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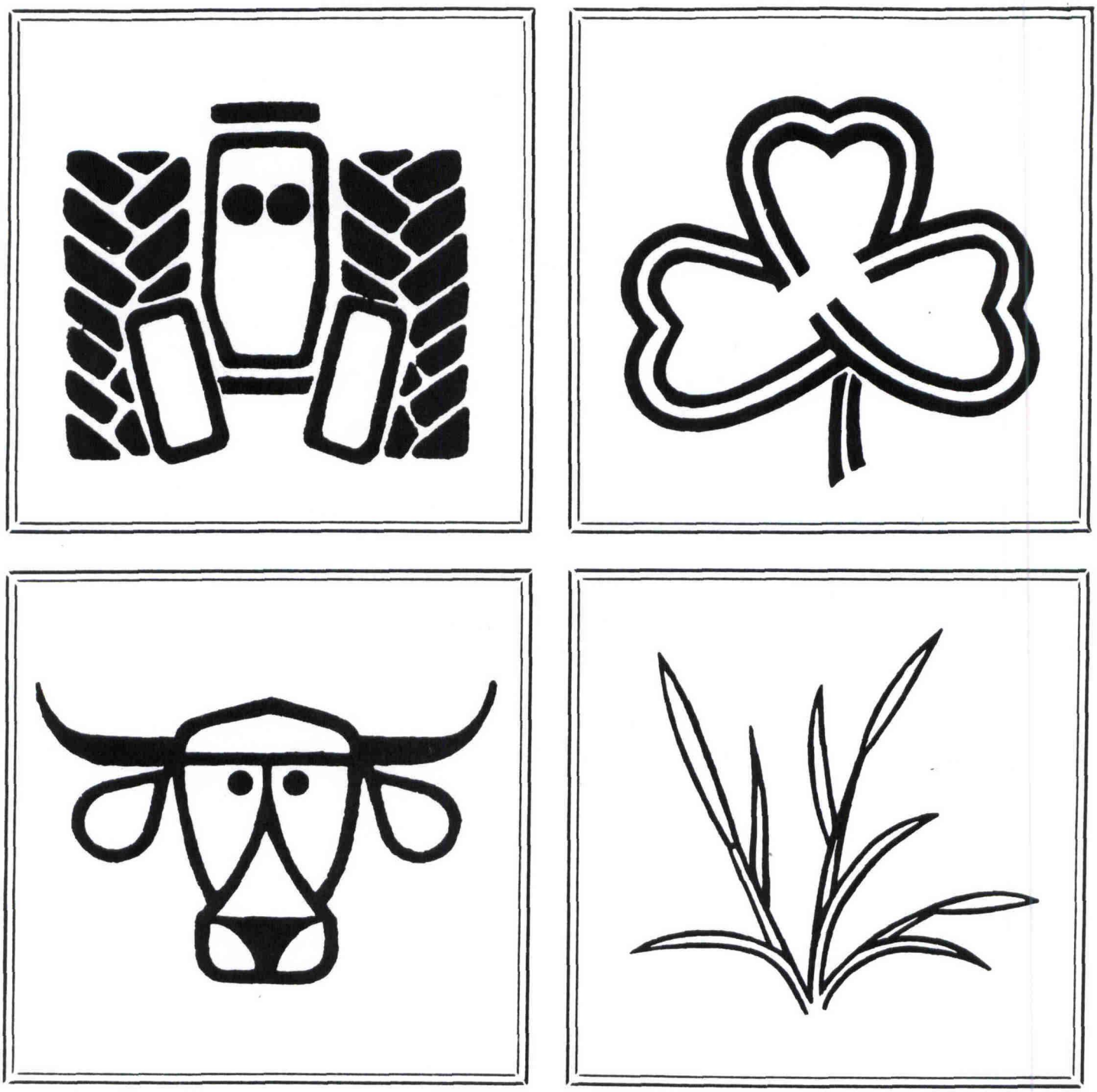

Forage Research in Texas

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

Clover Variety Trials in Southeast Texas

Gerald W. Evers[1]

Summary

Varieties of eleven clover species were evaluated for forage production in the Upper Gulf Coast of Texas at Angleton. Subterranean clovers were the most productive species with 11 varieties yielding in excess of 5000 pounds dry matter per acre. There was an additional 2000 to 3000 pounds below the 1 inch cutting height at the last harvest. Of the other clover species, Bigbee berseem clover was the most productive with 5400 pounds per acre. Other high yielding clovers were Yuchi arrowleaf, Dixie crimson and red clover varieties.

