Peanut Variety Performance in Florida, 2011 - 2014

Barry Tillman, Mark Gomillion, Justin McKinney, and George Person.

Variety choice is a critical management decision in producing a peanut crop. Several good peanut varieties are available to choose from, so it is essential to know the attributes of each variety, as well as how various varieties might fit into a farm plan.

When trying a new peanut variety for the first time, plant a relatively small test plot (20–50 acres) that will allow you to see the differences between varieties first-hand. Be aware, however, that comparing varieties planted in different fields, or even in different parts of the same field, can be misleading due to the potentially confounding differences between fields such as soil type, irrigation/rainfall, soil borne diseases, and planting date. When choosing which varieties to plant, consider pod yields and grades, but also consider a variety's disease resistance, maturity, seed supply, and anticipated planting dates.

Growers planting more than 100 acres of peanuts should plant at least two varieties. Planting more than one variety can help to spread risk of losses from weather, reduce opportunities for disease, and limit delays in harvest operations. For example, if a field has a history of white mold, use varieties that have a better resistance to that disease compared to other varieties. Use the *Peanut Disease Risk Index* to evaluate variety disease resistance (http://www.caes.uga.edu/commodities/fieldcrops/peanuts/documents/2015peanutupdate.pdf pp. 50-64). Your county agent can provide other useful resources. A summary table from the *Peanut 2015 Disease Risk Index* is included in this article (see Table 4).

The potentially devastating effects of tomato spotted wilt virus (TSWV) in the southeastern United States are another reason variety choice is very important. Severity of TSWV varies from year to year, and scientists are unable to predict disease levels for a coming crop season. Because TSWV is unpredictable, planting a peanut variety with good resistance to TSWV can significantly reduce the risk of losses from that disease. Over the past several seasons (2010 – 2014), spotted wilt incidence has been much lower than in previous seasons. However, there is no reason to believe that the disease has disappeared, or that the incidence will remain low, so it is important to continue to mitigate risk of losses from spotted wilt.

This report provides data from University of Florida trials conducted in Florida at IFAS research centers located in Gainesville (Citra), Marianna, and Jay from 2011–2014. Among the sites in Florida where peanut variety resistance to TSWV has been tested, TSWV is usually most severe in Marianna, so variety performance in that location will give a good indication of the TSWV resistance of a given variety. Results often are very different between Marianna, Gainesville, and Jay, depending on TSWV pressure, other disease pressure within those areas, and environmental conditions, including soil type and rainfall. Table 4 includes summarized data for variety resistance to TSWV.

Tests in Marianna and Gainesville were grown with irrigation. The tests at Jay were not irrigated except in 2012. All tests were managed for optimum production, including the use of pesticides to control various diseases, insects, and weeds. In-furrow insecticides aldicarb [Temik] or phorate [Thimet]) were used in throughout the trials. Plots consisted of 2 rows spaced 36 inches apart (91 cm) and were 15 feet long (4.6m). The seeding density was 6 seeds per foot of row. Plots were dug and inverted based on relative maturity and allowed to dry in the field 3-5 days prior to harvest either with a commercial two row peanut combine or by hand using a stationary plot thresher. A subsample of 200g of pods was used to determine the TSMK percentage (Total Sound Mature Kernels).

Peanut Varieties in the Southeastern United States

Historically, peanut acreage in the southeastern United States has been dominated by one variety during a given period. For about 20 years, from the early 1970s and continuing through the early 1990s, 'Florunner' was the dominant peanut variety grown in this region of the United States. In the mid-1990s, however, TSWV began to cause severe losses in Florunner as well as in other varieties used at the time that did not have TSWV resistance. From the late 1990s until the 2006-07 season, 'Georgia Green' was the dominant cultivar planted in this region, rising quickly in

popularity due to its moderate resistance to TSWV, good grades, and good pod yield. When it was released in 1996, it was the only medium-maturity runner variety with resistance to TSWV.

