

SOIL ALKALI; ITS ORIGIN, NATURE, AND TREATMENT

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Soil alkali; its origin, nature, and treatment by Franklin Stewart Harris

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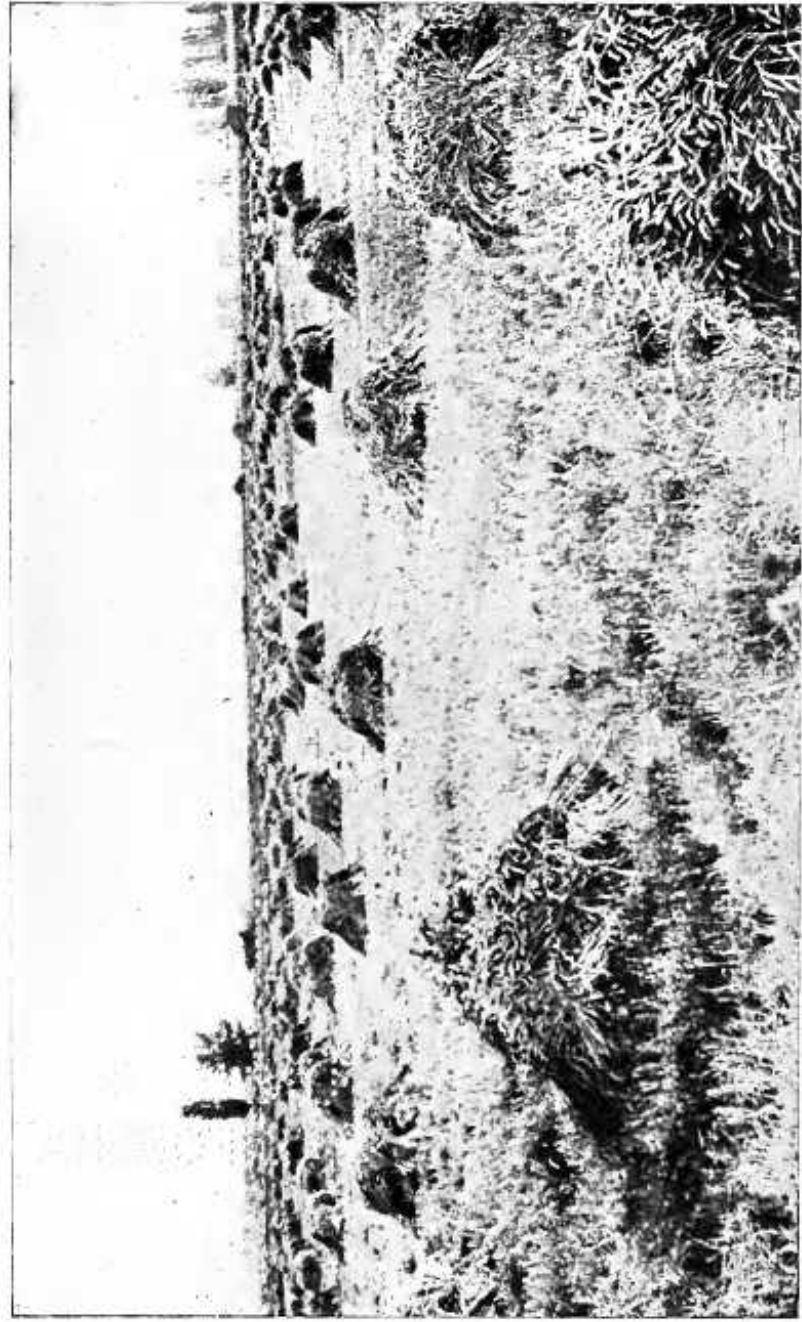
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FRANKLIN STEWART HARRIS

**SOIL ALKALI; ITS
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SOIL ALKALI

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Frontispiece

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WILEY AGRICULTURAL SERIES

SOIL ALKALI

ITS ORIGIN, NATURE, AND TREATMENT

BY

FRANKLIN STEWART HARRIS, Ph. D.

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1920

To

DR. JOHN ANDREAS WIDTSOE

PIONEER-INVESTIGATOR OF ARID AGRICULTURE, TEACHER
AND FRIEND, THIS BOOK IS AFFECTIONATELY DEDICATED

PREFACE

THE study of soil alkali is by no means simple, nor have all the problems relating to it been solved. The many different salts involved, each with its own properties; the various types of soils in which these salts occur, all with different textures and composition; the complex relations between the soluble salts of the soil and the plants growing on it; and the several economic factors involved in the reclamation of alkali land: these and numerous other considerations make the problems connected with soil alkali as difficult to solve as any found in agricultural science.

The excuse for writing a book on a problem that is so far from solution is found in the great demand that exists for one volume containing the important information concerning alkali. At present, the literature of the subject is very much scattered and is largely unavailable to the average student of soils.

There are hundreds of millions of acres of land in the world that are at present not used for agriculture but which might become productive if the alkali could be eliminated. The need for more land to supply food for the world's increasing population is making a very insistent demand that some of these alkali lands be made available. The response to this demand will depend on a better understanding of the nature of alkali and methods of reclaiming land impregnated with it. This accounts for the new interest that is being shown in the study of soil alkali.

The present volume is intended as a text and reference work for students of soils and others interested in arid agriculture. It should find wide use by county agricultural agents and the better trained farmers in regions where the alkali problem is encountered.

References are given in connection with each chapter. The figures in parenthesis in the body of the text indicate the number of the reference at the end of the chapter. No attempt has been made to cite all the literature, but most of the important papers are included. Foreign titles have usually been translated into English in order to make them clearer to the general reader. Where the original article is likely to be unavailable an attempt has been made to refer to an abstract in some available publication such as the Experiment Station Record.

The author wishes to acknowledge his indebtedness to all who have contributed either directly or indirectly to the work. He has drawn freely from all available sources, but he is particularly indebted to Dr. E. W. Hilgard and his associates in California and to the workers in the Bureau of Soils, U. S. Department of Agriculture. These two sources of information have proved to be veritable "gold mines."

The following who have read part or all of the manuscript have given many valuable suggestions: Doctors J. E. Greaves, E. G. Peterson, F. L. West, Willard Gardner, and G. R. Hill, Jr., and Professors George Stewart, O. W. Israelsen, D. W. Pittman, M. D. Thomas, Mrs. B. C. Pittman, and Mr. K. B. Sauls.

The author also wishes to express his appreciation to the several assistants and co-workers who have helped in his experiments with alkali during a number of years. Without the faithful and efficient services of these men the

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experimental work which led up to this book could not have been done. Mr. N. I. Butt deserves special mention for his help in reviewing literature and preparing the material of this book for publication.

F. S. HARRIS

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