

SOIL FERTILITY AND FERTILIZER PROBLEMS WITH SUGAR BEETS IN CALIFORNIA  
WITH SPECIAL REFERENCE TO THE SACRAMENTO--SAN JOAQUIN VALLEYS\*

Ray A. Pendleton, U.S.D.A.

Fertilization with common commercial fertilizers for better beet yields on the mineral soils of the Sacramento Valley has not given consistent results. Consequently no general fertilizer practice can be recommended. Early response to nitrogen can usually be secured, which may permit earlier thinning but generally is not reflected in the yield.

Observations indicate that fertilizer problems on these mineral soils should be approached from the standpoint of improving the organic matter supply, improved water penetration, and better knowledge of proper fertilizer placement.

On the peat soils of California the major problem in sugar beet production concerns the low sucrose synthesis often encountered.

Excess nitrate nitrogen supply in the soil appears to be a vital factor in low sucrose synthesis. The nitrogen content of the beet is directly correlated with the sucrose content of the beet.

Phosphate and potash fertilizers added to the soil to balance the nutriment ratio have not influenced the beet development.

Tillage practices may be an important factor in controlling the soil nitrate supply.

Certain important areas in the northern part of the Delta, and minor areas throughout the peat lands show strongly acid reactions and tests indicate high returns might be expected from the use of lime.

THE EFFECT OF ROTATIONS AND MANURE UPON SUGAR BEETS

S. B. Nuckols, U. S. D. A.

At the Scottsbluff station of the Office of Western Irrigation Agriculture, a number of rotations including sugar beets as one of the crops have been conducted since 1911. These plats are  $\frac{1}{4}$ -acre in size and one plat of each crop is grown each year.

The results from these experiments are presented in Table 1.

Continuous sugar beets for 25 years at Scottsbluff on land which has received no manure, produced during the past six years an average of 5.2 tons of beets per acre with a sugar percentage of 18.3% and apparent purity of

---

\*"This experimental work was conducted cooperatively by the Division of Soil Fertility and Division of Sugar Plants of the Bureau of Plant Industry, U.S. Department of Agriculture, and the University of California, Agricultural Experiment Station."