

'Rubaiyat' and Oklahoma's Winegrape Legacy

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Abstract

In the late 1800s and early 1900s, Oklahoma had vast vineyards of table and wine grapes. The climate and soils of Oklahoma were, and continue to be, favorable for production of grapes. Reports on grape growing in Oklahoma date back to 1894. Several grape cultivars were released from Oklahoma State University in the 1960s and 1970s. Chief among these cultivars was 'Rubaiyat' which is still grown in Oklahoma and has the potential for a larger contribution as the wine industry expands. 'Rubaiyat' is a dark blue-black grape that ripens in mid-August and compares favorably to 'Chambourcin' in several properties. Perhaps the greatest potential for 'Rubaiyat' is as a teinturier since it has the attribute of red flesh.

Historical Grape Industry Perspective

Before statehood and in the years immediately following, Oklahoma had vast vineyards of table and wine grapes. The amount of grapes grown in 1907 and 1908 were estimated to be 1501 ha and 2195 ha, respectively (9). The climate and soils of Oklahoma are quite favorable for the production of grapes. Munson (8) found several native species in Oklahoma, including *Vitis aestivalis* Michx. (summer grape), *V. mustangensis* Buckley (mustang grape), *V. linccumii* Buckl. (post-oak grape), *V. riparia* Michx. (river bank grape) and *V. rupestris* Scheele (rock grape). *Vitis rupestris* is relatively rare, but in Oklahoma three populations have been established as *in situ* conservation sites (10). Munson (8) was especially enamored with the post-oak grape, of which he found many wild vines on the Oklahoma side of the Red River. He also claimed that *V. linccumii* would have more value and renown than the well-known cultivars 'Norton', 'Concord', and 'Herbemont' (8), although presently it is considered a variant of *V. aestivalis*. Even though Munson focused mainly on hybrid material for recommendations in Oklahoma, he also stated that

some *V. vinifera* L. could be grown as far north as southern Oklahoma (8).

The history of the Oklahoma wine industry is indisputably bound to prohibition laws. As early as 1893, such groups as the Anti-Saloon League and the Woman's Christian Temperance Union worked to enact local anti-alcohol laws. In 1917, a significant reduction in grape growing began with the introduction of the "Bone Dry Law" that banned all importation of alcoholic beverages into Oklahoma. It was overturned the following year to protect religious freedoms and the use of sacramental wines, but the 18th Amendment enacting prohibition soon followed in 1919 (7). The next thirteen years were a time of reduced grape-related activity that was succeeded by the dust bowl and depression era; yet, from the period of 1925-1928, Oklahoma still averaged a production of more than 1633 MT of grapes – more than any state in the South Central U.S. aside from Arkansas (11).

Oklahoma State University (then Oklahoma A&M College) initiated grape research again in 1933 with 75 American and other hybrid cultivars and supplemented it in 1950 with 43 French-American hybrids (4). These

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Acknowledgments: Thanks are expressed to Phil Stewart for tracing the lineage of 'Rubaiyat', Rinda Skaggs from the Oklahoma Grape Growers and Wine Makers Association (OGGWMA) for Oklahoma grape historical information, and Becky Carroll for literature searches pertaining to the Oklahoma State University grape program.

evaluations were essentially for the purpose of identifying locally appropriate juice and table grapes (2), because prohibition continued for Oklahoma until 1959. Interest in wine grapes increased in Oklahoma throughout the 1970s (7). In 1975, Herman Hinrichs, a horticulturist at Oklahoma State University (OSU), introduced several cultivars ('Bounty', 'Eureka', 'Meteor', 'Rubaiyat', 'Sunset', and 'Vinok'), which followed the release of 'Cimarron' (5). These cultivars were the culmination of the grape breeding efforts at OSU. The grape growing industry waned during the 1980s, but viticultural efforts have continued at OSU under various scientists (7).

Recent developments in Oklahoma have led to a burgeoning of the grape growing and wine making industries. These notable wine-grape efforts lead to new initiatives by OSU to address the renewed interest throughout the state. The winegrape industry in Oklahoma is primarily dependent upon *V. vinifera* cultivars, although some areas of the state have found hybrids and American cultivars more appropriate.

Past Grape Cultivar Recommendations for Oklahoma

In 1894, Oklahoma A&M College reported on cultivars of grapes that were suitable for Oklahoma growing conditions (12). The climate of Oklahoma poses many difficulties for cultivar selection. Cold and heat adaptation are essential considerations, as well as resistance or tolerance to diseases such as black rot, powdery mildew, and botrytis bunch rot. Soil conditions are also quite variable, with some areas within the state being sandy and others heavy clay. The soil pH can also range broadly from strongly acidic to alkaline. The judicious use of rootstocks can help to overcome some of these soil deficiencies; however, the wildly fluctuating winter temperatures also pose the threat of freeze injury past the graft union. Based on some of these criteria, several cultivars were described as

