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PLANT TISSUE CULTURE

CONCEPTS AND APPLICATIONS

A Practical Approach

Tissue culture techniques refer to the cultivation of plant cells, tissues, or organs in controlled circumstances, including the right supply of nutrients, pH of the culture medium, a suitable temperature, light and a microbe free environment for growth and multiplication. It is one of the most widely adopted and commercially successful technology in the agricultural biotechnology field. In the agriculture field, tissue culture technology is used to produce large numbers of genetically identical plantlets (clonal multiplication) of economically important medicinal plants, fruit and forest trees that are difficult to multiply through conventional methods and rare endangered plants. It is also used to produce virus-free genetic stocks, regenerate transgenic plant cells that have been developed through recombinant DNA Technology and produce rare hybrids by protoplast fusion and cybridization. Plant tissue culture also helps in plant physiological and biochemical research to study the cell cycle, metabolism in cells, nutritional, morphogenetical and developmental studies in plants. So to utilize plant tissue culture technology effectively in agriculture and science field, one should know thoroughly about basic tissue culture techniques as well as its application.

This book deals with most of the important fundamental aspects of tissue culture, such as the basic properties of plant cells for successful in vitro culturing, components and types of nutrient media, essential requirements for setting up a tissue culture laboratory, the organizational setup for a commercial tissue culture laboratory, and its several applications, such as micropropagation, secondary metabolite production, protoplast culture, wide hybridization, etc., with suitable examples and detailed images for better understanding.

At present, entrepreneurship has ample scope. In this case, tissue culture is the best option for initiating a commercial venture as an entrepreneur since there is a lot of demand for good-quality and high-vigour plantlets for many commercial plants such as banana, bamboo, sugarcane, sandalwood, orchids, anthurium, gerbera, rose, aloe vera, etc.

This book has been written from both a theoretical and practical point of view, so it will help undergraduate and postgraduate students who are undergoing an agricultural and allied science or biotechnology course and common readers who wish to do tissue culture research and aspire to be entrepreneurs in the tissue culture field to understand the basic aspects and concepts of tissue culture and also gain more confidence to do tissue culture practical experiments.

M. Sivaji

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- Growth Hormones and its Importance in Plant tissue Culture
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- Shoot Tip and Meristem Culture for Virus Free Plant Production
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- Regeneration of Transgenic Cells by In Vitro Culture

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