

**Organic Agriculture.** P. K. Thampan (ed.). Peekay Tree Crops Development Foundation, MIG 141, Cochin 682 020. 1995. 354 pp. Price: Rs 480, \$ 50.00.

Organic agriculture as a sustainable farming system keeps the biological potential of soil alive offering better agricultural productivity. However, the concept of organic agriculture has not yet become popular among the farmers as a promising alternative farming system. Agriculturists and non-agriculturists interested in any aspects of agricultural beginnings should consider reading all or parts of *Organic Agriculture*. Specialists involved in the study of agricultural beginnings would also benefit from the eleven case studies.

The first and last chapters of this volume are written by the editor himself. Chapter 1 is an excellent overview touching on the concepts and basic features of organic agriculture. In the author's words, 'Organic agriculture is a farming system, devoid of chemical inputs, in which the biological potential of the soil and the underground water resource are conserved and protected from the natural and human-induced degradation or depletion by adopting suitable cropping models including agroforestry and methods of organic replenishment, besides natural and biological means of pest and disease management, by which both the soil life and the beneficial interactions are also stimulated and sustained so that the system achieves self-regulation and stability as well as capacity to produce agricultural outputs at levels which are profitable, enduring overtime and consistent with the carrying capacity of the managed agroecosystem'. Indeed, a lengthy definition! The last chapter presents an excellent framework for understanding the case studies, which are supplemented with additional field photographs and statistical data. The eleven case studies selected from different agroclimatic belts of India, cover those farmers who practised the concept of organic agriculture.

The contributors of other chapters are recognized experts who blend intuition with recent theoretical, observational and experimental results to elucidate the various aspects of organic agriculture. For an advanced reader, each chapter provides an extensive bibliography for more in-depth information. Soil microflora play an important role in the maintenance of

soil quality by regulating the nutrient flow. Chapters 2 and 3 cover various soil microbes and their role in maintaining soil health. Chapter 2 is more technical and hence not easily accessible to a general reader, however, both chapters are provided with several tables and figures. The importance of organic matter/organic amendments on soil health/ameliorating problem soils has been discussed in Chapters 4 and 5. The maintenance of on-farm diversity and its impact on organic agriculture have been dealt in detail in Chapters 6, 7 and 8. Chapter 9 reviews the global change towards organic movement, while the wisdom of Indian farmers is outlined in Chapter 10.

Some measure of overlapping among the chapters is inevitable, however, the repetition may be advantageous for non-specialists. The clarity of some field photographs is not satisfactory, but in general, the book itself is unusually attractive with a generous offering of figures and tables. Most of the material is appropriate and well organized and the editor/the authors should be commended for excellent proof-reading.

The organization of the book, along with its clear, almost non-technical presentation should make it useful to the farmers and students in agriculture for whom it is written. Let us hope that they use it and heed its advice.

SANTHOSH NAMPY

*Department of Botany,  
St. Joseph's College,  
Devagiri 673 008, India*

**Plant Physiology** by S. C. Datta. Wiley Eastern Ltd., 4835/24 Ansari Road, Daryaganj, New Delhi 110 002. 1994. 618 pp.

The field of plant physiology includes cellular physiology describing metabolic pathways and developmental physiology describing regulation of growth and differentiation. During the last two decades, knowledge in every small area of plant physiology has grown so much that separate books have appeared on what used to be a chapter in a book. A large

number of research journals have been added to emphasize the importance of each area of research. It is difficult to keep in touch with all these activities and therefore I personally always look forward to read a new book on plant physiology to catch up with newer concepts and information that one may have missed otherwise, and secondly to improve on my teaching course. It was with this enthusiasm that I immediately accepted to review this book on plant physiology. However, after reading the book I was disappointed. Although a lot of material has been given in this book, there is absolutely no new information. I rarely found any new reference in the literature cited. The comments I have on specific chapters are given below. In fact I also requested one of my colleagues Dr B. C. Tripathy, a better specialist on metabolism, to check if I was not presenting a biased opinion. He furnished me with his comments and was of the opinion that this book should have been in the market at least a decade earlier.

