NAME OF TEST: Ryegrass fertilizer test.
OBJECTIVES: To determine the yield of Gulf ryegrass as influenced by rate and frequency of nitrogen application.
EXPERIMENTAL PROCEDURE:
Location: Substation No. 3, Angleton, Texas.
Soil type: Lake Charles Clay
Cultural practices: Planted October 28 in plots 5 1/2 feet wide, 20 feet long, 4 replications. All fertilizer was applied at planting except for the split nitrogen applications. Thirty pounds of the 60 pounds N split and the 90 pounds N split was applied at planting. A second 30 pound application was made on February 18 with the final 30 pounds applied to the 90 pounds N split plots on March 22. La. S-1 white clover was seeded in one treatment. Although a good stand was obtained, the clover contributed little to total yield until late in the season.
RESULTS: See Table.

The Effect of Rate and Frequency of nitrogen on the yield of Gulf Ryegrass.

Treatment	Lbs. per Acre, Oven-dry forage			
$N\text{-}P_2O_5\text{-}K_2O$	2/8	3/21	5/9	Total
0-40-0	120	100	1330	1550
0-40-0, with La. S-1 white clover	100	180	1950	2230
30-40-0	620	290	1530	2440
60-40-0	1110	510	1380	3000
60-40-0, split	600	960	2330	3890
90-40-0	1410	750	1460	3620
90-40-0, split	630	1030	4350	6010
LSD .05	230	150	371	444
C.V.	23.6%	18.5%	12.2%	9.2%

PROJECT: Hatch 388
DATE SUBMITTED: August, 1960
WORKER: Marvin E. Riewe

NAME OF TEST: Crimson Clover fertilization test, 1959-60, Mt. Pleasant, Texas
OBJECTIVE: To determine the forage yield of crimson clover in response to various rates of fertilizer.
EXPERIMENTAL PROCEDURE:
Location: D. C. Hinson farm
Soil type: Norfolk sand
Experimental design: Randomized block, 3 replications, plots 6 feet by 15 feet, harvested plot 34 inches by 7 1/2 feet.
Cultural practices: Planted October 8, 1959, seed broadcast on a bermuda grass sod followed by a light disking. Fertilizer treatments applied broadcast just ahead of seeding and disking, one harvest date on April 19, 1960.
Source of materials: local
RESULTS: See tables.
DISCUSSION: The weather conditions during the growing season were very poor. A dry November was followed by a long period of cold wet conditions from January to mid-March. The month of April was dry. Local weather records indicated that this growing season was the most severe ever recorded. Total rainfall for the growing season (October through April) was 25.58 inches.

Phosphorus was applied uniformly (120 lbs./acre) to eliminate this element as a variable. Sixty pounds of potasium did not increase forage production significantly. The response of Crimson clover to Nitrogen applications was striking, even though yield differences were not significant. The first increment of 30 pounds of nitrogen resulted in increased yields of clover, but 60 pounds of nitrogen tended to reduce forage yields to the production level of plots which received no nitrogen.

PROJECT: Hatch 388
DATE SUBMITTED: July 1960
WORKER: J. A. Lancaster

Yield of Crimson clover overseed on bermudagrass sod and receiving various fertilizer treatments, Mt. Pleasant, Texas, 1959-60*

Fertilizer Treatment	Pounds of air-dry forage per acre-4/19/60				
	Rep. I	Rep. II	Rep. III	Average	Nitrogen Av.
N-P-K					
0-120-0	1520	770	960	1080	
0-120-60	1390	1420	1460	1420	1250
30-120-0	1295	1660	1760	1570	
30-120-60	1750	1840	3100	2230	1900
60-120-0	1720	2045	860	1540	
60-120-60	1680	1145	1155	1330	1430
Potassium Av.					
0				1400	
60				1660	

* No significant differences. C.V. = 32.5%

Average season yield of Crimson Clover with various fertilizer treatments at Mt. Pleasant, Texas. 1956-1960.

Fertilizer Treatment	Pounds air-dry forage per acre				
	1955-56	1956-57	1957-58	1959-60	4 yr. Average
N-P-K					
0-120-0	1440	900	1190	1080	1150
0-120-60	1530	720	1230	1420	1225
Nitrogen Avg.	1485	810	1210	1250	1190
30-120-0	1040	440	800	1570	960
30-120-60	1230	510	860	2230	1210
Nitrogen Avg.	1135	475	830	1900	1085
60-120-0	780	380	460	1540	790
60-120-60	790	280	550	1330	740
Nitrogen Avg.	785	330	510	1430	765
Potassium Avg.					
0	1090	570	820	1400	970
60	1180	510	880	1660	1060
LSD (.05) NPK	---	N.S.	208	N.S.	
N	*	N.S.	147	N.S.	
K	---	N.S.	N.S.	N.S.	
C.V. (%)	---	72.3	19.1	32.5	

NAME OF TEST: Coastal Bermudagrass fertilizer test, Temple
OBJECTIVE: To evaluate the yield response of Coastal Bermudagrass to various fertilizer treatments
EXPERIMENTAL PROCEDURE:
Location: Substation No.5, Temple, Texas
Soil type: Houston Clay
RESULTS: See Table
DISCUSSION: Yields increased on the average 1100, 1700 and 460 pounds per acre with each increment of 45 pounds of nitrogen. 45 pounds of phosphorus increased yields 520 pounds, but with the higher rates of nitrogen there was an indication of greater increase with phosphorus. Potash apparently increased yield about 470 pounds per acre with 60 pounds of potash.

RESULTS OF COASTAL BERMUDAGRASS FERTILIZER TEST, TEMPLE 1956-60

Treatment	Pounds per acre air dry forage 1956	1957	1958	1959	1960	Ave.
0-0-0	1400	3810	4415	2715	2205	2910
0-45-0	1470	3940	5045	2735	3085	3255
0-90-0	1370	4025	4830	3580	2530	3265
45-0-0	2055	4820	5610	4220	3975	4135
45-45-0	2015	4885	6750	4405	4090	4430
45-90-0	1950	4950	5495	4550	3710	4130
90-0-0	3525	6550	7065	6310	4670	5625
90-45-0	3930	6505	7810	6575	6180	6200
90-90-0	3595	6710	6745	5935	5790	5755
90-90-60	3655	7025	7515	6060	6605	6170
135-0-0	3405	6530	7465	5405	5125	5585
135-45-0	3405	7470	8095	7165	5990	6425
135-90-0	3020	6965	8300	7445	6915	6530
135-90-60	3845	8890	8985	7705	5900	7065

NAME OF TEST: Quantity and time of nitrogen application on Coastal Bermudagrass, Mt. Pleasant, Texas.

OBJECTIVES: To determine the influence of nitrogen rate and time of application on total forage yield and seasonal production of Coastal Bermudagrass.

EXPERIMENTAL PROCEDURE:

Experiment No.: 2938

Locations: D. C. Hinson Farm near Mt. Pleasant, Texas

Soil type: Norfolk sand

Experimental design: Fertilizer treatments in a randomized block design, 4 replications, plots 6 x 15 feet, harvested 21.25 square feet.

Cultural practices: The grass was established in 1956. 0-60-60 fertilizer applied each fall and the areas over-seeded with crimson clover. Nitrogen rates of 0, 60, 90 and 120 pounds per acre were applied in 2, 3 or 4 applications beginning in May or June. The initial application was made about May 1 with one set of treatments and delayed until June 1 with a second set. The times of application are given in the data tables.

