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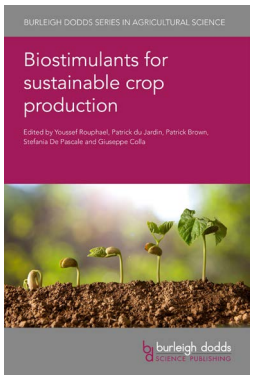

Biostimulants for sustainable crop production

Editors: Youssef Rouphael, Patrick du Jardin, Patrick Brown, Stefania De Pascale and Giuseppe Colla

This collection provides a comprehensive review of the key advances in understanding and using the major groups of biostimulants, from humic substances and seaweed extracts to protein hydrolysates and plant growth-promoting rhizobacteria (PGPR), as well as the practical application of biostimulants in areas such as enhancing nutrient use efficiency (NUE).

CHAPTER TITLES

Part 1 Introduction and biostimulant characterization; 1.Plant biostimulants: a new paradigm for the sustainable intensification of crops; 2.Bioactive compounds and evaluation of biostimulant activity; **Part 2 Non-microbial and microbial categories of biostimulants**; 3.Humic substances (HS) as plant biostimulants in agriculture; 4.Seaweed extracts as plant biostimulants in agriculture; 5.Biostimulant action of protein hydrolysates on crop; 6.Silicon as a biostimulant in agriculture; 7.Plant growth-promoting rhizobacteria (PGPR) as plant biostimulants in agriculture; 8.Arbuscular mycorrhizal fungi as biostimulants for sustainable crop production; **Part 3 Innovation and practical applications;** 9.Designing and formulating microbial and non-microbial biostimulants; 10.Plant biostimulants and their influence on nutrient use efficiency (NUE); 11.Combining plant biostimulants and precision agriculture

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Biopesticides for sustainable agriculture

Editors: Professor Nick Birch, formerly The James Hutton Institute, UK and Professor Travis Glare, Lincoln University, New Zealand

Part 1 of this collection reviews research on developing and assessing new biopesticides. Part 2 summarises advances in different types of entomopathogenic biopesticide. Part 3 assesses semiochemical, peptide-based and other natural substance-based biopesticides.

CHAPTER TITLES

Part 1 General; 1.Improving methods for developing new microbial biopesticides; 2.Implementing biopesticides as part of an integrated pest management (IPM) programme; 3.Improving regulatory approval processes for biopesticides and other new biological technologies in agriculture; **Part 2 Microbial biopesticides, entomopathogenic nematodes and mites;** 4.Advances in the use of entomopathogenic fungi as biopesticides in suppressing crop pests; 5.Advances in the use of entomopathogenic bacteria/microbial control agents (MCAs) as biopesticides in suppressing crop insect pests; 6.Advances in the use of Bt genes in insect-resistant crop; 7.Plant growth-promoting bacteria (PGPBs) as biocontrol agents against invertebrate pests; 8.Advances in the use of entomopathogenic viruses as biopesticides in suppressing crop insect pests; 9.Advances in the use of entomopathogenic nematodes (EPNs) as biopesticides in suppressing crop insect pests; 10.Advances in the use of entomopathogenic oomycetes as biopesticides in suppressing crop insect pests; **Part 3 Natural substance-based biopesticides;** 11.Advances in the use of semiochemicals in integrated pest management: pheromones; 12.Possible use of allelochemicals in integrated pest management (IPM); 13.Peptides as novel biopesticides: Lin Bao, Robert M. Kennedy; 14.Development of plant-derived compounds as biopesticides

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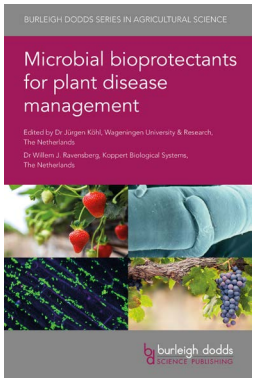

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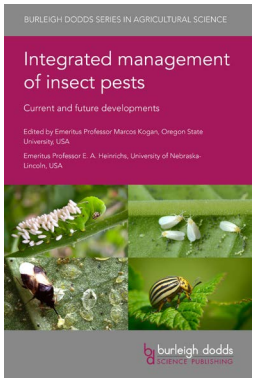

