

Blueberry Cultivar Development at The University of Georgia

A Progress Report for 2003

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The UGA Blueberry cultivar development program generates and evaluates numerous selections of southern highbush and rabbiteye blueberries each year. Currently, the UGA Research Blueberry Farm near Alapaha is the primary field evaluation site for advanced seedlings, new selections, and advanced selections. Griffin is the primary site for high density seedling nurseries and it is a duplicate test site for growing selections for further testing. Starting in 2001, the UGA Branch Station at Blairsville was enlisted as an advanced selection testing site for blueberry. Having these multiple sites provides considerable climatic and edaphic variability to actually enhance the cultivar development process.

General Overview of 2003

The 2003 growing season at Alapaha was generally highlighted by reduced yields across most all cultivars and selections. Some of the crop reduction was due to poor pollination weather and excessive rain fall; however, no significant freeze damage was experienced. In Griffin, there was a freeze event (27 F) on March 30, 2003 that caused some degree of damage to many selections and cultivars. Comprehensive flowering notes, cropping notes and fruit characteristic evaluations were taken for more than 300 selections and advanced seedlings of rabbiteye and southern highbush blueberries, as well as numerous cultivar standards at the test sites. Additionally, more than 2500 seedlings were evaluated in the nursery at the Griffin site in 2003. This resulted in several advanced seedlings and selections being identified for further testing. Ratings were made for some selections at the Blairsville, Ga test site for the first time in 2003, as the plants were of suitable age. Additionally, some on farm test sites in south Georgia were rated for the first time in 2003.

Performance of Rabbiteye Selections at Alapaha

Detailed data on plant and berry attributes were collected for numerous rabbiteye selections in 2003 at Alapaha. Table 1 depicts data for some of the more promising selections along with observations for some cultivar standards. Data for selections with numbers less than T-619 and for cultivar standards are from plants that are mature (8 to 15 years old). Those selections beginning with number T-626 are younger plants (2 to 5 years old). Older selections are in non-bedded, non-irrigated plots, while the younger selections are in plots that have been bedded and irrigated.

With rabbiteyes, we continue to be interested in early ripening selections to replace Climax. Climax had 50% ripening by May 31 this year, however, as in many other years the crop load of Climax was low (only 3.5 on a 1 to 10 scale). The new UGA release 'Alapaha' continues to perform well, having a ripening date similar to Climax, but with a much better crop load. Another outstanding early season rabbiteye selection is T-584. It too ripens with Climax, yet generally has a better crop load and bigger berry size. More detailed data on T-584 are presented in other sections of this report. This selection is under strong consideration for release in 2004. T-366 is a selection of interest due to its nominal crop load and early ripening date (May 26), however, berry size of the selection is small. T-541, T-611, and T-616 all had ripening dates earlier than Climax. Of these, T-616 had the best crop load and the largest berry size, and the selection was noted as being a rabbiteye with very smooth berry texture, having few seeds. Of the younger rabbiteye material, T-655 was of great interest due to its early ripening date and tremendous berry size (9.5 on a 1 to 10 scale). Propagations of T-616 and T-655 were made to conduct more advanced tests at multiple sites.

As for mid-season ripening berries, Brightwell continues to be the standard for testing. Brightwell ripened a bit earlier than usual in 2003 (June 9), and had a fair crop load. Several selections ripened with Brightwell or a bit earlier. Selections in the Brightwell season worth noting are T-538, T-619, T-626, and T-672. Of these, T-538 has very good berry size, T-619 has good berry color and scar, and T-672 has outstanding berry firmness. Some of these selections have been propagated for further testing.

As for the Tifblue ripening season, there are only a few selections we are looking at. Of these, T-459 is the most promising. This selection generally has a good crop, and berry size is really large compared to Tifblue. The berry size of T-459 is generally maintained across all harvests, which again makes it a desirable selection. We continue to have interest in T-300 due to its outstanding berry size, but additional testing is needed to better assess performance. The plant type of T-300 is somewhat compact, and slow growing. 'Ochlockonee' (released in 2002), performed well again in 2003. The new release continues to ripen later than Tifblue, and would provide a late season, high producing variety for those with interest in that ripening season.

Other rabbiteye selections worth noting for their large berry size are T-451, T-460, and T-675. We continue to exam T-451 as a potential release. Positive attributes for the selection are that it has an early ripening, very large berry; negatives are that it generally flowers early resulting in a low crop load, and it has a great tendency for fruit splitting in wet weather. In addition to favorable berry size, T-460 generally has a very good crop load, good berry color, and good plant vigor. In some years however, the ripening of T-460 has been too drawn out. T-675 is a very young selection with exciting potential. It has both very good berry size and firmness.