General: April 19, 1960 - Clipping was crimson clover. The weather conditions during the crimson clover growing period were very poor. A period of cold wet weather was prevalent from January to the middle of March. Dry conditions were prevalent during April. The weather conditions during the Bermuda growing period were favorable. Extreme dry conditions did occur in August and most of September. 7.22 inches of rainfall was recorded the last 1 1/2 weeks of September. Total rainfall for period covered by test was 50.78 inches. October through April 25.58 inches. May to October 25.20 inches.

RESULTS: See tables.

DISCUSSION: Good yields were obtained in 1958, 1959 and 1960 and fair yields in 1957 which was the first year of the test. Forage yields were increased on the average about 2000 pounds with 60 pounds of nitrogen, 900 pounds with an additional 30 pounds and 700 with the final increment of 30 pounds.

The time of initial nitrogen application did not significantly influence total yields. In years when a moisture deficit is encountered in midsummer, initial applications earlier in the spring would be expected to give greater response.

The effect of time of application of nitrogen is apparent in individual harvest yields. August yields were favored by nitrogen applications the first of August even though moisture was limited during that month. May production was definitely higher where nitrogen applications were started May 1. September yields were very poor and were increased only slightly on the plot receiving nitrogen on September 1. Moisture was limited until the last 10 days of the month.

The good production on plots receiving no nitrogen is attributed to fall fertilization with 0-60-60 and the winter legume.

Selection No. 3 Bermudagrass was included in this study through 1959 and results are reported in the 1959 data compilation. The test was closed at the end of the 1960 growing season.

PROJECT NO: Hatch 388

DATE SUBMITTED: November 1960

WORKER: J. Albert Lancaster

The influence of quantity and time of nitrogen application on Coastal Bermudagrass, Mt. Pleasant, 1960.

Total lbs. N/ac.	Treatment Time of application of each increment	Pounds of air-dry forage per acre 4/19	6/1	6/28	7/27	8/29	9/30	Total
120	May, June	1360	3500	1460	2880	1180	620	11000
120	May, June, July, Aug.	1200	3110	1200	3600	2700	640	12450
90	May, June, July	1650	2990	1160	3450	1320	590	11160
60	May, June	1540	3110	1070	2040	1260	610	9630
Average		1440	3180	1220	2990	1615	615	11060
120	June, July	1320	2590	1370	5260	1420	520	12480
120	June, July, Aug., Sept.	820	2230	1150	3320	2290	950	10760
90	June, July, Aug.	1190	2260	1050	2700	2580	640	10420
60	June, July	1700	2430	1030	3460	1230	520	10370
Average		1260	2380	1150	3680	1880	660	11010
No nitrogen		1990	2440	660	1460	1060	580	8190
LSD (.05) for total yields								1020
C.V. (%)								17.2

The influence of quantity and time of nitrogen application on Coastal Bermudagrass, Mt. Pleasant, 1957-60.

Treatment		Pounds of air-dry forage per acre				
Total lbs. N/ac.	Time of application of each increment	1957	1958	1959	1960	Average 1958-60
120	May, June	6110	11150	13070	11000	11740
120	May, June, July, Aug.	7980	11760	13040	12450	12420
90	May, June, July	6170	10360	12170	11160	11230
60	May, June	4790	9270	11980	9630	10290
Average		6260	10630	12560	11060	11420
120	June, July	8280	9890	12120	12480	11500
120	June, July, Aug., Sept.	7880	12220	12900	10760	11960
90	June, July, Aug.	6680	10770	12360	10420	11180
60	June, July	6180	9340	11110	10370	10270
Average		7260	10560	12120	11010	11230
No Nitrogen		4160	6870	8710	8190	7920
LSD (.05)		1190	1000	1030	1020	1010
C.V. (%)		17.4	15.0	16.1	17.2	6.5

NAME OF TEST: The influence of Louisiana S-1 white clover, nitrogen and potash on yield, leaf percentage and protein content of several adapted warm season grasses grown on Lake Charles clay, Angleton, 1957-59.

OBJECTIVES: (1) To determine the influence of La. S-1 white clover, nitrogen and potash on the yield and protein content of forage of four adapted warm season grasses, (2) to determine the influence of two rates of nitrogen on the percentage leaves in the grass forage and (3) to determine the protein content of each of the leaf and stem fraction.

EXPERIMENTAL PROCEDURE:

Location: Substation No. 3, Angleton, Texas.

Soil type: Lake Charles clay.

Experimental design: A split plot randomized block design. The main plots included Coastal Bermudagrass, Common Bermudagrass, Dallisgrass and Angletongrass. Each main plot was split into five subplots receiving the following treatments: 0-80-0, 100-80-0, 100-80-80 with La. S-1 white clover and 100-80-0 and 200-80-0 without clover.

Plot size: Each sub-lot is 6.67 ft. wide and 25 ft. long.

Seeding date: The grasses were sodded in August, 1956; the white clover was seeded in October, 1956.

Fertilization: The rates of fertilizer used annually have been indicated above. The phosphorus and potash was applied each fall. The nitrogen was split into 5 applications of 40 and 20 pounds of nitrogen per acre for the 200 and 100 pound treatments, respectively. The first application in the spring was made about April 1.

RESULTS: The forage yields by clipping dates for 1959 is given in Table 1, while a three year summary of the yield data is given in Table 2. Yield by clipping dates for 1957 and 1958 have been previously reported in annual reports of Forage Crops Research Data.

Table 3 gives the percent leaves by clipping dates in 1959 for three grass species grown alone at two levels of nitrogen, while the summary data for leaf percentage is presented in Table 4.

The total plant material from three selected treatments on each grass specie was analyzed for protein content in 1958. This data is presented in Table 5. The leaf and stem fraction for three grass species grown alone at two levels of nitrogen were also analyzed for protein. This data is presented in Tables 6 and 7.

DISCUSSION:

Forage Yield: The application of 100 pounds of nitrogen per acre annually to the Coastal and Common Bermudagrass-clover combination increased the yield over that obtained without the use of nitrogen. The application of 100 pounds nitrogen per acre annually to Dallisgrass-clover or Angletongrass-clover had no apparent real effect. A slight response to potash is indicated for the Coastal Bermudagrass-clover combination fertilized with 100 pounds of nitrogen but no response was indicated by the other grass-clover combinations. The response to potash by Coastal Bermudagrass occurred generally after mid-season.

With the exception of Angletongrass, the grass-clover combination without nitrogen produced yields equal to the grass grown alone but

fertilized with 100 pounds of nitrogen annually. In this case the clover was too competitive for Angletongrass with the result that the stand of Angletongrass was reduced. In other work at the Angleton station, however, but clover has been grown with Angletongrass quite successfully.

Coastal Bermudagrass is quite competitive with white clover, particularly when fertilized with nitrogen. However, observations indicate that if proper fertilizer balance is maintained, the La. S-1 white clover can be successfully grown with Coastal Bermudagrass.

Where the grass was grown alone, yields were significantly increased for Coastal and Common Bermudagrass and Dallisgrass when the annual application of nitrogen was increased from 100 to 200 pounds per acre. Coastal Bermudagrass responded very markedly. Angletongrass did not respond at all.

Leaf Percentage: Leaf percentage is considered a fair indicator of digestible energy. For this reason, samples of Coastal Bermudagrass, Dallisgrass and Angletongrass were taken at each clipping date from plots where the grass was grown alone and separated into leaf-stem fractions. The leaf sheath was considered leaf along with the leaf blade. Dallisgrass had a significantly higher leaf percentage than Angletongrass each year and a significantly higher leaf percentage than Coastal Bermudagrass in 1957.

Protein Content: The protein content of forage produced by three selected treatments with each grass was determined in 1958. In addition, protein analysis was obtained for the leaf and stem fractions of three grass species grown alone with two levels of nitrogen.

