

BURNING AND GRAZING HAVE LITTLE EFFECT ON CHEMICAL
PROPERTIES OF COASTAL PLAIN FOREST SOILS

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Recent tests indicate that the chemical characteristics of the relatively infertile, sandy soils of the Coastal Plain region are not materially affected by either grazing or burning. Comparisons were made between grazed and ungrazed ranges which had been subjected to several rotations of winter burning.

These samples were later composited and analyzed for organic matter, phosphate, potash, and soil acidity according to procedures outlined in the table. Differences in these elements between grazed-ungrazed and burned-unburned areas were not statistically significant.

Since little or no change occurred in soil organic matter, phosphate, potash or acidity, indications are that burning and grazing do not appreciably influence timber or other vegetative growth on these soils.



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SOUTHEASTERN FOREST EXPERIMENT STATION

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BURNING AND GRAZING HAVE LITTLE EFFECT ON CHEMICAL PROPERTIES OF COASTAL PLAIN FOREST SOILS

Contradictory results have been noted by various workers regarding burning and grazing effects upon the soil organic matter and nutrient content. Inherent fertility, physical makeup of soil, and climate provide reasonable explanations for these variations. Recent tests indicate that the chemical characteristics of the relatively infertile, sandy soils of the Coastal Plain region are not materially affected by either grazing or burning (see table).

These studies^{1/} were conducted on a series of forest grazing units located at the Alapaha Experimental Range near Tifton, Georgia. Comparisons were made between grazed and ungrazed ranges which had been subjected to several rotations of winter burning. Two soil samples representing each condition were collected at each of two depths (0 to 3 inches and 3 to 10 inches) during the winter, 8 years after treatments were initiated. These samples were later composited and analyzed for organic matter, phosphate, potash, and soil acidity according to procedures outlined in the table. Differences in these elements between grazed-ungrazed and burned-unburned areas were not statistically significant.

Topography of this region is nearly flat (0-2 percent slope). Predominant soil types are the imperfectly drained Lynchburg loamy fine sand and poorly drained Plummer sand. The cover consists of a scattered stand of longleaf and slash pine, with an understory of ericaceous shrubs and wiregrass.

^{1/} Conducted by the Forest Service in cooperation with Agricultural Research Service, USDA, and Georgia Coastal Plain Experiment Station.

Composition of coastal plain soils after burning and grazing

COMPOSITION AT 0 TO 3-INCH DEPTH

Treatment	Organic matter ^{1/}	Phosphate (P ₂ O ₅) ^{2/}	Potash (K ₂ O) ^{2/}	Acidity ^{3/}
	Percent	Lbs. per acre	Lbs. per acre	pH
Burned				
Grazed	2.7	50.6	74.7	4.7
Ungrazed	2.8	46.9	75.1	4.7
Unburned				
Grazed	2.6	62.7	68.4	4.7
Ungrazed	2.8	74.3	61.5	4.7

COMPOSITION AT 3 TO 10-INCH DEPTH

Burned				
Grazed	1.2	47.3	28.0	4.9
Ungrazed	1.2	45.0	33.7	4.9
Unburned				
Grazed	1.3	62.5	36.5	4.9
Ungrazed	1.2	69.3	33.4	4.8

^{1/} Procedure followed is described by A. Walkley and I. A. Black in "An Examination of the Degtjareff Method for Determining Soil Organic Matter, and a Proposed Modification of the Chromic Acid Titration Method," in Soil Sci. 37: 29-38, 1934.

^{2/} Extracted with a solution .025 N HCL and .05 N H₂SO₄.

^{3/} Beckman glass electrode.

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