State Cooperative Soil - Vegetation Survey

CALIFORNIA DIVISION OF FORESTRY
Department of Conservation, The Resources Agency

PACIFIC SOUTHWEST FOREST AND RANGE EXPERIMENT STATION
Forest Service, U. S. Department of Agriculture

DIVISION OF AGRICULTURAL SCIENCES
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SOIL FERTILITY STUDIES: NO. 2 - Guenoc series

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This leaflet, a product of the Soil-Vegetation Survey, is one of a series giving results of greenhouse pot tests and field fertilizer trials on soils primarily associated with range lands. The data indicate fertility status with regard to nitrogen, phosphorus, and sulfur. Field trials also give preliminary data on potential range forage production and species changes resulting from fertilizer treatments. Methods are detailed in: Powell, W. Robert. 1964. Procedures used in range land soil fertility studies. State Cooperative Soil-Vegetation Survey, Calif. Div. of Forestry, Sacramento, 15pp.

FIELD NUTRIENT TRIAL No. 45-4

Shasta County
Plot 10 of Quad 32A-1
NE¼ NE¼, Sec. 17, T30N, R2W, MDMB
Slope southwest-3%; elevation 875 feet
Woodland-grass
Fertilized 26 October 1960
(Greenhouse soil sample No. FA61-45-104)

Table 1. Herbage Yields, pounds per acre, oven-dry

Fertilizer Treatment[1/]	25 May 1961	24 May 1963
Check	1099 a	1236 a
S	1200 a	---
P	1589 a b	2490 b
PS	1358 a b	2928 b
N	2246 b	---
NS	2001 a b	---
NP	4214 c	2544 b
NPS	5971 d	2484 b

1/ N = 150, P = 88, S = 100 lb/A

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Table 2. Per cent cover of herbaceous species, 25 May 1961

	Fertilizer Treatment							
	Check	S	P	PS	N	NS	NP	NPS
Grasses								
Aira caryophyllea	1	1	2	6	1	3	2	1
Avena barbata	+		+		+			
Briza minor	+	1	1		+	1	2	
Bromus madritensis		+	+		1	+		1
Bromus mollis	3	4	4	3	11	10	50	49
Bromus rigidus	+	+	+	+	1	+	9	8
Bromus rubens		+		+	2		4	4
Festuca megalura	4	3	10	8	28	13	17	31
Festuca reflexa	+	+	1	+		+		
Gastridium ventricosum	+	+	1		1	+		
Poa scabrella	+					+	1	
Forbs								
Brodiaea elegans						+	1	
Centaurea melitensis			+		+	+	2	
Daucus pusillus	+	+	+		1			
Erodium obtusiplicatum[1/]			1	1				
Erodium cicutarium	+	+	1		2	+	2	2
Galium aparine	1	2	3	3	3	2	4	1
Linathus bicolor	1	2	2	1	+	1	1	
Lotus Purshianus			1	3		+		
Lupinus bicolor	+			+				
Medicago hispida		+	2	1	+			
Micropus californicus	+			2	+			
Navarretia spp.				+		+		
Plantago Hookeriana var. californica	+	+	1			+		
Ranunculus occidentalis var. Eisenii	+	+						
Trifolium olivaceum var. columbinum	+	2	5	7	1	1	1	1
Other species[2/]	+	+	2	2	+	2		

1/ Includes Erodium botrys

2/ Includes Cynosurus echinatus, Chlorogalum pomeridianum, Clarkia sp., Rigiopappus leptocladus, Sanicula sp., Thysanocarpus radians

COMMENTS:

This site was strongly deficient in nitrogen and phosphorus. With these two corrected, sulfur produced a third-order yield response the first year. Nitrogen alone was associated with an increase in Bromus mollis and Festuca megalura. Nitrogen-phosphorus and nitrogen-phosphorus-sulfur responses were associated with Bromus rigidus in addition to B. mollis and F. megalura. Phosphorus alone stimulated Aira caryophyllea, F. megalura and Trifolium olivaceum var. columbinum. Although species composition was measured only one year, other Trifolium species as well as Medicago hispida have appeared responsive to phosphorus in subsequent years. Because there appeared to be no yield responses the second year, no yield measurements were made then.