In this test, clover grown in association with the grass but without supplemental nitrogen resulted in a markedly higher average protein content than was the case with nitrogen fertilized grass grown alone. This was the result of spring clover growth - the clover having a high protein content. After May 27, grass grown alone fertilized with 200 pounds of nitrogen per acre annually contained the most protein.

As expected, the leaf fraction had a much higher protein content than the stems. The protein content of both leaf and stem of Dallisgrass was higher than that of the other grasses. An interesting note was that while the Angletongrass leaf had a higher protein content than the Coastal Bermudagrass leaf, the reverse was true of the stem. This resulted in only small differences in protein content of the total forage. It should be pointed out that limited analysis in 1957 indicated no such differences in the protein content of the leaf and stem fractions between Coastal Bermudagrass and Angletongrass as was found in 1958.

SUMMARY: When four grasses - Coastal Bermudagrass, Common Bermudagrass, Dallisgrass and Angletongrass - were grown in association with La. S-1 white clover, supplemental nitrogen at the rate of 100 pounds per acre annually increased the forage yields of the Bermudagrass only.

With the exception of Angletongrass, the grass grown in association with the clover but without supplemental nitrogen produced yields equal to the grass grown alone fertilized with 100 pounds of nitrogen per acre annually.

When the grass was grown alone, increasing the nitrogen from 100 to 200 pounds per acre annually resulted in significantly increased yields with the exception of Angletongrass.

Table 1. Oven dry forage yield, pounds per acre, 1959.

Species	Treatment	Date 3/2	4/20	6/9	8/11	10/19	Total
Coastal Bermuda-Clover	0-80-0	170	1810	2650	3650	2800	11080
Coastal Bermuda-Clover	100-80-0	60	1290	2950	3860	2370	10530
Coastal Bermuda-Clover	100-80-80	20	1410	3010	3980	3100	11520
Coastal Bermudagrass	100-80-0		1080	1670	3340	2420	8510
Coastal Bermudagrass	200-80-0		1300	3700	4420	3140	12560
Common Bermuda-Clover	0-80-0	590	1850	2280	2930	1540	9190
Common Bermuda-Clover	100-80-0	190	1230	3140	3290	2100	9950
Common Bermuda-Clover	100-80-80	160	1180	2860	3410	1740	9350
Common Bermudagrass	100-80-0		550	2120	3140	1500	7310
Common Bermudagrass	200-80-0		320	2820	4980	1890	10010
Dallisgrass-Clover	0-80-0	370	1780	1870	2250	1340	7610
Dallisgrass-Clover	100-80-0	110	1130	2120	2580	1290	7230
Dallisgrass-Clover	100-80-80	110	970	2260	2950	1400	7690
Dallisgrass	100-80-0		490	1830	2890	1170	6380
Dallisgrass	200-80-0		810	2050	3530	950	7340
Angletongrass-Clover	0-80-0	190	1270	2000	2950	2550	8960
Angletongrass-Clover	100-80-0	140	1020	2130	2830	1690	7810
Angletongrass-Clover	100-80-80	110	1200	3010	2850	1580	8750
Angletongrass	100-80-0			2670	6280	3560	12510
Angletongrass	200-80-0			3340	4750	2680	10770

Dallisgrass had the highest leaf percentage while Angletongrass had the lowest leaf percentage. Coastal Bermudagrass was intermediate.

The forage from the grass-clover combination contained more protein than the forage from nitrogen fertilized pure grass stands. The protein content of Dallisgrass was higher than the protein content of the other grasses.

In each case, the leaf contained more protein than did the stem. The leaf and stem of Dallisgrass contained more protein than the leaf and stem of Coastal Bermudagrass and Angletongrass.

PROJECT: Hatch 388
DATE SUBMITTED: September, 1960
WORKER: Marvin E. Riewe

Table 2. Oven dry forage yield, pounds per acre, 1957-59.

Species	Treatment	1957	1958	1959	Average
Coastal Bermudagrass-Clover	0-80-0	12690	7840	11080	10540
Coastal Bermudagrass-Clover	100-80-0	15010	9230	10530	11550
Coastal Bermudagrass-Clover	100-80-80	17140	9770	11520	12810
Coastal Bermudagrass	100-80-0	16180	8270	8510	10990
Coastal Bermudagrass	200-80-0	21060	12430	12560	15350
Common Bermudagrass-Clover	0-80-0	6620	7630	9190	7810
Common Bermudagrass-Clover	100-80-0	9420	9400	9950	9590
Common Bermudagrass-Clover	100-80-80	8260	8940	9350	8850
Common Bermudagrass	100-80-0	11400	4970	7310	7890
Common Bermudagrass	200-80-0	12600	9120	10010	10580
Dallisgrass-Clover	0-80-0	8150	5910	7610	7220
Dallisgrass-Clover	100-80-0	9340	7010	7230	7860
Dallisgrass-Clover	100-80-80	9290	6500	7690	7830
Dallisgrass	100-80-0	11370	5280	6380	7680
Dallisgrass	200-80-0	13290	7640	7340	9420
Angletongrass-Clover	0-80-0	7830	6250	8960	7680
Angletongrass-Clover	100-80-0	9480	5600	7810	7630
Angletongrass-Clover	100-80-80	8300	5420	8750	7490
Angletongrass	100-80-0	16910	7420	12510	12410
Angletongrass	200-80-0	16340	7540	10770	11730
LSD .05: Grass		NS	1931	NS	2225
LSD .05: Treatment		1511	695	1104	829
LSD .05: Grass X Treat.		3020	1390	2208	1658

Table 3. Percent leaves of total forage produced by clipping dates for 1959, Angleton, Texas.

Species	Treatment	4/20	6/9	8/11	10/19	Weighted Average
Coastal Bermuda	100-80-0	88	70	58	66	66
Coastal Bermuda	200-80-0	94	69	55	65	66
Dallisgrass	100-80-0	96	77	51	57	63
Dallisgrass	200-80-0	97	78	64	58	71
Angletongrass	100-80-0		60	42	47	47
Angletongrass	200-80-0		59	46	50	51

LSD .05		
	Grass	10.0
	Treatment	3.6
	Grass & treat.	NS

Table 4. Oven dry leaf yields per acre and average leaf percentage, 1957-1959.

Species	Treatment	Leaf Yields				Leaf Percentages			
		1957	1958	1959	Ave.	1957	1958	1959	Ave.
Coastal Bermuda	160-80-0	9710	5790	5620	7040	60	70	66	64
Coastal Bermuda	200-80-0	13480	8200	8290	9990	64	66	66	65
Dallisgrass	100-80-0	8530	3480	4020	5340	75	66	63	70
Dallisgrass	200-80-0	9970	5580	5210	6920	75	73	71	73
Angletongrass	100-80-0	9640	4160	5880	6560	57	56	47	53
Angletongrass	200-80-0	8980	4000	5490	6160	55	53	51	53

Table 5. Percent protein in forage from four grass species or affected by selected treatments, 1958, Angleton,Texas.

