

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

INSTITUTION: University of Georgia

PROJECT TITLE: Development of Peanut Cultivars with Improved Water Use Efficiency and
Development of Peanut Cultivars with Resistance to the Peanut Root-knot
Nematode and TSWV

RES. AGR. NO.: 25-21-RF328-645

PROJECT LEADER: Dr. C. Corley Holbrook

EXPIRATION DATE: December 31, 2003

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FINAL REPORT:

There were two broad objectives for this multi disciplinary research project. The first objective was to conduct research which would further development of peanut cultivars with improved water use efficiency. Previous research conducted by the project leader had shown that drought tolerance genotypes are less susceptible to preharvest aflatoxin contamination in comparison to drought intolerant genotypes. Drought tolerant cultivars would also enable farmers to produce a crop using less water.

During this granting period we conducted research to evaluate several different physiological measurement for their effectiveness as tools to select for improved drought tolerance. In addition to visual assessments of drought stress at four degrees of stress, we assessed genotypes for leaf temperature, specific leaf weight, and for relative chlorophyll content using a SPAD meter. The visual drought stress ratings were the only variables showing a significant correlation with yield under drought stress. These ratings were also the only variable which appeared to be related to preharvest aflatoxin contamination. We are now using visual assessments of drought stress to select within our breeding populations for improved drought tolerance and resistance to preharvest aflatoxin contamination.

The second objective was to conduct research which would further development of peanut cultivars with resistance to the peanut root-knot nematode and TSWV. Cultivars which have resistance to each of these pathogens are available, however, there are no cultivars which have resistance to both of these pathogens.

During this granting period we evaluated several breeding lines from the USDA-ARS program in Tifton along with several breeding lines from the University of Florida breeding program and several breeding lines from the program at AgraTech seed. These lines were evaluated for resistance to both pathogens using experimental field, greenhouse, and on-farm studies. Breeding lines having resistance to both pathogen were identified. Further breeding work will be needed to improve the grade of these lines.