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Sex Expression in Texas Bluegrass

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Summary

Fifty plants of Texas bluegrass (*Poa arachnifera* Torr.) were established in a space plant nursery at the Texas A&M University Research and Extension Center at Dallas to evaluate this grass as a cool-season perennial forage crop. This accession TBPC 1-86 was collected in 1986 10 miles South of Stephenville. There were 22 dioecious plants (12 male and 10 female) 27 monoecious plants, and 1 had no panicles.

Introduction

Texas bluegrass (*Poa arachnifera* Torr.) is a dioecious cool-season perennial with long slender rhizomes. Gould (1975) reported that this grass occurs in regions 1, 2, 3, 4, 5, 7, and 8 of Texas. The only regions it does not occur in are the High Plains, Trans-Pecos, and South Texas Plains. Chase, in Hitchcock's Manual (1951), reported the distribution as "Prairies and plains, southern Kansas to Texas and Arkansas; introduced eastward to North Carolina and Florida; Idaho. Sometimes cultivated for winter pasture."

The accession TBPC 1-86 was collected as seed 10 miles south of Stephenville in 1986. This material had survived several years of very heavy grazing and its existence was not known until after cattle were removed in fall 1985 and the subsequent seed head formation the following spring. There had been no fertilizer added to this pasture for at least 10 years.

Procedure

Seeds were planted in June 1986 in a mixture of 1:1 of peat moss and perlite in a flat. Fifty plants were then transplanted into one gallon plastic pots in the same media used for germination of the seed and were grown in a greenhouse. In December 1986 the plants were randomly divided into 10 different groups to test for vernalization. One group was left in the greenhouse at temperatures ranging from 65°F to 85°F. The other four groups were placed in a vernalization chamber used to vernalize wheat. The chamber was maintained at 35°F + 3°F with continuous light. Starting at 4 weeks, one group was removed from the chamber each 2 weeks and returned to the greenhouse. None of the plants were vernalized with this treatment so no flowering occurred the first year. In October 1987 the plants were transplanted to a space plant nursery in the field on 3-ft centers. The nursery was fertilized at a rate of 100 lbs/A with 18-46-0 in the fall and with 100 lbs/A with 33.5-0-0 in March.

In April when the plants were at anthesis the number of panicles with pistillate and staminate spikelets were counted on each plant. A paired t test was conducted to determine if there were significantly more male or female panicles. The percent female panicles per plant was calculated using PC SAS and a bar graph prepared using Sigma Plot.

Results and Discussion

It is not known why the Texas bluegrass plants were not vernalized in the wheat vernalization chamber. However, when the plants were grown under field conditions vernalization was obtained.

There were a total of 729 staminate panicles and 1,012 pistillate panicles, but this difference was not significantly different. The panicles were either staminate or pistillate with no staminate and pistillate florets occurring on the same panicle. No perfect flowers were observed. Figure 1 shows the frequency of female panicles expressed as percent females. There were 22 plants that were dioecious and 27 that were monoecious. Twelve of the dioecious were males and 10 were female. The sex expression in Texas bluegrass is very similar to that reported in buffalograss by Huff and Lin Wu (1987).

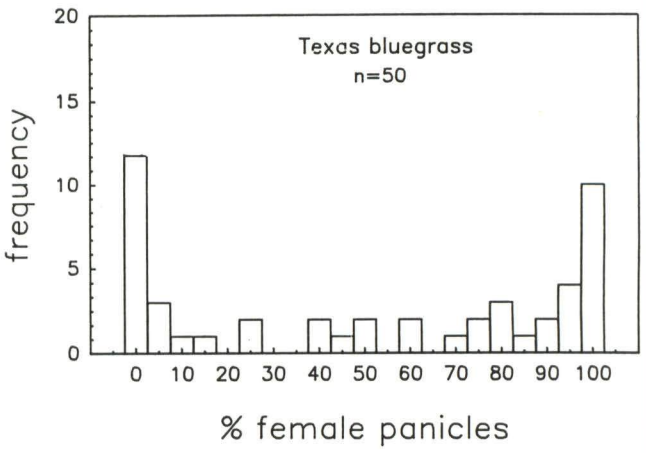

Figure 1. Frequency distribution of percent female panicles of Texas bluegrass plants. Male plants have a value of 0 percent and female plants have a value of 100 percent.

Literature Cited

1. Gould, F. W. 1975. The Grasses of Texas. Texas A&M University Press, College Station. 651 p.
2. Hitchcock A. S. 1950. Manual of the grasses of the United States. U.S. Government Printing Office, Washington. 1051 p.
3. Huff, D. R. and L. Wu. 1987. Sex expression in buffalograss under different environments. Crop Sci. 27: 623-626.