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**PROGRESS REPORT  
TO  
NORTH CAROLINA PEANUT GROWERS ASSOCIATION, INC.**

**TITLE:** Developing High-Oleic Peanut Varieties With Multiple Disease Resistance  
**LEADERS:** S. P. Tallury  
**DEPARTMENT:** Crop Science

**REPORT:**

**Field and laboratory evaluations of segregating progenies**

- a. In 2009, 100 F<sub>2:4</sub> families from high-oleic cultivars (N02054 ol, Brantley, ANorden, Hull, Sun-Oleic 97R) crossed with multiple disease resistant interspecific breeding lines, SPT 06-06 and SPT 06-07, were evaluated in a no fungicidal spray test at Lewiston. We selected 65 plants based on low defoliation scores for early leaf spot (ELS)
- b. So far, 7/65 plants were analyzed for fatty acid (FA) compositions and 2 contained high-oleic progenies with ELS scores of 3.0. (1 = resistant and 9 = susceptible).
- c. Seeds of the 65 lines were planted in Puerto Rico Winter Nursery. Returning seeds will be individually analyzed for FA and high-oleic seeds will be planted in Lewiston in 2010 for ELS and TSWV evaluations.
- d. Similarly, 25 F<sub>2</sub> progeny rows derived from a different set of high-oleic x interspecific lines were evaluated as above and 32 single plants were selected with low ELS scores (5.0 or less). Of the 32, seven were evaluated for FA composition and 4 of them contained high-oleic progenies. Seeds from the 32 plants were planted in PRWN. Returning seeds will be individually analyzed for FA and high-oleic seeds will be planted in Lewiston in 2010 for disease evaluations.
- e. Additionally, among the F<sub>4:6</sub> (2009) families, we have identified 15/34 different lines as high-oleic homozygotes. Four of the lines had ELS defoliation scores of 2.0 (1 = no defoliation and 9 = complete) and were high-oleic. Remaining lines will also be analyzed for FA composition to confirm high-oleics for planting in replicated tests in 2010.
- f. Also, new F<sub>1</sub> hybrids were made in the summer of 2009. F<sub>1</sub>s derived from high-oleic Perry, Hull, Sun-Oleic 97R, ANorden with root-knot nematode resistant runner variety, Tifguard, were crossed to PI 593239 and PI 561917. These two PIs are resistant to thrips and to bud necrosis virus, a tospovirus similar to TSWV. The idea in making these crosses is to see if the resulting high-oleic progenies will have TSWV resistance in addition to ELS and root-knot nematode resistances. The F<sub>1</sub> hybrid seeds were planted in PRWN and the resulting F<sub>2</sub> seeds will be planted at Lewiston in 2010 for TSWV and ELS evaluations.

## IMPACT STATEMENT

High-oleic peanuts are becoming an important part of peanut snack consumption mainly because of their potential health benefits and extended shelf life of the peanuts and their derived products. The latter trait influences the maintenance of good flavor for longer periods of time. In 2009, we have evaluated several early generation ( $F_2$  and  $F_4$ ) hybrid materials from crosses of high-oleic peanut cultivars with leaf spot, TSWV and root-knot nematode resistant interspecific hybrid breeding lines. Thirty-two and 65 single plant selections were made, respectively in  $F_2$  and  $F_4$  materials, based on low leaf spot scores. Four of the 32 and 2/65 contained high high-oleic with leaf spot scores of 3.0 (1 = resistant and 9 = susceptible). Additionally, among the  $F_{4:6}$  families, we have identified 15/34 different lines as high-oleic homozygotes. Four of the lines had ELS defoliation scores of 2.0 (1 = resistant and 9 = susceptible) and were high-oleic. Remaining lines will also be analyzed for FA composition to confirm high-oleics for planting in replicated tests in 2010.