

Contents

Preface	v
Acknowledgments	vii
Contributors	xi

Elm Breeding and Cytology

1. Why Bother About the Elm?	1
<i>Hans M. Heybroek</i>	
2. Seven Dutch Women Scientists Whose Early Research Is Basic to Our Knowledge of the "Dutch Elm Disease"	9
<i>Francis W. Holmes</i>	
3. The Dutch Elm Breeding Program	16
<i>Hans M. Heybroek</i>	
4. American Liberty Elms and Beyond: Going from the Impossible to the Difficult	26
<i>Eugene B. Smalley, R.P. Guries and D.T. Lester</i>	
5. Progress in the Development of Disease-Resistant Elms	46
<i>Alden M. Townsend and Frank S. Santamour, Jr.</i>	
6. An Old Problem; A New Approach.....	51
<i>Lawrence R. Schreiber</i>	
7. Demands and Opportunities for Selecting Disease-Resistant Elms	60
<i>James L. Sherald</i>	
8. Cytological and Biochemical Aspects of Elm Improvement	69
<i>Frank S. Santamour Jr.</i>	

Tissue Culture & Toxins

9. Elm Improvement Via Biotechnological Methods	75
<i>David F. Karnosky and Gopi K. Podila</i>	
10. Micropropagation and Regeneration of DED-Resistant Elms Using Protoplast and Tissue Culture Techniques	81
<i>Subhash C. Domir, M.B. Sticklen, P.M. Pijut, M.G. Bolyard and R.D. Lineberger</i>	

11. Cerato-ulmin: A Unique Wilt Toxin of Instrumental Significance in the Development of Dutch Elm Disease	89
<i>Wayne C. Richards</i>	
12. Amino Acid Sequence and Spectroscopic Studies of Dutch Elm Disease Toxin, Cerato-ulmin.....	152
<i>Makato Yaguchi, M. Pusztai-Carey, C. Roy, W.K. Surewicz, P.R. Carey, K.J. Stevenson, W.C. Richards and S. Takai</i>	
13. Strategies for the Production of Disease-Resistant Elms	171
<i>Mark G. Bolyard and Mariam B. Sticklen</i>	
14. Development of Model Systems to Screen Elms Resistant to Dutch Elm Disease.....	181
<i>Subhash C. Domir, Lawrence R. Schreiber and Paula M. Pijut</i>	
15. Biological Control of Dutch Elm Disease by Exploiting Resistance in the Host	188
<i>D. M. Elgersma, T. Roosien and R. J. Scheffer</i>	

Molecular Biology Approaches

16. Cloning of Pathogenesis-Related Genes from <i>Ulmus americana</i>	193
<i>Ravindra K. Hajela, Lawrence S. Graham and Mariam B. Sticklen</i>	
17. Mansonones, Elicitors and Virulence	208
<i>Martin Hubbes</i>	
18. Characterization of Isolates of <i>Ophiostoma ulmi</i> by Molecular Techniques	216
<i>Robert S. Jeng</i>	
19. Genetic Diversity in Elms: What Molecular Data Tell Us	227
<i>S.J. Wiegrefe, R.P. Guries, E.B. Smalley and K.J. Sytsma</i>	
20. Mechanisms of Resistance: Can They Help Save Susceptible Elms?	239
<i>Luc C. Duchesne</i>	
21. Alterations of Vessel Elements and Reactions of Surrounding Tissues in the DED Syndrome	255
<i>G. B. Ouellette and Danny Rioux</i>	
22. Conventional and Molecular Genetic Approaches to the Study of Pathogenicity in <i>Ophiostoma ulmi sensu lato</i>	293
<i>Louis Bernier</i>	
23. DNA Polymorphism, Perithecial Size and Molecular Aspects of D Factors in <i>Ophiostoma-ulmi</i> and <i>O. novo-ulmi</i>	308
<i>C. M. Brasier, M. R. Bates, N. W. Charter and K. W. Buck</i>	
24. D Factors and Their Potential for Controlling Dutch Elm Disease	322
<i>J. F. Webber</i>	

Index.....	333
------------	-----