

LINSKENS, H. F., JACKSON, J. F. (ed.): NUCLEAR MAGNETIC RESONANCE. — Springer—Verlag, Berlin—Heidelberg—New York—Tokyo 1986. XII + 196 pp. DM 139.00.
 LINSKENS, H. F., JACKSON, J. F. (ed.): GAS CHROMATOGRAPHY/MASS SPECTROMETRY. — Springer-Verlag, Berlin—Heidelberg—New York—Tokyo 1986. XVI + 304 pp. DM 169.00.

The (certainly welcome) new series of the well known manual "Modern Methods of Plant Analysis" is produced with respect to the appearance or increased use of groups of analytical methods in plant biochemistry and physiology.

A special rather tiny volume is dedicated to each group; the volumes appear as soon as they are prepared, without any exact sequence or relationship between individual types of procedures.

Two volumes of this series appeared more or less at the same time: Vol. 2 on nuclear magnetic resonance, and Vol. 3 on gas chromatography with mass spectrometry.

Nuclear magnetic resonance is used nowadays in plant studies for solving a series of problems. Very important are the ^{13}C metabolic studies (T. J. Simpson): the NMR spectra provide information on the origin of carbon skeletons of biosynthesized products and metabolites, and ^{13}C is often used for this purpose in combination with ^2H , ^{15}N and ^{18}O . ^{31}P -NMR is used successfully to measure concentrations of free ATP, ADP and free energy for the $\text{ATP} \rightarrow \text{ADP} + \text{P}_i + \text{H}^+$ hydrolysis in plant tissues (J. K. M. Roberts). NMR spectroscopy may be also used to follow deuterium fate in fungi (C. Abell), to analyze DNA structure (P. Bendel), and to determine intracellular pH — easily in cytosol and vacuoles, with complications in chloroplasts and mitochondria (J. K. M. Roberts). Special utilizations involve measurements of chloroplast orientation in leaves by means of ^1H -NMR spectroscopy (D. C. McCain), rubber content determination by means of ^{13}C -NMR determination (J. Visintainer and R. C. Hirst), and pollen quality determination (C. Kerhoas and C. Dumas).

Twelve chapters of Vol. 3 deal with the use of gas chromatography combined with mass spectrometry for the analysis of various groups of growth substances, pectic polysaccharides, cyclic nucleotides, unsaturated and glycolipid fatty acids, phospholipids, sterols, terpenoids, esters of indol-3-ylic acid and myo-inositol, volatile flavour components, and tobacco constituents (among others carotenoids). They were written by 17 authors from Australia, Finland, France, the F.R.G., Japan, Switzerland, the U.K., and the U.S.A. Materials are lower and higher plants and their products.

The series is being edited by experienced editors, which is reflected in the quality of texts. Nevertheless, the editors did not succeed in unifying the manuscripts (e.g., only short references in the paper of H. Kodama) and using consistently the SI units (ppm as a measure of the β -constant). The volumes supplemented by good subject indexes (including also scientific names of plants) belong certainly in every plant physiological, biochemical, agricultural and foodstuff laboratory.

Z. ŠESTÁK (Praha)

RASMUSSEN, D. C. (ed.): BARLEY. — ASA, CSSA, SSSA, Madison 1985. 522 pp. US \$ 40.00.

Number 26 of the series Agronomy has been devoted to barley, "the world's fourth most important cereal crop, after wheat, maize and rice". Thirty contributions from the U.S.A. (23), Canada (4), Sweden (1), England (1) and Denmark (1) headed by the Editor put together a reasonable amount of information on barley. The following topics are dealt with in 16 contributions: 1. Adaptation and distribution; 2. Origin, taxonomy, and related species; 3. Germplasm resources; 4. Morphology and anatomy; 5. Physiology and development; 6. Cytogenetics; 7. Wide crosses in *Hordeum*; 8. Genetics; 9. Barley breeding; 10. The diseases; 11. Breeding for pest resistance; 12. Insects and related pests; 13. Malting and brewing quality; 14. Nutritional quality; 15. Cultural practices; 16. Production and marketing in the United States and Canada.

