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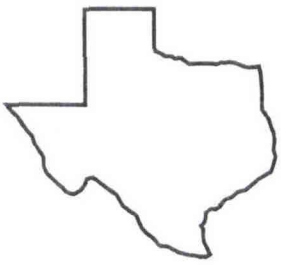
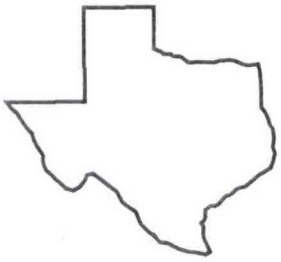
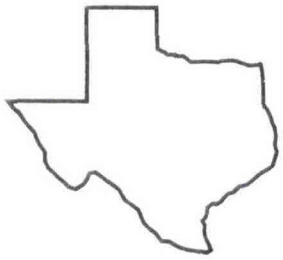
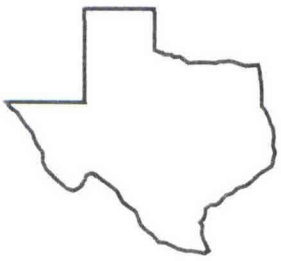




Overton Field Day Report - 1994





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RESPONSE OF ALFALFA TO BORON AND SURFACE APPLIED LIMESTONE

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Background. Plots in a site used for the previous 3 years to study response of rose clovers, interseeded into Coastal bermudagrass, to limestone rates, limestone ECCE and boron, were retreated with ECCE 62 and 100 limestones at 0, 1, and 2 tons/acre. Boron was reapplied to individual plots at rates equivalent to 0, 1, and 2 lb/acre before seeding in Oct. 1992. A blended fertilizer was applied that provided 125 lb P_2O_5, 166 lb K_2O, 66 lb S, and 33 lb Mg on 12 Oct. 92. Alfalfa was seeded into these plots in 27-inch rows at the rate of 6.7 lb of seed/acre in Oct. 1992. The blended fertilizer was reapplied at the same rate on 19 May 93 with 50 lb N/acre. An additional 50 lb N/acre was reapplied for the bermudagrass on 28 June 93. The 1993 growing season was initially wet through the month of June, followed by an 86-day period of essentially no effective rainfall. The largest amount received in any precipitation event was 0.22 inches.

Research Findings. Alfalfa production on the limestone rate, ECCE, and B treated site was low (Table 2). This site is located adjacent to the row-spacing and N-rate experiment that yielded up to 5 tons of oven-dry alfalfa per acre. The major difference in the variable limestone and boron treated plots is that the limestone was surface applied and not incorporated. Until fall of 1993, copper and zinc were not applied. In addition to the lack of water in the 1993 growing season, the low yield of alfalfa on this site could be attributable to a nutrient deficiency or to the lack of incorporation of the limestone. When the limed area on the soil surface dries, alfalfa roots are unable to extract nutrients from the pH adjusted soil surface. Limed soil is critical for alfalfa growth.

Though the yields are low, there were significant increases in alfalfa due to increased limestone, ECCE, and B. As the alfalfa yield increased, yield of bermudagrass decreased indicating a competition for light or water.

Application. The low yield on this site shows the necessity of incorporating the applied limestone for alfalfa production. During incorporation of the limestone, other plant nutrients that have accumulated in the surface few inches are also turned under. As the soil dries, alfalfa growing in soils limed without incorporation of the limestone has access to moisture and nutrients only from the acid depths of soil. Under these conditions, alfalfa will not be very productive.

The fall boron treatment was raised to 2 and 4 lb/acre in 1993. Research will continue on limestone and boron requirements for alfalfa production in Coastal bermudagrass.

Table 1. Response of alfalfa and bermudagrass to lime and boron.

Lime rate	Alfalfa	Bermudagrass	Total forage
tons/ac	----------tons/ac----------		
0	0.14 B	1.59 A	1.73
1	0.57 A	1.29 B	1.86
2	0.79 A	1.21 B	2.00
ECCE 62	0.49 B	1.38 A	1.87
ECCE 100	0.86 A	1.12 B	1.98
Boron rate			
lb/ac			
0	0.21 B	1.55 A	1.76
1	0.74 A	1.25 B	1.99
2	0.77 A	1.16 B	1.93