Effect of introduction and/or management of beneficial microorganisms and biocontrol agents on soil processes and plant production.

Organism Species (site)	**Effect on soil properties, biota and processes**	**Effect on the plant**
Arbuscular mycorrhizae (e.g., glomales, agaricales, *Acaulospora, Gigaspora, Scutelospora*, etc.)	Improved soil aggregation, C sequestration, changes in nutrient (esp. P and N stocks), extramatrical hyphae colonization of soil, positive or negative interactions with various soil organisms (nematodes, earthworms, plant pathogens, collembola, rhizobia and rhizobacteria), food for some soil biota	Generally better plant production, but Carbon drain on the plant can sometimes be negative, production of plant growth regulators, changes in plant diversity and structure, improved nutrient (esp. N and P) and water uptake, protection against pathogens, water stress resistence, tolerance to pollutants, interaction with other plants (hyphal links), useful in plant-driven restoration of degraded lands, some plants grow very poorly if not present
Ectomycorrhizae (e.g., *Amanita, Laccaria, Russula, Boletus,* etc.)	Soil aggregation, organic matter mineralization, interaction with other soil organisms, creation of hartig nets, mantles, rhizomorphs and mushrooms (external features of fungus), food for some soil biota	Similar to arbuscular mycorrhizae, many plants grow very poorly or not at all when fungi absent
Rhizobia (e.g., *Rhizobium, Bradyrhizobium, Allorhizobium,* etc.)	N inputs into the soil, interaction with other soil biota (esp. rhizobacteria and mycorrhizae)	Production of nodules that fix N_2 and provide the plant with N, better plant growth, particularly when native rhizobia for plant are not present or compatible
Frankia (Actinomycetales)	N inputs into the soil, interaction with other soil biota (e.g., mycorrhizae, earthworms)	Nodule formation and N_2 fixation provide the plant with N, improving growth; similar effects as rhizobia
Endophytic Diazotrophic Bacteria (e.g., *Azotobacter, Azospirillum, Acetobacter*, etc.)	N inputs into the soil, interaction with other soil biota, esp. rhizobacteria	Release hormones in the colonized root that increase plant growth, higher root hair density, changed morphology
Other plant growth promoting bacteria (seed inoculants) (e.g., pseudomonads, bacili)	Greater nutrient availability and release, secondary metabolites, interaction with endo- and ecto-symbionts and other soil biota, lower plant pathogen populations (biocontrol)	Release hormones in the rhizosphere that affect plant growth, generally positively, greater plant systemic resistance
Biocontrol fungi (e.g., *Arthrobotrys Fusarium, Rhizoctonia, Metarrhizium, Trichoderma* and *Nematophthora*)	Antibiotics, parasitism or competition with disease pathogen, death of the parasites and insect pests in soil, often non-target effects on and interactions with other organisms	Induced systemic resistance and indirectly, by death of the insect and nematode (eggs, cysts and juveniles) pests and disease agents (generally other fungi)
Suppressive soils	Lower pathogen and parasite abundance and/or activity in root zone by antibiosis, parasitism and competition	Induced systemic resistance and enhanced yields over areas in field or agroecosystem where suppressiveness is absent
Biocontrol nematodes	Reduced populations and	Reduced lesions to roots and

(entomopathogens and for disease control)	activity of root and shoot feeding insect pests and pathogenic fungi, greater nutrient release, interaction with other organisms (e.g., reduction in mycorrhizae)	root rots, lower disease incidence