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Root growth dynamics in golf greens with different compression intensities and winter survival

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Abstract

The aim of this study was to measure root growth dynamics under Nordic putting green conditions in order to estimate the sensitivity of root growth to winter damages and compression. Root numbers of turfgrasses were measured from soil depths of 0–40 cm by minirhizotrons. The minirhizotrons tubes were installed in the most compressed (center) and less walked (edge) parts of putting greens with good or weak winter survival. The highest root numbers were recorded under less walked green edge areas with good winter survival. The lowest root numbers were measured from center areas of greens, especially from areas suffering winter damage in previous years. Morphological parameters of roots were studied by a destructive soil sampling method in midseason 1998. Based on image analysis of washed roots, root length density at soil depths of 0–2.5 cm was 400 cm⁻³ in greens of weak winter survival and up to 900 cm⁻³ in greens of good winter survival. Our findings emphasize that root growth of turfgrasses is highly dynamic and sensitive to compression despite of non significant effects on soil porosity. Reduced root growth of greens with weak winter survival continued despite of recovery of shoot growth.

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