

Peanut Variety Performance in Florida, 2004 - 2007¹

Barry Tillman, Dan Gorbet, Mark Gomillion, Justin McKinney, George Person, and Bill Thomas²

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 and how various varieties might fit into a farm plan.

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 diseases and weather. 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.

To evaluate variety resistance to diseases, use the Peanut Diseases Risk Index (<http://www.caes.uga.edu/commodities/fieldcrops/peanuts/2008peanutupdate/seuspnutdis.html>) or the University of Florida Plant Protection Pointers (http://edis.ifas.ufl.edu/TOPIC_SERIES_PPP). Your county agent can also help you find these resources. A summary table from the Peanut Disease Risk Index is included in this article (Table 5).

If you are trying a new variety for the first time, plant a relatively small test plot (20-50 acres) to make sure you see the differences first-hand. When

choosing which varieties to plant, first consider pod yields and grades, but also consider disease resistance, maturity, seed supply, and anticipated planting dates.

The potentially devastating effects of tomato spotted wilt virus (TSWV) in the southeastern United States make variety choice 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 TSWV.

Among the tests grown in Florida, 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, such as soil type and rainfall. Variety resistance to TSWV is summarized in Table 5, which is from the 2008 Peanut Disease Risk Index.

-
1. This document is SS AGR 311, one of a series of the Agronomy Department, Florida Cooperative Extension Service, Institute of Food and Agricultural Sciences, University of Florida. Original publication date, December 2008. Visit the EDIS Web site at <http://edis.ifas.ufl.edu>.
 2. Barry Tillman, assistant professor; Dan Gorbet, professor; Mark Gomillion, biological scientist, Department of Agronomy, North Florida Research and Education Center (NREC) -- Marianna, FL; Justin McKinney, senior biological scientist, Research and Demonstration Site, Citra, FL; George Person, senior biological scientist, NREC; Bill Thomas, extension agent IV, Columbia County Extension Office, Lake City, FL, Institute of Food and Agricultural Sciences, University of Florida, Gainesville, FL.

The Institute of Food and Agricultural Sciences (IFAS) is an Equal Opportunity Institution authorized to provide research, educational information and other services only to individuals and institutions that function with non-discrimination with respect to race, creed, color, religion, age, disability, sex, sexual orientation, marital status, national origin, political opinions or affiliations. U.S. Department of Agriculture, Cooperative Extension Service, University of Florida, IFAS, Florida A. & M. University Cooperative Extension Program, and Boards of County Commissioners Cooperating. Larry Arrington, Dean

This report provides data from University of Florida trials conducted in Florida at IFAS research centers located in Gainesville (Citra), Marianna, and Jay from 2004-2007. Tests in Marianna and Gainesville were grown with irrigation. The tests at Jay were not irrigated. All tests were managed for optimum production, including the use of pesticides to control various pests. In-furrow insecticides (Temik or Thimet) were used in Gainesville and Jay, but not in Marianna.

Peanut Varieties in the Southeastern United States

Historically, peanut acreage in the southeastern United States has been dominated by one variety during a given time 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. In the mid 1990s, TSWV began to cause severe losses in Florunner and in other varieties used at the time that did not have TSWV resistance. Since the late 1990s, 'Georgia Green' has been the dominant cultivar planted in this region. The main reasons for the popularity of Georgia Green were its moderate resistance to TSWV, good grades and good pod yield. When Georgia Green was released in 1996, Georgia Green was the only medium-maturity runner variety with resistance to TSWV.

As the TSWV epidemic of the 1990s demonstrated, it is dangerous for the peanut industry to rely so heavily on one cultivar at a time. Like Florunner before it, Georgia Green in 2005 occupied about 75 percent of the certified seed acreage in Alabama, Florida and Georgia (Figure 1). In the 10 or more preceding years, Georgia Green occupied at least that amount in these states. In 2006, however, other varieties began to displace Georgia Green in certified seed acreage in this region (Figure 2 and Figure 3).

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.

