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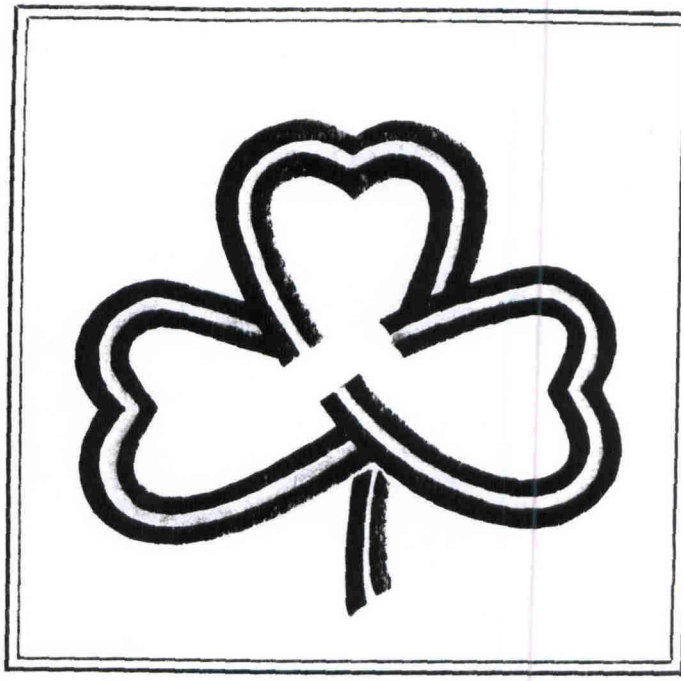
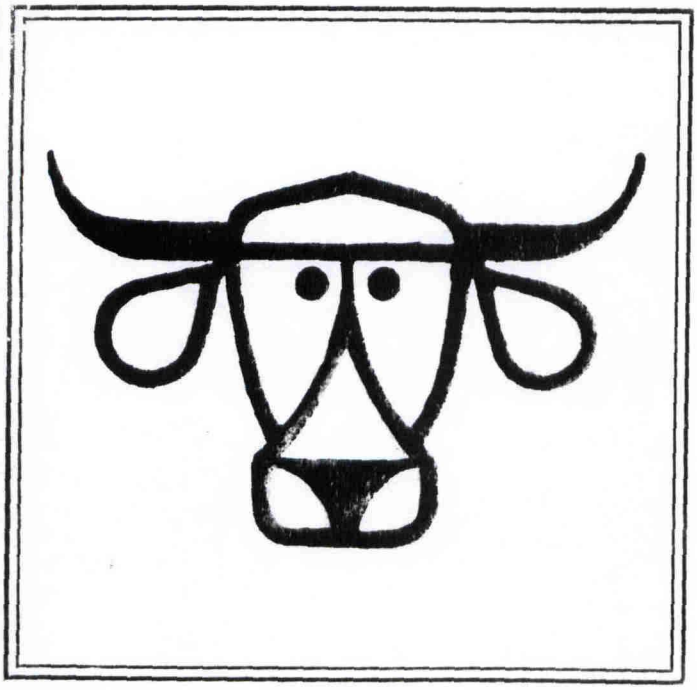
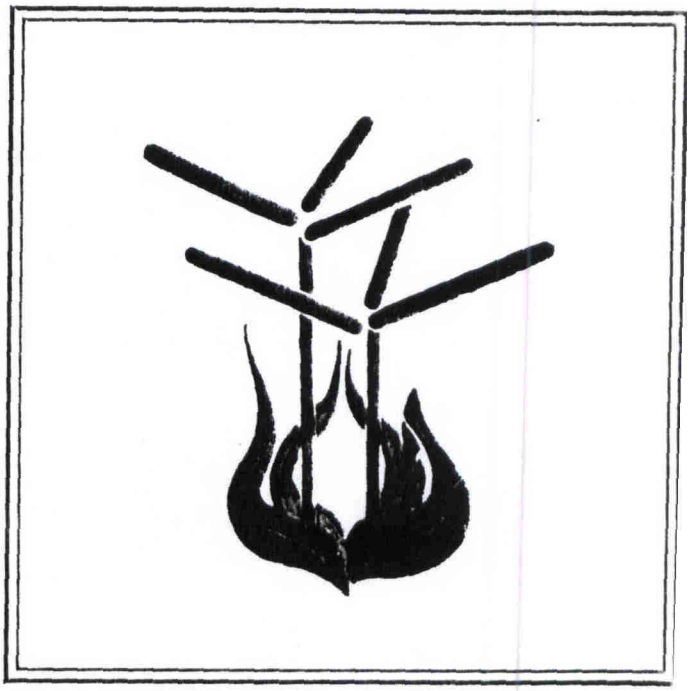
The Texas Agricultural Experiment Station, Neville P. Clarke, Director, The Texas A&M University System, College Station, Texas







Forage Research in Texas

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Worker: E. C. Holt,
Marshall Haferkamp
L. D. Allison

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THE GROWTH AND QUALITY OF SELECTED LEGUMES AND GRASSES IN A 750 MM RAINFALL AREA

OBJECTIVE:

To determine the seasonal forage quality pattern of selected legumes and grasses at Beeville.

