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Report of the 2006 Oklahoma Grape Growers Survey

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Thanks are expressed to Becky Carroll, John Coleman, and to the Oklahoma Grape Growers' and Wine Makers' Association.

Introduction

In early 2006, a survey was developed to help ascertain the present state of the grape growing industry in Oklahoma. The primary motivation was to establish a baseline of information from which to establish an extension, research, and educational program at Oklahoma State University. This information would also be shared with the Oklahoma Grape Growers' and Wine Makers' Association, as well as OSU cooperative extension county educators in all 77 Oklahoma counties. The results would aid county educators in recognizing the importance of viticulture in their counties and guide them to initiate programs for grape growers.

Methods

The survey consisted of 33 questions: 2 preliminary, 3 introductory, 6 cultivar information, 13 yield and use, 8 general, and 1 optional comment. Distribution of the survey was conducted through the OGGWMA and OSU cooperative extension service in an electronic format to reduce costs associated with postage and copying. These electronic formats included on-line and email in a Microsoft Word document and Adobe Acrobat pdf.

Results and Discussion

Seventy-five surveys were returned through the OGGWMA (including those returned directly to Dr. Stafne) and 15 from OSU county educators, for a total of 90 surveys. Because values such as acreage and number of vines were not always included in the answers provided by respondents, some assumptions were made; a spacing of 8 feet within row by 10 feet between rows was assumed, equating to 545 vines per acre. Sometimes, vines per acre and acreage reported did not correspond; however, whatever the grower reported was included in the tabulations. Therefore, there may be numbers that do not remain the same for each table. These results should be considered approximations. Also, many growers did not answer all questions, hence totals result from differing numbers of responses.

Viticulture

The total acreage reported was between 232 and 242 acres (Table 1), of which about 112 acres are in the bearing stage. Red grapes are preferred by growers with nearly 60% of the total acreage. The total number of vines reported in Oklahoma is between 142,000 and 148,000. As for breakdown of the grapes being grown by species, *Vitis vinifera* dominates with nearly 80%. Hybrid grapes account for less than 15%, American species grapes around 7%, and Muscadine grapes make up less than 1% of the total. Thirty-four counties were represented in the survey, encompassing 86 vineyards (Table 2). Nearly 50% of all acres reported are in the bearing stage. Lincoln County had the largest acreage, followed by Pottawatomie, McClain, Washita, Okfuskee, Oklahoma, and Kiowa counties. The majority of the grapes grown are for use in wine, but grapes for fresh market, juice, and jelly are also being grown. Growers are using three main types of trellis systems: vertical shoot positioning (VSP), high cordon, and Geneva double curtain (GDC). Other trellis systems, such as the 4-arm Kniffen are also employed, but to a

lesser scale.

Of the *V. vinifera* (European) grapes grown in Oklahoma, 'Cabernet Sauvignon' constitutes the most acres (Table 3). 'Cabernet Sauvignon' is considered to be a fairly cold tolerant European grape that is relatively easy to grow. It is also one of the most widely grown grapes in the world, hence there is no surprise that it is grown by many grape growers in Oklahoma. Second behind 'Cabernet Sauvignon' is 'Merlot' followed by 'Shiraz' ('Syrah'). Both of these grapes make excellent red wines and are widely grown in grape growing areas throughout the world. However, neither of them are particularly cold hardy, thus they may be predisposed to cold mid-winter temperatures as well as fluctuating fall, winter, and spring temperatures. These two varieties are probably grown in Oklahoma more out of name recognition rather than appropriateness for the climate. 'Merlot' and 'Shiraz' are followed by 'Riesling'. 'Riesling' is one of the most cold hardy European grapes. It may have some difficulties with the sometimes oppressive summer heat in Oklahoma, but overall has been observed to have little to no winter injury when compared to other European grapes. 'Muscat Blanc' and 'Chardonnay' rank after 'Riesling'. 'Chardonnay' is somewhat cold hardy, but breaks bud early in the spring predisposing it to frost that can destroy succulent, green tissue. 'Zinfandel' is also in the top 10 grapes grown in Oklahoma, but often has difficulty accumulating sugars due to high water demand because of the large cluster size, high night temperatures that do not allow for a Arest period@, and overcropping of vines. It is also susceptible to winter injury.

