Preface

Phenomenal progress has been made in our understanding of the several and diverse ways in which micronutrients alter or regulate the functioning of plants and produce a wide array of responses enabling quantitative and qualitative changes in plant yield. Developments on different aspects of micronutrients in plants have been reviewed and their implications discussed in several contemporary publications dealing with them, both collectively and individually. The author's resolve to add a resource on the biochemical and physiological roles of micronutrients in plants and the diverse ways in which they react to limitations in micronutrient supply, contributing to global constraints in crop production, came from his long stint as a teacher of plant nutrition at the Lucknow University. This need was augmented by spectacular developments in molecular biology. Immunocytochemical localization of specific proteins, functional analyses of phenotypic mutants, cloning and sequence analysis of genes and their expression in transgenics have provided new insight into the functional sites of micronutrients, their roles in macromolecular biosynthesis, and developmental processes and adaptive response to biotic and abiotic stresses. The author's long association with the All India Coordinated Research Project on Micronutrients of Soil and Plants, supported by the Indian Council of Agricultural Research, New Delhi, provided the impetus for adding a resource on the evaluation and amelioration of micronutrient deficiencies. These deficiencies account for a wide gap between the production potential of the major food crops and their productivity on low micronutrient soils and also necessitate their prompt management for sustained increase in crop yields. In keeping with these imperatives, the book has been presented in two parts. Part I deals with roles of micronutrients and the changes induced in plants in response to their inadequate supply. Part II addresses the factors contributing to micronutrients deficiency, their diagnosis, evaluation and management through soil - and plant - based approaches.

The author is deeply indebted to late Professor SC Agarwala, who not only inducted him to plant nutrition research, but also provided strong motivation to prepare resource material for students opting for advanced courses on physiology and biochemistry of micronutrients. During the preparation of the book, the author received valuable help from Dr BD Nautiyal, Dr Nalini Pandey, Dr GC Pathak and Ms R Pandey, all from the Department of Botany, Lucknow University. The author would like to make particular mention of the support and helpful suggestions received in the making of the book from Dr Nalini Pandey and his son Dr Samir Sharma, faculty with the Lucknow University Department of Biochemistry. The author is grateful to Dr HK Jain, Director, Center for Science Writing, New Delhi, who not only encouraged him to work on the book but also provided financial support to defray part of the pre-publication costs. Thanks are also due to Mr Abhist Kumar for typing the first draft of the manuscript, which made difficult reading.

The author is conscious of the limitations in bringing out the book single handed, which might have left many deficiencies. Any criticism and suggestions that may help overcome the deficiencies will be greatly welcome.

Dec. 2005

C.P. Sharma
Department of Botany
Lucknow University
Lucknow