Project Description:

Development of Peanut Cultivars with Resistance to Diseases and Improved Water Use Efficiency and Development and Use of Molecular Markers for Marker Assisted Selection.

C. C. Holbrook et al.

Project Fiscal Year:

2010

Executive Summary:

Molecular markers are widely used in other crops to improve breeding efficiency and effectiveness. Use of molecular marker assisted selection (MAS) in peanut breeding has lagged other crops because of a lack of molecular markers for important traits. We have recently developed molecular markers for resistance to the peanut root-knot nematode, and molecular markers for both genes controlling the high oleic acid trait in peanut. We actively using these markers to enhance our breeding efficiency. We are also developing segregating populations that should be useful in developing molecular markers for several other important traits in peanut.

Previous progress from this project has resulted in the development of peanut genotypes with relatively high yield and relatively low aflatoxin contamination when grown under drought and heat stress conditions. Continued breeding efforts are needed to improve the yield and grade to develop drought tolerant peanut cultivars. During this year we continued these breeding efforts and conducted numerous field tests containing breeding lines that we are evaluating to assess their tolerance to drought, yield, and grade. These lines were planted in replicated studies in our field at the Gibbs Farm that has ten rain out shelters, and in our field at the Bowen Farm that has three rain out shelters. The shelters were then used to impose heat and drought stress for the 40 days immediately prior to harvest. Plots were visually rated for drought stress, and the yield and aflatoxin contamination was measured. Breeding lines that have relatively high yield and relatively low aflatoxin were identified.

Final Report 2010 (4th quarter ending Dec. 31, 2010)

Summary

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PROGRESS REPORT:

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Our research group has developed Tifguard, a high yielding cultivar with resistance to the peanut root-knot nematode and TSWV. We have also developed molecular markers for nematode resistance, and for both alleles that confer high oleic fatty acid. During the past year we continued our efforts to develop populations that will be essential for our effort to develop molecular marker for other disease resistances in peanut.