The two hybrids in the top 10 are 'Chambourcin' and 'Chardonel'. Both of these are better options for certain parts of Oklahoma that get considerable cold periods during the winter. 'Chambourcin' is a red wine grape that is grown in surrounding states and does quite well in Oklahoma. 'Chardonel' is a white wine release from Cornell University that has 'Chardonnay' as a parent. It is more cold tolerant than 'Chardonnay' and produces a high quality wine. Both of these varieties have drawbacks as well, such as mildew problems on 'Chardonel'.

The only strictly American grape to make the list is 'Cynthiana' ('Norton'). This grape has been cultivated for over 100 years and has become the primary grape of the Missouri wine industry. It has small clusters, but can be somewhat prolific in the right conditions. Wine quality from this grape can range from excellent to poor and does require a knowledgeable wine maker to produce the best results. This grape cannot be sprayed with sulphur products because of toxicity issues.

Many different grape varieties are grown in Oklahoma. By county, the varieties most widely grown in order of number of counties in which they were reported are 'Cabernet Sauvignon', 'Merlot', 'Chardonnay', 'Riesling', 'Shiraz', 'Muscat Blanc', 'Cabernet Franc', 'Cynthiana', and 'Zinfandel' (Table 4). Several other varieties aside from those in table 4 are also grown, but on a small scale. *Vitis vinifera* varieties dominate this list, with only 'Cynthiana' as the lone American grape.

The acreage of grapes in Oklahoma has increased greatly since 2000 (Table 5). In the early to late 1990's little grapes were being grown. Acreage started to rise in 1999 when nearly 8 acres were planted. By 2001 almost 20 acres were planted. That number continued to rise throughout

the 2000s. The years 2005 and 2006 have had the most acres planted with over 85 acres in those two years combined. In 2000, OSU initiated a Grape Management Short Course and it has been offered continuously every year since. Whether grape acreage is tied to this educational offering is unknown.

Few growers indicated that they would be removing vines in 2007. Nearly 86% of respondents reported that they would not remove vines, whereas 12.5% said they would remove vines. The main reason for removal of vines was cold damage. Many growers planned to add vines in 2007; however, some of those were replacing dead vines. The majority of growers who were adding vines in 2007 were planting *V. vinifera* grapes. Of the new grapes to be planted, 62.5% will be *V. vinifera* grapes, followed by 22.5% hybrids, and 15% American types. There were some troubling choices for variety selections indicated by some respondents. For example, one grower indicated adding 'Merlot' and 'Roussanne' in Osage County. Both of these varieties are not cold hardy and chances for long-term survival in northern Oklahoma are poor. Another grower in Roger Mills County is adding 'Sauvignon Blanc' and 'Semillon', whereas another is adding 'Pinot Noir' in Tulsa County. The reason for each choice was not disclosed, but choosing the correct variety for the appropriate site is paramount in the pursuit of sustainable, long-term success.

Wineries

There are more than 40 wineries in Oklahoma; however only 16 responded to the survey (Table 6). Two more respondents were in the process of establishing a winery. The majority did not have a winery and were just growing the grapes. Most growers plan to sell their grapes to a winery at some point in the future, if they do not already do so. These grape growers may have future plans for a winery, no plans for a winery, or are uncertain of their future plans. Of the established wineries that responded, most were started since 2004. Of the growers without a current winery, 10 plan to open a winery in 2007 or 2008. These numbers confirm continued strong growth of the industry in the near future.

Prices paid for grapes were similar whether one had a contract with a winery or not, based on the few responses that were given. Those growers with a contract received an average of \$1100 per ton. The growers who had no contract were paid an average of \$1000 per ton. However, this average included American grapes that had low prices per ton (\$300-\$400 per ton). If the American grapes were excluded and only *V. vinifera* and hybrid grapes were used to calculate the average, then the price per ton rose to \$1300. From this very small sample, it appears that growers who do not have a contract get slightly better prices for their grapes. One grower reported up to \$1600 per ton for 'Cabernet Sauvignon'. The yields reported on a tons per acre basis ranged from 0.5 tons to 5 tons per acre, with an average of 2.4 tons per acre. Specific variety results varied. 'Chardonnay' yielded an average of about 2.7 tons per acre, 'Merlot' had 2.6 tons per acre, and 'Cabernet Sauvignon' had 2.3 tons per acre.