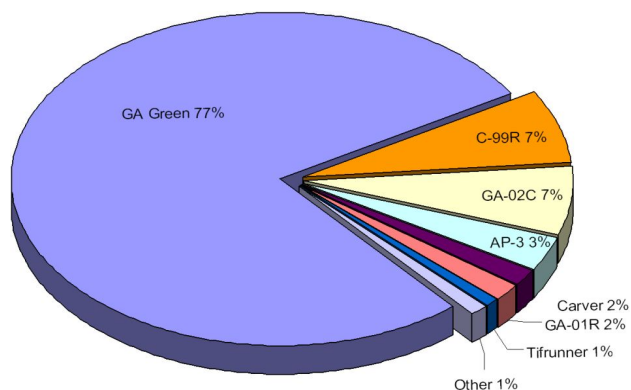


Figure 1. Certified seed acreage in Alabama, Florida, and Georgia in 2005.

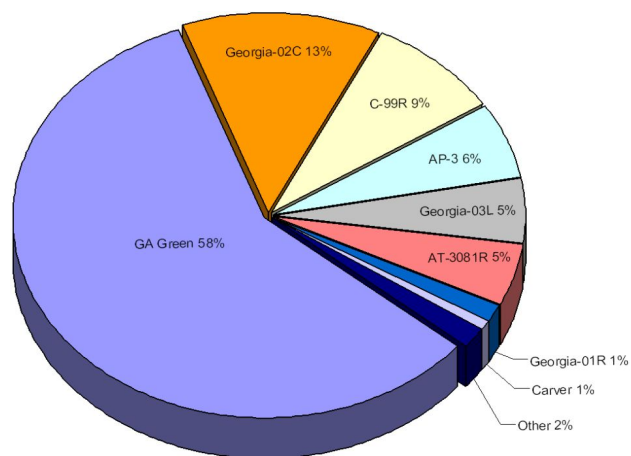


Figure 2. Certified seed acreage in Alabama, Florida, and Georgia in 2006.

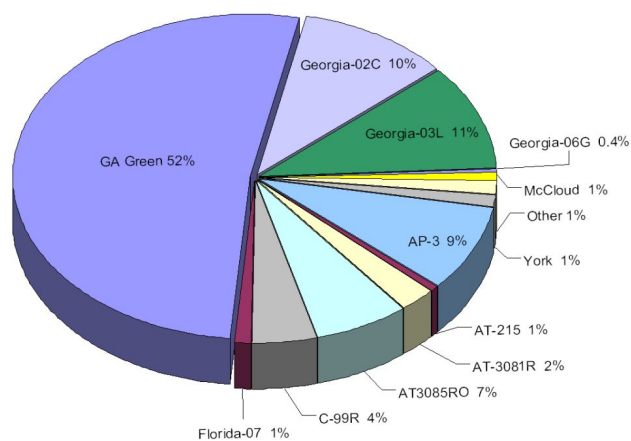


Figure 3. Certified seed acreage in Alabama, Florida, and Georgia in 2007.

Recently Released Varieties

Several new runner varieties were released in 2006 and 2007. The University of Florida released 'Florida-07', 'McCloud', 'York' and 'AP-4'. Florida-07 is a medium-maturing to medium-late maturing, large-seeded runner with excellent resistance to TSWV, good resistance to white mold, and some tolerance to leaf spots. Florida-07 has high oleic oil chemistry and has demonstrated excellent yield potential and good grades.

McCloud is a medium-maturity, large-seeded runner with high oleic oil chemistry. McCloud has better TSWV resistance than Georgia Green and is similar to Georgia Green in its resistance to other diseases. McCloud has demonstrated good yield potential and excellent grades.

York is a late-maturing runner with typical runner seed size, similar to Georgia Green. York has an excellent disease-resistance package with a high level of resistance to TSWV, white mold and leaf spots. York has high oleic oil chemistry and has demonstrated excellent yield potential and good grades. Seed of Florida-07, York and McCloud should be readily available for the 2009 season.

AP-4 is a large-seeded runner with good resistance to TSWV and moderate resistance to white mold. AP-4 is better than Georgia Green in both of these important measures. AP-4 has also demonstrated excellent pod yield and very good grades. AP-4 has normal oleic oil chemistry. Seed of AP-4 should be available for the 2010 season.

The new virginia variety, 'Florida Fancy', was released by the University of Florida in 2007. Florida Fancy has high oleic oil chemistry and standard virginia pod and seed size. Florida Fancy has demonstrated very good yield potential and has among the best resistance to TSWV available in a virginia variety. Seed of Florida Fancy should be available for the 2010 season.

