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Influence of Stubble Height and Growth Stage at Harvest on Gordo Bluestem Production

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Summary

'Gordo' bluestem (*Dichanthium aristatum*) was subjected to eight hay harvest treatments for 2 years in southeast Texas. Plots were harvested at four growth stages ranging from an 18-in. plant height to boot stage. Each growth stage was also harvested at a 2- or 6-in. stubble height. Total yields increased with advancing growth stage up to a plant height of 34 to 36 in. There was a yield advantage with the 2-in. stubble height when cut at the two earliest growth stages. Gordo bluestem should be harvested at a 2-in. stubble height when it reaches a height of 24 to 30 in.

Introduction

Gordo bluestem is a warm-season perennial grass used primarily as a hay crop in southeast Texas. Its growing area is limited to south of Interstate Highway 10 because of its limited cold tolerance. Although Gordo bluestem has been grown in the area for more than 40 years, there is little published information to document proper hay harvest management. We harvested Gordo bluestem at a 2- and 6-in. stubble height at four growth stages for 2 years.

Procedure

The test site consisted of a Gordo bluestem hay meadow on a clay loam soil near Lake Texana in Jackson County. Soil analysis indicated a pH of 7.0 with 1, 1, and 361 ppm of nitrogen (N), phosphorus (P), and potassium (K), respectively. The area was mowed to a 2-in. height on April 19, 1989, using a flail mower with a catch box to remove weeds and

old Gordo bluestem growth. At that time, 50 lb N/A and 75 lb P/A were applied, and an additional 50 lb N/A were applied on July 17.

Harvest treatments were cutting to a 2- or 6-in. stubble height when Gordo reached 18-, 30-, or 34-in. high, or the boot stage. The last harvest was taken on all treatments on November 15, 1989. The following year, weeds were cleaned off the same plot area by mowing at a 2-in. stubble height on April 24, 1990. At that time, 50 lb N/A and 70 lb P/A were applied. An additional 50 lb N/A were applied on June 29 and August 15. Plant height at harvest was modified the second year to 18, 27, and 36 in. and boot stage. The last harvest was made on October 31, 1990, on all treatments.

Experimental design was a randomized complete block with four replications and a plot size of 6 x 15 ft. A 3-ft strip was harvested from the center of each plot with a flail mower at the appropriate growth stage and stubble height. A subsample of the harvested forage was dried for 48 hours at 150 °F to determine dry matter percentage.

Results and Discussion

In 1989, the first harvest was not made until July 17 because of a dry spring and poor spring growth (Table 1). Gordo bluestem typically initiates growth in April but has a slow growth rate until late May or early June (Evers, 1992). Yield increased substantially by delaying the initial harvest to a later growth stage. Although no forage quality measurements were made on the harvested forage, digestibility and protein content would be expected to decrease with plant maturity (Dabo et al., 1988). There was no regrowth on treatments harvested on September 20 or later because of poor moisture conditions in the autumn. Yields of the other treatments at the last harvest were low, which also

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reflects the poor moisture conditions in 1989. Total yields for the season increased with advancing growth stage at harvest up to the 34-in. height.

Rainfall was above average in 1990, which resulted in higher forage production (Table 2). Yields at the initial harvest increased with advancing growth stage except for the boot growth stage, 6-in. stubble height treatment. Cutting at the 2-in. stubble height provided a significant yield advantage except at the 36-in. growth stage. There were no significant yield differences between the 18-

and 27-in. growth stages at the same stubble height. Delaying harvest until Gordo bluestem was 36 in. tall increased yield only about 1,000 lb/A at the 2-in. stubble height. The reason for the decrease in yield from the 36-in. to boot growth stage at the 6-in. stubble height is not known. Considering the expected decrease in forage quality with plant maturity, harvesting Gordo bluestem at a plant height of 24 to 30 in. to a 2-in. stubble height would be a good compromise between yield and forage quality.

Table 1. Response of Gordo bluestem to cutting frequency and cutting height, 1989.

Growth stage	Stubble height	Harvest date						Total	
		July 17	Aug. 2	Aug. 29	Sept. 20	Oct. 17	Nov. 15		
	in. Dry matter yield (lb/A)							
18 in.	2	1591			2784		†	4375	e*
18 in.	6	796		2417		1124	†	4337	e
30 in.	2		4320				1888	6208	c
30 in.	6		3261				2001	5262	d
34 in.	2			6458			737	7195	ab
34 in.	6			6309			823	7132	b
boot	2				7898		†	7898	a
boot	6				7023		†	7023	b

* Yields followed by the same letter are not significantly different at the 0.05 level, Waller-Duncan K-ratio T test.

† No regrowth.

Table 2. Response of Gordo bluestem to cutting frequency and cutting height, 1990.

Growth stage	Stubble height	Harvest date						Total	
		June 29	July 27	Aug. 6	Aug. 15	Sept. 24	Oct. 31		
	in. Dry matter yield (lb/A)							
18 in.	2	1610		4356			4406	10,372	c*
18 in.	6	765	1835			4022	60	6,682	e
27 in.	2		5812				4769	10,581	c
27 in.	6		4089				3469	7,558	e
36 in.	2			7589			4034	11,623	b
36 in.	6			7834			3351	11,185	bc
boot stage	2				8145		4511	12,656	a
boot stage	6				5765		3246	9,011	d

* Yields within a column followed by the same letter are not significantly different at the 0.05 level, Waller-Duncan Multiple Range Test.

Acknowledgment

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Literature Cited

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