

Examination of Cold Deacclimation Sensitivity of Annual Bluegrass and Creeping Bentgrass

Lindsey Hoffman, Michelle DaCosta, and Scott Ebdon

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 among 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, LT_{50}) 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 (LT_{50} of -17.7°C) was significantly lower than CB (LT_{50} 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). Acclimated AB exhibited a 2.5 fold greater loss in freezing tolerance compared to CB during the early stages of deacclimation in response to thawing temperatures at 4°C . Furthermore, total shoot growth and LT_{50} were correlated during deacclimation in these species.