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Trends and Economics of Washington State Organic Grape Production

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Summary

Washington State currently ranks 1st in U.S. organic juice grape production, and 2nd in organic wine grape production. Recent data on acreage, production, and value are presented here to assist growers and other industry personnel in making informed business decisions. State organic grape acreage increased 25% from 2,037 acres in 2005 to 2,600 acres in 2011, but declined to less than 2,200 acres by 2015. Organic wine grape acreage grew at a faster pace than juice grape acreage: in 2005 wine and juice grapes made up 13% and 87% of total organic grape acreage, respectively, whereas by 2015 wine grapes accounted for 40%, and juice grapes 59%. Table grapes make up around 1% of total Washington organic grape acreage. A select data set was compiled to summarize organic grape sales and production values for 2009 through 2012. WSDA-certified organic producers reported a gross farmgate value for organic grapes of \$5.86 million for the 2012 sales year, however, this value is less than the actual farmgate value due to incomplete data. Market average yields of organic juice grapes were equal to or greater than average yields reported by USDA-National Agricultural Statistics Service (NASS) for all Washington juice grapes. Market average organic wine grape yields ran 20% less than NASS yield values. Organic prices for both juice and wine grapes ranged 10-15% higher than NASS prices. Cost-of-Production Calculator values showed 10% and 22% greater total costs for organic juice grapes and organic wine grapes, respectively, compared to conventional.

Introduction

Washington State is a leading producer of organic foods, including a range of fruits such as apples, cherries, blueberries, and juice and wine grapes. Organic food sales, both fresh and processed, continue to increase, creating opportunities for producers. For example, the Organic Trade Association's 2015 Industry Survey (OTA 2015) reported a 14.8% annual growth in U.S. retail sales of organic canned and bottled juice and 13.9% growth of wine during 2014. An undefined share of organic grapes is also used to produce "wine made with organic grapes". Such wines, typically containing sulfites, cannot be labeled or sold as "organic". As retail sales continue to experience strong growth, supply of organic products remains tight.

This publication summarizes recent Washington organic grape **acreage** (2005-2015), and **production** and **value**, and provides baseline analyses of organic **yield**, **price**, and **gross revenue per acre** (2009-2012). The report is part of the Trends in Washington Organic Crop Production Series. The data supplement information provided by industry and are intended to assist supply forecasts and support producer decisions regarding entry into or expansion of organic production. This is especially important for crops like juice grapes, where Washington production represents a significant portion of the national organic supply. Price and yield data are limited and difficult to find. This report is intended to increase the publicly available information on organic grape production.

Methods and Data Description

Organic grape results reported here were derived from data provided by the Washington State Department of Agriculture (WSDA) Organic Food Program, which includes approximately 95% of National Organic Program (NOP)-certified Washington producers. The organic data include eleven years of farm site acreage values (2005-2015) that are not segregated by bearing status. A specific data set was compiled to summarize four years (2009-2012) of production values and gross crop sales

(farmgate, not including value added) as reported by producers, and then compared to similar USDA-National Agricultural Statistics Service (NASS) data for all grapes in the state. Sales year value includes gross income reported within a calendar year; crop year value includes total value for a crop produced in a designated year, including sales occurring over multiple calendar years. Wine and juice grapes are segregated, and some data have also been segregated by geography within the state, with “West” meaning west of the Cascade Range, and “East” meaning east of the mountains.

Aggregate and market average values were calculated similar to NASS methods. The aggregate value represents the statewide total for a given parameter in a given year (e.g., total production, in tons, of juice grapes in 2011). The market average is calculated by dividing one aggregate value by another (e.g., market average yield is total production divided by total acres). Market average values are “self-weighted” in that larger farms have a greater influence on the calculated average, and this value will be more relevant to larger farms. The “unweighted” grower average is calculated by developing a value for each farm (e.g., farm production divided by farm acreage equals farm yield) and then averaging across farms.

To protect producer confidentiality, all observations were anonymous and values were reported only where a minimum of three producers reported and where no one producer accounted for 60% or more of total value annually. More detailed definitions and explanation of data calculations can be found online at: <http://csanr.wsu.edu/data-and-calculations/>.

