

National Peanut Board Check-Off Research
Final Report with Executive Summary- 2008

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FL-46
560
2008

I. Title: Breeding Superior Peanut Varieties for the Southeast

II. Investigators:

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III. Objectives:

Development and deployment of peanut varieties with improved yield, grade and disease resistance is one of the most cost effective ways to improve the competitiveness of peanut. Peanut farmers continue to face increasing costs of production. In addition, the value of bio-fuel crops has provided opportunities for farmers to diversify often at the expense of peanuts. In order to help keep peanut competitive, research should focus on reducing costs and/or increasing yields. High yielding, disease resistant cultivars are a very important method of reducing costs and increasing yields. The ongoing University of Florida Peanut Breeding program is focused on developing varieties with disease resistance, high yield and good grades.

Peanut breeding is a long-term endeavor such that most of the objectives do not change dramatically with time. The UF breeding program screens germplasm for resistance to tomato spotted wilt (TSWV), leafspots, white mold, CBR (Cylindrocladium black rot) and nematodes. We have the capability to screen large numbers of genotypes for reaction to TSWV and leafspot and, in 2006-07, with assistance from the SPRI-NPB, we implemented screening programs for CBR, nematodes and white mold for much larger breeding populations. Screening for nematode resistance and CBR are being conducted in farmer's fields, whereas white mold nurseries are on the research station in Marianna.

On-going University of Florida Breeding Program

- a. Test University of Florida peanut breeding lines for resistance to late leafspot, white mold, TSWV, CBR, and root knot nematodes, as well as for pod yield, grades, and maturity.
- b. Evaluate advanced University of Florida breeding lines for fatty acid composition.
- c. Variety management
 - i. Evaluate advanced lines for maturity
 - ii. Evaluate advanced lines and varieties in leafspot fungicide management studies (i.e., 0, 4, 8 leafspot sprays), to determine which ones could perform well in a reduced leafspot spray program.
 - iii. Evaluate advanced lines and varieties for white mold resistance in plots with and without inoculation with *S. rolf sii*.

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IV. Results

Grading of peanut samples from the 2007 season was completed and selections of promising lines for testing in 2008 commenced. Evaluation of single plant selections for Stage II testing and breeding nursery evaluation was completed.

Planting began in late April with experiments designed to evaluate TSWV reaction to certain pesticides. All breeding nurseries disease nurseries, Stage II, III and IV tests were planted during April, May, and June in Marianna, Jay and Citra, FL. There were a total of 1037 disease nursery plots, 256 plots dedicated to research projects, 468 Stage II plots, 1262 Stage III plots, and 2479 Stage IV plots including seed increases for a grand total of 5502 plots planted. Disease nurseries were designed to evaluate reaction to leaf spots, white mold, CBR and root knot nematode. All other tests were grown with standard management for foliar and soil-borne diseases. The first crossing nursery was planted in late May.

Crossing in the first nursery began in July and a second crossing nursery was planted in August and crossing commenced in it in September. Data collection in field tests began in August and continued through September. Harvest began in early September. Crosses from the first nursery were harvested.

Grading began in November and we began cleaning and processing peanuts for the 2009 season.

Overall, 2008 was a productive season and several lines were identified as potential cultivars.

V. Expenditures

Of the \$25,000 provided by this project, \$23,000 was used to partially support an Agricultural Research Assistant and \$2,000 was used to purchase supplies for the breeding program.

VI. Executive Summary

The 2008 season was characterized by high yield potential and little disease in normal production systems, making purposeful disease screening important in the breeding process. Planting began in late April with experiments designed to evaluate TSWV reaction to certain pesticides. Other disease nurseries were planted during May and June in Marianna, FL. There were a total of 1037 disease nursery plots, 256 plots dedicated to research projects. Disease nurseries were designed to evaluate reaction to leaf spots, white mold, CBR and root knot nematode. All other tests were grown with standard management for foliar and soil-borne diseases.

Overall, this project enabled us to evaluate several hundred advanced breeding lines for resistance to four major peanut diseases. Notably, a large group of lines were characterized for their resistance to leaf spot, white mold and TSWV. Annually, these three diseases are the most problematic across the southeastern peanut belt. No cultivars were released during the period.