

## TITLE:

Performance of commercially available Runner and Virginia peanut cultivars and advanced breeding lines under varying conditions.

## AUTHORS:

Jason Woodward, Extension Plant Pathologist, Peanut Specialist, Lubbock  
Bobby Rodriguez, Technician, Texas A&M AgriLife Extension Service, Lubbock  
Ira Yates, Technician, Texas A&M AgriLife Extension Service, Lubbock  
Eric Williams, Extension Assistant, Lubbock  
Manda Anderson, County Extension Agent - IPM, Seminole

## MATERIALS AND METHODS:

Field trials were conducted throughout Gaines Co. to evaluate the performance of Runner and Virginia cultivars and breeding lines under varying conditions, such as irrigation capacity, soil type and disease pressure (predominantly *Verticillium* and Pod rot). Trials were planted between 25-Apr and 5-May in conjunction with collaborating producers. Plots were 2 rows wide by 40 to 50 ft in length (depending on location). Treatments (cultivars and breeding lines) were arranged in a randomized complete design with four replications. All other production practices followed producer decisions or extension recommendations. Stand counts were made 21-28 days after planting (DAP). *Verticillium* wilt was monitored throughout the season and final ratings were taken just prior to plants being inverted. Peanuts were dug at maturity, allowed to dry in windrows (to ~10% moisture) and thrashed. Yields were estimated by weighing pods collected from each plot and grades were determined by shelling 250 g sub-samples and subjecting kernels to Federal Grading Procedures. All data were analyzed using ANOVA and means were separated via Fisher's Protected LSD ( $P < 0.05$ ).

## RESULTS AND DISCUSSION:

Where *Verticillium* wilt did not develop at appreciable levels, pod yields averaged 5463 lb ac<sup>-1</sup>, ranging from 4343 to 6301 lb ac<sup>-1</sup> (Table 1). Yields of the cultivars AT-215, Florida-107 Florida Fancy (Virginia), TUFRunner 727, Flavor Runner 458, ACI-149 and Tamrun OL 07, and the breeding lines TX-1305, TX-1304, PR-2 and WT-090789 were similar averaging 5848 lb ac<sup>-1</sup>. Grades ranged from 63.0 to 76.7% smk+ss for *WT-090808* and AT-215, respectively.

**Table 1.** On-farm Runner cultivar trial, Gaines Co. 1<sup>‡</sup>.

<b>Cultivar</b>	<b>Pod yield (lb ac<sup>-1</sup>)</b>		<b>Grade (% smk+ss)</b>	
AT-215	6,301	a	76.7	a
Florida 107	6,133	ab	71.6	d-f
<i>TX-1305</i>	5,996	a-c	72.9	a-f
Florida Fancy	5,916	a-d	71.2	ef
TUFRunner 727	5,898	a-d	72.4	b-f
Flavor Runner 458	5,878	a-d	75.4	a-d
<i>TX-1304</i>	5,778	a-e	74.3	a-f
ACI-149	5,719	a-e	75.8	a-c
Tamrun OL07	5,644	a-e	76.0	ab
<i>PR-2</i>	5,567	a-e	71.2	ef
<i>WT-090789</i>	5,495	a-f	72.0	c-f
Georgia 09-B	5,287	b-f	73.6	a-f
<i>WT-090808</i>	5,204	c-f	63.0	g
Tamrun OL11	5,193	c-f	75.7	a-c
TamrunOL02	5,169	c-f	73.7	a-f
Florida 07	5,066	d-g	65.0	g
Red River Runner	5,048	d-g	75.2	a-d
McCloud	4,960	e-g	72.9	a-f
<i>WT-090814</i>	4,672	g	70.4	f
<i>WT-080883</i>	4,343	g	74.0	a-f

<sup>‡</sup>Data are the means of four replications. Means within a column followed by the same letter are not significantly different according to Fisher's protected LSD.

