

Research Report

Sugarbeet Conference, Fort Collins, Colorado

February 5-7, 1974

Prepared by D. T. Westermann, January 15, 1974

- A. Location of Project: Western Region
Idaho-Montana-Utah Area
Snake River Conservation Research Center
Kimberly, Idaho
- B. Work Reporting Unit Title: Maintenance of soil fertility by use of
fertilizer and adaptable soil management
practices
- C. Work Reporting Unit: No. 5704-12320-001
- D. SMY's for Past Year at Location: 0.3 SMY
- E. Names of Scientists in Project at Location: D. T. Westermann, J. N.
Carter, G. E. Leggett

F. Mission of Research:

To determine the phosphorus fertilizer requirements for maximum sugarbeet root and sucrose yields at different phosphorus soil test levels.

G. Objectives of Research:

To identify a critical phosphorus soil level as determined by the NaHCO_3 test; to evaluate the effect of phosphorus fertilization at different phosphorus soil test levels; to relate phosphorus concentrations in the plant to yield components and to soil test levels.

H. Research Accomplishments:

Results show that a yield response to phosphorus fertilization would not be expected when the NaHCO_3 soluble soil phosphorus was greater than 14 ppm in the plow-layer. Critical petiole $\text{PO}_4\text{-P}$ concentrations varied from 1000 ppm early in the season to 750 ppm late in the growing season. The optimum rate of phosphorus fertilization increased as the soil test level decreased. High phosphorus soil test levels were not detrimental to root or sugar yields. Neither soil nor plant phosphorus level affected sucrose percentage.

I. Impact of Research Accomplishments on Science and General Public:

Information will be used by Extension Service in preparation of a fertilizer guide for sugarbeet production in Idaho. This guide is used to relate soil tests to fertilization rates. Results indicate that a significant reduction in phosphorus fertilizer usage on sugarbeets would not reduce yields or quality for much of southern Idaho. A reliable phosphorus soil test index would also be of direct economic benefit to the grower, help extend a limited natural resource and decrease the potential for environmental pollution from phosphorus.

J. Obstacles to Achieving Objectives:

Although the objectives have been generally obtained, there is a small difference in the critical phosphorus soil test level between years. Perhaps of more importance is the problem of acceptance of the research results by the industry.

K. Future Plans and Needs:

With the data collected from this study and others, we are evaluating the overall nutritional needs of the sugarbeet and attempting to identify nutritional factors that may be limiting production.

More research effort is also needed in (1) identifying the factors influencing early seasonal growth and what effects they have on yields, and (2) improving the success of stand establishment.