‘Faith’, ‘Gratitude’, ‘Hope’, and ‘Joy’ Seedless Table Grapes

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‘Faith’, ‘Gratitude’, ‘Hope’, and ‘Joy’ seedless table grapes are new cultivars (*Vitis* hybrid) developed by the University of Arkansas Division of Agriculture, bringing to 12 the total number of releases from the program. These releases expand options for table grape growers for local markets in the United States. All four cultivars have non-slip-skin flesh with good skin quality, fruit cracking resistance, good vine health, and winterhardiness. ‘Faith’ is blue-fruited, slight fruity to neutral in flavor, semicrisp, and ripens in late July to early August, the earliest of the four. ‘Gratitude’ berries are green with exceptional flesh crispness and neutral flavor, ripening usually in late August at this same location. ‘Hope’ is green-fruited, has a fruity flavor, is rather soft in texture, has high production potential, and ripens near 19 Aug. ‘Joy’ is blue-fruited with exceptional fruity flavor but very soft texture and ripens the first or second week of August. All ripening dates are for west-central Arkansas. All of the cultivars exhibit stenospermocarpic seedlessness. These cultivars, in addition to prior releases from the program (including ‘Mars’, ‘Jupiter’, and ‘Neptune’) (Clark, 2010), provide for a range of dates of harvest along with choices of fruit colors, shapes, textures, and flavors. These should be adapted in the mid-South and Pacific Northwest of the United States but should be further evaluated for adaptation and hardiness in the Midwest. It is envisioned that these cultivars will be best used by local-market growers, because they differ from commercial table grapes commonly found in retail markets in the United States in that these new releases tend to be smaller-fruited, softer in texture, and can vary in seed remnant size compared with most commercial cultivars.

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Origin

‘Faith’ is a result of a cross of Ark. 1962 × ‘Jupiter’ made in 1990 (Fig. 1). The original plant was selected in 1993 and tested as selection Ark. 2412. ‘Gratitude’ resulted from a cross of Ark. 1925 × Ark. 1581 (Fig. 2) made in 1990, selected in 1994, and tested as Ark. 2505. ‘Hope’ resulted from a cross of Ark. 1562 × Ark. 1704 made in 1983 (Fig. 3) and the original plant was selected in 1986 and tested as Ark. 2053. ‘Joy’ parentage is Ark. 1919 × Ark. 1908 made in 1991 (Fig. 4), selected in 1994, and tested as Ark. 2494. All original vines were selected from a seedling vineyard located at the University of Arkansas Fruit Research Station, Clarks-ville, AR (FRS) (west-central Arkansas; lat. 35°28′17″ N, long. 93°80′0″ W; USDA hardiness zone 7a).

A single, own-rooted, three-vine plot of each cultivar was established at FRS on a fine sandy loam soil the year after selection and began fruiting usually in the third year after planting. The vines were trained to a bilateral, high-cordon/curtain training system and pruned to three- to four-bud spurs annually. Vines were spaced 2.4 m and rows 3.1 m. Data were taken on all cultivars in these plots for a number of fruiting seasons ranging from 1990 to 2011, depending on time of establishment of the cultivar in the vineyard after selection. Subjective ratings including berry size, texture, flavor, cluster size, and fill along with vine crop, vigor, and health were done each year on these plots using a scale of 1 to 10 with 1 very poor for the character rated to 10 for exceptional or usually most desired. One character in which a 10 is not desired is cluster fill, in which a 10 rating represents a very tight cluster that is less optimum as a result of possible difficulty in handling and increased concern for disease development. A cluster rating of 7 to 8 is more desired for this trait. Additionally for vigor, a rating of 9 or 10 reflected excessive vigor and a rating of 7 to 8 is again usually more desirable. Objective data were collected for berry weight (average of 25 berries per cultivar), cluster weight (average of five clusters), and soluble solids (measured on juice extracted from a 25-berry sample) for all years except 2007, in which a late frost damaged the crop and data were not collected. Means and SDs were calculated over multiple years for each variable and cultivar. Additionally, a replicated trial consisting of four two-vine

