Studies on a *Meloidogyne* sp. (root-knot nematode) occurring in Coachella Valley turf grasses

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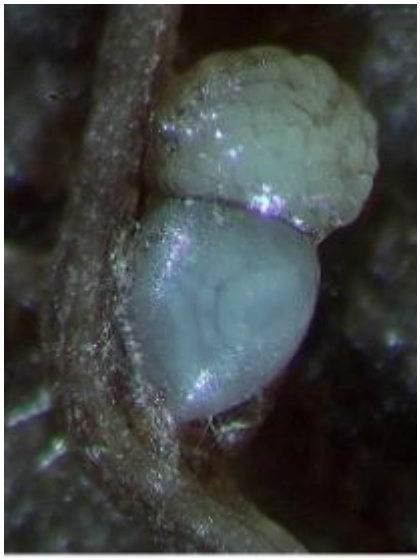
A severe decline in bentgrass *(Agrostis palustris cv Penn A-4)* occurred in all greens of a private golf club near Palm Desert, CA. In contrast, none of the Bermuda grass fairways and roughs *(Cynodon dactylon cv Tiff)* or ornamental landscape plants appeared to have similar problems. Bentgrass roots and soil sampled from affected areas contained high population densities of root-knot nematodes *(Meloidogyne sp.).* They were also present in samples from the fairways but they were not recovered from landscape plantings. Declining bentgrass had characteristic root galls with light to dark brown discoloration indicating advanced stages of root senescence. Such symptoms are often associated with secondary microbial infections that follow the initial root invasion by endoparasitic nematodes. For laboratory and greenhouse studies a root-knot population was raised on bentgrass from a single egg mass obtained from a parasitized root. In the past, root-knot nematodes in Coachella Valley turf were primarily identified as the barley root-knot nematode, *M. naasi*. However, in contrast to *M. naasi*, the bentgrass nematode exhibited an exclusive preference for the family of true grasses (Poaceae). Morphological and mitochondrial DNA phylogenetic analysis suggested a very close relationship to *M. graminis*. The nematodes were incubated under axenic conditions on excised corn roots. Such culture is a valuable research tool to study the nematode's life cycle and parasitism. The transparent medium allowed undisturbed microscopic observations of host-parasite interactions that are normally hidden in the soil environment. Based on such controlled condition studies and greenhouse experiments in temperature tanks, base temperature and heat sum for the completion of the life cycle were estimated at 8.4˚C (47.1˚F) and 500 degree-days, respectively. At an optimum temperature of 29˚C (84.2˚F) the life-cycle of the nematode was completed in approximately 24 days. Greenhouse studies at 25˚C (77˚F) with increasing population densities of the root-knot nematode did not result in significant growth reductions in ‘Penn A-4’ bentgrass despite causing abundant root galling. We hypothesize that the observed bentgrass decline required temperature stress and/or interactions with soilborne fungal pathogens in addition to a high root-knot nematode population density.



A grass root parasitized by a female root-knot nematode (with egg sack).