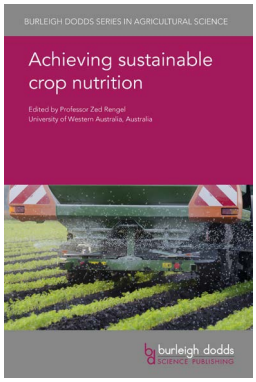

Microbial bioprotectants for plant disease management

Editors: Dr Jürgen Kohl, Wageningen University & Research, The Netherlands and Dr Willem J. Ravensberg, Koppert Biological Systems, The Netherlands

This collection provides a comprehensive coverage of the recent advances in the development of more ecologically balanced biological methods to control plant diseases.

CHAPTER TITLES

Part 1 General issues; 1.Advances in understanding modes of action (MOA) of microbial bioprotectants; 2.Advances in screening and product development of microbial bioprotectants; 3.Microorganisms for bioprotection and biostimulation; 4.Durability of efficacy of microbial bioprotectants; 5.Advances in production and formulation of microbial bioprotectants; 6.Key issues in regulation of microbial bioprotectants; 7.Microbial bioprotectants and the market place; 8.Role of bioprotection in integrated crop protection approaches; **Part 2 Bacterial bioprotectants**; 9.The use of Bacillus spp. as bacterial biocontrol agents to control plant disease; 10.The use of Pseudomonas spp. as bacterial biocontrol agents to control plant disease; 11.Are there bacterial bioprotectants besides Bacillus and Pseudomonas?; **Part 3 Fungal bioprotectants;** 12.The use of Trichoderma spp. for plant disease control; 13.Clonostachys rosea for plant disease control; 14.The use of atoxigenic Aspergillus flavus (Aflasafe) to combat mycotoxin contamination of staple foods in Africa; 15.The use of Verticillium albo-atrum WCS850 to control Dutch elm disease; **Part 4 Viral bioprotectants;** 16.The use of bacteriophages for plant disease control; 17.The use of weak viruses for control of plant pathogenic viruses; 18.Mycoviruses: a neglected option for bioprotection?; 19.Future outlook for microbial bioprotectants:

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Integrated management of insect pests: Current and future developments

Editors: Emeritus Professor Marcos Kogan, Oregon State University, USA and Emeritus Professor E. A. Heinrichs, University of Nebraska-Lincoln, USA

This volume reviews current developments in integrated pest management (IPM), focussing on insect pests. It discusses advances in understanding species and landscape ecology on which IPM is founded, as well as advances in cultural, physical and biological methods of control.

CHAPTER TITLES

Part 1 Ecological foundations of IPM; 1.Foundations of an IPM program: detection, identification, and quantification; 2.Advances in understanding species ecology: phenological and life cycle modeling of insect pests; 3.Understanding agroecosystems and pest management: from chemical control to integrated biodiversity management; 4.Advances in understanding agroecosystems ecology and its applications in integrated pest management; 5.Advances in understanding the ecology of invasive crop insect pests and their impact on IPM; 6.Plant-insect interactions, host-plant resistance, and integrated pest management; **Part 2 Cultural and physical methods in IPM;** 7.Advances in breeding crops resistant to insect pests: rice as a paradigm; 8.The role and use of genetically engineered insect-resistant crops in integrated pest management systems; 9.Biotechnology applications for integrated pest management; 10.Advances in physical control methods in IPM; 11.Robot-enhanced insect pest control: reality or fantasy?; **Part 3 Biological methods in IPM;** 12.Advances in classical biological control to support IPM of perennial agricultural crops; 13.Advances in conservation biological control and habitat management for IPM**;** 14.Advances in augmentative biological control in integrated pest management;

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Achieving sustainable crop nutrition

Editor: Professor Zed Rengel, University of Western Australia, Australia

This collection reviews current research on understanding nutrient cycles, the ways crops process nutrients, the environmental effects of fertilizer use and how this understanding can be used to improve nutrient use efficiency for a more resource-efficient and climate-smart agriculture.

