

Examination of Cold Deacclimation Sensitivity of Annual Bluegrass and Creeping Bentgrass

Abstract

Annual bluegrass (*Poa annua* L.) (AB) frequently exhibits increased susceptibility to winter injury compared to other cool-season turfgrass species such as creeping bentgrass (*Agrostis stolonifera* L.) (CB). Interspecific differences in winter survival of these two species may be associated with enhanced sensitivity of AB to decreases in freezing tolerance (deacclimation) during winter and early spring months; however, there is limited understanding of the factors associated with cold deacclimation between these two species. Therefore, the objective of this research was to determine the deacclimation sensitivity of one AB ecotype and one CB cultivar in response to varying temperature increases and durations. Total shoot growth and freezing tolerance (lethal temperature resulting in 50% mortality [LT₅₀]) of AB and CB was monitored throughout cold acclimation (20, 2, and –2°C) and following exposure to a combination of 4, 8, or 12°C for 1 or 5 d. Overall, freezing tolerance of AB (LT₅₀ of –17.7°C) was significantly lower than CB (LT₅₀

of -21.2°C) following cold acclimation, and in general CB maintained higher levels of freezing tolerance throughout deacclimation compared to AB (LT_{50} of -16.2 and -12°C , respectively). Both AB and CB exhibited deacclimation in response to above-freezing temperatures; however, the threshold temperature required to induce greater losses in freezing tolerance was lower for AB compared to CB. Specifically, a 2.5-fold greater loss in freezing tolerance was detected in AB compared to CB following exposure to 4°C . Furthermore, total shoot growth and LT_{50} were correlated during deacclimation in these species.

Please view the pdf by using the Full Text (PDF) link under 'View' to the left.

Copyright © 2014. . Copyright © by the Crop Science Society of America, Inc.