Nutritional and PGR effects on lipid unsaturation, osmoregulant content, and relation to bermudagrass cold hardiness.

by

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(ABSTRACT)

Winter injury of bermudagrass (*Cynodon spp.*) continues to be a problem across the transition zone. In an attempt to delay or induce winter dormancy while maintaining cold hardiness, applications of seaweed extract (SWE) (0.54 kg ha^{-1}), ethephon (16 L ha^{-1}), Fe (1 kg ha^{-1}), and N (49 kg ha^{-1}) took place every three weeks during the fall of 2001 and 2002. Cultivars examined included 'Riviera', 'Midiron', 'Princess', and 'Tifway'. Tifway exhibited greatest fall color retention in both years of the study. Ethephon promoted early senescence and turfgrass quality during fall ratings in both years of the study while N, Fe, and SWE increased quality over the control in 2001 and only N showed better quality and color retention over the control in 2002. Samples removed from cold acclimated plots were artificially frozen as a measure of cold hardiness. Treatments did not have an effect on post freeze regrowth, however, cultivar was significant in both years. Midiron showed best regrowth followed by Riviera, Tifway, and Princess. In both years Riviera and Midiron displayed the quickest and greatest amount of spring greenup followed by Tifway and then Princess. Ethephon reduced greenup in both years and SWE, Fe, and N showed no differences from the control in 2001 and Fe showed significantly better greenup in 2002. Proline and Linolenic acid levels were highest in Midiron, followed by Riviera, Tifway, and Princess. Nitrogen, SWE, and Fe generally did not have an effect on linolenic acid and no consistent effects were noted on proline concentration. Ethephon treatments did not have an effect on linolenic acid levels, however, there was a negative effect on proline concentrations. The results of this study indicate that judicial N applications during the fall can promote color retention and do not have a negative effect on bermudagrass cold-tolerance. Linolenic acid and proline findings also help to explain differences in cold-tolerance between different bermudagrass cultivars.