EFFICACY OF GRANULAR *PASTEURIA USGAE* FOR CONTROLLING STING NEMATODES IN TURFGRASSES AND GOLF GREENS.

L. J. Simmons*, K. S. Smith, T. E. Hewlett, and J. P. Waters. Pasteuria Biosciences, Inc., Alachua, FL.

Pasteuria Biosciences, Inc. has developed a granular product for controlling sting nematodes (*Belonolaimus longicaudatus*) in turfgrasses and golf greens utilizing the biological control agent *Pasteuria usgae*. Technologies developed at Pasteuria Biosciences have allowed for practical and economical, large-scale *in vitro* production of these bacteria that are obligate parasites of nematodes in nature. The *Pasteuria usgae* product as well as other *Pasteuria* spp. products being developed at Pasteuria Bioscience are highly host-specific and can only parasitize the target nematode pests; therefore, they are apparently safe for human handling and have no deleterious effects on the non-target soil microflora.

Nemacur® will only be available for turf use as long as stock-piles remain, leaving the fumigant, Curfew® (1,3-dichloropropene), as the only practical nematicide registered for use on turf. Knife-injection into expensive greens, re-entry periods, limitations to annual treatments, and costs over $0.08 per treated square foot make this an unattractive option in many situations. Sting nematodes can cause such devastating damage to high-value turf, such as golf greens, that these methods of treatment are often accepted.

Pasteuria Bioscience has developed a granular product using *P. usgae* for use on golf greens and turf. The product can easily be calibrated and applied using equipment typically found at a golf course or sports field as the granule is very similar to typical greens-grade topdressing granules like Profile™. First-year field trial results using granular *P. usgae* at 17 locations on golf-greens and sport turfgrasses located throughout the southeast are very promising. Nematodes in *Pasteuria*-treated plots were typically parasitized with the bacteria and the number of healthy nematodes were also fewer at most test sites (Figures 1 – 4). In some locations these numbers were reduced below the economic threshold of the nematode (Figures 1 and 2). Along with the positive results attained from the initial field testing, a great deal of information has been collected on how to optimize the efficacy of the product and potentially reduce rates. The U.S. registration process of this product is underway and a commercial launch of the product could be as soon as fall of 2009.

Liquid formulations of the product that can be applied via drip irrigation have been developed and efforts are underway to investigate the potential use or uses in Florida strawberries. Since there is no phytotoxicity caused by *Pasteuria* nor any residue or toxicological concerns associated with the product, it can be applied post-planting to control sting nematodes throughout the season unlike other products registered for strawberries.