Species	Treatment	Percent Protein in Forage								
		2/28	3/28	4/28	5/27	7/14	8/19	9/30	12/2	Average
Coastal Bermudagrass-Clover	0-80-0	17.6	27.1	17.4	13.9	7.4	8.6	5.3	9.6	11.4
Coastal Bermudagrass	100-80-0			11.4	10.0	7.7	8.7	6.4	9.0	8.0
Coastal Bermudagrass	200-80-0			10.8	10.1	7.9	9.4	6.8	10.6	8.4
Common Bermudagrass-Clover	0-80-0	19.6	27.1	19.0	18.5	.0	7.9	8.0	10.3	15.8
Common Bermudagrass	100-80-0			13.0	10.7	.4	8.1	7.8	9.8	8.8
Common Bermudagrass	200-80-0			12.0	8.5	8.6	9.4	7.8	11.0	8.9
Dallisgrass-Clover	0-80-0	18.5	26.5	19.2	13.0	9.1	8.4	8.2	10.4	15.0
Dallisgrass	100-80-0			11.8	8.8	7.9	10.0	8.3	10.0	9.0
Dallisgrass	200-80-0			12.4	8.0	8.6	10.2	9.4	12.5	10.2
Angletongrass-Clover	0-80-0	18.6	27.1	20.2	17.6	8.5	10.5	7.8	7.6	14.9
Angletongrass	100-80-0				11.9	7.6	8.6	5.9	8.5	7.1
Angletongrass	200-80-0				10.1	8.6	8.6	7.2	9.3	8.1

LSD Grass - NS
Treatment - .78%
Grass X Treatment - 1.56%

Table 6. Percent protein in the leaves of three grass species grown with two levels of nitrogen by clipping dates, 1958, Angleton, Texas.

Species	Treatment	Percent Protein in Leaves						
		4/28	5/27	7/14	8/19	10/1	12/2	Ave.
Coastal Bermudagrass	100-80-0	10.2	10.0	8.3	9.1	7.1	10.1	8.7
Coastal Bermudagrass	200-80-0	10.4	11.4	8.8	10.4	8.3	10.7	9.4
	Average							9.1
Dallisgrass	100-80-0	11.9	9.4	8.5	8.3	9.2	10.4	9.8
Dallisgrass	200-80-0	11.9	13.3	8.0	9.4	10.9	12.4	11.1
	Average							10.6
Angletongrass	100-80-0			9.1	9.8	7.6	10.2	8.6
Angletongrass	200-80-0			12.1	10.1	9.8	11.4	10.6
	Average							9.5

LSD .05 Grass - .85%
Treatment - .73%
Grass X Treatment - NS

Table 7. Percent protein in the stems of three grass species grown with two levels of nitrogen by clipping dates, 1958, Angleton, Texas.

Species	Treatment	Percent Protein in stems						
		4/28	5/27	7/14	8/19	10/1	12/2	Ave.
Coastal Bermudagrass	100-80-0	7.9	7.9	4.6	4.4	3.2	5.8	4.2
Coastal Bermudagrass	200-80-0	8.4	6.9	4.3	5.8	3.8	6.6	4.7
	Average							4.5
Dallisgrass	100-80-0	9.2	6.3	5.9	5.6	4.9	5.6	5.3
Dallisgrass	200-80-0	9.8	8.2	5.6	6.3	6.1	5.3	6.0
	Average							5.7
Angletongrass	100-80-0			3.1	3.9	2.8	5.3	3.4
Angletongrass	200-80-0			4.1	3.7	4.7	7.1	4.6
	Average							4.0
LSD .05	Grass - .26%							
	Treatment - .44%							
	Grass X Treatment - NS							

NAME OF TEST: The influence of winter legumes versus summer nitrogen on Coastal Bermuda forage production, Mount Pleasant, 1960.

OBJECTIVES: To determine the influence of winter legume on spring and summer forage production as compared with nitrogen and the legume plus various nitrogen treatments.

EXPERIMENTAL PROCEDURE:

Experiment No.: 2930
Location: D. C. Hinson Farm, Mount Pleasant
Soil type: Sandy (norfolk)
Source of Materials: Local
Experimental design: (a) Randomized: 4 reps., (b) Plot size: 6 x 15 feet, area clipped for yield 34" x 7 1/2'

CROP MANAGEMENT PRACTICES:

Fertilized: 0-60-60 applied in the fall of 1959. Overseed with Crimson Clover, October 9, 1959.
Top-dressed: Dates on summary sheet, overseeded with Crimson Clover in 1957 and 1958.
General: Clipping on April 19, 1960 was Crimson Clover. The weather conditions during the crimson clover growing period were very poor. A period of cold wet weather was prevalent from January to the middle of March. Dry conditions were prevalent during April. The weather conditions during the Beruda growing period were favorable. Extreme dry conditions did occur in August and most of September. 7.22 inches of rainfall was recorded the last 1 1/2 weeks of September. Total rainfall for period covered by test was 50.78 inches. October through April, 25.58 inches. May to October, 25.20 inches.

RESULTS: See tables.

DISCUSSION: The winter legume definitely extended the period of forage production, no yields being obtained in late March and early April without the legume. Production without nitrogen but with a legume was about as good in 1960 as where nitrogen was used without the legumes. The three-year average indicates about a 600 pound advantage for nitrogen alone over the legume without nitrogen. Nitrogen (120 pounds) applied after the legume disappeared increased total production about 1.2 tons and gave the best distribution of production. The heavier rate of nitrogen, 120 pounds, produced about the same amount of forage as the 90 pounds of nitrogen. September growth was not influenced by either nitrogen or the winter legume.

These results indicate that a winter legume followed by nitrogen starting about June 1 is the best practice.

PROJECT: Hatch 388
DATE SUBMITTED: November 1960
WORKER: J. Albert Lancaster

Forage yield of Coastal Bermudagrass as influenced by winter legumes and nitrogen treatments, Mt. Pleasant, 1960.

Treatment	Pounds of air-dry forage per acre 4/19	5/21	6/29	7/27	8/29	9/30	Total
Winter legume	1710	1900	740	1230	1230	610	7420
Legume + 60# N June 1 60# N July 1	1290	2160	1410	4450	1610	600	11520
Legume + 30# N June 1 30# N July 1 30# N Aug. 1	1260	2050	1240	3240	2670	570	11030
No legume + 60# N May 1 60# N June 1	----	2220	1220	1970	1190	540	7140
No legume + 30# N May 1 30# N June 1 30# N July 1	----	2650	1070	3320	1340	540	8920
LSD for total yield (.05)							1600
C.V. (%)							19.6

Forage yield of Coastal Bermudagrass as influenced by winter legumes and nitrogen treatments, Mt. Pleasant, 1958-60.

Treatment	Pounds of air-dry forage per acre 1958	1959	1960	Avg.
Winter legume	7570	7780	7420	7590
Legume + 60# N June 1 60# N July 1	11420	11770	11520	11570
Legume + 30# N June 1 30# N July 1 30# N Aug. 1	10880	11050	11080	11000
No legume + 60# N May 1 60# N June 1	8580	8750	7140	8160
No legume + 30# N May 1 30# N June 1 30# N July 1	7850	8350	8920	8370
LSD (.05)	1150	1890	1600	

NAME OF TEST: Sudan variety and stage of harvest, 1960.
OBJECTIVE: To evaluate Sudangrass varieties and hybrids for yield and regrowth ability with various harvesting procedures.
EXPERIMENTAL PROCEDURE:
Location: Substation No. 5, Temple, Texas
Soil type: Houston clay
Cultural practices: Planted in 40-inch rows in mid-March, cultivated, and harvested as indicated inthe tables which follow.
RESULTS: See tables.
DISCUSSION: Sudax 11 produced more forage under each of the harvest procedures than any other entry. The Texas hybrids performed about the same as the standard varieties.

The yield from the boot stage of harvest was almost twice that of plots cut when the plants were 18 inches high. This was true even though there was only 10 days difference between the two stages at the first and second harvests, and the dates were the same for the final harvests. About the same total yields were obtained with a single harvest in the mature stage as with four earlier harvests.

