollow tine coring (HTC), solid tine coring (STC), and rototilling (RO). A TORO aerifier with half inch solid and hollow tines was used for the coring operations. The experiment was also designed to have three separate extractions. The first set of rooting boxes were lifted on September 9, 1987 (one month after sodding [AS]), the second extraction on October 10, 1897 (two months AS) and the third was on June 21, 1987 (10 months AS).

The results show that after one month, STC and RO promote better root development compared to the other treatments (Table 6). On the other hand, HTC did not have the same shattering effect on the compacted soil and therefore was relatively slower in promoting a good rooting system. Similar root development patterns were observed after 2 months. However, the patterns changed somewhat after 10 months. Root development on HTC plots appeared to

have caught up with STC. The RO plots, on the other hand, showed a reduced increment in root development as compared to STC and HTC. This reduction may be due to the instability of the fine soil aggregates, created by the rototilling effect, which appear to recompact easily. This could lead to a serious, long-term maintenance problem. From the third extraction, the effects of rooting between the CK and CO treatments began to separate out. The results show that, on a longer term basis, compaction did adversely affect root development.

Shortly after the study was initiated, soil strength was measured with a penetrometer. Results showed that the soil strength (resistance to penetration) of noncultivated plots was significantly greater than all cultivated plots.

Conclusion

The study shows that vertical operating cultivation not only offers an alternative to rototilling, it appears to be a more efficient means of soil preparation. Solid tines effectively loosen soil, particularly when soil is moderately dry.