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'Valvin Muscat'TM Grape

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'Valvin Muscat'TM is a mid-season white wine grape with a distinctive muscat flavor and no objectionable bitterness. It is suitable for the production of desirable highly aromatic varietal wines or for blending purposes. It is more winter hardy and disease resistant than muscat grapes that are pure *V. vinifera*.



ORIGIN

'Valvin Muscat'TM was developed at the New York State Agricultural Experiment Station, Cornell University. It is a complex interspecific hybrid grape resulting from a cross made in 1962 between Couderc 299-35 (an interspecific hybrid known as 'Muscat du Moulin') and 'Muscat Ottonel' (Fig. 1). From 529 seeds, 62 seedlings were evaluated in a first test vineyard, and four were

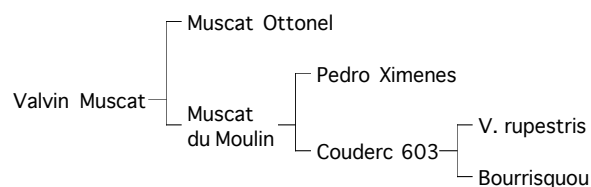
propagated for further testing. The original seedling vine was planted in 1964 and identified as test selection NY62.0122.01 when it was propagated in 1969. This selection has been available to growers and research cooperators for test purposes since 1990.

DESCRIPTION

Own-rooted vines grown in phylloxera (*Daktulosphaira vitifoliae* Fitch) infested soils have been long lived but pruning weights were low. With its *V. vinifera* background, susceptibility to root phylloxera was suspected. Subsequent testing has shown that this selection is vigorous and productive when grafted onto commonly used rootstocks such as 5C and Couderc 3309.

Own-rooted vines were tested in a replicated trial at the Vineyard Research Labora-

Figure 1. Pedigree of Valvin Muscat.



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Table 1. Performance of grape cultivars at Fredonia, NY, 1988-1993.

Cultivar	Cane pruning weight (lbs./vine)	Mean cluster weight (lbs.)	Fruit yield Tons/acre
Valvin Muscat	1.1b	0.15c	3.1c
Seyval blanc	1.3b	0.48a	5.6b
Melody	3.9a	0.28b	6.5a
(*Valvin Muscat / 5C)	2.4	0.17	4.5

* indicates observations taken on a grafted vine in a non replicated border row, for comparison with own-rooted vines of Valvin Muscat. Means followed by the same letter within columns are not significantly different according to Duncan's Multiple Range Test.

Table 2. Observations of vines grown at Geneva, New York, 1996-2005.

Cultivar	Cane pruning weight (lbs./vine)	Cluster weight (lbs.)	Berry weight (gm)	Fruit yield (lbs./vine)
Valvin Muscat	1.7	0.20	2.2	10.8
Valvin Muscat / 5C	4.8	0.22	2.2	29.9
Cayuga White	2.7	0.47	2.7	20.7
Traminette	3.6	0.33	1.8	19.0

tory, Fredonia, NY, between 1988 and 1993. Vines were smaller than 'Melody' and less productive than either 'Seyval' or 'Melody' (Table 1). A single vine of 'Valvin Muscat' grafted onto rootstock 5C was included in a border row of this trial, and showed a promising improvement in vine size as well as potential for productivity (Table 1).

In observations of vines growing at Experiment Station trial sites, grafted vines were much larger (greater pruning weights) and more productive than were own-rooted vines (Table 2). However, they did not differ in mean cluster or berry weight. The unusually high total fruit weight for grafted vines is partially attributable to the lack of other vines growing adjacent to the various plots of grafted vines of 'Valvin Muscat'. Growers have also observed the potential for reasonably high fruit yields in their

trials of 'Valvin Muscat', with observations in the range of 5.0 - 6.0 tons/acre. The vine has an upright growth habit.

Budbreak is usually after 'Concord' but before 'Cayuga White' and 'Traminette'. Spring frost damage has been observed only occasionally. Bloom (50%) is usually reached about 3-7 days after 'Concord'. Fruit have been harvested between late September and mid October. Growers and researchers agree that fruit should be harvested when a full muscat flavor is detected by direct tasting of berries in the field, rather than using a set of criteria based on sugar, pH and/or acidity.