replications (same spacing as three-vine plots) of own-rooted vines of each cultivar arranged in a randomized complete block was established in 2007 with one vine in each replication used for data collection providing means for budbreak date, harvest date, yield, cluster, and berry weights and soluble solids. Data were collected in this planting for 2009–11 and were analyzed by analysis of variance and mean separation by least square means (1% level of probability) (SAS Institute, 2012). Overall, winter low temperatures ranged from –17 °C (Winters of 1996, 1997, and 2011) to –9 °C (Winter of 2008) during the evaluation of the cultivars and most cultivars survived these winter lows with no to minimal winter damage (winter injury observations were made at fruit maturity each year). Fungicides were applied similar to a commercial requirement to control black rot (*Guignardia bidwellii* Viala & Ravaz), powdery mildew (*Erysiphe necator* Schw. [syns. *Uncinula necator* (Schw.) Burr., *E. tuckeri* Berk., *U. americana* Howe, and *U. spiralis* Berk. & Curt; anamorph *Oidium tuckeri* Berk.]), downy mildew (*Plasmopara viticola* Berl. & de Toni), and anthracnose (*Elsinoë ampelina* Shear) in seedling and selection plantings. Insecticides were applied as needed to control climbing cutworm (several species common including *Agrotis ipsilon* Hufnagel, *Feltia jaculifera* Guenée, and *Peridroma saucia* Hübner) and grape berry moth (*Paralobesia viteana* Clemens). However, the last application of any fungicide was usually done near the end of June, 4 to 7 weeks before harvest depending on cultivar harvest date, as a result of the evaluation vineyard having genotypes that ripened from mid-July onward requiring the discontinuation of applications. Weeds were controlled by applications of preemergence and post-emergence herbicides applied annually. All vines received trickle irrigation as required. Vines were fertilized annually in March or April with nitrogen or complete fertilizers. No storage evaluations of fruit were done on any cultivars nor were growth regulators such as gibberellic acid used in trials to affect berry or cluster characteristics as often practiced in table grape production.

Description and Performance

‘Faith’. Berries of ‘Faith’ are blue to black at full maturity, and are consistently uniform in color (Fig. 5). Fruit ripened from late July to early August, with the early ripening cultivar Jupiter and provides another choice for growers wanting to enter markets for the early table grape season (Table 1). Berry weight was usually near 4 g (Tables 1 and 2), medium in size, and berries are elliptic to oblong in shape. Berries are seedless with small residual seed traces seen. Occasionally, particularly in very hot summers, seed traces were noted to harden making them more noticeable when eaten. Berry weight and rating were usually near that of its male parent ‘Jupiter’ (Tables 1 and 2). Fruit texture is a non-slip-skin type, rated slightly higher

Fig. 1. Pedigree of 'Faith' seedless table grape.

Fig. 2. Pedigree of 'Gratitude' seedless table grape.

Fig. 3. Pedigree of 'Hope' seedless table grape.

Fig. 4. Pedigree of 'Joy' seedless table grape.

than 'Jupiter' and 'Neptune' (Table 3) and semicrisp. Flavor was rated 7.6 (Table 3) and noted to usually be sweet and neutral to slightly fruity, different from the distinct muscat flavor of 'Jupiter'. In some years astringency was noted in the flavor of 'Faith', the source being

the skin of the berry. Berry soluble solids ranged from 16% to 20% in replicated trials and averaged 19% in three-vine plot samples (Tables 1 and 2). One of the major challenges in growing table grapes in climates where summer rainfall during fruit maturity occurs

is fruit cracking or splitting of the skins. 'Faith' usually produced fruit that did not crack even with occasional summer showers near harvest, although in severe rainfall pressure seasons, some cracking was seen. Fruit usually held well on the vines after maturity.

Fruit cluster average weight ranged from 158 to 251 g in the replicated trial (Table 1), averaged 277 g in three-vine plot samples (Table 2), and cluster size rating averaged 7.2 (Table 3), reflecting medium cluster size often similar to ‘Jupiter’ but smaller than ‘Neptune’. Cluster fill rating averaged 7.2 (Table 3), indicating well-filled but rather flexible or loose clusters. One concern noted in several years with ‘Faith’ was poor berry set in some clusters with numerous small berries (referred to as “shot” berries) present

that did not ripen with the normal crop. This is thought to be related to weather during bloom and fruit set, a period when rains can occur.

