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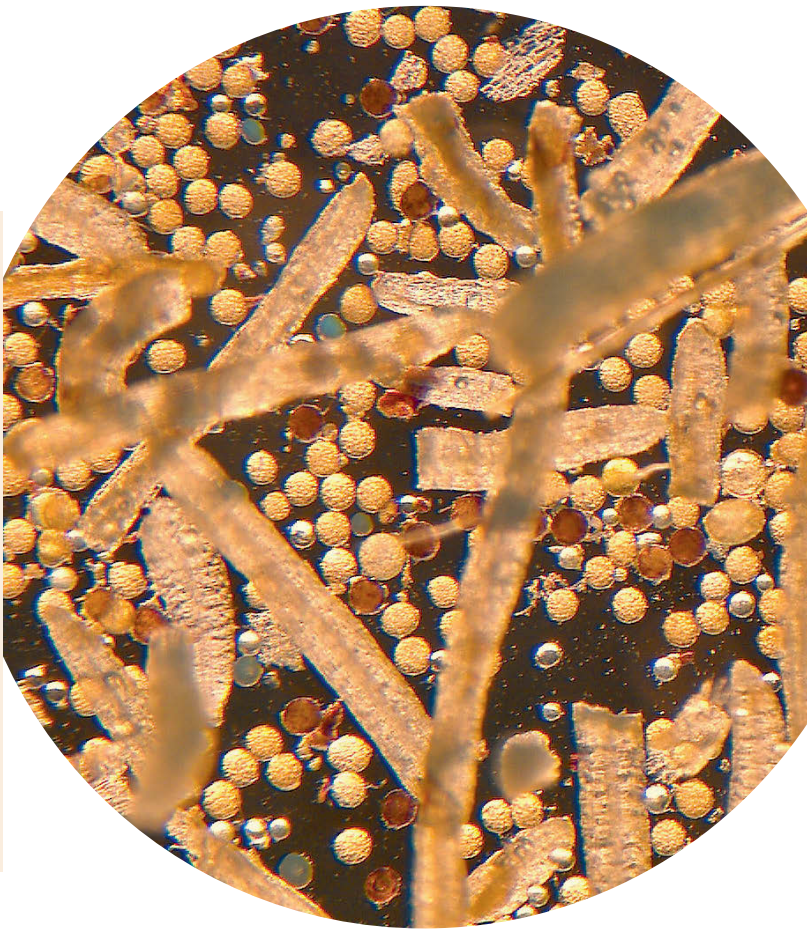
Biofertilisers



In the last years, organic amendments, active natural metabolites or beneficial microbes are discussed as environmentally friendly strategies to reach the goal of a more sustainable crop production. The use of microbial-based inoculants and the exploitation of beneficial interactions with plants has gained increasing interest worldwide. Beneficial microbes can enhance plant growth by increasing their tolerance to adverse soil and environmental conditions or by improving the plants' resource utilisation efficiency. However, developing specific microbial-based inoculants or so called biofertilisers with beneficial effects that are also suitable for agricultural applications under different environmental conditions is challenging. Currently, some commercially available biofertilisers are of low quality or are difficult to apply. This results in a loss of confidence from farmers. However, the quality improvement of microbial-based formulations and the advancements in the understanding of biological mechanisms have continuously helped enhance the efficiency at field level. This fact sheet summarises the latest research findings.

Agriculture and the role of soil microorganisms

The Green Revolution of the 20th century allowed the high increase in global food production. Two main developments characterised it: chemical inputs (such as pesticides, herbicides and chemical fertilisers); and improving crop plants through targeted breeding and genetic manipulations. However, advantages achieved through chemical fertilisation have high environmental costs. In the last few years, there has been a rising demand to reduce the use of chemical products and to develop more sustainable agri-food systems both for environmental and human health. A promising approach to achieve this goal is based on natural inputs with reduced environmental impact, such as the utilisation of microbial-based inoculants and manipulations of the microbial community structure[1].

Soil microorganisms are the most abundant organisms on the Earth; there are more microbes in one teaspoon of soil than there are people on Earth. At an area of one square meter to a depth of 15 cm, there can be up to 500 g of bacteria, 500 g of actinomycetes and 1.5 kg of fungi depending on the type of ecosystem[1]. Some of these are essential for decomposing organic matter and recycling of nutrients, while others form relationships with plant roots and provide important nutrients[2]. Their potential was recognised, leading to their

[1]https://ohioline.osu.edu/factsheet/SAG-16