

# Forage Research in Texas

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Department of Soil and Crop Sciences

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Location: Overton

#### MINERAL COMPOSITION OF FORAGES GRAZED AT DIFFERENT INTENSITIES

##### OBJECTIVE:

Evaluate the influence of level of forage availability on mineral content of selected forages.

##### PROCEDURE:

Paddocks composed of common bermudagrass-crimson clover-ryegrass Coastal bermudagrass, Pensacola bahiagrass, and common weeping lovegrass were grazed at two or more levels of forage availability. Coastcross I bermudagrass was grazed at only the medium intensity. The heavily grazed paddocks had approximately 250-300 kg/ha available forage throughout the grazing period. The medium grazed paddocks had approximately 1000 kg/ha available forage; whereas, the lightly grazed paddocks had approximately 2500 kg/ha available forage throughout the grazing period. Forage samples for chemical analyses were taken to ground level from all paddocks. The mineral analyses, therefore, were expected to estimate the status of available forage rather than consumed forage. Forage samples were dried, ground, and prepared for mineral analysis by dry ashing. Phosphorus was determined by the phosphomolybdate blue color method. The other minerals assayed, potassium, calcium, iron, zinc, manganese, magnesium, and copper were determined via atomic absorption.

##### RESULTS AND DISCUSSION:

Percent phosphorus content of the forages tested is presented in Table 1. Phosphorus content was highest in the clover-ryegrass and in the immature Coastcross I bermudagrass, and lowest in weeping lovegrass. Forage from the lightly grazed paddocks was generally lower in percent phosphorus than forage from the other stocking rates. Percent potassium of forage followed a trend similar to that of phosphorus (Table 2). Potassium level of Coastcross I was considerably higher than that of the other forages (Table 3). However, the influence of grazing pressure did not appear to have the same effect as previously shown for phosphorus and potassium.

Percent iron, zinc and manganese are presented in Tables 4, 5, and 6, respectively. Bahiagrass had relatively high contents of zinc and manganese. The heavily grazed forages appeared to have slightly higher concentrations.

[illegible]



Table 2. Potassium content of forage utilized at different grazing pressures.

Date	Common-Crimson-Ryegrass			Coastal			-%-Coast-cross		Bahia		Love-grass	
	H	M	L	H	M	L	M		H	L	H	L
2-24	6.7	-	4.4	-	-	-	-		-	-	-	-
3-11	2.9	3.8	4.7	-	-	-	-		-	-	-	-
3-24	-	3.0	-	-	-	-	-		-	-	1.5	2.2
4-7	3.7	2.6	2.8	-	-	-	-		-	-	1.5	1.4
4-23	5.3	3.2	3.1	2.9	2.6	2.6	6.0		2.1	2.7	1.4	1.4
5-7	2.7	2.8	2.4	2.0	2.3	2.1	5.3		2.2	2.3	1.7	1.4
5-19	2.1	2.1	2.8	2.4	2.3	2.1	4.6		-	2.5	1.6	1.3
6-4	2.1	2.4	1.7	2.0	2.0	1.9	2.3		2.1	2.9	1.5	1.4
6-17	1.7	2.4	1.5	2.1	2.1	2.4	2.4		2.1	1.7	1.2	1.3
7-2	2.3	2.0	2.1	2.2	2.4	1.8	5.3		1.8	2.1	1.3	1.3
7-16	2.3	2.3	1.8	2.2	2.0	1.7	4.0		1.8	2.1	1.3	1.0
7-28	2.1	1.9	1.8	2.4	2.2	1.9	3.6		1.8	1.8	1.1	1.2
8-13	2.4	2.4	2.5	2.5	-	2.4	4.0		2.7	1.8	1.4	1.4
8-26	2.0	2.1	2.3	2.3	2.4	2.1	4.6		2.0	1.9	1.2	1.3
9-15	1.8	2.5	2.6	2.2	2.1	2.0	3.6		2.0	1.7	1.1	1.0
10-1	-	3.0	-	2.1	2.1	1.9	3.6		2.3	2.0	1.3	1.9
10-15	-	-	-	2.0	2.0	1.8	2.8		2.2	2.1	1.4	1.2
10-28	-	-	-	1.8	1.5	1.7	2.8		1.9	1.8	-	1.1
11-12	-	-	-	0.9	0.8	1.6	2.8		1.9	1.6	-	2.3
11-24	-	-	-	-	-	-	-		-	-	1.0	1.7

[illegible]

Table 4. Iron content of forage utilized at different grazing pressures.

