

Carbohydrate Metabolism and Efficiency of PSII in Mown Creeping Bentgrass

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ABSTRACT

Regrowth of leaf tissue after mowing is necessary to form photosynthetic leaf area required for CO₂-assimilation and plant growth and development. Leaf tissue regrowth often is dependent on levels of reserve carbohydrates stored in leaf sheath and leaf bases. The objective of this study was to quantify mowing injury by measuring levels of fructan, sucrose, glucose, fructose, and efficiency of PSII in not-cut, rolled, single-cut, and double-cut creeping bentgrass grown in a greenhouse. Efficiency of PSII was reduced in double-cut grasses by as much as 9% compared to not-cut grasses. Fructan levels were reduced in single- and double-cut grasses compared to not-cut grasses by 52 and 45%, respectively, 36 hours after mowing. Glucose levels were 31% lower in double-cut grasses compared to not-cut grasses. No differences were observed in sucrose and fructose levels among not-cut, rolled, single-cut, and double-cut grasses. Mowing transiently reduced fructan and glucose levels in mowed grasses. Duration of reduction of fructan levels and magnitude of reduction in glucose levels and efficiency of PSII were greatest in double-cut grasses, suggesting that multiple cuttings may be more damaging to plant vigor than single-cutting.