# Book Reviews

**Böhme, H.; Müller-Stoll, W.R.; Müntz, K.; Rieger, R.; Rieth, A.; Sagromsky, H.; Stubbe, H. (eds.): Die Kulturpflanze.** Mitteilungen aus dem Zentralinstitut für Genetik und Kulturpflanzenforschung Gatersleben der Akademie von Wissenschaften der DDR, Band XXVI.
DDR-Berlin: Akademie-Verlag 1978. 422 pp., 66 figs., 84 tabs., 3 plates. Hard bound DM 78,–
This annual periodical reflects the scientific activity of the most important breeding institute of the German Democratic Republic. In addition to reviews and original articles it presents a summary of the institute's activity in the field of molecular and cellular genetics, as well as in the areas of molecular, genetical and taxonomical basis of plant production.

Excellent review articles discuss methodological requirements and the application of cell genetics to plant breeding. Somatic hybridization experiments and mutant isolation via cell culture are extensively reviewed and a survey is given on the present status of the application of culture techniques to important crop plants. The second review (unfortunately the only article written in English), is concerned with the function of the fleshy and reserve material which accumulates in the fruit pericarp of crop legumes. On the basis of available literature and results from their own well-documented investigations it is shown that optimally coordinating the development of pericarp and seeds in fruits of grain legumes will be of great importance in producing increased yields. Pericarps not only protect against mechanical damage of the sensitive developing embryo and maintain a favourable microclimate but they also control the transport streams supplying nutrients to the embryos. Pericarp metabolism is controlled by the seeds. Temporary physiological processes in the pericarp can buffer seed development against external stress.

The 18 primary articles indicate the wide interests of the staff of the institute. Crucial papers cover the Gatersleben collections of cereals and pulses, of which protein and lysin content as well as the resistance against stripe rust are described. The better the collections are characterized, the higher value they have for breeding programs. Conspicuous is the number of papers which are concerned with the pollination ecology of corn species, a fact which underlines the increasing consciousness of the importance of adapted pollen transfer in breeding systems. Two physiological papers treat $CO_2$ compensation concentration in C3 and C4 plants. Other crops which had the attention of the Gatersleben's scientists are onion, *Vicia faba* and *Poa pratensis*. The jewel of this volume is a survey of the 1976-1977 literature on the archeological remains of cultivated plants in which 101 references are briefly discussed. The volume is rounded off by a 1975-1977 literature review of papers on taxonomy and evolution of cultivated plants. This is to be continued regularly.

The volume is once more a fine picture of a broad-minded, progressive and successful breeding institute.

H.F. Linskens, Nijmegen

**Ellenberg, H.: Vegetation Mitteleuropas mit den Alpen in ökologischer Sicht.**
2. Ed. Stuttgart: Ulmer 1978. 981 pp., 499 figs., 130 tabs. Hard bound DM 120,–
This volume covers not only the vegetation of Germany, Switzerland, Austria, Denmark but also that from most parts of Czechoslovakia and Poland, including some adjacent regions. An introduction emphasizing anthropogenic influences is followed by chapters on forests, on aquatic, littoral, peatland and alpine vegetation and on pastures, meadows and other anthropogenic plant communities. Many tables and diagrams provide information on species composition with syntaxonomic characterization, structure, microclimate, soil conditions and other attributes of the plant communities. Ecological groups comprising species with similar site preferences and the differentiated indicator values of the species for various factors (e.g., pH, available nitrogen, moisture conditions) are used to accentuate connections between vegetation and abiotic environments. Highly informative photographs characterize the habitate of the vegetation concerned. Compared with the first edition, the number of ecophysiologic considerations and data has been highly augmented. Paragraphs on industrial influences, successions on fallow lands (old fields), forest edge vegetation and other topics have been added. The number of pages have not been greatly increased owing to reductions and partial omissions in other topics. The text is written in an impressive clear style. It explains extremely well fundamental principles and causal correlations within the vegetational pattern of Central Europe, with special consideration given to the works of the author, and also reviews publications of many other scientists.

R. Knapp, Giessen

**Russell, G.E.: Plant Breeding for Pest and Disease Resistance.** London-Boston: Butterworths 1978. 485 pp., 47 figs., 16 tabs. Hard bound £ 25.000
The genetic interrelations between crop plants and their diseases and pests had gained considerable attention during the last decade. A number of books and symposium reports have been published, generally with the ambition to explain past failures in breeding for resistance, but also to propose new ones by overemphasizing certain strategies.

G.E. Russell has a balanced message. By an overwhelming exemplifcation covering parasitic fungi, bacteria, mycoplasmas, Rickettsia-like organisms, viruses, as well as different kinds of animal pests and parasitic weeds, he demonstrates that no type of genetic resistance or tolerance created in nature should be neglected. There is a general tendency that polygenic, incomplete defence systems are more reliable because they demand a correspondingly complex counteradaptation of the parasite at lower selection pressure. There are, however, too many cases of successful uses of mono- or oligogenic resistance to disregard this easier way of approach in breeding.

Russell is completely within his rights to be impressed by the potential of breeding for resistance to control diseases and pests either as an independent method or in combination with management procedures, biological control systems or chemical treatments. Incomplete or deployed resistance is often effective enough and less selective on the parasite. Genes for resistance can often be found even within the gene pool of the species if it is only carefully enough explored. 'Break-downs' of resistance can generally be rapidly overcome. He founds them more easily occurring in connection with fungi than with other damage producers.

