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Forage

Beef Cattle

Soil

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COASTAL BERMUDAGRASS RESPONDS TO POTASSIUM

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SUMMARY

Coastal bermudagrass rhizome production is almost doubled with the application of 120 lbs or more of K_2O per acre. Coastal bermudagrass stand in the spring changes as rhizome production changes. Potassium deficiency was not found to influence the amount of regrowth reserve stored in the rhizomes.

OBJECTIVES

To measure some general Coastal bermudagrass stand characteristics while the grass is subjected to potassium deficiency.

PROCEDURE

Experimental plots with at least a seven-year history of receiving 0, 112, 224 kg/ha of potassium (0, 120, 240 lbs/acre of K_2O , potash) were selected to study stand, rhizome, and rooting characteristics. Stand was rated visually while rhizomes were dried and weighed. Rhizome regrowth reserves were measured as those contents of the rhizomes that could be used to produce new roots and top growth.

RESULTS

The particular location on which this experiment was conducted provides some potassium from the breakdown of soil minerals. Other locations may have sufficient potassium reserves to provide some potassium for a few years after Coastal bermudagrass is established, but little or no potassium is provided by soil mineral breakdown. As the reserve soil potassium is depleted potassium shortages will occur with Coastal bermudagrass.

Potassium deficiency has been related to "winter kill" in the past. Above ground plant parts of bermudagrass are killed by temperatures in the range of 26 to 27°F. For bermudagrass to overwinter successfully and maintain a thick stand, there must be many stems below the ground or rhizomes from which new growth can be initiated. The influence of

potassium on rhizome production is shown in Table 1. The rhizome production is almost doubled with the low rate of applied potassium.

The influence of potassium on rhizomes and their influence on stand thickness in the spring is also shown in Table 1. Note that as the rhizomes produced almost doubled, so does the stand. This is important in that yield of Coastal bermudagrass hay from the field will increase almost directly as stand increases. Thus, if the stand is not thick enough, some of the nitrogen fertilizer applied will be wasted.

There is a question concerning the rhizomes that are produced under the potassium stress and that is, "Are they weakened because of potassium deficiency and are unable to generate top growth in the spring?" The answer is shown on the fall regrowth reserve in Table 1. Those rhizomes produced contain the same regrowth reserves whether or not the bermudagrass is suffering a potassium stress. Thus, the amount of rhizomes produced is more important than their regrowth reserves in producing spring regrowth.

Table 1. Influence of potassium fertilizer on Coastal bermudagrass stand characteristics.

<u>Potassium rate</u>		<u>Rhizome Production</u>		<u>Stand</u>	<u>Fall</u>
<u>kg/ha</u>	<u>(lbs K₂O/acre)</u>	<u>kg/ha</u>	<u>(lbs/acre)</u>	<u>in spring</u>	<u>Regrowth</u>
				<u>%</u>	<u>Reserve</u>
					<u>%</u>
0	(0)	1203	(1073)	43	20.9
112	(120)	2014	(1797)	73	25.2
224	(240)	2172	(1938)	69	23.4
Least significant difference, 0.05 level		762	680	11	9.0