Bermudagrass and Seashore Paspalum Cultivar Response to the Sting Nematode

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Objectives:

1. Determine the range of response (resistance or tolerance) of bermudagrass and seashore paspalum cultivars to the sting nematode and identify the best performing cultivars.
2. Investigate if a proposed alternative method for assessing sting nematode response is as effective, or more efficient, than traditional methods.

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A major limitation of planting turfgrasses in the sandy soils of Florida is the destruction of roots by the sting nematode (*Belonolaimus longicaudatus*). Spiral nematodes (*Helicotylenchus* spp.) are also frequently found in high numbers (>500 nematodes/cm^3 soil) on seashore paspalum in Florida. Utilization of resistant and tolerant turfgrass cultivars is one of the most environmentally safe nematode management practices. Several commercial cultivars of bermudagrass and seashore paspalum have been tested for their responses to *B. longicaudatus* or *H. pseudorobustus* under greenhouse conditions. However, information is lacking with respect to their responses under field conditions or multiple nematode species in the field.

In May 2008 and April 2009, two field studies were conducted separately through 2010. Nematode population densities in each plot were assayed on the same day the plots were planted. Soil samples were subsequently collected every 90 days after planting. Turfgrass health was determined by evaluating root lengths and turf density every three months throughout the turf growing season.

Population densities of *B. longicaudatus* exhibited variable changes from 2008 to 2010 for the bermudagrass cultivars studied. *Belonolaimus longicaudatus* populations increased in 'Champion' (37%) and 'Mini Verde' (40%); and dropped in 'Tifgreen' (4%), 'TifEagle' (18%), and 'Celebration' (27%), 'Floradwarf' (32%), 'Tifway' (33%), and 'TifSport' (93%). Population densities of *B. longicaudatus* were not different among dwarf bermudagrass cultivars, but remained the lowest in 'TifSport'.

Population densities of *B. longicaudatus* in 'TifSport' continuously declined from 102 to 7 nematodes/cm^3 soil, which indicated resistance to *B. longicaudatus*. However, 'TifSport' was a good host to *H. pseudorobustus*, whose population densities increased from 6 to 744 nematodes/cm^3 soil (124 fold) from 2008 to 2010. Nematode densities of other bermudagrass cultivars remained below 180 nematodes/cm^3 soil. 'TifSport' appeared to be more effective at suppressing the reproduction of *B. longicaudatus* in field.

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Seashore paspalum was a better host to *H. pseudorobustus* than *B. longicaudatus*. The population densities of *H. pseudorobustus* increased 177-, 106-, and 214-fold, while population densities of *B. longicaudatus* decreased by 69, 96, and 86%, respectively, in the seashore paspalum cultivars, 'Aloha', 'SeaDwarf', and 'Sea Isle I' within the two years. 'SeaDwarf' was the most effective seashore paspalum cultivar at suppressing the reproductive capabilities of *B. longicaudatus* in field.

Interactions were found between *B. longicaudatus* and *H. pseudorobustus*. *H. pseudorobustus* had a suppressive effect on the reproduction of *B. longicaudatus* in all seashore paspalum cultivars studied and for 'TifSport' and 'Celebration' bermudagrass. The interaction between the two nematode species was not apparent for other bermudagrass cultivars. This effect may be host-dependent and could vary with different species and cultivars.

Nematodes affected the total root length and turf density of the turfgrass cultivars. A negative linear relationship was found between the population density of *B. longicaudatus* and the total root length as well as turf density of 'Celebration' bermudagrass. A negative relationship between the population density of *B. longicaudatus* and the turf density of 'Aloha' was also identified. A negative linear relationship between the population densities of *H. pseudorobustus* and the total root length, as well as turf density, was found in 'Floradwarf' bermudagrass, and for total root length of 'Tifgreen' and turf density of 'TifEagle'. Regression analysis indicated that 'Celebration' bermudagrass and 'Aloha' seashore paspalum may be intolerant to *B. longicaudatus*, while 'Floradwarf', 'Tifgreen', and 'TifEagle' bermudagrasses could be intolerant to *H. pseudorobustus.*

Summary Points

- Bermudagrass is a better host to *B. longicaudatus*, and seashore paspalum is a better host to *H. pseudorobustus*.
- *Belonolaimus. longicaudatus* was a better competitor than *H. pseudorobustus* in bermudagrass cultivars other than 'TifSport', and *H. pseudorobustus* was a better competitor than *B. longicaudatus* in seashore paspalum cultivars.
- Population densities of *B. longicaudatus* were not different among dwarf bermudagrass cultivars, but remained the lowest in 'TifSport' among the non-dwarf cultivars.
- 'TifSport' bermudagrass and 'SeaDwarf' seashore paspalum were best for suppression of *B. longicaudatus* densities in the field.
- 'Celebration' bermudagrass and 'Aloha' seashore paspalum showed intolerance to *B. longicaudatus*, and 'Floradwarf', 'Tifgreen', and 'TifEagle' bermudagrasses were intolerant to *H. pseudorobustus*.