FINAL #87 2005 TX (carries to 2006)

a **National Peanut Board –Annual Report for 2005**

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Project Title: Introgression of nematode resistance into peanut genotypes with resistance to the tomato spotted wilt virus
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Proposed achievements for 2005:

1. Begin field testing selected lines developed for resistance to root-knot nematodes and TSWV for yield potential and virus resistance.
2. Evaluate several isolates of *Botrytis cinerea*, cause of Botrytis blight of peanut for fungicide sensitivity.
3. Screen common peanut cultivars for resistance to Botrytis blight

Achievements:

1: Twelve breeding lines were evaluated for yield potential at four locations in 2005, two locations were nematode infested and two locations were non-infested. These lines were also sent to Tifton, GA for evaluation of TSWV resistance by USDA-ARS collaborator (P. Timper). The breeding lines all had higher yield potential than the nematode-susceptible cultivars Florunner, Tamrun 96 and Tamrun O/L 02 in the nematode-infested fields (Fig. 1) and two lines had yields that were numerically higher than yield of NemaTAM. In the non-infested locations, yields of several lines were similar to that of Tamrun O/L 02 (Fig. 1). It was notable that at the Stephenville test site, six breeding lines had pod yields of greater than 6,000 lb/acre. With one exception, all of the breeding lines suppressed nematode population densities relative to the susceptible cultivars (Fig. 2). The exception (PR11 at nematode-infested location 1) was likely due to segregation of the nematode-resistance gene.

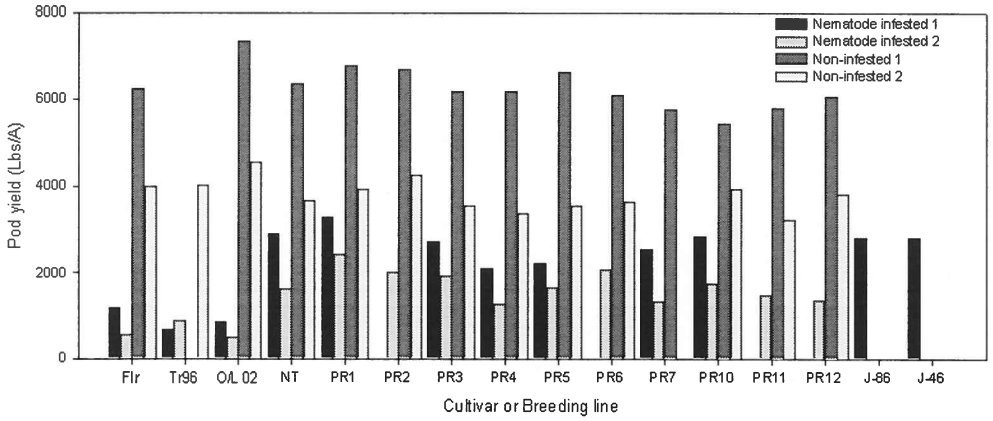
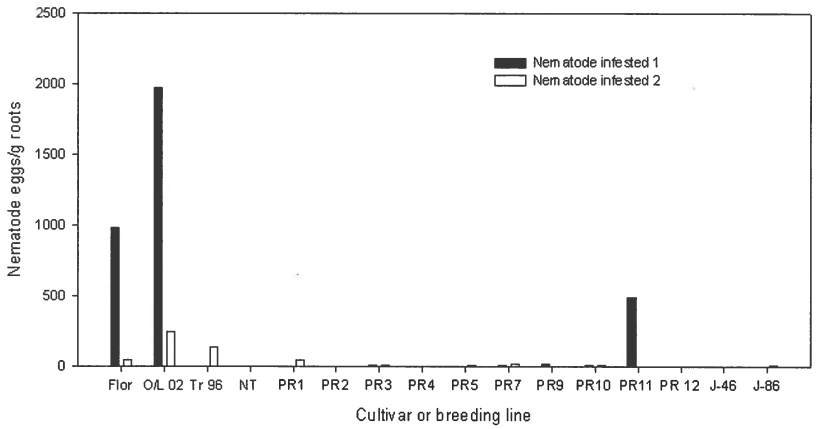


