

DEVELOPMENT OF CULTIVATION PROGRAMS ON TURFGRASS TO REDUCE WATER USE
AND IMPROVE TURF QUALITY

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A major cause of deterioration and increased water use on golf course turfgrasses is soil compaction, which limits rooting and reduces water infiltration. Cultivation is the primary means to alleviate soil compaction. Five cultivation techniques were compared for their relative effectiveness under compacted soil conditions to improve soil physical properties and shoot/root growth of common bermudagrass. The techniques were: core aeration, Verti-drain with solid tines to 10 inches, Verti-slicer, solid tine "Agri-Vator", and a new experimental approach by Toro. Compacted and non-compacted treatments were included. The site is a Cecil clay loam, typical of the Piedmont region of the Southeast.

Severe compaction was applied with a smooth power roller in early May and early July with a maintenance level at other times. Cultivation by the various methods was applied the week after the two severe compaction periods.

Plant measurements included: root sampling on 30 June and 12 September at 0-8 and 8-24 inch depths; clipping yield; verdure; visual quality; color, and shoot density. Water extraction from the soil by depth (0-8 inch, 8-24 inch) and evapotranspiration were obtained periodically throughout the season. Oxygen diffusion, bulk density, and water infiltration determinations were also obtained.

Data under preparation and computer analysis include rooting, water extraction, and soil physical properties. Preliminary results on shoot responses indicated that a short term (1-2 weeks) decline in shoot density and quality was apparent from the Verti-slice, Agri-vator, and hollow-time coring treatments. However, after two weeks shoot density and quality were similar to the compacted control.