ROLE OF ABA IN BERMUDAGRASS COLD ACCLIMATION AND FREEZING TOLERANCE
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Abscisic acid (ABA) has been shown to play an important role in responses to low temperature and has been associated with enhanced freezing tolerance in some plant species. Our research objective was to investigate whether there is an association between stolon ABA content during cold acclimation (CA) and freezing tolerance of bermudagrass cultivars commonly used on sports turf surfaces. Two relatively cold-sensitive (‘Tifway’ and ‘Princess’) and two cold-tolerant (‘Patriot’ and ‘Riviera’) cultivars were either subjected to CA at 8/4 °C (d/n) for 21 d or maintained at 28/24 °C. ABA content in leaf and stolon tissues increased sharply during the first week of CA and remained relatively stable thereafter. Patriot and Riviera had greater ABA content and improved freezing tolerance relative to Tifway and Princess. Expression of a 25-kDa dehydrin protein increased during CA in all four cultivars. A significant correlation was found between ABA content and freezing tolerance. In a companion trial, exogenous ABA application on non-CA Patriot was also shown to increase dehydrin expression and freezing tolerance.