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YIELD COMPARISON OF KLEINGRASS, BUFFELGRASS
AND BLUESTEMS IN NORTH CENTRAL TEXAS

OBJECTIVE:

To make a comparison of yield potential of kleingrass, buffelgrass and bluestems under similar environmental conditions.

PROCEDURE:

All grasses were planted in 1975 in plots 6 x 12 feet. Kleingrass, Llano buffelgrass (hybrid No. 331) and Pretoria 90 bluestem were transplanted on May 27 and June 2 from small pots started in the greenhouse. Old World bluestem and Caucasian bluestem were field seeded in early June.

The kleingrass breeding lines and the four bluestem and buffelgrasses were planted in two separate but adjacent areas in randomized complete-block designs. Therefore, yields of kleingrasses, buffelgrass, and bluestems are compared statistically (Table 3). All conditions were similar for the two tests.

Fertilizer, harvest dates, and rainfall received are shown in Table 1. Nitrogen was applied as ammonium nitrate, phosphorus as triple superphosphate, and potassium as muriate of potash. At harvest a 3 x 12 ft. swath was cut from the center of the plot at a height of two inches. Forage was weighed and subsamples were dried at 70°C to determine dry matter yields. Harvests were usually made at boot-flowering stage, but at two or three harvests seed had formed.

All varieties were irrigated by solid-set sprinklers in 1975 to insure a stand. Three-fourths of an acre-inch was applied June 1, June 30, July 11, and August 7.

RESULTS AND DISCUSSION:

Dry matter yields are shown in Table 3. Forage yields of kleingrass breeding lines in 1975, 1976 and 1978 were not statistically higher than Klein-75. In 1977 and 1979 forage yields of klein 67-13 and klein 67-11, respectively, were significantly lower than Klein 75.

The effects of rainfall are readily seen in the yield differences between 1976 and 1977 or 1978. Rainfall from April through September of

both 1977 and 1978 was near the thirty-eight year average for that period while in 1976, rainfall was 6.7 inches above the average. Higher fertilizer rates in the latter two years did not override the effects of less rainfall as compared with 1976.

Old World bluestem produced significantly higher yields than Caucasian bluestem in 1978 while Caucasian bluestem was higher in 1979. Yields of Old World bluestem were higher, though not statistically higher, in 1976-1977.

Pretoria 90 bluestem and Llano buffelgrass produced more forage than all other grasses in 1976. Yields of Pretoria 90 continued statistically higher than other grasses through 1978. However, significant loss of stand of Llano buffelgrass resulted from cold temperatures of the 1976-77 winter. Complete winterkilling of the stand occurred in the winter of 1977-78 when Pretoria 90 bluestem was also destroyed. There were one, nine, and eight days in the winters of 1975-76, 1976-77, and 1977-78, respectively, on which minimum temperatures of 7-15°F were recorded.

Kleingrass-75 and Old World bluestem emerge as the two best species in this test. Yields were about the same for each. Analysis of forage cut on June 11, 1976 showed Klein-75 at 46.6% IVDMD while Old World bluestem showed 49.8% IVDMD (Table 2). Although not enough samples were analyzed to make a definite comparison of IVDMD, there is indication that Old World bluestem might warrant further tests.

Table 1. Record of fertilizer application, harvest dates, and rainfall for kleingrass, buffel, and bluestem tests during five years at Stephenville.

<u>1975</u>	<u>1976</u>	<u>1977</u>	<u>1978</u>	<u>1979</u>
Pounds N-P ₂ O ₅ -K ₂ O Per Acre				
50-40-0	150-80-160	300-40-0	200-80-160	150-0-0
Dates of Harvest				
9/24	6/11,7/23,10/18	5/25,7/11,11/18	5/31,9/18	7/2
Acre-Inches of Rainfall Received from April-September				
11.91	24.54	18.44	17.87	20.55

Table 2. Percentage in vitro digestible dry matter for kleingrass, buffelgrass, and bluestems in 1976.

	%IVDDM*	
	<u>June 11</u>	<u>July 23</u>
Klein 67-13	42.7	43.0
Klein 64-5	46.7	46.6
Klein-75	46.6	41.9
Klein 64-2	44.0	42.1
Klein 67-11	44.4	43.8
Klein 63-1	42.4	43.8
Old World bluestem	49.8	
Pretoria 90 bluestem	50.2	
Caucasian bluestem	44.7	
Llano buffelgrass	51.4	

*Duplicate average of four replications of klein; duplicate average of two replications of Old World, Pretoria 90, Caucasian, and Llano.

Table 3. Dry matter yields of kleingrass, buffelgrass and bluestems grown at Stephenville on Windthorst fine sandy loam

Specie or breeding line	Pounds Dry Matter Per Acre			
	1975	1976	1977	1978
Klein 67-13	5131a*	8463b	5263d	6490bcd
Klein 64-5	4932ab	9160b	6186bcd	6652bcd
Klein-75	4618ab	10154b	6917bc	7013b
Klein 64-2	4167b	9006b	5419cd	6478bcd
Klein 67-11	4167b	8144b	5684bcd	6462bcd
Klein 63-1	4048b	9834b	6538bcd	7053b
Old World Bluestem	5464a**	9331b	7262b	6912bc
Pretoria 90 Bluestem	5371a**	16454a	13224a	10833a
Caucasian Bluestem	4314a**	7900b	5917bcd	5363d
Llano Buffelgrass	4258a**	15776a	2650e	***
				1448bcd
				2186b
				2440b
				1584bcd
				829d
				1367bcd
				1936bc
				998cd
				3513a

*Means within a year not followed by the same letter are significantly different at the 0.05 level, Duncan's New Multiple Range Test. Bluestem analysis was separate from kleingrass analysis for 1975 data only.

**Only two of four replications were harvested in 1975.

***Llano killed by freezing temperatures in winter of 1977-78.