TEMPORAL STUDY OF THE INTERACTION BETWEEN *Meloidogyne incognita* and *Thielaviopsis basicola* ON COTTON

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Meloidogyne incognita and *Thielaviopsis basicola* are both important cotton pathogens in Arkansas. When these two pathogens co-infect cotton plants, disease severity increases dramatically. This interaction also expands the temperature ranges at which both pathogens cause damage to the plant, allows the fungus to colonize the root vascular tissue and decreases *M. incognita* reproduction. The objective of this study was to understand the nature of this interaction by examining the spatial and temporal relationship between *M. incognita* and *T. basicola*. A soil from Ashley county, Arkansas, with a long history of the presence of both pathogens was used. Soil was pasteurized at 60ºC for 30 minutes. Soil was infested with *M. incognita* at 8 eggs/cc soil and *T. basicola* at 20 chlamydospore chains/g soil. Treatments included non-infested soils; infested with one or both pathogens at planting, 10 days after planting (DAP) or 20 DAP; plants grown in infested soil with one or both pathogens for the first 10 or 20 DAP and then removed and planted in pasteurized soil; and soil infested with *T. basicola* or *M. incognita* at planting, and then the other pathogen was added 10 or 20DAP. Pots were watered to saturation at –10 joules/kg the first 21 days and –30 joules/kg from 22 to 44 days. This experiment was run twice in controlled environmental chambers with 14 hours of light at 15ºC and 24ºC (day and night, respectively) during the first 21 days and at 26ºC and 24ºC from 22 to 44 days. Plant growth, root discoloration, root colonization by *T. basicola* and galling by *M. incognita* were measured. Plant height was reduced by each pathogen and their interaction. Reduction in plant height was greater with both pathogens and for treatments when both pathogens were present earlier and when pathogen duration in the soil was longer. However, the effect of the interaction of the pathogens on plant growth was not affected by which pathogen was introduced first in the soil. The earlier presence of *M. incognita* in the soil increased galling. However, galling was reduced by the earlier occurrence of *T. basicola*. Root colonization and discoloration by *T. basicola* increased when the fungus and its interaction with the nematode occurred earlier and their interaction with the plant was longer. This study suggests that an earlier presence and a longer duration of either pathogen caused greater reduction in plant growth and nematode survival. Apparently, either pathogen can infect the plant first for the interaction to take place.