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Subject: Peanut Breeding

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Title: Early Generation Screening for the High O/L Trait in Segregating F₂ Peanut Populations

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Final Report:

We received NPB funding for this project in the amount of \$10,000.00 for the fiscal year of 2007. The College Station project had J. Leek and Associates evaluate 3,340 individual F₂ generation seeds for O/L ratios with this funding. The Lubbock and Stephenville projects each sent 2,500 individual seeds for analysis for a total of 8,340.

All of these seeds came from populations which were segregating for the high O/L trait in the F₂ generation. For example, all of the individual seeds sent from College Station and Stephenville were a result of crosses made between lines that were low O/L with Leafspot resistance and lines that were high O/L with both *Tomato spotted wilt virus* resistance and *Sclerotinia* resistance.

This screening allowed us to eliminate approximately 70% of the seeds from planting due to low O/L ratios. Eliminating these lines made the project more efficient by saving precious plot land and by saving time and energy. Typically, we would use a lower selection pressure on unscreened material because we knew that approximately 70% to 75% of the individual plants would be low oleic which would also translate to the same percentages in our selections. To insure that we had a certain amount of high oleic selections, we had to make additional selections which meant more labor and time for harvesting, shelling, and cleaning the additional selections.

Now that we are pre-screening all of this seed for O/L ratios, we know that every plant we are selecting is high Oleic and we can therefore put more selection pressure on the population. We also have less seedling death because the NIR analysis is non-destructive unlike the GC method in which we cut a small portion of the seed off which leads to sites for infection by pathogens.