Nevertheless, as the TSWV epidemic of the 1990s had demonstrated, the practice of relying heavily on one cultivar at a time is dangerous for the peanut industry. Like Florunner before it, Georgia Green in 2005 occupied about 75 percent of the certified seed acreage in Alabama, Florida, and Georgia. In the 10 or more years before 2005, Georgia Green had also occupied at least that amount of acreage in these states. In 2006, however, other peanut varieties began to displace Georgia Green in certified seed acreage in this region. By 2009, Georgia Green occupied only about 10 percent of the seed acreage in Alabama, Florida, and Georgia and by 2010, Georgia Green was only 2% of the seed acreage. By 2012, Georgia-06G occupied 77-79% of the certified seed acreage similar to Georgia Green in 2005 and continues to be the dominant variety in the southeastern USA (Figure 1).

On an industry-wide scale, it seems preferable that no one variety occupy more than 50 percent of the certified seed acreage. Diversity in peanut varieties planted can reduce the risk of losses from disease and provide a buffer against differential environmental impacts on a given variety. Considering that the seed-increase ratio of peanuts is low, having several varieties in seed production at significant levels allows a much quicker shift to different varieties if needed. Using the information on variety performance provided below, it is possible to devise a plan that uses several varieties to spread risk of losses from disease. This information also helps in choosing varieties based on their relative maturity and disease resistance to help spread harvest and planting operations over a longer period.

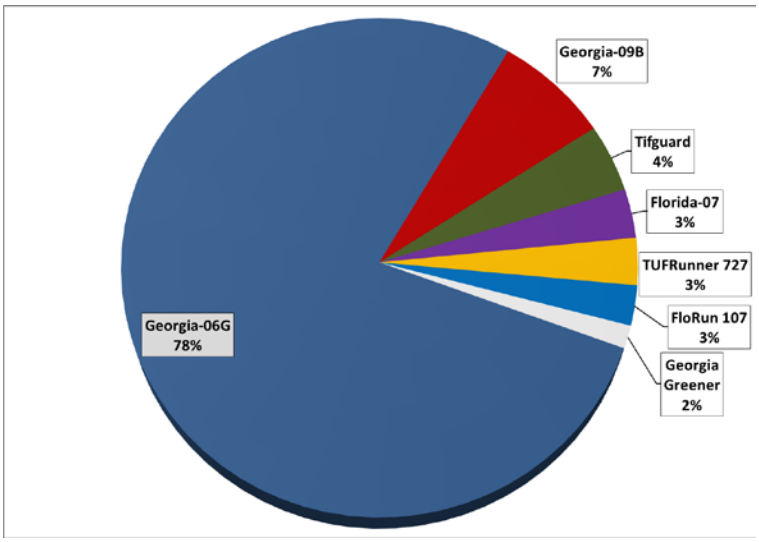

Figure 1. Certified seed acreage in Alabama, Florida, and Georgia in 2014.

Recently Released Varieties

Several new runner varieties have been released over the past several years. The cultivar 'TUFRunner™ '727' was released in 2012 from the University of Florida. TUFRunner '727' is a high oleic, medium-late maturity variety with large runner seed and excellent disease resistance. The University of Georgia released 'Georgia-10T' in 2010 and 'Georgia-11J' in 2011. Georgia-10T is a late maturity, normal oleic variety with excellent resistance to spotted wilt. Georgia-11J is a Virginia type with high oleic oil chemistry. In 2012, the University of Georgia released 'Georgia-12Y' and in 2013 'Georgia-13M'. Georgia-12Y is a medium-late maturity, normal oleic runner with excellent yield potential. Georgia-13M is a medium seed size, high oleic runner type. In 2013, the University of Florida released 'TUFRunner '511', a large seeded, high oleic runner with excellent yield potential and grades. Seed supplies of 'TUFRunner '511' and Georgia-13M will be very limited in 2015. In 2014, TUFRunner™ '297' was released by the University of Florida and in 2014, about 30 acres of Foundation seed were grown. It is an extra-large seeded runner

type with excellent yield potential and grade. It has very good resistance to TSWV and white mold and is susceptible to leaf spot. The University of Georgia released Georgia-14N in 2014. It has resistance to root knot nematode and is high oleic.

