'T-959' Rabbiteye Blueberry Titan™

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Rabbiteye blueberry (*Vaccinium ashei* Reade) cultivars constitute the major portion of the blueberry acreage in Georgia and across much of the Southeast (Krewer and NeSmith, 2002; Scherm et al., 2001). The species is largely grown as a result of its high plant vigor and adaptability to the area. However, the small fruit size of most current rabbiteye blueberry cultivars often diminishes their potential to compete in the fresh market with larger-fruited highbush (*V. corymbosum* L.). Also, small berry size results in inefficient hand harvesting, often increasing harvest costs. Thus, commercial growers could reap immediate tangible benefits from large-fruited rabbiteye cultivars. Concurrently, many small pick-your-own operations would greatly benefit from larger-fruited cultivars to improve the overall "harvest experience" for their customers. We have been seeking to develop larger-fruited rabbiteye cultivars at the University of Georgia (UGA) in the past 15 years and are pleased to announce the release of 'T-959' (USPP 24135) Titan™ as our newest large-fruited rabbiteye.

Origin and Description

Titan™ was selected in 2005 at the Georgia Experiment Station in Griffin, GA, originating from a cross made in 2002. The maternal parent, T-460, is a UGA selection, and the paternal parent, FL 80-11, is an older University of Florida selection. Tested and patented as selection T-959, the new cultivar is being released for commercial use as well as pick-your-own and homeowner markets. Titan™ ripens around the time of the early rabbiteyes 'Alapaha' (USPP 16266), 'Vernon' (USPP 18291), and 'Premier', but before the midseason 'Brightwell' (Austin, 1994; Austin and Draper, 1983; NeSmith et al., 2002, 2005). Titan™ has very large (greater than 3.0 g), firm berries that are medium blue with a small, dry picking scar. Plants are highly vigorous and upright, having shown very good adaptation to both the Coastal Plains and Piedmont regions of Georgia. No notable disease or other pest

problems have been observed for Titan™ that were not also common on other blueberry cultivars and selections in the vicinity of the test plots. However, the new cultivar is susceptible to fruit splitting/cracking after certain rainfall events during fruit ripening, which can be problematic (Marshall et al., 2007). Titan™ is estimated to have a chilling requirement of 500 to 550 h below 7 °C. Planting with other rabbiteye blueberry cultivars with a similar flowering time is recommended for cross-pollination.

Performance

Titan™ was tested in UGA Research Farm plantings at Alapaha and Griffin, GA, locations starting in Fall 2006. Tables 1 and 2 present multiyear fruit and plant data for Titan™ and several commercial blueberry standard cultivars at the two sites. Overall, numerical ratings indicate Titan™ berry

size, firmness, and plant vigor were generally superior to other cultivars at both locations. The new cultivar generally ripens with the early-season rabbiteyes 'Alapaha', 'Vernon', and 'Premier'. The outstanding feature of large berry size for Titan™ is more clearly denoted in Table 3, which depicts mean berry weight (obtained from multiple samples of 25 to 50 berries per variety) for the new cultivar and standards over three growing seasons. Data were obtained from the first 25% of ripe fruit for each cultivar. In each of the site/years, Titan™ had much larger berries than all standards. Data from several harvests over time (not shown) have revealed that Titan™ maintains superior berry size over the entire season by a similar magnitude, although berries of all cultivars decrease in size as harvest progresses. Titan™ consistently produces large fruit, especially with supplemental irrigation.

Total yield per plant was determined for three single plant replicates through hand harvesting in selection test plots at Alapaha in 2009 and 2010 and in Griffin in 2010 (Table 4). These data support that Titan™ is also high-yielding. In fact, the total yield of 10.5 kg per plant for Titan™ from the Alapaha test site in 2010 is the largest yield we have ever recorded for 4-year-old plants at this site. Hence, it appears the large berry size of Titan™ leads to not only more efficiently harvested yield, but greater yield as well.

