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## SEASONAL PRODUCTION OF ALFALFA AND RED CLOVER 1982-85

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### SUMMARY

Fourteen alfalfa and two red clover varieties were evaluated for seasonal forage production and stand persistence at Overton in 1982-85. Seedling year production of alfalfa ranged from 5720 to 3947 lbs DM/ac. Second year yields of alfalfa ranged from 5913 to 4453 lbs DM/ac. Red clover yields in the seedling year were 5075 and 5009 lbs DM/ac for the varieties 'Kenland' and 'Kenstar', respectively. Red clover yields in the second year decreased to 3885 and 3515 lbs DM/ac for Kenland and Kenstar, respectively. By the beginning of the third production season, stands of both red clover varieties were less than 6% and only six alfalfa varieties had stands greater than 20%. The range in stand for these six alfalfas was 27.5 to 53.8% for 'Weevilchek' and 'Vancor', respectively.

### OBJECTIVES

Our objectives in this study were to measure, under sod-seeding conditions with no herbicides or irrigation: 1) the seasonal dry matter yield of alfalfa and red clover; (2) to determine the potential stand longevity for these two legume species; and 3) to assess potential pest problems with alfalfa and red clover.

### PROCEDURE

Fourteen alfalfa varieties and two red clover varieties were drilled into a native sod (common bermudagrass and Paspalum setaceum Michx.) in 5x7 foot plots October 13, 1982. A small plot drill with six double disk openers was used to place the seed at a one-half inch depth. Soil pH was 6.8 (0-6 inches) and soil test ratings of phosphorus and potassium were low and very low, respectively. Prior to planting, 450 lbs 0-20-20/ac were applied to the Sawtown fine sandy loam soil. Four hundred and fifty pounds per acre of 0-20-20 were also applied in September of 1983 and in October of 1984. The grass was mowed to two inches prior to sod-seeding. Alfalfa was seeded at 20 lbs/ac and Rhizobium type A inoculant was applied at 1

oz/lb of seed. Seeding rate for the red clover was 14 lbs/ac and Rhizobium type B inoculant was applied at 1 oz/lb of seed. Peat inoculant was supplied by the Nitragin Co. Pelgel solution was used as an adhesive to stick inoculant to the seed.

This experiment was sprayed with Sevin 805 (1½ lb/ac) five times for alfalfa weevil larvae control in 1983. Furadan 4F (1 pt/ac) was also applied in March 1984 and March 1985.

The alfalfa and red clover lines were arranged in a randomized complete block design with four replications. The experiment was harvested to 3 inches with a rotary mower when the alfalfa was in approximately one-tenth bloom. Plot fresh weights were recorded in the field. Subsamples were weighed, dried at 70°C for 48 hours and weighed again. Percent dry matter of subsamples was used to calculate dry matter yield per acre.

A percent stand rating was taken at the beginning and end of each season. Plot weights were not recorded from the first harvest in 1983 due to high weed infestations.

#### RESULTS

Forage production of the sodseeded alfalfa (Table 1) ranged from 5720 to 3997 lbs DM/ac for 'Southern Special' and 'WL-512', respectively, during the 82-83 season. The variety 'Florida 77' was the second highest in yield at 5565 lbs DM/ac. Florida 77 started with an 80% stand but sustained no stand loss during the first year. Stand losses ranged from 14 to 35.3% during the first season for Southern Special and Vancor, respectively. Forage production for the red clover during the first season (Table 1) was 5364 lbs DM/ac for Kenland and 5075 lbs DM/ac for Kenstar. Stand loss between the second and fourth cut were 5.3% for Kenland and 2.0% for Kenstar.

During the second season (1983-84) the 1st and 4th replications were eliminated because of stand loss. Total production during the 83-84 season ranged from 5913 to 4453 lbs DM/ac for 'Apollo' and 'Classic', respectively (Table 2). Over the season, Florida 77 ranked 3rd with a yield of 5659 lbs DM/ac. Stand ratings taken June 6, 1985 ranged from 32.2% loss for Vancor to a 77.5% loss for Florida 77. Red clovers production for the second season was 3885 lbs DM/ac for

Kenland and 3515 lbs DM/ac for Kenstar. The red clover varieties started the 1984 season with a stand percent of 89.5 for Kenland and 94.8 for Kenstar, but neither made regrowth after the second cut.

Both alfalfa and red clover have the potential to produce high quality forage with no nitrogen fertilizer inputs. This late spring/summer forage production is highly dependent upon rainfall and for the alfalfa, timely insect control. Rainfall at Overton for the months of June-September during the seedling year of this experiment was near the 17-year average of 13 inches. In the second year (1984), for the same time period, total rainfall was 5.7 inches. This resulted in severe stand losses ranging from 100 to 47% (Table 3). Once established, alfalfa appeared more drought tolerant than red clover on the sandy soils used in this experiment. Well distributed summer rainfall is required to insure the summer survival of red clover in East Texas.