Grape Production and Sales Trends

Washington State currently ranks 2nd in national grape production (conventional plus organic) with 6.8% of the total U.S. bearing acreage, 5.4% of total tonnage and 5.3% of utilized value of all grapes in 2015 (NASS 2016a). Washington leads the nation in *juice* grapes (*Vitis labrusca* types) and follows California in wine grapes (*Vitis vinifera*). The majority of grapes are located in central Washington. NASS reports

show that grape acreage has continued to increase in the state since 2005: in 2015 Washington had 70,000 bearing acres of grapes, up 30% from 54,000 acres in 2005 (Figure 1). Annual production has been variable, with similar tonnage in 2005 (415,000 tons) and 2015 (419,000 tons). Production was greatest in 2014 at 512,000 tons. Value has steadily increased from \$141 million in 2005 to \$296 million in 2015; average price per ton has ranged from \$390 to \$708 in the same period. Grapes were the 6th most valuable Washington crop in 2015. Most of the growth in acreage since 2000 has been in wine grapes; juice grape acreage has not changed substantially in the past decade. Wine and juice grapes made up 69% and 31%, respectively, of Washington grape acres in 2015 compared to just 45% of total acreage in wine grapes in 2000 (NASS 2012a; 2016b).

Washington also ranks 2nd in national *organic* grape production, after California (NASS 2017a). State organic grape acreage (all types) was just over 2,000 acres in 2005; acreage peaked at 2,600 acres in 2011 and then declined to 2,173 acres by 2015 (Kirby and Granatstein 2012; 2014; 2017). The organic sector represents 3-4% of the Washington grape industry. For the 2009 to 2012 period, grapes were the 6th most valuable *organic* Washington crop following apple, cherry, pear, blueberry and sweet corn, but had just 2.3% of the total reported Washington organic farmgate crop value. Annual organic grape production and reported crop value held steady during this period, averaging more than 14,000 tons and \$5.6 million per year. The most recent NASS (2017a) organic survey listed Washington organic grape production and value at 10,481 tons and \$11.2 million.

Similar to all Washington grapes, organic grapes have seen a shift in the proportion of wine and juice grapes; organic wine grapes have increased from 13% of the total organic grape acreage in 2005 to 40% in 2015; organic juice grape acreage has remained flat. Small acreages of organic table grapes are also grown (Figure 1).

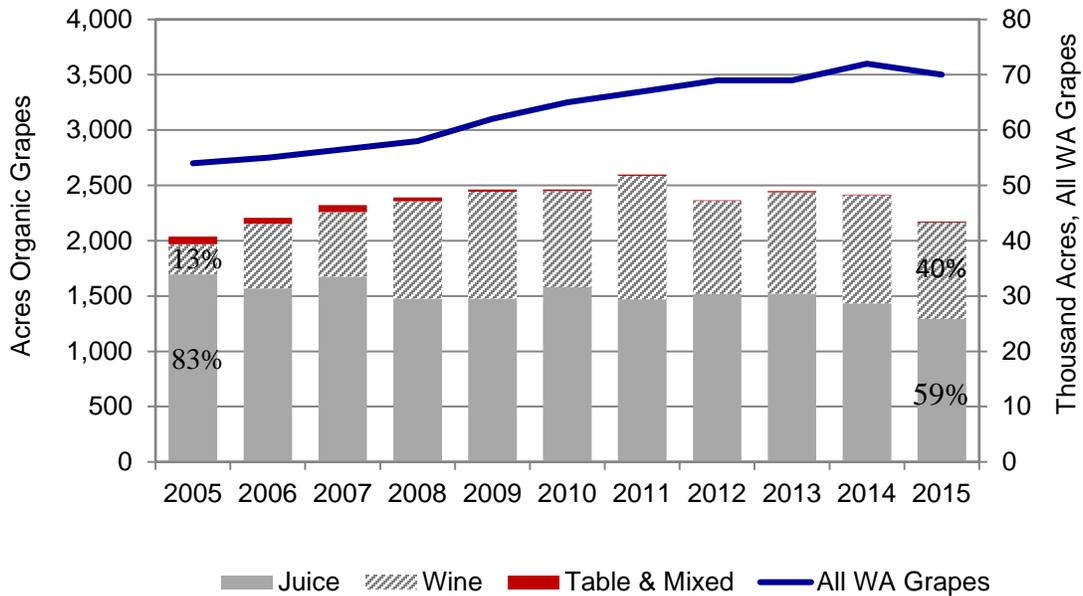


Figure 1. Trend in Washington certified organic juice, wine and table grape site acreage compared to all Washington grapes (conventional plus organic).

