UNIVERSITY OF GEORGIA

SEEDED BERMUDAGRASS PERFORMANCE, WATER USE, AND ROOTING AS AFFECTED BY TRAFFIC AND NITROGEN

1993 Research Grant: $12,273
(First year of support)

Dr. Robert N. Carrow
Principal Investigator

A primary objective of the USGA-supported turfgrass breeding programs is to develop grasses with high drought resistance including low evapotranspiration (ET). Also, the USGA stated as a goal the development of basic cultural program/adaptation data on turfgrasses to be released. This would insure rapid acceptance of these grasses by golf course superintendents and other growers. The seeded bermudagrass project objectives will result in data directly related to the above-mentioned USGA goals.

a) ET, drought resistance, rooting/water extraction patterns and shoot responses will be determined under field conditions. These data are essential if the USGA is to substantiate that their turfgrasses are truly superior in these characteristics. In this project, a soil is used that imposes two of the major soil stresses (i.e., high soil strength and Al toxicity) that may produce differential rooting responses from the bermudagrasses. Any bermudagrass cultivar able to develop a deep and extensive (i.e., high root length density) root system, will have a major drought avoidance advantage.

b) Basic cultural programs (fertility, disease/insect, traffic tolerance) will be defined.

c) Data obtained in Georgia can be compared to similar data in Oklahoma to determine environmental stability of these grasses with respect to environment, disease, and insect pressures.

Nine seeded bermudagrass experimentals from Dr. C. M. Taliaferro's USGA supported breeding program and two commercial seeded bermudagrass cultivars (AZ common, Primavera) were seeded at 1.25 lb/1000 ft^2 PLS on 8 June 1993. The experimental cultivars were: 91-1, 91-2, 91-3, 91-4, 91-10, 91-12, 91-14, and 91-15. By mid-fall 1993, >90% coverage was observed for 91-2, Primavera, 91-1, and AZ common with least for 91-14 (68%). Highest shoot density occurred on 91-15, 91-2, 91-1, and Primavera with lowest on 91-12 and 91-14. Traffic and N-program treatments will be initiated in April 1994.

Oct. 1993

Annual Progress Report

SEEDED BERMUDAGRASS WATER USE, ROOTING AND SHOOT GROWTH UNDER SOIL STRESSES

University of Georgia
Griffin, GA

Dr. Robert N. Carrow
Principal Investigator

1993 Research Grant: $12,273
(First Year of Support)

A primary objective of the USGA-supported turfgrass breeding programs was to develop grasses with high drought resistance including low evapotranspiration (ET). Also, the USGA stated as a goal the development of basic cultural program/adaptation data on turfgrasses to be released. This would insure rapid acceptance of these grasses by golf course superintendents and other growers. The seeded bermudagrass project objectives will result in data directly related to the above-mentioned USGA goals.

a) ET, drought resistance, rooting/water extraction patterns and shoot responses will be determined under field conditions. These data are essential if the USGA is to substantiate that their turfgrasses are truly superior in these characteristics.

b) Basic cultural programs (fertility, disease/insect, traffic tolerance) will be defined. Criteria to determine the "best" cultural programs will not be limited to shoot responses but will entail rooting and ET influences.

c) Data obtained in Georgia can be compared to similar data in Oklahoma to determine environmental stability of these grasses with respect to environment, disease, and insect pressures.

In this project, a soil is used that imposes two of the major soil stresses (i.e., high soil strength and Al toxicity) that may produce differential rooting responses from the bermudagrasses. Any bermudagrass cultivar able to develop a deep and extensive (i.e., high root length density) root system, will have a major drought avoidance advantage.

Nine seeded bermudagrass experimentals from Dr. C. M. Taliaferro's USGA supported breeding program, and two commercial seeded bermudagrass cultivars (AZ common, Primavera) were seeded at 1.25 lb/1000 ft^2 PLS on 8 June 1993. The experimental cultivars were: 91-1, 91-2, 91-3, 91-4, 91-10, 91-12, 91-14, and 91-15. During establishment, the grasses received fertilization as follows: 0.5 lb N/1000 ft^2 as 33-0-0 at seeding, 1.0 lb N 1 July (10-10-10), 1.0 lb N (33-0-0) 1 August, and 1.0 lb N (10-10-10) 2 September. Mowing was at 1.0 inch with clippings returned in 1993, but will be lowered to 0.63 inch thereafter. In October, boxes were installed for TDR soil moisture probes.

In April 1994, the three annual N treatments (2.0, 4.0, and 6.0 lb N/1000 ft^2) will be initiated, as well as the three traffic treatments (none, soil compaction, wear plus compaction). Thus, water use and rooting data can be collected in 1994.

Establishment year data are presented in Table 1. The summer of 1993 was drier than normal. Most rapid coverage occurred for Primavera, 91-2, 91-1, and AZ common, while least were 91-14 and 91-12. By mid-fall, highest shoot density on areas with full coverage was evident for 91-15, 91-2, 91-1, and Primavera, and lowest for 91-12 and 91-14. Color was starting to decrease with somewhat cooler fall temperatures. Best color was on 91-3, 91-4, and 91-14, with least on Primavera and 91-3. On uniformly covered sites, highest quality was exhibited by 91-3 and 91-2, and lowest by 91-12 and 91-14 (significantly different at 10% level).