Performance of Rabbiteye Selections at Griffin

Many of the rabbiteye selections listed above for the Alapaha location also performed well at the Griffin test site (Table 2). All plants at the Griffin test site are young (5 years old or less), and all plants are irrigated and mulched with bark. In Griffin, Climax ripened on June 21. Again, the new release 'Alapaha' performed well in comparison to Climax, as did the selection T-584. Other selections ripening before Climax in Griffin were T-366, T-626, T-630, and T-655. Although T-366 ripened earlier than Climax in Griffin, the selection still has a problem with berry size. T-630 is a selection that has performed well in Griffin over the past couple of years, especially with regards to crop load. However, the selection has performed only moderately well in south Georgia. T-626 had the greatest crop load of all rabbiteye selections in Griffin, and ripened 3 days earlier than Climax and 10 days earlier than Brightwell. We will continue to evaluate this selection at both Griffin and Alapaha. Those selections having good berry size in Griffin were T-451, T-459, T-655, T-672, and T-675. Most of these selections were those with good berry size at the Alapaha test site as well.

Multi-year Yields of Advanced Rabbiteye Selections at Alapaha

Yields have been taken for several rabbiteye selections and cultivar standards at the Alapaha test site since 1998 (Table 3). When considering the early season, Climax yield has been inferior to the new release 'Alapaha' and to the selections T-451 and T-584. As mentioned previously, T-584 is under strong consideration for release in 2004. The 6-year average yields for this selection are nearly twice that of Climax. As for T-451, the 6-year average yields are nearly triple that of Climax. The large berry size of this selection tends to give high total yields even when cropping is low. However, the selection is plagued by a fruit splitting problem. T-451 is being considered for release in 2004 or 2005, but the commercial potential may be limited. However, the selection should make an outstanding variety for the homeowner and smaller, pick-your-own grower due to its tremendous berry size.

In the mid season, T-431 has been a selection we have scrutinized for several years as a potential cultivar. The yield data suggest that the selection has been equal to Brightwell over a 6 year period in south Georgia. The older plants of this selection have continued to perform well, however, younger plantings of the selection have been slow to begin production. Due to this problem, we have abandoned the release of this selection for the time being.

In the later season, 'Ochlockonee' continues to outperform Tifblue, although the new release does ripen 7 days later than the standard cultivar. T-459 continues to perform well for a later season selection, and again, it has a very favorable berry size across multiple harvests. We are considering it for release in the next couple of years.

Multi-location Yields and Performance of Advanced Rabbiteye Selections

In addition to the multi-year yield data from Alapaha, in 2003 we were able to collect yield and performance data for three advanced selections at three diverse test sites (Table 4). Chill hours (calculated from Oct. 1 thru Feb. 15) at the locations in 2003 were as follows: Blairsville had 1800 to 1850; Griffin had 1340 to 1390; Alapaha had 900 to 950. Plants at Alapaha were mature plants (more than 10 years old); whereas, plants at Griffin and Blairsville were generally very young (only 2 years old), except for the Tifblue and T-459 plants in Griffin, which were 4 years old. Bloom dates in Griffin were generally 8 to 14 days later for a particular selection than at Alapaha, and Blairsville bloom dates were generally 2 to 3 weeks later than in Griffin. Bloom date ranking was similar at the locations, except for T-451. T-451 is one of the earlier blooming selections in south Georgia, but it was among the later blooming ones in middle and north Georgia. T-584 generally bloomed a week later than Climax at all locations, but ripened with the standard cultivar. This response of T-584 indicates it would be a better early season choice due to the fact that it blooms later, thus missing some early season freeze events that would harm Climax. The further north we went, the closer ripening dates for Brightwell and Climax were. A similar trend was observed for Tifblue and T-459.

T-584 performed well across the environments, yielding more than Climax at two of the locations. This is additional evidence that the selection would make a good cultivar. T-459 tended to have similar yield to that of Tifblue across locations, but again, berry size is more favorable for T-459. Berry size of T-451 was very large across all locations, and berry size of T-459 was large to very large. Climax berries were very small in south Georgia, but size became more favorable as we moved north. Berry size of all selections was generally greatest in the cooler mountain location of Blairsville.

The data from the multi-location tests are very valuable in determining the adaptability of selections across environments. We will continue to monitor these selections at the locations for a few more years, and we will add new plantings of selections to the various sites.

Performance of Southern Highbush Selections at Alapaha

The UGA Blueberry Breeding Program continues to aggressively generate and evaluate southern highbush plant material. Most southern highbush selections that existed at Alapaha prior to 1998 had very low vigor due to the lack of suitable highbush soil at the site, poor drainage, and absence of irrigation. The exception was the selection TH-471, which has proved to have a nominal level of vigor. This selection was submitted for release in 2003, and additional data concerning this is presented later in the report.