Current Varieties

Three runner type varieties are available for general production from the University of Florida. 'Florida-07' is a large seeded, high oleic runner type with excellent resistance to spotted wilt and white mold combined with excellent yield and good grades. FloRun™ '107' is a high oleic, runner with normal runner seed size and good resistance to TSWV. The variety TUFRunner '727' is a large seeded runner type with very good resistance to white mold and leaf spot diseases. The Virginia-type variety, 'Florida Fancy', was released by University of Florida in 2007. Florida Fancy has high oleic oil chemistry and standard Virginia-type pod and seed size. Florida Fancy has demonstrated very good yield potential, and it has among the best resistance to TSWV available in a Virginia-type variety. The seed supply of the newer varieties TUFRunner™ '511' and TUFRunner™ '297' will be limited in 2015 to registered and certified seed production.

University of Georgia has four runner varieties that are generally available: 'Georgia-06G', released in 2006, and 'Georgia Greener' and 'Georgia-07W', both released in 2007, and Georgia-09B. All but Georgia-09B have normal oleic oil chemistry and all have excellent grades, medium maturity, and competitive pod yield. Georgia-06G is a large-seeded runner with good TSWV resistance. Georgia Greener has smaller seed than Georgia-06G and very good resistance to TSWV. Georgia-07W has large seed and very good resistance to TSWV and white mold. Seed supplies of the newer varieties Georgia-12Y and Georgia-13M will be limited although some Georgia-12Y may be available for general production.

The U.S. Department of Agriculture (USDA) released a runner variety in 2007—'Tifguard'. It is a medium-maturing, large-seeded runner, and the first variety to combine resistance to TSWV and a high level of resistance to root-knot nematode. That combination of resistance to disease and nematodes will allow growers in the southeastern United States to take advantage of the same root-knot nematode resistance as in 'NemaTam', a peanut variety developed in Texas and released in 2002. Seed of Tifguard have been available since the 2011 season. Growers who normally use 1,3-D (Telone) to control nematodes should be able to cultivate Tifguard on nematode-infested sites without using Telone.

2014 Results

Table 1 details pod yields, total sound mature kernels percentage (TSMK), maturity, and TSWV ratings for tests at three locations in Florida in 2014. Ratings for TSWV were on a 1–10 scale, where 1 = less than 10% diseased plants, and 10 = more than 90% diseased plants.

Spotted wilt pressure was low to moderate in 2014, and yields were excellent. Among the medium-maturity varieties tested, Georgia-07W had the highest pod yield which was statistically similar to Georgia-13M, Georgia-09B, Georgia-06G, TUFRunner™ '511', TUFRunner™ '297', and Georgia-12Y and was greater than other runner cultivars. Among the Virginia-type varieties, 'Bailey' has the highest pod yield, and it was statistically similar to Florida Fancy and Georgia-11J. Grades were generally very good in 2014 with most cultivars TSMK percentage in the mid to high 70% range. TUFRunner™ '511', TUFRunner™ '297', Georgia-07W, Georgia-09B, Georgia-06G, Georgia Greener, Georgia-13M, and Tifguard had the highest TSMK grade among the runner cultivars.

Results from any single year should not be used to determine variety performance for the purpose of variety selection. Rather, the results from 2014 presented here are simply a reflection of the growing season that occurred in that year and how varieties performed. The multi-year results are better suited for comparison of the performance of

varieties year over year and are a better estimate of how they could perform in any given season. Results over multiple years are presented in the next section.

Table 1. Performance of peanut varieties in three locations in Florida in 2014, with varieties sorted by market type, maturity, and then yield, in descending order. MR=Marianna, GV=Gainesville, and JY=Jay.