Insect, Disease, and Abiotic Pests

Numerous insect problems were reported by respondents; however the greatest number of mentions were given to green June beetle, grasshoppers, caterpillars and worms, and Japanese beetle (Table 7). Many varieties are affected by these insects. Green June beetle is the most problematic insect that growers in Oklahoma encounter. These beetles feed on the grapes just before harvest and can cause catastrophic damage if not controlled. The main problem in controlling this insect is having an insecticide with a pre-harvest interval (PHI) of short duration. Japanese beetles were also reported although they are not known to be widespread throughout Oklahoma. They are usually an urban area insect that is transported to new areas as grubs in sod or ornamental potted plants. Although they are known to exist in areas around Tulsa, Oklahoma City, and Ponca City it is possible that misidentification of these beetles is leading to more reporting of them than actually exists. They can be pests, but mainly are foliar feeders, thus disrupting photosynthetic activity in the grape vine which can lead to delayed harvest and a decrease in cold hardiness.

Even though insects are a serious problem in Oklahoma, they do not approach the potential damage of grape diseases. The most serious disease encountered in Oklahoma is black rot (Table 8). Black rot is a serious disease and must be prevented to ensure having healthy vines and fruit. It does require humidity to proliferate, so eastern parts of Oklahoma will have more serious problems than western sections of the state, but all areas are susceptible. All varieties are susceptible as well, although that can vary. Some varieties carry genetic resistance to the disease, but most of those are American and hybrid varieties. All European grapes are highly susceptible. Other reported diseases are crown gall, mildew (downy and powdery), bunch rot, and phomopsis. Of these crown gall is most prevalent. It is either brought in through infected plants or is endemic in the soil. The bacteria that cause crown gall can be latent within the plant until some damage is done to disrupt the tissue, such as mechanical damage done by weeding equipment, pruning shears, or environmental damage like winter injury. Crown gall will not immediately kill vines, but decrease productivity over time in most cases. Infected vines should be removed so that other vines will not be infected. However, if the infection is widespread within the vineyard vines can continue to be cropped until they are no longer profitable.

Several abiotic problems were reported (Table 9). The most cited problem was winter injury on *V. vinifera* grapes (namely, 'Cabernet Sauvignon', 'Shiraz', 'Merlot', 'Cabernet Franc', and 'Muscat'). These results show that *V. vinifera* grapes are being grown in areas that they may not be best adapted. Injury from phenoxy herbicides like 2,4-D were also reported. Grapes are highly sensitive to phenoxy herbicides. Damage can range from minor to severe. Slight damage may not affect the final crop, but more serious damage can affect vine growth for years or even be a factor in vine death. Many other abiotic problems were mentioned including bird, deer, and raccoon damage. Environmental factors like drought and spring frosts were also mentioned. Some of the problems resulted from poor management (cattle damage, lack of irrigation water, poor nutrition, and overproduced vines).

OSU-specific

Sixty-four percent of the respondents said they had attended the OSU Grape Management Short

Course, while 36% had not. This appears to imply that the OSU short course has had a positive impact on the industry and educated many of the growers who responded to the survey. While encouraging these numbers are not high enough. People who venture into grape growing without specific knowledge of Oklahoma conditions may not be well-equipped to deal with problems that arise.

OSU county educators from 12 counties (Canadian, Carter, Choctaw, Grant, Hughes, LeFlore, Lincoln, McCurtain, Murray, Okfuskee, Payne, and Seminole) submitted information about grape growers in their counties. That leaves 65 counties where the OSU county educators did not reply to the survey. Reasons for this could be numerous, but are mainly unknown. Most of the acreage was very small-scale and totaled 13.75 acres.

