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2007

Peanut Breeding
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NPB Final Report

Title: **Increase of Early-Maturing Peanut Lines**

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Objectives.

Our goal is to develop peanut lines maturing approximately two weeks earlier than current varieties and that have the high-oleic trait. We are also attempting to select for disease resistance now. This is because of the serious levels of Sclerotinia blight, leafspot, and TSWV in Texas.

Results

As a result of the winter increase, we had a large number of materials to evaluate in the field in 2007. In addition, we increased high-oleic single plant selections from materials segregating for the high-oleic trait.

1. Winter nursery increase.

We sent some materials for increase in Puerto Rico. The materials that we received back from the nursery included:

- High-oleic lines of Valencias, selected from Valencia materials that had good yield, maturity, and shelling characteristics but needed to incorporate the high oleic trait and proper seed coat color.
- Lines of the peanut minicore collection, some early in maturity, others having drought tolerance.

2. Field increase.

Because of funding for sending materials to J Leek for rough determination of the oleic:linoleic ratio of 3000 seeds from high-yielding, early maturing plants, we were able to increase high-oleic single plants of early-maturing lines in the field and make selections for pod shape and overall appearance.

3. Greenhouse increase.

We improved our ability to increase single plants over the winter by reinforcing greenhouse benches and purchasing large (2 ft diameter) pots.

We increased 4 populations of F₂ plants made from leafspot-resistant but late-maturing and often low-yielding introgression lines crossed to runner and Spanish cultivars. This allowed us to plant approx. F₃ families in the field in the summer of 2007.

Three populations of F₁'s developed to test for heat and drought stress tolerance were increased over the winter. We have obtained approx. 2000 F₂ seed from each of two populations, which will allow us to perform greenhouse and field tests for stress tolerance, as well as identification of markers for tolerance. F₁ plants of the third population were feeble and many died, so this population was not carried forward.

4. Backcross promising lines with early maturity. Crosses included the following:

- Backcross high-oleic, early-maturing, high-yielding runners selections to improve pod shape and resistance to Sclerotinia and TSWV.
- Backcross early-maturing high-oleic Spanish and Valencia lines for better combinations of yield, early maturity, disease resistance, and shelling.
- Make additional crosses for drought tolerance.

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