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FERTILITY REGIMEN DESCRIPTIONS DURING 37 YEARS OF CONTINUOUS STOCKING OF COMMON AND COASTAL BERMUDAGRASS PASTURES

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Background. During the spring of 1968, common and 'Coastal' bermudagrass pastures were established at the Texas A&M University Agricultural Research and Extension Center at Overton. Initial pH ranged from 5.7 to 6.4 on these upland, sandy loam Coastal Plain soils. During year of establishment, all pastures received 2 tons/ac lime (ECCE 65), and split-applications of fertilizer at a rate of 120-65-65 lbs/ac N-P₂O₅-K₂O (Table 1). Both common and Coastal bermudagrass areas were sub-divided into 3 pastures of 2.3, 3.2, and 5.3 acres. Grazing was first initiated during the spring of 1969. Different stocking rates were established and a variable (put-and-take) stocking method was used based on forage available for consumption. Beginning in 1969, all pastures received a total fertilization rate during the growing period of 200-100-100 lbs/ac N-P₂O₅-K₂O. Nitrogen was split applied at 50-65 lbs/ac at each fertilization; whereas, P₂O₅ and K₂O was applied once at the initial spring fertilization.

During the 1969 and 1970 grazing season (April to October) of 180-days, pastures consisted of bermudagrass only and were not overseeded. Common bermudagrass pastures were overseeded in the fall of 1970 with a mixture of 'Gulf' ryegrass and 'Dixie' crimson clover. Coastal bermudagrass pastures were evaluated as pure stands until overseeding with Gulf ryegrass and 'Yuchi' arrowleaf clover in the fall of 1974. From the initiation of grazing overseeded common bermudagrass in 1971 and overseeded Coastal bermudagrass pastures in 1975, all pastures have been overseeded with ryegrass and/or clover through 2006.

The original fertilization strategy was to apply N-P₂O₅-K₂O at an approximate ratio of 2:1:1. Although fertilizer rates were reduced by half during 1974 and 1975, the average annual fertilizer applications approximated 200-100-100 lbs/ac N-P₂O₅-K₂O from 1969 through 1984 (Table 1). In the fall of 1984, all stocking rate pastures for both common and Coastal bermudagrass were sub-divided equally into two fertility x winter annual forage treatments of N +ryegrass vs. no N +clover. Fertilizer applications of either N-0-0 vs. 0-0-K₂O were initiated in 1985 through 1997 (Table 2). The N rates varied from an average of 408 lbs/ac from 1985-1989 to 238 lbs/ac from 1990-1994 to 290 lbs/ac for 1995-1996 to 221 lbs/ac for 1997. The K₂O rates averaged about 112 lbs/ac. During this 13 year period, 1985-1997, no fertilizer P was applied.

Beginning with the 1998 grazing season and continuing through 2005, all pastures received phosphorus, potassium, sulfur, magnesium, and boron; however, only the N +ryegrass pastures received nitrogen fertilizer (Table 2). The annual application rates of N have ranged

from 213 lbs/ac to 360 lbs/ac, and P₂O₅ and K₂O rates ranged from 100 to 135 lbs/ac from 1998 through 2004 and were reduced to about 50 lbs/ac each in 2005.

Stocking rates have varied by bermudagrass and fertility regimens. Long term averages for stocking from mid-February to late September have approximated 0.75, 1.3, and 2.0 cow-calf pair (1500 lbs)/acre for common bermudagrass and about 1.0, 1.7, and 3.0 cow-calf pair/ac for Coastal bermudagrass.

Table 1. Annual fertilization rates for all bermudagrass pastures.

Year	Lime tons/ac	N	P ₂ O ₅	K ₂ O
1968	2 (all pastures)	120	65	65
1969 thru 1973		200	100	100
1974 and 1975		110	50	50
1976		175	50	50
1977		220	100	100
1978		200	70	70
1979		175	100	100
1980	2 (all pastures)	225	100	100
1981	1	225	100	100
1982		195	100	100
1983		250	100	100
1984	1 (all pastures)	200	100	100

Table 2. Annual fertilization rates for bermudagrass pastures receiving Nitrogen plus ryegrass and no-Nitrogen plus clover.

Year	Lime tons/ac	N + Ryegrass	no -N + Clover
1985	2 (all PAS)	408-0-0	0-0-114
1986		400-0-0	0-0-100
1987	1 (all PAS)	400-0-0	0-0-0100 +B
1988		450-0-0	0-0-150 +1.5
1989		400-0-0	0-0-120 +1.5
1990		250-0-0	0-0-112 +1.5
1991	2.25 (N only)	250-0-0	0-0-100 +1.5
1992 thru 1993		250-0-0	00-125 +1.5
1994	1 (N-only)	190-0-0	0-0-114 +2
1995 and 1996		290-0-0	0-0-108
1997	0.5 (N only)	221-0-0	0-0-120
N-P ₂ O ₅ -K ₂ O-S-Mg-B lbs/ac			
1998		255-100-100-44-22-1	0-100-100-44-22-1
1999		360-114-114-50-27-1.2	0-114-114-50-27-1.2
2000		255-135-133-60-32-1.4	0-135-135-60-32-1.4
2001		306-100-100-44-24-1.1	0-100-0100-44-24-1.1
2002	1 (all PAS)	365-120-120-53-29-1.2	0-120-120-53-29-1.2
2003		365-120-120-53-29-1.2	0-120-120-53-29-1.2
2004		213-116-116-52-27-1.2	0-116-116-52-27-1.2
2005		306-48-48-42-22-1	0-48-48-42-22-1