Date	Common- Crimson- Ryegrass			Coastal			-%- Coast- cross		Bahia		Love- grass	
	H	M	L	H	M	L	M		H	L	H	L
2-24	.006	.009	.010	-	-	-	-		-	-	-	-
3-11	.006	.006	.002	-	-	-	-		-	-	-	-
3-24	-	.006	-	-	-	-	-		-	-	.002	.001
4-7	.005	.004	.005	-	-	-	-		-	-	.002	.0005
4-23	.008	.002	.009	.015	-	.010	.002		.001	.019	.002	.001
5-7	.005	.014	.002	.012	.010	.007	.001		.002	.012	.002	.0005
5-19	.002	.004	.004	.015	.009	.012	.002		-	.020	.001	.001
6-4	.012	.006	.005	.013	.002	.007	.002		.001	.010	.002	.001
6-17	.002	.004	.010	.005	.004	.004	.001		.001	.011	.002	.002
7-2	.002	.010	.010	.009	.011	.008	.002		.002	.012	.001	-
7-16	.008	.002	.010	.007	.009	.002	.001		.004	.011	.002	.002
7-28	.010	.005	.002	.009	.009	.009	.002		.002	.008	.002	.001
8-13	.009	.010	.001	.002	-	.002	.002		.002	.006	.001	.002
8-26	.007	.006	.005	.002	.002	.004	.002		.002	.008	.002	.002
9-15	.010	.009	.004	.008	.001	.004	.002		.004	.020	.002	.002
10-1	-	-	-	.011	.001	.008	.002		.002	.001	.002	.004
10-15	-	-	-	.002	.001	.001	.002		.005	.015	.002	.001
10-28	-	-	-	.011	.002	.008	.001		.020	.010	-	.002
11-12	-	-	-	.009	.009	.010	.002		.015	.013	-	.001
11-24	-	-	-	-	-	-	-		-	-	.001	.001



Table 5. Zinc content of forage utilized at different grazing pressures.

[illegible]

Table 6. Manganese content of forage utilized at different grazing pressures.

Date	Common-Crimson-Ryegrass			Coastal			-%-Coast-cross		Bahia		Love-grass	
	H	M	L	H	M	L	M		H	L	H	L
2-24	.005	-	.01	-	-	-	-		-	-	-	-
3-11	.009	.006	.007	-	-	-	-		-	-	-	-
3-24	-	.009	-	-	-	-	-		-	-	.018	.017
4-7	.007	.009	.01	-	-	-	-		-	-	.014	.018
4-23	.013	.011	.011	.007	.01	.014	.01		.03	.04	.014	.014
5-7	.012	.008	.009	.009	.007	.009	.009		.02	.02	.014	.012
5-19	.012	.013	.013	.01	.012	.013	.012		-	.03	.022	.015
6-4	.013	.01	.01	.009	.009	.01	.005		.02	.02	.016	.011
6-17	.01	.01	.01	.009	.009	.011	.012		.017	.02	.013	.013
7-2	.01	.01	.02	.013	.013	.012	.012		.018	.03	.029	.014
7-16	.02	.02	.02	.017	.012	.009	.018		.017	.02	.021	.017
7-28	.02	.02	.02	.015	.013	.013	.012		.028	.03	.022	.021
8-13	.01	.02	.01	.01	-	.008	.012		.032	.03	.019	.017
8-26	.01	.02	.02	.013	.009	.016	.011		.028	.04	.022	.017
9-15	.01	.02	.02	.013	.012	.012	.007		.027	.04	.021	.019
10-1	-	.01	-	.012	.013	.018	.007		.043	.04	.019	.016
10-15	-	-	-	.009	.013	.015	.009		.024	.045	.019	.012
10-28	-	-	-	.013	.01	.017	.01		.04	.04	-	.013
11-12	-	-	-	.019	.008	.016	.007		.035	.53	-	.025
11-24	-	-	-	-	-	-	-		-	-	.018	.016



Table 7. Magnesium content of forage utilized at different grazing pressures.

