

# Forage Research in Texas

1982

## Forage Yields of Irrigated Legumes at Stephenville

Ronald M. Jones and J. C. Read\*

### SUMMARY

'Redman' red clover, 'Madrid' sweetclover, three cultivars of arrowleaf clover, four cultivars of subterranean clover, five cultivars of vetch, and two cultivars of crimson clover were tested for forage production. Redman produced 5719 pounds dry matter per acre, the highest yield in the test. 'Yuchi' produced more than the other arrowleaf clovers with 5031 pounds. Both 'Nova II' and 'Vanguard' vetch produced over 4900 pounds, which was higher than the other vetch cultivars. Vetch yields were reduced by early spring harvest. Madrid sweetclover produced 4558 pounds, and 'Clare' had the highest production of the subterranean clovers. Although total yield of 'Tibbee' crimson clover was low, early production was greater than any other winter hardy cultivar. Distribution of production among all cultivars ranged from early spring to early summer. All annual cultivars reseeded and produced acceptable stands in the fall of 1981, but common vetch and subterranean clover suffered freeze damage.

### Introduction

Legumes have long been recognized as high quality forage and are used for silage, pasture, and hay. Since they have high nitrogen content and utilize atmospheric nitrogen, many species were used as green manure crops before relatively inexpensive nitrogen fertilizer became available. Greater use of legumes may again be necessary as the cost of nitrogen fertilizer continues to rise. This test is an effort to find high-yielding legumes that are well adapted to north central Texas.

### Materials and Methods

Sixteen cultivars from seven species were seeded October 9, 1980 on Windthorst fine sandy loam. Fertilizer at the rate of 0-215-0 was applied September 18, 1980 and incorporated by disking. Seed were inoculated with appropriate Rhizobium species and seeded one-half inch deep at recommended rates in rows spaced one foot apart. Plots fifteen feet long and five rows wide were arranged in a randomized complete-block design with four replications.

---

\*Respectively, research associate, The Texas Agricultural Experiment Station, Stephenville, and associate professor, The Texas Agricultural Experiment Station, Dallas.

Irrigation was applied following planting to aid seedling emergence through crusted soil. Applications of 0.63, 1.0, 1.0, and 0.75 inch were made October 15, 24, 29 and November 14, respectively. Additional irrigation was applied December 1, February 17, and April 7 to supplement rainfall. Moisture that was received by the three harvest dates is shown below Table 1.

Forage was harvested with a flail-type harvester except that the final harvest of subterranean clover was hand clipped. The center three rows of each plot were cut at a height of two inches the full length of the plot. Subterranean clover was cut one inch above ground level from two randomly selected one square foot areas within each plot. The effect on vetch of multiple cutting and early harvest was determined by harvesting separate plots either one, two, or three times.

### Results and Discussion

'Redman' red clover and 'Yuchi' arrowleaf clover produced 5719 and 5031 pounds dry matter per acre, respectively, which was more than all others in the test (Table 1). Distribution of yield differed in that 'Yuchi' production essentially ended with the May 12 harvest; 'Redman' growth continued through June, and 2924 pounds per acre were harvested near seed maturation July 15 (Table 1). 'Madrid' sweetclover also continued growth throughout June and was well past full bloom when cut July 15. This late production is attributed to ample rainfall received after the second cutting.

'Vanguard' and 'Nova II' vetch produced higher yields than other vetches and ranked third and fourth, respectively, among all legumes tested (Table 1). Cutting February 16 reduced the April 2 harvest; cutting for the first time on April 2 eliminated further growth (Table 2). Total yields were greater from a single cutting May 12.

'Clare' produced slightly greater yields than the other cultivars of subterranean clover (Table 1). Most of the forage was harvested May 12.

Total production of the crimson clovers was less than all other cultivars (Table 1). However, earliness of production and winter hardiness of 'Tibbee' crimson clover make it more desirable for early forage than all other cultivars tested.

All annual cultivars reseeded and produced acceptable stands in the fall of 1981. However, most were harvested in the bloom stage, and seed were produced only on nonharvested plot edges. Since subterranean clover produced seed at ground level, reseeding was not affected by harvesting.

The common vetch and subterranean clover cultivars suffered freeze damage in January of 1982 from near-record low temperatures of 3 and 4 degrees Fahrenheit on two consecutive days having maximum temperatures of

22 and 27 degrees F. Damage of subterranean clovers was apparently limited to dieback of stems to the crown of the plant. Damage to the vetch included killing of smaller plants as well as stems. Approximately 20% and 75%, respectively, of the stems of subterranean clover and vetch cultivars were killed. No difference in winter hardiness was observed among cultivars within each group.

#### Acknowledgement

The authors appreciate the contribution of inoculants by the Nitragin Company.



Table 1. Seasonal Distribution and Total Forage Production of Legumes Cut at Three Dates at Stephenville, Texas in 1981.

Legume	Cultivar	Harvest Dates			
		April 2	May 12	July 15	Total
		a			
-----Pounds Dry Matter Per Acre-----					
Red clover	Redman	294	2501	2924	5719
Arrowleaf clover	Yuchi	772	4259		5031
Arrowleaf clover	Amclo	1330	3136		4466
Arrowleaf clover	Meeche	306	3294		3600
Vetch (Common)	Vanguard		4952		4952
Vetch (Common)	Nova II		4913		4913
Vetch (Common)	Cahaba White		4303		4303
Vetch (Hairy)	Common		4158		4158
Vetch (Common)	Vantage		3950		3950
Sweetclover	Madrid	0	2608	1950	4558
Subterranean clover	Clare	0	4227		4227
Subterranean clover	Tallarook	310	3817		4127
Subterranean clover	Woogenellup	430	3558		3988
Subterranean clover	Mt. Barker	221	3549		3770
Crimson clover	Tibbee	3227			3227
Crimson clover	Dixie	2391	800		3191
Rainfall (inches)		7.31*	1.79**	9.09***	
Irrigation (inches)		6.88*	2.00**	0	

\*Since planting October 9, 1980

\*\* Since first cutting

\*\*\* Since second cutting

a Mean of four replications

Table 2. Yields of Five Vetch Cultivars Cut in Different Combinations of Dates at Stephenville, Texas in 1981.

Dates	Cahaba White	Hairy	Nova II	Vanguard	Vantage	Mean
-----Pounds Dry Matter Per Acre <sup>3/</sup> -----						
Feb. 16	112	16	728	131	88	
April 2 <sup>1/</sup>	2374	2812	2215	2357	2862	
May 12*	-	-	-	-	-	
Total	2486	2828	2943	2488	2950	2739
April 2 <sup>1/</sup>	3391	3127	3170	3112	2770	
May 12*	-	-	-	-	-	
Total	3391	3127	3170	3112	2770	3114
May 12 <sup>2/</sup>	4303	4158	4913	4952	3950	4455

\* Only a few plots produced measurable yield

<sup>1/</sup> All cultivars were in vegetative growth stage

<sup>2/</sup> All cultivars were in full bloom

<sup>3/</sup> Mean of four replications