

National Peanut Board Check-Off Research  
Final Report- 2010

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2010

I. Title: Breeding Superior Disease Resistant Peanut Varieties for the Southeast

II. Investigators:

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III. Objectives:

The University of Florida Peanut Breeding Program is a continuous effort to develop and deploy peanut varieties with improved yield, grade and disease resistance. New cultivars are one of the most cost effective ways to improve the competitiveness of peanut with other crops. Production costs continue to escalate forcing producers to find ways to increase yield and/or reduce costs. 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.

We seek funding to continue the breeding effort with special emphasis on combining disease resistance to spotted wilt, white mold, and leaf spot with superior pod yield and grade. Tests will be conducted to determine resistance to white mold, spotted wilt and leaf spot in Marianna, Florida.

- 1) Objective 1: Test advanced breeding material for resistance to white mold, leaf spot, and spotted wilt.
  - a. About 300 advanced breeding lines will be tested in for reaction to these three diseases in Marianna, Florida in 2010.
- 2) Objective 2: Test advance breeding material for pod yield and grade.
  - a. About 300 advanced breeding lines will be tested for pod yield and grade in Marianna and/or Gainesville, FL in 2010.

IV. Results:

- 1) Objective 1: Test advanced breeding material for resistance to white mold, leaf spot, and spotted wilt.
  - a. About 300 advanced breeding lines will be tested in for reaction to these three diseases in Marianna, Florida in 2010.

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A total of 249 experimental lines and 15 cultivars were selected for testing reaction to leaf spot, spotted wilt and white mold. Selection was based on pod yield, grade and disease reaction from the 2009 season. Plots were planted during April-June, 2010 with spotted wilt plots planted in April, white mold plots planted in May and leaf spot plots planted in June. Planting during these time-periods provides a good environment for disease to occur. Plots were managed for optimum pod yield except that leaf spot plots were not sprayed with fungicides, white mold plots were sprayed only with chlorothalonil, and spotted wilt plots were not treated with thimet.

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White mold plots were inoculated with *S. rolfisii* in late July and irrigated to encourage disease development. Warm temperatures and humid conditions were very favorable for white mold and signs and symptoms were apparent within 2 weeks of inoculation. Plots were evaluated for disease using a 1-10 scale during late September and were harvested during the last week of September. Disease ratings ranged from 1 to 9 with several lines demonstrating exceptional resistance to white mold with ratings of 1 or 2 compared to ratings of 5-7 for Georgia-07W and AP-4, both considered to have good resistance to white mold. Pod yields ranged from less than 1000 lbs./A to over 4000 lbs./A and were highly correlated with white mold disease ratings indicating that white mold cause significant yield loss in susceptible genotypes.

Spotted wilt plots were evaluated for disease, but the disease did not develop as it has historically. On a scale of 1 to 10, the highest rating was 5 with most genotypes scoring a 1 or 2. Interaction with colleagues in Georgia confirmed that spotted wilt disease was much less prevalent in 2010 than in previous years. The test probably succeeded in identifying some of the most susceptible lines, but did not differentiate among those genotypes with moderate versus high resistance. Plots were harvested in September and yields ranged from at high of 6700 lbs./A to a low of 3200 lbs./A.

During October, leaf spot plots were evaluated for disease and harvested. Leaf spot disease developed late in the season and did not cause major yield losses. However, several lines performed very well with good yield and low leaf spot ratings.

Results from these tests will be used to plan tests for 2011 and to help characterize disease reaction of current cultivars.

- 2) Objective 2: Test advance breeding material for pod yield and grade.
  - a. About 300 advanced breeding lines will be tested for pod yield and grade in Marianna and/or Gainesville, FL in 2010.

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The same lines tested for disease reaction under Objective 1 were grown in plots in Marianna and Gainesville using standard management to determine their yield potential and grade. Tests were planted beginning in April in Gainesville and through May in Marianna. Yield data was encouraging with several lines demonstrating competitive yield with current cultivars (Florida-07, Georgia-06G, Tifguard). One line with resistance to root knot nematode was among the group of high yielding lines.