

Weising, K., Nybom, H., Wolf, K., Kahl, G.: **DNA Fingerprinting in Plants. Principles, Methods and Applications**, 2nd Edition. - CRC Press, Taylor & Francis Group, Boca Raton 2005. 444 pp. GBP 58.99. ISBN 0-8493-1488-7.

This handy format book is concisely written by team of experienced plant molecular biologists. It suitably combines textbook and laboratory protocol manual into one book structured into 9 chapters and 4 appendixes. The reader is guided through theory towards practical use of DNA fingerprinting techniques. With very rapid progress in molecular biology field it is difficult to predict how will look marker technology in ten years, especially having in mind rapid progress in model and also crop plant genome sequencing, which surely will lead into new generation of gene-based markers, but authors have succeeded in providing solid overview of current state of art.

In the first chapter dense but reasonably detailed information are provided on repetitive DNA as a source of variation in eukaryotic genomes. In just 19 pages are explained genome dominating tandem-repetitive DNA elements such as mini- and microsatellites, together with transposable elements. In the second chapter authors describe the methods of detecting DNA variation by molecular markers. Starting from traditional but still used systems such as proteins, isozymes and RFLP analysis, the emphasis is put onto today widely used PCR based marker technologies, where exhausting list with dense description is given from RAPD, through microsatellite, inter-repeat PCR, AFLP applications till very modern SNPs. Since ten years ago, the average plant molecular laboratory employed RAPD and RFLP analysis being now widely substituted by microsatellite and AFLP, while avantgarde use single-nucleotide polymorphism (SNPs) and DNA chips. It is reasonable to assume that SNPs become routine markers in near future.

In the third chapter, very brief informative but not boring overview is provided about necessary laboratory equipment and set up. The major attention is given on 120 pages to complete methodologies, starting from DNA isolation and basic molecular techniques to detailed user

friendly and ready protocols for generation and use of PCR based markers, previously described in principles of chapter 2. The next chapter five continues with one of the most important issues of molecular marker data evaluation, where again thorough details are provided. Several commonly used approaches are described and inevitable problems and pitfalls are appropriately discussed.

In chapter 6 the reader is introduced on 42 pages to various applications of DNA fingerprinting in plant sciences. Examples of genotype identification, genetic diversity studies, plant taxonomy and systematics and finally phylogeography are given. Chapter 7 is likely due to limited book space condensed into just 12 pages where linkage analysis and genetic maps are very briefly mentioned. This chapter would deserve more space, especially practically very important topic of marker-assisted selection. In chapter 8 a comparison of which marker for what purpose is given. Last chapter 9 provides authors view into near future of marker technologies – SNIps and DNA/RNA chips. Valuable information provide all four appendixes. The first one gives list of DNA isolation by species with appropriate references, the second provides molecular biology newcomers with list of important commercial companies, the very useful is appendix 3 with computer programs links and finally appendix 4 supply readers with web pages of further interest.

High information content culminates by 1623 keys up-to-date references appropriately mentioned in entire text.

The concise and focused topic of molecular marker applications in plant sciences target this information smooth-flow and reader friendly book for the general interest of whole range of plant biologist from students till experienced researchers and finally also breeders.

P. SMÝKAL (Šumperk)

Kang, M.S. (ed.): **Genetic and Production Innovations in Field Crop Technology: New Developments in Theory and Practice**. - Food Products Press, an Imprint of the Haworth Press, Binghamton 2005. 384 pp. ISBN 1-56022-122-4. Co-published as Journal of Crop Improvement. Vol. 14, No. 1/2, 2005.

During the last decades, the number of scientific publications devoted to crop improvement and production considerably decreased as a consequence of relative food surplus in the developed countries. The sufficient food availability restricted public investments into crop research although the starvation of human population on

the Earth has by far not been eliminated. Hence, any publication devoted to crop studies is to be welcome.

The content of the book is divided into 13 contributions. From the total of 35 authors, the following countries are represented: USA (10 authors), Canada (6), France (6) Argentina (4), Australia (1), Brazil (1),

Colombia (1), India (1), Japan (1), Mexico (1), Poland (1), PR China (1) and Vietnam (1). Furthermore, two pages are devoted to the description of the editor's scientific career. In the preface, the editor himself characterized the content of each of the individual contributions. Finally, a detailed index terminates the publication.

In the first contribution, L.T. Evans (CSIRO, Australia) briefly emphasizes the necessity to further enhance plant breeding efforts by both conventional and biotechnological procedures. Similarly, D.N. Duvick (Iowa State University, USA) in the second paper analyses crop breeding in the 21st century. He also presents his optimistic view that "the current tripartite division of responsibilities will prevail: private sector, public sector, and participatory (*i.e.* farmer-breeder partnership)".

However, the subsequent contributions do not represent a comprehensive treatise of the topics presented in the title. It is not clear why just the described innovations and crops have been selected for the inclusion into the book. Maize, sunflower, wheat and especially soybean are dealt in detail. The book also

includes a thorough study on cassava and rubber. On the other hand, other important crops such as sugar cane, beet, potato or barley are absent totally.

Some papers are devoted to genetic diversity, breeding, genotype and environment interaction or marker-based selection. My attention was attracted by a very competent analysis of the contribution entitled "Physiological determinants of crop growth and yield in maize, sunflower and soybean: their application to crop management, modelling and breeding" comprising 50 pages. Nevertheless, among the production innovations I would also expect *e.g.* remote sensing, precision agriculture or agroforestry.

In general, the book represents an important sign of a revitalization of research interest on crop breeding, physiology and production. I would not recommend it to those researchers and/or students who expect to gain efficiently a general overview of the topics presented by the book's title. But it could be effectively used by those interested in either crop species included in the individual contributions or in some special procedures of crop breeding, production and physiology.

L. NÁTR (*Praha*)

Darby, I.A., Hewitson, T.D. (ed.): ***In Situ Hybridization Protocols***. - Humana Press, Totowa 2006. 269 pp. ISBN 1-58829-402-1

In situ hybridization is already 25 years known method, which allows to detect specific RNA and DNA sequences at the cellular level within tissue sections. The third edition of this book focuses on tissue and cell *in situ* hybridization.

The book is divided into 19 chapters written by prominent authorities on particular fields. Chapters are independent and self supporting, describing in detail techniques for preparation, detection and tissue hybridization. Nonradioactive labelling methods and amplification techniques have been improved and represent a big advantage in *in situ* hybridization. Among the new developed techniques described are peptide nucleic acid (PNA) probes for plant *in situ* hybridization, viral diagnostic, cell proliferation detection and

quantitation of *in situ* hybridization. Derivative techniques such as the use of PNA probes, identification of transplanted cells, histones, nick end labelling for apoptosis and plant *in situ* hybridization are also included. Further presented techniques are for expanded cell culture, expanded embryology-developmental gene detection and tissue microarrays. Every chapter consists of short summary, introduction to the specific technique, necessary material, detailed laboratory work flow, useful tips for successful performance of experiments and references.

The book is written with a broad readership in mind. It provides information for all researchers to set up this technique in the laboratory, as well as to update the recent protocols, which are already in use.

H. PLCHOVÁ (*Praha*)