HortScience 55(6):961–964. 2020. https://doi.org/10.21273/HORTSCI14970-20

‘RubyCrisp’ Muscadine Grape

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Additional index words. breeding, cultivar, *Muscadinia rotundifolia*, variety, *Vitis rotundifolia*

‘RubyCrisp’ is a muscadine grape (*Vitis rotundifolia*) that was released by the University of Georgia (UGA) College of Agriculture and Environmental Sciences (Athens, GA). ‘RubyCrisp’ produces high yields of large-sized berries with excellent taste and texture. ‘RubyCrisp’ berries are dark red in color, which is distinct from the normal bronze and dark purple colors of most muscadine cultivars. ‘RubyCrisp’ has hermaphroditic flowers and produces berries of similar size to those of the largest female cultivars (≈15 g). ‘RubyCrisp’ has a midseason harvest date with an average first pick on 21 Aug. in Tifton, GA. ‘RubyCrisp’ has a low percentage of dry pedicel scar and is not recommended for commercial packing for this reason. Excellent texture, attractive and unusual color, and overall eating quality suggest ‘RubyCrisp’ berries will be an ideal home-garden and pick-your-own cultivar.

Origin

‘RubyCrisp’ originated in Tifton, GA, from a cross of ‘Supreme’ by ‘Tara’ (Fig. 1) that was made in 2008. ‘Supreme’ is a female cultivar that produces black berries with exceptional size and firmness (Conner, 2009). ‘Tara’ is hermaphroditic and produces bronze berries with dry pedicel scars that ripen early in the muscadine harvest season (Conner, 2009; Lane, 1993). The original ‘RubyCrisp’ vine first fruited in 2010. The vine was selected in 2011 for its large berry size, hermaphroditic flowers, and excellent flavor and it was propagated for further trials as Ga. 8-1-338.

Methods

Testing locations were Tifton, GA (lat. 31°28′39.81″N, long. 83°31′39.61″W) and Wray, GA (lat. 31°32′46.59″N, long. 83°4’49.04″W). The Tifton trial took place on UGA experimental farms, and the Wray trial was located in a commercial vineyard. At each location, four single vine replicates were planted in randomized order in 2012. Vines at Tifton were spaced 3.0 m between plants within the row and 4.5 m between rows. Vines at Wray were spaced 6.1 m between plants within the row and 3.7 m between rows. Vines were trained to a single wire trellis with a single trunk and two cordons per vine. Vines were annually spur pruned by hand and fertilized with 560 kg·ha^{-1} of 10N–4.4P–8.3K. Drip irrigation was used, and diseases and insects were controlled according to commercial guidelines (Poling et al., 2003).

Vine yields were estimated by harvesting fruit from 1 m of the interior cordon (cordon most distal to the trellis post) and then multiplying the sample yield by the total cordon length. Vines were harvested in 2014–16 from one to four times depending on the uniformity of ripening, with the first harvest occurring as soon as ≈50% of the berries were ripe. Once the yield was weighed to give the total yield weight, the berries were then sorted. Berries with any visible signs of decay were removed and weighed to calculate percent berry rot. Of the undecayed berries, berries were sorted into those which had pedicel scar splits (large cracks in which the interior flesh was visible), pedicel scar tears (peeling back of the berry epidermis), and dry pedicel scars. Percentage of each of these categories was calculated by dividing the weight of each category by the total weight of all three categories and then multiplying by 100. Rotted berries and berries with pedicel scar split are commonly removed when commercial growers pack fruit, so percent usable yield was calculated by the following equation: 100 × (1 – % berry rot / 100) × (1 – % pedicel scar split / 100). Ten berries were immediately selected at random from the usable yield sample and measured for berry weight, diameter, and number of seeds. All 10 berries were then crushed together to provide juice to determine percent soluble solids.

