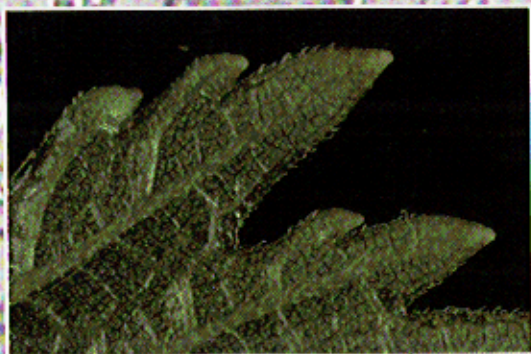
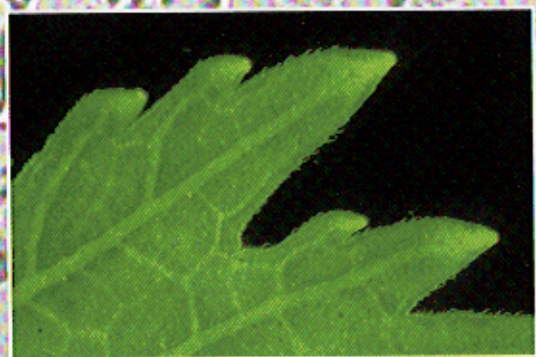




Plant Development and Biotechnology

EDITED BY

**Robert N. Trigiano
Dennis J. Gray**



CRC PRESS

Table of Contents

SECTION I

Introduction.....	1
--------------------------	----------

Chapter 1	Introduction	3
	<i>Dennis J. Gray and Robert N. Trigiano</i>	

SECTION II

History of Plant Tissue Culture.....	7
---	----------

Chapter 2	History of Plant Tissue and Cell Culture	9
	<i>James D. Caponetti, Dennis J. Gray, and Robert N. Trigiano</i>	

SECTION III

Supporting Methodologies.....	17
--------------------------------------	-----------

Chapter 3	Getting Started with Tissue Culture: Media Preparation, Sterile Technique, and Laboratory Equipment	19
	<i>Caula A. Beyl</i>	

Chapter 4	Histological Techniques	39
	<i>Robert N. Trigiano, Kathleen R. Malueg, Kimberly A. Pickens, Zong-Ming Cheng, and Effin T. Graham</i>	

Chapter 5	Photographic Methods for Plant Cell and Tissue Culture	49
	<i>Dennis J. Gray</i>	

Chapter 6	Elements of <i>In Vitro</i> Research	55
	<i>Michael E. Compton</i>	

Chapter 7	A Brief Introduction to Plant Anatomy	73
	<i>Robert N. Trigiano and Dennis J. Gray</i>	

Chapter 8	Plant Growth Regulators in Plant Tissue Culture and Development.....	87
	<i>Victor P. Gaba</i>	

Chapter 9	Software and Databases as Tools for Analyzing Nucleic Acid and Protein Sequences	101
	<i>Zhijian T. Li</i>	
Chapter 10	Molecular Approaches to the Study of Plant Development.....	119
	<i>Albrecht G. von Arnim</i>	

SECTION IV
Propagation and Development Concepts..... 143

Chapter 11	Shoot Culture Procedures	145
	<i>Michael E. Kane</i>	
Chapter 12	Propagation from Nonmeristematic Tissues: Organogenesis.....	159
	<i>Otto J. Schwarz, Anjuna R. Sharma, and Robert M. Beaty</i>	
Chapter 13	Molecular Aspects of <i>In Vitro</i> Shoot Organogenesis	173
	<i>Shibo Zhang and Peggy G. Lemaux</i>	
Chapter 14	Propagation from Nonmeristematic Tissues: Nonzygotic Embryogenesis.....	187
	<i>Dennis J. Gray</i>	
Chapter 15	Some Developmental and Molecular Aspects of Somatic Embryogenesis (Nonzygotic Embryogenesis).....	201
	<i>Andreas Mordhorst, Erika Charbit, and Sacco C. de Vries</i>	

SECTION V
Crop Improvement Techniques..... 211

Chapter 16	Use of Protoplasts for Plant Improvement.....	213
	<i>Richard E. Veilleux, Michael E. Compton, and James A. Saunders</i>	
Chapter 17	Haploid Cultures	225
	<i>Sandra M. Reed</i>	
Chapter 18	Embryo Rescue	235
	<i>Sandra M. Reed</i>	
Chapter 19	Genetic Engineering Technologies	241
	<i>Zhijian T. Li and Dennis J. Gray</i>	

Chapter 20	Genetically Modified Plant Controversies: Sensational Headlines versus Sensible Research	251
	<i>Harry A. Richards, Laura C. Hudson, Matthew D. Halfhill, and C. Neal Stewart, Jr.</i>	
Chapter 21	Construction and Use of a Simple Gene Gun for Particle Bombardment	265
	<i>Dennis J. Gray, Michael E. Compton, Ernest Hiebert, Chia-Min Lin, and Victor P. Gaba</i>	
Chapter 22	A Simple Illumination System for Visualizing Green Fluorescent Protein	273
	<i>Dennis J. Gray, Subramanian Jayasankar, and Zhijian T. Li</i>	
Chapter 23	Germplasm Preservation	277
	<i>Leigh E. Towill</i>	
Chapter 24	Valuable Secondary Products from <i>In Vitro</i> Culture.....	285
	<i>Mary Ann Lila</i>	

SECTION VI

***Special Topics* 291**

Chapter 25	<i>In Vitro</i> Plant Pathology.....	293
	<i>Subramanian Jayasankar and Dennis J. Gray</i>	
Chapter 26	Variation in Tissue Culture	301
	<i>Subramanian Jayasankar</i>	
Chapter 27	Commercial Laboratory Production	311
	<i>Gayle R. L. Suttle</i>	
Chapter 28	Indexing for Plant Pathogens.....	321
	<i>Alan C. Cassells and Barbara M. Doyle</i>	
Chapter 29	Entrepreneurship for Biotechnology Ventures: From Bench to Bag.....	333
	<i>David W. Altman</i>	

Index	343
--------------------	------------