Vines of ‘Faith’ were moderately productive with mature vines yielding 9 to 22 kg/vine (Table 1). Average cropload rating was lower for ‘Faith’ than other cultivars, this being the result of some crop reduction in some years as a result of poor fruit set and cluster fill (Table 3). Buddbreak date was the earliest of the Arkansas cultivars

tested, 28 Mar. to 1 Apr. (Table 1). Vine vigor rating averaged 7.6, indicating good vine growth but usually not excessive vigor (Table 3). Vigor was usually optimum when a balanced crop was produced on the vines, but vigor could be excessive with low cropload. Vine health rating was 8.3 (Table 3), indicating vines that had good leaf color, usually no disease presence, and consistent year-to-year health even with low winter temperatures. The only diseases noted on the vines were slight infections of powdery and downy mildew observed in 2 of 16 years of observation, and in no years did the diseases cause substantial foliar damage or defoliation. However, vines of ‘Faith’ and other Arkansas-developed table grapes are required to have fungicide applications to ensure reliable cropping, and full disease resistance was not evaluated during the development of these cultivars. ‘Faith’ was observed to have less downy mildew compared with ‘Jupiter’, which appears substantially more susceptible to this pathogen. No crop loss resulting from winter cold occurred for ‘Faith’ and no vines were observed to have substantial spur, cordon, or trunk damage when exposed to the low of -17°C .

‘Gratitude’. ‘Gratitude’ has green, seedless berries with elliptic to narrow-elliptic shape (Fig. 6). A very slight pink blush was seen in very few years on ‘Gratitude’ berries. Fruit ripened later in the season from 19 to 28 Aug., near that of ‘Neptune’ (Table 1). Berry weight was usually near 3.5 g (Tables 1 and 2) with average size rating of 7.2 (Table 3). Seed traces were always very small or not present for ‘Gratitude’ berries, very unusual for a stenospermocarpic seedless grape in the eastern United States. Fruit texture is a non-slipskin type, very crisp, and has the most *Vitis vinifera* L.-type texture of any Arkansas-developed table grape; this was reflected in its 8.7 texture rating (Table 3). Flavor of ‘Gratitude’ is neutral, the most similar of the

Fig. 5. Cluster of ‘Faith’ seedless table grape.

Table 1. Replicated trial data from a four-replication trial at the Fruit Research Station, Clarksville, established in 2007 for six cultivars.

Cultivar ²	Yield/vine (kg)	Cluster wt	Berry wt	Soluble solids	Buddbreak			Harvest date
					Date	Day of yr	Date	Day of yr
2011								
Faith	9.4 b	158.2 c	3.2 a	20.6 a	—	—	29 July	232.5 c
Gratitude	12.1 b	392.6 a	3.5 a	17.9 b	—	—	19 Aug.	232.1 a
Hope	21.4 a	309.3 b	2.5 b	17.1 b	—	—	20 Aug.	232.5 a
Joy	7.5 b	254.2 b	2.4 b	16.4 b	—	—	4 Aug.	217.0 b
Jupiter	12.6 b	136.9 c	3.7 a	20.5 a	—	—	29 July	211.0 c
Neptune	13.0 b	345.2 ab	3.3 a	17.5 b	—	—	21 Aug.	234.1 a
2010								
Faith	22.7 ab	250.8 cd	3.9 a	16.1 d	1 Apr.	92.0 bc	3 Aug.	216.0 c
Gratitude	15.5 c	515.3 a	3.7 ab	19.6 ab	2 Apr.	93.3 a	19 Aug.	231.5 a
Hope	25.0 a	307.9 bc	3.1 c	16.9 cd	2 Apr.	91.5 bc	19 Aug.	231.5 a
Joy	21.9 a–c	333.2 bc	3.4 bc	17.8 cd	2 Apr.	92.6 ab	11 Aug.	224.0 b
Jupiter	17.5 bc	133.8 d	3.9 a	18.2 bc	30 Mar.	90.0 d	29 July	210.9 d
Neptune	18.7 a–c	428.8 ab	3.6 ab	21.2 a	31 Mar.	91.0 cd	20 Aug.	233.1 a
2009								
Faith	13.5 a–c	217.5 c	4.2 a	19.7 bc	28 Mar.	88.3 cd	2 Aug.	216.0 c
Gratitude	8.5 c	440.6 a	3.7 b	18.2 d	2 Apr.	92.8 a	28 Aug.	240.9 a
Hope	16.8 a–c	236.0 c	3.0 cd	19.0 cd	30 Mar.	90.1 bc	18 Aug.	231.0 b
Joy	11.3 bc	255.6 bc	3.0 cd	20.2 bc	2 Apr.	93.2 a	19 Aug.	231.5 b
Jupiter	18.8 a–c	106.8 c	3.3 b–d	21.3 ab	27 Mar.	87.1 d	2 Aug.	215.3 c
Neptune	21.6 a	353.3 ab	3.9 ab	22.3 a	27 Mar.	86.6 d	29 Aug.	242.1 a

²Mean separation for individual years within columns by least square means, 1% level.

