

264
TX-70
931
2010

Project Summary: 2010

Project Title:

Development and evaluation of peanut varieties adapted to West Texas.

Personnel and Agency:

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Since the revival of the Flavor Runner Breeding program in 2003, ACI has expanded the breeding program significantly. During the 2010 growing season, 1153 breeding line plots were planted near Brownfield, Texas. Also planted at this site, were a preliminary test, an advanced test, a Spanish test, a Virginia test and seed increases of 5 potential releases. The preliminary test consisted of 15 uniform lines not previously tested. The advanced yield trial consists of advanced lines that had performed well in other tests in other years and locations. Another advanced test with the same entries was planted in Gaines County. Spanish and Virginia tests consisted of new Spanish and Virginia lines not previously tested.

In 2010, 35 new lines were identified as uniform and were entered into the 2011 preliminary yield. Results of this test identified 14 new lines that are high yielding and earlier maturing than FR 458. These are high yielding varieties with the high oleic character and 'Florunner' milling quality.

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Problem and Need:

The West Texas peanut growing region is unique from all other growing regions in the U.S. and is uncommon relative to peanut growing regions world wide. The combination of high altitude and arid climate sets the region apart from the humid coastal plains where most U.S. peanuts are produced. This unique growing region poses unique challenges to peanut production not experienced elsewhere. Peanut seed varieties grown in West Texas tend to mature more slowly and produce larger kernel size and lower O/L ratios by comparison when grown in other U.S. growing regions. West Texas needs an earlier maturing seed variety that is selected, developed, and tested in West Texas. The variety needs to have high yield and grade, disease resistance, and high oleic oil chemistry.

Plan of Action:

Currently, the most widely grow peanut seed variety in West Texas is 'Flavor Runner 458', developed by Mycogen Seeds. This is the chemically induced high oleic mutant of 'Florunner'. Flavor Runner 458' has the quality characters of 'Florunner' but is still a variety developed for the long hot growing season of the

Southeast. After 'Flavor Runner 458' was released as a variety, crosses were made between 'Flavor Runner 458' and early maturing parental lines. Uniform and segregating lines from these crosses were licensed to ACI by Mycogen/Dow AgroSciences. Over the past 7 years, uniform lines developed from those crosses have been evaluated for adaptability in West Texas. Other uniform lines from the Flavor Runner breeding program are still under evaluation and consideration for commercial production.

This is an ongoing peanut variety development program that requires two principal objectives.

Objective 1: Development of segregating lines for selection in West Texas

Starting in 2003 and continuing to the present, crosses were made between Flavor Runner 458 breeding lines and lines with sources of disease resistance and early maturity. Through generational advancements in the Puerto Rico winter nursery, these lines are in F₂₋₈ generations. Over the past 7 years plant selections have been made in West Texas with emphasis on yield, grade, early maturity, disease resistance and high oleic oil chemistry.

Objective 2: Evaluation of uniform lines

Uniform lines from the original Flavor Runner breeding program were tested in 2010 in multi-location replicated field trials. New uniform lines were selected in 2010 and will enter replicated field trials in 2011. These new lines will first be tested in a preliminary test. The best lines in the preliminary test will go on to be tested the following year in the advanced tests at multiple locations. The best lines in the advanced tests will be considered for seed increase and release.

Current project status

Since the revival of the Flavor Runner Breeding program in 2003, ACI has expanded the breeding program significantly. During the 2010 growing season, 1153 breeding line plots were planted near Brownfield, Texas. Also planted at this site, were a preliminary test, an advanced test, a Spanish test, a Virginia test and seed increases of 5 potential releases. The preliminary test consisted of 15 uniform lines not previously tested (Table 1). The advanced yield trial (Table 2) consists of advanced lines that had performed well in other tests in other years and locations. Another advanced test with the same entries was planted in Gaines County (Table 3). Spanish and Virginia tests consisted of new Spanish and Virginia lines not previously tested.

In 2010, 35 new lines were identified as uniform and will be entered into the 2011 preliminary yield. Preliminary visual evaluation indicated these lines are high yielding and earlier maturing than FR 458.



Harvest of 2010 Test plots near Brownfield, Texas.