Russell's deposition of his rich material appears to hinder him from making any more thorough conclusion from this different pattern for 'break-downs'. Risks can better be taken where there exists an advanced cooperation programme between plant pathologists and breeders than in developing countries. Chances for

'break-downs' have not only to do with genic complexity of the involved host resistance but also with characteristics of the parasite, such as population size, reproduction speed, genomic complexity and degree of ploidy, mutation frequency and tolerance, recombination potential, degree of specialization, and selection pressure, including nonpreferential reactions among animal pests.

The abundant information accumulated in the book makes it heavy and not too exciting to read. There is a tendency towards numerous repetitions which adds to this reaction. Instead of being speculative and provoking, it has become a solid book for rereading and references. J. MacKey, Uppsala

**Stugren, B.: Grundlagen der Allgemeinen Ökologie.** 3. ed.
Jena: VEB Gustav Fischer 1978. 312 pp., 151 figs., 8 tabs. Hard bound DDR 25,– M

This third edition of Stugren's book differs considerably from the second edition of 1974. Some chapters have been added whereas others have been largely rewritten; the book contains nearly 100 more pages. Important changes also include the incorporation of more botanical aspects in the text. The book deals with an impressive array of ecological topics and problems. It has attempted to cover this extensive field in a logical sequence: terminology and definitions, the biosphere, biotope and biocenosis, ecosystem, biocenotic structure of the ecosystem, trophodynamic structure, energetics, biochemical structure, temporal aspects and population aspects. The latter two chapters stand somewhat apart from the intended structure.

Judged on the rapid sequence of new editions (the first edition appeared in 1972) the book seems to enjoy quite a lot of interest. And although it certainly has value, I do not like it as a basic ecological text. To my tastes the book contains far too many 'uncooked' details and tries to give an enormous amount of terms, definitions, classifications, divisions and subdivisions which often have only little scientific relevance. The result is that here and there the text gives the impression of a sort of catalogue of terms and jargon. Because of this, and the incorporation of too many incidental facts, the book reads rather jerkily.

Moreover, quite a number of illustrations are unsatisfactory: some are too simple and thus lose their value (e.g. Figs. 2, 3, 17, 23, 60, 105) while some others are superfluous (e.g. 15, 144 to list a few).

More serious are a number of unintelligible statements or obvious mistakes, sometimes again resulting from oversimplification. Such statements as 'the development of the plant depends mainly on the chemical element which has the lowest concentration in the plant's environment' (p. 23), 'from the view point of botanists, animals are not part of the mineral cycling' (p. 70-71), and 'during succession biomass ever increases' (p. 224), are simply not true. Page 60 and 62 contain completely mistaken statements on the Braun-Blanquet method; the terms life form and growth form have been confused (p. 56); in plant ecology 'niche' is not just understood in a spatial sense (p. 141); and the observation that 'during the past thousand years climate has hardly changed in central Europe, but biocenoses did change' (p. 227) certainly cannot be made without any further references or facts.

Though the number of topics discussed remains impressive, frequently the discussion does not touch on the most relevant literature of the last ten years, and some 'hot topics' in ecology remain unmentioned.

All this, and quite a number of other details, do not make me a user of this book, although tastes may differ, and the book is cheap and technically well-produced. M.J.A. Werger, Nijmegen

**Müntzing, A.: Triticale, Results and Problems. Advances in Plant Breeding, Vol. 10.**
Berlin: Parey 1979. 103 pp., 15 figs., 2 tabs. Soft bound DM 58,–

Triticale, the artificial hybrid between wheat and rye, is becoming the first cereal crop to be produced purely scientifically from all the other cereals of natural occurrence. Superiority of triticale to wheat and rye was theoretically predicted, and the interdisciplinary coordination of breeders, geneticists, pathologists, cereal chemists, nutritionists, and others has led to the improvement of raw triticale materials to advanced forms which are now being successfully cultivated, though in limited areas.

It has been hoped for some time that a book would be written covering our acquired knowledge of triticale. Because of new developments in breeding techniques and the potentiality of triticale to save man from hunger it is most advantageous to have a concise picture of triticale's past, present and future. Prof. Arne Müntzing is the most eligible person to write such a book. His long career with triticale started as early as 1930 and his vast knowledge of cereals encompass theoretical as well as practical problems. In fact, this small book written by him is not only timely but perfectly fulfills our requirements.

In this book triticale of different ploidy levels, i.e., tetra-, hexa-, octo- and decaploid, is discussed although of course, the largest space is divided between hexaploid and octoploid triticale. The history of research with hexa- and octoploid triticale is properly documented. This was urgently needed because already a half century has passed since triticale work was initiated. The present status of triticale breeding is given with respect to various breeding schemes employed, successful cases of cultivation and problems on sterility, cytological irregularities and seed shrivelling. Informations on such agronomic traits as disease resistance and nutritional value as food, feed or forage, as well as baking quality, are also compiled. Finally, present problems in relation to the future possibilities of this crop are presented together with suggestions as to how to solve them. A concise summary added to the end helps readers with little time to grasp the entire picture of triticale described in the book.

This book is recommended to all the researchers, students and general public who are interested in triticale.

K. Tsunewaki, Kyoto