Two other trials in Gaines Co. had appreciable levels of *Verticillium* wilt develop (Tables 2 and 3); however, onset and severity of the disease was lower than in previous years. At the Gaines Co. 2 location, disease incidence ranged from 8.8 to 36.3% (Table 2). The lowest disease ratings were associated with the breeding lines *PR-2* and *WT-090814* and highest for the breeding line *WT-080883*. Disease incidence for the commercial standards Flavor Runner 458 and Tamrun OL07 were 27.5 and 23.6%, respectively. Tamrun OL11 exhibited an intermediate level of disease (15.0%), as did ACi-149 (13.8%). Disease incidence was not correlated with yield (data not shown). Little separation was observed among the cultivars tested, the test averaged 3659 lb ac<sup>-1</sup>. Yields were numerically highest for McCloud followed Florida-107, *TX-1304*, Florida-07, Florida Fancy (Virginia) Tamrun OL02, AT-215, Tamrun OL07, Tamrun OL11, Georgia 09-B, *WT-090789*, *PR-2* and TUFRunner 727. Yields were lowest for the susceptible check cultivar Tamrun OL06 (Spanish) and the breeding line *WT-080883*. No differences in grades were observed. The test average was 72.5% smk+ss.

**Table 2.** On-farm Runner cultivar trial, Gaines Co. 2

<b>Cultivar</b>	<b>Wilt incidence (%)</b>		<b>Pod yield (lb ac<sup>-1</sup>)</b>		<b>Grade (% smk+ss)</b>	
McCloud	18.8	a-c	4,488	a	72.2	a
Florida 107	20.0	a-c	4,393	ab	73.4	a
<i>TX-1304</i>	12.5	bc	4,261	a-c	71.9	a
Florida 07	17.5	bc	4,152	a-c	73.7	a
Florida Fancy	25.0	a-c	4,051	a-c	70.1	a
TamrunOL02	11.3	bc	4,001	a-c	71.6	a
AT-215	18.8	a-c	3,932	a-c	71.7	a
Tamrun OL07	26.3	a-c	3,851	a-c	71.7	a
Tamrun OL11	15.0	bc	3,817	a-c	73.1	a
Georgia 09-B	13.8	bc	3,675	a-d	72.4	a
<i>WT-090789</i>	22.5	a-c	3,656	a-d	72.9	a
<i>PR-2</i>	8.8	c	3,629	a-d	71.9	a
TUFRunner 727	26.3	a-c	3,589	a-d	74.6	a
<i>TX-1305</i>	13.8	bc	3,405	b-d	71.6	a
ACI-149	13.8	bc	3,381	b-d	73.3	a
Red River Runner	17.5	bc	3,300	cd	72.1	a
<i>WT-090814</i>	8.8	c	3,297	cd	73.5	a
Flavor Runner 458	27.5	ab	3,252	cd	73.1	a
<i>WT-090808</i>	13.8	bc	3,227	cd	73.2	a
<i>WT-080883</i>	36.3	a	2,777	d	72.7	a
Tamnut OL06	26.3	a-c	2,702	d	71.8	a

<sup>‡</sup>Data are the means of four replications. Means within a column followed by the same letter are not significantly different according to Fisher's protected LSD.

In addition to *Verticillium* wilt, appreciable levels of pod rot developed at the other field trial in Gaines Co. (Table X). A rating scale (1-5) was developed (where 1 = no disease and 5 = 50% of the plot exhibiting pod rot symptoms) to rate the disease after plots were inverted. While this method may require some refining, differences among the cultivars were observed. Pod rot values ranged from 1.9 to 4.6. Pod rot ratings were lowest for the cultivar Tamrun OL07 and the breeding lines *TX-1305*, *PR-2* and *WT-090789* (with ratings of 2.1, 2.4 and 2.5, respectively). Information on pod rot is fairly limited; however, the observation with Tamrun OL07 having low levels of pod rot agree with other reports in 2009, 2010 and 2011. *Verticillium* wilt was varied within the test area. The trial averaged was 23.3%. The highest levels of the disease were observed in Tamrun OL02, TUFRunner 727 and *WT-090808*. *WT-090789* Tamrun OL07 and *TX-1305* exhibited among the lowest levels of *Verticillium* wilt. Yields ranged from 2967 to 6006 lb ac<sup>-1</sup> with a test average of 4903 lb ac<sup>-1</sup>. Yields were similar for the cultivars Georgia 09-B, Tamrun OL11, Florida 07, McCloud and Tamrun OL07 and the breeding lines *WT-090789*, *TX-1305* and *TX-1304*.with an average of 5519 lb lb ac<sup>-1</sup>. Grades ranged from 66.1% smk+ss for Florida 07 to 74.7% smk+ss for AT-215.