The Central Washington climate offers favorable conditions for organic grape production; 98% of the organic acreage is located in the Columbia Basin. In 2015, 80% of the acreage was located in Benton and Yakima counties, and Grant and Walla Walla counties together had an additional 15%. Several smaller-scale producers are located across the state. Eighty-five Washington operations were certified for organic grape production in Washington during the 2015 crop year; 60 of these operations reported acreage segregated as grapes, whereas 25 additional producers had small areas of table, wine, and/or non-specified grapes that were not reported by acreage (Table 1). Of the 60 operations reporting acreage, 22 had juice grapes, 25 wine grapes, 13 table grapes, and 4 producers did not specify grape type for the acreage reported. A few operations grew two or more types of grapes. The number of operations reporting acreage of organic grapes in 2015 (60) declined slightly from the number reporting in 2009 (70). Forty percent of farms with organic grapes in 2009 had exited the organic program by 2015, or did not produce certified organic grapes, with an estimated average annual exit rate of 7%. Nearly half of the exited farms previously reported very small areas, typically less than an acre, of table or mixed

grapes. The number of producers that exited organic juice and wine grape production was similar, as well as the size of operations. Of the exiting wine grape producers, three had less than 5 certified acres, two were in the 5 to 10-acre category, and one had more than 100 acres. Organic juice grape producers that exited included five that had less than 15 certified acres, two were in the 15 to 50-acre category, and two had more than 50 acres. Thirty-nine of the operations in 2009 were still producing organic grapes in 2015. Twenty-six percent of these producers expanded whereas 13% reduced their organic grape acreage over the 7-year period; grape acreage was unchanged, or nearly so, for the other (61%) of producers. An additional 14 farms reported grape acreage in 2015 that did not report grapes in 2009. These farms either became WSDA-certified after 2009, or were previously certified but did not segregate grape acreage in 2009.

The size of organic vineyard operations varies widely. In 2015, juice grape area ranged from less than one acre to over 400 acres of organic production per operation with an average of 59 organic acres; the median was 29 acres. Organic wine grape operations ranged from less than one acre to more than 200 acres. Whereas the average size was 35 organic acres, half of the producers had eight or fewer acres. There were a larger number of smaller-sized organic wine grape operations compared to juice grape operations. Just one producer reported more than one acre of organic table grapes (Table 1).

Table 1. Number of Washington organic grape producers and acreage in 2015.

	No. of producers				Acres reported						
	State	East	West	No. reporting acreage		State	East	West	Range	Avg.	Median
All Grapes	85	66	19	60	All Grapes	2,173	2,089	33	--	--	--
Juice	22	22	0	22	Juice	1,291	1,291	0	6-400	59	29
Wine	32	28	6	25	Wine	873	841	32	<1-228	35	8
Table	31	22	9	13	Table & NS	6	5	1	<1-5	0.6	0.2
NS= not specified											

Juice grapes

Washington juice grape acreage has held nearly constant over the last decade. NASS historical data show 24,000-26,000 acres annually from 2000 to 2014, declining to 22,000 acres in 2015. Concord is the primary cultivar accounting for 90% of Washington juice grape production in 2015. Total 2012 production was 192,000 tons, and utilized value was nearly \$54 million. Juice grapes (conventional and organic) represented 36% of acreage, 51% of production and 22% of value of all Washington State grapes in 2012 (NASS 2012a; 2014a; 2016a). Showing little sign of growth or decline in recent years, the organic juice grape sector represented 6-7% of the total Washington juice grape acreage, production and value in 2012. Organic acreage ranged from 1,475 to 1,581 acres during 2009-2012; 96% of this acreage was in Concord (Kirby and Granatstein 2017). Reported sales year value of organic juice grapes increased from \$2.7 million to \$3.9 million as price increased (Table 2). NASS (2017a) reported \$1.5 million organic juice grape value for 2016 based on 15 growers who reported.

Table 2. Washington juice grape acreage, production and value, 2009-2012.

Juice Grapes	Organic				NASS-WA ¹			
	2009	2010	2011	2012	2009	2010	2011	2012
WA Acres ²	1,475	1,581	1,516	1,520	26,000	26,000	26,000	24,000
Reported Acres ³	1,286	1,383	1,420	1,421	--	--	--	--
Production (ton)	11,801	11,411	12,937	10,325	225,000	176,000	174,000	192,000
Crop Year Value (\$mill)	3.21	3.27	3.79	3.31	54.67	47.69	45.41	53.95
Sales Year Value (\$mill)	2.71	3.14	3.53	3.95	--	--	--	--
¹ NASS (2012b; 2014a) values are for both conventional and organic; ² includes acreage from WSDA site acreage data and acreage reported by any additional certifiers; ³ includes acreage compiled from WSDA-certified producer organic income and production data.								

