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Dutta Gupta, S., Ibaraki, Y. (ed.): **Plant Tissue Culture Engineering**. - Springer, Dordrecht 2006. 480 pp. EUR 149.80. ISBN 1-4020-3594-2.

This book is the sixth volume of the series "Focus on Biotechnology" edited by M. Hofman and J. Anzé.

In contrast to many previous books focused on basic methods and applications of plant tissue and cell cultures, this book combines plant science with engineering principles. This new direction is a prerequisite for development of efficient, cost effective and large scale applications of plant *in vitro* cultures.

The book is divided into five parts. Part 1 deals with new approaches for monitoring of a quality of *in vitro* grown plants. Its four chapters comprise image analysis of chlorophyll fluorescence for determination of photosynthetic capacity of *in vitro* grown plants, methods for control transient and stable gene expression, simulations of metabolism of plants *in vitro* using network technology, and evaluation of plant suspension cultures by texture analysis. The largest Part 2 containing eight chapters reviews bioreactor technologies and possibilities of their application in micropropagation, cultivation of transgenic plants, or production of proteins and pharmacologically important compounds. Possibilities of different innovations (e.g. airlift, thin films of

liquid media, nutrient mist, temporary immersion, wave-induced agitation) for improvement in bioreactor efficiency are discussed. Two chapters of the Part 3 show ways for reduction of labour costs by mechanization of micropropagation (automation technologies and robotics). Additional methods and technologies important in large scale plant propagation are surveyed in Part 4 (closed transplant production systems using minimum resources, engineering aspects of vessel design, determination and effects of gel firmness, role of dissolved oxygen concentration, commercialized photoautotrophic micropropagation, and temperature gradients in culture vessels). The last Part 5 with 4 chapters covers rather special techniques such as electrical control of plant morphogenesis, the use of ultrasound in tissue cultures, acoustic characteristics of *in vitro* plants, and perspectives of *in vitro* plant cryopreservation.

This comprehensive book with many tables and figures can serve not only as up-to date source of information for researchers and teachers in the area of plant biotechnology but it also open up new vistas in this field.

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