

# Plant Macronutrient Use Efficiency

## Molecular and Genomic Perspectives in Crop Plants

### Edited by

**Mohammad Anwar Hossain**

Department of Genetics and Plant Breeding, Bangladesh Agricultural University, Mymensingh, Bangladesh

**Takehiro Kamiya**

Laboratory of Plant Nutrient and Fertilizers, Department of Applied Biological Chemistry, Graduate School of Agricultural and Life Sciences, University of Tokyo, Japan

**David J. Burritt**

Department of Botany, University of Otago, New Zealand

**Lam-Son Phan Tran**

Signaling Pathway Research Unit, RIKEN Center for Sustainable Resource Science, Japan

**Toru Fujiwara**

Laboratory of Plant Nutrition and Fertilizers, Department of Applied Biological Chemistry, Graduate School of Agricultural and Life Sciences, University of Tokyo, Japan

*Plant Macronutrient Use Efficiency* presents an up-to-date overview of the latest research on the molecular and genetic basis of macro-nutrient use efficiency (NUE) in plants, and strategies that can be used to improve NUE and nutrient-associated stress tolerance in crop plants. Plant NUE is a measure of how efficiently plants use available nutrients and an understanding of plant NUE has the potential to help improve the use of limited natural resources and to help achieve global food security. This book presents information important for the development of crop plants with improved macro-NUE, a prerequisite to reducing production costs, expanding crop production into noncompetitive marginal lands with low nutrient resources, and for helping to prevent environmental contamination.

*Plant Macronutrient Use Efficiency* provides a comprehensive overview of the complex mechanisms regulating macro-NUE in crop plants, which is required if plant breeders are to develop modern crop varieties that are more resilient to nutrient-associated stress. Identification of genes responsible for macro-NUE and nutrient-related stress tolerance in crop plants will help us to understand the molecular mechanisms associated with the responses of crop plants to nutrient stress.

This volume contains both fundamental and advanced information, and critical commentaries useful for those in all fields of plant science research.

### Key Features

- Provides details of molecular and genetic aspects of NUE in crop plants and model plant systems
- Presents information on major macronutrients, nutrient sensing and signaling, and the molecular and genomic issues associated with primary and secondary macronutrients
- Delivers information on how molecular genetic information associated with NUE can be used to develop plant breeding programs
- Includes contributions from world-leading plant nutrition research groups

### Related Titles

Marschner, *Marschner's Mineral Nutrition of Higher Plants*, 3rd edition, 9780123849052

Sadras and Calderini, *Crop Physiology: Applications for Genetic Improvement and Agronomy*, 2nd Edition, 9780124171046



**ACADEMIC PRESS**

An imprint of Elsevier  
[elsevier.com/books-and-journals](http://elsevier.com/books-and-journals)

AGRICULTURE / BIOLOGICAL  
/ FOOD SCIENCE

ISBN 978-0-12-811308-0



9 780128 113080