Table 2. Average cluster weight, berry weight, and soluble solids (with sds) for seven grape cultivars over several years at the Clarksville, AR, Fruit Research Station, with data taken from three-vine plots.

Characteristic	Faith ^z	Gratitude ^y	Hope ^x	Joy ^v	Jupiter ^v	Mars ^v	Neptune ^u
Cluster weight	277 ± 79	544 ± 148	329 ± 112	314 ± 79	282 ± 71	220 ± 69	373 ± 113
Berry weight	3.8 ± 0.6	3.6 ± 0.8	3.1 ± 1.1	2.8 ± 0.5	4.1 ± 0.7	3.3 ± 0.7	3.2 ± 0.9
Soluble solids	19.4 ± 1.5	19.4 ± 2.9	18.8 ± 1.6	19.8 ± 1.5	19.9 ± 1.1	18.0 ± 1.6	20.6 ± 2.2

^zYears evaluated for cluster weight: 1997–2006, 2008–11. Years evaluated for berry weight and soluble solids: 1996–2006, 2008–11.

^yYears evaluated characteristics: 1998–2006, 2008–11.

^xYears evaluated for all characteristics: 1990–96, 1998–2006, 2008–11.

^vYears evaluated for all characteristics: 1997–2006, 2008–11.

^uYears evaluated characteristics: 1990–2006, 2008–11.

^wYears evaluated for cluster weight: 1991–95, 1997–2006, 2008–11. Years evaluated for berry weight and soluble solids: 1991–2006, 2008–11.

Table 3. Subjective ratings (with sds) for seven table grape cultivars, Fruit Research Station, Clarksville, AR, from three-vine selection plots.^z

Characteristic	Faith ^y	Gratitude ^x	Hope ^w	Joy ^v	Jupiter ^u	Mars ^l	Neptune ^s
Fruit size	7.5 ± 0.5	7.2 ± 0.6	7.2 ± 0.4	6.9 ± 0.3	8.2 ± 0.9	7.0 ± 1.3	7.5 ± 0.6
Texture	7.8 ± 0.7	8.7 ± 0.9	6.9 ± 0.4	6.8 ± 0.7	7.5 ± 0.7	7.0 ± 0.0	7.1 ± 0.9
Flavor	7.6 ± 0.5	7.4 ± 0.5	7.7 ± 0.5	8.0 ± 0.6	8.9 ± 0.5	7.9 ± 0.6	8.0 ± 0.4
Cluster fill	7.2 ± 0.9	10.0 ± 0.6	8.6 ± 2.1	8.1 ± 1.0	7.8 ± 0.9	8.3 ± 0.9	9.0 ± 0.7
Cluster size	7.2 ± 0.7	7.8 ± 0.4	7.4 ± 0.8	7.4 ± 0.5	7.3 ± 0.9	6.9 ± 0.6	7.8 ± 0.5
Crop	6.4 ± 2.0	7.1 ± 1.4	7.2 ± 1.6	7.8 ± 0.8	7.4 ± 1.5	7.1 ± 1.6	6.7 ± 2.2
Vigor	7.6 ± 0.9	7.2 ± 0.4	7.4 ± 0.6	7.5 ± 0.8	8.0 ± 0.8	8.4 ± 1.2	6.9 ± 0.6
Health	8.3 ± 1.2	7.2 ± 0.6	7.3 ± 0.8	8.5 ± 1.0	8.4 ± 1.2	9.1 ± 0.8	7.2 ± 0.8

^zRatings were done using a scale of 1 to 10 with 1 very poor for the character rated to 10 for exceptional or most desired. Exceptions to this scale were cluster fill rating ranged from very loose to very compact, with excessive compactness not the most desirable cluster fill, and vigor where a rating of 9 or 10 reflected excessive vigor.

^yYears evaluated for fruit size: 1995–2002, 2004–06. Years evaluated for texture: 1996, 1997, 1999–2002, 2004, 2005, 2007, 2008, 2010, 2011. Years evaluated for flavor: 1996–2002, 2004, 2005, 2007–11. Years evaluated for cluster fill and cluster size: 1997–2002, 2004–11. Years evaluated for crop, vigor, and health: 1995–2002, 2004–11.

