

Turf Rolling of Greens

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Benefits and Precautions

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Historically, turf rolling was one of the most basic cultural practices utilized in maintenance of turfs and was regularly utilized for many centuries. To this day, frequent rolling at intervals ranging from 7 to 3 times weekly is practiced on high quality bowling greens around the world. In their book "Turf for Golf Courses" published in the 1920s Piper and Oakley stated that rolling is a treatment that should be employed in moderation, especially on putting-greens.

"The popular belief that rolling appreciably promotes the growth of grass has been largely responsible for the liberal use of the roller."

A scientific understanding as to the negative effects of turf rolling on the root zone and indirectly on turfgrass growing conditions evolved in the 1950s. This resulted in a strategy to minimize rolling of putting greens in order to avoid soil compaction problems and resultant lack of aeration that restricts root growth and weakens the turf. These effects are of particular concern on greens constructed of fine-textured, clayey soils.

Turf rolling re-entered the cultural program as an option with the extensive use of high-sand root zones in the construction of putting greens, and this renewed interest is being driven by the desire for fast putting greens. Use of the proper sands, such as the Texas-USGA Method, in root-zone construction results in minimal susceptibility to soil compaction problems. Such root zones may be rolled without imparting detrimental compaction effects, thereby accomplishing improved smoothness and speed of roll. This is of great interest in that the putting speed may be enhanced via turf rolling, which reduces the need to utilize an excessively close mowing height that results in turf thinning and subsequent development of moss and algae problems.

The effects of turf rolling on ball roll distance were assessed with (a) a 3-gang powered mechanical roller by S. Hammon and M. Morris at Crystal Downs C.C., Frankfort, Michigan and (b) a single-weighted powered mechanical walking unit by D. Kenoziorski and J. Holmes at the Grand Traverse Resort, Traverse City, Michigan. The pressure applied was 2.2 kg (4.8 lb) per lateral 25 mm (1 inch) for the former and 5.4 kg (11.9 lb) per lateral 25 mm (1 inch) for the latter. Both experimental sites were constructed of a well-drained, high-sand root zone. The turf was composed of mature *Agrostis stolonifera* subsp. *stolonifera* (creeping bentgrass), that had a minimum mat accumulation.

The non-rolled putting green ball roll distance at the test sites ranged from 2.8 to 3.3 meters (9.3 to 10.7 feet) during the duration of the study conducted in September of 1992. Five experiments were conducted to assess the effects of:

(a) one-time rolled versus not rolled and (b) 4 intensities of rolling. A single turf rolling resulted in a - 300 mm (1 foot) increase in ball roll distance at both locations when assessed in mid-morning of the same day, with a - 150 mm (0.5 foot) increase in ball roll distance persisting through late afternoon of the same day. Comparisons of rolling intensities of 1, 2, 3 and 4 times resulted in enhanced ball roll distance ranging from 10 to 20 percent at both experimental locations. There basically was no significant difference in effect on ball roll distance between the two pressures of 2.2 and 5.4 kg per lateral 25 mm. These data demonstrate a substantial enhancement in putting green ball roll speed from turf rolling, while also greatly improving the smoothness and uniformity of ball roll. These investigations will be continued during 1993.

Two alternatives to turf rolling that may achieve increased putting green speed include (a) excessively close

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mowing and (b) frequent topdressing. However, very close mowing eventually introduces problems in terms of a weakened turf, with resultant thinning that provides openings for moss and algae invasion. Topdressing is more expensive and disruptive of play.

This author first observed a newly developed mobile, mechanically powered turf roller for putting greens over 7 years ago in Melbourne, Australia. It led to authorship of a turf rolling article in the January 1986 issue of *Grounds Maintenance*. Now after 6 years, the interest in turf rolling of high-sand root zone greens has increased to the point that U.S. turf equipment manufacturers are developing powered mechanical models of turf rolls specifically designed for putting greens. A prime time for use of a turf roller to achieve increased smoothness and distance of ball roll is just prior to tournaments. There is a learning curve of proper utilization of a turf roller, as with any cultural practice being considered for routine use. A significant portion of this technical information remains to be generated.

A **primary precaution** in the routine use of turf rolling is to employ it primarily in situations where potential soil compaction is minimal, such as high-sand root zones

of the proper particle size distribution. Soils with significant clay contents have a much greater potential for soil compaction from turf rolling, plus associated problems in maintaining turfgrasses. This may limit turf roller use at a minimal frequency if at all on clayey soils, and, if used, the turf roller selected should impose a lighter pressure than on high-sand root zones.

Based on the studies reported herein, and especially in view of the golfer's desire for fast putting greens, it is evident that turf rolling will become a more important and perhaps a significant routine component in the cultural maintenance program of high-sand putting greens. As with any cultural practice, turf rolling should not be viewed as a panacea to solve a multiplicity of problems. Rather, it is one additional component in a range of cultural practices available to turfgrass managers to produce the highest quality surface on a cost-efficient basis, particularly in relation to the smoothness and distance of ball roll.

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