	Market		Pod Yield (lbs./A)				TSMK (%)			TSWV (1-10 rating***)			
	Type	Maturity*	MR	GV	JY	AVG.	MR	GV	AVG.	MR	GV	JY	AVG
Georgia-07W	R	M	7401	5663	6722	6595	76.9	78.6	77.7	1.5	1.2	1.0	1.2
Georgia-12Y	R	M	7223	5415	6609	6416	77.3	72.0	74.6	1.2	1.2	1.0	1.1
TUFRunner™ '297' **	R	M	7170	5768	5979	6305	80.2	74.9	77.5	1.8	1.3	1.0	1.4
TUFRunner™ '511' **	R	M	6808	6342	5671	6274	78.9	76.1	77.5	2.7	1.0	1.0	1.6
Georgia-06G	R	M	7531	6175	4823	6176	79.4	76.3	77.8	1.0	1.0	1.0	1.0
Georgia-09B **	R	M	6812	6124	4854	5930	78.5	77.4	78.0	1.7	1.0	1.0	1.2
Georgia-13M **	R	M	6792	4782	6211	5928	79.8	72.1	75.9	1.7	1.0	1.0	1.2
Georgia Greener	R	M	7052	5768	4255	5692	81.0	75.1	78.0	1.3	1.3	1.0	1.2
FloRun™ '107' **	R	M	6316	5712	4882	5637	78.1	72.1	75.1	1.8	1.0	1.7	1.5
Tifguard	R	M	6584	4878	5247	5570	78.5	75.7	77.1	2.0	1.0	1.0	1.3
TUFRunner™ '727' **	R	M	6271	5451	4806	5509	77.1	72.2	74.6	1.8	1.3	1.3	1.5
Florida-07 **	R	M	6802	4670	4561	5344	76.7	69.1	72.9	1.7	1.0	1.0	1.2
Bailey	V	M	7407	6169	6307	6628	77.3	71.1	74.2	1.0	1.3	1.0	1.1
Florida Fancy **	V	M	6116	5279	6544	5980	75.1	72.0	73.5	2.7	1.2	1.0	1.6
Georgia-11J **	V	M	6218	5065	6354	5879	74.1	74.8	74.4	1.7	1.0	1.0	1.2
C.V			8	7	14	10	1.6	1.7	1.6	49.6	17.1	25.0	39.8
LSD			733	553	1074	805	2.1	2.1	0.4	1.1	0.3	0.4	0.1

* E = 125–130 days after planting, DAP; M = 133–139 DAP; M-L 140-145; L = 146–155 DAP
**High Oleic
***Ratings for TSWV were on a 1–10 scale, where 1 = no disease, and 10 = all plants severely diseased or dying.

Multi-Year Results

Averaging over two or more years and locations is a good method of determining how a peanut variety will perform over a wide array of environments. The performance of runner market-type peanut varieties in Florida over the past four years (2011-2014) is shown in Table 2.

Among the medium-maturity cultivars tested during four years (2011–2014), TUFRunner™ '297' had the highest pod yield which was statistically similar to TUFRunner™ '511', and greater than the other cultivars tested. In the same group of cultivars tested during 2012-2014, TUFRunner™ '297' was again the highest yielding with TUFRunner™ '511' and Georgia-07W being statistically similar. The two year (2013-2014) average showed that Georgia-12Y had the highest yield and that TUFRunner™ '297', TUFRunner™ '511' and Georgia-07W were statistically similar. TUFRunner™ '511', TUFRunner™ '511', Georgia-06G, Georgia-07W, Georgia-09B, and Georgia Greener had the highest TSMK grade among the medium-maturity runner types.

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Table 2. Performance of runner market-type peanut varieties in 2–3 Florida locations over four years, 2011–2014, with entries sorted by maturity and four-year average yield, in descending order.