Table 1. Average ratings of some fruit and plant characteristics of Titan™ and rabbiteye standard cultivars Alapaha, Vernon, Premier, and Brightwell from 2008–10 in field test plots at Alapaha, GA.^z

Berry and plant attributes ^y	Cultivar				
	Titan™	Alapaha	Vernon	Premier	Brightwell
Berry size	9.5 ± 0.2	6.9 ± 0.1	7.9 ± 0.2	7.8 ± 0.2	7.0 ± 0.1
Berry scar	8.2 ± 0.2	7.6 ± 0.1	8.0 ± 0.1	7.7 ± 0.2	7.7 ± 0.2
Berry color	7.3 ± 0.1	7.0 ± 0.1	7.2 ± 0.2	7.5 ± 0.3	7.3 ± 0.2
Berry firmness	8.3 ± 0.3	7.0 ± 0.2	7.7 ± 0.3	6.9 ± 0.2	7.7 ± 0.2
Berry flavor	7.0 ± 0.1	7.8 ± 0.1	7.7 ± 0.2	7.8 ± 0.1	7.0 ± 0.2
Cropping	6.3 ± 0.5	6.2 ± 0.2	4.5 ± 1.0	2.5 ± 0.3	7.8 ± 1.0
Plant vigor	10.0 ± 0.1	8.0 ± 0.1	8.8 ± 0.1	9.3 ± 0.4	9.2 ± 0.6
Date of 50% flowering	21 Mar.	22 Mar.	20 Mar.	23 Mar.	25 Mar.
Date of 50% ripening	1 June	4 June	2 June	6 June	19 June
Fruit development period (days)	73 ± 3.2	75 ± 2.0	74 ± 4.5	75 ± 3.5	86 ± 4.5

^zRating scales are based on a 1 to 10 score, with 1 being the least desirable and 10 being the most desirable. A value of 6 to 7 is generally considered to be the minimum acceptable rating for a commercial cultivar. These plants were established in Fall 2006.

^yValues are means ± SE with n = 3.

Table 2. Average ratings of some fruit and plant characteristics of Titan™ and rabbiteye standard cultivars Alapaha, Vernon, Premier, and Brightwell from 2008–10 in field test plots at Griffin, GA.^z

Berry and plant attributes ^y	Cultivar				
	Titan™	Alapaha	Vernon	Premier	Brightwell
Berry size	9.6 ± 0.2	7.1 ± 0.2	8.0 ± 0.3	7.7 ± 0.2	6.8 ± 0.2
Berry scar	8.2 ± 0.2	7.7 ± 0.3	7.8 ± 0.2	7.5 ± 0.3	7.7 ± 0.2
Berry color	7.3 ± 0.1	7.0 ± 0.1	7.2 ± 0.2	7.3 ± 0.4	7.4 ± 0.2
Berry firmness	8.3 ± 0.3	7.2 ± 0.2	7.8 ± 0.2	6.8 ± 0.1	8.1 ± 0.1
Berry flavor	7.2 ± 0.2	7.9 ± 0.1	8.0 ± 0.1	7.7 ± 0.2	7.1 ± 0.2
Cropping	5.5 ± 0.6	5.2 ± 1.3	4.2 ± 0.9	3.2 ± 0.7	6.0 ± 2.1
Plant vigor	9.8 ± 0.1	8.3 ± 0.2	8.2 ± 0.4	7.8 ± 0.3	8.3 ± 0.2
Date of 50% flowering	6 Apr.	3 Apr.	2 Apr.	2 Apr.	5 Apr.
Date of 50% ripening	20 June	16 June	14 June	16 June	28 June
Fruit development period (days)	75 ± 2.0	74 ± 2.5	73 ± 3.5	75 ± 2.0	86 ± 2.3

^zRating scales are based on a 1 to 10 score, with 1 being the least desirable and 10 being the most desirable. A value of 6 to 7 is generally considered to be the minimum acceptable rating for a commercial cultivar. These plants were established in Fall 2006.

^yValues are means ± SE with n = 3.

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Table 3. Average berry weight for Titan™ and four standard rabbiteye blueberry cultivars at Griffin and Alapaha research farm locations during 2008–10.^z

Variety	2008		2009		2010	
	Griffin	Alapaha	Griffin	Alapaha	Griffin	Alapaha
	Average berry wt (g) ^y					
Titan™	4.0 ± 0.1	4.4 ± 0.2	4.2 ± 0.1	3.3 ± 0.1	3.1 ± 0.2	3.2 ± 0.1
Alapaha	1.6 ± 0.1	—	1.8 ± 0.1	1.4 ± 0.1	1.8 ± 0.1	1.4 ± 0.1
Vernon	2.0 ± 0.1	—	2.3 ± 0.1	2.1 ± 0.1	2.2 ± 0.1	2.1 ± 0.1
Premier	1.8 ± 0.1	1.6 ± 0.1	2.1 ± 0.1	1.8 ± 0.1	2.0 ± 0.1	1.7 ± 0.1
Brightwell	1.5 ± 0.1	—	1.6 ± 0.1	1.5 ± 0.1	1.2 ± 0.1	1.6 ± 0.1

^zAverage berry weights were determined from multiple berry samples (25 to 50 fruit per sample) taken from the first 25% of ripe fruit for each cultivar.

