

**INFLUENCE OF SOIL BULK DENSITY ON THE INTERACTION BETWEEN *MELOIDOGYNE*
INCOGNITA AND *THIELAVIOPSIS BASICOLA* ON COTTON**

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Abstract

Meloidogyne incognita (Mi) and *Thielaviopsis basicola* (Tb) are widely distributed in cotton production areas in Arkansas. The distribution of both pathogens within cotton fields is influenced by the soil texture, with *T. basicola* reproduction and black root rot severity being greater in fine soil textures, while *M. incognita* reproduction and galling are greater in coarse soil texture. Nevertheless, when both pathogens are in the same soil, a synergistic interaction may occur resulting in areas with severe stunting and yield reduction. Greater soil bulk density has been associated with these stunted areas. The impact of soil bulk density on cotton growth, *M. incognita*, *T. basicola* and their interaction was studied. Soil bulk densities of 1.25 and 1.5 g/cc were established using a pasteurized soil (54% of sand) and soil was infested with one of four treatments: 1) noninfested control, 2) Mi - 4 eggs/cc, 3) Tb - 40 chlamydospores chains/cc or 4) Mi - 4 eggs/cc + Tb - 40 chlamydospores chains/cc. Pots were watered to saturation at -20 joules/kg. Plant root and top dry weight were reduced by *M. incognita* and *T. basicola* in both bulk densities. The interaction between both pathogens resulted in a greater reduction in plant nodes at both soil densities compared to either pathogen alone. The presence of *T. basicola* reduced galling. Root colonization by *T. basicola* was reduced at the higher bulk density and increased by the presence of the nematode. Soil bulk density had a greater impact on *T. basicola* than *M. incognita* and plant growth in this study where soil water content was controlled.