having considerable promise by Waugh (12). Among these were: 'Amanda', 'Barry', 'Black Pearl', 'Brilliant', 'Cambridge', 'Catawba', 'Champion', 'Clinton', 'Concord', 'Cottage', 'Cunningham', 'Cynthiana', 'Devereaux', 'Dr. Warder', 'Early Victor', 'Elvira', 'Etta', 'Faith', 'F.B. Hayes', 'Goethe', 'Hartford Profile', 'Herbemont', 'Herbert', 'Herman Jaeger', 'Iron Clad', 'Irving', 'Isabella', 'Israella', 'Janesville', 'Jaquez', 'Lutie', 'Mills', 'Lady Washington', 'Marion', 'Perkins', 'Umland', 'Wilder', 'Worden', and 'York Madeira'. A later publication detailed time of ripening, fruit color, and yield of 175 cultivars of grapes (3). Another 100 were also tested but found to have no merit for reporting. Another publication (13) recommended 'Bailey', 'Beacon', 'Campbell Early', 'Catawba', 'Delaware', 'Extra', 'Goethe', 'Lucile', 'Moore Early', 'Muench', 'Niagara', 'Ripley', and 'Seneca'.

Whitehead (14) made several recommendations for French hybrid grapes that had been tested in Oklahoma. All of the recommended cultivars were of Seyve-Villard (SV) or Seibel (S) origin. Suggested white grapes were SV 12-375 ('Villard Blanc'), SV 5276 ('Seyval Blanc'), S-9110, and S-2653. Recommended black grapes were SV 18-315, S-7055, SV 23-657, and S-5898. High praise was lavished on SV 12-375 ('Villard Blanc'), as Whitehead (14) stated that it was one of the greatest hybrid grapes ever developed.

At one time 'Concord' was the primary cultivar grown in Oklahoma, but uneven fruit ripening made it undesirable. When growers failed to replace 'Concord' with better cultivars, the grape acreage in Oklahoma declined rapidly (4). Herman Hinrichs began to make crosses in the 1950s and 1960s to develop table and wine grapes for the increasing interest in Oklahoma. He worked closely with the Oklahoma City Wine Club, who clandestinely produced wine from his selections as an "unofficial" way to evaluate quality under the state-imposed prohibition. Several promising

selections emerged from this work. Foremost among them was OK 308, which was released as 'Rubaiyat' (1).

Characteristics of 'Rubaiyat'

'Rubaiyat' was a cross between Seibel 5437 and 'Bailey' (Fig. 1). Seibel 5437 was a black grape that had characteristics of ripening fairly early to midseason, medium size cluster and berry, and medium débourement (budbreak). A heavy producer (although with a tendency to overbear) and cold hardy, Seibel 5437 also had good vigor and disease resistance. Seibel 5437 produced a good wine and would be appropriate as a teinturier. In Perkins, Okla. the average ripening date for Seibel 5437 was Aug. 20 and it had an average yield of 6.8 kg per vine (4).

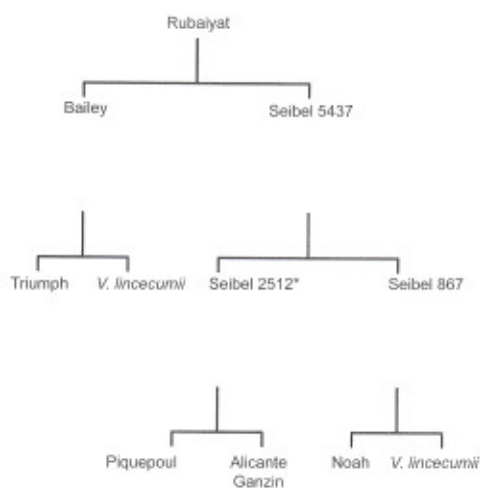


Figure 1. The lineage of 'Rubaiyat'. The exact parentage of Seibel 2512 is unknown, but assumed to be as stated in the figure above.

'Bailey' was a hybrid developed by T.V. Munson that was moderately to very vigorous and had medium to large, conical, shouldered, and compact clusters with medium to large black berries. The fruit of 'Bailey' also had

a slight bloom and ripened midseason. In Perkins, Okla. the average ripening date for 'Bailey' was Aug. 19 with an average yield of 5.9 kg per vine (4).

The overall genetic constitution of 'Rubaiyat' (based on disomic inheritance) is 37.5% *V. linccumii*, 31.25% *V. vinifera*, 18.75% *V. labrusca* L., 6.25% *V. rupestris*, and 6.25% *V. riparia*. Among the important progenitors in its background are 'Muscat of Alexandria', 'Concord', and 'Alicante Bouschet'. The original cross was made in 1952. The seed was germinated in 1953, grown in a nursery for two years and placed into the field at the Pecan and Fruit Experiment Station, Perkins, Okla. in 1955. The first fruit was observed in 1957. In 1959, clonal propagules were made to create four additional vines. A replicated study was established in 1967.