Textural analysis of 20 ripe berries was carried out in a separate study. Textural analysis was conducted using an Universal Testing Machine TaxT2i Texture Analyzer (Stable Micro System, Godalming, Surrey, UK) equipped with an 25 kg load cell and a 2-mm flat cylinder probe. Skin tenderness was estimated by berry penetration work

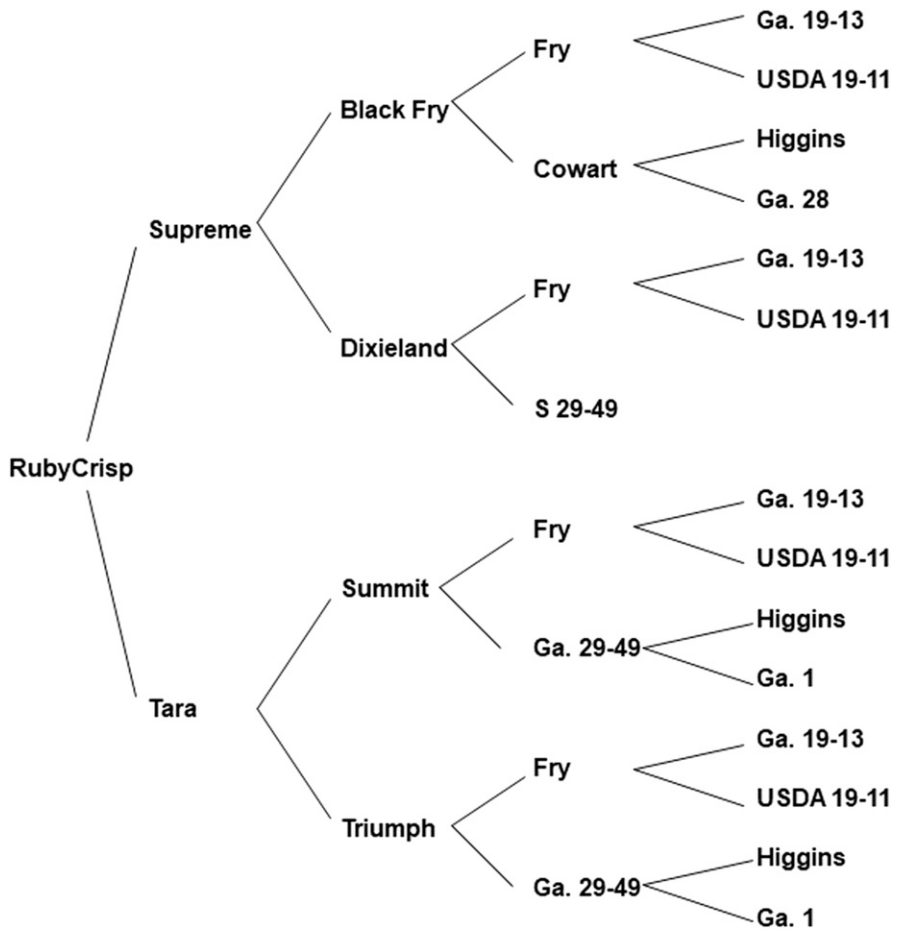

Fig. 1. Pedigree of ‘RubyCrisp’ muscadine.

Received for publication 26 Feb. 2020. Accepted for publication 31 Mar. 2020.
Published online 1 May 2020.
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Table 1. Yield (kilograms/3 m vine) of 'RubyCrisp' and standard muscadine cultivars at Tifton, GA, in the third through fifth years of growth (2014–16).