PROJECT: H - 388
WORKER: E. D. Cook
DATE SUBMITTED: March, 1960

Forage yield of Sudan varieties harvested when 18 inches high, Temple, Texas, 1960

No.	Varieties	Pounds per acre air dry forage									
		May 30		July 1		Aug. 9		Nov. 1		Total	
		Green	Dry	Green	Dry	Green	Dry	Green	Dry	Green	Dry
1	Greenleaf	3045	1065	2705	930	7380	370	2960	1000	16090	3365
2	Georgia 337	2100	735	2540	875	7750	330	3115	1055	15505	2995
3	Perennial Sweet (Sorgrass)	730	255	1760	605	7885	345	2855	910	13230	2115
4	Piper	2855	1000	3215	1110	7815	320	2440	900	16325	3330
5	Stoneville Selection	2485	870	2315	800	7125	330	4180	1370	16105	3370
6	Stoneville Syn. #1	2055	720	2135	735	8100	370	4070	1190	16360	3015
7	Sweet 372	2800	980	2785	960	7580	325	1610	540	14775	2805
8	Tift	2985	1045	2640	910	8360	320	3875	1290	17860	3565
9	Texas 9901	3400	1190	2985	1030	7295	345	2525	985	16205	3550
10	Texas 9902	3615	1265	3255	1125	7900	350	2765	1055	17535	3795
11	Texas 9907	3585	1255	2655	915	7360	360	3025	1125	16625	3655
12	Sorghum almum	2070	725	2855	985	7950	325	3485	1300	16360	3335
13	Common	3100	1085	4135	1425	7815	370	2310	910	17360	3790
14	Sweet	1645	575	2460	850	6770	320	2745	825	13620	2570
15	Sudax 11	3970	1390	2925	1010	11345	385	5095	1595	23335	4380

Forage yield of Sudan varieties harvested in the boot stage, Temple,Texas, 1960

No.	Varieties	Pounds per acre air dry forage									
		June 10		July 17		Aug. 9		Nov. 2		Total	
		Green	Dry	Green	Dry	Green	Dry	Green	Dry	Green	Dry
1	Greenleaf	4785	1675	13740	4490	2505	880	3700	1205	24730	8250
2	Georgia 337	3300	1155	12280	4015	3025	1060	4300	1315	22905	7545
3	Perennial Sweet	1430	500	12800	4020	2655	930	3830	1280	20715	6730
4	Piper	5100	1785	13200	5055	3210	1125	3070	1095	24580	9060
5	Stoneville Sel.	3300	1155	13325	4370	3155	1105	4550	1280	24330	7910
6	Stoneville Syn.#1	3485	1220	16180	5160	2470	865	5290	1625	27425	8870
7	Sweet 372	3985	1395	13935	4735	2880	1010	2550	805	23350	7945
8	Tift	3855	1350	16460	5335	3515	1230	3505	1190	27335	9005
9	Texas 9901	4230	1480	12825	4860	3105	1085	2220	815	22380	8240
10	Texas 9902	5415	1895	11565	4195	3280	1150	3290	1195	23550	8435
11	Texas 9907	4355	1525	12105	4310	3185	1115	3310	1170	22955	8120
12	Sorghum almum	3730	1305	13085	4660	2980	1045	3440	1250	23235	8260
13	Common	4485	1570	10585	4210	3730	1305	1810	660	20610	7745
14	Sweet	3430	1200	14785	4715	3030	1061	1295	400	22540	7376
15	Sudax 11	6285	2200	18120	6270	3480	1220	6530	2180	34415	11870

Forage yield of Sudan varieties harvested in the mature seed stage, Temple, Texas, 1960.

No.	Varieties	Pounds per air dry forage					
		July 7		Oct. 10		Total	
		Green	Dry	Green	Dry	Green	Dry
1	Greenleaf	13075	5110	6590	2515	19665	7625
2	Georgia 337	15245	5290	5715	1970	20960	7260
3	Perennial Sweet	13285	4810	7080	2485	20365	7295
4	Piper	10670	4525	7745	3115	18415	7640
5	Stoneville Sel.	15680	5285	8495	2870	24175	8155
6	Stoneville Syn. #1	15845	5560	10685	3740	26530	9300
7	Sweet 372	10400	3755	8170	3000	18570	6755
8	Tift	13505	5010	8495	3065	22000	8075
9	Texas 9901	12905	5420	9910	3965	22815	9385
10	Texas 9902	12625	5240	8660	3480	21285	8720
11	Texas 9907	12145	4895	8495	3355	20640	8250
12	Sorghum almum	11055	4700	7625	3095	18680	7795
13	Common	7625	2820	8820	3210	16445	6030
14	Sweet	12740	4800	10235	3635	22975	8435
15	Sudax 11	19930	7195	12850	4525	32780	11620

Summary of forage yields of Sudan varieties harvested at three stages of maturity, Temple, Texas, 1960

No.	Varieties	Total pounds of forage per acre					
		Preboot stage		Boot stage		Mature seed stage	
		Green	Dry	Green	Dry	Green	Dry
1	Greenleaf	16090	3365	24730	8250	19665	7625
2	Georgia 337	15505	2995	22905	7545	20960	7260
3	Perennial Sweet	13230	2115	20715	6730	20365	7295
4	Piper	16325	3330	24580	9060	18415	7640
5	Stoneville Selection	16105	3370	24330	7910	24175	8155
6	Stoneville Syn. #1	16360	3015	27425	8870	26530	9300
7	Sweet 372	14775	2805	23350	7945	18570	6755
8	Tift	17860	3565	27335	9005	22000	8075
9	Texas 9901	16205	3550	22380	8240	22815	9385
10	Texas 9902	17535	3795	23550	8435	21285	8720
11	Texas 9907	16625	3655	22955	8120	20640	8250
12	Sorghum almum	16360	3335	23235	8260	18680	7795
13	Common	17360	3790	20610	7745	16445	6030
14	Sweet	13620	2570	22540	7376	22975	8435
15	Sudax 11	23335	4380	34415	11870	32780	11620

NAME OF TEST: The effect of harvesting at several stages of maturity on yield of four sorghum varieties and upon physical characteristics of the forage.

OBJECTIVES: (1) to determine the yield of four sorghum silage varieties as influenced by stage of maturity at harvest (2) to determine the influence of stage of maturity where harvested upon leaf, head, stem and moisture percentages and (3) to determine the influence of stage of maturity at harvest on recovery growth.

EXPERIMENTAL PROCEDURE:

Location: Brazos River Valley Lab near College Station

Soil type: Miller clay

Experimental design: A randomized block split-plot design with varieties as main plots and stage of maturity at harvest as sub-plots, 4 replications. The plots were 3 40-inch rows, 20 feet long, the center row harvested for yield. The four varieties were Atlas, Tracy, Silo King and Beef Builder. Stages of harvest were: (1) Early boot, (2) Late boot, (3) Late flower, (4) Soft dough, (5) Hard dough.

Crop Management: The test was planted April 18, 1960, fertilized with 48-48-48 prior to planting and top dressed with 45-0-0 on June 6, 1960. The area was flood irrigated as needed to maintain adequate moisture for growth, June 8 and July 21, 1960.

RESULTS: See table.

DISCUSSION: The plot area was shredded by a farm worker by mistake on September 9, making it impossible to collect further data. At that time, Silo King and Atlas had been harvested a second time at three stages by maturity and Tracy at one stage.

The only information of value obtained in this study is the influence of stage of maturity on first cutting performance. Total yields could not be obtained because of various amounts of regrowth at the time the plots were shredded.

With the first harvest, dry matter yields increased with advanced maturity to the soft dough stage. There appeared to be no advantage in green yield, dry yield or grain yield in allowing the plants to advance beyond the soft dough stage. Maximum green weight was reached by the late flowering stage.