Fig 1. Yield potential of several peanut cultivars and breeding lines (with resistance to root-knot nematodes and Tomato Spotted Wilt Virus) in nematode infested and non-infested plots. (Flr = Florunner, TR96 = Tamrun 96, O/L 02 = Tamrun O/L 02, NT = NemaTAM)

Fig. 2 . Final nematode population densities on several breeding lines with nematode and TSWV resistance in nematode-infested fields compared to nematode susceptible cultivars. (Flr = Florunner, TR96 = Tamrun 96, O/L 02 = Tamrun O/L 02, NT = NemaTAM)



These twelve breeding lines were rated for percentage of plants exhibiting symptoms of virus disease twice during the growing season at the Tifton, GA location. All but two lines had lower incidence of virus disease than did Florunner (Fig. 3). One line had a TSWV rating lower than Georgia Green and another line was intermediate between Georgia Green and Tamrun 96.

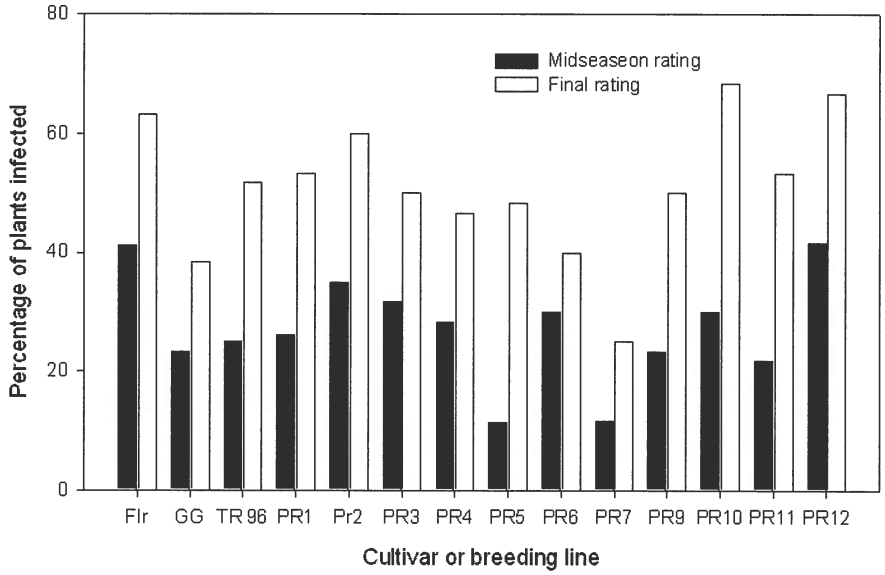


Fig. 3. Comparison of Tomato Spotted Wilt Virus ratings of several breeding lines and cultivars grown in Tifton, GA. (Flr = Florunner, TR96 = Tamrun 96, GG = Georgia Green).

2. More than 50 isolates of *B. cinerea* were collected from peanut in west Texas in the fall of 2004 following an unusually high incidence of Botrytis blight. All isolates were screened for sensitivity to four fungicides commonly used on peanut. Several isolates were identified that were relatively tolerant of the fungicides Omega (fluazinam), Botran (dicloran), and Topsin-M (thiophenate-methyl) (data not shown). No isolate was tolerant of Roval (iprodione)

3: In laboratory tests, 29% of isolates of *B. cinerea* were nonpathogenic. All pathogenic isolates caused greater disease at 20°C (68F) than at 24°C (75F) or 28°C (82F). Ten common peanut cultivars were evaluated in laboratory tests for susceptibility or resistance to Botrytis blight using two isolates of the pathogen. All cultivars became infected, with isolate GilE-6 generally causing more disease than did isolate DM1-R. However, rate of disease development on Flavorrunner 458, the breeding line TX607, and Valencia C was lower than on other cultivars inoculated with isolate GilE-6 (Fig. 4). The resistance of TX607 was less evident when the plants were inoculated with pathogen isolate DM1-R.

