Germination and Emergence of Several Varieties of Barley in Salinized Soil Cultures

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Barley has been grown on the croplands of the West for many years with generally good results. It has been particularly satisfactory as one of the early crops planted in the process of reclamation of saline lands. Harris and Pitman (5), Hilgard (6), and Kearney and Scofield (7), were among the early investigators who reported that barley had excellent salt tolerance. Recent studies at the U. S. Salinity Laboratory (2, 4) have shown barley to be more salt tolerant than most other crops during germination as well as in the later stages of the growth cycle.

Barley varieties have been selected primarily for disease resistance and production under dryland or irrigated conditions in particular geographic or climatic locations. Selection or breeding for salt tolerance has not been an objective, and there is very little information regarding differences in salt tolerance among barley varieties. It seemed desirable to investigate this subject in order to make better recommendations for planting on saline lands and for future breeding programs. This paper reports studies on the salt tolerance of barley varieties during germination and emergence.

EXPERIMENTAL PROCEDURE

A number of varieties of barley seed were obtained from G. A. Wiebe. These were germinated in salinized solutions of water containing the desired amount of salt, usually in 0.05% increments. The moisture content of the soil was adjusted to approximately 14.5%, although a few of the experiments were carried out on soils having 11.5% moisture. Sodium chloride was added to the soil used was Pachappa fine sandy loam having a wilting point of 5.8%, a field capacity of approximately 20%, and a saturation percentage of 29%.