

1. Preface

When the first Dutch edition of this book appeared in 1975 it was not anticipated that it would arouse so much interest. The rapid development of this subject persuaded the author to produce an extensively revised second edition in 1985. This third edition has been further revised and extended by 20% to accommodate the recent advances, including those presented at the 6th Plant Tissue and Cell Culture Congress in Minnesota (1985) and the 12th Horticultural Congress in California (1986).

Since 1975 in vitro culture of higher plants has shown a spectacular development. In scientific laboratories methods have been developed for the culture of plants, seeds, embryos, shoot tips, meristems, tissues, cells and protoplasts on sterile nutrient media, resulting in the production and regeneration of viable individuals of many plant species. Since 1980 there has been an explosion in the development of genetic manipulation and biotechnology techniques.

The production of higher plants in vitro, one of the most important aims of tissue culture, strongly appeals to the imagination. But to philosophize about the interesting aspects of producing a plant from a cell, tissue, etc. does not take us very far. The practical person, such as an agriculturist is more interested in knowing whether vegetative propagation can be satisfactorily achieved in this way, especially in cases where cloning by current methods such as by cuttings, division, budding and grafting are difficult or even impossible.

This book has been written in response to the practical problems and questions encountered by the author working in a horticultural laboratory. There are two aspects to these practical problems. Firstly, it was necessary to write a book suitable for university students, as an introduction to the in vitro culture of higher plants. Secondly, tissue culture laboratories (research and applied) required a practical handbook especially for technicians and research assistants. As a result of consultation with numerous colleagues in teaching and research as well as those involved in

practical agriculture and horticulture, the author has attempted to answer these demands.

The author is indebted to Prof. Dr. Ir. J. Doorenbos, and Dr. C.J. Gorter for their critical appraisal of the first edition of this book.

To avoid errors and omissions during preparation of the second edition I am grateful to colleagues who accepted my invitation, for them to critically read specific Chapters: Dr. Ir. J.B.M. Custers (Chapter 16), Drs. F. Quak (Chapter 19), Ir. J.A.J. van der Meys and Dr. G. Staritzky (Chapters 20 and 21), Prof. Dr. Ir. J.G.Th. Hermesen (Chapters 22, 23, and 24), Dr. J.J.M. Dons (Chapter 24), Dr. Ir. M. Koornneef (Chapter 24) and Dr. Ir. C. Broertjes, Prof. Dr. Ir. J. Doorenbos (Chapter 25). Many others sent me criticisms and additions for which I am most grateful. The author hopes that in subsequent years, the readers of this third edition will supply further critical comments, suggestions, omissions or errors.

I am especially grateful to the technicians and research assistants who have worked with me, over the years, in the Department of Horticulture of the Agricultural University, Wageningen, without whose contributions the research presented in this book would not have been possible. Numerous M. Sc. students have also made a great contribution to this new edition through their research during the last years of their study. This research has been a source of inspiration and the foundation stone for writing this third edition.

My present technical assistants H.H.M. Steegmans and P.A. Sprenkels have given much help over many years. Their critical observations and additions have been of great value during the preparation of this book. Thanks go to my wife for much of the typing and M.A. Ruibing for corrections during the final stages of preparation. Without the support of my sons A.J. Pierik and L.M. Pierik in the use of the computer/word-processor the appearance of this book would have certainly been delayed several months.

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Wageningen the Netherlands, April 1987 Prof. Dr. Ir. R.L.M. Pierik