In my opinion, really any topic concerning barley can be found in the book reviewed. The particular chapters written by the particular authors do not correspond to a uniform structure. I do not find it as an handicap. But the reader should be aware of it. For example the comprehensive chapter on morphology and anatomy (pp. 73—101) has only 26 references, while that on physiology and development (pp. 103—125) covers more fully the appropriate literature by citing 164 references.

The most serious shortcoming of the volume should be seen in what has been stated in the Foreword, namely: "It emphasizes barley in North America, specifically the USA and Canada". If such a limitation were expressed in a subtitle, it would explain the fact that in some chapters an absolute majority of references contain only literature from the English-speaking countries

although *e.g.* "the largest production was in the USSR, with 39.9 % of the world hectareage and 30.7 % of the world production" (p. 5).

The book covers quite well the topics related to all the aspects of genetics and breeding. The physiology contains a fine summary which should be taken as an introduction to more detailed studies. The chapter on cultural practices is oriented to the readers in North America or to those interested in experience with barley cultivation in this region. The same is valid to the problems on production and marketing.

The book contains a well arranged subject index.

In general, any well edited publication containing recent information on biology of crops should be welcome. Although in some chapters restricted to the limited geographical region the book offers a lot of information on barley. It may be considered as a valuable reference book for readers looking for general information as well as for those especially interested in most of the topics indicated in the chapter titles.

L. NÁTR (*Praha*)

HAUCK, R. D., WEAVER, R. W. (ed.): FIELD MEASUREMENT OF DINITROGEN FIXATION AND DENITRIFICATION. — SSSA Special Publ., No. 18. Madison 1986. 115 pp. US \$ 18.00.

Papers included in the book have resulted from a symposium held by the SSSA in Washington, August 1983, which was devoted to an accurate measurement of the gain and loss of nitrogen by plants and soil under field conditions.

A half of 8 articles presented here are focussed on the acetylene-ethylene and in the main on the ^{15}N -isotope dilution techniques for measurement of biological N_2 fixation. Advantages, limitations and the main sources of error (*e.g.* $^{15}\text{N}/^{14}\text{N}$ isotope discrimination, level of ^{15}N -labelled fertilizer applied, selection of a most suitable control nonfixing plants) have been evaluated in detail.

The second part of the book is devoted to the field measurement of denitrification. After an overview of indirect and direct methods of determination of the key biological denitrification products, the three following chapters discuss the most attractive direct method — acetylene blockage technique and outline potential problems connected with the use of this method (*e.g.* short-term assays have been recommended, field sample locations should be changed frequently, C_2H_2 should not be used in strongly reducing environments, C_2H_2 persistence in the soil should be considered).

In consideration of the useful information on the topics mentioned above the reviewer recommends the book as an excellent methodical brochure.

V. ŠKRDLETA (*Praha*)

HOHN, B., DENNIS, E. S. (ed.): GENETIC FLUX IN PLANTS. — Springer Verlag, Wien—New York 1985. 253 pp. Hard cover. DM 98.—; öS 690.—.

This book informs on the rapidly growing body of knowledge on the flux of genetic material in higher plants. The movement of genetic information is not restricted to transposable elements but exchanges also occur between DNA of the nuclei, chloroplasts and mitochondria. In this volume organized into three sections, the leading experts discuss and assess the many aspects of current research into changes that occur in the genetic material in plants. Section 1: "Movement of genetic information from the environment to the plant" treats the relations between plants and viruses and the DNA flux across genetic barriers, mainly the molecular genetics of the *Agrobacterium* crown gall phenomenon. Section 2: "Movements of genetic information between the plant organelles" focusses mainly on the movement of genetic material between the chloroplasts and mitochondria, chloroplasts and nuclei and mitochondria and nuclei. Section 3: "Movement of genetic information within plant organelles" presents articles on the supernumary DNA in plant mitochondria, repeated sequences and genom change, sequence variation and stress the activation of maize controlling elements and on somaclonal variation in tissue culture.

The volume was published in the series: Plant Gene Research Basic Knowledge and Application. Serving as both a review of fundamental theory and a summary of recent research, it will be a valuable reference to researchers in molecular biology and plant sciences.

T. GICHNER (*Praha*)