***Streptomyces* for Biological Control of Pathogenic Fungi and Nematodes**

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Streptomyces are a group of antibiotic-producing bacteria that are found commonly in agricultural soils. Typically *Streptomyces* populations in soil are in the range of 10^5-10^7 colony forming units/g soil. Fumigation with methyl bromide eliminates this group of bacteria and they are slow to recolonize previously fumigated soils. *Streptomyces* isolates are important for the ecology of soils as they degrade recalcitrant substrates such as chitin and lignin and produce a variety of antibiotics. The diversity of *Streptomyces* species in non-fumigated soil is typically very high, but the taxonomy and ecology of this group are not well understood.

Entomos has a collection of *Streptomyces* isolates initially selected from soils on the basis of chitinolytic activity and antibiotic properties. Isolates were screened *in vitro* for activity against fungal pathogens, including *Fusarium*, *Pythium*, *Colletotrichum* and *Rhizoctonia*. Isolates have been identified that have significant antifungal activity *in vitro* with no phytotoxic effects on plants. Greenhouse and microplot trials with selected isolates are being conducted. Additional plot and field trials are planned.

Selected isolates were also screened for activity against plant parasitic nematode eggs *in vitro*. Parasitization of *Meloidogyne arenaria* eggs by *Streptomyces* isolates inoculated onto water agar plates was shown to prevent nematode hatch. *Streptomyces* spores from selected isolates applied to soil of tomato plants at 10^5 spores per gram of soil and inoculated with *Meloidogyne arenaria* eggs, significantly reduced the production of root galls in greenhouse pot tests.

The goal of Entomos is to develop a soil amendment based on selected *Streptomyces* species with a chitin carrier to suppress soil-borne pathogenic fungi and nematodes. Additional research is being conducted and further pot and field trails are being planned. Products containing *Streptomyces* are promising candidates as methyl bromide alternatives as they offer the possibility of broad-based control against both pathogenic fungi and nematodes. The mode of action of this activity includes the production of chitinase enzymes as well as various anti-fungal substances. Development of these products will involve the low-cost mass-production of natural organisms without genetic modification. This approach will significantly reduce the regulatory issues.