		YIELD (lbs./acre)				TSMK (%)				TSWV (1-10)***			
Name	Maturity*	2014	2-YR†	3-YR††	4-YR†††	2014	2-YR	3-YR	4-YR	2014	2-YR	3-YR	4-YR
TUFRunner™ '297' **	M	6305	6043	6231	6337	77.5	77.4	77.7	77.8	1.4	1.3	1.3	1.3
TUFRunner™ '511' **	M	6274	5921	6090	6234	77.5	78.2	78.7	78.6	1.6	1.5	1.3	1.4
Georgia-07W	M	6595	5977	6085	5995	77.7	77.4	78.1	78.3	1.2	1.2	1.2	1.2
Georgia-06G	M	6176	5850	5867	5959	77.8	78.6	79.1	79.1	1.0	1.2	1.2	1.2
FloRun™ '107' **	M	5637	5448	5828	5925	75.1	74.9	76.1	76.2	1.5	1.4	1.4	1.4
Florida-07 **	M	5344	5376	5667	5813	72.9	73.9	74.3	74.5	1.2	1.3	1.3	1.3
Georgia-09B **	M	5930	5644	5753	5771	78.0	78.7	79.2	78.9	1.2	1.2	1.2	1.4
TUFRunner™ '727' **	M	5509	5448	5664	5754	74.6	76.5	77.2	77.5	1.5	1.4	1.3	1.2
Georgia Greener	M	5692	5477	5427	5644	78.0	77.7	78.5	78.8	1.2	1.3	1.3	1.3
Tifguard	M	5570	5176	5356	5362	77.1	77.3	77.7	77.6	1.3	1.2	1.2	1.2
Georgia-12Y	M	6416	6189			74.6	76.0			1.1	1.1		
Georgia-13M **	M	5928				75.9				1.2			
C.V.		10	8	9	8	1.6	1.7	1.5	1.6	39.8	34.1	33.4	33.4
LSD		805	347	343	307	2.1	1.5	1.1	0.9	0.7	0.4	0.3	0.3

**High oleic
† Average of 2012 and 2013 test data.
†† Average of 2011, 2012, and 2013 test data.
††† Average of 2011, 2012, 2013, and 2014 test data.

Location Results

The pod yield of peanut cultivars grown at three Florida locations is shown in Table 3. In general, the highest-yielding entries in one location also did well in the other locations. Yields are sometimes lower in Jay because the peanuts there are not irrigated. Pod yields in Gainesville are generally higher because TSWV is very mild in this area. In Marianna, yields can be severely limited by TSWV. For that reason, varieties that are most resistant to TSWV usually have the highest yield in Marianna**.** During the test period in Marianna, TSWV pressure was low, so the impact in these tests is minimal.

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Table 3. Pod yield of peanut varieties in three Florida locations over four years, 2011–2014, with entries sorted by market type, maturity, and the overall average yield, in descending order.

			Pod Yield (lbs./acre)															
			Marianna (MR)					Jay (JY)					Gainesville (GV)					
Name	Maturity	Market-type	2011	2012	2013	2014	MR Average	2011	2012	2013	2014	JY Average	2011	2012	2013	2014	GV Average	Overall Average
TUFRunner™ '297' **	**M**	**R**	7327	5431	6387	7170	6579	6243	-	5514	5979	5912	6398	7783	5437	5768	6346	6312
TUFRunner™ '511' **	**M**	**R**	7259	5460	6229	6808	6439	6188	-	5285	5671	5715	6549	7398	5192	6342	6370	6216
Georgia-07W	**M**	**R**	6249	4982	5792	7401	6106	5066	-	5111	6722	5633	5852	7620	5176	5663	6078	5967
Georgia-06G	**M**	**R**	6950	4437	6382	7531	6325	5338	-	4869	4823	5010	6417	7366	5323	6175	6320	5965
FloRun™ '107' **	**M**	**R**	6279	5437	5379	6316	5853	6147	-	5095	4882	5375	6219	7743	5301	5712	6244	5865
Florida-07 **	**M**	**R**	6673	5408	5708	6802	6148	6128	-	5737	4561	5475	5954	7092	4780	4670	5624	5774
Georgia-09B **	**M**	**R**	6213	4220	6482	6812	5932	5628	-	4230	4854	4904	5633	7718	5363	6124	6210	5753
TUFRunner™ '727' **	**M**	**R**	6005	5060	5926	6271	5815	6015	-	5466	4806	5429	6047	7135	4766	5451	5850	5723
Georgia Greener	**M**	**R**	6840	3924	6108	7052	5981	6135	-	4537	4255	4976	5915	6732	5140	5768	5889	5673
Tifguard	**M**	**R**	5866	4627	5213	6584	5573	5045	-	4392	5247	4895	5235	6801	4744	4878	5415	5330
Georgia-12Y	**M**	**R**	-	-	6686	7223		-	-	5730	6609		-	-	5472	5415		
Georgia-13M **	**M**	**R**	-	-	-	6792		-	-	-	6211		-	-	-	4782		
Bailey	**E**	**V**	6273	5372	5755	7407	6202	6650	-	5424	6307	6127	6754	8114	5266	6169	6576	6317
Florida Fancy **	**M**	**V**	5014	5150	5658	6116	5485	7028	-	5679	6544	6417	5579	7417	3812	5279	5522	5752
Georgia-11J **	**M**	**V**	-	-	-	6218		-	-	-	6354		-	-	-	5065		
C.V.			6	10	4	8	7	11	-	9	14	12	8	7	7	7	7	8
LSD			530	655	362	733	289	852	-	674	1074	503	622	706	490	553	295	203

