



RANGE IMPROVEMENT STUDIES

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THE IMPORTANCE OF SITE SELECTION IN SEEDING FOR RANGE IMPROVEMENT

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Seeding with adapted forage plants is an important part of improving chaparral-covered land for range use. After brush has been cleared effectively it is essential that a cover be re-established on the land. While the main reason for seeding is to grow more and better forage, there are additional benefits of watershed protection and prevention of soil erosion.

When plans are made to seed a cleared area careful evaluation of the site is needed to determine what parts should be seeded, and which plants are most likely to succeed. Studies to provide information on the effect of two common kinds of soil on growth of plants, and the local adaptability of some common forage plants, were included in work done on the Williams Ranch in Shasta County by range specialists of the California Division of Forestry.

The Two Range Sites Compared

The two soils were Contra Costa loam and Los Gatos clay loam. The Contra Costa loam is a residual soil developed from slightly metamorphosed rocks, mostly two to three feet in depth in this area, and slightly acid in reaction. It is generally rated as "medium" in suitability for range forage production. On this site the cover was woodland-chaparral, dominated by common and whiteleaf manzanitas (Arctostaphylos manzanita and A. viscida).

Los Gatos clay loam is developed on metamorphosed sandstones or shales, mostly less than two feet in depth here, and also is

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slightly acid in reaction. It is usually considered to be "low" in suitability for range forage production. The dominant vegetation on the study area was chamise (Adenostoma fasciculatum). Two phases of Los Gatos soil were included: Los Gatos stony clay loam; and a "rocky" phase, which could be distinguished by more abundant surface rocks and less dense chamise cover.

The greatest distance between our plots occupied by these different kinds of soil was less than one-half mile; elevations were between 2,200 and 2,400 feet above sea level; slopes were moderately steep, facing toward the south and east. During the two years of this study the seasonal precipitation was 39.01 and 34.40 inches, respectively.

Seeding -- And The Results

Annual and perennial grasses and forbs of species commonly available from commercial sources were broadcast by hand in the ash, shortly after controlled burning. No measures were taken to cover the seed after sowing.

Seeding was done in September, 1951. Measurements to determine plant establishment were made in June, 1953, after two growing seasons. Results were determined on the basis of the number of plants present on randomly located sample plots (table 1). Each sample plot had an area of 10 square feet, and there was an average of 12 plots per acre.

Table 1. Forage plants growing on two different soil series, two years after seeding: Williams Ranch Study, Shasta County.

Plant species	Average number of plants per plot (10 sq. ft.)		
	Contra Costa loam	Los Gatos stony clay loam	Los Gatos rocky clay loam
Harding grass	1.1	0.3	0.1
Smilo	1.2	0.6	0.4
Annual ryegrass	0.1	0	0
Perennial ryegrass	4.2	2.3	0.4
Prairie brome grass	1.0	0	0
Harlan brome grass	0	0.1	0
Smooth brome grass	0.2	0.4	0
Alfalfa	0	0	0
Rose clover	0.4	0	0
Burnet	0	0	0
Totals	8.2	3.7	0.9

At the time the sampling was done there were more than twice as many plants per unit area on the Contra Costa loam as on the Los Gatos stony clay loam; over one-half of these plants were perennial ryegrass. There were four times as many plants on the Los Gatos stony clay loam as on the Los Gatos "rocky" clay loam; here also the perennial ryegrass was most abundant. Establishment and vigor of the plants were better on the Contra Costa soil than on either phase of the Los Gatos soil.

Our results indicate that a better stand of forage plants can be obtained in this locality on Contra Costa soil than on Los Gatos soil. Perennial ryegrass, smilo, and Harding grass seem better adapted to this locality than the other species used (table 1).

Summary

This study emphasizes the limitations which quality of the site impose on the success of getting a forage cover started after brush is cleared. These limitations make it extremely important to evaluate the site carefully, particularly when seeding areas of poor soil such as the Los Gatos. In this case variations in site quality were indicated to a considerable degree by factors which could be readily observed: differences in surface conditions of the soil; and in the size, density, and general luxuriance of the brush cover. When used in conjunction with a soils map of the area, these factors were adequate for determining the major differences in site quality.

FROM
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TO

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