Since 1998, southern highbush selections have been planted in raised beds, with irrigation and pine bark mulch. Performance of several of these new selections at Alapaha, along

with some standard cultivars, is depicted in Table 5. These selections are all less than 5 years old, except for Georgiagem and TH-471.

Highbush selections beginning with the number TH-642 and later are those that have resulted from crosses we made at UGA. Much of our effort has been aimed at developing southern highbush that have quality berry attributes and a high degree of plant vigor. In Table 5, the results suggest that we are making considerable advances toward these goals. Numerous selections have a vigor rating of 8.0 or higher (on a 1 to 10 scale). Notable selections are TH-621, TH-622, TH-647, TH-654, TH-656, and TH-685. Of these, TH-654 has the greatest plant vigor; however, the selection is deficient with regards to berry firmness. TH-621 and TH-622 have a high degree of plant vigor, and have very good berry quality. However, these selections tend to ripen late for the south Georgia southern highbush market. We are anxious to determine if these selections have interest among growers for a vigorous, high quality berry, that ripens just before the rabbiteye season.

Early ripening continues to be a property of southern highbush that appeals to many south Georgia growers. The Florida release 'Star' is currently a prominent standard cultivar, and it had 50% ripe fruit by May 7 at Alapaha in 2003. Among the new selections, TH-642 is one of the more outstanding with regards to early ripening (50% ripe on May 3), and it has very good berry size, crop load, and plant vigor. We have propagated this selection for further testing. Other selections that ripen near the time of 'Star' are TH-471 (to be discussed later), TH-644, and TH-647. Many of the selections ripen 5 to 8 days after 'Star'. Of these, the selection TH-653 was the most notable, having large fruit size, excellent firmness, and better than average cropping and vigor. We have several highbush selections with excellent fruit color (TH-621, TH-622, TH-681, TH-683, TH-691), and some with outstanding firmness (TH-661, TH-663, TH-680). We will need to evaluate these selections for 3 to 5 more years in order to identify those that are suitable as cultivars.

Performance of Southern Highbush Selections at Griffin

All of the southern highbush plants growing in Griffin are 4 years old or less. While the test site is not considered very suitable for southern highbush production, we have been able to grow several of our selections in the red Piedmont soil with pine bark mulch and irrigation. Table 6 lists data for several of the highbush selections in Griffin. Some of these were evaluated at Alapaha as well. Again, we have selections that demonstrate outstanding plant vigor, including TH-664, TH-667, and TH-668. Of these, TH-667 is the most notable as it also had large berry size, a good crop load, and a ripening date as early as Star. TH-642, one of the prominent selections in south Georgia, had a ripening date 9 days earlier than Star in Griffin.

One of the most noteworthy highbush selections in Griffin during 2003 was TH-658. This selection had the highest firmness rating possible, and also had good berry size and above average plant vigor. In Griffin, TH-658 bloomed 10 days later than Star, yet ripened a week earlier. The selection will be closely monitored at both Griffin and Alapaha over the

next 3 to 5 years to determine its suitability as a cultivar. We have also propagated a limited number of plants to test at additional locations.

Performance of Southern Highbush Selections in A High Density System

Some Georgia growers are interested in growing southern highbush blueberries in high density production systems. To date, there has been little or no comparative information on how different southern highbush selections and cultivars perform in such a system. In 2002, we established a high density test site at Alapaha consisting of several leading cultivars and some of the new UGA selections. This site consists of raised beds filled with bark, overhead irrigation, bird netting, and a plant spacing of 3 ft. x 5 ft. Table 7 presents performance data for the various selections during 2003, which was the first cropping season. Generally all selections and cultivars had suitable plant vigor in this system, the one exception being that Star plants were a little weak. Two of the most important pieces of data for this system are the ripening date and crop load for the various entries, as growers need to maximize returns. Emerald had one of the best crop loads, but several selections had earlier ripening fruit. TH-658 was a notable selection that ripened early (May 7), had outstanding berry firmness, and produced nearly half a crop. The cultivar Windsor had a decent crop load, but the ripening time was very late (May 28). It appears plants having berries that ripen May 15 or earlier would be those to be considered for high density production. Possible candidates are Emerald, Star, and O'neal, with respect to existing cultivars, and TH-471, TH-649, TH-656, TH-658, and TH-663 with respect to new selections. We will evaluate the plants in this setting again next year in order to provide more decision making information.