PROCEDURE:

Three temperate annual legumes (Mt. Barker, subterranean clover, Yuchi arrowleaf clover, Hubam sweetclover),one termperate perennial legume (Mesilla alfalfa), one warm-season perennial legume (Illinois bundleflower) and one perennial warm-season grass (Kleingrass) were planted at Beeville in early November, 1977. Illinois bundleflower winterkilled and was replanted in the spring. Plots consisted of 4 20-inch rows, 50 feet long, 4 replications. Samples (2-foot section of row) were collected at the ground level from three locations in each plot at two-week intervals beginning in early February while the plants were still in the seedling stage. Each sample was collected from a previously unsampled area. The three subsamples plot dried were weighed, composited, ground to pass a 2 mm screen and analyzed in vitro with adjustment to a known standard.

The annual crops were not cut or harvested during the growing season, thus quality samples represent advancing ages. Alfalfa was harvested in the early bloom stage; Illinois bundleflower and Kleingrass were harvested about three times per growing season.

RESULTS:

Data for the entire 1978 calendar year are shown in Table 1. These data represented the 1977-78 and part of the 1978-79 production years for the annuals and the 1978 production period for the perennials. Illinois bundleflower was high in IVDMD in the seedling state (> 60%) but decreased to about 50% by late June and remained at that level or lower the remainder of the year, even for regrowth following cutting in early August and mid-September. Illinois bundleflower is an erect plant and tends to be stemmy. Selective utilization by grazing animals probably would result in intake of much higher quality contrasted to the entire plant including the basal stem.

Alfalfa was harvested in early June, early August, mid-September, and late October. The June and August harvests were delayed well beyond the optimum harvest stage because of weather. Leaf shedding occurred because a combination of a late harvest and leaf diseases. The quality pattern reflects the effect of leaf shedding with declines in IVDMD to less than 50% in late May and 52% in late July. Alfalfa quality was high from early August to the end of the year.

Mt. Barker subclover quality was high except for a period from mid-May to mid-June during flowering and seed formation. The stand was regenerated in the early fall from seed. Quality was high as would be expected in young legume plants.

Hubam sweetclover quality was as high as the true clovers until mid-March but declined rapidly thereafter, reaching a low of 40% IVDMD at maturity. The declining quality and the final low level in sweetclover are probably related to stem elongation and the declining leaf: stem ratio and to leaf shed following maturity. Peak accumulated dry matter occurred on May 15. By July 10 most of the leaves had been lost.

Yuchi arrowleaf clover quality followed about the same pattern as Hubam except that the decline did not start as early and IVDMD did not drop as low as for Hubam. Quality was high until early May and declined to 47% IVDMD by July 10. Stem elongation is much greater in arrowleaf clover than in sub-clover. This delcine probably represents stem maturity and a declining leaf-stem ratio.

Kleingrass quality samples were not collected until early July at which time the plant was in advanced stages of maturity and quality was low. Following cutting, IVDMD increased to 59% in August but declined to 47% in 2-month old material in late September. Following fall cutting IVDMD was maintained at about 60% until early December.

These data indicate that annual legumes will contribute little to forage quality in the critical period beginning in June and continuing into September. Alfalfa had the longest period of high quality, and a more disease resistant cultivar and better management probably would have maintained an IVDMD level above 60% throughout the year.

Table 1. Forage quality pattern in legumes growth study at Beeville, 1978.

Variety	% IVDMD										
	2/6	2/28	3/3	3/20	3/31	4/17	5/3	5/15	5/29	6/12	6/26
Illinois bundleflower								61.3	62.5	55.0	52.9
Mesilla alfalfa	72.3	73.6	69.3	65.9	63.2	58.4	61.9	55.3	47.0	66.1	59.5
Mt. Barker subclover		73.0	67.8	70.5	70.6	68.7	74.4	61.0	55.9	55.9	62.6
Hubam sweetclover		75.5	70.3	71.3	65.4	55.3	57.7	48.7	48.6	43.0	42.0
Yuchi arrowleaf clover			73.6	70.6	69.9	67.7	70.2	61.7	58.8	53.8	53.0
Kleingrass 75											

Variety											
	7/10	7/25	8/7	8/14	8/28	9/25	10/9	11/8	11/22	12/4	12/18
Illinois Bundleflower	52.1	53.3	48.8	47.4	50.3	50.5	45.4	54.0	49.9	47.6	39.7
Mesilla alfalfa	55.3	51.9	69.7	63.9	61.2	65.8	67.1	66.3	65.2	63.7	61.8
Mt. Barker subclover	63.9					65.0	62.2	69.4	71.3	66.1	66.7
Hubam sweetclover	40.6										64.2
Yuchi arrowleaf clover	47.3								67.5	66.8	66.0
Kleingrass 75	43.4	53.7	59.2	59.1	57.0	47.7	57.3	60.6	59.0	61.6	54.1