

Date Submitted: 3/12

NCARS/NCCES CODE: NC-24
____EXTENSION x RESEARCH
REPORT PERIOD 01/11 - 12/11
____INTERIM ____x____FINAL

279
NC-24
1068
2011
Juel

PROGRESS REPORT
To
NCPGA

TITLE: Transfer of Disease-Resistance Genes from Diploid *Arachis* Species into peanut cultivars

LEADERS: S. P. Tallury

DEPARTMENT: CROP SCIENCE

REPORT:

A. Field evaluation of early leaf spot resistant lines in Unsprayed Leaf Spot Test at Lewiston

- A set of 56 entries consisting of interspecific hybrid breeding lines and susceptible cultivar checks were evaluated in a replicated test
- Plots received no fungicidal sprays to control leaf spots
- Based on low defoliation scores, plant and pod characteristics, a total of 23 entries were selected for ELS resistance with defoliation scores of 4.0 or less (Mean defoliation score of susceptible checks was 7.2 where a 1 = highly resistant and 9 = highly susceptible)
- Additionally, 11 of the 23 entries had mean defoliation scores between 1.0 and 2.5.
- Advanced yield evaluations of some of these breeding lines will be continued to develop high-yielding ELS resistant peanut lines in 2012

B. Field evaluation of TSWV resistant lines in no insecticidal tests at Lewiston

A. Whole Plot Evaluations

- The same set of 56 entries evaluated in the ELS study (above), were also evaluated in a replicated TSWV test
- Plots received no insecticidal applications to control TSWV
- Twenty-six whole plots were selected based on TSWV incidence by counting diseased/dead plants every 2 weeks starting in late June until late September. Also, plant and pod characters were considered in making the final plot selections
- Of the 26 plots selected for TSWV resistance, 6 plots also had ELS scores of 4.0 or less

- These selections will be evaluated at Lewiston in replicated yield and TSWV tests in 2012 summer

B. New Interspecific Hybrids for TSWV (Sandhills Research Station, 2011)

- Gregory x *A. diogeni* (10602), Gregory x *A. correntina* (9530)
VA 98R x *A. correntina* (9530) were advanced to the next generation
- These hybrids will be advanced until tetraploid 40 chromosome progenies are identified which will be tested for TSWV-resistance incorporated from *A. diogeni* and *A. correntina*

Date Submitted: 3/12
NCARS/NCCES CODE: NC-24

279
NC-24
1068
2011
Summary

IMPACT STATEMENT

Early leafspot (ELS) and Tomato Spotted Wilt Virus (TSWV) have been the most persistent disease problems that the peanut growers have to confront annually in North Carolina. Although commercial cultivars available in the V-C production area have moderate levels of resistance to ELS and TSWV, stable resistance is lacking in these cultivars. Many diploid *Arachis* species have exhibited very high levels of resistance to ELS and TSWV with some also resistant to CBR and Sclerotinia blight. As a result, development of genetic resistance by transferring resistance genes from diploid *Arachis* species into *A. hypogaea* will help growers reap good quality peanuts with less input costs.

We selected 26 whole plots for TSWV resistance and also are in the process of developing new interspecific hybrid (Gregory x *A. diogeni*, Gregory x *A. correntina* and VA 98R x *A. correntina*) populations to select for TSWV resistance. Additionally, 23 whole plots were selected for high levels of ELS resistance. Further, new diploid *Arachis* species have been identified for resistance to CBR and Sclerotinia blight. These species will be utilized to make crosses to produce populations for multiple disease evaluations. It is anticipated that the selections resulting from the interspecific breeding materials will provide lines with high levels of multiple disease resistance with good quality pods.