Plant Genetic Engineering

Edited by J.H. Dodds

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In view of the current explosion of interest in plant molecular biology, a book entitled 'plant genetic engineering' is likely to attract a potentially wide readership. The present volume is a collection of articles mainly concerned with reviewing technical advances and evaluating the impact that recombinant DNA techniques may have in plant improvement programmes. It is not a manual of laboratory methods such as appear in the IRL Press 'Practical Approach' series.

The first two chapters, which are rather brief and unspecific, consider the isolation, culture and fusion of plant protoplasts. More substantial is the subsequent chapter on the use of isolated organelles and sub-protoplasts in somatic fusion strategies, and this is followed by short but lucid introductions to the background and development of T_i-plasmid-based vectors and potential uses of viral vectors. The three final chapters deal with the actual applications of gene technology to plant systems, with specific reference in chapters 7 and 8 to ribulose-bisphosphate carboxylase and seed storage proteins respectively, and in chapter 9 to a more general cross-section of potential applications. The chapter on seed storage proteins is particularly comprehensive, running to 125 pages, and includes the only discussions in the book on the methods of cDNA cloning and sequencing, and gene expression studies. These sections would perhaps have been better placed earlier in the book, as would some of the important general introductory points stressing, for example, the large gaps in our knowledge of basic plant metabolism, which occur in chapters 7 and 9.

Organisation of material apart, this book collects together thoughtful, highly readable and generally well illustrated accounts of topics of much current interest. It is clearly impossible, in such a rapidly expanding field, to remain up to date, and topics such as the targetting of gene products to organelles and the use of anti-sense RNA are not covered. The book can, however, be recommended to advanced students, researchers, and especially teachers in this area by virtue of its clear presentation of the potentials of, and, equally importantly, the constraints relating to, the application of recombinant DNA techniques to crop plants.

R.A. Dixon

Genetic engineering is also used to modify plants. Specifically, some plant species have been developed which include their own pesticide which can protect them from animals and insects. In this way, scientists hope to be able to increase crop yields. However, this altering of genetic code in plants can lead to a resistance of certain insects to the pesticide. This may pose big problems to the agricultural system since if insects or other pests become resistant against toxins, they are harder to fight. Presentation on theme: "Plant Genetic Engineering"â€" Presentation transcript: 1 Plant Genetic Engineering. 2 Genetic Engineering The process of manipulating and transferring instructions carried by genes from one cell to another Why do scientists want to change gene instructions? to produce needed chemicals to carry out useful processes to give an organism desired characteristics Genetic engineering is the process of manipulating and transferring instructions encoded by genes from one cell to another. Genetic engineering, also called genetic modification or genetic manipulation, is the direct manipulation of an organism's genes using biotechnology. It is a set of technologies used to change the genetic makeup of cells, including the transfer of genes within and across species boundaries to produce improved or novel organisms. New DNA is obtained by either isolating and copying the genetic material of interest using recombinant DNA methods or by artificially synthesising the DNA. A construct is Genetic engineering is not bound by the limitations of traditional plant breeding. Genetic engineering physically removes the DNA from one organism and transfers the gene(s) for one or a few traits into another. Since crossing is not necessary, the 'sexual' barrier between species is overcome. Therefore, traits from any living organism can be transferred into a plant. This method is also more specific in that a single trait can be added to a plant.