Performance of a New Southern Highbush Release

After several years of testing, we have submitted the selection TH-471 to be approved for release in 2003. If approved, the planned name for the new cultivar is 'Palmetto'. We have compared TH-471 with several southern highbush cultivars for the past 5 years. Table 8 portrays yield for TH-471, along with Georgiagem and Sharpblue. These data are from plants that were established at Alapaha in 1992, without bedding, irrigation or soil amendment. 'Georgiagem' has yielded no fruit during the first week in May, whereas, TH-471 yielded more than 35% of its fruit during that time period on average. When the first 2 weeks of May are considered, TH-471 ripened more than 75% of its fruit during that time on average, compared to only 38% and 51% for 'Georgiagem' and 'Sharpblue', respectively. TH-471 yields overall were twice that of 'Georgiagem' for the 5 year average.

Table 9 portrays average berry attributes and plant vigor for TH-471 and 4 other southern highbush blueberry selections grown at Alapaha, Ga. over a 6 year period. TH-471 exceeded all of the cultivars with respect to berry scar, berry firmness, and plant vigor. For other berry attributes, TH-471 was generally similar to the various cultivars, except for berry

size, which was smaller (but commercially acceptable). Thus, TH-471 has good to excellent fruit quality, and outstanding plant vigor.

Flowering and ripening times are important data for growers who are considering producing southern highbush blueberries. Generally, the early flowering times require frost protection measures, and growers want the ripening times to be early enough to offer a “high price reward” for the risk they encounter. Table 9 lists flowering and ripening dates for TH-471 and 3 southern highbush cultivars at Alapaha, Ga. over a 6 year period. The flowering times of all of the selections (late February to early March) are early, yet, TH-471 generally ripens the earliest.

As for adaptability to other areas, TH-471 seems to be as adaptable as the popular cultivar ‘Star’ (released by Florida in 1996). Table 10 depicts fruit and plant characteristics of TH-471 and ‘Star’ for 2 to 4 year-old plants at 3 locations in Georgia and one location in Mississippi during 2003. The two entries generally ripened at the same time, and had similar attributes. The exceptions were that TH-471 had firmer fruit than ‘Star’, and typically had a better cropping score also.

Plans are being made to have TH-471 plant material available for propagators by February 2004, assuming the release is approved. In order to obtain a license for propagating ‘Palmetto’ and other UGA blueberry cultivars, contact the Georgia Seed Development Commission in Athens (ph. 706-542-5640).

Goals of The UGA Blueberry Cultivar Development Program for 2004

Plans for the year 2004 are to continue aggressively evaluating seedlings, advanced seedlings, selections, and advanced selections of both rabbiteye and southern highbush blueberries. More than 30 new crosses (yielding 50 to 300 seedlings per cross) of rabbiteye and southern highbush will be made during 2004. Nearly 2500 seedlings were generated from crosses made in 2003. These seedlings will be planted in a seedling nursery during the early summer of 2004 to be grown for future evaluations. More than 5000 seedlings were planted in nurseries during 2002 and 2003, and these seedlings will be screened during 2004 for fruit characteristics including size, scar, firmness, color, and flavor. The most promising seedlings will be identified as advanced seedlings for further evaluation (estimated to be 2 to 3% of total seedlings). In 2003, over 90 seedlings were identified as advanced seedlings from 2001 crosses. These advanced seedlings will be planted in the field at Alapaha, and will be further evaluated as potential selections in 2004. In addition to the advanced seedlings from 2003, more than 60 new selections were made from seedlings of crosses made by the UGA program in the last 2 years. These were propagated, and multiple plants will be established at Alapaha and Griffin in 2004 for replicated evaluations. These new selections will be added to the more than 200 selections currently growing at these locations, and all will be evaluated during 2004 for possible designation as advanced selections.

In 2003, several selections were identified as advanced selections and were propagated. These will be further evaluated in 2004 for potential as cultivars, and some of the advanced selections will be distributed to cooperators to assist in the evaluation process. Several rabbiteye and southern highbush advanced selections were distributed to grower-cooperators in 2002 and 2003 to begin the final phase of testing for their potential as cultivar releases. Furthermore in 2004, 4 to 6 advanced selections from the UGA program will be entered into a Southern Regional Blueberry Trial along with standard cultivars and selections from other breeding programs. Plantings of these selections will be made in Georgia, Florida, Mississippi, North Carolina, and Arkansas. Data from these trials will be collected beginning in 2006 and will continue through 2009. Evaluations of these advanced selections will include fruit characteristics, plant growth characteristics, flowering times, and yields. A similar Southern Region Trial was established with other selections in 2001, and data were collected from this trial for the first time in 2003. These trials will continue thru 2005.

Table 1. Ratings (1 to 10 scale) of some fruit and plant characteristics of rabbiteye blueberry cultivars and selections from the Blueberry Cultivar Development Program at the Alapaha, GA location during 2003. A value of 7 is generally considered to be the minimum acceptable rating for a commercial cultivar.

