

**FIELD AND LABORATORY
STUDIES OF CROPS: AN
ELEMENTARY MANUAL FOR
STUDENTS OF AGRICULTURE**

Published @ 2017 Trieste Publishing Pty Ltd

ISBN 9780649539468

Field and Laboratory Studies of Crops: An Elementary Manual for Students of Agriculture by
A. G. McCall

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

A. G. MCCALL

**FIELD AND LABORATORY
STUDIES OF CROPS: AN
ELEMENTARY MANUAL FOR
STUDENTS OF AGRICULTURE**



"No richer gift hath Autumn poured
From out her lavish horn."

The Corn Song—Whittier.

FIELD AND LABORATORY
STUDIES OF CROPS

*AN ELEMENTARY MANUAL
FOR STUDENTS OF AGRICULTURE*

BY

A. G. McCALL

Professor of Agronomy, Ohio State University

FIRST EDITION

FIRST THOUSAND



NEW YORK

JOHN WILEY & SONS, INC.

LONDON: CHAPMAN & HALL, LIMITED

1916

S495
N12

COPYRIGHT, 1916,
BY
A. G. McCALL

TO VIND
APPLIED

THE SCIENTIFIC PRESS
ROBERT DRUMMOND AND COMPANY
BROOKLYN, N. Y.

SUGGESTIONS TO TEACHERS

THERE is a growing tendency in the schools toward educating children in the common things of life. In some States laws have been passed requiring the teaching of elementary agriculture in the village and rural schools. The object of this work is to interest the pupils in the practical things of country life and to give them some conception of the opportunities which surround them. A majority of the children who attend the village and rural schools will remain in the country, and it is right and proper that they should be educated in the things with which they will have to deal every day of their lives.

The success of the work will depend very largely upon the teacher. Pupils are naturally interested in those things with which they are constantly in contact, and need only the encouragement of the teacher to direct their enthusiasm. In this manual a few exercises are given to illustrate some of the fundamental principles of plant growth, but the central idea throughout is the practical application of these principles to crop production and improvement. Some of the exercises are original, but many of them have been adapted from the publications of the United States Department of Agriculture and from the bulletins of the Extension Department of the Ohio State University. The writer wishes to acknowledge his deep indebtedness to his wife, Hattie F. McCall, for helpful criticisms and suggestions.

No expensive equipment is required, but every effort should be made to induce the pupils to make use of materials on the home farm or in the school gardens. Each pupil should have at home or in the school garden a small plot of ground on which to grow some crops for which he shall be entirely responsible.

The book is expected to furnish material for two periods per week for a half year or one period per week if the work is extended over the entire school term. In order to give the teacher some choice of subjects, fifty exercises have been included. They are arranged in logical order, but it is expected that this arrangement will need to be modified in order to adapt the studies to the season.

In addition to the standard books on elementary agriculture, the school library should have the publications of the State Experiment Station, the Agricultural College, and the United States Department of Agriculture. The former can usually be obtained by direct application to the Station and College, while the latter can be secured by writing to your Senator or Representative in Congress. The Yearbook and the Farmers' Bulletins are the most useful publications put out by the federal government.

At the conclusion of each exercise the pupils should be assigned reference readings bearing upon the work of the period and be required to make a written report. As far as possible, the class-room recitations and discussions should center about the field and laboratory exercises.

DEPARTMENT OF AGRONOMY,
OHIO STATE UNIVERSITY,
August, 1915.

CONTENTS

EXERCISE	PAGE
1. How Plants Grow.....	1
2. Where The Plant Obtains its First Food.....	3
3. To Show That Plants Get Food Material from the Soil.....	5
4. To Show How Plants Take up Food Material from the Soil..	8
5. To Show That Sunlight is Necessary for Plant Growth.....	10
6. To Show That Air is Necessary for the Germination of Seeds and the Growth of Plants.....	12
7. To Show That Heat is Necessary for Plant Growth.....	14
8. To Show That Plants Take up Moisture from the Soil and Give it off Through their Leaves.....	16
9. To Show the Amount of Moisture Retained by Plants.....	18
10. To Study the Growth Rate of Plants.....	20
11. To Show the Proper Depth for Planting.....	22
12. A Study of Corn.....	24
13. The Corn Kernel.....	26
14. The Study of an Ear of Corn.....	29
15. Early Growth of the Corn Plant.....	31
16. A Study of the Mature Corn Plant.....	33
17. Pollination of Plants.....	36
18. The Selection of Seed Corn in the Field.....	39
19. The Storage of Seed Corn.....	42
20. Judging Corn Ears.....	46
21. To Study the Effect of Stand upon the Yield of Corn.....	51
22. To Test the Vitality of Seed Corn.....	53
23. Testing the Corn Planter.....	57
24. To Study the Necessity for Proper Cultural Methods for Corn.	59
25. The Production of Corn in the United States.....	62
26. Study of a Head of Wheat.....	65
27. Early Development of the Wheat Plant.....	68
28. Judging Wheat.....	70
29. The Production of Wheat in the United States.....	72

EXERCISE	PAGE
30. Early Growth of the Oat Plant.....	74
31. Judging Oats.....	76
32. The Treatment of Seed Oats for Smut.....	78
33. The Production of Oats in the United States.....	80
34. Early Growth of the Rye Plant.....	83
35. Early Growth of the Barley Plant.....	84
36. The Identification of Legume Seeds.....	86
37. Purity Test for Grass, Clover or Alfalfa Seed.....	88
38. A Study of Weed Seeds.....	92
39. Weed Dissemination.....	94
40. A Field Study of Weeds.....	97
41. Germination Test for Clover or Grass Seed.....	101
42. A Field Study of Legumes.....	104
43. A Study of Soy Beans.....	106
44. A Study of the Potato.....	108
45. A Field Study of the Potato.....	111
46. Treatment of Seed Potatoes for Scab.....	113
47. A Laboratory Study of Cotton.....	115
48. A Study of Cotton in the Field.....	118
49. A Study of Rice.....	121
50. Planning the Home Garden.....	122

APPENDIX

To Observe Corn Day.....	129
--------------------------	-----