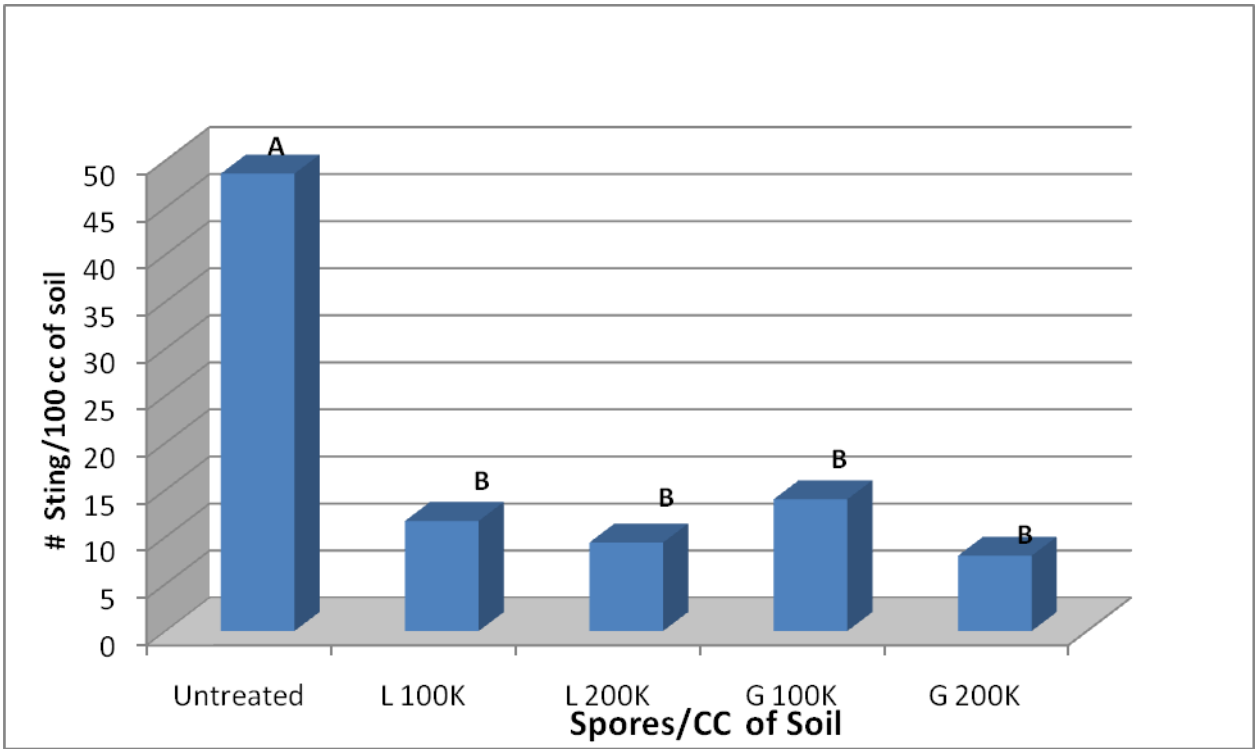

Figure 1: Total number of sting nematodes 14 days after treatment with liquid and granular formulations of *Pasteuria usgae* at the Francis Lake Country Club in Georgia (2008).

