THE SALT CONTENT OF SOME SOILS NEAR THE SALT PLAIN
IN ALFALFA COUNTY, OKLAHOMA, IN RELATION
TO CROP PRODUCTION

H. F. Murphy

It is the purpose of this paper to present some data showing the salt content which wheat land in the Great Plains may have and yet produce a profitable yield. A few other crops are also included, but for the most part data on these are rather limited. Data on the soluble and replaceable sodium and calcium for these solonchak soils, as well as for some solonetz soils, are presented.

DESCRIPTION OF THE AREA AND SOILS EXAMINED

The Alfalfa County salt plain lies south of the Salt Fork of the Arkansas River, about 4 miles east of Cherokee, Oklahoma. It covers an elliptical area of about 60 square miles. The plain is practically level, and is absolutely devoid of vegetation except for a few grassy mounds near the edge. The farm land surrounding the plain is slightly higher than the plain and is nearly level. It is used primarily for wheat production, although some other crops, such as grain sorghums, corn, oats, sudan grass, barley, and alfalfa, are grown to a limited extent. Native grass, largely Andropogon scoparius and A. furcatus, is found surrounding and even growing on the grassy hammocks occurring within the borders of the salt bed. There is, however, a considerable acreage of land lying southwest and northwest of the plains proper in which scattered areas occur where the salt content is such as to make them unproductive. Such areas are commonly found in the wheat fields, and are so numerous and of sufficient size as to reduce greatly the yield of wheat. The boundary between excellent wheat and absolutely barren soil is usually sharp and quite distinct, though in some instances narrow borders of inferior crops occur. Twelve sandy loams, 16 loams, 16 silt loams, 4 silty clay loams, 43 sandy clay loams, and 18 clay soils were studied.

METHOD OF PROCEDURE

Samples of soil were collected in the field by means of a soil auger or with soil tubes, and placed in sampling sacks. They were taken to the laboratory and allowed to air dry. The surface 6 inches are

1Contribution from the Department of Agronomy, Oklahoma Agricultural Experiment Station, Stillwater, Okla. Received for publication January 19, 1934.
2Associate Professor of Soils. The author is indebted to H. A. Daniel for some of the analyses reported here.