The University of Georgia has two new runner varieties, 'Georgia-06G', which was released in 2006, and 'Georgia Greener', which was released in 2007. Both Georgia-06G and Georgia Greener have normal oleic oil chemistry, excellent grades, and competitive

pod yield. Georgia-06G is a large-seeded runner with good TSWV resistance. Georgia Greener has normal runner size seed and very good resistance to TSWV. Seed of these varieties should be generally available for the 2010 season.

The USDA released a new runner variety in 2007, 'Tifguard', a medium-maturing, large-seeded runner. Tifguard is the first variety to combine resistance to TSWV and a high level of resistance to root knot nematode. That combination of disease resistance 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. Seed of Tifguard should be generally available for the 2010 season.

2007 Results

Pod yields, TSMK (total sound mature kernels) percentage, maturity and TSWV ratings for tests at three locations in Florida in 2007 are reported in Table 1. Each entry was harvested (dug) at their apparent optimum maturity stage (i.e., E = 125-130 days after planting, DAP; M = 133-139 DAP; L = 145-155 DAP). Ratings for TSWV were on a 1-10 scale, where 1 = no disease, and 10 = all plants with severe damage or dying.

Spotted wilt was worse in 2007 compared to 2006, and yields were generally lower in 2007, especially in Marianna (Table 1). Only two early-maturing varieties are available, 'Virugard' and 'Andru II'. Andru II was the higher yielding in 2007. Among the medium-maturity varieties, Florida-07, Georgia Greener and AP-4 had statistically greater yield that year than Georgia Green.

Notably, Florida-07 had statistically higher yield in 2007 than all other medium maturity varieties tested except Georgia Greener and AP-4. The yield of 'Georgia-03L' was much lower in 2007 than in previous years, especially in Marianna and Gainesville.

Our results over the past four years have shown that some years Georgia-03L is afflicted by a disease that we confirmed in one field in 2007 as Diplodia Collar Rot. Yield was similar among the late-maturing varieties. Among the virginia varieties,

'Gregory', 'Florida Fancy' and 'Georgia-05E' had the highest pod yield in 2007.

Multi-year results

Averaging over two or more years and locations is a powerful method of determining how a variety will perform over a wide array of environments. The performance of runner market-type peanut varieties in Florida over the past four years (2004-2007) is shown in Table 2.

Among the medium-maturity cultivars tested during 2003 - 2007, 'AP-3' and Georgia-03L demonstrated the highest pod yields and a good TSMK percentage. AP-3 had the best resistance to TSWV.

In three years of testing (2005 – 2007), Florida-07 has had excellent pod yields, very good TSMK and a high level of resistance to TSWV resistance. Statistically, no other variety in any maturity category yielded as high as Florida-07 during 2005-2007.

Among the late-maturing varieties tested from 2004-2007, 'Georgia-01R' and 'C-99R' had higher yields than 'Georgia-02C'. Over the three-year period from 2004-2006, Georgia-01R, C-99R, and York had similar yield, followed by Georgia-02C. High TSMK percentage for both Georgia-01R and Georgia-02C, averaged over 2004 – 2007, was around 79 percent; high TSMK is a strength of those varieties. Acreage of Georgia-01R has been limited because of poor seed quality, a problem shared by several late-maturing varieties.

The performance of virginia market-type varieties in Florida over the four-year period 2004-2007 is shown in Table 3. Most of these varieties are more susceptible to TSWV than the popular runner varieties. If these TSWV-susceptible varieties contract the disease, yield losses could be substantial. Two new virginia varieties -- Georgia-05E and Florida Fancy -- appear to have better TSWV resistance than the others. Georgia-05E and Florida Fancy also have very competitive pod yield.

Location Results

The pod yield of peanut cultivars grown in three locations in Florida is shown in Table 4. In general, the highest-yielding entries in one location also did well in the other locations. Yields are generally lower in Jay because the peanuts 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 that area. In Marianna, TSWV pressure was much lower in 2006 compared to 2005.

Which varieties have the best resistance to TSWV and other diseases?

Disease resistance is a very important factor in choosing a variety. The reaction of most peanut varieties to some diseases present in Florida is detailed in Table 5. To optimize the disease-resistance benefits of these varieties, choose varieties based on their disease resistance.

Using Table 5, find a variety with the right disease package for your situation. If white mold is a problem in some of your fields, AP-3, C-99R, or Georgia-02C would be good choices. Similarly, in terms of late-maturing varieties, C-99R, Georgia 01R, and Tifrunner have good leafspot resistance and could allow a reduction in the frequency of fungicide sprays needed for leafspot compared to other, susceptible varieties. The new variety, Tifguard, has resistance to root knot nematode and so would be a good choice in fields with a history of that pest. AP-3 has also demonstrated tolerance to root knot nematode.