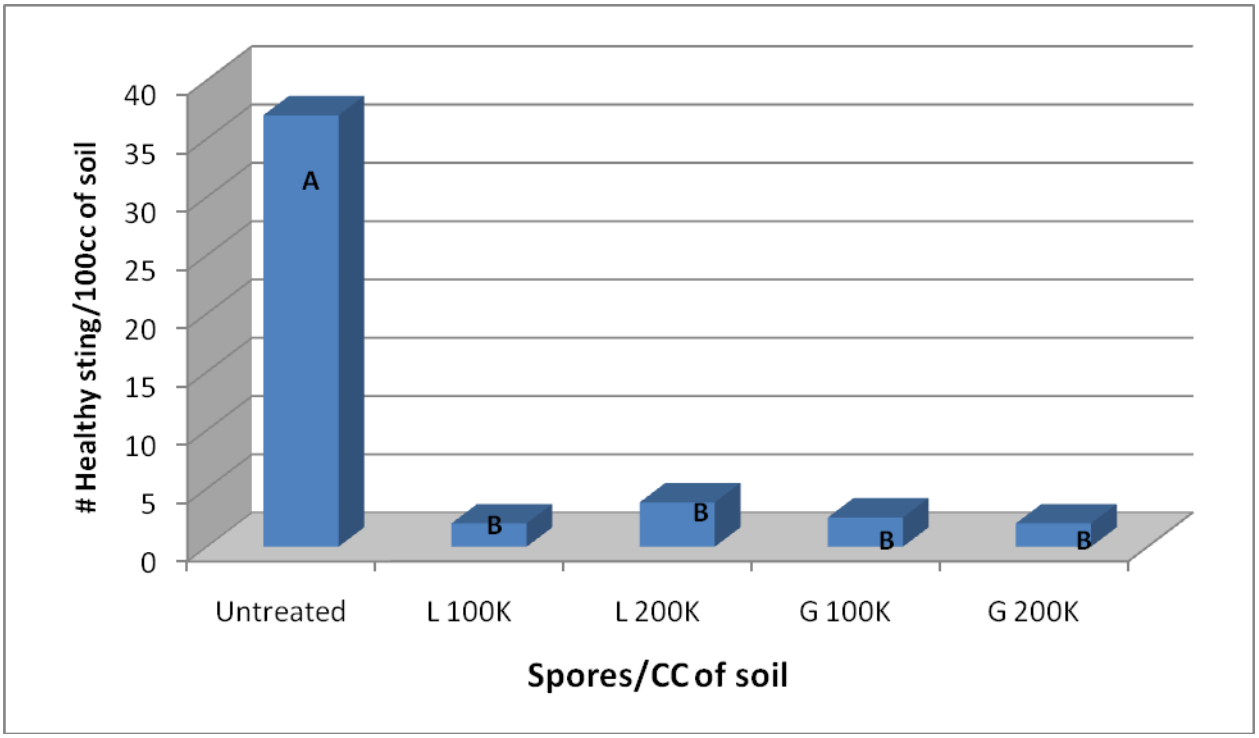

Figure 2: Number of healthy sting nematodes 14 days after treatment with liquid and granular formulations of *Pasteuria usgae* at the Francis Lake Country Club in Georgia (2008).