^xYears evaluated for fruit size, texture, flavor, cluster fill, cluster size, crop, and health: 1998–2002, 2004–11. Years evaluated for vigor: 1998–2002, 2004–09, 2011.

^wYears evaluated for all other characteristics fruit size, flavor, cluster fill, cluster size, crop, vigor, and health: 1991–2002, 2004–11. Years evaluated for texture: 1991–95, 1997–2001, 2004–11.

^vYears evaluated for fruit size, flavor, cluster fill, cluster size, crop, vigor and health: 1997–2002, 2004–11. Years evaluated for texture: 1998–2002, 2004–11.

^uYears evaluated for fruit size, flavor, cluster fill, cluster size,; 1991–2002, 2004–11. Years evaluated for texture: 1998, 1999, 2001, 2002, 2004–11. Years evaluated for crop, vigor, and health: 1991–2002, 2004–07, 2009–11.

^lYears evaluated for fruit size, flavor, cluster fill, cluster size, vigor and health: 1991–2002, 2004–11. Years evaluated for texture: 2000, 2004–08, 2010.

^sYears evaluated for fruit size, flavor, vigor, and health: 1991–2002, 2004–11. Years evaluated for cluster fill, cluster size: 1991–95, 1997–2002, 2004–11.

Fig. 6. Cluster of 'Gratitude' seedless table grape.

Arkansas-developed cultivars to table grapes grown in the western United States (*V. vinifera*) and was rated 7.4 (Table 3). No astringency was noted in the flavor of 'Gratitude'. Berry soluble solids ranged from 18% to 20% in replicated trials and averaged 19% in three-vine plot samples (Tables 1 and 2). Berry skin was noted to be edible and usually thin. Fruit cracking was not observed on 'Gratitude', reflecting a substantial achievement to produce a grape with crisp texture and thin skin without cracking during rainy periods during the harvest period. Fruit usually held well on the vines after maturity.

Fruit cluster average weight ranged from 393 to 515 g in the replicated trial (Table 1), averaged 544 g in three-vine plot samples (Table 2), and cluster size rating averaged 7.8 (Table 3), reflecting large cluster size and larger than 'Neptune'. Cluster fill rating averaged 10.0 (Table 3), indicating very tight clusters that do not have good flexibility in handling.

Vines of 'Gratitude' were moderately productive with mature vines yielding 9 to 16 kg/vine (Table 1). A factor in productivity was likely winterhardiness, because some crop reduction was attributed to winter injury, particularly to fruiting spurs. During the 13 years of observation, some winter injury was noted in four of these and one vine was killed in the three-vine plot planting. Thus, 'Gratitude' is likely the least hardy of the new cultivars and this should be noted by potential growers. Average crop load rating was 7.1 (Table 3). Budbreak date was 2 Apr., later than most other Arkansas cultivars tested (Table 1). Vine vigor rating averaged 7.2 and with good vigor balance (Table 3). Vine health rating was 7.2 (Table 3) and was rated lower than some cultivars as a result of winter injury that decreased green leaf color (resulting in chlorosis, which was observed in limited years). Slight powdery mildew was seen 1 of 13 years and downy mildew observed 2 of 13 years but never a severe infection.

'Hope'. 'Hope' has green berries with an attractive, narrow-elliptic shape (Fig. 7). Fruit ripened ≈20 Aug., near that to slightly earlier than the other Arkansas green-colored table grape cultivar Neptune (Table 1). Berry weight was usually near 3 g, a medium to small size, and among the smaller of the Arkansas releases (Tables 1 and 2). Berries are seedless, and in most of the 20 years of observation, no seed trace was observed, and 'Hope' is likely the best Arkansas cultivar for absence of seed trace. Fruit texture is a non-slipskin type, but the texture is soft and not crisp, as reflected in a lower texture rating (6.9) compared with other Arkansas developments (Table 3). Flavor was rated 7.7 (Table 3) and was noted to be fruity with a blend of American grape and possibly slight muscat flavors. No skin astringency was observed for 'Hope'. The skin was noted to be edible but moderately thick, although not as thick as 'Neptune'. Berry soluble solids ranged from 17% to 19% in replicated trials and averaged 19% in three-vine plot samples

Fig. 7. Cluster of 'Hope' seedless table grape.

