

## Book reviews

**Gastel, A. J. G. van; Varma, S.; Abdul Elah Hamood, S. (eds.): Seed Production in the Arabian Peninsula.** Seed Multiplication Projects in Dhamar YAR, and the International Center for Agricultural Research in the Dry Areas. Aleppo, Syria: ICARDA 1989. 76 pp.

The demand for high quality seed is expected to increase as more farmers appreciate the benefits it brings. Large investments are being made at both the national and international level to develop successful plant breeding programs. However, seed resulting from these programs has to reach the farmers, and it is the international centers that play a decisive role in this process. Consequently, the Seed Production Unit of the ICARDA organized a workshop on Seed Production in the Arabian Peninsula at Sana and Dhamar. The proceedings of these meetings are restricted to the discussion of the seed multiplication programs of Saudi Arabia, Lebanon, Egypt, Jordan and both Yemen republics, and will prove to be interesting reading to any breeder interested in promoting seed production and distribution programs in the Middle East.

H. F. Linskens, Nijmegen

**Findley A. M.; McGlynn, S. P.; Findley, G. L.: The Geometry of Genetics.** New York: Wiley 1989. 156 pp., 7 figs., 10 tabs. Hard bound £ 31.35.

This book is an interdisciplinary approach to molecular genetics and evolutionary biology and presents their mathematical basis from the perspective of chemical physics. Relying on physical principles to uncover “hidden symmetries” in biological phenomena, this publication describes a range of specific problems in genetics, presents the relevant mathematics, and provides mathematical reformulations of each problem under consideration.

The authors have divided the book into three parts: structure; statics and dynamics. The discussion of each part proceeds from a presentation of the relevant mathematics to a description of the biological problem and ends with a mathematical reformulation of the biological problem. The main contents of these three parts can be shortly described by the following topics:

Structure: set-theoretic and linear algebraic notions, description of the origin and evolution of the genetic code.

Statics: discussion of the basic processes of molecular genetics (replication, transcription, translation) as operators on a certain linear space.

Dynamics: action of molecular genetics as a differential geometry.

For a deeper insight into the contents of the book a citation of the headings of the chapters and the sub-chapters may be sufficient: introduction (general overview, biological overview); structure (sets and their structures, the genetic code, genetic code symmetries); statics (linear spaces, transformations of macromolecules, realization of molecular genetics in a linear space); dynamics (differential geometry, macromolecular evolution, realization of molecular genetics as a differential geometry).

The main aim of this book has been characterized by the authors in the preface: “This monograph is inherently interdisciplinary: the subject is molecular genetics and evolutionary biology; the machinery that we develop relies heavily on mathematics; and the motivation for our approach is rooted in physics, at least insofar as our emphasis is on a search for ‘hidden symmetries’ in biology”.

This monograph must be characterized to be a very exciting and stimulating one. Without any restriction it can be highly recommended. Nevertheless, for most of the readers of this journal we suppose that it would be quite difficult to read this monograph because of the considerable amount of higher mathematics which has been presumed by the authors. Without a solid knowledge of the relevant mathematical facts and techniques the book cannot be profitably used by the non-mathematician. This critical comment should in no way narrow the value of this recommendable book. It will be highly welcomed by specialists.

M. Huehn, Kiel

**Industries Assistance Commission: The Wheat Industry, Report No. 411.** Canberra: Australian Government Publishing Service 1988. 310 pp. Soft bound \$ 24.95.

From out Australia, one regards the rest of the world in a strange and rather special way. This is also true for the wheat industry of the fifth continent, which in 1986 produced 16 million metric tons, or 3% of the world production. It is rather surprising that this report, produced by a governmental industry assistance commission, mentions the contribution of research in only two places when it discusses the supply factors that influence world wheat production, which rose on the world scale from 1.6 tons/ha in 1972 to 2.3 tons/ha in 1986 and which was particularly noticeable in Asian countries. “Technological factors, such as increased application of fertilizers, installation of irrigation systems, the development of new strains of wheat and advancement of agricultural equipment have also contributed to increased yields”. The “have also contributed” may be just a little euphemistic for the great contribution that intensive breeding research has delivered to what once was called the “Green Revolution”. Nevertheless, the introduction of better adapted and higher yielding wheat varieties is expected to increase the net rate of yield from genetic improvement from 1% to 1.5% per year, although it is also suggested that new breeding methods could also increase the rate. Insight? In Australia, 40 cents per ton are contributed to a Wheat Trust Fund under a grower-to-buyer arrangement; this is also called a wheat tax. According to the report, the benefits of wheat research appear to accrue principally to growers and therefore the recommendation is that it seems appropriate that the growers’ contribution continue to be made through the compulsory tax on production. No wonder that this report is concerned mostly with competitiveness, guaranteed minimum prices, marketing arrangements, shipment, and financial performances and adjustments.

H. F. Linskens, Adelaide

**International Board for Plant Genetic Resources: Annual Report 1988.** IBPGR Headquarters c/o FAO of the UNO, Rome 1989. 87 pp. Soft bound.