CHAPTER TITLES

Part 1 Primary macronutrients: nitrogen; 1.Advances in understanding the nitrogen cycle in crop production; 2.Advances in understanding uptake and utilization of nitrogen in wheat; 3.Advances in optimising nitrogen-use efficiency in crop production; **Part 2 Primary macronutrients: phosphorus;** 4.Advances in understanding crop use of phosphorus; 5.Advances in understanding the environmental effects of phosphorus fertilization; 6.Enhancing phosphorus-use efficiency in crop production; P**art 3 Primary macronutrients: potassium;** 7.Advances in understanding the potassium cycle in crop production; 8.Potassium in crop physiology; 9.Advances in optimizing potassium-use efficiency in crop production; **Part 4 Secondary macronutrients and micronutrients;** 10.Secondary macronutrients: advances in understanding calcium cycling in soils, uptake/use by plants and ways of optimizing calcium-use efficiency in crop production 11.The effect of soil organic matter on plant mineral nutrition; 12.Advances in understanding iron cycling in soils, uptake/use by plants and ways of optimising iron-use efficiency in crop production; 13.Current advances in zinc in soils and plants: implications for zinc efficiency and biofortification studies; 14.Advances in understanding boron cycling in soils, uptake/use by plants and ways of optimizing boron use efficiency in crop production; 15.Micronutrients: advances in understanding manganese cycling in soils, acquisition by plants and ways of optimizing manganese efficiency in crops; 16.Micronutrients: advances in understanding molybdenum in crop production;

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NEW

Advances in measuring soil health

Editor: Professor Wilfred Otten, Cranfield University, UK

This volume begins with a review of advances in measuring soil biological activity. Parts 2 and 3 survey developments in measuring soil physical and chemical properties. The collection concludes by reviewing soil health indicators and decision support systems for improving soil management.

CHAPTER TITLES

Part 1 Measuring soil biological activity; 1.Assessing soil health by measuring fauna; 2.Quantifying earthworm species as indicators of soil health; 3.Quantification of fungi and fungal traits in soil; **Part 2 Measuring soil physical and chemical properties;** 4.Advances in visual techniques to assess soil structure; 5.Imaging soil structure to measure soil functions and soil health; 6.Geophysical methods to assess soil physical conditions; 7.Advances in techniques to assess soil erodibility; 8.Advances in measuring mechanical properties of soils in relation to soil health; 9.Advances in instrumental techniques to assess soil chemistry; 10.Spectral mapping of soil organic carbon; **Part 3 From measurement to management;** 11.Developing soil health indicators for improved farm soil management; 12.Developing decision support systems for farm, soil management

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NEW

Improving soil health

Editor: Professor William Horwath, University of California-Davis, USA

This collection summarises current research on the effects of different management strategies on the physical, chemical and biological properties of soils. It assesses the viability of these management strategies, including zero tillage and intercropping, as a means for improving crop yield, ecosystem productivity and soil health in general.

CHAPTER TITLES

1.Soil health: definitions and key concepts; **Part 1 Dimensions of soil health;** 2.Understanding biological processes in soil; 3.Soil physical properties, soil biology and nutrient cycling; 4.Understanding mycorrhizal activity as a component of soil health; 5.Assessing the effects of compost on soil health; **Part 2 The role of zero/reduced tillage;** 6.Assessing the effects of zero/no till cultivation practices on soil health; **Part 3 The role of rotations, intercropping and cover crops;** 7.Assessing the effects of rotations on soil health; 8.Assessing the effects of cover crops on soil health; **Part 4 The role of organic and other amendments;** 9.Assessing the effects of crop residue retention on soil health; 10.Assessing the effects of plant-based composts on soil health; 11.Assessing the effect of biosolids on soil health; 12.Biofertilizers: assessing the effects of arbuscular mycorrhizal fungi (AMF) on soil health; 13.Biofertilizers: assessing the effects of plant growth-promoting rhizobacteria (PGCR) on soil health; **Part 5 Conclusions;** 14.Where next for soil health research and improvement