Cultivar	No. vines	Total yield (kg)	Usable yield (kg)[z]	Percent usable yield
Year 3				
RubyCrisp	4	16.4	13.0 ab[y]	79.5 ab
Fry	4	11.7	7.0 c	55.9 d
Hall	4	14.6	10.3 ab	74.0 bc
Lane	4	12.9	8.4 c	67.2 cd
Paulk	8	17.3	15.3 a	88.7 a
Supreme	4	12.8	10.3 bc	81.0 ab
Significance		NS	0.006	<0.001
Year 4				
RubyCrisp	4	28.1 a	19.9 a	71.7 b
Fry	4	8.7 c	6.7 b	77.7 cd
Hall	4	21.2 b	19.5 a	92.1 ab
Lane	4	13.5 c	9.6 b	71.3 d
Paulk	8	20.6 b	19.2 a	93.6 a
Supreme	4	25.1 ab	23.0 a	85.8 bc
Significance		<0.001	<0.001	<0.001
Year 5				
RubyCrisp	4	33.0 a	28.1 a	85.3 ab
Fry	4	13.8 c	11.6 c	82.8 bc
Hall	4	22.9 b	17.7 bc	76.7 c
Lane	4	20.2 bc	17.0 bc	83.6 bc
Paulk	8	31.0 a	28.4 a	91.7 a
Supreme	4	24.0 b	21.4 b	88.7 ab
Significance		<0.001	<0.001	<0.001
All Years				
RubyCrisp	4	25.2 a	19.6 ab	78.0 bcd
Fry	4	11.4 c	8.5 d	72.1 cd
Hall	4	19.3 ab	15.7 bc	81.3 bc
Lane	4	15.5 bc	11.7 cd	74.1 cd
Paulk	8	22.9 a	21.0 a	91.3 a
Supreme	4	20.7 ab	17.7 ab	85.1 ab
Significance		<0.001	<0.001	<0.001

[z]Usable yield is total yield minus weight of rotted berries and berries with pedicel scar splitting.
[y]Mean separation within columns by Duncan's multiple range test, $P < 0.05$.
NS = nonsignificant.

and pulp firmness by flesh maximum force as described in Conner, 2013. Textural analysis was conducted in 2012 for all cultivars except RubyCrisp and Hall, which were evaluated in 2014. All berries were sampled from the Tifton location.

Differences between cultivars were determined using one-way analysis of variance with mean separation by Duncan's multiple range test ($P < 0.05$). Percentage data were analyzed after arcsine-square root transformation. Statistical analysis was performed

Table 2. Yield (kilograms/6.1 m vine) of 'RubyCrisp' and standard muscadine cultivars at Wray, GA, in the third through fifth years of growth (2014–16).

Cultivar	No. vines	Total yield (kg)	Usable yield (kg)[z]	Percent usable yield
Year 3				
RubyCrisp	4	19.8 abc[y]	13.3 bc	69.7 b
Fry	4	7.5 c	5.2 c	68.9 b
Hall	4	26.9 ab	22.3 ab	83.6 a
Paulk	2	36.8 a	33.8 a	92.2 a
Supreme	4	17.7 bc	14.9 bc	84.9 a
Significance		0.027	0.007	0.005
Year 4				
RubyCrisp	4	50.4 b	29.9 a	57.1 bc
Fry	4	71.9 a	36.6 a	51.3 c
Hall	4	20.6 c	14.3 b	69.9 b
Paulk	2	11.8 c	10.3 b	90.5 a
Supreme	4	22.1 c	19.9 b	89.5 a
Significance		<0.001	<0.001	<0.001
Year 5				
RubyCrisp	4	28.7	18.9 ab	62.5 c
Fry	4	12.3	4.6 b	33.3 d
Hall	4	27.5	23.0 a	83.8 ab
Paulk	2	40.9	37.8 a	92.3 a
Supreme	4	30.2	22.5 a	75.1 b
Significance		NS	0.033	<0.001
All Years				
RubyCrisp	4	33.3	20.5	63.2 c
Fry	4	32.2	16.4	52.8 d
Hall	4	25.0	19.9	79.1 b
Paulk	2	29.8	27.3	91.7 a
Supreme	4	23.3	19.1	83.1 ab
Significance		NS	NS	<0.001

[z]Usable yield is total yield minus weight of rotted berries and berries with pedicel scar splitting.
[y]Mean separation within columns by Duncan's multiple range test, $P < 0.05$.
NS = nonsignificant.