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Nota di contenuto	1. Introduction to Plant-Microbe Interactions -- Part I. Introductory Chapters -- 2. The Importance of Microbiology in Sustainable Agriculture -- 3. Life of Microbes in the Rhizosphere -- 4. Life of Microbes on Aerial Plant Parts -- 5. Life of Microbes Inside the Plant -- 6. Microbial Cell Surfaces and Secretion Systems -- 7. Microbial Biofilms and Quorum Sensing -- 8. Bacterial Volatiles as Airborne Signals for Plants and Bacteria -- Part II. Phytopathogens and Pest Insects -- 9. Phytopathogenic Bacteria -- 10. Plant Pathogenic Fungi and Oomycetes -- 11. Phytopathogenic Nematodes -- 12. Herbivorous Insects - a Threat for Crop Production -- 13. Phytopathogenic Viruses -- 14. Induced Disease Resistance -- 15. Apologies to the Planet – Can we Restore the Damage? -- 16. Will the Public ever Accept Genetically Engineered Plants? -- Part III. Control of Plant Diseases and Pests using Beneficial Microbes -- 17. Microbial Control of Phytopathogenic

Nematodes -- 18. Microbial Control of Root-Pathogenic Fungi and Oomycetes -- 19. Control of Insect Pests by Entomopathogenic Nematodes -- 20. Bacillus thuringiensis-based Products for Insect Pest Control -- 21. Post Harvest Control -- Part IV. Plant Growth Promotion by Microbes -- 22. The Nitrogen Cycle -- 23. Biological Nitrogen Fixation -- 24. Phosphate Mobilisation by Soil Microorganisms -- 25. Arbuscular Mycorrhizas: the Lives of Beneficial Fungi and their Plant Host -- 26. Plant Hormones Produced by Microbes -- 27. Stress Control and ACC Deaminase -- 28. Plant-Microbe Interactions and Water Management in Arid and Saline Soils -- 29. Rhizoremediation -- Part V. Important Technologies -- 30. Microbial Communities in the Rhizosphere Analyzed by Cultivation-independent; DNA-based Methods -- 31. Visualization of Plant-Microbe Interactions -- Part VI. Products for Plant Growth-promotion and Disease Suppression -- 32. Commercialisation of Microbes: Present Situation and Future Prospects -- 33. Commercialization of Microbes: Manufacturing, Inoculation, Best Practice for Objective Field Testing, and Registration -- 34. Towards a New Generation of Commercial Microbial Disease Control and Plant - Growth Promotion Products -- 35. Important Organizations and Companies -- Part VII. Paradigms in Plant-Microbe Interactions -- 36. Trichoderma: a Multi-Purpose Tool for Integrated Pest Management -- 37. Agrobacterium, the Genetic Engineer -- 38. Take-All Decline and Beneficial Pseudomonads -- 39. The Oomycete Phytophthora infestans, the Irish Potato Famine Pathogen -- 40. Bacillus, a Plant-Beneficial Bacterium; Rainer Borriss -- 41. Soybean Production in the Americas -- Part VIII. Future Prospects and Dreams -- 42. Exploring the Feasibility of Transferring Nitrogen Fixation to Cereal Crops -- 43. The Minimal Rhizosphere Microbiome -- 44. The Edible Plant Microbiome: Importance and Health Issues -- 45. From Nodulation to Antibiotics.

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## Sommario/riassunto

Plants interact with small organisms in their environment, such as bacteria, fungi, oomycetes, nematodes and insects. Some of these can cause diseases and pests whereas others can have a plant-beneficial action, such as (i) protecting plants against diseases, (ii) enhancing plant growth and productivity, (iii) reducing plant stresses caused by attackers, draught and salts, and (iv) cleaning soils from pollutants. Our understanding of plant-microbe interactions advances rapidly and the application of beneficial microbes in agriculture and horticulture - presently USD 1.7 billion annually - is increasing fast. Therefore, there is a strong need to present the principles of these interactions to a broad public. In this book, the basics of all interactions mentioned above are explained in an easily understandable way. Modern state-of-the-art technology on visualization of these interactions and on DNA techniques will be highlighted. Successful examples of progress are presented in the section "Paradigms of Plant-Microbe Interactions". Finally, a number of innovative ongoing research projects will be presented. Presently, plants are mainly protected from diseases and pests by using agrochemicals. However, many of these chemicals pollute the environment and can be a health threat for animals and humans. This book show that microbes can help to reduce chemical input and can also be used in combination with chemicals, or even replace agrochemicals. It is generally accepted that the use of microbes will cause a breakthrough in agriculture and horticulture, making it more sustainable in a cost-effective way. Major chemical companies are buying microbial biotech companies. This book is aimed at everybody working in or interested in one of the many fields of plant-microbe interactions and who wants to become quickly familiar with (other) aspects of this broad field.

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