Synopsis for Landscape Architects, Designers, Managers, and Golf Course Grounds Superintendents

RTF® Water Saver® Sod

Effect of Root System on Drought Tolerance and Soil Physical Properties

By Devesh Singh, Barenbrug USA, Director of Research

RTF® Water Saver® sod consists of Barenbrug's best performing tall fescue varieties in the National Turf Evaluation Program (NTEP) trials. These tall fescue varieties have been selected for their high turf quality under various environmental conditions, including moderate and extreme soil moisture stress. They exhibit high tolerance to wilting and turf dormancy under drought conditions. These tall fescue varieties also are chosen for rapid recovery if the turf is subjected to extreme drought conditions.

Performance of tall fescue cultivars under drought and its correlation with the deep and vast root system of tall fescue is well documented in the scientific and extension publications[1,2,3].

The magnitude of differences in drought avoidance and drought resistance characteristics among tall fescue cultivars is directly correlated to differences in root length density and total root length[1]. Total root length of tall fescue is 180 to 270% greater and root extension 29 to 63% deeper than most warm season grasses[2]. Warm season grasses such as Bermuda grass have long been recognized as an efficient user of water. Tall fescue can extract over 50% more water than Bermuda grass and zoysiagrass. The deep and extensive root system of tall fescue cultivars is a very important component of leaf wilt resistance under drought[2].

An extensive root system makes tall fescue valuable in nutrient recycling systems and protection of groundwater from nitrate contamination[3]. This deep, fibrous root system makes it effective for reducing surface soil erosion by anchoring the plant in the soil. The roots decrease soil density, improve soil structure, and prevent erosion[3].

The rate of movement of water into a soil is called the infiltration rate. A dense thatch layer can severely reduce water infiltration rates[4] leading to loss of water due to evaporation. Thatch accumulation is higher in turfgrasses with too dense of a canopy e.g., bentgrass, Kentucky bluegrasses and perennial ryegrass. However, the tall fescue canopy is more open and less prone to thatch accumulation. Still, cultivation (aeration, vertical mowing, and topdressing) provides an effective means of removing and controlling thatch accumulation in turf if needed[4].

The turfgrass root zone is a unique soil system. A healthy turf root zone will help improve soil structure and reduce soil compaction, thus allowing greater infiltration of rain or irrigation[5].

Top performing tall fescue grass varieties in RTF Water Saver sod perform superbly under drought conditions due to their deep and vast root systems. They also promote the soil's physical properties including water infiltration.

RTF Water Saver sod includes traditional tall fescue varieties of Water Saver along with a new variety, Labarinth. The unique characteristic of Labarinth is its ability to produce high number of rhizomes (underground stems), which store carbohydrates and increase heat and wear tolerance. Rhizomes allow the plant to spread and fill bare spots through its growing points underground. Labarinth was developed from Mediterranean germplasm with inherent ability to survive drought and heat.

For more information go to www.aboutRTF.com.

[1] Carrow, R.N., 1996. Drought avoidance characteristics of diverse tall fescue cultivars. Crop Science. 36 (2): 371-377.
[2] Qian, Y.L., J.D. Fry, and W.S. Upham. 1997. Rooting and drought avoidance of warm-season turfgrasses and tall fescue in Kansas. Crop Science. 37 (3): 905-910.
[3] Hannaway, D., S. Fransen, J. Cropper, M. Teel, M Chaney, T. Griggs, R. Halse, J. Hart, P. Cheeke, D Hansen, R. Klinger, and W. Lane. 1999. Tall Fescue (*Festuca arundinacea* Schreb.). Pacific Northwest Extension Publication 504. pp. 14.
[4] Duble, Richard L., Water management of turfgrasses. http://aggie-horticulture.tamu.edu/plantanswers/turf/publications/water.html
[5] Mugaas, R.J., M.L. Agnew, and N.E. Christians. 1997. Turfgrass management for protecting surface water quality. University of Minnesota Extension Service Publication BU-05726.