Date	Common-Crimson-Ryegrass			Coastal			-%-Coast-cross		Bahia		Love-grass	
	H	M	L	H	M	L	M		H	L	H	L
2-24	.25	-	.23	-	-	-	-		-	-	-	-
3-11	.21	.29	.16	-	-	-	-		-	-	-	-
3-24	-	.23	-	-	-	-	-		-	-	.16	.16
4-7	.22	.31	.24	-	-	-	-		-	-	.14	.12
4-23	.21	.41	.21	.17	.21	.17	.29		.30	.27	.14	.11
5-7	.23	.20	.20	.15	.17	.16	.30		.29	.22	.14	.12
5-19	.21	.20	.27	.15	.15	.15	.28		-	.23	.15	.13
6-4	.23	.25	.30	.25	.19	.16	.26		.25	.39	.12	.12
6-17	.27	.35	.29	.19	.19	.16	.23		.30	.21	.14	.12
7-2	.21	.27	.23	.13	.15	.16	.24		.25	.23	.14	.14
7-16	.24	.25	.24	.14	.17	.15	.27		.23	.25	.13	.11
7-28	.24	.25	.28	.15	.15	.17	.29		.26	.23	.14	.12
8-13	.24	.22	.23	.17	-	.19	.22		.32	.22	.15	.14
8-26	.22	.23	.23	.17	.15	.15	.26		.25	.23	.13	.12
9-15	.20	.25	.24	.15	.17	.16	.31		.24	.17	.11	.09
10-1	-	.18	-	.14	.19	.15	.25		.27	.27	.11	.10
10-15	-	-	-	.15	.23	.15	.28		.31	.23	.12	.13
10-28	-	-	-	.15	.17	.17	.28		.15	.20	-	.12
11-12	-	-	-	.16	.15	.17	.25		.22	.27	-	.14
11-24	-	-	-	-	-	-	-		-	-	.13	.12

Table 8. Copper content of forage utilized at different grazing pressures.

Date	Common-Crimson-Ryegrass			Coastal			Coast-cross		Bahia		Love-grass	
	H	M	L	H	M	L	M		H	L	H	L
2-24	.001	-	.002	-	-	-	-		-	-	-	-
3-11	.001	.001	.004	-	-	-	-		-	-	-	-
3-24	-	.002	-	-	-	-	-		-	-	.001	.003
4-7	.006	.002	.004	-	-	-	-		-	-	.001	.001
4-23	.002	.004	.003	.009	.006	.002	.005		.004	.004	.005	.002
5-7	.0005	.003	.0005	.003	.007	.004	.005		.002	.005	.001	.001
5-19	.0005	.001	.0005	.003	.002	.002	.002		-	.007	.004	.001
6-4	.002	.007	.002	.003	.002	.003	.001		.002	.004	.001	.002
6-17	.003	.002	.003	.001	.002	.003	.003		.001	.009	.001	.001
7-2	.003	.002	.002	.005	.003	.002	.004		.002	.005	.002	.001
7-16	.003	.004	.004	.005	.002	.001	.004		.002	.004	.002	.003
7-28	.002	.001	.001	.004	.001	.004	.002		.007	.004	.003	.006
8-13	.003	.004	.001	.0005	-	.0005	.002		.002	.005	.002	.001
8-26	.001	.001	.004	.0005	.001	.003	.005		.001	.003	.001	.001
9-15	.002	.002	.004	.002	.001	.001	.003		.004	.001	.001	.001
10-1	-	.002	-	.003	.0005	.0005	.002		.002	.005	.001	.001
10-15	-	-	-	.0005	.001	.0005	.001		.001	.004	.001	.001
10-28	-	-	-	.0005	.0005	.002	.001		.006	.006	-	.001
11-12	-	-	-	.002	.002	.002	.001		.004	.007	-	.001
11-24	-	-	-	-	-	-	-		-	-	.001	.0005