Other Comments

A section for comments was left at the end of the survey. Some of the comments were consolidated because they overlapped with other comments. In the end, nine common comments were reported over all the survey respondents. Each of these comments deserves specific answers or responses:

1. I liked the annual meeting with great speakers there.

Response: This comment indicates that many growers are happy with the content and delivery of the annual conference held each year in January. Continuation and improvement of the annual conference should be viewed as essential for future years.

2. OSU needs a field representative to visit locations and make suggestions. The extension service is of no help and they do not know anything about grapes.

Response: This is an unclear definition of a field representative. Dr. Stafne is available to visit locations statewide and can make suggestions. He may also be contacted by phone or email. Grower site visits are an integral part of his position; however, initial contact must be made by the grower or through a county educator. Unfortunately, limited travel funds may not allow for multiple visits each year. This can be alleviated by the willingness of growers to support travel by Dr. Stafne. Historically, Oklahoma has been a state dominated by row crops and animals and therefore most of the county educators must dedicate their time and energy to these efforts. There are very few county educators in Oklahoma that have specific training in horticulture and even fewer with training in fruit crops. Dr. Stafne will provide in-service training in the area of viticulture to interested county educators. He also offers tips on grape growing in newsletters and is available for consultation.

3. Please offer advanced courses.

Response: OSU is committed to expanding their viticulture and enology education offerings. The first step in this commitment is the new Viticulture Education Program that also involves

partners OSU-OKC and TCC. Through this program, new, advanced viticulture and enology courses are already in the process of being developed for individuals who have previously completed the OSU Grape Management Short Course.

4. Please offer weekend courses, because it is difficult to take off work.

Response: The desire to have weekend courses offered is well understood. In the future it is likely that some workshops may be offered on weekends; however the OSU short course will probably not. Dr. Stafne currently works 5 days per week, but often has weekend, night, and overnight commitments. Therefore, he has deemed it necessary to protect time to spend with his family.

5. There needs to be tailgate meetings. There is no organization in the industry. There is no newsletter from the university. The classes offered by OSU are too expensive, inconvenient, and money-making. Tax dollars are not helping the industry.

Response: Tailgate meetings are a fine idea and can be done by anyone with an interest, willingness, and expertise. Dr. Stafne is open to the idea of organizing and participating in these activities in the future. Organization in the industry must be established by members of the respective organizations. As much as OSU and Dr. Stafne would like to aid in this endeavor, this must be worked out among the membership. A newsletter from OSU is now being published quarterly. It is entitled ALe Vigneron@ and can be access from the OSU horticulture department website, the OGGWMA website, or by contacting Dr. Stafne. The price that is charged for the OSU short course is reasonable for the amount of information that is offered. Each participant has the opportunity to interact with experts in various fields. They also receive a binder with great amounts of information on grape growing as well as food and drinks at each session. Unfortunately, the timing of the class may be inconvenient to some potential grape growers; however, the level of commitment may be measured by the level of sacrifice one is willing to make. The OSU short course generates enough money to be self-sustaining, allowing OSU to offer the course each year. Any money beyond the minimum is used to make improvements in the course through vineyard upkeep and enhancement of educator knowledge. It is unclear as to the comments concerning tax dollars not helping the industry. If this is directed at OSU, it is clear that OSU has a commitment to helping the grape growers of Oklahoma through the offerings of the OSU short course, the new Viticulture Education Program, the research vineyard at Perkins, and in-state visits by Dr. Stafne.

6. The OSU course was interesting and helpful, but lacked hands-on experience. Classes at Redlands CC are exactly what we need. The OSU course should incorporate labs like OSU science classes.

Response: The OSU course lacks hands-on training mainly due to its popularity. It is not feasible to allow 70 participants hands-on opportunities at every class. Every attempt will be made to enhance hands-on participation in future classes. The classes at Redlands CC may offer another option for grape growers to learn as much as possible, and that can be viewed as a positive. The OSU course is not equipped to incorporate labs like OSU science classes. Many

of the campus courses have labs associated with them, but they are also small in class size and also have lab fees. Thus, the size of the OSU course would need to be limited further and costs would increase.

7. The broad topics covered in the OSU short course need more depth on individual topics. Also, online courses would be helpful.

