

## Plant Breeding Research (Field 6G)

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**Objectives and Methodology:** The Peanut Breeding and Genetics Program planted material at the Helms Farm for the first time in 2003. This location was chosen as a cooler-climate site, especially useful for putting peanuts under stress for early maturity. Materials were grown with surface drip irrigation, supplemented by flood irrigation prior to planting.



The following field experiments were grown at this location:

1. *F<sub>2:5</sub> Maturity Single Plant Maturity O/L Test.* The purpose of this experiment was to evaluate and select early-generation breeding lines for early maturity, high oleic acid ratio, and yield for runners, bunch, and Spanish peanuts. We are still working on evaluation of these experiments as of this date.

2. *Evaluation of Bolivian Valencia Germplasm for Maturity.* Peanuts grown in the river basins in Bolivia mature in 70 days in that country. We grew a number of varieties for evaluation in this area to determine whether these materials have promise as breeding materials. It appeared that this material grew faster initially and had set pods when control Spanish and Valencia lines had only beginning to peg. However, it is not certain that the Bolivian material matured earlier, as birds ate much of the crop at harvest. Visual inspection had suggested that a few lines were early, but it appeared that the Bolivian materials slowed their maturation as the season progressed. We will expand evaluation in 2004, paying particular attention to time of first flowering and pod set. It is possible that some of this material possesses useful genes for earliness that can be combined with other lines.

3. *Valencia x Spanish Crosses.* These crosses were begun by the late Dr. Olin Smith, with the intention of combining the earliness of Valencia peanuts with the high-O/L trait being developed in the Spanish market class [and released since as the variety OLin]. Three segregating backcross populations were grown, and are being evaluated for yield, maturity, O/L ratio, number of seeds per pod, and testa color.

4. *Spanish BC<sub>4</sub> and BC<sub>5</sub> evaluation.* This is an ongoing attempt at developing high-yield Spanish peanuts with the high-O/L trait. The variety OLin was released as a high-O/L Spanish variety, but the yield averages about 7% less than Tamspan 90. By repeated backcrosses to Tamspan 90, we are hoping to increase the yield to equal to or greater than Tamspan 90.

5. *Spanish and Runner Maturity Comparison Test.* This is part of a multiyear proposal to compare maturities of runner and Spanish lines in South, Central, and West Texas. In these experiments, 10 Spanish and 10 runner lines were dug at three dates two weeks apart in all three regions of Texas. Results will be available later this spring.