During test years at Geneva, 'Valvin Muscat' has shown only moderate susceptibility to downy and powdery mildew (*Plasmopara viticola* and *Uncinula necator*, respectively) of leaves and fruit. Up to 25% fruit infection with black rot (*Guignardia*

Table 3. Wine and juice analyses for ‘Valvin Muscat’ and additional white wine varieties, 1999-2005.

Date of Harvest	JUICE ANALYSES					WINE ANALYSES (after ML, before TA adjustments)			
	Brix	pH	TA g/L	Tartrate g/L	Malate g/L	pH	TA g/L	Tartrate g/L	Malate g/L
13-Sep-05	17.0	3.22	11.9	3.7	7.6	3.15	10.4	3.4	4.7
13-Sep-05	17.2	3.31	9.8	3.3	5.7	3.18	8.9	3.2	3.6
19-Sep-05	21.2	3.17	9.8	3.9	4.5	3.15	8.8	3.9	2.8
7-Sep-05	17.5	3.11	11.7	6.2	4.9	3.11	9.7	4.7	3.1
27-Sep-05	20.6	2.94	9.8	5.9	2.2	2.78	8.6	5.1	1.1
27-Sep-04	22.3	3.11	12.5	***	***	***	***	***	***
27-Sep-04	15.0	3.14	12.5	***	***	***	***	***	***
27-Sep-04	15.9	***	***	***	***	3.25	11.1	3.2	5.8
27-Sep-04	19.6	3.06	12.5	***	***	3.25	10.6	3.6	5.1
13-Sep-04	16.6	3.04	11.9	***	***	3.09	11.2	5.1	3.9
4-Oct-04	17.1	3.02	12.5	***	5.1	3.05	11.0	5.5	3.5
	20.6	3.35	8.4	***		***	***	***	***
30-Sep-03	17.6	3.18	12.8	***	***	***	12.2	3.1	6.3
13-Oct-03	17.4	3.25	12.2	***	***	***	11.9	3.0	6.4
20-Oct-03	22.4	3.05	8.6	***	***	***	11.8	4.2	4.3
20-Oct-03	19.5	3.09	10.4	***	***	***	12.7	3.9	5.5
16-Sep-03	16.9	3.03	14.4	***	***	***	13.5	4.8	5.4
30-Oct-03	20.4	2.95	9.1	***	***	***	10.6	5.5	2.6
17-Sep-02	17.6	3.20	9.2	***	***	3.49	7.2	***	***
15-Oct-02	22.4	2.93	8.4	***	***	3.06	8.0	***	***
17-Sep-02	17.5	3.14	8.5	***	***	3.11	8.0	***	***
24-Oct-02	21.2	3.03	7.2	***	***	3.17	7.6	***	***
01-Oct-02	22.4	3.16	6.2	***	***	3.19	6.3	***	***
26-Sep-01	20.0	3.52	7.4	2.7	3.1	3.37	8.2	1.3	3.9
02-Oct-01	21.6	3.41	8.4	3.3	2.7	3.23	9.3	2.2	3.5
18-Sep-01	17.6	3.28	9.0	4.7	2.3	3.23	8.9	3.2	2.9
15-Oct-01	23.0	3.23	9.9	7.4	3.0	3.20	8.2	3.2	1.7
3-Oct-01	22.6	3.21	10.5	4.8	2.5	3.05	9.4	4.8	***
18-Oct-00	17.6	2.96	13.4	***	***	3.13	11.4	2.1	5.9
19-Oct-00	20.4	2.90	12.5	8.02	5.45	3.16	11.0	2.4	4.9
19-Oct-00	21.2	2.78	12.6	8.11	5.19	2.85	12.0	4.4	3.9
7-Nov-00	20.0	***	***	***	***	2.89	11.6	4.0	3.4
17-Oct-00	21.0	2.88	10.7	7.10	4.62	2.97	10.2	3.5	3.4
22-Sep-99	18.4	3.09	10.7	***	***	3.25	7.8	1.7	3.0
22-Sep-99	21.2	2.85	10.6	5.3	3.6	3.02	8.5	2.5	2.1
9-Sep-99	16.4	2.90	8.8	***	***	3.01	9.4	4.2	2.4
6-Oct-99	18.8	3.00	8.2	***	***	2.89	8.3	3.8	0.8
23-Sep-99	21.4	3.07	7.6	***	***	3.07	7.5	2.2	2.2