Response: The advanced courses currently being developed will help to add more depth to the broad topics covered in the OSU short course. Unfortunately, a wide range of knowledge bases are represented in the participants of each short course. Ultimately, the course must cover the basics of grape growing. Online courses are offered by other avenues, but OSU is interested in providing the most convenient and best education opportunities for Oklahoma grape growers. Future plans may involve development of an online grape course similar to that of the online pecan management course offered by OSU or online courses similar to those offered by other universities.

8. Work needs to be done to get some laws changed in Oklahoma.

Response: This is being aggressively confronted by the OGGWMA. OSU participates in an educational context rather than political.

9. More focus needs to be done on disease and insect pests and their management.

Response: Disease and insect problems are probably the most daunting for grape growers. Dr. Mulder provides the insect pest management strategies in the OSU short course and is also available for consultation. In early 2006, Dr. von Broembsen retired leaving a hole in the plant pathology area for grape growers. Dr. Stafne has attempted to fill that gap the best he could. Currently, that position is being interviewed for and a replacement is expected sometime in 2007. Dr. Mulder and Dr. Stafne have also applied for a grant to enhance the insect and disease education within the OSU short course. The grant would provide for a microscope with digital projection capabilities, permanent collections of common insects and diseases, as well as a new publication for identification of the most common insect, disease, and abiotic pest in Oklahoma.

Conclusions

In total 90 surveys were returned. This number is somewhat disappointing considering the time and effort expended to develop and advertise the survey. Only 16 of the more than 40 wineries participated in the survey. The question of why so few wineries answered the survey questions needs to be addressed. As in any survey, the expectation is less-than-desired participation. There seems to be a general lack of willingness to share information or a lack of understanding as to its importance based on the total number of surveys returned, as well as the number of questions that were not answered by respondents. Another survey may be warranted at a later date.

The acreage reported in the survey is approximately 240 acres. If one were to extrapolate total acreage based on the percentage of wineries that responded (~40%), the total acreage may approach 600 acres statewide; however, that is speculation and in no way constitutes a true estimate. As expected, *Vitis vinifera* varieties are the most widely grown in Oklahoma because of the burgeoning wine industry. Observation and research has shown some vinifera varieties to be highly susceptible to cold damage. More research needs to be conducted to elicit where vinifera varieties do best in Oklahoma. French H American hybrids are good alternatives due to their better cold tolerance, but have not been embraced by Oklahoma grape growers outside of the northeast part of the state. Reasons for this bias likely include hybrid varieties being perceived as lower quality than vinifera varieties, ignorance of available hybrid varieties, personal preference, and misinformation.

Grape acreage has increased most years since 1998. As of now, there appears to be no ceiling for grapes in Oklahoma. The industry is vibrant and public interest is high. The main obstacles for development of a sizable and sustainable industry are unfavorable liquor laws, environment (particularly cold damage), and education. Oklahoma State University is making every effort to work toward solving the cold damage and education limitations.

Pest problems that grape growers face are numerous. Insect pests are usually troublesome rather than catastrophic in most cases. Green June beetle is perennially the most damaging. Diseases are more important as related to harvest potential. Black rot is widespread throughout Oklahoma and prevention with fungicides and/or genetic resistance are the only methods to control it. Other diseases like crown gall, downy and powdery mildew, and bunch rot are also serious for grape growers. Growers should look for assurance of crown gall-free plant material before receiving shipments from nurseries. Abiotic problems like environment, herbicide drift, and animal pests vary in their importance depending on location. Harsh environmental factors were often mentioned in the survey, including frosts, freezes, and drought. As more grapes are grown in Oklahoma depredation will likely increase, especially from birds. In the future, some growers may need to net their vineyards to ensure harvestable fruit. The sensitive crop viewer that vineyard owners can register for with the Oklahoma Department of Agriculture, Food, and Forestry is a good initial step to curb potential herbicide drift; however, grape growers must also be vigilant in educating neighbors of the potential ramifications of phenoxy (and other) herbicide drift on grapes.

