

PREFACE

The Second Edition of *Plant Physiology*, like the First Edition, provides the college student with an introduction to the physiology of plants. Although revision in certain parts is extensive, the original organization and aims of the book have been maintained.

The Second Edition includes discussions on the presence of RNA and DNA in mitochondria and chloroplasts, an important discovery with exciting implications. New concepts on chlorophyll and starch synthesis have been added and the possible role of microtubules in cell wall formation is discussed. To Chapter 9 have been added more detailed discussions of the effects of temperature, light, and natural plant-growth hormones on translocation in the phloem. These discussions emphasize the growing interest that this area of plant physiology has attracted. Chapters 10 and 11 have been largely rewritten, giving a detailed and more accurate description of photosynthesis. Particular attention has been given to C. B. van Niel's studies, the "Emerson Effect," the role of ferredoxin in electron transfer, and the two pigment systems. Chapters 17 and 19, dealing with plant-growth hormones, have been revised to accommodate the many advances that have been made in this area over the last few years. New concepts on auxin translocation and the exciting discovery that IAA is capable of new RNA and protein induction are discussed. An up-to-date description of phototropism and geotropism and a discussion of the newly isolated natural inhibitor abscisic acid have been included. In addition, recent work on gibberellins and cytokinins has been given attention, with particular reference to the activity of gibberellins in the mobilization of storage compounds during germination.

Many other changes have been made, including the addition of new illustrations and new references, to make the text a more efficient tool for classroom use.

The book has been organized in a manner to make it applicable to a one- or two-semester course. Adequate coverage of the entire book can be accomplished in a full academic year. With a certain amount of trimming and condensation, it can be used in a one-semester course. It is suggested that students preparing for a course using *Plant Physiology* take general courses in botany and inorganic and organic chemistry. In our time one is "hard put" to distinguish between the fields of biochemistry and physiology, a situation that makes it almost mandatory for a student to be well grounded in certain chemical principles before he undertakes a course in plant physiology.

The book is divided into seven sections, each section covering a specific area of plant physiology. The instructor may start at the beginning of any one section, depending upon the background of his students. In other words, lecture units may conveniently be associated with sections in the book, allowing for closer ties between lecture and text.

Robert M. Devlin