

Seasonal Growth and Nutritive Quality of 7 Warm Season Perennial Grasses in the Texas Rolling Red Plains

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Introduction

Nutritive quality of grass is important to livestock producers as they make pasture and grazing management decisions based on the nutritional needs of the grazing animal. Understanding growth and nutritive quality of warm season grasses is needed in the Texas Rolling Red Plains to assist livestock producers with forage management options. Our study objective is to compare the seasonal growth and nutritive change of seven warm season perennial grasses to determine optimum forage harvest and grazing times to meet nutritional needs of different beef cattle.

Materials and Methods



The study was conducted at the USDA-NRCS James E. "Bud" Smith Plant Materials Center, Knox City, Texas on a Miles fine sandy loam soil.

Grasses were drilled in May 2006 using NRCS seeding rate recommendations for Texas.

7-ft x 32-ft plots were arranged in a randomized complete block with 3 replications. Nitrogen was applied at 0 and 60 lb/acre at the 3rd leaf stage.

Plots were divided into 8 quadrants. Each quadrant represents a monthly clipping date of April to November. Growth stage and plant height measurements were collected prior to harvest.

Warm Season Grass Cultivars



'Earl' big bluestem (*Andropogon gerardii*)



'Lometa' Indiangrass (*Sorghastrum nutans*)



'Haskell' side oats grama (*Bouteloua curtipendula*)



Grass samples were collected for nutritive quality estimates every 30 days using a 50-cm x 50-cm sampling frame.



'Alamo' switchgrass (*Panicum virgatum*)



'San Marcos' eastern gamagrass (*Tripsacum dactyloides*)



'Selection 75' kleingrass (*Panicum coloratum*)



Upland switchgrass (*Panicum virgatum*)

Plant Height and Growth Stage of Warm Season Grass Species by N Rate and Month

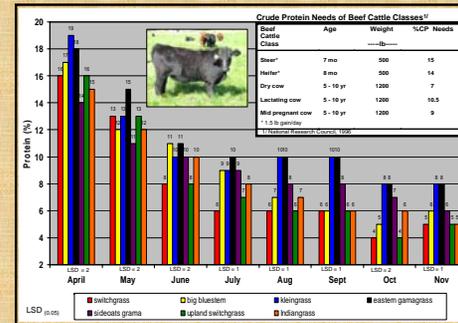
Grass Species	N Rate (lb/acre)	April	May	June	July	Aug	Sept	Oct	Nov
Alamo switchgrass	0	26a ²	47a	60a	72a	72a	73a	73a	84a
	60	27a	47a	58b	72a	75a	75a	85b	84a
	SD	V	LV	LV	BI	SD	SD	SD	S
Earl big bluestem	0	19a	23a	24a	48a	50a	53a	65a	57a
	60	19a	21a	24a	49a	48a	48a	52b	61a
	SD	V	V	LV	BI	SD	SD	SD	S
Selection 75 kleingrass	0	12a	44a	39a	40a	39a	35a	32a	44a
	60	13a	44a	40a	42a	38a	36a	35a	38a
	SD	V	SD	SD	SS	S	S	S	S
San Marcos eastern gamagrass	0	13a	33a	51a	63a	60a	43a	40a	27a
	60	14a	33a	52a	70a	49a	37a	26b	28a
	SD	V	LV	BI	SD	SD	SD	SD	S
Haskell side oats grama	0	10a	13a	29a	37a	36a	34a	36a	34a
	60	11a	16a	31a	38a	36a	37a	36a	36a
	SD	V	SD	SD	SD	SD	SD	SD	S
Upland switchgrass	0	17a	42a	48a	60a	60a	63a	60a	66a
	60	18a	39a	48a	58a	56a	58a	57a	67a
	SD	V	LV	LV	BI	SD	SD	SD	S
Lometa Indiangrass	0	16a	29a	29a	40a	42a	42a	57a	64a
	60	15a	27a	30a	42a	39a	42a	58a	59a
	SD	V	V	LV	LV	LV	LV	SD	SD

¹GS = Growth Stage where V = vegetative leaf development; LV = beginning of stem elongation/first or second node visible; BI = boot stage/reproductive development (inflorescence beginning to emerge to joint anthesis); SD = Seed development (seed visible to mature seed); SS = seed shattering; S = seed shattered

² Means in columns for each species by N rate within a given month followed by the same letters are not significantly different at P<0.05.

Results

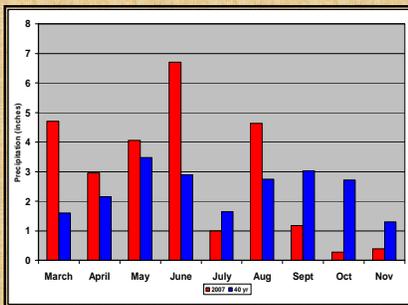
Crude Protein of Warm Season Grasses



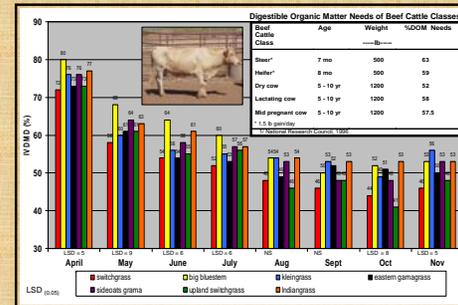
- 60 lbs N/acre did not increase crude protein, digestibility, plant height or change the growth stage development of the grasses
- Crude Protein and digestibility (% *in vitro* dry matter digestibility (IVDMD)) percentages of the grasses were highest in April-July (vegetative - boot stage) and declined in July - November (seed head emergence - seed maturity)
- Monthly crude protein and digestibility percentages varied among cultivars by month/growth stage
- 'Earl' big bluestem maintained the highest digestibility (IVDMD) from April-July (80-60%) and was among the highest digestible grasses from August-November (54-53%)

2007 and 40 Year Average Rainfall

James E. "Bud" Smith Plant Materials Center, Knox City, TX



Digestibility of Warm Season Grasses



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