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Plant Protoplasts and Genetic Engineering II

Edited by Y. P. S. Bajaj

With 141 Figures

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*Dedicated to my wife,
Professor Dr. Satinder Bajaj*

Preface

Genetic engineering through DNA recombinants and the in vitro manipulation of isolated protoplasts has recently attracted much attention in agricultural biotechnology, and has greatly advanced during the last 5 years. In an earlier book, *Plant Protoplasts and Genetic Engineering I*, methods for the isolation, fusion and culture of protoplasts were reviewed and the regeneration of complete plants from isolated protoplasts of rice, potato, soybean, linseed, cabbage, chicory, lettuce, butterbur, orchids, citrus and some other tree species, and interspecific and intergeneric somatic hybrids in *Lycopersicon*, *Petunia*, *Nicotiana*, *Solanum*, *Glycine*, *Citrus*, *Brassica*, *Medicago* and *Trifolium* spp. were discussed.

The present volume, *Plant Protoplasts and Genetic Engineering II*, deals with some of the newer techniques such as microinjections, electrofusion, flow cytometry, uptake and integration of DNA, nuclei, isolated chromosomes by plant protoplasts and the subsequent regeneration of transgenic plants. The literature on the DNA recombinants and genetic transformation, both *Agrobacterium*-mediated and direct gene transfer in agricultural crops and trees, such as poplars, is reviewed, and the uses of cytoplasts and miniprotoplasts in genetic manipulation are highlighted.

The recent studies on cereals and trees are of special significance. In the past genetic manipulation with these species was rather discouraging because of their inability to regenerate complete plants from isolated protoplasts. Now, due to technical advances, this hurdle has been removed and completely transformed plants of rice, maize and poplar have been obtained. This should pave the way, especially for wheat and forest trees. Genetic manipulation through the use of isolated protoplasts has far-reaching implications in agricultural and forest biotechnology, thus this book will be of particular interest to research scientists, teachers and advanced students of plant biotechnology, tissue culture, plant breeding and genetic engineering.

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