Selection or Variety	Date of 50% Flowering	Date of 50% Ripening	Berry Size	Berry Scar	Berry Color	Berry Firmness	Berry Flavor	Crop Load	Plant vigor
Alapaha	---	May 31	7.5	8.5	7.5	8.0	8.0	7.5	8.5
Brightwell	March 21	June 9	8.0	8.5	8.0	8.5	8.0	7.0	8.5
Climax	March 14	May 31	7.5	8.5	8.0	8.5	8.0	3.5	8.5
Ochlockonee	March 24	June 28	7.5	8.5	8.5	8.0	8.5	8.5	9.5
Tifblue	March 21	June 17	7.0	8.5	8.5	8.0	8.0	7.0	9.5
T-300	March 24	June 15	9.0	9.0	7.0	8.5	7.0	7.0	7.5
T-366	---	May 26	6.8	8.5	7.0	7.8	8.5	8.2	7.5
T-431	March 20	June 8	8.5	8.5	9.0	8.0	8.0	6.0	8.5
T-451	March 15	June 8	9.5	8.5	7.5	8.0	7.5	4.0	9.5
T-459	March 22	June 23	8.7	8.7	8.5	8.0	8.3	7.5	8.2
T-460	March 18	June 12	9.0	9.5	9.0	8.0	8.5	8.0	9.0
T-516	March 23	June 12	8.3	7.5	9.0	7.0	8.0	7.8	8.5
T-538	March 21	June 7	9.0	8.5	8.0	8.0	7.8	6.5	8.5
T-541	---	May 21	7.5	8.5	7.0	8.0	9.0	3.5	8.0
T-551	March 19	May 31	8.0	8.5	8.5	9.5	8.5	6.0	8.0
T-584	March 20	May 31	8.0	9.0	7.5	8.5	7.0	5.0	9.0
T-611	----	May 25	8.0	8.0	8.0	7.8	7.3	5.8	8.0
T-616	March 16	May 24	8.5	8.5	7.5	7.5	8.5	6.0	8.5
T-618	March 11	May 31	8.5	8.5	8.5	7.5	7.5	7.5	9.0
T-619	March 16	June 8	8.5	9.0	9.0	8.0	7.0	5.0	8.5
T-626	March 7	June 9	7.5	9.0	8.5	8.5	8.0	5.0	9.5
T-630	March 14	May 29	8.5	8.0	8.0	7.5	7.5	3.5	8.0
T-655	March 19	May 31	9.5	9.5	8.0	8.0	7.0	6.5	8.0
T-671	---	June 1	8.0	8.5	8.5	9.5	7.5	5.0	7.0
T-672	---	June 6	8.0	8.5	8.0	9.0	7.5	6.5	8.0
T-675	---	June 3	9.0	9.0	7.0	9.0	8.0	6.0	8.0

Table 2. Ratings (1 to 10 scale) of some fruit and plant characteristics of rabbiteye blueberry cultivars and selections from the Blueberry Cultivar Development Program at the Griffin, GA location during 2003. A value of 7 is generally considered to be the minimum acceptable rating for a commercial cultivar.

Selection or Variety	Date of 50% Flowering	Date of 50% Ripening	Berry Size	Berry Scar	Berry Color	Berry Firmness	Berry Flavor	Crop Load	Plant vigor
Alapaha	March 29	June 17	7.5	8.5	7.5	8.0	8.0	6.0	8.5
Brightwell	March 29	June 29	8.0	8.0	7.5	8.5	8.0	6.5	8.5
Climax	March 26	June 21	7.0	8.0	7.5	8.0	7.5	4.0	7.5
Ochlockonee	April 7	July 10	7.5	8.5	8.0	8.0	8.0	6.5	8.5
Tifblue	March 29	July 4	7.0	8.5	8.0	8.0	8.0	6.5	9.0
T-300	March 29	July 1	8.0	8.0	7.0	8.5	7.0	4.0	7.5
T-366	April 4	June 16	6.5	8.0	7.0	8.0	8.0	6.5	7.5
T-431	March 30	June 21	8.5	8.5	9.0	8.0	8.0	3.5	8.0
T-451	April 1	July 4	9.0	8.5	7.5	8.0	7.0	3.5	8.0
T-459	March 31	July 3	8.5	8.5	8.0	8.0	8.0	5.0	7.5
T-584	April 2	June 20	8.0	8.0	7.5	8.0	7.5	4.0	8.5
T-626	March 25	June 18	7.5	9.0	8.5	8.5	8.0	8.5	9.0
T-630	March 31	June 13	8.5	7.0	8.5	8.0	8.0	7.5	7.5
T-655	March 26	June 19	9.0	8.5	7.5	8.0	8.0	6.0	7.5
T-670	---	July 2	8.0	8.5	7.5	8.0	8.0	3.5	8.5
T-672	April 5	June 29	9.0	8.5	7.5	9.0	8.0	6.5	8.0
T-673	---	June 21	7.5	7.5	7.0	8.0	7.0	3.0	8.0
T-674	---	June 25	8.0	8.0	8.0	8.0	7.0	3.5	7.5
T-675	---	June 26	8.5	8.0	7.0	9.0	8.0	4.5	7.5

Table 3. Total yield (lbs/bush) during 1998 thru 2003 of some early, mid, and late season rabbiteye blueberry selections and cultivar standards at The University of Georgia Blueberry Research Farm, Alapaha, Ga.

