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Genetics, Genomics and Breeding of Sugarcane. Edited by R. Henry and C. Kole. Boca Raton, FL, USA: CRC Press/Taylor and Francis (2010), pp. 272, US\$129.95. ISBN 978-1-57808-684-9.

As emphasized in the last chapter of this book, interest in sugarcane is increasing because of its potential for bio-energy production – helped by high yields, perennial growth and high fermentable sugars. This book provides some informative reviews of the genetics of this complex, highly polyploid, inter-specific hybrid. However, it takes an almost exclusively molecular genetics perspective: four of the twelve chapters focus on DNA marker research, three to other types of ‘omics’, one each to bio-informatics, cytogenetics and genetic diversity analysis, plus an introduction and conclusion. An underlying theme is the challenges of working with a complex polyploid.

Assuming a book title is meant to be a guide to its content, a notable deficiency is lack of mention about the breeding technologies and programmes that continue to deliver all sugarcane cultivars in the world, or the underpinning statistical genetics research. Also surprisingly given the molecular bias, there is hardly a mention of the major programmes underway in development of GM sugarcane.

Each chapter reads very well as a review paper focused on a particular topic. However, editing to reduce repetition of the same points across chapters and draw together important issues could have made a better ‘book’ rather than a set of ‘stand alone’ reviews.

Overall, this book provides some excellent reviews for those interested in molecular genetics of sugarcane. However, if it is sugarcane breeding or the practical process of sugarcane cultivar development you wish to read about, you will be disappointed.

Phil Jackson

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Physiology of Cotton. Edited by J. M. Stewart, D. M. Oosterhuis, J. J. Heitholt and J. R. Mauney. Heidelberg, London and New York : Springer (2010), pp. 564, £34.99. ISBN 978-90-481-3194-5, ISBN 978-90-481-3195-2.

Both reviewers began their careers in cotton genetics, and note that ‘physiology’ is applied today in a wider, more integrated sense than when it referred mainly to plant nutrition and response. This volume is wide-ranging, covering evolution, anatomy, biochemistry and cultivation practices, bridging a 25-year gap since the publication of its predecessor *Cotton Physiology*.¹

This book covers the growth and development of the cotton plant in terms of seeds, root systems, leaves, the canopy and fibre. It comprehensively summarizes responses to environmental factors such as temperature, light, water, CO₂ and ozone, and deals with nutrition and stresses such as mineral deficiencies and toxicities, salinity, air pollution, pests and reactions to microbes and fungi. There is invaluable new information on mycorrhizas.

Crop management is not neglected, and to aid profitable cropping, the book provides up-to-date information on irrigation, the application of seed treatments, fertilizers, herbicides, pesticides and defoliant, plus sections on plant mapping and monitoring.

There are chapters on the cotton fibre, giving key facts about its structure, development, biochemistry and how they impinge upon quality and the book focuses on using new techniques to identify and quantify secondary compounds.

The book devotes little space to breeding and genetics, but informs about the locations and diversity of germplasm collections and their possible contributions to specified objectives, as well as having chapters on molecular biology and genetic engineering.

As the most up-to-date overview of current knowledge of the crop it is, with c.1000 references, an invaluable compendium of cotton agronomy.

Xianmin Chang and Trevor Walker

¹*Cotton Physiology*. Mauney, J. R. and Stewart, J. M. (1986). The Cotton Foundation, Memphis, TN, USA.