



Crop Science: Progress and Prospects

Edited by
J. Nösberger
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CABI Publishing

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Contents

Contributors	ix
Preface	xiii
Foreword	xv
Congress Sponsors	xvii
Part 1: Facing the Growing Needs of Mankind	
1 Food Security? We Are Losing Ground Fast! <i>F.W.T. Penning de Vries</i>	1
2 The Future of World, National and Household Food Security <i>F. Heidhues</i>	15
3 Crop Science Research to Assure Food Security <i>K.G. Cassman</i>	33
4 Modifying the Composition of Plant Foods for Better Human Health <i>R.F. Hurrell</i>	53
5 Facing the Growing Needs of Mankind – Grasslands and Rangelands <i>R.J. Wilkins</i>	65

Part 2: Stress in Crops and Cropping Systems

- 6 Abiotic Stresses, Plant Reaction and New Approaches Towards Understanding Stress Tolerance 81
H.J. Bohnert and R.A. Bressan
- 7 Plant Stress Factors: Their Impact on Productivity of Cropping Systems 101
U.R. Sangakkara
- 8 Optimizing Water Use 119
N.C. Turner
- 9 Abiotic Stresses and Staple Crops 137
G.O. Edmeades, M. Cooper, R. Lafitte, C. Zinselmeier, J.-M. Ribaut, J.E. Habben, C. Löffler and M. Bänziger
- 10 Biotic Stresses in Crops 155
R. Nelson
- 11 Management of Complex Interactions for Growth Resources and of Biotic Stresses in Agroforestry 175
C.K. Ong and M.R. Rao

Part 3: Diversity in Agroecosystems

- 12 Optimizing Crop Diversification 191
D.J. Connor
- 13 Biodiversity of Agroecosystems: Past, Present and Uncertain Future 213
P.J. Edwards and A. Hilbeck
- 14 Conservation and Utilization of Biodiversity in the Andean Eco-region 231
W.W. Collins
- 15 The Role of Landscape Heterogeneity in the Sustainability of Cropping Systems 243
J. Baudry and F. Papy

Part 4: Designing Crops and Cropping Systems for the Future

- 16 Cropping Systems for the Future 261
J. Boiffin, E. Malezieux and D. Picard

17	Will Yield Barriers Limit Future Rice Production? <i>J.E. Sheehy</i>	281
18	New Crops for the 21st Century <i>J. Janick</i>	307
19	Plant Biotechnology: Methods, Goals and Achievements <i>U. Sonnewald and K. Herbers</i>	329
20	Transgenic Plants for Sustainable Crop Production <i>B. Keller and E. Hütter Carabias</i>	351
Part 5: Position Papers		
21	Crop Science: Scientific and Ethical Challenges to Meet Human Needs <i>L.O. Fresco</i>	369
22	Declaration of Hamburg <i>J.H.J. Spiertz</i>	381
	Index	385

Preface

This book contains 20 invited chapters written by renowned scientists from throughout the world, that resulted from the Third International Crop Science Congress held in Hamburg, 17–22 August 2000. After the Congress, the papers were adapted to meet the requirements for a stimulating textbook for advanced students or young professionals. The topics around the theme of the Congress, 'Meeting Future Human Needs', are crucial to crop scientists worldwide. The challenges raised in each chapter clearly show the tasks ahead for crop scientists interested in meeting the demands for food of a growing population in a sustainable way.

The subject matter presented in this book is organized into five general parts that correspond to the four programme themes of the Congress. The first provides an overview of the growing needs of humankind and stresses the constraints imposed by scarce natural resources and the actual genetic potential of crop plants. Part 2 focuses on biotic and abiotic stress in crops and cropping systems. The analysis of the stress situation from the molecular to the system level offers new insights that are a prerequisite for innovative approaches in agronomy and plant breeding. However, agricultural land use is not only the core activity for the production of food, but also a driving force for the diversity and stability of agro-ecosystems. Part 3 explains why regional differences in gene populations as well as biological diversity in agricultural ecosystems are crucial traits for sustainable production systems, while the potential of new technologies is developed in Part 4. Cropping systems can be designed for specific requirements on a more rational basis with the use of decision support systems. Biotechnology offers great opportunities for changing crops for the future. Finally, the book contains the Declaration of Hamburg, expressing the concern of crop scientists about the role of science and society in meeting the demands of future human needs,

while a contribution from FAO analyses world agricultural trends from an ethical perspective.

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Foreword

Through the achievements made in crop science and production technology over the last decades, agriculture is now able to feed the majority of the world's population better than in the past. However, there is an increasing concern that the present knowledge, resources and technologies will not be adequate to meet the demands, once there are 8 billion people on this planet by about 2020. Challenges are to feed and to fulfil the needs of a growing population in a sustainable way. This requires a better and more comprehensive insight into ecologically sound crop production processes, especially in fragile environments and resource-poor countries. Furthermore, there is a need to integrate the newly acquired knowledge in the field of gene and information technology in the development of future crops and cropping systems.

Strengthening agricultural research and education at national and international levels is a prerequisite to fulfilling future human needs. There is a need for crop scientists worldwide to rethink their responsibility towards the global needs for food, rural development, and human health and well-being at the one side and the conservation and efficient use of scarce resources at the other. Crop science deals with problems that are consumer related, such as food quality and safety, but at the same time with sustainable use of land, water and genetic resources. The scope is from the gene to the field and from the crop to food and health.

It was a great honour to organize the Third International Crop Science Congress in Europe. The European Society for Agronomy (ESA) in cooperation with the German Societies for Agronomy and for Plant Breeding took the formal responsibilities. Many individuals contributed to the success of this Congress with participants from over 100 countries. The core group of the Programme Committee made an utmost effort to invite outstanding

scientists in the various fields to enrich the scientific quality of the programme. The proceedings cover the plenary and keynote papers of four themes: food security and safety, biotic and abiotic stresses, diversity in agroecosystems and future crops and cropping systems. It is highly appreciated that these papers could be published in a way that the proceedings may serve as a textbook for advanced students and young professionals in crop science.

Hartmut Stützel
President ESA 1998–2000

Hubert Spiertz
President ICSC – 2000