Preface

Micropropagation of horticultural crops, including ornamental plants, is a reliable technology applied commercially worldwide, which allows large-scale plant multiplication, production, and supply of selected plants. Tens of millions of rootstocks and fruit species, gardening and cut-flowers, vegetable plants are produced annually by micropropagation in several European countries, such as Belgium, Holland, Italy, Germany, and France. Moreover, new commercial laboratories have been recently established in Turkey, Greece, Czech Republic, Poland, Hungary, and other Eastern European countries. Outside Europe, micropropagation of horticultural crops is highly advanced and routinely applied commercially, such as in USA, Australia, India, South Africa, China, New Zealand, Argentina, and Brazil. In addition to rapid plant multiplication, tissue culture is largely used also for germplasm conservation, elimination of pathogens, and genetic manipulations.

Micropropagation, however, is highly labor oriented and, thereby, commercial companies are outsourcing plant multiplication activities to low-labor cost areas. Hence, in the technologically advanced countries, the great potential of micropropagation for large-scale plant multiplication can be tapped by cutting down the cost of production per plant, pursued by applying low-cost tissue culture, adopting practices, and optimizing use of equipment and resources to reduce the unit cost of micropropagule and plant production without compromising the quality. Furthermore, the development and rapid multiplication of new ornamental cultivars are required to meet the demand of consumers all year round. The existing and refined protocols for in vitro culture, as well as their direct applications in improving and developing new cultivars, regularly supply plant material year round. Moreover, in vitro long-term storage of valuable germplasm would immensely provide benefits to both the industry and academic Institutes. The outcome of recent studies carried out in various research laboratories and institutions shows optimized micropropagation protocols for many economically-important species and well-developed in vitro techniques, such as thermotherapy and cryotherapy for virus-free production, exploitation of somaclonal variation, long-term shoot culture conservation, and plant rejuvenation.

This book is focused on the recent advances on the micropropagation of several economically important horticultural species. A total of 35 chapters are included, divided into four major sections. Part I contains 13 chapters, covering economically-important fruit and nut species; Part II includes 11 chapters on outdoor/indoor ornamentals and cut-flowers; Part III includes five chapters dealing with vegetables. Each chapter contains a step-wise protocol of micropropagation and a "Notes" section, i.e., an extensive overview based on the personal expertise of contributing authors. Part IV contains six specific reviews on

pivotal topics, such as in vitro rejuvenation, synthetic seed technology, thermotherapy and meristem culture, genetic transformation, flower color somaclonal variation, and cryotherapy of horticultural crops. All submitted manuscripts have been peer-reviewed and revised accordingly.

The readership of the book will be horticulturists, researchers, commercial companies, plant propagators, biotechnologists, and students.

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