

Turfgrass Cultivation and Compaction

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Soils on which turf is being grown are often quite compacted because of intensive use and maintenance, poor physical properties of soils (especially subsoils), and poor establishment procedures which are far too often utilized. Although nature provides some relief of compacted conditions over time through freezing and thawing, wetting and drying, root growth and other organisms activities (such as earthworms), compacted soil conditions are still common. Coring is one cultivation practiced in an attempt to counteract compaction. A question arises, however, as to whether coring causes compaction of its own.

Penncross creeping bentgrass was seeded on the fine sandy loam in June, 1976. Treatments initiated in 1977 were: 1) coring with 3/8 or 1/2 inch tines using a Ryan's Greensaire at monthly or spring and fall intervals; 2) coring at soil moisture levels of saturation, 10 centibars, and 33 centibars (field capacity); and 3) compacted and uncompacted treatments. After 2 years of treatments no meaningful differences were observed in turf quality or oxygen diffusion in the soil. On the compacted plots there was an increase in soil strength (based on penetrometer readings) compared to uncompacted plots. This response would be expected, of course.

Laboratory studies with the same soil (minus stones) have shown that soil just around the coring hole is more dense than farther from the coring hole. The increase in soil density on the sides was 8% but this effect was dissipated within 12 mm horizontally from the hole. In addition, this soil tends to slough off into the hole with time. At the bottom of the coring hole soil density increased 17% with the one treatment. This area has potential for developing a compacted zone with frequent coring at the same depth over a period of years. The increase in soil density adjacent to the coring hole was less on a more compacted soil.

Although the potential exists for increasing soil density at the bottom of the coring hole we are not about to suggest that coring is a questionable practice. One must determine what is the highest priority among the various alternative practices available. Coring may be the best means of counteracting surface compaction, thus improving infiltration and aeration.