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## FOREWORD

# Foreword

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### **New perspectives and approaches in plant growth-promoting rhizobacteria research**

Plant growth-promoting rhizobacteria (PGPR) are defined as root-colonizing bacteria that exert beneficial effects on plant growth and development. Root colonization comprises the ability of bacteria to establish on or in the plant root, to propagate, survive and disperse along the growing root in the presence of the indigenous microflora. Rhizobacteria are considered as efficient microbial competitors in the root zone. Representatives of many different bacterial genera have been commercialized and/or introduced into soils, onto seeds, roots, tubers or other planting materials to improve crop growth. These bacterial genera

include *Acinetobacter*, *Agrobacterium*, *Arthrobacter*, *Azospirillum*, *Bacillus*, *Bradyrhizobium*, *Frankia*, *Pseudomonas*, *Rhizobium*, *Serratia*, *Thiobacillus* and others. To date, probably the most widely used PGPR in agriculture are *Rhizobium* and *Bradyrhizobium* species for their nitrogen-fixing capacity in roots of Leguminosae. In addition to the promotion of plant growth, PGPR are also employed for controlling plant pathogens, enhancing efficiency of fertilizers, and degrading xenobiotic compounds (rhizoremediation). The application of PGPR is a growing market.

There is an active and growing group of scientists working on fundamental and applied aspects of PGPR. Since the late eighties,

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developments of PGPR research have been addressed at International Workshops on PGPR. The first meeting was held in 1987 in Orilla, Ontario, Canada, and since then in Interlaken, Switzerland (1990), Adelaide, Australia (1994), Sapporo, Japan (1997), Cordoba, Argentina (2000) and Calicut, India (2003). In 2006, the 7th workshop was organized in Noordwijkerhout, The Netherlands, where over 130 scientists from 17 countries worldwide participated and presented their results in 49 oral and 69 poster presentations.

Topics addressed during the PGPR workshops include:

- mechanisms of plant growth promotion and disease suppression
  - traits involved in root colonization by PGPR
  - the role of PGPR in microbial interactions
  - the molecular and biochemical basis of disease suppression and root colonization
  - the role of PGPR in disease-suppressive soils
  - plant responses to PGPR
  - discovery of novel PGPR strains and traits
  - pathogen responses to PGPR
  - risk assessment of PGPR
- production, formulation and delivery strategies of PGPR
  - performance of PGPR in greenhouse trials and agricultural fields
  - registration and commercialization of PGPR

In addition to these topics the 7th meeting focused on recent developments in genomics, proteomics and metabolomics of PGPR. The abstract book is available at <http://www.bio.uu.nl/~fytopath/PDF%20files/abstract%20book%20PGPR%20final.pdf>. Last but surely not least, this meeting was dedicated to the great efforts of several PGPR scientists. These are Jim Cook, Geneviève Défago, Ben Lugtenberg and Kees van Loon. In this special issue of the *European Journal of Plant Pathology*, key contributions are published that give an overview of the work presented at the workshop.

The attendance and excellent contributions by an ever-growing group of young scientists guarantees a healthy future for PGPR research. Our best wishes to David Weller and Joyce Loper who will organize the next workshop in the Pacific Northwest, USA.