

## Scientists get to the root of tall fescue yield, quality

ATLANTA, Ga. — U.S. Department of Agriculture researchers, in cooperation with Auburn University, are identifying root system characteristics that will improve tall fescue's forage yield and quality, according to C. Bruce Williams.

Tall fescue is a cool season perennial grass utilized for pasture, hay, and erosion control throughout much of the United States. Forage yield and quality is often limited by poor physical and

chemical conditions. At times during the year, the plant is unable to supply grazing animals with sufficient magnesium which results in grass tetany.

Speaking at the American Society of Agronomy meeting, Williams said that "the root system of tall fescue is an important but often ignored portion of the plant. Therefore, the isolation of tall fescue plants which have root systems enabling penetration of compacted soils, efficient soil

water use, and high nutrient uptake is the first step toward more efficient crop production."

Williams, a research agronomist with USDA's Agricultural Research Service at Auburn University, Ala., says "the methods used in the study will enable plant breeders to more efficiently select for planting tall fescue with superior root systems."

Citing that root growth is difficult to evaluate under normal

conditions, he described how growth containers were designed to permit detailed root observations. Many plant characteristics were measured, such as root diameter, root number, root and shoot weights, and mineral composition of the plants.

Williams reports that these and other studies indicate that the large-diameter root is beneficial in increasing persistence and drought tolerance, even though large roots reduce mineral uptake.

For optimum uptake of essential minerals, he stressed that while root system characteristics are under genetic control, soil and climatic environment appear to greatly influence the expression of some root traits.

Other members of the research team were research associate Cliff G. Currier, ARS soil scientist Charles B. Elkins, University of Georgia agronomy professor Carl S. Hoveland, and former Auburn University agronomy associate professor Ron L. Haaland.



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