Pasteuria sp. for Biological Control of the Sting Nematode, *(Belonolaimus longicaudatus)*, in Turfgrass

Dr. Robin Giblin-Davis

University of Florida

Goals:

- *Examine bacteria ultrastructure with transmission electron microscopy and begin describing a new species of Pasteuria that was discovered parasitizing the sting nematode, Belonolaimus longicaudatus.*
- *Perform host range studies on this new Pasteuria sp.*
- *Begin studies to elucidate the population dynamics of this new Pasteuria sp. on sting nematode grown on St. Augustinegrass in laboratory pot cultures under controlled conditions.*

A new species of Pasteuria (S-1) was discovered that parasitizes the sting nematode, *Belonolaimus longicaudatus*. Host range studies with several species of soil inhabiting nematodes have demonstrated that this obligate endoparasitic bacterium only attaches to members of the genus of *Belonolaimus*. Ultrastructural and morphometric studies of mature and developing endospores with transmission and scanning electron microscopy (TEM and SEM) have shown that this *Pasteuria* is unique relative to the other described species of Pasteuria. However, different geographical isolates are morphologically and morphometrically constant.

A two-year survey of *Pasteuria* (S-1) was conducted at six different hybrid bermudagrass (fairway) sites at the Ft. Lauderdale Research and Education Center. Within these sites, *Pasteuria* (S-1) was naturally present at different levels and was monitored for its suppressive effects at three different soil depths on sting nematodes. Density dependent regulation of sting nematodes appears to be occurring in areas with *Pasteuria* (S-1). Survey locations that started with low levels of spore encumbrance showed a building trend in encumbrance levels and a corresponding decline in the numbers of sting nematodes. Locations with high spore encumbrance levels cycled and appeared to suppress sting nematode population resurgence, suggesting that *Pasteuria* (S-1) might help produce suppressive soil for the sting nematode in

the turfgrass ecosystem.

An eighteen-month study was completed that compared the effects of inoculation with 900 ml of *Pasteuria* (S-1) spore-infested soil (approximately 5,000 endospores/ml) versus 900 ml of autoclaved soil in square meter *TIFDWARF* bermudagrass (putting green) plots. This study showed that a relatively small amount of Pasteuria-infested soil can be introduced into a USGA green with high numbers of sting nematodes and bring about density dependent suppression within about 12 months.