Cultivar or selection	Total yield per bush (lbs)						multi-year avg.
	1998	1999	2000	2001	2002	2003	
<i>Early Season</i>							
Climax	6.6	6.2	11.2	7.9	5.2	3.5	6.8
Alapaha	11.5 ^{Z/}	13.4	15.0	12.5	13.0 ^{Z/}	14.0 ^{Z/}	13.2
T-451	8.6 ^{Z/}	23.0 ^{Z/}	23.2	23.8	14.0	10.7	17.2
T-584	7.4 ^{Z/}	13.4	14.0	22.5	13.0	6.6	12.8
<i>Mid Season</i>							
Brightwell	13.0	6.8	13.1	20.2	11.4	8.9	12.2
T-431	11.4	9.5	13.4	13.3	17.8	8.3	12.3
<i>Late Season</i>							
Tifblue	6.3	3.1	17.5	16.8	6.7	5.8	9.4
Ochlockonee	14.5	5.3	26.5	17.5	21.0	22.0 ^{Z/}	17.8
T-397	7.9	13.2	12.8	10.4	13.5	6.7	10.8
T-459	8.8	14.3	16.8	10.1	17.3	9.0	12.7

^{Z/} These yields were estimated using cropping scores.

Table 4. Performance data for standard rabbiteye blueberry cultivars and some advanced selections at the three locations in Georgia during 2003.

Location	Cultivar or selection					
	Brightwell	Climax	Tifblue	T-451	T-459	T-584
<i>Total yield (lbs/plant)</i>						
Alapaha	8.9	4.2	6.1	10.7	9.0	6.6
Griffin	3.0	2.7	7.1	2.8	6.4	2.6
Blairsville	4.4	2.5	2.4	1.1	1.1	5.8
<i>Berry weight (g/100 berries)</i>						
Alapaha	172	126	126	287	221	161
Griffin	170	162	132	270	261	184
Blairsville	208	166	143	275	217	196
<i>Date of 50% blooming</i>						
Alapaha	March 21	March 12	March 21	March 15	March 22	March 20
Griffin	March 29	March 26	March 29	April 1	March 31	April 2
Blairsville	April 15	April 15	April 15	April 21	April 21	April 21
<i>Date of 50% ripening</i>						
Alapaha	June 9	May 31	June 18	June 8	June 23	May 31
Griffin	June 29	June 21	July 4	July 4	July 3	June 20
Blairsville	July 9	July 9	July 25	July 25	July 25	July 11

Table 5. Ratings (1 to 10 scale) of some fruit and plant characteristics of southern highbush blueberry cultivars and selections from the Blueberry Cultivar Development Program at the Alapaha, GA location during 2003. A value of 7 is generally considered to be the minimum acceptable rating for a commercial cultivar.

Selection or Variety	Date of 50% Flowering	Date of 50% Ripening	Berry Size	Berry Scar	Berry Color	Berry Firmness	Berry Flavor	Crop Load	Plant vigor
Bladen	---	May 12	7.0	7.5	8.5	7.5	7.0	5.0	6.5
Georgiagem	March 20	May 16	7.5	7.0	7.5	6.5	7.0	4.0	6.5
Legacy	---	May 20	7.5	8.0	8.0	8.0	8.0	7.5	7.5
Reveille	---	May 15	6.5	8.5	8.0	8.5	7.0	7.0	7.0
Star	---	May 7	7.5	8.0	7.5	7.5	7.0	7.5	6.5
TH-471	March 13	May 8	7.0	8.5	8.0	8.5	8.5	7.0	8.0
TH-605	---	May 16	8.5	8.5	9.0	8.5	7.5	6.5	8.0
TH-621	---	May 22	8.5	8.0	9.5	8.0	7.0	7.0	9.0
TH-622	---	May 26	8.5	8.0	9.5	8.5	8.0	7.5	8.5
TH-642	March 5	May 3	8.5	8.0	8.0	8.0	7.0	7.5	8.0
TH-644	March 8	May 8	8.0	8.5	7.0	8.5	7.0	6.0	7.0
TH-647	March 16	May 9	7.5	8.0	8.5	8.0	7.0	4.5	8.5
TH-649	March 15	May 12	7.5	8.5	8.5	8.5	8.5	3.0	7.5
TH-652	March 20	May 14	7.5	8.5	8.0	7.5	7.0	7.5	7.0
TH-653	March 12	May 15	8.0	8.5	8.0	9.0	7.5	7.5	8.0
TH-654	Feb. 26	May 15	7.5	7.0	8.5	6.5	7.0	7.5	9.5
TH-656	March 5	May 12	8.0	7.0	7.0	8.0	7.0	3.5	8.5
TH-660	---	May 11	8.0	8.0	8.0	8.5	7.0	6.0	7.5
TH-661	---	May 12	7.0	7.5	8.0	9.0	7.0	5.0	7.0
TH-663	---	May 14	7.5	8.5	8.5	9.0	9.0	4.5	7.0
TH-680	---	May 14	8.0	8.0	8.0	9.0	7.0	6.0	8.0
TH-681	---	May 24	9.5	7.5	10.0	7.0	8.5	6.0	8.0
TH-683	---	May 31	9.0	8.5	10.0	8.0	7.5	6.5	7.5
TH-685	---	May 25	9.5	8.5	9.5	7.5	7.0	7.5	8.5
TH-691	---	May 24	8.5	8.5	10.0	7.5	8.5	5.5	8.0