^yValues are means ± SE with n = 3.

Table 4. Total yield (kg/plant) for Titan™ and three standard rabbiteye blueberry cultivars at Griffin (2010) and Alapaha (2009 and 2010) research farm locations during 2009 and 2010.^z

Variety	2009		2010	
	Griffin	Alapaha	Griffin	Alapaha
	Total yield per plant (kg) ^y			
Titan™	—	5.6 ± 0.2	6.7 ± 1.2	10.5 ± 0.5
Alapaha	—	3.5 ± 0.5	4.9 ± 0.2	7.9 ± 0.5
Vernon	—	2.4 ± 0.4	4.9 ± 0.4	4.7 ± 0.1
Brightwell	—	3.9 ± 0.7	1.9 ± 0.3	7.1 ± 0.7

^zTotal yields were obtained from three to five hand harvests at each location from plants established in Fall 2006. Three single plant replicates were harvested for each variety at each location.

^yValues are means ± SE with n = 3.

Table 5. Average berry firmness for Titan™ and four standard rabbiteye blueberry cultivars at the Griffin research farm location during 2008–10.^z

Variety	2008	2009	2010
	Avg berry firmness (g/mm) ^y		
Titan™	237 ± 8.3	213 ± 2.0	260 ± 18.5
Alapaha	221 ± 3.1	194 ± 2.1	210 ± 9.1
Vernon	208 ± 4.7	191 ± 1.9	206 ± 15.6
Premier	199 ± 5.9	172 ± 3.5	165 ± 3.8
Brightwell	211 ± 10.5	216 ± 1.0	241 ± 8.9

^zAverage berry firmness was determined from multiple 25-berry samples using a FirmTech 2 firmness device. Fruit samples were taken from the first 25% of ripe fruit.

^yValues are means ± SE with n = 4.

Fig. 1. Rabbiteye blueberry 'T-959' Titan™ fruit during ripening.

In addition to large berry size, Titan™ has also demonstrated excellent firmness (Table 5). 'Brightwell' is considered the standard for firmness in the industry, which makes it useful for machine harvesting and long distant shipping. 'Premier' is considered

the softer berry of these cultivars. Titan™ had equal or greater firmness than 'Brightwell' (as measured with a FirmTech 2 specialized laboratory instrument) in each of 3 years in Griffin. The new cultivar had greater firmness than 'Alapaha', 'Vernon', and 'Premier'.

Field observations from 2010 indicated that Titan™ berries held firmness very well on the plant after ripening. This ability to hold firm on the plant without rapid softening can result in longer intervals between harvests and can increase berry size even more.

With all of the positive attributes, Titan™ does carry the negative characteristic of fruit splitting susceptibility. Fruit splitting is a physiological phenomenon, not completely understood, that occurs periodically for certain cultivars after heavy rains that occur during fruit ripening (Marshall et al., 2007). The laboratory test used to assess fruit splitting does not represent the actual degree of splitting that occurs under field conditions (it is typically much less in the field), but it has proven useful for ranking splitting-susceptible cultivars. Titan™ ranked among the highest of the cultivars listed here in being likely to encounter fruit splitting problems under certain conditions (data not shown), but this would not be an issue in years of low rainfall or in more arid regions.

In summary, Titan™ (Fig. 1) is a large-fruited rabbiteye with excellent firmness. The high degree of plant vigor, good yields, and an early ripening time all add to the desirability of this new cultivar. Titan™ is susceptible to rain splitting; however, this potentially negative trait appears to be greatly overridden by the benefits of the very large berry size and other positive attributes.

Availability

Blueberry 'T-959' (USPP 24135) Titan™ is owned by the University of Georgia Research Foundation. Propagation rights controlled by University of Georgia Research Foundation, Technology Commercialization Office, GSRC Boyd Building, Athens, GA 30602-7411 (<<http://www.ovpr.uga.edu/tco/>>).

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