Moisture content was extremely high in the two boot stages, actually exceeding 90% in some cases. Silo King, Atlas and Tracy yielded about the same with Beef Builder being somewhat higher in yield.

The limited amount of regrowth information indicates that an early boot stage of harvest would result in reduced yields even if an extra harvest was obtained. Also the extremely high moisture content would require special treatment. Harvesting in the late boot stage also would result in reduced yields unless an extra harvest was obtained. Since the second harvest in late boot and late flower was only two weeks apart, it is doubtful that late boot would produce an extra cutting over late flower. It is not possible to determine the relationship between late flower and soft dough.

The study was attempted in 1959 and accidentally lost at about the same stage due to dehydration of an adjacent cotton field.

PROJECT: Hatch 388

DATE SUBMITTED: November, 1960

WORKER: E. C. Holt

Performance of four silage sorghums harvested at five stages of maturity, BRVL, 1960

Variety	Stage of harvest	Date of harvest	Yield (tons) Green	Dry	% Moisture	Stalk Height (ft.)	Stalk Diameter (inch)	Percentage Heads	Leaves	Stalks
			First Harvest							
Silo King	Early boot	6/29	18.5	1.9	90		9/16	0	62	38
	Late boot	7/1	22.7	3.1	86	9.2	11/16	0	50	50
	Late flower	7/12	24.4	4.8	80	10.2	9/16	5	39	56
	Soft dough	7/26	24.8	6.9	72	8.1	10/16	7	31	62
	Hard dough	8/2	25.0	5.8	77	8.0	12/16	10	30	60
Atlas	Early boot	6/29	17.4	1.9	89		10/16	0	55	45
	Late boot	7/5	19.2	2.6	87	7.8	10/16	0	52	48
	Late flower	7/12	23.7	4.3	82	9.1	9/16	6	39	55
	Soft dough	7/26	20.4	3.8	82	7.1	10/16	13	26	61
	Hard dough	8/2	24.6	5.4	77	7.6	12/16	14	26	60
Tracy	Early boot	6/29	14.4	1.2	91		9/16	0	56	44
	Late boot	7/23	21.3	3.9	82	7.9	10/16	2	36	62
	Late flower	8/2	27.7	5.1	82	9.5	14/16	4	26	70
	Soft dough	8/10	27.9	9.1	67	11.0	11/16	6	26	72
	Hard dough	8/19	28.8	6.9	76	8.9	7/16	11	21	68
Beef Builder	Early boot	6/29	25.3	2.4	90		10/16	0	65	35
	Late boot	8/2	35.4	6.2	82	8.9	15/16	1	39	60
	Late flower	8/10	36.1	8.9	75	11.1	9/16	7	31	62
	Soft dough	8/16	39.9	10.4	74	12.5	11/16	7	25	68
	Hard dough	8/24	38.6	10.8	72	12.2	13/16	18	23	59
			Second Harvest							
Silo King	Early boot	8/19	8.5	1.3	85	7.1	7/16	10	35	55
	Late boot	8/25	16.4	3.0	81	7.0	7/16	11	33	56
	Late flower	9/9	13.9	3.0	78	7.1	6/16	7	30	63
Atlas	Early boot	8/19	7.9	1.3	84	5.0	5/16	8	41	51
	Late boot	8/29	7.9	1.6	80	5.4	7/16	8	39	53
	Late flower	9/9	14.9	3.3	78	5.9	4/16	9	34	57
Tracy	Early boot	8/29	3.9	.6	81	4.8	7/16	5	43	52

NAME OF TEST: Forage sorghum variety and stage of harvest, 1960.
OBJECTIVES: To evaluate forage sorghum varieties and hybrids harvested at various stages of maturity for yield and regrowth ability.
EXPERIMENTAL PROCEDURE:
Location: Substation No. 5, Temple, Texas
Soil type: Houston clay
Cultural practices: Planted in 40-inch rows in mid-March and harvested as indicated in the tables which follow.
RESULTS: See tables.
DISCUSSION: Even though four cuttings were obtained, preboot harvesting resulted in reduced yields. Three harvests were obtained in the boot stage and total yields for the hybrids exceeded the single yield in the mature seed stage. The standard varieties, especially those requiring a long growing season, produced more with a single harvest than with three harvests. Earlier observations have indicated better regrowth of the hybrids and these results follow the same pattern.

The mature seed harvest was made in mid-July and considerable regrowth occurred but was not harvested because the mature seed stage was not reached a second time. Had the regrowth been measured, it is likely that total yields for the late harvest stage would have been greater than for the boot stage.

PROJECT: H-388
WORKER: E. D. Cook
DATE SUBMITTED: March, 1961

Forage sorghum variety test, harvested in boot stage, Temple, Texas, 1960.

No.	Varieties	Pounds per acre of forage							
		June 25, 1960		Aug. 9, 1960		Sept. 13, 1960		Total	
		Green	Dry	Green	Dry	Green	Dry	Green	Dry
1	Sart	5030	1675	21780	7925	550	155	27360	9755
2	Wiley	3800	1265	19055	7525	2920	875	25775	9665
3	Texas 9918	9685	3225	26135	10195	5895	1880	41715	15300
4	Beef Builder	11215	3735	24065	9000	7860	2860	43140	15595
5	Honey Sargo	6515	2170	25370	9895	2615	865	34500	12930
6	Lindsey 101F	10195	3395	21455	8345	10235	3795	41885	15535
7	Texas 9913	10660	3550	21560	8235	7450	2965	39670	14750
8	NK 320	11770	3920	27335	10470	9730	3465	48835	17855
9	NK x 3065	8890	2960	22540	8835	7680	2985	39110	14780
10	Lindsey H5F	9940	3310	25920	10160	8230	3095	44090	16565
11	Texas 9915	9160	3050	22110	8270	8275	3030	39545	14350
12	Tracy	6410	2135	18620	7040	3820	1135	28850	10310
13	Texas 9910	9220	3070	24175	9330	8465	3420	41860	15820
14	Silo King	7880	2625	15900	6710	7405	2745	31185	12080
15	NK x 3058	9355	3115	24610	10510	7695	3060	41660	16685
16	Texas 9917	9415	3135	24395	9220	10105	3880	43915	16235
17	Lindsey 92F	9610	3200	17535	6855	7070	2490	34215	12545
18	NK x 3059	8365	2785	18515	7425	6505	2485	33385	12695
19	No. 25	7850	2615	25920	9925	5560	1700	39330	14240
20	Texas 9912	12280	4090	23195	8185	8945	3460	44420	15735
21	Sumac	9310	3100	14375	5935	7100	2685	30785	11720
22	Atlas	4310	1435	13395	5330	3700	1115	21405	7880
23	Texas 30	7975	2655	--	--	--	--	7975	2655
24	Texas 34	4910	1635	--	--	--	--	4910	1635
25	Reg. Hegari	4115	1370	11760	4925	4935	1760	20810	8055

Forage sorghum variety test, harvested in preboot stage (18-inches high), Temple, Texas, 1960

