Selection for Dehydration Avoidance Mechanisms in Tall Fescue and Perennial Ryegrass. (C05-bonos194708-Poster)

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Abstract:

The selection of germplasm with improved drought avoidance characteristics will play an important role in developing tall fescue and perennial ryegrass with better drought tolerance. The objectives of the study were to: 1) determine realized heritability after two cycles of selection for low shoot: root ratios and increased root mass in the lower soil profile and 2) determine the feasibility of selecting plants for germination ability in a high negative water potential (polyethylene glycol -PEG) solution. Seeds from tall fescue and perennial ryegrass populations as well as standard cultivars of each were germinated in 29.5% and 26.5% PEG-8000, respectively. The vigorous seedlings were transferred to flexible root tubes, 63.5 cm long and filled with silica sand, to evaluate for deep root production in the greenhouse. Analysis of variance for clipping yields and root weights (bottom 30 cm) were used to select the top 12.5% of the populations. Gain from selection for high root weight in the lower soil profile, without dramatically increasing shoot weight, was between 40% - 80% in tall fescue and 130% in perennial ryegrass. This technique should be very successful in developing low-growing turfgrasses with improved drought avoidance characteristics.

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