Abbreviations used: SC = Skin contact for (x) hours; ML = malolactic fermentation; CS = cold soak for (x) hours

bidwellii) has been observed when disease pressure is severe, so measures to control black rot when conditions warrant are recommended. ‘Valvin Muscat’ is resistant to *Botrytis* bunch rot (*Botrytis cinerea*). The overall level of disease observed is on par with many other interspecific hybrid grapes, and generally less than observed with European grapes (*V. vinifera*). Under a disease control program usually used for interspecific hybrid grapes, there should be no special disease concerns.

Symptoms of “rupestris speckle”, an apparent physiological disorder associated with grapevines related to *Vitis*

rupestris, are commonly seen on ‘Valvin Muscat’. This disorder, also sometimes known as “muscat spot”, is characterized by circular to angular necrotic spots, under 2 mm, found especially on older leaves. The effects of this disorder on vine growth are apparently not significant.

Vines of ‘Valvin Muscat’ are moderately winter hardy; similar in hardiness to ‘Seyval blanc’ and ‘Traminette’, less hardy than ‘Vignoles’, but more hardy than ‘Cayuga White’ or ‘Vidal blanc’. Between 1996 and 2005, mid-winter primary bud cold hardiness was measured by differential thermal analysis (Pool et al. 1990).

The predicted temperature of 50% primary bud kill (LTE_{50}) for 'Valvin Muscat' was -14.7 F. During the same period, the LTE_{50} for 'Concord', 'Traminette' and 'Cayuga White' were -17.9 F, -15.7 F, and -11.8 F, respectively. Following severe winter temperatures (-14 to -17 F) experienced in 2003/04 and 2004/05, Geneva-grown own rooted vines produced little fruit. However, grafted vines were very productive in 2005. Trunks are moderately hardy, showing signs of trunk damage in both 2004 and 2005. Between 1996 and 2003, very little trunk damage was observed. Due to crown gall development following cold winters, trunks on own-rooted vines are renewed periodically.

'Valvin Muscat' provides consistently high quality wines with spicy, floral muscat aromas and no objectionable bitterness. When ripe, Brix are between 16 and

22, depending on the year and crop load (**Table 3**). The grape must pH is between 3.0 and 3.3 and the titratable acidity between 10 and 13 g/L. Fruit are typically given 24 hours of skin contact (cold soak at 41 to 50 F) before fermentation. In a cool year, the fruit might receive longer skin contact. After a cold soak with 50 mg/L of SO_2 added, the grapes are pressed, the must is settled overnight, then racked clear. Alcoholic fermentation is carried out with selected pure culture yeasts either at constant 61 or 68 F depending on the yeast strain used. We have not seen a high acidity nor a high pH problem with this cultivar. Usually, the wines receive no malolactic fermentation. Acidity might be adjusted down by 0.5 or 1 g/L after alcoholic fermentation. If necessary, the must was chaptalized to 20 or 22 Brix. In warm years and with long skin contact the

Table 4. Performance of grape cultivars at Vincennes, IN (SW) 2000-2005.

Cultivar	Cane pruning weight (lbs./vine)	Mean cluster weight (lbs.)	Berry weight (gm)	Fruit yield (lbs./vine)
Valvin Muscat / 3309	1.7	0.22	2.7	16.5
Cayuga White	1.1	0.45	2.9	29.3
Chardonel	1.0	0.38	2.1	16.1
Seyval blanc	0.4	0.45	1.9	22.6
Traminette	2.9	0.31	1.8	17.2
Vidal blanc	1.9	0.44	1.9	22.2
Vignoles	1.8	0.24	1.5	15.8

Table 5. Performance of grape cultivars at West Lafayette, IN (EC) 1997-2002.

