Book reviews

P.J. Davies. *Plant hormones and their role in plant growth and development.* Dordrecht, Boston, Lancaster: Martinus Nijhoff Publishers, 681 pp. ISBN: 90-247-3497-5 (hardback); 90-247-3498-3 (paperback). Hardcover $170.00, softcover $45.00.

A team of forty-one experts has been invited to contribute to this book on plant hormones under the editorial direction of Dr P.J. Davies from Cornell University. According to the preface, the choice of topics is the choice of the editor but in each chapter the coverage and approach have been decided by the authors.

The book is divided into five sections of very different lengths. Two small chapters constitute the first part, both written by P.J. Davies; the first one deals with some general ideas about plant hormones, their nature, occurrence and functions, while the second one defines the plant hormone concept. It is in this introduction part that readers can find the definition of the concept of plant hormones which is used by the authors throughout the book: 'plant hormones are a unique set of compounds, with unique metabolism and properties.... Their only universal characteristics are that they are natural compounds in plants with an ability to affect physiological processes at concentrations far below those where either nutrients or vitamins would affect these processes.' It is, of course, possible to discuss this definition but its credit is to be simple. In the same first chapter are given in a few words some peculiarities of each class of hormones: auxin, gibberellins, cytokinins, ethylene, abscisic acid and polyamines. The following points are very briefly considered: the nature of the hormones, their sites of biosynthesis, their transport and effects and their mode of action (except for cytokinins because, according to the editor, 'the mode of action is poorly understood and insufficient evidence exists to conclusively identify any biochemical point of action').

The second part (about 110 pp.) contains five chapters on hormone synthesis and metabolism, one chapter per class of hormones but nothing on polyamines (why?). The third part (about 90 pp.) is entitled 'How hormones work' and contains four chapters:
1. Auxin and cell elongation
2. The control of gene expression by auxin
3. Gibberellins and abscisic acid in germinating cereals
4. Hormone binding and its role in hormone action

The fourth part (about 35 pp.) deals with hormone analysis including the immunoassay methods. Finally the fifth part, the largest one (about 400 pp.) concerns the functioning of hormones in plant growth and development. It is in this last part that about 20 pages are devoted to the use of natural and synthetic growth regulators in horticultural and agronomic crops. The volume ends with a good index.

In the preface the editor writes that 'a volume such as this cannot be encyclopedic... Nevertheless, we have covered the majority of topics in which active research is taking place.' Yes and no, and if there is a lot of information about hormones to be found in this book, it is not always where you expect it. For example, in the chapter on the use of plant growth regulators in horticultural and agronomic crops nothing can be found on the use of ethylene-releasing agents for inducing the flowering of Bromeliaceae (particularly pineapples) but only the indication that exogenous ethylene inhibits or delays flowering. Instead this information is to be found in the Chapter on hormones and reproductive developments.

The editor writes also that the information contained in this book is 'directed at advanced
students and professionals in the plant sciences... or in the horticultural, agricultural and forestry sciences. It is intended that the book should serve as a text and guide to the literature for graduate level courses in the plant hormones. I am not sure that the authors achieved the aims stated by the editor. In my opinion, for a non-encyclopedic book, this volume is too long, but it is too short to give enough information in every chapter. I guess also that even for advanced students, there is too much information here and too many details in some chapters and maybe not enough in some other ones. Of course, the editor's task was very difficult as plant hormones represent a very broad field. The quality of the coverage is also very different according to the authors (that is the big point in a multi-authors book). I would also have liked to find in this volume more authors coming from outside North America but it is the liberty of the editor to invite the authors he wants to work with, and the liberty of the reader to think that the choice could be different. Finally I will add that the technical presentation of the book is of high quality.

Sint-Truiden

R. MARCELLE

D.W. Lawlor. Photosynthesis: metabolism, control and physiology. Harlow: Longman Scientific & Technical, X + 262 pp. ISBN 0-582-44633-3, £14.95 (paperback)

This book copublished in the United States with John Wiley & Sons (ISBN 0-470-20681-0, USA only) 'provides a simplified description of the partial processes of photosynthesis at the molecular, organelle, cell and organ levels of organization.' It is 'intended for undergraduate and graduate study in plant biology courses and for non-specialists in other disciplines who wish to understand photosynthetic mechanisms and control.'

It contains twelve chapters followed by a short index:

1. Introduction to the photosynthetic process
2. Light—the driving force of photosynthesis
3. Light harvesting and energy capture in photosynthesis
4. Architecture of the photosynthetic apparatus
5. Water splitting and the electron transport chain
6. Synthesis of ATP: photophosphorylation
7. The chemistry of photosynthesis
8. Metabolism of photosynthetic products
9. C4 photosynthesis and crassulacean acid metabolism
10. Carbon dioxide supply for photosynthesis
11. Photosynthesis by leaves
12. Photosynthesis, plant production and yield

References are mainly from the secondary or review literature where primary literature could be found.

Contrasting with the book on plant hormones edited by P.J. Davies, this book on photosynthesis seems to me a good example of a textbook particularly well adapted for students. It contains updated information, not too much, but enough. One could always discuss some details, such as why this bit of information is included but that bit is not (for example, nothing on the large effect of photoperiod in CAM plants) but the choice of literature is very good, and very rapidly more details can be found in the excellent and more specialized review papers. I recommend this manual to every student taking courses in plant biology.

Sint-Truiden

R. MARCELLE