

Preface

The chapters in this book are mainly from selected oral presentations at the International Conference on Crop Improvement held in Universiti Putra Malaysia in December, 2015. Additional chapters are from authors that were invited to contribute certain topics to strengthen the content of the book. The theme of the conference ‘Sustainability Through Leading-Edge Technology’ used as the book title is a clear reflection of the content. The book aims to enlighten the readers on various strategies utilising molecular-biotechnology tools and agricultural engineering innovations to overcome the challenges in crop production in a sustainable manner. Sustainability issues are addressed along the supply chain from crop production to preserving and processing crops after harvest.

Major impacts on crop production due to catastrophic diseases and global climate change need urgent and innovative solutions. One of the main issues is the limited availability of gene pool due to domestication that prevents further genetic improvement. Sourcing for new alleles from various untapped genetic resources for important traits like disease and abiotic stress resistance is critical and appropriately presented as one of the key strategies in current crop improvement efforts. Systems biology that relies on various ‘omics platform and strong bioinformatics support is essential in understanding biological processes and the underlying mechanisms of importance for enhancing crops’ performance and ensuring their survival under adverse conditions. The information generated forms the basis for subsequent genetic improvement efforts through molecular marker technology and genetic engineering. Some of the powerful genetic manipulation strategies as well as recent development that speed up the process of obtaining the desired trait with better public acceptance are elaborated.

The book also includes aspects of preserving crops after harvest and diversifying usage of by-products as these are key factors in promoting sustainable crop quality, addressing waste, and moving crops through the food and industrial supply chain. Agriculture engineering innovations in the form of biosensors for field application, bioreactors for culturing of plants for production of valuable secondary metabolites and crop processing technology to minimise loss as important

development towards attaining sustainability are also included as food for thoughts for current and future generation.

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Crop Improvement

Sustainability Through Leading-Edge Technology

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