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Sommario/riassunto	<p>Growing demographic trends require sustainable technologies to improve quality and yield of future food productions. However, there is uncertainty about plant protection strategies in many agro-ecosystems. Pests, diseases, and weeds are overwhelmingly controlled by chemicals which pose health risks and cause other undesirable effects. Therefore, an increasing concern on control measures emerged in recent years. Many chemicals became questioned with regard to their sustainability and are (or will be) banned. Alternative management tools are studied, relying on biological, and low impact solutions. This ResearchTopic concerns microbial biocontrol agents, root-associated microbiomes, and rhizosphere networks. Understanding how they interact or respond to (a)biotic environmental cues is instrumental for an effective and sustainable impact. The rhizosphere is in this regard a fundamental object of study, because of its role in plant productivity. This e-book provides a polyhedral perspective on many issues in which beneficial microorganisms are involved. Data indeed demonstrate that they represent an as yet poorly-explored resource, whose exploitation may actively sustain plant protection and crop production. Given the huge number of microbial species present on the planet, the microorganisms studied represent just the tip of an iceberg. Data produced are, however, informative enough about their genetic and functional biodiversity, as well as about the ecosystem services they provide to underpin crop production. Challenges for future research work</p>

concern not only the biology of these species, but also the practices required to protect their biodiversity and to extend their application in the wide range of agricultural soils and systems present in the world. Agriculture cannot remain successfully and sustainable unless plant germplasm and useful microbial species are integrated, a goal for which new knowledge and information-based approaches are urgently needed. Growing demographic trends require sustainable technologies to improve quality and yield of future food productions. However, there is uncertainty about plant protection strategies in many agro-ecosystems. Pests, diseases, and weeds are overwhelmingly controlled by chemicals which pose health risks and cause other undesirable effects. Therefore, an increasing concern on control measures emerged in recent years. Many chemicals became questioned with regard to their sustainability and are (or will be) banned. Alternative management tools are studied, relying on biological, and low impact solutions. This ResearchTopic concerns microbial biocontrol agents, root-associated microbiomes, and rhizosphere networks. Understanding how they interact or respond to (a)biotic environmental cues is instrumental for an effective and sustainable impact. The rhizosphere is in this regard a fundamental object of study, because of its role in plant productivity. This e-book provides a polyhedral perspective on many issues in which beneficial microorganisms are involved. Data indeed demonstrate that they represent an as yet poorly-explored resource, whose exploitation may actively sustain plant protection and crop production. Given the huge number of microbial species present on the planet, the microorganisms studied represent just the tip of an iceberg. Data produced are, however, informative enough about their genetic and functional biodiversity, as well as about the ecosystem services they provide to underpin crop production. Challenges for future research work concern not only the biology of these species, but also the practices required to protect their biodiversity and to extend their application in the wide range of agricultural soils and systems present in the world. Agriculture cannot remain successfully and sustainable unless plant germplasm and useful microbial species are integrated, a goal for which new knowledge and information-based approaches are urgently needed.