**High oleic

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Varieties with the Best Resistance to TSWV and Other Diseases

Disease resistance is a very important factor in choosing a peanut variety. The reaction of most varieties to the most prevalent peanut diseases in Florida is detailed in Table 4. To optimize the disease-resistance benefits of these varieties, varieties should be chosen based on their disease resistance in relation to diseases known to be problematic, or suspected of being problematic, in a particular field or farm.

Table 4. Disease resistance of major peanut varieties in the southeastern United States
(Adapted from the 2015 Peanut Rx, compiled by the University of Georgia, the University of Florida, and Auburn University. Fewer points mean better resistance and lower risk of losses to disease.)

Variety[1]	Spotted Wilt	Leaf Spot	White mold
Georgia Green	**30**	**20**	**25**
Florida Fancy[2]	**25**	**20**	**20**
Georgia-09B[2]	**20**	**25**	**25**
FloRun™ '107'[2]	**20**	**25**	**20**
Georgia Greener[3]	**10**	**20**	**20**
TUFRunner™ '727'[1,2]	**20**	**15**	**15**
TUFRunner™ '511'[1,2]	**20**	**30**	**15**
Georgia-06G	**10**	**20**	**20**
Florida-07[2]	**10**	**20**	**15**
Georgia-07W	**10**	**20**	**15**
Tifguard[4]	**10**	**15**	**15**
Bailey[3]	**10**	**15**	**10**
Georgia-12Y[1]	**5**	**20**	**10**

[1] *Adequate research data is not available for all varieties with regards to all diseases. Additional varieties will be included as data to support the assignment of an index value are available.*

[2] *High oleic variety.*

[3] *Varieties Georgia Greener, and Bailey have increased resistance to Cylindrocladium black rot (CBR) than do other varieties commonly planted in Georgia.*

[4] *Tifguard has excellent resistance to the peanut root-knot nematode.*

Use Table 4 to find a variety with the right disease package for your situation. If white mold is a problem in some of your fields, the following varieties would be good choices: Florida-07, Tifguard, TUFRunner™ '727', Georgia-12Y, and Georgia-07W. For another example, Tifguard and TUFRunner™ '727' have demonstrated some resistance to leaf spot. Use of these varieties in fields with a history of leaf spot could reduce the risk of losses from that disease. In situations where leaf spot risk is low, it might also allow for a reduction in the frequency of fungicide sprays needed for leaf-spot control compared to the need for such sprays with leaf-spot susceptible varieties. The variety Tifguard has resistance to root-knot nematode and so would be a good choice in fields with a history of that pest. Varieties that have enough resistance to TSWV to be planted relatively early include the following: Florida-07, Georgia-12Y, Georgia-06G, Tifguard, Georgia-12Y, and Georgia-07W.

Summary

Variety choice is clearly a critical management decision for peanut production. There are several very good peanut varieties to choose from today with similar pod yield and grade performance. Many varieties with good to excellent resistance to TSWV are suitable for production in the southeastern United States. Additionally, several of these TSWV-resistant varieties also have resistance to other diseases. Growing disease-resistant varieties can reduce risk and production cost.