

Pasteuria for Nematode Control : Development of a Commercial Production Process

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Abstract

Bacteria of the genus *Pasteuria* have long been recognized as promising biological control agents for plant-parasitic nematodes. They have been shown to reduce root-knot nematode damage below economic threshold levels and to improve crop yields. *Pasteuria* endospores, the active ingredient applied to crops, are very desirable as nematode control products due to their inherent resistance to heat, drying and mechanical shearing. *Pasteuria* is highly host-specific and has an excellent safety profile. It has never been produced commercially due the inability of researchers to grow it in the absence of a nematode host, thus precluding the use of large-scale, low-cost production methods. Pasteuria Bioscience has developed a production process using submerged fermentation, which has allowed us to produce active endospores in benchtop fermenters. Submerged (liquid culture) fermentation is well-understood as an economical production method for a huge variety of industrial products, including biopesticides. Our process models indicate that production of *Pasteuria* will be possible at costs competitive with chemical nematicides, using standard fermentation equipment.

We have conducted tests of *Pasteuria* endospores produced in-vitro for nematode control activity and have found them to be as effective or better than in-vivo endospores in these experiments. In addition, we can produce endospores of *Pasteuria* isolated from Sting nematode, and have demonstrated growth of *Pasteuria* from Cyst, Lance and Lesion nematodes in tissue culture plates. Products controlling this group of nematodes will allow us to become an integral part of pest management strategies in a wide variety of crops, including turf, tomato, strawberry, vegetables, peanut, soybean and sugar beet.



Carrots infested with root-knot nematodes



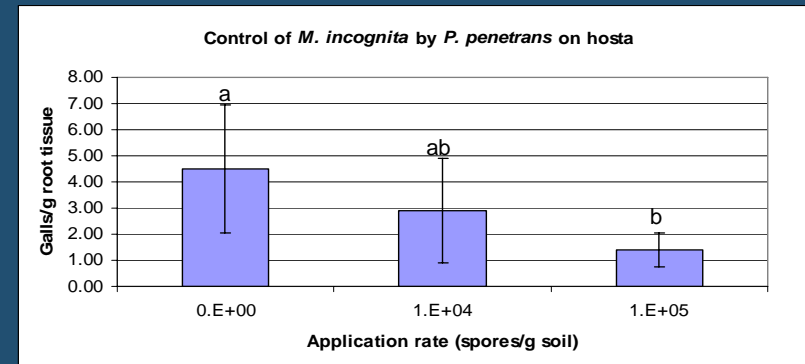
Soybeans dying due to cyst nematode damage



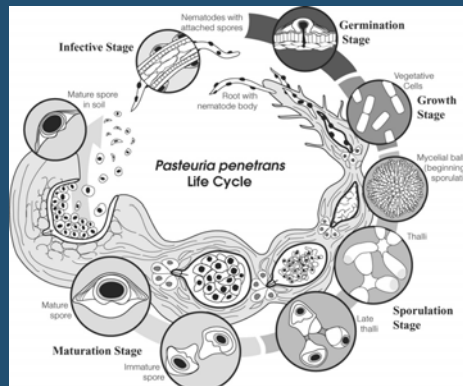
Plot trial for control of root-knot nematode on ornamental plants (hostas)



Benchtop fermentation producing *Pasteuria* endospores



Results of plot trial showing statistically significant control



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