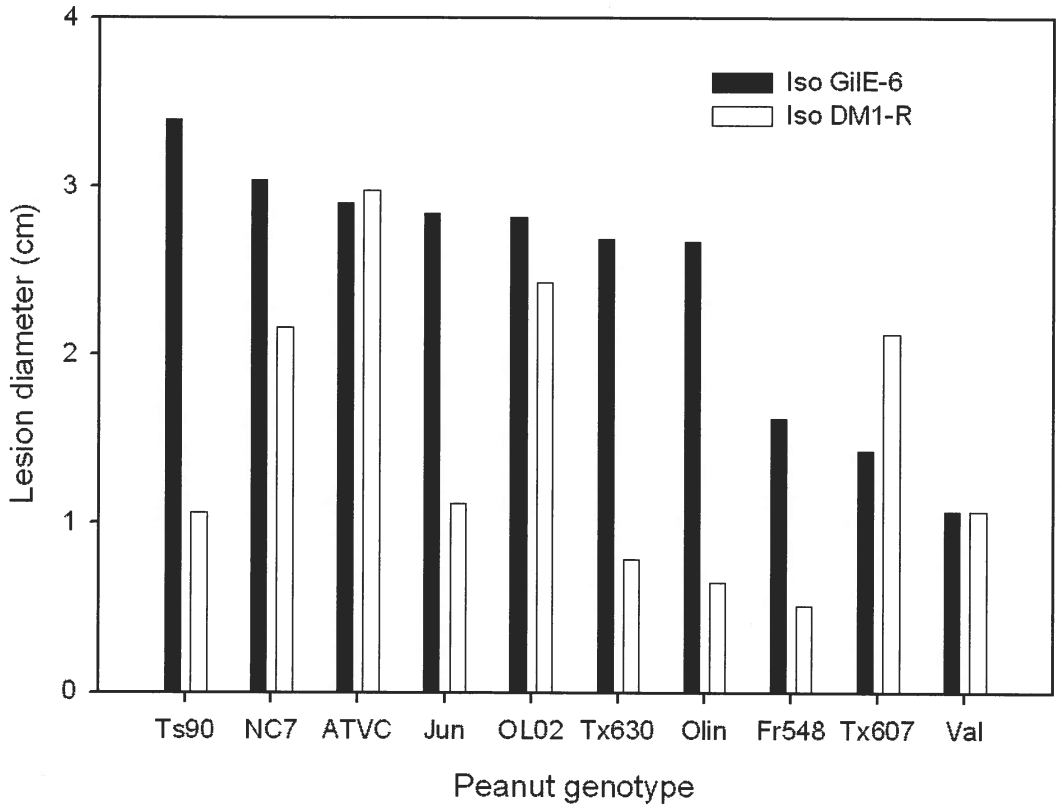


Fig. 4. Variation is susceptibility of several peanut cultivars to Botrytis blight in laboratory tests.

Summary:

Continued progress was achieved in the development of peanut with multiple disease resistance. Importantly, two of these lines also have the high O/L ratio desired by many shellers. Future emphasis will be the development of peanut with multiple disease resistance and the high O/L trait.

Most isolates of *Botrytis cinerea* collected from peanut in west Texas were pathogenic to peanut and were sensitive to several fungicides. However, significant variation in fungicide sensitivity was observed, suggesting that the potential for inadequate control following fungicide application may be observed in some fields. If Botrytis blight continues to be a problem in west Texas, field evaluation of several fungicides will be needed along with a system for monitoring pathogen populations for development of high levels of tolerance to commonly used fungicides. Finally, sufficient variation in susceptibility to Botrytis blight was observed among the 10 cultivars tested to suggest that useful levels of resistance might exist. These and other cultivars and breeding lines need to be tested under field conditions to confirm laboratory observations.

Acknowledgements:

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