ID #84 project continues to next year #8C TX

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Title: Selection of a Multiple Disease Resistant Runner-Type Peanut

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Final Report for 2002:

This study is concerned with determining the best selection technique for creating a multiple disease resistant runner peanut. Three different selection techniques were applied to nine different segregating populations. Two consecutive years of selection work and O/L analysis reduced the study to four populations.

Selections from these four populations were evaluated for disease ratings, grades, O/L values and agronomic characteristics. The top two selections from each of the remaining four resistant populations for each of the three selection techniques were compiled into a thirty-entry yield test. There are twenty-four selections, three parents (Tamrun 96, Tx901639-3, Sun Oleic 95R), and three local varieties (Flavorrunner 458, Georgia Green, Tamrun O/L 01) added as checks.

This test was planted as a complete randomized block design with three replications. The locations included all of the original disease screening sites; Pearsall, Tx., Stephenville, Tx. and Ft. Cobb, Ok. An additional location at Seminole, Tx. was added as a disease free site and to determine the adaptability of the lines in the major growing region of the state.

The TSWV nursery in Pearsall had little to no disease pressure in 2002, however, it did have over 50 inches of rain from planting to harvest. No damage was noted due to the extremely high amount of rainfall. Sclerotinia *minor* infection at the Stephenville nursery was aided by physical inoculation, which created extremely high disease pressure on the selections. Moderate to heavy Scleortinia pressure was noted at the Ft. Cobb location.

Analysis for yield, grade and value per acre based on the 2003 USDA loan schedule have recently been completed. However, the results of this data are still being analyzed to determine whether or not there were any effects on the data due to locations, techniques or populations. Once these analysis are completed we will be able to determine which selection technique if any are better suited for developing a multiple disease resistant runner peanut.

Results from the raw data show that two lines 01F5415 and 01F5404 are consistently in the top statistical grouping across all locations. The tables below show the top 20% or the best six lines from each location. All of the data is based upon three replications and any mean followed by the same letter are not significantly different by Fisher's LSD (p=0.05). It should also be noted that harvest at the Stephenville location was delayed due to rain events which coupled with extreme Sclerotinia minor pressure caused lower than average yields. The line 01F5415 doubled the yield of the best check variety at this location.

**** Top Six Entries at Each Location**

PEARSALL, TX. LOCATION – TSWV NURSERY

Cultivar	Value/Ac	Pods/Ac lbs.	TSMK %	100 Sd. Wt.(g)
01F5415	1299a	6591a-e	77.5a	60.7h-m
TamrunO/L01	1248ab	7093a	71.5e-i	72.7a
01Y4104	1215a-c	6651a-d	74.0b-f	73.1a
01Y4126	1210a-d	6328b-h	76.5ab	62.7e-k
01F5478	1206a-e	6724a-c	72.5d-h	62.0f-k
01F5404	1184a-f	6509b-f	73.6b-g	61.4g-l

STEPHENVILLE, TX. LOCATION- MULTIPLE DISEASE NURSERY

Cultivar	Value/Ac	Pods/Ac lbs.	TSMK %	100 Sd. Wt.(g)
01F5415	362a	2002a	72.9a	49.4d-h
01F5404	323ab	1971ab	64.8a-g	50.5d-h
01F5405	310a-c	2009a	61.4b-g	55.8ab
01Y4134	299a-d	1756a-d	68.5a-c	53.9a-d
01F5478	297a-d	1900a-c	62.0b-g	50.2d-h
01Y4123	278a-e	1741a-e	62.3b-g	49.2d-h

FORT COBB, OK. LOCATION- SCLEROTINIA NURSERY

Cultivar	Value/Ac	Pods/Ac lbs.	TSMK %	100 Sd. Wt.(g)
01F6239	488a	2598ab	76.0a	48.5k-l
01F6246	476ab	2598ab	74.7ab	56.0d-f
01F5415	473ab	2614a	73.0a-e	51.5h-k
TamrunO/L01	444a-c	2589ab	69.8e-j	69.0a
Tamrun 96	432a-d	2581ab	68.3g-m	55.0d-g
01Y4126	426a-d	2356a-c	73.4a-d	53.5e-i

SEMINOLE, TX. LOCATION- DISEASE-FREE SITE

Cultivar	Value/Ac	Pods/Ac lbs.	TSMK %	100 Sd. Wt.(g)
Flav. Run. 458	1386a	7118a	79.5a	73.3e-k
Ga. Green	1361ab	7075a	78.5ab	72.3f-l
01F5404	1217a-c	6606ab	75.0f-j	73.4e-k
Tamrun 96	1210bc	6581ab	75.1e-i	75.9c-h
Sun Oleic 95R	1207bc	6342a-c	77.7a-d	79.9bc
01F5415	1206bc	6391a-c	76.7b-f	71.5g-m

While more analysis are needed to determine whether or not there is a statistical difference between selection techniques, it is evident from the individual location data that several lines are performing better than the check varieties in areas of high disease pressure and statistically as well in disease-free areas.

An additional yield test at the Pearsall location dealt with Spanish and Bunch-type growth habits that segregated out of the four populations in this study. These selections had good to excellent disease ratings over the past two years in both TSWV and

Sclerotinia infested locations. Seed quantities were such that only one location could be tested in a three-replication trial. The following is a table of the top ten entries from this test. Some of the entries were large seeded so, AT108 and Virugard were added as large seeded checks.

PEARSALL, TX. LOCATION- Top nine entries

Cultivar	Value/Ac	Pods/Ac lbs.	TSMK%	100Sd. Wt.(g)
AT108	1223a	7231a	68.4a-e	75.8d-f
Virugard	1172a	6770a	70.3a-d	84.0b-d
01F6235	971b	5610b	70.2a-d	83.0b-d
01Y4199	945bc	5373bc	71.5ab	78.8c-e
01F5407	886b-d	4884cd	73.7a	68.7f
01Y4201	863b-e	5240bc	66.5b-f	78.9c-e
OLin	842b-e	4830c-e	71.1a-c	47.0g
01F5496	841b-e	5042b-d	68.2a-f	73.8ef
Tamspan 90	837b-e	5293bc	64.4c-f	43.1g

These lines were harvested 130 DAP and were mature enough to have been harvested at around 121 DAP, but rainfall prevented the earlier harvest. Line 01F5407 is of particular interest with the highest grade in the test and seed size similar to average runner peanuts. However it has a small erect growth habit and we feel there is room for yield improvement if this line and several of the other lines were planted in twin rows. These lines will be tested at several locations in 2003 as a replicated twin row study.

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