Introduction

The combination of climate and soil types dictate which forages will grow in an area and how productive they will be. The better adapted a particular clover is, the less management (fertility, weed control, grazing systems, etc.) is required to maintain that forage. The climate of southeast Texas is subtropical in nature with annual rainfall ranging from 36 to 55 inches. Approximately 75 percent of the soils in the area have a claypan layer 10 to 14 inches below the soil surface. This claypan restricts the downward movement of water and root growth. It is responsible for the poor drainage in the winter and poor plant growth during low rainfall periods in the summer. Because of this unique environment, cool season annual clover variety trials were conducted to determine the best adapted cultivars for the area.

Procedure

Because of the large number of entries the subterranean clovers were in one test and all other clovers in a second test. Management practices and harvest dates were identical. The study site was a Lake Charles clay which was fertilized with 60 pounds of phosphorus and 40 pounds of potassium per acre before planting. Subterranean clovers were seeded at 20 pounds per acre. Seeding rates of the other clovers are reported in Table 1. All seed were inoculated with their proper Rhizobium strains using the Pelinoc-Pelgel system and planted on 15 Oct. 1982. Plots consisted of six-8 in. rows, 15 ft. long. Experimental design was a randomized block with four replications. One pound of Basagran per acre was applied on December 7 for broadleaf weed control. Plots were harvested with a flail mower at a 1 inch cutting height. Harvest dates were 14 Feb., 22 Mar., 15 May, and 8 June. Only the red clover cultivars were harvested on the last harvest date. Because of the prostrate

[1]Professor, Texas Agricultural Experiment Station, Angleton, Texas 77515.

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type growth of subterranean clovers, a 12 x 16 inch sample of the forage below the cutting height was hand clipped after the last harvest.

Results and Discussion

Bigbee berseem, Dixie crimson, and Yuchi arrowleaf produced significantly more forage at the first harvest than the other clovers (Table 1). Early production is very important because it occurs at a time when livestock are normally fed stored forages and protein supplements. Previous studies at this location have shown Yuchi arrowleaf to have only moderate early production. The high yield at the first harvest in this study can be attributed to the unusually mild winter.

Bigbee berseem clover was the most productive clover in the study. It's seedling vigor and early production is impressive. At this time it appears to be adapted to a wide range of soils and climate conditions. Red clovers were the next highest yielding. Initial production is low but they will grow through the early summer if adequate moisture is available. April, May and June of 1983 were very dry with only .16, 1.45, and 1.68 inches of rain, respectively. Yields of the late maturing clovers such as red and arrowleaf were lower than normal because of the poor moisture conditions. Yuchi arrowleaf and Dixie crimson produce 4100 pounds per acre which was not significantly different from red clover production.

Entries of the subterranean clover variety test consisted of eight varieties from Australia, one from Mississippi, and five plant introductions selected by Dr. Ray Smith at the TAMU Res. & Ext. Center at Overton. Production at the first harvest of PI 168638, Woogenellup, Mt. Barker, Nungarin, and PI 184962 were equal to Bigbee berseem, Yuchi arrowleaf and Dixie crimson in the other variety test. Production of most subterranean clovers at the second and third harvest was equal to or greater than the other clover species.

Total dry matter production was closely related to maturity with the late maturing Tallarook and PI 168638 being the highest yielding. Nungarin, the earliest variety, was the least productive except for Clare. Larisa, and especially Clare, had poor stands due to low seed germination. Except for Nungarin, Larisa, and Clare, harvested forage of subterranean clovers equalled or exceeded other clovers.

