CORING ON GOLF COURSE GREENS

STOP #11

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Compacted soil is a major problem on high use recreational turf. As soil density increases, water and air movement through the soil are reduced. A reduction in water infiltration will increase the chance of water runoff and ponding. Runoff results in an inefficient use of an increasingly valuable resource, water. Ponded water can subject a turf to undo water stress, and the resulting reduced air movement can limit the amount of oxygen reaching the roots. Also, as soil density increases the physical resistance to root growth increases. One practice used to combat compaction is turf cultivation.

Turf cultivation can take on many forms such as coring, spiking, slicing, and subaerification. Each type of cultivation affects the turf and soil below in different ways. Therefore, each method should be evaluated for its effectiveness in achieving the desired results, including, relief of compation, improved rooting, thatch control, and increased water infiltration.

Of all the cultivation practices, coring is probably the most frequently used to alleviate compaction. Coring is the removal of soil cores up to 3 inches in length and from ¼ to 1 inch in diameter.

Some worthy considerations before performing any coring operation are: 1) stress conditions at the time of coring, 2) growth rate of the turf, 3) soil moisture status, 4) the possibility of weed encroachment after coring, and 5) the amount of surface area affected by coring.

Times of minimal stress are best in reducing the amount of injury to a turf during coring. An actively growing turf insures quick recovery from any injury sustained when coring.

Proper soil moisture is important when coring a turf. A very dry and compact soil may not allow the coring tines to penetrate the soil, and also produces excessive shock on machinery. Conversely, too wet a soil can plug tines and the soil will be compressed instead of soil cores being removed.

Coring operations should not coincide with weed seed germination periods. A more favorable environment is provided for weed germination as soil cores are removed and deposited at the soil surface.

Attention must be given to the size and spacing of the tines. Table 12 illustrates the amount of surface area affected by varying tine size and spacing. Depending on the desired results, several passes with a coring unit may be required to achieve the final goal.

Current studies are evaluating the effects of coring when the hollow tines are replaced with solid tines, a method referred to as shattercoring. The idea behind shattercoring is to fracture the soil as the solid tine impacts and penetrates the soil. Preliminary observation suggest that soil moisture content and bulk density strongly influence the effectiveness of shattercoring. A study on a creeping bentgrass green has been designed to examine shattercoring and hollow tine coring under differing soil density and moisture conditions.

Table 12. Percent of surface area affected as influenced by size and spacing of tines.

Diameter of tine	Area of tine	Spacing of tines, inches			
inch	sq. in.	2 x 2	4 x 4	4 x 6	6 x 8
0.25	.05	1.2%	0.3%	0.2%	0.1%
0.5	.20	5.0	1.3	0.8	0.4
0.75	.44	11.0	2.8	1.8	0.9
1.0	.79	19.6	4.9	3.3	1.6