Table 6. Ratings (1 to 10 scale) of some fruit and plant characteristics of southern highbush blueberry cultivars and selections from the Blueberry Cultivar Development Program at the Griffin, GA location during 2003. A value of 7 is generally considered to be the minimum acceptable rating for a commercial cultivar.

Selection or Variety	Date of 50% Flowering	Date of 50% Ripening	Berry Size	Berry Scar	Berry Color	Berry Firmness	Berry Flavor	Crop Load	Plant vigor
Georgiagem	---	May 28	7.5	8.0	7.0	7.0	7.0	3.0	5.5
Reveille	March 12	May 25	7.0	8.5	7.5	8.5	7.5	6.0	7.0
Star	March 14	May 26	7.5	7.5	8.0	7.5	7.5	6.0	7.0
TH-471	March 27	May 26	7.5	8.5	7.5	8.5	8.5	6.0	7.0
TH-642	March 12	May 17	8.5	9.0	8.0	7.5	7.5	5.0	7.5
TH-647	March 26	May 30	7.5	8.5	8.0	8.5	8.5	6.0	7.0
TH-649	March 14	May 22	7.5	8.5	8.0	8.5	8.5	5.5	8.0
TH-652	March 21	May 30	7.5	7.0	7.0	7.0	7.0	8.5	8.5
TH-653	March 21	May 31	8.5	8.5	8.0	9.0	8.0	7.5	7.5
TH-654	March 12	May 28	7.5	7.0	7.0	6.5	7.0	4.5	8.5
TH-658	March 24	May 19	8.5	9.0	7.5	10.0	8.0	5.5	8.0
TH-660	March 27	June 4	7.5	8.0	8.0	7.5	7.5	8.5	8.5
TH-661	March 19	May 27	7.5	7.5	8.0	8.0	8.5	7.0	8.5
TH-662	March 27	May 29	8.5	7.0	8.5	8.5	8.0	8.0	8.5
TH-664	March 28	May 24	8.0	8.5	8.0	8.5	8.0	8.0	9.0
TH-665	March 17	May 23	7.5	8.5	9.0	8.5	7.0	7.5	7.5
TH-667	March 19	May 25	8.5	8.0	8.0	7.5	7.0	8.0	9.0
TH-668	March 12	June 5	8.0	7.0	8.0	7.5	8.5	7.5	9.0
TH-678	March 26	May 26	8.0	8.0	7.5	9.0	7.0	6.5	7.0
TH-683	April 2	June 5	8.5	8.0	8.5	8.5	7.0	7.5	8.5
TH-687	April 7	June 13	9.0	8.5	9.0	7.5	7.0	7.5	8.5
TH-691	March 20	June 18	8.5	8.5	8.0	6.5	8.0	7.5	8.0

Table 7. Ratings (1 to 10 scale) of some fruit and plant characteristics of southern highbush blueberry cultivars and selections in a high density test plot at Alapaha, GA during 2003. A value of 7 is generally considered to be the minimum acceptable rating for a commercial cultivar.

