

A third cultivation study, initiated in 1988, examined the effect of hollow tine cultivation (HTC) on shoot and root growth of a heavily compacted "Cheri" Kentucky bluegrass turf. All plots received 6 passes of compaction per week with a Ryan's water filled vibrating roller. HTC was applied on 7/6, 8/10, and 9/28 in 1988. Fresh clippings yields were collected on various dates following each treatment date and are presented in Table 2. Soil core samples were collected and roots were washed free of soil for weight analysis in October, 1988.

Table 2. Clipping yield of "Cheri" Kentucky bluegrass as influenced by hollow tine cultivation (HTC) on 7/6, 8/10 and 9/28 in 1988.

Fresh Clipping Yields								
TREATMENTS	Date							
	7/25	8/10	8/19	8/24	8/31	9/6	9/13	9/26
	g m ⁻² day ⁻¹							
Check	13.7	5.7	8.4	8.3	13.4	7.7	3.6	2.6
HTC	11.1	5.5	5.6	5.7	9.8	6.1	3.2	1.8
L.S.D. (.05)	2.3	NS ^a	2.0	1.4	2.1	NS	NS	NS

a NS denotes not significant

HTC reduced shoot growth up to 3 weeks following the second treatment application when compared to the noncultivated treatment (check). The removal and injury of plant crown tissue with HTC could explain some of the loss in shoot growth. However, the maximum area affected by two HTC treatments is considerably less than the percent clipping yield reductions. In addition to heavy compaction stress, high temperature stress predominated this growing season. It is possible the combination of crown tissue injury, compaction and high temperature stress could have resulted in the greater than expected reduction in yields. Once air temperatures declined no differences were detected between HTC and check plot clipping yields. This data points out that midseason cultivation could be harmful to already weak stands of turf. When considering cultivation the vigor of the turf must be evaluated in order to determine the intensity of cultivation the turf can withstand.

Table 3 presents root data of October, 1988. HTC had no significant effect on total root weight or root weight densities. There was a tendency for more roots to occur in the surface 2 inches, however, this response was not

consistent across all plots. This data suggests that intense cultivation treatment may not have major a impact on root weight in a single season. However, the activity or functioning of the root system following HTC treatment still needs to be evaluated. This research will be continuing.

Table 3. October, 1988 root weight and root weight densities of "Cheri" Kentucky bluegrass as influenced by hollow tine cultivation (HTC) on 7/6, 8/10 and 9/28 in 1988.

<u>TREATMENTS</u>	Total Root Weight	<u>Root Weight Density Zones (cm)</u>		
	<u>0-20 cm</u>	<u>0-5</u>	<u>5-10</u>	<u>10-20</u>
	kg m ⁻²	kg m ⁻³		
Check	0.106 a	1.38 a	0.35 a	0.19 a
HTC	0.115 a	1.57 a	0.36 a	0.19 a
L.S.D. (.05)	NS ^a	NS	NS	NS

a NS denotes not significant

SUMMARY

Cultivation is one cultural practice the turf manager can use to alleviate poor soil conditions associated with compaction. Aerators with wide tine spacings will require several passes to alleviate problems associated with severely compacted soil. Deep tine cultivators, which penetrate compacted zones, can adequately manage deep soil or subsurface compaction. Incorporating soil back into a Kentucky bluegrass turf/thatch with frequent cultivation can enhance turf quality (slightly darker and more uniform color). Prior to performing cultivation the vigor of the turf must be evaluated in order to determine the intensity of cultivation the turf can withstand. Cultivation treatment may not have major a impact on the amount of roots during that season. However, the activity or functioning of the root system following core cultivation treatment still needs to be investigated.