Creeping Bentgrass Growth and Physiological Responses to Temperature. (C05-knievel091652-Poster)

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Abstract:

Penncross (PC), Penn-A4 (A4), and Pennlinks (PL) creeping bentgrass were grown from 14 to 40C. Shoot growth rate was highest (7 to 8 g m-2 d-1) at 14C to 22C, but declined with increasing temperature to 3g m-2 d-1 after 6 days growth at 40/36C. A4 had a lower photosynthetic rate than PC or PL (19.4, 21.2 and 20.4 mmol m-2 pot area s-1, respectively). PL had the highest respiration rate followed by PC and A4 (18.9, 17.6 and 15.8 mmol m-2 s-1, respectively). Turf evapotranspiration increased from 4.8 to 12.3 mmoles m-2 pot area s-1 with increasing temperature. Chlorophyll fluorescence (Fv/Fm) declined from 0.754 at 22C to 0.309 at 40C and with exposure duration at 35 and 40C. Shoot growth rate and Fv:Fm ratios declined about 60% for the three bentgrasses from the coolest to warmest temperatures while photosynthetic rate declined 35%. This suggests to me that carbon fixation was not closely coupled to photosystem II energy efficiency and that the decline in growth of these bentgrasses with exposure to high temperature was linked more with processes of carbon utilization than with processes of carbon fixation.

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