**Table 3.** On-farm Runner cultivar trial, Gaines Co. 3

<b>Cultivar</b>	<b>Wilt incidence (%)</b>	<b>Pod rot (1-5 scale)</b>	<b>Pod yield (lb ac<sup>-1</sup>)</b>	<b>Grade (% smk+ss)</b>
Georgia 09-B	12.3 ef	4.6 a	6,006 a	70.3 c-g
<i>WT-090789</i>	5.7 f	2.5 g-j	5,972 ab	70.9 b-f
<i>TX-1305</i>	9.7 ef	2.1 ij	5,611 a-c	69.3 d-h
Tamrun OL11	16.2 d-f	3.9 a-d	5,560 a-c	71.3 b-f
Florida 07	36.7 bc	3.3 c-f	5,513 a-d	66.1 i
McCloud	16.7 d-f	3.1 e-h	5,256 a-e	68.5 f-i
Tamrun OL07	9.5 ef	1.9 j	5,121 a-f	73.8 ab
<i>TX-1304</i>	21.1 c-f	2.7 f-i	5,110 a-f	69.0 d-i
<i>WT-090808</i>	42.1 ab	3.6 b-e	5,058 b-f	67.1 hi
<i>M-040149</i>	13.4 ef	3.3 c-f	4,985 c-g	73.7 ab
Florida 107	23.7 c-e	3.6 b-e	4,983 c-g	71.4 b-f
ACI-149	13.6 ef	3.2 d-g	4,908 c-g	73.8 ab
Red River Runner	33.3 b-d	2.8 f-i	4,904 c-g	69.9 d-h
<i>WT-090814</i>	10.5 ef	3.0 e-h	4,616 d-g	71.9 a-d
TUFRunner 727	46.4 ab	4.1 a-c	4,581 e-g	67.8 g-i
<i>PR-2</i>	36.9 bc	2.4 h-j	4,390 e-g	71.9 a-e
TamrunOL02	58.8 a	2.7 f-i	4,207 g	73.5 a-c
AT-215	34.8 bc	4.4 ab	4,156 g	74.7 a
Flavor Runner 458	13.2 ef	3.1 d-h	4,155 g	73.5 ab
<i>WT-080883</i>	10.8 ef	2.9 e-i	2,967 h	71.1 b-f

<sup>‡</sup>Data are the means of four replications. Means within a column followed by the same letter are not significantly different according to Fisher's protected LSD.

Little disease was observed at the Gaines Co. 1 location and pod yields averaged 5353 lb ac<sup>-1</sup>. Florida Fancy, Suggs *NC08070*, AT-07V and *AU-1101* provided yields of 6006, 5676, 5610, 5465 and 5386 lb ac<sup>-1</sup>, respectively (Table 4). Yields were lowest for Jupiter at 4739 lb ac<sup>-1</sup>. Grades averaged 68.1% smk+ss, ranging from 61.1% for *AU-1101* to 73.6% for Florida Fancy.

**Table 4.** On-farm Virginia cultivar trial, Gaines Co. 1

<b>Cultivar</b>	<b>Pod yield (lb ac<sup>-1</sup>)</b>	<b>Grade (% smk+ss)</b>
Florida Fancy	6,006 a	73.6 a
Suggs	5,676 ab	67.7 a-c
<i>NC08070</i>	5,610 ab	72.5 ab
AT-07V	5,465 a-c	62.2 cd
<i>AU-1101</i>	5,386 a-c	61.1 d
Gregory	5,201 bc	68.2 a-c
Perry	5,108 bc	69.3 ab
<i>NC08085</i>	4,990 bc	70.8 ab
Jupiter	4,739 c	67.1 b-d

<sup>‡</sup>Data are the means of four replications. Means within a column followed by the same letter are not significantly different according to Fisher's protected LSD.