'Rubaiyat' is a dark blue-black grape that ripens in mid-August. The berries are medium-sized and round. The clusters are medium in size with a long shoulder. The shank is short to medium in length. The vine has medium vigor and good to very good resistance to black rot and other diseases (M. Knotts, OGGWMA, personal communication). The juice is very dark red with about 19% sugars and tartaric acid levels of 0.63%, and quality is best when clusters are left to hang for sugar accumulation (D. Pool, Cimarron Cellars, personal communication). It is self-fruitful having erect stamens. The wine is fruity and has good balance. A slightly "foxy" flavor from the *V. labrusca* is sometimes evident in wine made from 'Rubaiyat' (M. Knotts, OGGWMA, personal communication). When rated by a taste panel before release it averaged 2.6 out of 5, where 1=excellent and 5=poor. At Perkins the harvest date ranged from Aug. 5 to Aug. 22 in the years from 1964 to 1974, averaging Aug. 15. The yield ranged from 2.0 to 18.4 kg per vine (unpublished data).

Currently, other hybrid grape cultivars such as 'Chambourcin' are more popular for use as red wine varieties than 'Rubaiyat'.

However, in observational plots established at the Pecan and Fruit Experiment Station near Perkins, Okla., 'Rubaiyat' compares favorably to 'Chambourcin' for yield, berry weight, brix levels (Table 1), as well as visual observations of cold tolerance. 'Rubaiyat' may exceed yields of 'Chambourcin', at least as observed in central Oklahoma. Both cultivars ripen within a few days of each other, though 'Chambourcin' breaks bud roughly one week earlier than 'Rubaiyat'. 'Chambourcin' generally has larger cluster size, lower pH, and higher titratable acidity than 'Rubaiyat'.

The Future of 'Rubaiyat' and the Oklahoma Wine Industry

As recently as 1997, only 68 ha of grapes were grown in the entire state of Oklahoma; however, that number grew to 151 ha in 2002 and 212 ha in 2005 (9). The number of licensed wineries has increased from 4 in 2001 to 18 in 2003 and 31 in 2005 (9). With this increase in grape growing and wine making

comes the necessity to evaluate commercially appropriate cultivars. While much of the growing industry is supported by *V. vinifera* cultivars, especially 'Cabernet Sauvignon', 'Merlot', 'Shiraz', and 'Zinfandel', there remains opportunity for high quality hybrids. Hybrids can offer better cold tolerance and disease resistance than *V. vinifera* cultivars, which is important in the continental climate of Oklahoma where winter temperatures can fluctuate significantly and humidity in the summer can be conducive to high disease pressure situations.

Based on results at the Perkins Experiment Station, many *V. vinifera* cultivars must hang on the vine to accumulate sugar. In the process, titratable acidity drops and pH goes up such that it could be problematic in wine-making. The same is true of 'Rubaiyat' (G. Main, University of Arkansas, personal communication); however, blending with higher acid hybrids at the start of fermentation to perhaps remedy this problem could alleviate

Table 1. A comparison of recent observations of performance data for 'Rubaiyat' and 'Chambourcin' at the Perkins Experiment Station in Perkins, Okla. from 2003 to 2005.

Year	Budbreak date	Harvest date	Yield (kg/ha)	Berry wt. (g)	Cluster wt. (g)	pH	TA [†] (%)	Brix (°)
Rubaiyat [‡]								
2003 [*]	April 16	Aug. 21	1,408	20.6	126.0	4.4	0.50	22.15
2004	April 17	Aug. 31	10,655	19.2	104.7	4.2	0.48	20.05
2005	April 10	Aug. 22	9,830	18.0	82.8	3.8	0.42	19.00
Chambourcin [¶]								
2003 [*]	April 12	Aug. 19	1,928	20.4	117.8	3.9	0.71	25.50
2004	April 5	Aug. 20	786 [‡]	23.7	139.2	3.7	0.59	21.60
2005	April 6	Aug. 27	6,976	22.7	173.1	3.9	0.53	20.70

^{*}Values are based on an average of three plants on a high cordon trellis.

[†]Titratable acidity.

[‡]Initial year of harvest.

[¶]Values are based on an average of five plants with vertical shoot positioning (VSP).

[‡]Deer feeding caused low yields for this year.

the need for other additives (e.g. tartaric acid, citric acid, DL-malic acid). This type of timely blending could potentially boost the market for hybrid grapes within Oklahoma as well as regionally, and help familiarize the wine buying public with hybrid cultivars if the blends were appropriately labeled.

Herman Hinrichs believed that 'Rubaiyat' would make a high class table wine and should have national prominence when it was introduced in 1975. It was very productive and had a grower demand at the time of release. He also stated that aside from good wine it made an excellent jelly. Perhaps the greatest potential for 'Rubaiyat' is as a teinturier since it has the attribute of red flesh derived from its progenitor 'Alicante Bouschet', a parent of 'Alicante Ganzin' (Fig. 1). Wine grapes produced in high heat regions generally have poorer color than those grown in cooler regions (6), thus blending with a strongly colored grape such as 'Rubaiyat' can offset that deficiency. Currently, 'Rubaiyat' is not widely grown, but potential exists for it to become an important cultivar for Oklahoma and surrounding states.

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