IMPACT OF SOIL TEXTURE ON THE REPRODUCTION AND DAMAGE POTENTIAL OF MELOIDOGYNE INCOGNITA AND THIELAVIOPSIS BASICOLA, AND THEIR INTERACTION, ON COTTON

Juan de Dios Jaraba
C. S. Rothrock
Department of Plant Pathology, University of Arkansas
Fayetteville, AR
T. L. Kirkpatrick
University of Arkansas
Hope, AR

Abstract

Meloidogyne incognita and *Thielaviopsis basicola* cause significant losses on cotton in Arkansas. When they are in the same field, a synergistic interaction may occur. Microplot experiments at Fayetteville and Hope, Arkansas, examined the impact of soil texture on cotton growth and pathogen reproduction and survival. Sandy loam soils (48% sand) were used and artificial soil textures were produced by mixing these soils with sand (texture range 54 to 91% sand). Soils were pasteurized and six treatments were applied: 1) noninfested, 2) *M. incognita* - 4 eggs/cc, 3) *M. incognita* - 8 eggs/cc, 4) *T. basicola* (100 chlamydospores/g), 5) *M. incognita* - 4 eggs/cc and *T. basicola*, and 6) *M. incognita* - 8 eggs/cc and *T. basicola*. Soil water was controlled by watering each soil texture to saturation at –10 or -30 joules/kg (early and late season, respectively). For 2007, plant height and weight were reduced as sand content increased, and by *M. incognita* and *T. basicola*. Both pathogens also reduced plant nodes and root weight. In addition, *M. incognita* delayed fruiting. Root discoloration and colonization by *T. basicola* decreased in the sandiest soil. The interaction of *T. basicola* and *M. incognita* resulted in a reduction in galling and *M. incognita* reproduction. *T. basicola* reproduction was reduced in the sandiest soil textures, whereas *M. incognita* reproduction was higher in soils containing more sand. Soil texture had a greater impact on *T. basicola* than on root-knot nematode for the soil textures used in this study where soil water content was similar across textural treatments. However, in field conditions, changes in soil texture may have a greater impact on both pathogens and their interaction as a result of greater differences in soil water over soil textures.