Twelve OSU county educators responded to calls for distribution of surveys. In total the survey revealed 33 counties in Oklahoma where grapes are grown; therefore, a disconnect is apparent between grape growers and county educators. Many county educators have no background in viticulture and grape growers may dismiss them due to this lack of knowledge. Grape growers and county educators need to work together to bridge the gap and forge ahead as partners for the good of the industry. Dr. Stafne will provide all interested county educators with in-service training on grapes, as well as other educational materials to foster improvement in this area.

Overall, the survey was successful in identifying what varieties are being grown, what problems growers are encountering, and the future direction for educational programs. The survey fell

short in gaining a comprehensive report of the industry in terms of acreage and value. More education needs to be done to inform potential survey takers that information collected will be important to the future of the industry and that all information collected is anonymous and confidential.

Table 1. Approximate acreage, percentage, and number of vines breakdown of winegrape types in Oklahoma.

Grape Color			
Color	Acres	%	# of vines
Red	137.5	59.2	85,101
White	94.8	40.8	57,201
Grape Types			
American	17.7	7.3	9,661
Hybrid	34.5	14.3	19,793
Vinifera	188.8	78.0	117,971
Muscadine	1	0.4	242

Table 2. Breakdown by county by approximate total acres of grapes, bearing acres of grapes, percent bearing acres grown, and number of vineyards of growers who responded to the 2006 grape growers survey.

County	Total acres	Bearing acres	% bearing	Vineyards reporting
Beckham	4	1	25	1
Creek	3.1	1	32	2
Caddo	3	2	67	1
Canadian	9.3	5.6	60	2
Cleveland	6.1	3.7	61	4
Comanche	2.5	0	0	2
Craig	6.6	4.1	62	2
Custer	5	0	0	1
Delaware	5	0	0	1
Greer	2	0	0	1
Hughes	2.5	0.5	20	2
Kiowa	10.5	5	48	1
Lincoln	42.5	17	40	15
Logan	7	4	57	3
Major	5.5	4.8	87	2
Mayes	3	1	33	2
McClain	14.6	7	48	3
McIntosh	5	1	20	1
Murray	6	2	33	1
Okfuskee	11.3	9	80	3
Oklahoma	11.3	7	62	6
Osage	8.1	0.5	6	6
Payne	8.6	7	81	2
Pittsburg	5.5	0	0	1
Pottawatomie	16.1	2.2	14	7
Roger Mills	3.5	3.5	100	1
Rogers	1.5	1.5	100	1
Seminole	3.5	2	57	3
Sequoyah	2	2	100	1
Stephens	5	0	0	2
Tillman	2	1	50	1
Tulsa	0.9	0.3	33	1
Wagoner	5.8	5.3	91	2
Washita	12.8	10.8	84	3
Total	241.1	113.8	47	86

Table 3. Top 10 grape varieties grown in Oklahoma as reported in 2006 survey.

Variety	Acres	# of vines	Color	Type
Cabernet Sauvignon	32.4	20,524	red	Vinifera
Merlot	22.4	14,180	red	Vinifera
Shiraz	21.6	13,653	red	Vinifera
Riesling	17.9	10,458	white	Vinifera
Muscat Blanc	15.2	9,153	white	Vinifera
Chardonnay	12.6	7,243	white	Vinifera
Cynthiana	11.0	5,630	red	American
Chambourcin	8.2	4,513	red	Hybrid
Zinfandel	7.9	4,534	red	Vinifera
Chardonel	7.7	4,510	white	Hybrid

Table 4. Breakdown of major varieties grown in Oklahoma by approximate acreage, number of vine, number of counties represented, and type of grape.