The large amount of forage below the one inch cutting height at the last harvest was surprising. Dry matter per acre ranged from 2000 to 3000 pounds except for PI 209924. As subclovers mature, the stems and leaves form a thick mat on the soil surface. Even though livestock may not be able to utilize all of this forage, it can improve soil fertility. When added to the harvested forage, the total forage produced by the late maturing cultivars exceeded 8000 pounds per acre. High forage yields coupled with a unique form of seed production indicate a great potential for subterranean clover in southeast Texas.

Table 1. Production of cool season clovers at Angleton 1982-83.

Variety	Seeding rate	14 Feb.	22 Mar.	15 May	8 June	Total
	lb/ac	lb D.M./ac				
Bigbee berseem	18	1316 a[1]	1492 bc	2564 a	0 c	5372 a
Nolin's red	12	588 c-f	1407 cd	2386 ab	568 b	4949 ab
Florie red	12	575 c-f	1035 ef	2228 a-c	869 a	4707 ab
Kenstar red	12	418 ef	1283 c-e	2068 a-d	735 a	4504 bc
Pawera red	12	379 f	1198 d-f	2056 a-d	752 a	4385 bc
Kenland red	12	596 c-f	1174 d-f	1769 c-e	752 a	4291 bc
Florex red	12	554 c-f	973 f	1960 b-d	768 a	4255 b-d
Tensas red	12	638 c-e	1236 c-f	1877 b-e	484 b	4235 b-d
Dixie crimson	18	1158 a	1698 b	1298 e-h	0 c	4154 b-d
Yuchi arrowleaf	9	1150 a	1237 c-f	1735 c-f	0 c	4122 b-d
Abon Persian	9	380 f	1186 d-f	2162 a-d	0 c	3728 c-e
Kondinin rose	18	784 bc	2021 a	658 i	0 c	3463 d-f
Wilton rose	18	544 c-f	1492 bc	1171 f-i	0 c	3207 e-g
Palestine strawberry	15	701 b-d	973 f	1343 e-h	0 c	3017 e-h
La. S-1 white	5	481 d-f	1258 c-e	1151 g-i	0 c	2890 f-h
Hubam sweetclover	15	892 b	561 g	1093 h-g	0 c	2546 gh
Lappa clover	5	690 b-d	671 g	1002 hi	0 c	2363 h

[1]Yields within a column followed by the same letter are not significantly different at the .05 level, Duncan's Multiple Range Test.

Table 2. Dry matter production of subterranean clovers at Angleton 1982-83.

Variety	14 Feb.	22 Mar.	15 May	Harvested forage	Forage below cutting height[1]	Total forage
	---------- lb D.M./ac. ----------					
PI 168638	1412 a[2]	1832 a	3271 ab	6515 a	2322 ab	8837 a
Tallarook	1063 b-d	1876 a	3560 a	6499 a	2106 ab	8605 ab
PI 184962	1128 b-d	1909 a	3051 a-c	6088 ab	2664 ab	8752 ab
Mt. Barker	1148 b-d	1908 a	2911 b-d	5967 ab	2502 ab	8469 ab
PI 209924	588 f	1627 ab	3494 a	5709 bc	1674 b	7383 bc
Woogenellup	1307 ab	1840 a	2556 c-e	5703 bc	2808 ab	8511 ab
PI 239907	1056 b-d	1937 a	2666 c-e	5659 bc	2898 ab	8557 ab
Nangeela	1012 cd	1756 ab	2870 b-d	5638 bc	3006 a	8644 ab
Meteora	948 de	1908 a	2490 c-e	5346 bc	3132 a	8478 ab
PI 209927	729 ef	1522 ab	2909 b-d	5160 c	2826 ab	7986 a-c
Miss. Ecotype	906 de	1839 a	2281 e	5026 c	2790 ab	7816 a-c
Larisa[3]	270 e	1614 ab	2401 de	4285 d	2610 ab	6895 c
Nungarin	1148 b-d	1373 b	0 f	2521 e	2772 ab	5293 d
Clare[3]	933 de	1566 ab	0 f	2499 e	2700 ab	5199 d

[1]Estimated from a 12 x 16 in. sample.

[2]Values within a column followed by the same letter are not significantly different at the .05 level, Duncan's Multiple Range Test.

[3]Poor stand because of poor seed germination.