

## 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. However, the high-oleic virginia-type peanut cultivars available for commercial production in the V-C area are, in general, susceptible to one or more of the commonly occurring diseases of peanut. The peanut genetics program at NCSU maintains several germplasm lines derived from diploid *Arachis* species with very high levels of resistance to many important diseases and insect pests of peanut. We propose to transfer these resistant genes into susceptible, high-oleic peanut cultivars to develop genetically resistant cultivars with superior oil chemistry.

Several hundred early generation ( $F_2$  and  $F_4$ ) progeny rows and advanced generation ( $F_6$ ) families were evaluated in unsprayed leaf spot tests in 2011 at the Peanut Belt Research Station in Lewiston. Two hundred and seventy nine single plant selections were made in the early generation progeny rows based on low defoliation scores ( $< 4.0$ ) for leaf spots where a 1 = resistant and 9 = susceptible. Among the advanced generation families, single plant selections were made in 10 families with low defoliation scores. Additionally, five high-oleic advanced interspecific breeding lines were selected with low leaf spot defoliation scores and low TSWV incidence in field tests. Seeds of these five lines will be increased in Lewiston in 2012 summer for advanced yield and disease evaluations in the future.

We are hopeful that the breeding lines from this project will have high levels of ELS and TSWV resistance in addition to the high-oleic trait.

**PROGRESS REPORT  
TO  
NORTH CAROLINA PEANUT GROWERS ASSOCIATION**

**TITLE: Developing High-oleic Peanut Varieties with Multiple Disease Resistance**

**LEADER(S): S.P. Tallury**

**DEPARTMENT(S): Crop Science**

**REPORT:**

**Field and laboratory evaluations of segregating progenies**

- a. In 2011, 330 plots of early generation ( $F_2$  and  $F_4$ ) and 72 plots of advanced generation ( $F_6$ ) high-oleic progenies were evaluated in an unsprayed leaf spot test at Lewiston. Based on low defoliation scores of  $< 4.0$ , for early leaf spot (ELS), plant and pod characteristics, among the early generation progeny rows/families, 279 single plants were selected (1 = resistant and 9 = susceptible).
- b. Seeds from selected progeny rows are being planted in the Puerto Rico Winter Nursery (PRWN) for generation advancement for field evaluations in 2012.
- c. From the  $F_6$  families, single plant selections were made in 10 ELS resistant families and seeds from these selections will be evaluated in replicated field tests in 2012.
- d. Additionally, five high-oleic advanced interspecific breeding lines were selected with low leaf spot defoliation scores and low TSWV incidence in field tests. Seeds of these five lines will be increased in Lewiston in 2012 summer for advanced yield and disease evaluations.
- e. Twenty seven new  $F_1$  hybrids from crosses of susceptible high oleic cultivars/breeding lines x multiple disease resistant interspecific breeding lines were created. The hybrid seeds are being planted in PRWN and the segregating progenies will be evaluated in disease tests in Lewiston in 2012.