In chapter 3, which deals mainly with pH and colloids, one would have expected a good write-up on buffers and a need for buffering system in plant cells. It would have been appropriate to have brought out the importance of  $pK_a$  value and appropriate equations for its determination. In chapter 4, negative and positive aspects of osmotic potential are not explained, especially the equations to determine osmotic potential of salts and sugars. The potentials are now expressed in pascal units which is not mentioned. In chapters 5-7, the reference to soil-plant-atmosphere continuum concept should have been introduced and so also the role of conductance capacitance in water relations. There is now a lot of information available about the molecular mechanism of stomatal opening and closing which has not even been mentioned. In fact, work on the patch-clamp studies on guard cells has also been done and nature of channels has been characterized. Even in chapter 9, the recent reports on biological functions of various metal ions are totally missing.

The introduction of a separate chapter on plant pigments (chapter 10) was a good plea. However, information provided in this chapter is still old and it may mislead a reader. For example, it is written that chlorophyll is synthesized from 5-aminolevulinic acid which in turn is syn-

thesized from condensation of glycine and succinyl co-A. It is now, however, shown for certain that ALA biosynthesis in plants usually does not take place by this route, rather in the majority of plants it is synthesized via glutamic acid pathway. It would have been better if more information was also included for carotenoid biosynthesis.

While it is understandable that historical perspectives are also included, especially in a chapter on photosynthesis, it is as much essential to put the present concepts based on newer knowledge. There is so much known today regarding the two photosystems, Z-scheme and proteins involved in PSII and PSI which have not been included or even briefly cited. The mechanism shown for photolysis of water is an old concept. Reference to  $\text{TPNH}_2$  instead of  $\text{NADPH}_2$  may confuse a student. Description of  $\text{CO}_2$  reduction cycle is extremely inadequate. Similarly a description on photorespiration has not been updated.

In the chapter on carbohydrates, role of sucrose phosphate synthase should have been elaborated and similarly in respiration, cyanide-resistant respiration, so unique to plants, should have found a place. The diagram on the mechanism of protein synthesis (chapter 15) has been taken from Cohen (1966). In this chapter a description of role of nitrate and nitrite reductase, is totally missing. In fact, the

genes of both the enzymes have been cloned and lot of data on protein structure are available.

The chapter on flowering gives a good account of what was known till early 1970s. We have new books related to molecular biology of flowering and a number of genes involved in flowering have been identified. However nothing of this finds a mention in the book. On p. 412, the author still refers to phytochrome as a glycoprotein! On p. 413 it is mentioned that red and far-red light shifts the double bond position and the reference cited is of Figure 109, which shows effect of night-break on flowering. While we know today of light-regulatory promoter elements and the *cis*-elements involved in transcription regulation, the book refers to only the experiments done with actinomycin D. On p. 425, the concentration of RNA is given in ppm.

In chapter 18 the newer methods of estimating hormones like radio immunoassays are not given at all. The mechanism of action of hormones has not been well described. It is mentioned that no hormone receptor has been found and the reference given is of 1981. Similarly it is mentioned that no cytokinin has been isolated from coconut milk and the reference is of 1955. In 1975, van Staden found zeatin and its ribosides from coconut water. On p. 529, it is written that gibberellic acid control is not possible to know! And we

know of 'GARE' elements (gibberellic acid responsive *cis* elements) in 5' upstream region of  $\alpha$ -amylase gene which respond to the hormone. Similarly there has been a lot of information on phototropism and geotropism which finds no mention in chapter 20. In this chapter, however, nature and use of herbicides etc. has been well covered.

As pointed out by the author, the book has been written for botanists and for other well-informed persons who desire to understand various functions in living plants. For a general reader the book is too detailed, has no important observations and with very poor-quality pictures and graphs. For specialists it is lacking in up-to-date information. I can recommend this book for those who would like to know what is plant physiology and what topics are covered in such a course and for those who want to have an understanding of the earlier concepts. For serious students of plant physiology this book will have to be read along with other recent books or *Annual Review of Plant Physiology and Plant Molecular Biology*.

S. K. SOPORY

*Department of Life Sciences,  
Jawaharlal Nehru University,  
New Delhi 110 067, India*

## Errata

In 'On the use of animals in research and education' (Jane Goodall, *Curr. Sci.*, 1995, **69**, 301-303), the name of the second author, Walter Miale was inadvertently omitted. We regret the error.

In 'Mushrooms: Beauty, diversity, relevance' (Subramanian, C. V., *Curr. Sci.*, 1995, **69**, 986-988) picture credits should read: Cover picture, figures 1, 3, 5 courtesy K. Natarajan; figures 7, 8, 10, 11 courtesy Chen, Hsinchu. On page 995 read 'Chemical structure of mushroom toxins and hallucinogens, after BRESINSKY and BESL', and not as printed.