Forage Research in Texas

1982

Evaluation of Bermudagrass Hybrids

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SUMMARY

Twenty-two new bermudagrasses and three standards were established in a replicated test in 1980. Due to weed competition and a very dry summer in 1980, some of the sources did not become well established until 1981. Yields in 1981 ranged from less than 2 tons to more than 8 tons per acre. Forage digestibility which is one of the important characteristics averaged from 50% for Coastal to 62% for the top ranking source. None of the sources ranked at the top for both yield and quality, though several sources exceeded Coastal in both characteristics. Most of the highest quality sources were damaged by low temperatures in the 1981-82 winter. Further evaluations are needed to identify the best combinations of yield, forage quality, cold tolerance and ground cover density.

Introduction

Bermudagrass is the most important tame pasture grass in Texas, and Coastal is by far the most important improved variety in terms of total acreages. Research in recent years has shown that forage quality in bermudagrass can be improved through breeding. Improved quality is reflected in turn in increased animal performance. The important characteristics of an improved bermudagrass cultivar are higher dry matter digestibility, winterhardiness, ground cover density and stand maintenance under grazing, and yield. Coastal bermudagrass is a highly productive cultivar with adequate winterhardiness for most of the state and adequate ground cover to resist common bermudagrass invasion even under intensive grazing. Thus, Coastal serves as a standard for these characteristics. The major improvement needed over Coastal is forage quality and winterhardiness for North Texas.

A study was initiated in 1980 to evaluate 22 new genotypes of bermudagrass for the characteristics described above.

Experimental Procedure

Twenty-two genotypes of bermudagrass not previously evaluated in Texas were made available for study in the spring of 1980. Fourteen of these are hybrids from the USDA bermudagrass breeding program at Tifton, Georgia (Dr. G. W. Burton) and eight originated from a field where an observation nursery had been grown previously on the J. Pybas ranch near Gainesville, Texas as types surviving two preceding severe winters.

KEYWORDS: Bermudagrass genotypes, yield, IVDMD, winter damage.

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Four rooted sprigs were planted four feet apart in the center of 6 x 20 foot plots, 4 replications, on June 4, 1980. The plot area was treated with a preemergence herbicide following sprigging, but prostrate milkweed developed and competition retarded spread and ground cover development, especially in the slow spreading genotypes.

The test was harvested five times in 1981: May 13, June 30, July 30, September 11, and November 19. Nitrogen was applied at the rate of 60 pounds per acre in late March and following the June 30 and September 11 harvests. Forage samples were saved from each harvest and analyzed by the in vitro technique for dry matter digestibility.

Results and Discussion

Forage yields (total of 5 cuttings) ranged from 8.7 tons per acre to less than 2 tons per acre. Yield data were variable probably because of inadequate establishment of some genotypes at the time harvesting was initiated. Statistically significant differences occurred only between the highest yielding genotypes and a few of the lowest yielding genotypes.

Forage quality, averaged for the five cuttings, ranged from 62.0% IVDMD to 49.8 or more than a 12-unit difference. All of the genotypes exceeded Coastal numerically but only the extremes were statistically significant.

None of the sources were ranked at the top for both yield and quality. The highest yielding source (P-7) was ranked 21 in quality, and the highest quality source (B-2) was ranked 18 in yield. Several of the higher quality genotypes exceeded Coastal in yield. Several of the genotypes show promise for improvement over Coastal in both characteristics.

Because several of the plots were not well established until late in the season, it seems likely that yield rankings will change in 1982. For the same reason, ground cover density ratings were delayed until 1982.

The plots were rated on April 1, 1982 for relative amount of winter damage. It is obvious that the highest quality materials encountered considerable winter damage. Low temperatures on January 13-14 were 6 to 7^{o} F. Damage seemed to be more severe in this test than in adjacent areas in that Coastal and Brazos showed no damage in three other tests. The late cutting (November 19) may have been a contributing factor to winter damage on some of the new materials. However, late defoliation did not result in damage to Coastal and Brazos in other tests.

Table 1. Forage yield and quality of bermudagrass hybrids, Brazos River bottom near College Station, 1981

Hybrid or genotype	Total yield and (rank) tons/acre	IVDMD and (rank) %	Winter damage rating (1=none)	Recovery 4/30/82 (1=good)
B-1	8.2 (4)	57.4 (10)	8.5	4.8
B-2	5.7 (18)	62.0 (1)	7.8	4.5
B-3	7.0 (13)	61.9 (2)	7.0	3.3
B-4	7.2 (12)	59.4 (5)	5.8	3.3
B-5	3.0 (22)	61.5 (3)	9.7	5.0
B-6	8.6 (2)	57.0 (9)	6.0	3.0
B-7	7.7 (10)	55.4 (14)	5.3	2.8
B-8	6.2 (17)	58.9 (6)	7.5	3.0
B-9	7.7 (8)	59.5 (4)	7.8	4.0
B-10	5.4 (19)	57.0 (9)	2.5	1.8
B-11	4.0 (21)	54.8 (17)	5.0	3.5
B-12	7.9 (7)	56.5 (12)	5.3	2.5
B-13	8.3 (3)	56.8 (11)	4.3	2.8
B-14	8.0 (6)	58.2 (8)	4.0	2.0
P-1	8.2 (4)	55.2 (15)	1.3	1.0
P-2	8.0 (5)	55.5 (13)	1.3	1.0
P-3	8.0 (5)	53.9 (20)	1.3	1.0
P-4	7.2 (11)	54.1 (18)	1.3	1.0
P-5	7.7 (9)	54.9 (16)	1.3	1.0
P-6	6.9 (14)	54.9 (16)	2.3	1.0
P-7	8.7 (1)	52.7 (21)	1.8	1.0
P-8	6.5 (16)	55.5 (13)	2.8	1.8
Costal	6.5 (15)	49.8 (22)	4.0	2.0
Tifton 44	1.9 (23)[1]	54.0 (19)	2.0	3.0
Brazos (SS-16)	4.3 (20)[1]	58.5 (7)	4.3	2.3
LSD	4.1	9.1		

[1] Plots did not become well established until after the third planting.