'Jupiter' Seedless Grape

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'Jupiter' is the fifth in a series of seedless table grapes (*Vitis* sp.) released from the Univ. of Arkansas. Previous cultivars include 'Venus' (Moore and Brown, 1977), 'Reliance' (Moore, 1983), 'Mars' (Moore, 1985), and 'Saturn' (Moore et al., 1989). This new cultivar is intended to expand the options for eastern table grape growers, specifically providing a muscat-flavored, seedless cultivar.

Origin

'Jupiter' resulted from a cross of Ark. 1258 x Ark. 1672 made in 1981 (Fig. 1). The original vine was selected in 1984 in a seedling vineyard at the Univ. of Arkansas Fruit Substation, Clarksville, and was tested as selection Ark. 1985. The source of the muscat flavor of 'Jupiter' was the *Vitis vinifera* L. cv. Gold, and the source of seedlessness was 'Glenora'.

A three-vine plot trained to a four-arm Kniffin training system and cane pruned was established in 1985 at Clarksville. Data were collected from this plot from 1987 through 1998. Trials consisting of four replications of three-vine plots of 'Jupiter', 'Mars', and 'Venus' and trained to a bilateral cordon were established in 1995 at Clarksville [west-central Arkansas, U.S. Dept. of Agriculture (USDA) hardiness zone 7a; lat. 35°31'58"N and long. 93°24'12"W] and Fayetteville (northwest Arkansas, USDA hardiness zone 6b; lat. 36°5'47"N and long. 94°0'29"W). Both replicated plantings were arranged in a randomized complete-block design. Vines were spur-pruned utilizing three- to five-node spurs on the cordon-trained vines. Vines in all plantings were spaced 2.4 m apart with rows spaced 3.1 m and were trickle-irrigated, had fungicide and insecticides applied according to a commercial pest control program, received annual preemergence and postemergence herbicide applications, and were fertilized annually with nitrogen. Data from 1997 and 1998 from the

replicated trials were analyzed by analysis of variance and the means separated by multiple *t* tests. Additionally, 'Jupiter' was evaluated at Purdue Univ., West Lafayette, Ind.

Description and performance

Fruit of 'Jupiter' is reddish-blue at early maturity and becomes completely blue when

fully mature. Berry shape is oval to slightly oblong. Berry weight averaged 5.5 g over 12 years of evaluation, larger than that of 'Venus', 'Reliance', and 'Mars' (Table 1). In replicated trials, 'Jupiter' berry weight ranged from 3.9 to 4.5 g (Table 2). No evaluations of gibberellic acid or girdling effects on berry weight of 'Jupiter' have been conducted. 'Jupiter' berries are non-slipskin and semi-crisp in texture. Small, soft seed traces have been observed in berries of 'Jupiter' in some years of evaluation, but were usually considered not noticeable due to size and softness and also to the non-slipskin texture of the berries. Seedlessness of 'Jupiter' is stenospermocarpic. No skin cracking was observed on 'Jupiter' in any year of evaluation although severe cracking occurred on 'Reliance' and other susceptible genotypes. Skin of 'Jupiter' is of medium

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

Table 1. Plant and fruit characteristics of four table grape cultivars grown at the Univ. of Arkansas Fruit Substation, Clarksville.

Characteristic	Jupiter	Mars	Reliance	Venus
Date				
Budbreak ^z	25 Mar.	29 Mar.	---	25 Mar.
Harvest ^y	24 July	05 Aug.	29 July	19 July
Berry				
Weight (g) ^{y,x}	5.5	2.6	2.1	3.0
Flavor ^{y,w}	9.2	8.3	9.6	8.0
SSC (%) ^{yv}	19.8	17.6	22.1	17.3
Cluster				
Weight (g) ^{y,u}	257.1	214.2	311.4	266.6
Fill ^{y,t}	8.5	6.7	7.6	7.8
Plant				
Crop ^{y,w}	8.1	7.3	7.9	6.5
Health ^{y,w}	8.7	9.3	9.1	7.8
Vigor ^{y,w}	8.3	9.3	8.4	7.8
Pruning wt/vine (kg) ^{z,s}	0.7	1.9	---	0.7

^zMeans of 2 years, 1997 and 1998, recorded on 12 vines planted in 1995 and trained to a bilateral cordon system.