Selection or Variety	Date of 50% Flowering	Date of 50% Ripening	Berry Size	Berry Scar	Berry Color	Berry Firmness	Berry Flavor	Crop Load	Plant Vigor
Emerald	March 1	May 15	8.8	8.0	8.5	6.8	7.0	7.3	8.3
O'neal	March 13	May 15	7.5	7.3	7.8	7.0	8.0	4.8	7.8
Star	March 8	May 9	7.5	7.3	7.5	7.0	7.0	3.3	6.5
Windsor	March 24	May 28	8.7	6.5	7.5	6.5	7.0	5.0	7.5
TH-471	March 17	May 10	7.5	8.5	8.0	8.3	7.5	5.8	8.0
TH-621	March 15	May 25	9.3	8.0	9.3	8.0	7.5	7.0	9.3
TH-622	March 25	May 31	8.5	8.0	9.3	8.0	8.0	7.0	9.5
TH-637	Feb. 27	May 2	6.5	6.8	7.5	7.0	7.0	2.8	7.8
TH-646	March 24	May 24	7.0	7.5	7.0	8.0	7.8	7.8	7.5
TH-649	March 19	May 9	7.5	6.8	7.3	8.3	8.0	3.8	8.0
TH-654	Feb. 27	May 11	7.3	6.8	8.0	6.5	7.0	8.3	9.5
TH-656	March 8	May 14	8.3	7.0	7.5	8.5	8.0	4.5	9.0
TH-658	March 12	May 7	7.8	8.5	7.5	9.3	8.5	4.5	7.8
TH-663	March 15	May 12	7.5	8.3	8.3	8.5	7.0	5.8	7.3

Table 8. Yield of the southern highbush selection TH-471 and the standard cultivars ‘Georgiagem’ and ‘Sharpblue’ for different harvest periods during 1999 thru 2003 at Alapaha, GA.

Harvest time	Total yield per bush (lbs)		
	Georgiagem	Sharpblue	TH-471
<i>1st week of May</i>			
1999	0.0	1.7	1.0
2000	0.0	1.3	3.0
2001	0.0	2.8	1.8
2002	0.0	1.1	2.7
2003	0.0	---	1.9
5 yr average	0.0	1.7	2.1
<i>2nd week of May</i>			
1999	0.0	2.2	2.4
2000	1.3	2.1	3.7
2001	1.6	2.9	2.8
2002	0.8	0.0	0.7
2003	0.7	---	2.0
5 yr average	0.9	1.8	2.3
<i>Total for season</i>			
1999	2.6	7.2	6.2
2000	3.2	5.9	8.1
2001	4.3	13.1	6.2
2002	0.8	1.1	3.4
2003	1.2	---	5.0
5 yr average	2.4	6.8	5.8

Table 9. Average ratings (1 to 10 scale) of some fruit and plant characteristics of TH-471 and several southern highbush standard cultivars over a 6 year period at Alapaha, Ga. A value of 7 is generally considered to be the minimum acceptable rating for a commercial cultivar.

Berry and plant attributes	Cultivar				
	TH-471	'Georgiagem'	'Sharpblue'	'Star'	'O'neal'
Berry size	7.3	7.5	7.7	7.8	8.1
Berry scar	8.5	7.0	7.8	7.8	7.9
Berry color	8.0	7.9	8.4	8.0	7.9
Berry firmness	8.3	6.7	7.6	7.5	7.6
Berry flavor	8.0	7.0	7.9	7.3	8.0
Plant vigor	8.8	7.0	6.8	6.3	5.1
50% bloom time	March 1	March 10	Feb. 22	----	March 4
50% ripe time	May 9	May 17	May 13	----	May 17

Table 10. Ratings (1 to 10 scale) of some fruit and plant characteristics of TH-471 and the southern highbush standard ‘Star’ at four locations in 2003. Plantings are 2 to 4 years old and all have been irrigated. A value of 6-7 is generally considered to be the minimum acceptable rating for a commercial cultivar.

Berry and plant attributes	Location								Avg across locations	
	Alapaha, Ga.		Griffin, Ga.		Ware Co., Ga.		Stone Co., Miss.			
	TH-471	Star	TH-471	Star	TH-471	Star	TH-471	Star	TH-471	Star
Berry size	7.5	7.5	7.5	7.5	8.0	8.0	7.0	8.0	7.5	7.8
Berry scar	8.5	7.5	8.5	7.5	7.5	7.0	7.0	7.0	7.9	7.3
Berry color	8.0	7.5	7.5	8.0	7.5	7.5	8.0	7.0	7.8	7.5
Berry firmness	8.3	7.0	8.5	7.5	8.5	8.0	8.0	8.0	8.3	7.6
Berry flavor	7.5	7.0	8.5	7.5	8.5	8.0	7.0	7.0	7.9	7.4
Plant vigor	8.0	6.5	7.0	7.0	8.5	8.5	8.0	7.0	7.9	7.3
Cropping	5.7	3.5	6.5	6.0	9.0	5.0	8.0	5.0	7.3	4.9
Ripening date (50%)	May 10	May 10	May 26	May 26	May 4	May 6	May 21	May 19	May 15	May 14