SOILS; THEIR PROPERTIES, IMPROVEMENT, MANAGEMENT, AND THE PROBLEMS OF CROP GROWING AND CROP FEEDING

Published @ 2017 Trieste Publishing Pty Ltd

ISBN 9780649707362

Soils; Their Properties, Improvement, Management, and the Problems of Crop Growing and Crop Feeding by Charles William Burkett

Except for use in any review, the reproduction or utilisation of this work in whole or in part in any form by any electronic, mechanical or other means, now known or hereafter invented, including xerography, photocopying and recording, or in any information storage or retrieval system, is forbidden without the permission of the publisher, Trieste Publishing Pty Ltd, PO Box 1576 Collingwood, Victoria 3066 Australia.

All rights reserved.

Edited by Trieste Publishing Pty Ltd. Cover @ 2017

This book is sold subject to the condition that it shall not, by way of trade or otherwise, be lent, re-sold, hired out, or otherwise circulated without the publisher's prior consent in any form or binding or cover other than that in which it is published and without a similar condition including this condition being imposed on the subsequent purchaser.

www.triestepublishing.com

CHARLES WILLIAM BURKETT

SOILS; THEIR PROPERTIES, IMPROVEMENT, MANAGEMENT, AND THE PROBLEMS OF CROP GROWING AND CROP FEEDING





PLOW THE LAND EARNESTLY, AND IT GIVES ITS FAT WITH GLADNESS AND WITH DOUNTY

SOILS

Their Properties, Improvement, Management, and the Problems of Crop Growing and Crop Feeding

By

CHARLES WILLIAM BURKETT

Director of the Agricultural Experiment Station, Kansas State Agricultural College

Where grows?—Where grows it not? If vain our toil, We ought to blame the culture, not the soil.

POPE.

ILLUSTR ATED

NEW YORK ORANGE JUDD COMPANY

LONDON.

KEGAN PAUL, TRENCH, TRUBNER & Co., LIMITED

COPYRIGHT, 1907, BY ORANGE JUDD COMPANY All Rights Reserved

SENTERED AT STATIONERS' HALL, LONDON, ENGLAND!

S591 B912

ACKNOWLEDGMENTS

The author is under obligations to many friends for helpful suggestions and illustrations. Especial credit is due the following for illustrations used on the pages indicated: Professor E. O. Fippin, of Cornell University, 29, 31, 34, 36, 65, 91, 94, 113, 173, 174, 192, 195, 198, 204, 218, 236, 266, 280, 283, etc.; Professor A. M. Ten Eyck, of the Kansas Experiment Station, 2, 13, 20, 47, 197, 270; Professor Oscar Erf, of Kansas Experiment Station, 207, 209, 211, 259; Professor Charles E. Thorne, Director of the Ohio Experiment Station, 100, 105; Dr. C. G. Hopkins, of the Illinois Experiment Station, 267, 268; Mr. George K. Helder, 177, 178, 180, 182, 183, 194, 202. Thanks are also due the Orange Judd Company for many photographs and Mr. B. F. Williamson for the line drawings.

CONTENTS

PAG	Ε
	1
The Soil Makers	7
The Soils that Living Things Have Made	7
What We Find in Soils	3
Concerning the Texture of the Soil 3	4
How Plants Feed	4
The Elements that Plants Use 5	2
	2
Getting Acquainted with Plant Food	I
	9
The Rôle that Tillage Plays	8
	0
The Quest of Nitrogen	8
The Release of Soil Nitrogen: The Return to the Air 11	7
	4
Reclaiming Lost Nitrogen: the Call to the Air 13	12
Soil Inoculation: How Done	13
	2
	4
Dry Farming: A Problem in Water Conservation 15	16
Tillage Tools: What They are for; how to Use Them 18	5
The Cultivation of Crops: The Tools and Purposes 15	17
Stable Manure: Its Composition and its Preservation 20	6
Handling Manure on the Farm	6
Buying Plant Food for the Soil 22	27
Using Chemical Manures Intelligently 23	18
The Old, Worn-out Soils: What we May do for Them 28	
	I
	The Soils that Living Things Have Made

