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NATIONAL PEANUT BOARD/SOUTHEAST PEANUT
RESEARCH INITIATIVE
QUARTERLY PROGRESS REPORT FOR WORK
DONE UNDER RESEARCH AGREEMENT _____

Quarter ending
June 30, 2004

INSTITUTION: USDA-ARS, National Peanut Research Laboratory

PROJECT TITLE: The Effect of Tomato Spotted Wilt Virus on the Physiological Water Use and Drought Response in Peanut Cultivars and the Interaction with Aflatoxin

RES. AGR. NO.: Not available

PROJECT LEADER: Dr. Diane Rowland

EXPIRATION DATE: December 31, 2004

SPRI CONTACT: Emory Murphy

NPB CONTACT: Stephen O'Brien

REPORT OF PROGRESS:

The specific objectives for this research were: 1) *quantify the physiological responses to TSWV infection, especially related to water use, in different peanut varieties subjected to late season drought, and 2) examine the interaction of TSWV with aflatoxin production to determine if physiological mechanisms may impart more resistance to TSWV or aflatoxin production in some varieties.* During May of 2003, plots were established and planted, and permanent identification of 50 plants from the three varieties, Georgia Green, NCV-11, and ANorden, was completed. These three varieties represent a continuum of TSWV susceptibility. To date, we have completed data collection on the progression of TSWV and INSV for four sampling periods since planting. We have also completed measurement of the decrease in physiological activity including water use due to these diseases by comparing symptomatic and asymptomatic leaf tissue on three dates. On 25 July 2003, a drought was imposed by using an existing shelter at the National Peanut Research Lab so that final infection of TSWV and INSV could be correlated with final aflatoxin production in order to determine the relationship between the two. Final harvests were completed by September 2003, and tissue analyses/grades were completed by December 2003. Initial data analysis has been completed. We have documented the progression of TSWV and INSV in belowground (root, peg, kernel) tissue and aboveground (leaf tissue). We have also documented significant differences in physiological activity among varieties and how this relates to a response to TSWV. These results will be presented at the 2004 American Peanut Research and Education Society's annual meeting on July 10th. We are continuing these experiments during the 2004 growing season to validate these first year responses and expand characterization of varietal physiological profiles. At the end of this time, we expect to provide information to growers quantifying the amount of yield loss they can expect with the severity of TSWV symptoms they observe and the increased risk from aflatoxin contamination. Funding from the NPB for this research was for a single year running July 2003 through June 2004.