^yMeans of 12 years, 1987–98; data collected on three vine plots, trained to a four-arm Kniffin system.

^xBerry weight each year was based on an average for 25 berries per three-vine plot.

^wRating scale of 1 to 10 where 10 = best.

^vSSC = Soluble solids concentration; measured on a 25-berry sample each year.

^uCluster weight each year was an average for five clusters per three-vine plot.

^tCluster fill rating of 1 to 10 where 10 = very tight cluster.

^sVines were balanced pruned to a 30 + 10 formula, with 30 buds left on the vine for the first 0.45 kg of pruning wood and 10 buds for each subsequent 0.45 kg.

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Table 2. Yield, berry and cluster weights, and soluble solids for three table grape cultivars grown at two locations in Arkansas. Data were collected from four, three-vine plots planted in 1995 and trained to a bilateral cordon system.

Cultivar	1997				1998			
	Yield (t·ha ⁻¹)	Cluster wt (g)	Berry wt (g)	Soluble solids (%)	Yield (t·ha ⁻¹)	Cluster wt (g)	Berry wt (g)	Soluble solids (%)
<i>Clarksville</i>								
Jupiter	16.7 a ^z	154.0 a	4.3 a	21.2 a	29.8 a	194.7 a	4.5 a	20.6 a
Mars	9.8 b	77.0 b	3.9 ab	18.7 b	26.7 a	144.9 b	3.5 b	19.2 b
Venus	18.5 a	185.6 a	3.4 b	16.6 c	25.9 a	163.0 b	3.3 b	18.0 c
<i>Fayetteville</i> ^y								
Jupiter	---	221.0 a	4.0 a	18.1 a	---	---	3.9 a	16.5 a
Mars	---	199.1 a	3.5 a	15.6 b	---	---	3.5 a	14.2 b
Venus	---	248.6 a	3.6 a	16.1 b	---	---	3.6 a	14.0 b

^zMean separation within columns and locations by *t* test ($P \leq 0.05$).

^yYield data from Fayetteville not presented in 1997 due to crop reduction from frost after budbreak, and in 1998 yield and cluster weight data not presented due to crop reduction from green June beetle infestation.

thickness and edible. Flavor of 'Jupiter' is a mild muscat and has been consistently rated high, exceeded only by 'Reliance' among the comparison cultivars (Table 1). Soluble solids concentration of 'Jupiter' averaged 19.8% over 12 years, higher than that of 'Venus' and 'Mars' but not as high as 'Reliance'; in replicated trials, soluble solids content exceeded 20% at Clarksville but was lower at Fayetteville (Table 2). No postharvest or processing evaluations have been conducted on 'Jupiter'.

Clusters of 'Jupiter' are conical and occasionally have a shoulder (Fig. 2). Cluster weight averaged 257 g over 12 years, similar to that of 'Venus' but smaller than that of 'Reliance' (Table 1). Cluster weight of 'Jupiter' in replicated trials ranged from 154 to 221 g (Table 2). Cluster fill ratings averaged 8.5 for 'Jupiter' (Table 1), indicating well-filled clusters, although the clusters are not too tight to hinder handling or packaging. Shatter of berries from the clusters at maturity has not been observed and the clusters hung well on the vines after

achieving full maturity.

Yield of 'Jupiter' was good in replicated trials, exceeding a calculated yield of 29 t·ha⁻¹ on 4-year-old vines at Clarksville (Table 2). Yields of 'Jupiter' were equal to or exceeded those for 'Venus' and 'Mars' in the replicated trials. Crop ratings, taken over 12 years, were higher for 'Jupiter' than for 'Venus', 'Reliance', and 'Mars', indicating consistent cropping during the evaluation period. In only 1 of the 12 years of evaluation was a crop rating of <7 recorded for 'Jupiter'; this occurred in 1996 following a spring freeze that damaged emerging buds. 'Jupiter' vines have not been evaluated for the effects of flower cluster thinning, and excessive cropping has not been observed on 'Jupiter' in Arkansas. In Indiana, however, 'Jupiter' was noted to have a tendency to overcrop if not cluster thinned (Bruce Bordelon, personal communication).

