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Biological Disease Control — Grow Your Own©

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INTRODUCTION

"Planting" or applying very small dormant propagules of beneficial microbes to your rooting medium can result in a population of organisms that provide many benefits including protecting your plant roots from disease. While the "crop" doesn't produce a plant of above-ground beauty or utility, some biological fungicides can result in hairy, disease-free, vigorous roots, which to a grower, are beautiful things!

I will be focusing on biological fungicides for root disease control. When approached with a new product to try, the first level of evaluation is to determine if it is EPA/DPR registered. Registered products have at least been screened for a basic level of efficacy against root diseases. Currently, the more commonly used biological fungicides are either bacterial or fungal organisms (Table 1). These include:

Table 1. List of some microbial pest control agents.

Product/type/REI	Primary source	Organism	Formulation/reapp
Actinovate® (bacterium) [REI-1]	Natural Industries, Inc.	*Streptomyces lydicus* (WYEC 108)	Powder (season long)
Actino-Iron (bacterium [REI-4]	Natural Industries, Inc.	*Streptomyces lydicus* (WYEC 108)	Granular (season long)
CEASE® (bacterium) [REI-4]	BioWorks, Inc.	*Bacillus subtilis* (QST 713)	Liquid (3–4 weeks)
Companion® (bacterium) [REI-4]	Growth Products, Inc	*Bacillus subtilis* (GB03)	Liquid (2–4 weeks)
Mycostop® (bacterium) [REI-4]	Verdera Oy	*Streptomyces griseoviridis* (K61)	Powder (2–6 weeks)
PlantShield® HC (fungus) [REI-0]	BioWorks, Inc.	*Trichoderma harzianum* strain T-22	Powder (10–12 weeks)
RootShield® (fungus) [REI -0]	BioWorks, Inc.	*Trichoderma harzianum* strain T-22	Powder or granules (10–12 weeks)
SoilGard 12G (fungus) [REI-0]	Certis USA, LLC	*Gliocladium virens strain GL-21*	Granules (1–4 weeks as needed)

STRENGTHS AND WEAKNESSES (VARY BY PRODUCT)

- Frequency of application
- Sensitivity to other inputs (Cu, H_2O_2, etc.)
- Mixing and prep complexity
- Disease spectrum
- Solubility or practicality of rate
- Shelf life, storage conditions