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BOOK REVIEW

Genetic improvement of cacao

L A S Dias (Editor)

By Peter Griffee1* and Élcio Perpétuo Guimarães2

In 2003, my colleague, Dr. Élcio Guimarães of FAO showed me the hard copy of the book "Melhoramento Genético do Cacaueiro" which he had received from the Editor, Luiz

Antônio dos Santos Dias. L A S Dias has 20 years of hands-on experience in working with cacao and people of all its disciplines and is now with the Federal University of Viçosa, working in BIOAGRO, Minas Gerais State, Brazil, and is the current Editor-in chief of the international journal CBAB (Crop Breeding and Applied Biotechnology).

Élcio was a rice breeder at the Embrapa Rice and Beans National Center and was the President of the Brazilian Society of Plant Breeding (SBMP) from 2001-2003 before joining FAO as the Senior Officer for Cereal/Crop Breeding.

I am the Senior Officer for Industrial Crops at FAO and my home has been in Brazil since 1974, so both Élcio and I were able to see, at once, the extraordinary quality of this book in uniting Genetic
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multidisciplinary aspects of cacao - from ancient ethno-botanical records through to modern biotechnologies; a unique work never before united into one - and with the support from many

renowned scientists. So - with total support from L A S Dias - I entered the entire Brazilian version of 578 pages into EcoPort.

We all perceived the urgent need for an English version -"Genetic Improvement of Cacao" to make the knowledge more universally available. With the help a grant from FAO this work has now become a reality. We would like to cite a quote from Mark Guiltinan who is Professor of Plant Molecular Biology, Department of Horticulture, The Biotechnology Institute Penn State University. Mark also manages the INGENIC molecular biology working group regarding cocoa genomics related research. "I am very interested to see the chapters, I would love to either make a link from our web site to it or host it as well as a mirror or alternative North American site.

¹Industrial Crops, Crop and Grassland Service, Plant Production and Protection Division, Food and Agriculture Organization of the United Nations (FAO), Rome, Italy. *E-mail: Peter.Griffee@fao.org ²Senior Cereal & Crop Breeding Officer, AGPC, FAO. This sort of cocoa literature is so hard to find, and as such I am investing some time to try to put the Archives of Cocoa Research online as well".

The translation was done by Ms Cornelia E. Abreu-Reichart of Viçosa, with support from Dias, myself and Élcio.

This EcoPort version will stay "as is" in respect of the original work and a new edition created - the great advantage being that it can be up-dated regularly as novel technologies emerge.

This book, had the collaboration of renowned specialists in their particular disciplines; all belonging to research institutions of national and international prestige. The collaborators were stimulated to contribute new - state of the art- technology on cacao breeding in their chapters. Conceived as to be encompassing and, at the same time, as in-depth as possible, the work is highlighted by its logical sequence and clarity of the themes developed in its 13 chapters. In Chapter 1, the principal aspects of cultivation and the strategies of environmental improvement are presented. In order to overcome the crisis, which assails the cacao economy, it deals with the socio-economic panorama that predicts changes of attitude of producers, researchers and institutions. Chapters 2, 3, 4 and 5 basically cover, the collection, conservation and rational use of genetic resources of Theobroma, the genus to which cacao (Theobroma cacao L.) belongs. The diversity in Theobroma is focussed on in Chapter 2 with a view to improvement by

incorporation of genes from wild species into the genetic make up of the cultivated one. Chapter 3 presents a new scenario for the origin and distribution of cacao, with important reflections on the collection and conservation of germplasm. The ecology of natural populations in its most diverse aspects is dealt with in Chapter 4. How to collect, conserve, evaluate, characterize and use germplasm saved are topics developed in Chapter 5.

From Chapter 6 onwards the book focuses on the actual genetic improvement. For the first time, the methodology of mixed mathematical models is introduced to cacao breeding, with a view to making it more precise and efficient. Chapters 7 and 8 cover the state of the art of resistance to diseases, in particular witches'broom, emphasizing the heredity mechanism and the biochemical and physiological bases of this resistance. Asexual breeding is highlighted and covered in Chapter 9. The introduction of molecular markers in breeding and the possibilities open for these new tools are reported in Chapter 10. Another grey area, never really covered in cacao breeding, (Chapter 11) is experimentation. In Chapter 12, breeding success is illustrated by the comparative results of improved cultivars against traditional ones. Finally, Chapter 13 capitalizes on all improvement aspects, harmoniously integrating sexual and asexual improvement and biotechnology to project the future of breeding programmes.

Finally we would like to congratulate the Editor on his capacity, dedication and courage in producing this work.

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