
Contents

Preface.....	ix
Editors.....	xi
Contributors	xiii

SECTION I Introduction

Chapter 1 Introduction	3
<i>Allen V. Barker and David J. Pilbeam</i>	

SECTION II Essential Elements: Macronutrients

Chapter 2 Nitrogen.....	17
<i>David J. Pilbeam</i>	
Chapter 3 Phosphorus	65
<i>Bryan G. Hopkins</i>	
Chapter 4 Potassium.....	127
<i>Nand Kumar Fageria</i>	
Chapter 5 Calcium	165
<i>Philip J. White</i>	
Chapter 6 Magnesium	199
<i>Witold Grzebisz</i>	
Chapter 7 Sulfur.....	261
<i>Cynthia Grant and Malcolm J. Hawkesford</i>	

SECTION III Essential Elements: Micronutrients

Chapter 8 Boron.....	305
<i>Monika A. Wimmer, Sabine Goldberg, and Umesh C. Gupta</i>	

Chapter 9	Chlorine.....	347
	<i>David E. Kopsell and Dean A. Kopsell</i>	
Chapter 10	Copper.....	367
	<i>Inmaculada Yruela</i>	
Chapter 11	Iron.....	399
	<i>Allen V. Barker and Margie L. Stratton</i>	
Chapter 12	Manganese.....	427
	<i>Touria E. Eaton</i>	
Chapter 13	Molybdenum.....	487
	<i>Dean A. Kopsell, David E. Kopsell, and Russell L. Hamlin</i>	
Chapter 14	Nickel.....	511
	<i>Bruce W. Wood</i>	
Chapter 15	Zinc.....	537
	<i>Allen V. Barker and Touria E. Eaton</i>	

SECTION IV Beneficial Elements

Chapter 16	Aluminum.....	567
	<i>F. Pax C. Blamey, Peter M. Kopittke, J. Bernhard Wehr, and Neal W. Menzies</i>	
Chapter 17	Cobalt.....	607
	<i>Aurelia Pérez-Espinosa, Raúl Moral Herrero, María Dolores Pérez-Murcia, Concepción Paredes Gil, and María De Los Ángeles Bustamante Muñoz</i>	
Chapter 18	Lanthanides.....	625
	<i>Silvia H. Haneklaus, Ewald Schnug, Bernd G. Lottermoser, and Zhengyi Hu</i>	
Chapter 19	Selenium.....	651
	<i>David J. Pilbeam, Henry M.R. Greathead, and Khaled Drihem</i>	
Chapter 20	Silicon.....	681
	<i>Jian Feng Ma</i>	

Chapter 21 Sodium	697
<i>Sven Schubert</i>	

Chapter 22 Vanadium	711
<i>David J. Pilbeam</i>	

SECTION V Conclusion

Chapter 23 Conclusion	725
<i>Allen V. Barker and David J. Pilbeam</i>	

Index	731
--------------------	-----