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 Book Reviews
 

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Sneep, J., Hendriksen, A.J.T. (eds.): *Plant Breeding Perspectives* Wageningen: Center for Agricultural Publishing and Documentation, 1979. 460 pp., 88 figs., 13 colour plates, 48 tabs. Hand bound Hfl. 120,-.

Among the nations of the world which pursue scientifically-based plant breeding, the Netherlands have played an important role through their production of seeds and nursery material. It is therefore desirable that one of the leading firms of plant-breeding, one which has been in existence in the country for more than 100 years, have its centenary noticed both from near and afar. The 'Royal Breeding Plant and Seed Trade D.J. van der Have' celebrated its centenary in a special way by producing a 'fest-schrift'. J. Sneep, A.J.T. Hendriksen and O. Holbek, 3 scientists who are well-known in the field of plant-breeding, collectively edited a very special book 'Plant Breeding Perspectives'. Not only is the present situation of plant breeding discussed but a general outlook into applied science is also given which contributes essentially to the weal and woe of the world. It must be emphasized that the breeding of agricultural crops by the creation of more efficient and species-specialized methods cannot be reviewed well by one scientist. However, the three editors of this book have succeeded entirely in producing a comprehensive survey of plant breeding of the highest scientific value by compiling information from more than fifty breeding specialists throughout the world.

The material is divided into 10 chapters with chapter 4, 'Current Breeding Methods', as a central core. Here the editors first discuss general methods of breeding for vegetatively propagated auto-, and allogamic crops. Male sterility within sexual systems receives special attention. With this background the topics extend into the present state of plant breeding and the new approaches being developed for the breeding of useful plants.

Various plants are discussed by example. In potato the topics include the reduction in dihaploid level and the return to the tetraploid level as well as the still essential broadening of the genetic basis of potato breeding. Wheat and rice still are the center of attention among the autogamic small grains, particularly in view of the great importance of hybrids. This is also true in corn breeding where the production of haploids is possible. Sugar beet breeding is characterized by the combination of polyploids and hybrids. The breeding of sunflowers is based on the production of hybrid seeds as well as on open-pollinated varieties with respect to the possibility of cultivation under special climatic conditions.

Only in reading this 4th chapter does one get the impression of a scientific textbook on plant breeding; the speciality of this monograph is in its perspectives. In a subtle way the editors steer the attention of the reader to the facts that at present one should pay attention to in breeding in mondial dimensions. The first chapter discusses the food situation in developing and developed countries, with strong emphasis on the former. The collaboration of FAO experts is recognizable, so that the nutritional objectives for plant breeders receive a sound foundation. The 2nd and 3rd chapters treat scientific matters essential for a modern successful breeding program. The basic points of the physiological potential of crop production is discussed with the point of view that all land now under cultivation has to be used more productively before new regions can be taken into cultivation. The physiology of nitrogen fixation independent of plant development is described in detail. The 3rd chapter is devoted to crop genetic resources which have to be preserved by an international network of gene banks. The successful gene banks for rice and corn are described in detail, as well as the national and international organizations which take care of genetic resource maintenance.

In this way chapters 1 to 4 deliver the basis for efficient breed-

ing activity in our time. A look into the future is presented in the chapters on crop adaptation and resistance to pests and diseases (chapter 5, 6). It is quite significant that chapter 7, written by M.S. Swaminathan, presents the very difficult, but at the same time very important, subject of opportunities and problems in the developing world. The main problem is getting the highest yield and the best quality in an active and well organized extension service, preferably with demonstration plots in farmers' fields. In this context the allusion is remarkable that the culture of potatoes in some districts of developing countries should get more attention. In chapter 8 the reader is provided with information on new methods in breeding. Haploids, their production and breeding possibility receive special attention. The breeding of symbiotic nitrogen fixers and the application of tissue-culture in plant breeding stresses. The Ti-plasmid as a vector in genetic engineering is presented in great detail. Chapter 9 describes the abundant demand for the production of healthy seeds of high quality and demonstrates the mode of action that is necessary in order that the seeds can reach the farmer through efficient and reliable distribution channels. The legal regulations of some states are explained. The last chapter ties together the perspectives resulting from the facts described before. The results of the sound economic success of breeding can be guaranteed by a national food security system. It also includes international collaboration in plant breeding. The varying importance of different breeding methods in the future is explained by a scheme in which current breeding methods still play the most important role. In the developed countries breeding for production per man hours is most important. In the developing countries, on the other hand, a huge number of varieties based on the level of management is expected, the so-called cafeteria approach to crop breeding. Three-dimensional cropping, kitchen gardening and home fish gardening are examples. The maintenance of genetic diversity is mentioned as being generally valuable and extremely important.

This book, the result of five years of cooperation between editors and authors, has been worthwhile. Together they have produced a work which demonstrates how efficient breeding in the most important crops can be. It shows the directions and the possibilities of practical breeding for the next decade, always relative to the changing needs and conditions of our world. Anyone working in either private enterprise or in state-directed institutions of breeding will profit highly by reading this book. We hope also that it will be available in libraries and laboratories so that students interested in applied genetics can get as early as possible information on practical breeding. But also those who create preconditions for practical breeding should take it to their heart.

There is no book known to me which makes plant breeding perspectives so evident and shows so clearly how breeding is linked with the changing world and the struggle for well-being and peace.

In the preface, Prince Bernhard of the Netherlands cites Jonathan Swift, the author of *Gulliver's Travels*, who describes someone who is able to grow two ears where before only one ear grew as a blessing for mankind. Anyone who is concerned with breeding should read the final pages of the text which state: 'The population expansion means that, like Alice through the Looking Glass we have to run twice as fast to remain where we are. It is hence necessary to emphasize that unless an age of humanism, in which the highest priority in all developmental programmes is given to providing the minimum needs of every human being, is superimposed upon the age of science and technology, there can be no happy world. In working towards this goal, the plant breeder has an important part to play'.

J. Straub, Köln-Vogelsang