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

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Objectives.
Our goals are to develop:
(a) runner 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,
(b) a high-oleic Spanish variety that is earlier than OLin and has a yield similar to Tamspan 90,
(c) a high-oleic Valencia cultivar,
(d) a high-oleic Virginia cultivar.

To do this, we have had to select high-oleic single plants and increase them for field evaluation. We also wanted to perform larger increases on potential runner cultivar releases.

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. Field selection for high-oleic single plants.
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.

We planted out the following:
- 848 high-oleic F5 runner selections from the best F4 runner rows in 2007
- 157 high-oleic F6 runner selections
- 423 high-oleic F6 spanish selections from the best F5 entries in 2007
- 289 high-oleic Spanish and/or Valencia plant selections from the best entries in 2007

These were from lines that had some potential for release, but were segregating for the high-oleic trait. By identifying high-oleic plants and making selections, we were preparing for future evaluation of derived high-oleic breeding lines.

Approximately half of these were selected based on plant appearance and yield, and about 1/2 of

the selections were sent to the winter nursery in Puerto Rico for increase. These will be planted in the summer of 2009 as single row plots for evaluation.

2. Winter nursery increase.
We sent some materials for increase in Puerto Rico. We expect to receive back materials within a month.

3. Field increase.
We increased the following single row plots, based on high-oleic single plants grown in the summer of 2007, selected and sent to the winter nursery in November 2007, and received in time for planting in the summer of 2008:

80 high-oleic early-runner lines

In addition, we increased the following selections:
90 lines from a new runner x runner cross for early maturity
90 lines from a new Spanish x Valencia cross
80 lines from wild species introgression x runner or Spanish cultivars to advance leafspot resistance

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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