On-Farm Tests

During the past three years -- 2005, 2006, and 2007, scientists conducted farm-scale variety tests in Columbia County, Fla., using a limited number of varieties. These tests consisted of one to two acre replicated plots within a peanut field managed under conditions normal for the farmers who cooperated in the tests. Management included a full-season

fungicide program. The typical rotation on this farm is two to three years of peanut followed by four to five years of bahiagrass. Soil-borne disease pressure is usually low, but leaf spots can be heavy. These tests were helpful to verify results from research trials under low disease pressure.

Over the three years of the test of the medium-maturity varieties, AP-3 and Georgia Green had similar yield, and in 2005 the three varieties planted that year had similar yield (Figure 4). Yields of two tons per acre are well above the state average of 2,500 - 2,800 pounds even though in some cases the tests were planted the season after a previous peanut crop. The results show that the yield potential of these varieties is similar under near-ideal conditions with little or no TSWV. The value of the long-term bahiagrass rotation with peanuts is especially striking. Similar results were obtained with late-maturing varieties on the same farm (Figure 5).

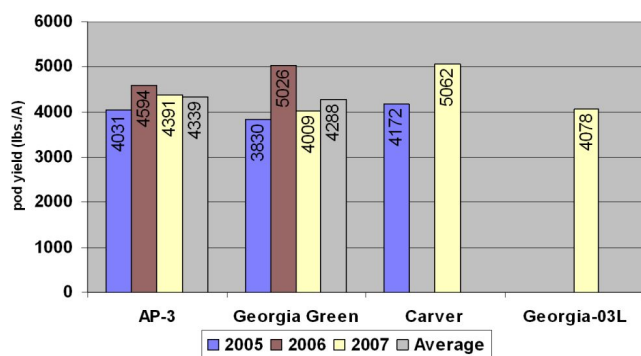


Figure 4. Performance of three medium-maturity varieties in 1-2 acre replicated plots in Columbia County, Fla., in 2005, 2006, and 2007. The fields were not irrigated, and 2005 was the first year of peanut following four to five years of bahiagrass. The 2006 and 2007 tests were planted in the same field following four to five years of bahiagrass.

Summary

Variety choice is a critical management decision for peanut production. 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 these varieties can reduce risk and production cost. The varieties C-99R, York, and Georgia 01R all have considerable resistance to leafspot. Use of these varieties, in combination with

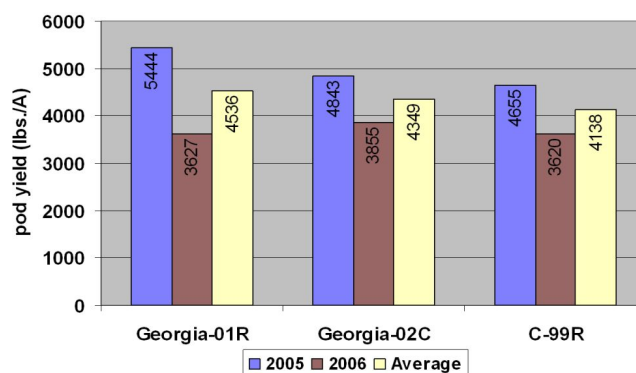


Figure 5. Performance of three late-maturity varieties in 1-2 acre replicated plots in Columbia, County, Fla., in 2005 and 2006. The fields were not irrigated, and in 2005 the plots were the first peanut crop planted after four to five years of bahiagrass. The 2006 peanut test followed in the same field as the 2005 test.

good crop rotation, might allow for reduced use of fungicide sprays and, therefore, lower production costs.

Some of the cultivars – Florida-07, Georgia-03L, C-99R, and AP-3 -- have good resistance to soil-borne diseases, such as white mold (*S. rolfisii*) Additionally, Georgia 01R, Georgia 02C, and 'Carver' have resistance to *Cylindrocladium* black rot (CBR).

When choosing a variety and making arrangements for seeds of the varieties that best fit your needs, evaluate your production and marketing situation. Seed of Florida-07, York, Georgia-06G and McCloud should be readily available for the 2009 season. Seed of AP-4, Georgia Greener, Tifguard, and Florida Fancy should be available for the 2010 season.