ILLUSTRATIONS

									100	AGE
Only the Roots Remain Behind			3.9	38	23	21	63	62		2
A Bit of Earth's Clothing										5
Gradually Changing from Rock to										8
Cover Crop for the Orchard								٥.		12
A Field of Corn Carried Away by a										13
Just after a Flood		8	9	20	40	40	4	Q.		15
Soil Builders at Work				***	•				*	18
Alfalfa Roots Go Deep into the Soil				8						20
A Crop that is Hard on the Soil .										24
Section of Soil Showing Air Spaces										26
On Two Types of Soil	•		4.7	40	*					20
Crop Adaptation								-		31
A Case of Bad Texture										34
Taking Soil Samples	200	20	245	200						36
The Pore-space of the Soil				400						37
A Soil that Needs Humms Circulation of Water in the Soil .					-	1				39
Circulation of Water in the Soil .		.5					. 1			40
Vegetable Matter Aids the Soil in I	Hol	din	g '	Wa	ter	w.				42
Trees in the Prairie Region										43
How Plant Food Gets into the Soil										44
The Underside of a Leaf with a Mi										46
Oats					40					47
Cross-section of Root Hair		*05	+11	400	***	*:				48
Root Hairs						÷				48
How the Sap Current Moves .			2					ψ.		49
The Greater Part of this Wonderful										55
Getting Humus into the Soil	9 13	*0;	KS	+::	×	100	240		œ	50
Cotton Plant Above and Below the										62
A Root Hair with Soil Attached .				2			V.			64
Making Plant Food Available			i));	+11		**	*			65
At Work in the Corn-field			10	+11	**	**	*.	*	140	67
At Work in the Corn-field Getting Ready for Cotton										68
Poor Grass, Poor Cattle		1 8	30	3	100		16	10	3	73

ILLUSTRATIONS

Corn Growing in Surface and Subsoil .	200	*	*	+.	*		12+	76
A Crop that Calls for Much Nitrogen .								79
A Crop that Gets Nitrogen from the Air								82
A Sure Way to Improve the Soil	*:			*			0.0	84
Increasing the Nitrogen with Legumes	+0	*		+				86
Alfalfa Roots: Vegetable Tillage Tools								89
A Good Job of Plowing		9						91
Plowed for the First Time		*:	*					93
Effect of Plowing Wet Land							1.2	94
Limed and Unlimed Land		÷.						100
Using the Lime Spreader	£0				٠	3	W.	105
A Magnificent Crop of Beans	12	*:			*			113
Two Kinds of Bacteria Found in Decaying	Veg	eta	ble	M	att	er		120
Bacteria Usually Found in Decaying Orga								121
Some Bacteria that Cause the Fermentatio								123
Nitrifying Bacteria	*:	*:		*	3	*		127
Losing Nitrogen and Humus		7.1				100		132
Root Tubercle Bacteria		٠.						139
Back of Good Tillage is the Well-bred Fa	arm	H	ors	c		12	-	142
Some Legume Roots Showing Root Tube	ercl	es	*	*	3		*	145
Growing Bacteria in the Laboratory	7.							149
Alfalfa: the Best All-round Crop in Amer	ica	•	-					150
Red Clover Roots	÷	*:	*:		4	4	+	153
Soil Temperature	*2	:00	*:		*:	*	141	155
A Way to Help the Drainage								156
Losing Soils by Heavy Rains		٠.						158
The Result when Water was Secured and	He	ld			*		ĐĐ	164
Effect of Cultivation of Corn Crop							×	165
Cultivation Checks Evaporation								166
A Home-made Roller	ĕ							169
Disking the Ground before Plowing			•		+			171
A Stone Mulch			*0			*	4	173
A Good Mulch		1		2			1	174
Kaffir Corn			¥6 .					177
Corn Planted with Disk Furrow-opener								178
Double Disking the Land								180
"Out There in Kansas"							V	181
Sub-surface Packing								182
Dry Land Farming			+	•00	£2		*	183
Ideal Plowing						,		186
Furrow Slices that are too Flat								186