

Project carries forward to 6

Inv dated 3/2/07  
Pd to FL

2005

Final #7  
FL 03  
Bud 349

Final Report-2005

## PEANUT BREEDING FOR IMPROVED QUALITY AND MULTIPLE-PEST RESISTANCE

Final Report- 2005

**BARRY L. TILLMAN**, Agronomy Department, University of Florida, NFREC, Marianna, FL  
[btillman@ifas.ufl.edu](mailto:btillman@ifas.ufl.edu) ; 850-482-1226.

**DAN W. GORBET**, Agronomy Department, University of Florida, NFREC, Marianna, FL,  
[dgorbet@ifas.ufl.edu](mailto:dgorbet@ifas.ufl.edu) ; 850-482-9904.

### Objectives:

Tomato spotted wilt virus continues to be a major threat to peanut production in the southeast. We need to continually improve the level and diversity of resistance in cultivars. Leafspots, white mold, CBR, and root knot nematode are major production problems in the southeast. The most economical method of dealing with these problems includes variety resistance. The primary focus of this work is to develop peanut cultivars that reduce grower costs and meet end-user requirements. In addition to farmer requirements, peanut varieties must be acceptable to end users. Recently, representatives from manufacturers of peanut products communicated their needs in a peanut variety. All segments of the industry listed "roasted peanut flavor" as the most important characteristic in their product. The manufacturers of roasted whole nuts and candy listed size, shape, sugar content and oleic acid content as important characteristics for their product. Peanut butter manufacturers listed uniformity of peanut size as an important characteristic. Because the methods used to measure these characteristics are costly and time-consuming usually only the last generation of breeding material is tested. Breeding programs would benefit greatly from rapid, non destructive seed testing methodologies. The ability to apply such seed testing methodologies in early generations of the breeding process would greatly improve our ability to select superior genotypes.

### Results:

#### A. On-going University of Florida Breeding Program

- a. In 2005, TSWV (Spotted Wilt) was severe from April throughout May. This allowed us to identify lines with the most resistance to this disease. We also evaluated lines for resistance to white mold, leafspot and root knot nematode. We have very good evidence now that some of our breeding lines including AP-3 have some tolerance/resistance to root knot nematode. We will verify these results beginning in the 2006 season and a graduate student has been hired to conduct some basic research into this potential new source of resistance.
- b. We have successfully used NIR (Near-Infrared Spectroscopy) to replace and enhance traditional wet chemistry methods for determining seed characteristics such as fatty acid composition and oil content. In addition to our own samples, we have assisted other researchers with testing and have had

other inquiries related to the use of NIR in peanut research. We will attempt to train others on its use and assist as we are able.

- c. Several advanced breeding lines were increased and sent for testing as part of the UPPT (Uniform Peanut Performance Trials). Testing includes blanching and flavor properties.
- d. Three new varieties were released from the University of Florida program in early 2006. They offer a range of maturity and disease resistance characteristics and have good to excellent yield and grade potential.

B. Research to enhance breeding efficiency and effectiveness

- a. Samples were collected to repeat a study which last year showed that the poor seed quality of late maturing, disease resistant cultivars is affected significantly by storage environment. We expect to begin testing for physiological causes during 2006.
- b. About 50 plants from an F2 population of NemaTam x Georgia Green were inoculated with root knot nematodes. We are testing a DNA marker and have found that it works well in this population. Once these results are finished, we will attempt to correlate field response to lab results.