EFFECT OF FERTILIZATION OF A CROWLEY CLAY LOAM ON THE CHEMICAL COMPOSITION OF FORAGE AND CARPET GRASS, *Axonopus affinis*

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The value of commercial fertilizers for pastures has been the subject of considerable research in recent years. The chemical composition is particularly of value in areas where, as in Texas and particularly along the Gulf Coast, quality rather than quantity of forage is often the limiting factor in animal production. Some workers (1, 2, 3, 10, 11, 12) have studied the effect of fertilizers on the chemical composition of single species of pasture plants, but most of the work has been done on changes in botanical composition of the pastures and in chemical composition of the mixed herbage. This paper presents a study of variations in yield and protein, phosphoric acid, and lime in total forage and carpet grass, *Axonopus affinis*, caused by fertilization of a Crowley clay loam soil.

**PLAN OF THE EXPERIMENT**

Crowley clay loam is a soil type of considerable importance on the Gulf Coast Prairie of Texas. The particular area used was located at Substation No. 4 at Beaumont. Plots were 14 feet by 4 feet 7 inches. Forage consisted principally of carpet grass with small amounts of Dallis grass, *Paspalum dilatatum*, lespedeza, *Lespedeza striata*, white clover, *Trifolium repens*, and black medic, *Medicago lupulina*. Six different fertilizer treatments were made as follows: 0, none; N, nitrate of soda, 80 pounds per acre; A, sulfate of ammonia, 100 pounds per acre; P, superphosphate, 20%, 160 pounds per acre; AP, combination of A and P; APK, combination of A and P, plus 32 pounds per acre of muriate of potash.

A second series of six plats received the same fertilizers plus lime (L) at the rate of 1 ton per acre. Fertilizers were applied about the middle of January of each year from 1935 through 1939. Lime was applied in 1935, 1937, and 1939. This series of treatments was replicated four times.

Samples of soil at two depths, 0 to 6 inches and 6 to 12 inches, were secured from the 48 plots. Samples from the four plots receiving the same treatment were composited and analyzed for total nitrogen, active (0.2 N nitric acid-soluble) phosphoric acid, and pH. Potash was not determined, but the soils were probably well supplied with that constituent (5).

Forage was mowed with a lawn mower each month of the growing season (March through September) and in December, 1938, and November, 1939. A part of the clippings was taken for fresh and air-dry weights. Samples of carpet grass were separated from the dry samples. The samples of carpet grass (or of the remaining forage) from the four plots receiving the same treatment were then combined, ground in a Wiley mill, and analyzed for protein, phosphoric acid, and

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