Table 1
Preliminary Test 2010 Brownfield, Texas

Entry	reps	Sum	Variance	Average	lbs/acre
WT09-0328	4	65.19	3.137158	16.2975	5329
WT09-0055	4	64.2	6.6858	16.05	5248
WT09-0052	4	64.01	21.09283	16.0025	5233
WT09-0079	4	63.32	2.776533	15.83	5176
WT09-0009	4	62.88	0.712667	15.72	5140
WT09-0325	4	61.82	0.474967	15.455	5054
WT09-0159	4	60.57	1.001225	15.1425	4952
WT09-0062	4	59.32	5.529867	14.83	4849
WT09-0336	4	59.13	12.98829	14.7825	4834
M04-0149	4	58.5	0.9699	14.625	4782
FR 458	4	57.57	2.309558	14.3925	4706
WT04-0121	4	56.44	7.7582	14.11	4614
WT09-0352	4	55.2	1.882467	13.8	4513
WT09-0381	4	54.82	1.599767	13.705	4482
WT09-0353	4	54.06	2.129967	13.515	4419
WT09-0067	4	48.56	10.33747	12.14	3970
WT09-0005	4	48	2.850733	12	3924
WT09-0379	4	41.88	0.077667	10.47	3424

Results of advanced tests from Terry County and Gaines County are summarized in Table 2 and Table 3.

Table 2 Terry County 2010

<i>Entry</i>	<i>Reps</i>	<i>Sum</i>	<i>Variance</i>	<i>Average</i>	<i>lbs/acre</i>
WT08-0077	4	64.94	0.6207	16.235	5309
WT08-0087	4	63.53538	0.313475	15.88385	5194
WT05-0219	4	61.57	1.333825	15.3925	5033
WT08-0085	4	61.13526	5.927746	15.28382	4998
NC99103	4	61.06	1.836433	15.265	4992
M04-0149	4	60.93579	0.704487	15.23395	4982
WT03-0048	4	59.19	0.237358	14.7975	4839
Gregory	4	59.06	2.709767	14.765	4828
WT08-0198	4	57.5	1.616367	14.375	4701
WT04-0121	4	56.92947	1.440008	14.23237	4654
WT08-0435	4	56.53	1.817211	14.1325	4621
FR 458	4	56.19	0.124025	14.0475	4594
WT08-0406	4	55.95	0.166425	13.9875	4574
WT08-0801	4	55.56526	0.857596	13.89132	4542
WT08-0009	4	54	1.3922	13.5	4415
WT08-0444	4	53.86263	0.332695	13.46566	4403
OL07	4	52.38	0.424967	13.095	4282
WT08-0883	4	45.82158	4.604537	11.45539	3746

Table 3 Gaines County 2010

<i>Entry</i>	<i>Rep</i>	<i>Sum</i>	<i>Variance</i>	<i>Average</i>	<i>lbs/acre</i>
WT08-0085	4	82.580	2.472	20.645	6751
WT08-0444	4	80.146	1.337	20.036	6552
NC99103	4	79.750	1.100	19.938	6520
WT08-0883	4	79.650	0.801	19.913	6511
M04-0149	4	78.570	1.321	19.643	6423
FR 458	4	78.130	0.733	19.533	6387
WT03-0048	4	77.570	0.236	19.393	6341
WT08-0198	4	76.930	0.056	19.233	6289
WT08-0077	4	76.370	1.258	19.093	6243
WT08-0009	4	76.090	1.662	19.023	6220
WT08-0406	4	76.060	2.025	19.015	6218
WT08-0435	4	75.620	0.022	18.905	6182
WT08-0801	4	75.310	0.443	18.828	6157
WT08-0087	4	74.920	2.597	18.730	6125
WT05-0219	4	74.630	7.213	18.658	6101

Gregory	4	72.500	0.405	18.125	5927
WT04-0121	4	70.390	13.777	17.598	5754
OL07	4	68.970	3.115	17.243	5638

New Variety Release

M04-0149 is scheduled for release under the variety name ACI-149. This variety has performed well in a wide range of environments. The variety has always yielded equal to or better than FR 458 in replicated yield trials. It has good general disease resistance. ACI-149 has been shown to have resistance to pod rot, moderate resistance to CBR and resistance to TSWV equal to Georgia Green. ACI-149 has good milling characteristics and has been shown to have good flavor. ACI-149 expresses the Flavor Runner high oleic character. Approximately 7000 acres of ACI-149 will be planted in 2011.