

**AN INTRODUCTORY
MANUAL FOR
SUGAR GROWERS**

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An Introductory Manual for Sugar Growers by Francis Watts

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INTRODUCTORY MANUAL
FOR SUGAR GROWERS

BY
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PREFACE.

AN experience of some years in the West Indies has led me to see the necessity for some simple hand-book for the use of those engaged in the sugar industry—a hand-book containing an outline of the principles of agriculture based on modern scientific discoveries, and also an outline of the principles underlying the manufacture of sugar.

An attempt is made in the following pages to collect together in as simple a manner as possible a series of observations on these points, in the hope that they will serve as a starting-point for young overseers about to begin their training in the sugar-fields and boiling-houses, and also, perhaps, as a means of rendering more easy and accessible to older men the information to be obtained from larger works and from scattered papers and pamphlets.

One difficulty which sugar growers experience is that writers on agriculture have rarely written upon their special subject, but have treated of the methods and productions of temperate climates; hence there has often been a doubt as to the extent to which the writers' remarks could be with

safety applied to a tropical plant and under tropical conditions.

A sugar literature is now springing up, and it is hoped that this little book may be one of a series of hand-books, each dealing in a more exhaustive manner than in the present case with some one branch of the sugar industry. If a number of competent writers could be induced to contribute to this end, such a course would do much to give accuracy and precision in the place of the old "rule of thumb."

FRANCIS WATTS.

GOVERNMENT LABORATORY, ANTIGUA, W. I.,
November, 1892.

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MANUAL FOR SUGAR GROWERS.

CHAPTER I.

Introduction.—Chemical Elements and Symbols.—Cells, Tissues, and Fibro-vascular Bundles.—Structure and Function of Roots, Stems, and Leaves.

IN the study of agriculture an acquaintance with a number of sciences is necessary. Prominent among these are chemistry and botany, some knowledge of chemistry being necessary in order that the changes taking place in soils under tillage and cropping may be understood and the requirements of the crops economically supplied. The sugar grower, being also as a rule a sugar manufacturer, requires to know some chemical facts in order that he may understand the changes to which sugar is liable, and how to promote advantageous ones while preventing those which are harmful. A knowledge of the fundamental principles of plant life and nutrition is quite invaluable to all engaged in agriculture.

One of the most important facts which chemistry has taught us is the indestructibility of matter: nothing is created, nothing is destroyed in the con-