Although alfalfa endured low soil moisture better than red clover, alfalfa weevil and three-cornered alfalfa hopper were major pests on the alfalfa in this study. Alfalfa weevil larvae were noted feeding in terminal buds whenever spring growth of alfalfa started. Application of Sevin at 1.5 lb/ac gave only marginal control and required multiple treatments to control the alfalfa weevil. Three-cornered alfalfa hopper damage was observed in July 1983 and was controlled by Sevin at 1.5 lb/ac. Furadan 4F at 1 pt/ac controlled alfalfa weevil with one application.

Forage legumes, either reseeding annuals or persistent perennials, are needed to increase quality and/or decrease N fertilizer inputs for warm-season pastures and hay across the southern region. Research at Overton indicated that alfalfa and red clover have the seasonal growth patterns and forage production potential to partially meet these needs in East Texas. However, neither legume species maintained an acceptable stand after a low rainfall summer and alfalfa required intensive insect control to maintain production. Further research with alfalfa and red clover is required to determine their place in East Texas forage systems.

TABLE 1. SEASONAL PRODUCTION OF ALFALFA AND RED CLOVER AT OVERTON, TX, 1982-83

Variety	Harvest Date <sup>2</sup>			Total
	6-16	7-19	8-23	
	-----lbs DM/ac-----			
Southern Special	2005	2399	1316	5720 a <sup>1</sup>
Florida 77	1831	2457	1277	5565 ab
Kenland Red Clover	2053	2184	1127	5364 ab
Kenstar Red Clover	2055	1966	1054	5075 ab
Apollo	1823	2170	1016	5009 ab
Vanguard	2048	2146	782	4976 ab
Arc	2092	1958	884	4934 ab
Cimarron	1978	2056	857	4891 ab
Weevilchek	1917	2111	848	4876 ab
Classic	1835	1960	838	4633 ab
Team	1878	1770	811	4459 ab
Vancor	1762	1843	769	4374 ab
Saranac AR	1663	1781	881	4325 b
Defender	1755	1834	570	4159 b
Hi-Phy	1566	1868	697	4131 b
WL-512	1625	1821	551	3997 b

C.V. = 24.4%

<sup>1</sup>Yields followed by the same letter are not significantly different using LSD (0.05).

<sup>2</sup>Test planted Oct. 13, 1982.

TABLE 2. SEASONAL PRODUCTION OF ALFALFA AND RED CLOVER AT OVERTON, TX, 1983-84

Variety	Harvest Date <sup>1</sup>				Total
	4-17	5-25	6-21	7-24	
	-----lbs DM/ac-----				
Apollo	2129	2121	995	668	5913 a <sup>2</sup>
Vancor	2021	2088	990	633	5732 a
Florida 77	1990	1984	981	704	5659 ab
Cimarron	1925	2048	727	648	5348 abc
Hi-Phy	1820	1784	823	645	5072 abc
Southern Special	1529	1950	811	619	4909 abc
Team	1794	1796	615	480	4685 abc
Saranac AR	1697	1644	708	561	4610 abc
Weevilchek	1500	1814	713	558	4585 abc
Classic	1519	1710	693	531	4453 abc
Kenland Red	2380	1505			3885 bc
Kenstar Red	2142	1373			3515 c
Vanguard <sup>3</sup>					
Arc <sup>3</sup>					
Defender <sup>3</sup>					
WL-512 <sup>3</sup>					

C.V. = 17.1%

<sup>1</sup>Planted Oct. 13, 1982.

<sup>2</sup>Yields followed by the same letter are not significantly different using LSD (0.05).

<sup>3</sup>Stands were too low to evaluate for yield.

TABLE 3. STAND DECLINE OF SOD-SEEDED ALFALFA AND RED CLOVER THROUGH TWO PRODUCTION SEASONS AT OVERTON, TX

Variety	6-16-83 <sup>1</sup>	8-23-83 <sup>1</sup>	4-12-84 <sup>2</sup>	6-7-85 <sup>2</sup>
	-----% Stand-----			
Kenland Red	98.3	93.0	89.5	2.8
Kenstar Red	98.0	96.0	94.8	5.0
Apollo	90.3	71.3	90.8	35.0
Arc	95.3	68.8	0.0	0.0
Cimarron	93.5	62.5	87.5	37.0
Classic	86.0	62.5	85.0	29.5
Defender	74.3	51.3	0.0	0.0
Florida 77	80.0	81.0	88.0	10.5
Hi-Phy	80.0	47.8	79.5	28.8
Saranac AR	83.8	50.0	72.5	19.5
Southern Special	93.3	79.3	81.0	15.8
Team	88.3	57.5	76.3	20.0
Vancor	90.3	55.0	86.0	53.8
Vanguard	89.5	65.0	0.0	0.0
Weevilchek	91.3	62.5	78.8	27.5
WL-512	73.8	46.3	0.0	0.0

<sup>1</sup> Mean of two evaluators and four reps

<sup>2</sup> Mean of two evaluators and two reps

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