
Book Reviews

Christiansen, M. N.; Lewis, C. F. (eds): Breeding Plants for Less Favorable Environments. New York: Wiley-Interscience 1982. 459 pp. Hard bound £ 35,-.

The high productivity associated with modern crop production is the result of cultivars which have been selected for maximum production in favorable environments enhanced by applying high energy inputs such as irrigation, fertilizers, etc. Future increases in food and fiber production which are essential to adequately feed and clothe the constantly expanding world population must rely on our present, more favorable cropland but also on the unfavorable, marginal areas which are not a major contributing factor to crop production at the present time but must be intensively cropped to meet future demands. The development of cultivars which can maintain high production and quality when grown in these more adverse environments is vital and requires extensive knowledge concerning the extent and type of genetic variation among and within species for specific environmental factors. The available information about genetic variation is recent in origin, limited in scope and scattered throughout the literature, while considerable information concerning the general morphological and physiological aspects of plant responses to many environmental factors is available in many recent comprehensive reviews. This book which contains 14 chapters discusses the effect of various environmental factors (temperature, mineral element deficiency and toxicity, water stress, light quality and quantity, air pollutants, root atmosphere stress, disease and pest infestations) on plants in general and relates this information to the extent of genetic variation identified. In general, the organization is excellent with Chapter I defining the scope and seriousness of the environmental problem and the last 2 chapters outlining the potential germplasm resources available

and possible genetic engineering techniques which could be useful in quickly transferring some of the exotic germplasm resources into acceptable cultivars in agronomic and horticultural species. The intervening chapters deal with the effect of specific environmental factors on plants followed by an analysis of the extent of genetic variation present in various species and any other pertinent inheritance information which could be useful in a practical plant breeding program. As expected, the amount of genetic information available varies considerably depending on the species and environmental factor involved. The authors made a concerted effort to relate the morphological and physiological response associated with a specific environmental factor to the genetic aspects and in most chapters, were successful in attaining this stated goal. In most chapters, the amount of literature cited and its in-depth analysis in the text were most impressive.

This book is highly recommended for students and research scientists in all phases of agriculture. It represents not only a valuable reference and literature review to those scientists actively working in this area, but also emphasizes the fact that a new reality in crop production is emerging because of our increasingly scarce and expensive energy resources and, as a result, new approaches to plant breeding are necessary. Our traditional approach of artificially improving the environment and then developing a cultivar adapted to this improved environment must be radically modified. In the future, cultivars must be developed to produce well in a broad range of environments or genetic adaptability to the environment must be substituted for technological modification of the environment. Research scientists especially those in the developed countries who are actively involved in training students should recognize this new direction and alter their outlook, attitude and methods accordingly.

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