

**INFLUENCE OF DIFFERENT ENVIRONMENTAL CONDITIONS ON THE
EPIDEMIOLOGY OF THE COTTON SEEDLING DISEASE COMPLEX**

N.M. Gomaa and C.S. Rothrock

University of Arkansas

Fayetteville, AR

Samy Moustafa-mahmoud

ARC

Giza, Egypt

Producers often plant cotton early to increase the growing season and avoid late season insect damage or inclement weather at harvest. Poor stands and more seedling diseases are often associated with early planting. Early planting increases the chance of low temperatures and rainfall that may predispose cotton to different seedling disease pathogens. Cotton, nontreated and fungicide treated seed, was planted in 2002 and 2003 in Crittenden and Ashley County, Arkansas, at several planting dates to examine the effect of environment on cotton stand and the epidemiology of cotton seedling diseases. Seeds or seedlings were collected at 1, 2, 4, 7, 10, 15, 21 and 28 days after planting from each planting date, rinsed with water to remove soil, surface sterilized and plated on water agar to isolate *Pythium* spp., *Rhizoctonia solani*, and other fungi and on the selective medium TB-CEN to isolate *Thielaviopsis basicola*. Lower stands occurred in 2002 compared with 2003 and early plantings usually had lower stands compared to late plantings. Of the environmental factors studied, temperature represented as day-degree (days until the cumulative difference of the mean daily temperature to 12°C reached 80) was the most important factor affecting cotton stand. A negative correlation was found between day-degree and both fungicide treated and nontreated stand. Day-degree also affected the amount of disease; as day-degree increased the disease pressure increased. Of the pathogens responsible for seedling disease, *R. solani* was the most important pathogen affecting disease severity. Both *R. solani* and *Pythium* spp. were isolated from cotton plants 24 h after planting, whereas *T. basicola* was isolated from plants only after 4 days. Of the environmental conditions studied, wet cold soils increased cotton root colonization by *T. basicola*. Cold soils increased colonization by *R. solani*. For *Pythium* spp., drier soils had lower colonization than wetter soils. Percent *R. solani* isolation was a good indicator of disease severity when the temperature was low, as temperature increased there was little value in the isolation data for estimating disease severity. Fungicides increased cotton stands in both years, but the fungicidal effect was higher in 2002 than 2003. Fungicide seed treatments also reduced the isolation of different cotton seedling disease complex pathogens, especially during the first four days after planting.