Salt Tolerance of Birdsfoot Trefoil

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Throughout the West, extensive areas are utilized for pasture and for the production of hay. In the 11 western states alone over 3,600,000 acres are devoted to growing tame hay exclusive of alfalfa. Wild hay is harvested on an additional 2,200,000 acres and there is no estimate of the area in pasture. Lands used for hay and for pasture are often some of the poorest in a given region or of an individual holding. It is not surprising, therefore, that saline soils frequently are used for pasture and that the salt tolerance of grasses and legumes is an important consideration in many western localities.

In tests on forage crops being conducted at the U. S. Regional Salinity Laboratory, the salt tolerance of birdsfoot trefoil, Lotus corniculatus var. tenuifolius, is outstanding. As there is considerable interest concerning the use of this species in pasture mixtures, a preliminary statement regarding its salt tolerance seems pertinent at this time.

PROCEDURE

Comparative studies were started at the Salinity Laboratory in the spring of 1947 with the following:


Red clover, Trifolium pratense, Midland variety, S.C.S. Nursery, Pullman, Wash.


Ladino clover, Trifolium repens latum, P-7200, S.C.S. Nursery, Pullman, Wash.

Strawberry clover, Trifolium fragiferum, F.C. 22,797, Nebraska

Birdsfoot trefoil was included in the salt tolerance trials at the suggestion of N. L. McFarlane, Riverside County Farm Adviser, as a result of his observations on its performance on some of the saline soils in southern California. McKee and Schoth have stated also that this plant has been observed growing in soils with moderate amounts of alkali.

The above-named species are being grown in plots 14 x 14 feet with a Latin square design of seven rows with seven two-plant sub-plots in each row. Three plots were artificially salinized by irrigating with salty water in such a manner as to produce three levels of salinity. This was done by irrigation with water which had an added salt content of 2,500, 5,000, and 7,500 ppm, respectively. At each irrigation, sufficient water was applied to wet through the root zone, thus keeping the salt content of the soil relatively constant. The fourth plot served as a control and has received only Riverside canal irrigation water with the addition of small amounts of fertilizer salts equal to those added to the other plots. In the following discussion, the four treatments are designated as the control, low-salt, medium-salt, and high-salt plots. Uniform seedlings were transplanted into the plots and allowed to become established before the addition of the saline irrigation water.

The soil used is classed as a Fallbrook, or closely related, fine sandy loam. It...