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Improving Soil Fertility Naturally

An increasing interest has been developed in beneficial microorganisms such as “free-living” rhizosphere bacteria of the genus *Bacillus* as well as non pathogenic and/or antagonistic fungi, which are now being used with vegetables, fruits, and cereals like wheat or rice, the primary global source of food.

The valuable effects of beneficial microorganisms are a complex mix of different mechanisms, which may include N₂ fixation, increased soil porosity and structure, increased water and mineral uptake, plant hormone synthesis including gibberellins and plant protection against pathogenic microorganisms.

Beneficial microorganisms may change nutrients into a form available to plants and when more nutrients become accessible, plant yields are higher. A healthy plant with a healthy rhizosphere, (dominated by beneficial microorganisms) may add value to bio-fertilizers, as they will not only provide supplementary plant nutrients and maintain adequate soil structure, but may also help to control pathogenic microorganisms.

Main constraints to plant productivity are low soil fertility (which includes physical, chemical, and biological properties) and plant diseases, and all these limitations will influence plant growth. Microbial Biotechnology will re-establish soil fertility and protect plants from soil diseases for sustainable soil management.

The use of Microbial Biotechnology has its advantages; in a sustainable agriculture, the product may help to reduce the use of chemical fertilizers and fungicides whilst increasing soil productivity.

The world still knows very little about bio-fertilizers and the interactions between soil microorganisms, soils, and plants; though, farmers are becoming increasingly aware of the value of bio-fertilizers: low-cost products; methods of controlling soil-borne diseases; increased supply of soil nutrients and an environmental friendly scheme.

When the world understands how these interactions occur, Microbial Biotechnology will become an everyday practice; will meet a suitable nutrient management system, and reach the goal of sustainable agriculture.

Microbial Biotechnology is the key for Sustainable Soil Management, restoring the biological activity in the soil and re-building soil productivity for the farming communities in Australia and around the world.

Lack of technical information around the world has limited most farmers from understanding the benefits that Microbial Biotechnology may provide to increase soil production.

Beneficial microorganisms act as bio-fertilizers, for stimulating plant growth and their function as biological control agents, for protecting plants against pathogenic microorganism. These two features (bio-fertilizers and biological control agents) will assist farmers in bringing back unproductive and stressful environments.

What is Microbial Biotechnology?

Microbial Biotechnology is the culture of beneficial microorganisms (bacteria and/or fungi) formulated along with a suitable carrier material that helps the soil improve its nutrient status for proper plant growth and protection for sustainable soil management. The beneficial microorganisms may (1) increase phosphorous uptake, (2) make atmospheric nitrogen available and readily accessible to roots, (3) promote the growth of roots by releasing plant regulation substances, and (4) protect the roots from pathogenic microorganisms to give plants a healthy environment for outstanding growth and performance.

Agriculture's frequent practices such as tillage and site preparation can reduce the population of beneficial microorganisms, which are one of the most important components of the soil. Beneficial microorganisms carry out many important processes, vital for improved soil fertility and plant production. The re-introduction of beneficial microbes using Microbial Biotechnology in areas where they have been reduced will bring back life into the soil, greatly recovering soil quality, and therefore improving plant health and establishment.

Microbial Biotechnology acts as a natural bio-catalizer by assuring a quick colonization of the rhizosphere with beneficial microorganisms that will re-establish a healthy soil and help the plant outperform.

A healthy plant with a healthy rhizosphere, dominated by beneficial microorganisms will make the most to the plant's advantage. Farmers will get real economic benefits by applying biotechnology to their own farming practices.

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