Fig. 8. Cluster of 'Joy' seedless table grape.

(Tables 1 and 2). In most years, no fruit cracking was seen with 'Hope', although in rainy years, some slight cracking was observed. Even so, it was among the best

Arkansas developments in fruit cracking resistance. Fruit was also observed to hold well on the vines, even after 2 months after the last fungicide treatment.

'Hope' fruit cluster average weight was usually just over 300 g in the replicated trial (Table 1), averaged 329 g in three-vine plot samples (Table 2), and cluster size rating averaged 7.4 (Table 3), reflecting medium to medium to large cluster size, although not as large as 'Neptune'. Cluster fill rating averaged 8.6 (Table 3), indicating tight cluster fill, and clusters did not exhibit good flexibility in handling as a result of this characteristic. Cluster fill was consistent among years.

Vines of 'Hope' were very productive, among the highest each year in a replicated trial with yields ranging from 17 to 25 kg/vine (Table 1). Average cropload rating was consistently good also, 7.2 (Table 3). Budbreak for 2009 was 30 Mar. and for 2010 was 2 Apr. (Table 1). Vine vigor rating averaged 7.4, indicating good vine growth but not excessive vigor (Table 3). Vine health rating was 7.3 (Table 3), although in many years, ratings were 8 or 9 and vines were usually noted to be very healthy. Downy mildew infections were observed in some years although they were always noted to be substantially less than that for 'Jupiter', and powdery mildew was almost never seen on this cultivar. No crop or vine loss as a result of winter cold occurred during testing of 'Hope', although some winter injury to spurs was noted during 2001 and 2008.

'Joy'. The blue/black-fruited 'Joy' exhibits even ripening at full maturity and has an ovate to narrow elliptic berry shape (Fig. 8). Fruit ripened on average $\approx$ 11 Aug. (Table 1). Berry weight was usually near 3 g (Tables 1 and 2), medium in size. Small residual seed traces were seen in some years and were occasionally noted to harden. Fruit texture is a non-slipskin type, rated 6.8 and the lowest of the Arkansas cultivars (Table 3). This lower texture rating was the result of a very soft or melting texture of berries, very unusual for a non-slipskin type berry. Flavor was rated 8.0, exceeded only by 'Jupiter' (Table 3), and was noted to have a very pleasant fruity flavor. The skin of 'Joy' is very thin, likely the thinnest of any Arkansas table grape. Astringency has not been noted in the flavor of 'Joy'. Berry soluble solids ranged from 16% to 20% in replicated trials and averaged 20% in three-vine plot samples (Tables 1 and 2). Fruit cracking was usually not seen on 'Joy', although it was seen to a slight degree in 3 of 15 years of observation. Fruit usually held well on the vines after maturity.

Fruit cluster average weight varied slightly in the replicated trial, from 254 to 333 g/cluster (Table 1), average 314 g in three-vine plot samples (Table 2), and cluster size rating averaged 7.4 (Table 3), reflecting medium cluster size. Cluster fill rating averaged 8.1 (Table 3), indicating well-filled but rather flexible clusters. One concern noted with 'Joy' was reduced berry set in 2 of 15 years of observation, which resulted in reduced cluster weight and vine yield. In these years, some "shot" berries were noted. Another concern seen in some years was shatter of

the berries from the pedicles. In a limited number of years, this was noted to be quite noticeable, resulting in difficulty in harvest of full clusters of berries. It is not known if this is related to a pathogen infecting the pedicle or pedicle/berry attachment point, but that is possible as a result of the long period between last fungicide application and harvest (usually 6 weeks).

Yields of 'Joy' ranged from moderate to high among the replicated trial entries, as high as 22 kg/vine in 2010 (Table 1). Average cropload rating was 7.8 for 'Joy',

the highest for all entries compared (Table 3). Budbreak date was the latest of the Arkansas cultivars tested, 2 Apr. each year shown (Table 1). Vine vigor rating averaged 7.5, a very good rating for both good growth and vigor balance (Table 3). Vine health rating was 8.5 (Table 3), exceeded only by 'Mars', and a common observation was excellent vine health. In 15 years of observation, slight downy mildew infection was noted twice and powdery mildew once. No winter injury was noted on 'Joy' during evaluation.

Availability

The four new cultivars will be patented and licensed to domestic nurseries. Vines should be available in a limited number in the Winter of 2012–13 and 2013–14 and more widely available in subsequent years.

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