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Book reviews

Bajaj, Y. P. S. (ed.): Plant Protoplasts and Genetic Engineering. 1. Biotechnology in Agriculture and Forestry, Vol. 8. Berlin Heidelberg New York: Springer, 1989. 444 pp., 152 figs. Hard cover DM 378.–.

Bajaj, Y. P. S. (ed.): Plant Protoplasts and Genetic Engineering. 2. Biotechnology in Agriculture and Forestry, Vol. 9. Berlin Heidelberg New York: Springer, 1989. 498 pp., 141 figs. Hard cover DM 398.–.

There is no doubt that genetic engineering through DNA recombinants, transformation, in vitro culture of isolated protoplasts and the regeneration of whole plants have changed the arsenal of modern methods in agriculture and forestry. Consequently, a compilation of the presently used methods by experts has to be welcomed. In two volumes, Y. P. S. Bajaj, a former professor of tissue culture at the Punjab Agricultural University, has compiled short, but well documented articles from 110 experts, each of whom present their specific expertise. In the first volume, the articles are grouped into units on "Isolation culture and preservation of protoplasts" and "Regeneration of plants from protoplasts", whereas in the second volume, new technique are covered: microinjection, electrofusion, uptake and integration of nuclei, chromosomes, mitochondria, chloroplasts, exogenous DNA, virus, and the firefly luciferase gene.

The special problems of transformation in potato, cotton, *Brassica, Populus, Vinca, Hyoscyamus* and *Nicotiana* are treated in separate chapters. I found the overview of the isolation techniques for vacuoles most interesting, although there isn't a direct application of this technique in technology yet. The special problems of regeneration in rice, potato, cabbage, chicory, lettuce, butterbur, orchids, forest trees, *Citrus, Linum, Glycine* and *Salpiglossis* are described. Routine methods for somatic hybridization are summarized for tomato, rice × soybean, *Lycopersicon* and *Petunia* hybrids, *Hyoscyamus, Nicotiana, Medicago, Moricandia, Brassica* and *Trifolium*.

It is evident that the genetic engineering of crops has made great progress during the past 5 years. Consequently, the way for developing new genotypes for specific plant breeding programs is now available. Both volumes are highly instructive and will be useful handbooks for any laboratory involved in modern breeding methods using cell genetics in combination with classical breeding methods, although a certain overlap with I.K. Vasil's handbook of 1984 is recognizable. Unfortunately, the rapid progress being made in this field will also make these valuable technique books obsolete in a short time.

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Ivanov, A. I.: Alfalfa. Russian Translation Series, Vol. 63. Rotterdam: Balkema 1988, 318 pp., 43 figs., 67 tabs. Hard bound DFl 100.–.

In this translation series, which is of considerable value and merit as it provides access to Russian literature that would otherwise be nearly inaccessable, alfalfa, a crop which has been under cultivation for some 7,000 years, receives adequate treatment. This perennial species of *Medicago* belongs to the subgenus *Falcago* – of which the three gene centers identified by Vavilov and Zhukovskii are directly associated with the Soviet Union. The general course of evolution of the genus *Medicago* proceeded from diploid to tetraploid and hexaploid species by means of polyploidy and hybridization.

The monograph under review was originally published in Moscow in 1980 and is based on many years of field studies and evaluation of published data: the evolution, introduction and breeding of alfalfa are discussed. Centers of localization of important breeding characters are pinpointed, and centers of introgressive hybridization identified in the Central Asia gene center are described. Ecobiological characteristics of specimens, the conservation of endemic species and the characteristics of introduced material are equally treated. The central part of the book is devoted to the breeding evaluation of the world collection of alfalfa. On each page one feels the pride of the All-Union Institute of Plant Industry (VIR) on the beneficial use of alfalfa in breeding work. And indeed, along with the USA with 11 million and Argentina with nearly 9 million ha of cropped alfalfa, the Soviet Union with its more than 5 million ha is one of the most important countries conducting alfalfa breeding research. Unfortunately, the book misses a subject index.

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Bajaj, Y. P. S. (ed.): Trees II. Biotechnology in Agriculture and Forestry, Vol. 5. Berlin Heidelberg New York: Springer, 1988. XVIII, 622 pp., 224 figs., 143 tabs. Hard bound DM 448.–.

The volume under review is a continuation of the earlier (1986) volume and is designed for use as a reference and textbook for scientists, teachers and students in forestry, horticulture, botany and tissue culture. It is arranged in 31 chapters and presents detailed reports on in vitro approaches to be used with fruit, forest, nut and ornamental plants, such as avocado, crabapple, quince, pistachio, walnut, hazel, pineapple, date, oil palm, cacao, rubber, maple, sweetgum, poplars, birches, Chinese tallow, willows, oaks, paper mulberry, rhododendrons, Scotch and Calabrian pine, Douglas fir, redwood, ginkgo, cycads, and some Australian and Indian ornamentals. In some cases stem-tip culture, callus culture, rooting studies, and shoot proliferations are also described in great detail. No doubt this compilation will help to continue the breakthrough in the mass production of test tube plants. Researchers are provided with detailed instructions on the composition of the most suitable media and optimal culture conditions. The extremely high price of the volume is to be deplored. It could have been produced at a much lower cost if a prudent editor had discarded, for example, the marginal, incidental information on diseases, pruning, conventional practices of breeding and propagation, world production data, areas under cultivation, composition of plant products, NMR spectra, yield, and microorganisms and insects affecting the full grown tree. Even worse, there are a large number of figures that are without informational value (e.g., on pages 54, 69, 84, 128, 141, 190, 193, 231, 249, 261, etc.) or are only decorative (e.g., on pages 14, 43, 100, 177, 204, 223, etc.). Thus the book could have been financially more attractive if much unnecessary data under the title of biotechnology had been left out and if many worthless figures had not been included.

By the way, Coryllus, I would call a shrub, and is pineapple really a tree?

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