'Jupiter's average maturity date was 24 July at Clarksville, and it is considered an early mid-season cultivar. 'Jupiter' ripened 5 d later

than 'Venus' and 5 and 12 d earlier than 'Reliance' and 'Mars', respectively (Table 1). Time of budbreak of 'Jupiter' was similar to that of 'Venus' and 4 d earlier than that of 'Mars' (Table 1).

Vines of 'Jupiter' have medium vigor, similar to 'Venus' in pruning weight and 'Reliance' in vigor rating, but are less vigorous than 'Mars' (Table 1). Growth habit of 'Jupiter' is mostly procumbent although not as much as 'Mars'. Shoot positioning is more easily conducted on 'Jupiter' than for 'Mars' due to lower vigor and less tendril interference. 'Jupiter' shoots mature early with wood maturity extending to the shoot tips in the fall. Minimum winter temperature at Clarksville from 1987 through 1998 was -22 °C in Dec. 1989, although for most winters the lowest temperature experienced was from -13 to -17 °C. Winter injury was not observed on 'Jupiter' during this period. 'Jupiter' fruited consistently during each year of evaluation and had a crop rating of 10 (indicating a full crop) for the 1990 season following exposure to -22 °C. Observations on 'Jupiter' in West Lafayette, Ind., indicated a moderate cold hardiness level. In this respect it is similar to 'Suffolk Red', harder than 'Einset Seedless', 'Canadice', 'Himrod', 'Marquis', 'Remail Seedless', 'Saturn', 'Vanessa Seedless', and 'Venus', but less hardy than 'Mars' and 'Reliance' (Bruce Bordelon, personal communication). Some vine death occurred after exposure to -32 °C in the West Lafayette planting. A crop reduction on 'Jupiter' occurred at Clarksville in 1996 due to a spring freeze (-12 °C in March) near budbreak but freeze damage ratings to breaking buds were similar to those of 'Mars' and less damage was noted than that for 'Venus'.

'Jupiter' has shown moderate resistance to black rot [*Guignardia bidwelli* (Ellis) Viala & Ravaz], powdery mildew [*Uncinulata necator*

Fig. 2. Clusters of 'Jupiter' seedless grape.

(Schw.) Burr.], and anthracnose [*Elsinoë ampelina* (de Bary) Shear] under field conditions. Slight infections of powdery mildew were observed in 2 of the 12 years of evaluation. Neither black rot nor anthracnose were observed with the fungicide program utilized in the test vineyard. No powdery mildew, black rot, or phomopsis cane and leaf spot (*Phomopsis viticola* Sacc.) was observed in Indiana evaluations (Bruce Bordelon, personal communication). 'Jupiter's downy mildew [*Plasmopara viticola* (Berk. & Curt.) Berl. & de Toni] susceptibility is similar to that of 'Venus'. However, downy mildew has not been a concern because of the use of available commercial fungicides. Overall, plant health ratings for 'Jupiter' were high during the 12 years of evaluation, exceeding that of 'Venus' and near that of 'Mars' and 'Reliance'. 'Jupi-

ter' is moderately sensitive to phenoxy-herbicides but not as sensitive as 'Mars', 'Sunbelt', or 'Remail Seedless' (Bruce Bordelon, personal communication). Feeding of green June beetle (*Cotinis nitida* L.) on ripening fruit of 'Jupiter' has been observed several years. The aromatic muscat fruit coupled with early ripening probably contributes to this insect activity. Additionally, feeding by mammalian predators has been noted in Arkansas and Indiana (Bruce Bordelon, personal communication).

The outstanding characteristics of 'Jupiter' are its excellent flavor, high fruit quality, large berry, good productivity, resistance to fruit cracking, and good level of vine hardiness. 'Jupiter' is recommended for trial where other eastern U.S. table grape cultivars are adapted.

Availability

An application for a U.S. plant patent has been filed for 'Jupiter'. A list of nurseries licensed to propagate and sell 'Jupiter' can be obtained from J.R.C., 316 Plant Science, Dept. of Horticulture, Univ. of Arkansas, Fayetteville, AR 72701.

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