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

Final Report

June 10, 2008

INSTITUTION: USDA, ARS, PGRCU; Griffin, Ga.

PROJECT TITLE: Regeneration and increase of F1 plants from crosses and
identification/evaluation of new sources of near immunity for TSWV and
resistance to diseases/pests in *Arachis hypogaea* varieties.

RESEARCH AGREEMENT NO.: 25-21-RF3030-387

PROJECT LEADER: Dr. James W. Todd (Dr. Roy N. Pittman)

EXPIRATION DATE: June 30, 2007

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REPORT OF PROGRESS:

Objectives addressed during research period:

- 1) Due to the late start of trying to make crosses in mid- to late- summer, no crosses were successful; heat and the lack of humidity in the greenhouse were problems.
- 2) All available accessions of *Arachis hypogaea* var. *hirsuta* (24), var. *peruviana* (13) and var. *aequatoriana* (41 accessions) were grown at Attapulgus, Ga. and evaluated for TSWV and leafspot resistance. Accessions were grown under sprayed and non-sprayed condition and evaluated throughout the growing season. Percent infection varied greatly between treatment and accessions. Non-sprayed *aequatoriana* ranged from 4% to 80%; while sprayed ranged from 5% to 67% infection for TSWV. Non-sprayed *peruviana* ranged from 2% to 43%; while sprayed ranged from 12% to 40% infection for TSWV. Non-sprayed *hirsuta* ranged from 2% to 56%; while sprayed ranged from 2% to 56% infection for TSWV. One accession from *peruviana* and four accessions from *hirsuta* were selected for further evaluation and possible crossing.
- 3) Evaluation of the breeding nursery material for TSWV and leafspot resistance. In the 2006 season at Attapulgus and Tifton, Ga., seven selections from the cross Nematam/0020-14 (0020-14 is a selection from the Bolivian Peanut CRSP Project) were made, 20 selections from the cross Ga. Valencia/PI 339967, 68 selections from the cross Ga. Valencia/0020-8, and 17 selections from 0020-20/UF94022 (UF94022 is a selection made in Florida of material obtained from Tom Islieb's program which has the best known TSWV resistance) were grown and individual plant selections made. In 2007, 76 individual plant selections of NemaTam/0020-14 were planted in Attapulgus, Ga. and evaluation for plot uniformity, disease resistance, and yield potential. Thirty-seven

selections of Ga. Valencia/PI 339967 were planted. Three hundred seventy-six selections of Ga Valencia/0020-8 were planted. One hundred thirty selections of 0020-20/UF94022 were planted. The ratings for TSWV and leaf spot varied greatly; it varied for TSWV from .5% infection to 100% across all selections and for leafspot varied from 1% to 100%. Of the plots selected for evaluation in 2008, no selection from the cross Nematam/0020-14 were advanced based on disease resistance; one selection was carried forward from the cross Ga. Valencia/PI339967; 31 selections were carried forward for the cross Ga. Valencia/0020-08; and 26 selections were carried forward for the cross 0020-20/UF94022. These are currently being evaluated in early yield and disease plots this year (2008) and increased. Observations made: This is the first time we have had disease resistance observed in the field as low as .5% and 1%; these were nearly immune to TSWV and leafspot. This indicates we are getting close to our goal of a "no spray" peanut. This is now F5 material in a Preliminary Yield Test at Attapulcus, Ga. All material selected had excellent germination and seedling vigor this year.

- 4) Based on observations from UPPT, we are looking at CRSP 702 for possible Sclerotinia blight resistance. Possible resistance was observed in plots in Texas.