Cultivar	Cane pruning weight (lbs./vine)	Mean cluster weight (lbs.)	Berry weight (gm)	Fruit yield (lbs./vine)
Valvin Muscat / 3309	0.42	0.11	2.0	9.8
Cayuga White	0.87	0.33	2.8	24.0
Chardonel	0.27	0.19	1.6	5.9
Seyval blanc	0.63	0.30	1.6	14.9
Traminette	1.34	0.24	1.6	17.8
Vidal blanc	0.73	0.26	1.6	20.8
Vignoles	0.38	0.12	1.1	5.4

muscat aromas are very strong, floral and spicy. In cool years with less ripe fruit, the aromas tend toward floral 'Gewürztraminer' aromas with some orange spice aromas.

VITICULTURAL PERFORMANCE IN INDIANA

As an indication of performance outside New York State, we include here some information about the performance of 'Valvin Muscat' in trials run by Purdue University. 'Valvin Muscat' has been evaluated at two sites in Indiana; Vincennes in Southwest Indiana, a warm site with well drained soils; and West Lafayette in West Central Indiana, a cold site with heavier soils. Vines were planted in 1996 and yield data collected from 2000. Vines grafted to 3309 performed very well in Southwest Indiana on deep, well drained soils (**Table 4**). Vine size has been comparable to other moderately vigorous cultivars such as 'Vidal blanc' and 'Vignoles', larger than 'Seyval' and 'Chardonel', but smaller than 'Traminette'. Fruit yield has averaged 17 lbs. per vine or approximately 4 to 5 tons per acre. Berry weight is moderately large and cluster size was moderately small. Fruit has generally been harvested in late August. Wines made from fruit from this warm location, have ranked highest when

fruit was picked early, before full maturity.

Vine size and yields are lower in West Lafayette on the heavier soils and in a colder climate (**Table 5**). Vines grafted to 3309 had small vine size similar to 'Vignoles' and fruit yield higher than 'Vignoles' and 'Chardonel', but lower than 'Seyval', 'Vidal blanc' or 'Cayuga White'. Berry weights were moderate and cluster size was small.

The low vine size and yield at West Lafayette may be due to the heavy soils and winter injury as this site frequently experiences temperatures lower than -15 F. Additionally, these weaker vines had a high incidence of "muscat spot", also known as "rupestris speckle", on the leaves that may have additionally reduced vigor. However, wine quality from fruit grown at West Lafayette was generally superior to that grown in the warmer climate of Vincennes. Fruit was generally harvested in mid to late September.

There have been no serious disease concerns with 'Valvin Muscat' in Indiana. It has experienced some late season fruit rots occasionally in the warmer location of Vincennes, particularly when rainfall occurred near harvest. It is not particularly sensitive to exposure to phenoxy herbicides.

OVERALL RECOMMENDATION

'Valvin Muscat' is recommended for the production of high quality muscat wines, and can be useful for both varietal wine production as well as blending to add flavor and aroma to table wines. Vines are well-suited to good grape growing sites in the Eastern United States, and should only be grown on suitable rootstocks. Some care should be exercised to control disease, and fruit should be picked when the muscat flavor reaches its peak.

AVAILABILITY

Vines of 'Valvin Muscat' are available from licensed commercial nurseries; contact B.I. Reisch <bir1@nysaes.cornell.edu> for a list of sources. Commercial nurseries should contact Cornell Research Foundation, 20 Thornwood Drive, Suite 105, Ithaca New York 14850 (phone: 607-257-1081; fax: 607-257-1015; email <des33@cornell.edu>; internet: <<http://www.cctec.cornell.edu/>>) for a license to propagate and distribute 'Valvin Muscat'. Virus-tested cuttings may be obtained from Foundation

Plant Services, University of California, One Shields Avenue, Davis, California 95616-8600 (phone: 530-752-3590; fax: 530-752-2132; email <fps@ucdavis.edu>; internet: <<http://fps.ucdavis.edu/>>).

LITERATURE CITED

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