In 1989 the IBPGR celebrated its fifteenth anniversary. The foundation of this organization 15 years ago marked the profound realization by scientists of the loss of genetic diversity – the so-called genetic erosion. During the first 10 years of its existence IBPGR focused on collecting threatened germ plasmas and establishing facilities for long-term conservation. Since 1986, however, the focus has changed from this more generalized collecting to more selective missions with greater emphasis on wider gene pools, and to increased support for research. The present yearbook is a proud presentation of these activities. It provides not only detailed information on the board of trustees (chairman: W. J. Peacock of the Australian CSIRO), the IBPGR staff, publications, administration, research programs, species covered, and the specific scope of collection, field and training programs, but also on its financial base. The largest contributors are Japan, Great Britain, USA, Canada, Sweden, Switzerland, The Netherlands and West Germany. Included is a most useful list of the abbreviations used in the world-wide network of international agricultural research centers.

H. F. Linskens, Nijmegen

**Babiuk, L. A.; Phillips, J. P. (eds.): Animal Biotechnology.** Comprehensive Biotechnology, First Supplement, 1st Edn. Oxford New York Beijing: Pergamon Press 1989. 260 pp., 53 figs., (2 in color), 18 tabs. Hard bound \$ 95.00.

Throughout the history of agriculture as a science, animal producers have attempted to utilize various approaches for animal improvement. With the present book scientists are aided in their utilization of an integrated biotechnological strategy for agricultural improvement so that significant progress in agricultural productivity can be promoted. Animal biotechnology is interpreted here, in a general sense, to cover all aspects of technology applied to the biology of livestock improvement. That means this multi-authored publication tries to relate rather diverse approaches such as basic research in the fields of genetic engineering and manipulation of reproduction and growth, applications of biotechnological principles and techniques to veterinary medicine, genetic selection of superior strains in producing animals, as well as questions of the economic value of all possible approaches. The reader does not only acquire information about the possible applications of biotechnology, but he also obtains a general view on a great number of recently developed methods in this field.

The topics covered by the nine chapters in the present book center on those areas currently of interest for further biotechnological research: utilization of synthetic peptides, applications of monoclonal antibodies (MAbs), recombinant vaccines and cytokines, nucleic acid hybridization for infection diagnosis and genotypic analysis, sex determination, and micromanipulation of embryos including gene transfer.

Of great interest with respect to the utilization of peptides is one of the major pathogens of domestic animals, the foot-and-mouth disease virus. Because of certain important benefits of a peptide vaccine over currently available vaccines, further prospects for a commercially viable peptide vaccine are discussed in Chap. I.

The contributions of MAbs to animal health, e.g., in the therapy of neonatal diarrhoea, diagnosis and vaccine development in parasitic and infectious diseases are presented in Chap. II. The author of this chapter also gives an account of another research field in which hormone-specific MAbs are used for the immunomodulation of various physiological functions,

e.g., reproduction and growth. This reviewer states the presence of some overlapping with the immunomodulation of growth discussed in the third section of Chap. I and is of the opinion that the immunoregulation of growth is described too simply in Chap. I. Furthermore, he finds it confusing for the reader that "Sm" is used instead of "SRIF" as an abbreviation for somatostatin.

In two chapters the potential advantages of recombinant DNA technology in the production of various vaccines and immunomodulators, like interferons, interleukins and tumor necrosis factor, are described. In addition, different modern recombinant DNA techniques (nucleic acid hybridization; polymerase chain reaction) are compared with respect to their use in genome analysis, e.g., in the diagnosis of microbial infections and genetic disorders.

The tremendous progress that has been made in embryo manipulation and gene transfer is presented in three chapters. The reader is given an extensive review over such methods as the in vitro and in vivo cultivation of embryos, the splitting of embryos or separation of single blastomeres, the production of chimaeras by combining embryonic cells of different origins, nuclear transplantation, cryoconservation, X- and Y-bearing sperm separation, embryonic sex determination, and gene transfer with the help of pronucleus microinjection.

The represented results of using biotechnology in animal production and veterinary medicine can only be model examples. Because of the rapid developments occurring in this field and the period of 2 years between the copy deadline of the book and its publication, it cannot contain the very latest knowledge. Nevertheless, this book will be useful, especially to those who deal with agriculturally related sciences and veterinary medicine.

B. Evers, Rostock

**Jennings, D. L.: Raspberries and Blackberries: Their Breeding, Diseases and Growth.** London: Academic Press 1988. 230 pp., 37 figs., 11 tabs. Hard bound.

The genus *Rubus* is one of the most diverse and tricky-to-classify genera in the plant kingdom. Red raspberries belong to the subgenus *Idaeobatus*, whose species can be distinguished by the ability of the mature fruits to separate from the receptacle. The wild species can be found in temperate regions around the world; in the Old World, however, domestication occurred more than 2,000 years ago. The book under review concentrates on raspberry cultivation in Great Britain and Europe, as considerable breeding has been done in both places and at the Max-Planck-Institute. While higher yields and prime-cane fruiting are important breeding goals, attempts have been made to adapt the plants to warm climates: even Siberian and tropical species have adapted.

True blackberries belong to the species *Rubus fruticosus* and *R. caesius*, of which there are many thousands of forms and cultivars. These are augmented by the large number of new species discovered in North and South America. All are treated in great detail. The greater part of the book is devoted to diseases caused by fungi, bacteria, viruses and mycoplasma-like organisms, and genetic disorders caused by pests and nematodes. The growth cycle, anatomy and morphology of branches, flowers, fruits, pyrenes and seeds are described. The origins of recently released cultivars of raspberries, blackberries and *Rubus* hybrids, and a gene list of *Rubus*, are given in the appendices.

This book gives a fine overview of the work already done and that to be done with *Rubus* and successfully follows up Focke's fundamental monograph of 1910–1914.

H. F. Linskens, Nijmegen