

Book Reviews

Plant Breeding Reviews, Vol. 17. Jules Janick (ed.). 1999. John Wiley, 605 Third Ave., New York, NY 10158. \$180. hardcover. ISBN 0471333735.

Volume 17 of *Plant Breeding Reviews* continues the tradition of presenting contributions to and history of plant breeding. Particularly significant is the story of hybrid rice by Li and Yuan. Volume 17 is appropriately dedicated to Longping Yuan who, more than any other scientist, deserves recognition for its ultimate development.

The dedicatory paper by Jiming Li and Yeyun Xin documents the progress of hybrid rice research from discovering suitable pollen sterility in 1964 to the development of usable A (pollen sterile) and B (maintainer) lines in 1972, and the first commercial hybrids in 1974, and the planting of 10 million ha by 1986. Yield increases of hybrid rice of 20% to 30% were not anticipated when this research started.

The dedicatory paper is followed by an extremely thorough history of hybrid rice by Jiming Li and Longping Yuan. This paper is a treasure for all plant breeders worldwide. They have presented systematically all aspects of this program including attempts to isolate pollen sterility, identify maintainer lines and the successful development of commercial hybrids. Two approaches to the control of pollination using pollen sterility are compared. The three-line system of hybrid seed production follows the methods found earlier in onion by Jones and Clarke using cytoplasmically inherited pollen sterility. A second, the two-line system, depends on a recessive photoperiod and temperature sensitive gene for pollen sterility. Chemical emasculators are also used since the level of pollen sterility is not entirely predictable. Whereas pollen fertility restoration genes are necessary in the male parent of hybrids using the three-line system, all hybrids made using the two-line system would carry the dominant allele required to override the photoperiod sensitive pollen sterility gene and would be pollen fertile.

A third system now under study, the one-line system, uses apomixis to capture heterosis and does not involve pollen sterility as a tool.

Horticulturists will welcome Serge Gudin's

paper on genetics and breeding in the genus *Rosa*. The author clearly presents the wide array of untapped germplasm that exists. His broad view of needs and opportunities worldwide should serve ornamental horticulturists well.

Likewise students of plant breeding methods will enjoy the very informative article by White et al. on molecular genetic research in white clover. The authors provide a wide perspective on successes and failures of molecular techniques in the improvement of this forage plant.

James Crow's paper on the rise and fall of overdominance should be a must reading for all plant breeders. His early papers (1948 and 1952) challenged the earlier suggestions of the dominance theory to explain heterosis. This paper systematically documents the research that has reestablished the importance of the dominance theory which, with additive genes, is now generally the accepted basis for heterosis. This paper includes molecular research support by Stuber and his coworkers using analyses of QTLs.

Lastly, the history of statistics presented by N.W. Simmonds is well done. Too few of us have had a good exposure to the early history of statistics. This was very interesting reading.

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Carrots and Related Vegetable Umbelliferae. V.E. Rubatzky, C.F. Quiros, and P. W. Simon. 1999. CABI Publishing, 10 E. 40th St., Suite 3203, New York, NY 10016. 294 p., illustrated, softcover. \$50.00. ISBN 0-85199-129-7.

Three highly qualified horticulturists have collaborated to produce the tenth volume in the Crop Production Science in Horticulture series. Most of the preceding volumes on individual crops or crop groupings have been reviewed in this journal or in *HortTechnology*.

Although the book focuses on carrot and celery, the two most important food species in the group, a large number (45) of other species are treated in a little to some detail. The chapters do not cover a species from A to Z but instead brings together topical information so that principles can be elaborated and extended across species. Accordingly, chapters on Botany and Taxonomy; Plant Breeding and

Seed Production; Plant Growth and Development; Crop Production; Diseases, Disorders, Insects and Other Pests; Harvesting, Postharvest Handling and Storage; and Umbellifer Utilization and Composition are included in the book. By approaching the organization of the book in this manner, the authors have been able to integrate the available information in orderly fashion.

Because this is a large and diverse plant grouping; it is difficult, if not impossible, to contrive a concise and descriptive title for the work. I suspect that the authors wrestled with this problem before settling on their final choice. To further complicate this situation, taxonomists have determined that Apiaceae is a more appropriate name for the family than the formerly used Umbelliferae. The authors are well aware of this change but attempt to justify the older family designation on page 1 by suggesting that, although incorrect, it will continue to be used for some time. In addition, the use of the word vegetable in the title does not fully recognize the many important components in this grouping that are discussed in the book. This reviewer might suggest 'Apiaceae for Food and Flavoring' or simply 'Apiaceae' as titles that cover most, if not all, of the intended topic. Enough nitpicking on the title.

In addition to my quibble with the title, there are a few other minor irritants. The Contents shows that the section of Propagation in the Crop Production chapter contains 40 of the 50 pages in that chapter. In fact, important sections on plant nutrition, irrigation, cultivation, weed control and rotations now included under Propagation could rightly deserve their own headings in the Contents. The black and white photographs are adequate and informative for the most part, however, I found those of celeriac (8-3), cilantro (8.4), and dill (8.5) to be distracting and possibly confusing with carrot, radish or whatever roots in the background of these figures..

There is much to commend this valuable addition to the vegetable crops literature for those horticulturists concerned with these crops; including teachers, graduate students, public and private crop advisors, and seed industry personnel. The book brings together information from diverse sources for the first time making it a valuable source for a modest price.

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