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BOOK REVIEWS

Sugar Beet. Edited by A.P. DRAYCOTT. Blackwell Publishing Professional, 2121 State Avenue, Ames, IA 50014–8300. 2006. Hardcover, 496 pp., $249.99. ISBN-10 1–4501–1911-X.

World demand for sugar approaches 140 million tonnes each year and is supplied by only two plants, one of which is the sugar beet (*Beta vulgaris* L.). A team of international researchers was assembled by the editor to review the literature on sugar beet production and assemble it into an accessible form. The first time this was attempted was with *The Sugar Beet Crop—Science into Practice* (Chapman and Hall), which was published in 1994 and is somewhat dated. Many of the 32 authors of *Sugar Beet* are Phillip Draycott's former colleagues at the Broom's Barn research center in the UK and the rest have extensive experience in sugar beet production around the world.

The authors have done a good job producing a book that encompasses sugar beet production world wide, as shown clearly in the first two chapters. The introduction gives us a snap shot of present day production and economics around the world, and the chapter on the development of sugar beet as an agronomic crop also takes a global view. The next three chapters present an overview of crop physiology, genetics and breeding, and seed production. The following five chapters cover tillage and crop establishment, agronomy, nitrogen nutrition, other plant nutrients, and water use and irrigation. There are three chapters that cover sugar beet pathology—virus diseases, fungal and bacterial diseases, and other pests—followed by a chapter on weed control. The final three chapters deal with storage of the crop after harvest, root quality from a processing perspective, and the co-products that help make sugar beet a profitable crop.

The genetics and breeding chapter provides a good overview, especially of commercial hybrid production techniques and goals. The chapter also makes a courageous attempt to comment on the impact of biotechnology on sugar beet breeding, which is a rapidly moving target in any crop. There is a useful summary of some of the molecular work from the last ten years, but it is not particularly thorough. Nonetheless this chapter provides a good overview of genetics and breeding, although serious students of plant breeding will still want a copy of the recently published *Genetics and Breeding of Sugar Beet* (Science Publishers Inc., 2005).

The chapters dealing with production provide a good overview and detailed review of the nutrient needs of the crop. There are a couple of real gems hidden in this section as well. Under the general heading of "Agronomy," K.W. Jaggard and A. Qi provide an excellent review of the physiology of crop development and its effect on yield. They bring together the literature on the interaction of the crop with climate, soil, nutrition, light, and water. In the chapter on "Water Use and Irrigation," in addition to the review of irrigation practices, E.S. Ober and R. Morillo-Verlarde provide a review of the response of sugar beet to water deficit, modeling of this response, and genotypic variation of drought tolerance in sugar beet. In the many areas of the world where sugar beet is an irrigated crop, efficient water use will be critical as water becomes limiting and more expensive. The plant pathology and disease chapters in this book are well done and very inclusive. There are a number of color plates illustrating disease symptoms (as well as nutrient deficiencies), and, although it is tedious flipping back and forth to the plates in the center of the book, the quality is excellent. The information presented here complements very well the information and photographs in the *Compendium of Beet Diseases and Insects* (The American Phytopathological Society Press, 1986) that most sugar beet pathologists will not want to give up.

The chapter on storage provides a good basic review of the biochemical pathways involved in respiration. The following chapter explains the effect of the various products of the respiration pathways on the quality of the sugar beet juice, and subsequent yield of sucrose. The final chapter looks at the uses of the co-products that result from the production of sucrose from sugar beet.

It is a difficult task to provide a comprehensive review of the production of a crop, but the editor and authors do an excellent job of that in this book. It is a reference that both undergraduate and graduate students will find useful. Agriculturalists and extension personnel working on sugar beet will also find this book an indispensable tool and the entry into the primary literature provided by the 2500+ references (many quite recent) will be welcomed by sugar beet researchers.

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