Variety	Acres	# of vines	# of counties	Type
Baco Noir	0.3	247	2	FxA Hybrid
Cabernet Franc	6.1	4,144	11	Vinifera
Cabernet Sauvignon	32.4	20,524	19	Vinifera
Catawba	0.4	254	2	American
Cayuga	0.8	488	3	Hybrid
Chambourcin	8.2	4,513	8	FxA Hybrid
Chardonel	7.7	4,510	9	Hybrid
Chardonnay	12.6	7,243	15	Vinifera
Chenin Blanc	1.4	708	3	Vinifera
Concord	1	575	3	American
Cynthiana	11	5630	11	American
Fredonia	0.5	349	2	American
French Colombard	1.4	807	4	Vinifera
Gewurztraminer	3.1	2324	4	Vinifera
Grenache	1.2	813	2	Vinifera
Malbec	0.3	150	2	Vinifera
Marechal Foch	3	1627	3	FxA Hybrid
Mars	0.9	592	2	Hybrid
Marsanne	0.6	360	2	Vinifera
Merlot	22.4	14,180	17	Vinifera
Mourvedre	0.6	410	2	Vinifera
Muscat Blanc	15.2	9,153	12	Vinifera
Niagara	2.6	1,628	5	American
Orange Muscat	3.2	2,376	5	Vinifera
Petite Sirah	0.3	178	3	Vinifera
Pinot Gris	3.2	2,072	5	Vinifera
Reliance	0.5	380	3	Hybrid
Riesling	17.9	10,458	15	Vinifera
Roussanne	0.4	278	2	Vinifera
Ruby Cabernet	1.3	659	2	Vinifera
Sangiovese	1.2	750	4	Vinifera
Sauvignon Blanc	5.6	3,755	9	Vinifera
Seyval Blanc	1.6	915	4	FxA Hybrid
Shiraz	21.6	13,653	13	Vinifera
St. Vincent	0.5	310	2	Hybrid
Sunbelt	0.5	277	2	Hybrid
Tempranillo	3.7	2,500	3	Vinifera
Traminette	3	1,725	4	Hybrid
Vignoles	3	1,706	6	FxA Hybrid
Viognier	6.4	3,724	6	Vinifera
Zinfandel	8	4,534	11	Vinifera

Table 5. Approximate acres of grapes planted by year in Oklahoma.

Year	Acres
1992	0.3
1993	0.3
1994	0.3
1995	5.3
1996	0.7
1997	2.7
1998	1.7
1999	7.7
2000	9.7
2001	18.6
2002	34.8
2003	26.8
2004	25.7
2005	42.7
2006	43.0

Table 6. Wineries in Oklahoma and years established.

Current Respondents with Winery	16
Current Respondents without	48
Current Respondents in process	2
Years in which Winery established:	
1999	1
2000	1
2002	1
2004	5
2005	4
2006	3
Current Respondents with future plans for winery	
Current Respondents without plans for winery	17
Current Respondents uncertain plans	21
Current Respondents uncertain plans	6
Years in which possible Winery may open:	
2007	5
2008	5
2009	1
2011	1
Uncertain	3

Table 7. Most reported insect problems by Oklahoma grape growers.

Insect	Affected varieties
Green June beetle	Muscat, Vignoles, Zinfandel
Grasshoppers	Syrah, Cabernet Franc
Caterpillars and worms	Chardonnay, Cynthiana, Cabernet Sauvignon, Zinfandel
Japanese beetle	Seyval Blanc
Others:	
-Borers	
-Grape berry moth	Muscat, Vignoles
-Leaf hoppers	
-Leaf phylloxera	Cynthiana
-Leaf rollers	Tempranillo
-Ants	
-Aphids	
-Flea beetles	
-Rose chafer	
-Spider mites	
-Spiders	
-Thrips	

Table 8. Most reported disease problems by Oklahoma grape growers.

Disease	Affected varieties
Black rot	All
Crown gall	Muscat, Vignoles, Shiraz, Zinfandel
Powdery and Downy mildew	
Bunch rot	
Phomopsis	
Others:	
-Anthrachnose	Chardonel
-Eutypa	
-Leaf spot	Chardonel

Table 9. Most reported abiotic problems by Oklahoma grape growers.

Problem	Affected varieties
Winter injury	Cabernet Sauvignon, Shiraz, Merlot, Cabernet Franc, Muscat
2,4-D injury	Shiraz
Birds	
Deer	
Drought	
Spring freeze	Chardonnay
Raccoons	
Others:	
-Cattle	
-Fall freeze	
-Excessive growth	Shiraz, Riesling
-Excessive heat	
-Hail	Niagara
-Irrigation water	
-Leaf discoloration	
-No support from OSU	
-Nutrition	
-Overproduced vines	Roussanne, Marsanne
-Premature leaf drop	
-Timber	