No.	Varieties	Pounds per acre of forage									
		May 28, 1960		July 6, 1960		Aug. 30, 1960		Nov. 15, 1960		Total	
		Green	Dry	Green	Dry	Green	Dry	Green	Dry	Green	Dry
1	Sart	1125	375	7025	2340	11325	3770	1260	420	20735	6905
2	Wiley	915	305	5975	1990	10170	3600	585	195	17645	6090
3	Texas 9918	3110	1035	7400	2465	11480	3235	960	320	22950	7055
4	Beef Builder	2550	850	6425	2140	11390	3350	1185	395	21550	6735
5	Honey Sargo	1530	510	7775	2590	18075	5295	825	275	28205	8670
6	Lindsey 101F	2760	920	6515	2170	13525	4330	1110	370	23910	7790
7	Texas 9913	2955	985	4400	1465	11760	3730	1200	400	20315	6580
8	NK 320	2895	965	6275	2090	12175	3775	1605	535	22950	7365
9	NK x 3055	1980	660	6485	2160	10630	3560	1000	330	20095	6710
10	Lindsey H5F	2400	800	8095	2695	10975	3380	1000	330	22470	7205
11	Texas 9915	2790	930	6065	2020	10975	3580	1335	445	21165	6975
12	Tracy	1980	660	6200	2065	9015	3220	945	315	18140	6260
13	Texas 9910	2295	765	5030	1675	12895	4025	1305	435	21525	6900
14	Silo King	1305	435	8635	2875	9890	3580	885	295	20715	7185
15	NK x 3058	2415	805	6695	2230	13025	4535	975	325	23110	7895
16	Texas 9917	2505	835	4730	1575	14115	4475	1465	490	22815	7375
17	Lingsey 92F	1755	585	6065	2020	8625	2960	720	240	17165	5805
18	NK x 3059	2415	805	5510	1835	8580	2780	915	305	17420	5725
19	No. 25	1740	580	6845	2280	12805	4225	1020	340	22410	7425
20	Texas 9912	2265	755	4790	1595	11410	3540	1000	330	19465	6220
21	Sumac	2505	835	7565	2520	7690	2615	780	260	18540	6230
22	Atlas	765	255	5690	1895	8015	3095	1095	365	15565	5610
23	Texas 30	2235	745	1230	410	--	--	--	--	3465	1155
24	Texas 34	1170	390	2165	720	--	--	--	--	3335	1110
25	Reg. Hegari	660	220	5825	1940	10280	3925	1185	395	17950	6480

Forage sorghum variety test harvested in mature seed stage, Temple, Texas, 1960

No.	Varieties	Lbs./acre forage* July 6 to Aug. 17 Green	Dry
1	Sart	39205	15250
2	Wiley	37845	13360
3	Texas 9918	38930	12690
4	Beef Builder	31695	12390
5	Honey Sargo	36970	11755
6	Lindsey 101F	29295	11190
7	Texas 9913	28970	10485
8	NK 320	27770	10245
9	NK x 3055	26900	10220
10	Lindsey H5F	28475	10195
11	Texas 9915	28425	10120
12	Tracy	28740	10085
13	Texas 9910	27390	9940
14	Silo King	27605	9940
15	NK x 3058	23955	9920
16	Texas 9917	27495	9680
17	Lindsey 92F	24010	9510
18	NK x 3059	25645	9310
19	No. 25	28675	9290
20	Texas 9912	26300	9075
21	Sumac	23415	8220
22	Atlas	21180	7585
23	Texas 30	21510	7420
24	Texas 34	18405	6605
25	Reg. Hegari	12415	4830
L.S.D.		2996	1049

* There was a lot of forage left on these plots when frost hit them.

Summary of total yields of forage sorghums harvested at three stages of growth, Temple, Texas, 1960

No.	Varieties	Pounds of forage per acre					
		Pre-boot stage		Boot stage		Mature seed stage	
		Green	Dry	Green	Dry	Green	Dry
1	Sart	20735	6905	27360	9755	39205	15250
2	Wiley	17645	6090	25775	9665	37845	13360
3	Texas 9918	22950	7055	41715	15300	38930	12690
4	Beef Builder	21550	6735	43140	15595	31695	12390
5	Honey Sargo	28205	8670	34500	12930	36970	11755
6	Lindsey 101F	23910	7790	41885	15535	29295	11190
7	Texas 9913	20310	6580	39670	14750	28970	10485
8	NK 320	22950	7365	48835	17855	27770	10245
9	NK x 3065	20095	6710	39110	14780	26900	10220
10	Lindsey H5F	22470	7205	44090	16565	28475	10195
11	Texas 9915	21165	6975	39545	14350	28425	10120
12	Tracy	18140	6260	28850	10310	28740	10085
13	Texas 9910	21525	6900	41860	15820	27390	9940
14	Silo King	20715	7185	31185	12080	27605	9940
15	NK x 3058	23110	7895	41660	16685	23955	9920
16	Texas 9917	22815	7375	43915	16235	27495	9680
17	Lindsey 92F	17165	5805	34215	12545	24010	9510
18	NK x 3059	17420	5725	33385	12695	25645	9310
19	No. 25	22410	7425	39330	14240	28675	9290
20	Texas 9912	19465	6220	44420	15735	26300	9075
21	Sumac	18540	6230	30795	11720	23415	8220
22	Atlas	15565	5610	21405	7880	21180	7585
23	Texas 30	3465	1155	7975	2655	21510	7420
24	Texas 34	3335	1110	4910	1635	18405	6605
25	Reg. Hegari	17950	6480	20810	8055	12415	4830

NAME OF TEST: Chemical control of weeds in pastures.

OBJECTIVES: (1) To determine minimal rates of certain selective herbicides for dock control (2) To determine the influence of weed control on forage yield (3) To evaluate chemicals for control of Bullnettle.

EXPERIMENTAL PROCEDURE:

Location: Substation No. 2, Tyler, Texas

Soil type: Kirvin fine sandy loam

Field design: Three herbicides, each at 2 rates were applied to dock (Rumex spp.) infested Bermudagrass on April 7, using 4 replications.

Chemicals: 2, 4-D, 4(2,4-DB), 4(MCPB)

Rates per acre: 1/2 and 1 pound actual

Data: Forage was harvested June 10 and separated into grass and weed components.

Bullnettle control: See below

RESULTS: Bullnettle (Cnidoscolus texensis) is common perennial weed in upland pastures of East Texas. Plants of this species are covered by sharp spines, and when high plant densities are present, forage utilization is reduced because livestock will not graze in or near plants of this species.

Broadcast field application of 2, 4-D at rates to control most common pasture weeds has not been effective in controlling this pest. Periodic mowing is effective in reducing the size of the plant, and thereby further reduces the mechanical interference of the plant to grazing livestock. Mowing, however, does not actually kill the bullnettle plants, at least as most farmers practice mowing in pastures.

Experiments were initiated in 1957 to determine first if chemicals could be used to effectively kill bullnettle. Due to the growth habit and length of life of the plant, evaluation of results of chemical tests, had to be made at least one year after plants were treated with the chemical. Two experiments were conducted between 1957 and 1960. The first test was initiated in 1957 and evaluated in 1958. The second experiment was initiated in 1959 and evaluated in 1960.

The results of these experiments indicate that bullnettle can be significantly reduced with amitrole (3-amino - 1,2,4-triozole) when applied as a spot treatment to individual plants. The most effective amitrole treatment consisted of 4 pounds of the actual chemical per 100 gallons of water. This treatment was applied to individual plants at a volume of 1/2 pint per plant. Both the 1957-58 and 1959-60 experiments showed the amitrole treatment to give significantly higher kills than any other treatment evaluated.

Results of the 1960 dock control study are presented in the table.

DISCUSSION: All of the chemicals at 1 pound per acre gave complete control of dock. Yield of the grass component of the forage appeared to be reduced due to weed competition on the check plot but the difference was not statistically significant. Dock represented 28% of the harvested material in untreated plots and less than 5% with 1/2 pound of 4(MCPB) per acre. 4(MCPB) and 4(2,4-DB) can be used for controlling weeds in a grass-clover mixture, but the materials are more costly than 2,4-D. These results indicate that 1/2 pound per acre of these materials is effective against dock.

PROJECT: Hatch 388
DATE SUBMITTED: February, 1961
WORKER: J. A. Long and P. R. Johnson

Forage yield as influenced by chemical weed control, Tyler, 1960.

