

State Cooperative Soil - Vegetation Survey

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SOIL FERTILITY STUDIES: NO. 9 - Sehorn 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. Division of Forestry, Sacramento, 15 pp.

FIELD NUTRIENT TRIAL No. 11-5

Glenn County, Quadrangle 41C-3

Spooner Ranch northeast of Fruto

NE $\frac{1}{4}$ Sec. 16, T20N, R5W, MDBM

Slope North - 40%; elevation 800 feet

Grassland

Fertilized 15 October 1959

(Site of greenhouse soil sample No. FA60-11-1)

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

Fertilizer Treatment ^{1/}	Date of sampling	
	5 May 1960	30 April 1961
Check	1572 a	1627 a
S	1404 a	-
P	1652 a	-
PS	1614 a	-
N	3750 b	3412 b
NS	6438 c	4075 bc
NP	5634 c	4104 bc
NPS	6222 c	4476 c

^{1/} N = 160 lb/A of nitrogen in urea; P = 88 lb/A of phosphorus in triple super phosphate; S = 100 lb/A of sulfur in gypsum.

Table 2. Percent ground cover of herbaceous species, 5 May 1960.

Species	Fertilizer Treatment							
	Check	S	P	PS	N	NS	NP	NPS
----- percent -----								
<u>Grasses</u>								
Avena fatua	16	21	14	18	68	91	80	90
Bromus madritensis	1	1	1	2	4	+	2	2
Bromus mollis	+	1	1	1	+	+	1	1
Festuca spp. (annual)	+	+	+	+	+	1	1	
Melica californica	2	4	2	2	11	7	11	3
Poa scabrella	+	+		+	+	+		1
Sitanion hystrix	+	+			+			
<u>Forbs</u>								
Achillea borealis								
californica	1	+	+		+		+	2
Achyrachaena mollis	+	+	+	+			+	
Brodiaea spp.	+	+	+	+	+	+	+	+
Clarkia gracilis	2			1	8	1	3	1
Lomatium sp.		2	2		1			
Ranunculus californicus	+	1	+		2	+	1	
Trifolium spp.	+	+	+	+				
Other species	+	1	+	+			+	
TOTAL HERBACEOUS COVER	23	31	21	25	94	100	99	100

Table 3. Percent ground cover of herbaceous species, 30 April 1961.

Species	Fertilizer Treatment				
	Check	N	NS	NP	NPS
	----- percent -----				
<u>Grasses</u>					
Avena fatua	20	69	87	92	88
Bromus madritensis	3	3	6	2	5
Bromus mollis	1	2	1		1
Festuca spp. (annual)	+				
Melica californica	1	6	1	3	
Poa scabrella				1	
Sitanion hystrix	+	1			
<u>Forbs</u>					
Achillea borealis californica	1	1			
Brodiaea laxa		1			
Brodiaea pulchella					2
Clarkia gracilis	1	2			
Ranunculus californicus	+		1		
TOTAL HERBACEOUS COVER	28	85	96	98	96

COMMENTS:

First year yields showed a strong primary response to nitrogen. Treatments NS, NP, and NPS were all better than N but not significantly different from each other. This pattern is similar to that of Trial No. 11-3 (Fertility Study No. 5) for which it was suggested that the sulfur impurity in triple super phosphate was sufficient to produce a sulfur response. Thus, treatment NP acted almost like another NS treatment. Although the cover of common wild oats (Avena fatua) changed dramatically on the nitrogen treatments, the proportion of it in the stand remained about the same. Thus, there was simply more or less yield of common wild oats. Nitrogen without sulfur (treatments N and NP) produced small increases of farewell-to-spring (Clarkia gracilis) and California melic (Melica californica).

Second year results were similar to first year results but the difference between N and NS was not so clear cut.

Pot test data of soil from this site indicated some response to phosphorus. A phosphorus response is not ruled out from the field trial results but additional study is needed.

Worthy of note on this and other trials on Sehorn soils is the almost complete absence of slender wild oats (Avena barbata). Most soils of foothill areas used for range have more or less slender wild oats but common wild oats is not often a significant part of the vegetation.