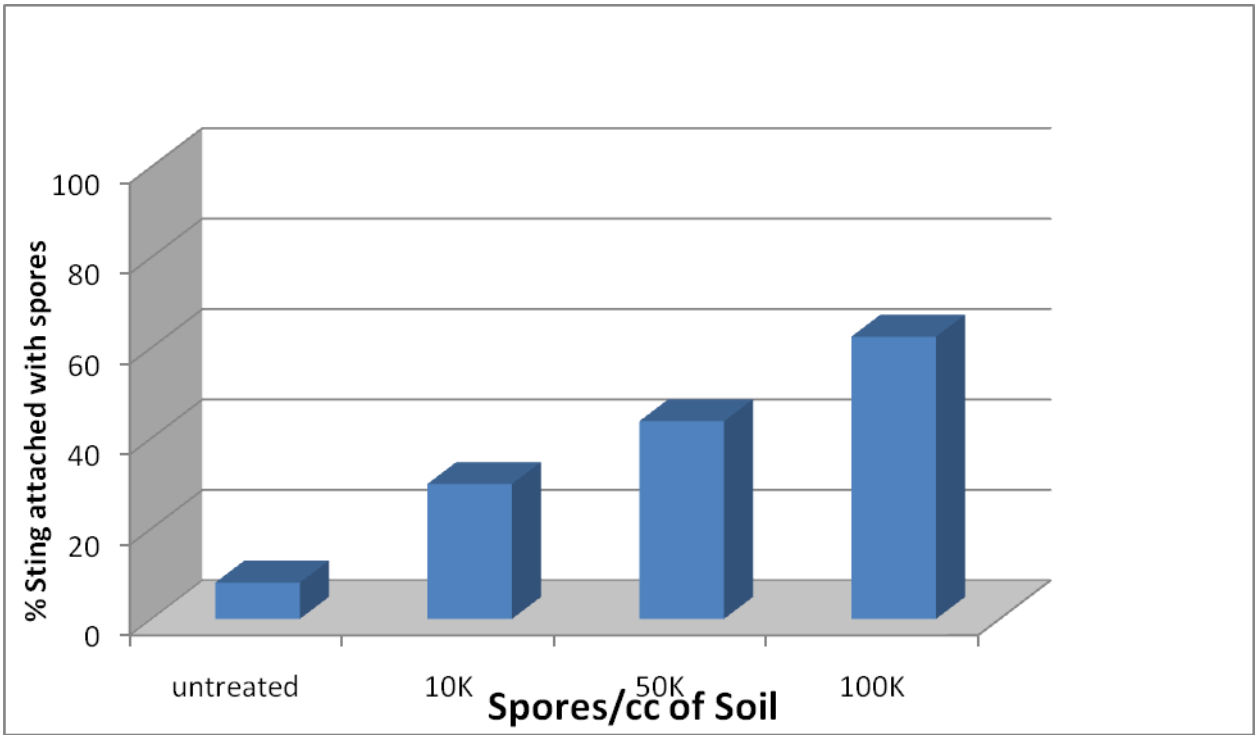

Figure 3: Percentage of sting nematodes 14 days after treatment with *Pasteuria usgae* attached from the Mt. Dora Country Club in Florida (Fall, 2007).

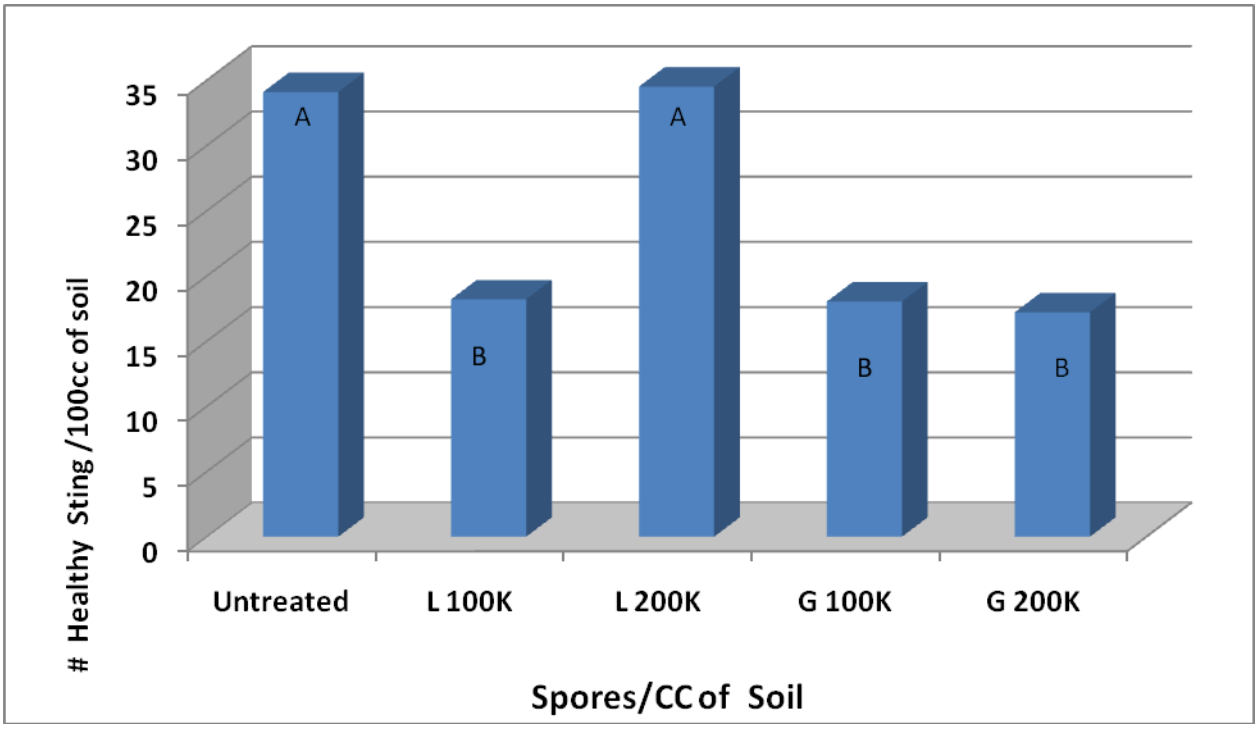

Figure 4: Number of healthy sting nematodes 14 days after treatment with liquid and granular formulations of *Pasteuria usgae* at the Raleigh Golf Association in North Carolina (2008).