Treatment		Pounds of dry matter per acre		Weed
Chemical	#/acre	Grass	Rumex spp.	Density
2,4-D	1/2	1911	197	2.5
2,4-D	1	2052	0	0
4(2,4-DB)	1/2	2248	0	0
4(2,4-DB)	1	2360	0	0
4(MCPB)	1/2	2136	112	2.5
4(MCPB)	1	2220	0	0
Check		1610	646	20.3

Treatment applied April 7, 1960. Plots harvested June 10, 1960.

NAME OF TEST: Pasture fertilization, irrigation and animal treatments at Lufkin, 1960.

OBJECTIVES: To find methods of preventing animal weight losses on improved common Bermudagrass pastures in late summer and fall.

EXPERIMENTAL PROCEDURES:

Location: East Texas Pasture Investigations Laboratory, Lufkin, Texas.

Soil type: Bibb sandy loam

TREATMENTS: Field plan attached

Fertilization - All pastures will receive 0-60-60 in late March and 40-0-0 about May 15, July 1 and August 15.

Irrigation - Pastures A-2, A-4, B-2 and B-4 irrigated as necessary to maintain active plant growth.

Stocking rate - All pastures stocked at about 1250 pounds liveweight per acre throughout the season.

Feed - Supplemental feeding consisting of 2 to 4 pounds of ground milo daily initiated on 7 pastures at the first indication of decreased animal performance to determine if this practice will prevent weight losses.

Trace mineral elements - Pastures and animals treated as follows: Copper injection in selected animals with and without supplemental feed as indicated in field plan.

Sulfur spray application on pasture B-3.

Minor element mixture spray on pasture C-4

Individual, minor element spray in strips on pasture C-3 and observation for selective grazing.

Animals - One yearling steer and one heifer used as testor animals in each pasture. The remainder of the animals from the station herd.

Supplemental animals - 8 animals comparable to those in the grazing study were maintained with the station herd. This phase of the study is to determine if the weight loss problem occurs only on the experimental pastures.

Data - All animals be weighed every 28 days, and forage availability determined on weigh days by mower stirp harvesting in each pasture.

Lufkin Pasture Study Field Plan

Feed + Copper	No Feed + Copper	Feed + Individual Trace elements in strips	No Feed + Trace element mixture
Feed + Harvesting	No Feed Irrigated	No Feed + Sulfur	Feed Irrigated
Feed	Feed Irrigated	Feed + Copper	No Feed Irrigated

East Fence

RESULTS: See tables

DISCUSSION: Feeding was started at the end of the first weigh period which was May 24. Greater total acre gains were recorded with feed than without feed. Average daily gain per animal was essentially the same with or without feed. Apparently the stocking rate was heavier on pasture where the animals were receiving feed. Thus, feed maintained averaged daily gains with heavier stocking rate at about the same level as lighter stocking rate without feed. However, the improvement in acre production probably would no more than offset the cost of the feed. Each additional 100 pounds of animal gain required about 850 pounds of grain.

During late May and early June most animals lost weight. Feed neither improved individual animal performance nor acre production during this period.

The trace minerals and copper injection could have been effective only during the July 19 to August 25 period since the treatments were not applied until early July. Four animals receiving copper injections made an average daily gain of only .37 pounds compared with the average of all animals of .86. Pastures C-3 and C-4 receiving trace minerals either in strips or a mixture were among the best in average daily gain. However, other pastures produced as good gains, thus there is no unqualified evidence of beneficial effects.

On August 25, 9 animals were left on 3 pastures without feed and 10 animals were left on 3 other pastures and received 2 to 4 pounds of cotton seed meal daily. During the period of August 25 to about November 16 the average daily gains were as follows: Pasture only, 0.46; pasture + cotton seed meal, 0.72. It is obvious that gains were poor either with or without feed.

At the beginning of the study, 7 animals similar to those used in the experimental pastures were placed with the breeding herds outside the experimental pasture area. These animals made an average daily gain of 1.35 pounds between April 27 and August 25 compared with 0.83 in the experimental pasture area. These results suggest an influence of pasture treatments, stocking rate or other factors such as internal parasites on animal performance in this area.

Forage was harvested from Pasture B-1 in July and September for a feeding trial with sheep, but the feeding has not been done.

PROJECT: Hatch 388 and State 1075

DATE SUBMITTED: January, 1960

WORKERS: E. C. Holt, E. K. Crouch and F. L. Fisher

Lufkin Experimental Pastures - Botanical Composition and available forage - 1961

Pasture No.	Botanical Composition (%) May 23, 1960 Grass	Legume	Weeds	Pounds of dry forage per acre in grazed pastures 4/27	5/23	6/23	7/19	8/18	9/27	Avg.
A-1	88	4	8	1037	1670	1919	2624	2515		1953
A-2	72	5	23	1564	2333	3293	3086	2857		3283
A-3	84	3	13	964	1603	2669	3012	3422		2917
A-4	96	1	3	663	895	1349	2518	2268		1539
B-1	85	1	14	1094	1112	2014	2476	3526		2044
B-2	92	1	7	916	989	1882	1803	1906		1499
B-3	79	1	20	575	1398	2513	3148	2432		2013
B-4	75	5	20	1017	820	2538	2379	2156		1782
C-1	42	21	37	1083	1533	1369	1414	2234		1527
C-2	88	3	9	936	2009	3448	3086	2258	3021	2347
C-3	74	3	23	561	1113	1567	2804	2590	2964	1727
C-4	97	1	2	658	1036	1512	2141	3288	3933	1727

Lufkin Experiment Pastures - Animal gain per pasture (2 acres)

Pasture	4/27-5/24	5/25-6/21	6/22-7/19	Total 4/27-7/19	7/19-8/25	Season Total
A-1	85	155	45	285	155	440
A-2	65	165	-40	190	145	335
A-3	70	145	35	250	110	360
A-4	120	70	50	240	35	275
B-1	130	85	-35	180	170	350
B-2	55	125	-45	135	95	230
B-3	55	125	20	200	65	265
B-4	65	125	-15	175	110	285
C-1	190	245	-30	405	165	570
C-2	85	120	- 5	200	40	240
C-3	50	120	-15	155	190	345
C-4	40	150	-20	170	115	285
Avg. Feed	93	148	- 8	234	149	383
No Feed	71	118	0	189	70	259

Lufkin Experimental Pastures- Average daily gains per animal, 1960.

Pasture No.	4/27-5/24	5/25-6/21	6/21-7/19	7/19-8/25	Average 4/27-8/25
A-1	1.20	1.57	.40	1.05	1.06
A-2	.92	1.67	- .36	.98	.80
A-3	.99	1.46	.31	.74	.88
A-4	1.69	.83	.60	.32	.86
B-1	1.55	.86	- .31	1.15	.81
B-2	.65	1.49	- .54	.86	.62
B-3	.77	1.49	.24	.59	.77
B-4	.92	1.30	- .19	1.00	.76
C-1	1.91	2.19	- .27	1.11	1.24
C-2	.86	1.43	- .06	.36	.65
C-3	.51	1.22	.14	1.28	.72
C-4	.40	1.79	- .24	1.04	.75
Average Feed	1.09	1.45	- .15	.95	.84
No Feed	.94	1.43	.09	.77	.81

(9 animals on pasture from August 25 to about November 16 made an ADG of .46
10 animals on pasture and receiving 2-4 pounds of CSM daily made an ADG of .72
7 animals outside the experimental pasture area made an ADG of 1.35 from April 27 to August 25.
4 animals receiving copper injection 7/19 made an ADG of 0.37 during the succeeding 37-day period to August 25.