

Report proposes microbiology's grand challenge to help feed the world

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A greater focus on the role of microbiology in agriculture combined with new technologies can help mitigate potential food shortages associated with world population increases according to a new report from the American Academy of Microbiology.

"Microbes are essential partners in all aspects of [plant physiology](#), but human efforts to improve [plant productivity](#) have focused solely on the plant," says Ian Sanders of University of Lausanne, chair of the colloquium that produced the report. "Optimizing the microbial communities that live in, on and around plants, can substantially reduce the need for [chemical fertilizers](#), pesticides and herbicides."

The report, How Microbes can Help Feed the World, is based on the deliberation of a group of scientific experts who gathered for two days in Washington DC in December 2012 to consider a series of questions regarding how plant-microbe interactions could be employed to boost [agricultural productivity](#) in an environmentally and economically responsible way.

It starts with a startling statistic: In order to feed the estimated global population of 9 billion in the year 2050, agricultural yields will have to increase by 70-100% .

Improved understanding of plant-microbe interactions has the potential to increase [crop productivity](#) by 20% while reducing fertilizer and pesticide requirements by 20%, within 20 years, according to the report.

These estimates rest on the recognition that all plants rely on microbial partners to secure nutrients, deter pathogens and resist environmental stress.

The report looks in depth at the intimate relationship between microbes and agriculture including why plants need microbes, what types of microbes they need, how they interact and the scientific challenges posed by the current state of knowledge. It then makes a series of recommendations, including greater investment in research, the taking on of one or more [grand challenges](#) such as characterization of the complete microbiome of one important crop plant, and the establishment of a formal process for moving scientific discoveries from the lab to the field.

"New technologies are making plant-microbe ecosystems easier to study and investment in this area of research could have dramatic benefits," says Marilyn Roossinck, Pennsylvania State University, who helped organize the colloquium.

More information: [academy.asm.org/index.php/brow ... -help-feed-the-world](https://academy.asm.org/index.php/brow...-help-feed-the-world)

Provided by American Society for Microbiology

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