Relationship Between WUE, 13C Discrimination, and Turf Performance in Genotypes of Kentucky Bluegrass During Drought. (C05-ebdon105446-Oral)

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Abstract:

13C isotope discrimination (CID) has been shown to be correlated with water use efficiency (WUE) and has been proposed as a screening method for selecting plants for moisture limiting environments. Turfgrass WUE, however, has been largely ignored. This study compared CID, WUE, rooting potential, and evapotranspiration (ET) in 12 Kentucky bluegrass (KBG) cultivars during drought imposed in the greenhouse. KBG was maintained at a 5 cm mowing height in 20 cm diam. by 65 cm deep lysimeters filled with 90-7-3 (sand-silt-clay, %) artificial rootzone. Rooting activity was measured as changes in volumetric soil moisture content (VSMC) using 17.5 cm length TDR rods inserted horizontally at 4 depths (8.25, 17.5, 35, and 52.5 cm). Drought resistance was assessed visually using wilting (%) and leaf firing (LF, %). Late in the dry down (days 9 to 12), less LF in KBG was correlated with higher WUE (clipping dry wt. to ET ratio, $r= -0.83$, $p< 0.001$), greater changes in VSMC at 35 cm ($r= -0.70$, $p< 0.05$) and 52.5 cm ($r= -0.90$, $p<0.001$) depths, and maintenance of ET (higher ET, $r= -0.93$, $p< 0.001$). Similar results were found with wilting at days 5 to 8 of the dry down. Results from 13C analysis will be discussed in relationship to WUE and turf performance during drought.

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Presentation Information:

Presentation Date: Tuesday, November 12, 2002
Presentation Time: 10:15 am

Keywords:

Water Use Efficiency, 13C Discrimination, Kentucky Bluegrass, Drought