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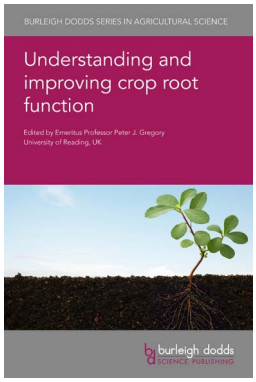

NEW

Understanding and improving crop root function

Editor: Emeritus Professor Peter J. Gregory, University of Reading, UK

Part 1 in this collection reviews recent research on understanding root system architecture and growth together key interactions in the rhizosphere. Parts 2 and 3 assess how roots respond to biotic and abiotic stresses whilst Part 4 explores how this understanding can be used to optimise root function.

CHAPTER TITLES

Part 1 Analysing root system architecture, growth and interactions with the rhizosphere; 1.Advances in root architectural modeling; 2.The development of crop root architecture and optimization of nutrition acquisition: the case of rice; 3.Advances in understanding plant root growth regulators; 4.Advances in understanding plant root anatomy and nutrient acquisition; 5.Advances in understanding plant root hairs in relation to nutrient acquisition and crop root function; 6.Understanding plant-root interactions with rhizobacteria to improve biological nitrogen fixation in crops**;** 7.Advances in understanding arbuscular mycorrhizal fungal effects on soil nutrient cycling; **Part 2 Root response to biotic threats;** 8.Advances in understanding plant root response to weedy root parasites; 9.Advances in understanding plant root responses to root-feeding insects; 10.Advances in understanding plant root response to nematode attack; **Part 3 Root uptake of nutrients and water;** 11.Advances in the understanding of nitrogen (N) uptake by plant roots; 12.Advances in understanding plant root uptake of phosphorus; 13.Advances in understanding plant root water uptake; **Part 4 Improving root function;** 14.Understanding and exploiting the genetics of plant root traits; 15.The use of plant growth-promoting rhizobacteria (PGPR) to improve root function and crop nutrient use efficiency; 16.The use of arbuscular mycorrhizal fungi to improve root function and nutrient-use efficiency; 17.Using systems agronomy to exploit deep roots in crops; 18.Rootstocks to improve root function and resource-use efficiency;19.Delivering improved phosphorus acquisition by root systems in pasture and arable **crops**

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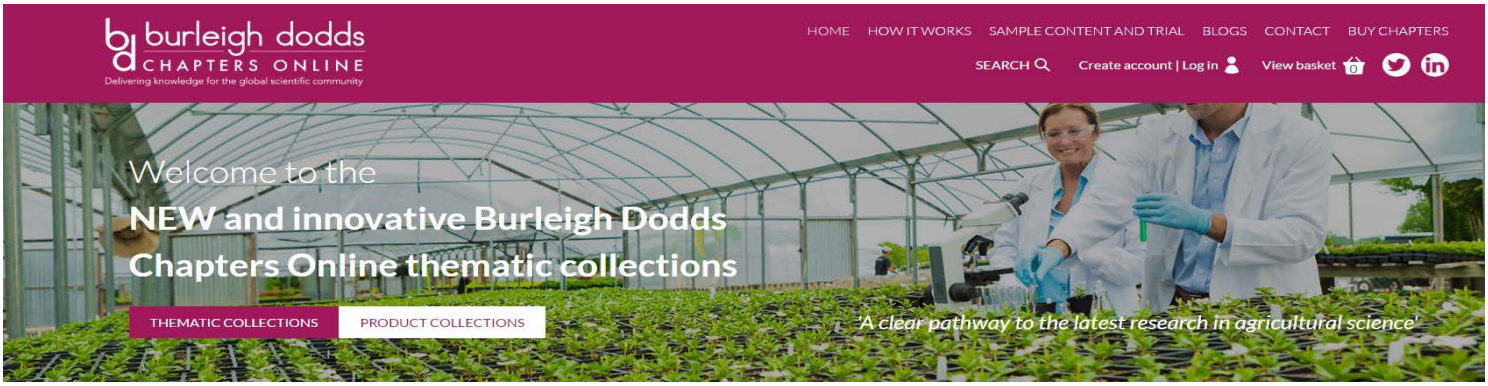

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