WSDA producer data were used to calculate average organic yield, price and gross revenue per acre to compare to NASS values for all Washington juice grapes (2009-2012 for yield, price and gross revenue). Table 3a shows the organic *market average* yield (MAY), price (MAP), and gross revenue per acre (MAR) compared to Washington NASS values for all juice grapes. Table 3b shows the organic *grower average* values for yield (GAY), price (GAP), and gross revenue per acre (GAR), along with

some basic statistics. The number of operations reporting sales or production volume for juice grapes ranged from 21 to 24 between 2009 and 2012.

Juice grapes appear to be well suited to organic production in eastern Washington. Favorable climatic conditions and low insect and disease pressures support organic management. However, high summer temperatures, water stress and high UV-B radiation may increase Concord susceptibility to blackleaf (Olmstead et al. 2005), while alkaline soils can contribute to the development of chlorosis. Organic yield potential is comparable to conventional. Washington NASS juice grape yield values (conventional + organic) averaged 7.5 ton/ac during the 2009-2012 period, while organic MAY averaged 8.7 ton/ac, or 16% higher than NASS values. Organic juice grapes received a price premium compared to all Washington juice grapes. Organic MAPs of \$270-\$356/ton (2009-2012) exceeded NASS price values by an estimated 16%. With the interaction of yield and price premiums, organic MAR was 32% greater than NASS values for the 2009-2012 period (Table 3a).

Table 3a. Washington juice grape **market average** yield, price and gross revenue per acre, 2009-2012.

Juice Grapes	Organic				NASS-WA ¹			
	2009	2010	2011	2012	2009	2010	2011	2012
Market Average (MA)	2009	2010	2011	2012	2009	2010	2011	2012
Yield (ton/ac)	9.36	8.41	9.64	7.49	8.65	6.77	6.69	8.00
Price (\$/ton)	270	285	313	356	243	271	261	281
Revenue (\$/ac)	2,500	2,369	3,063	2,499	2,103	1,834	1,747	2,248

¹NASS (2012b; 2014a) values represent all juice grapes (conventional + organic).

Table 3b. Washington juice grape **grower average** yield, price and gross revenue per acre, 2009-2012.

Juice Grapes	Organic				Organic 4-Year			
	2009	2010	2011	2012	Mean	Median	S.D. ²	n ³
Grower Average (GA)	2009	2010	2011	2012	Mean	Median	S.D. ²	n ³
Yield (ton/ac)	8.69	7.42	8.34	7.18	7.87	7.84	3.21	85
Price (\$/ton), All	270	333	291	413	324	284	154	81
Revenue (\$/ac)	2,323	2,226	2,761	2515	2442	2097	1500	89

²S.D.=standard deviation. ³n=number of observations

The unweighted organic GAY, GAP and GAR values help to estimate what an “average” grower might expect. Organic GAY (7.9 ton/ac, over 4 years) was greater than the NASS average yield for the same period but 10% lower than MAY suggesting that a proportion of smaller growers likely had lower yields

than larger producers (Table 3b). Supporting the conclusion that organic juice grape yield potential is comparable to conventional, 50% of organic GAY observations were at or greater than 7.8 ton/ac and 28% of all observations were 10 ton/ac or higher. Also, 20% of producers achieved 4-year average GAY values larger than 10.5 ton/ac (data not shown). Organic GAP and GAR values were both 23% higher, than NASS average values. The 4-year average organic GAP of \$324/ton was similar enough to the MAP (\$306/ton) to indicate that most of the grapes were sold to a processing market.

Wine Grapes

Washington wine grape (*Vitis vinifera*) acreage has grown steadily since 2000. Total acreage (organic and conventional) increased 71%, from 28,000 acres in 2005 to 48,000 acres in 2015. Wine grape production doubled while value increased 146% during this period (NASS 2008; 2016a). Organic wine grape acreage more than tripled, from 274 acres in 2005 to 873 acres in 2015 (Figure 1; Kirby and Granatstein 2012; 2014; 2017). Acreage, production and value showed little change during 2009-2011 but declined slightly in 2012 (Table 4). The organic sector represents about 2% of Washington's wine grape industry (acres, production, value), a much smaller share than for organic juice grapes. The number of operations reporting sales or production volume for wine grapes ranged from 13 to 17 between 2009 and 2012. The number of growers reporting sales was less than the total number of wine grape producers; thus total farmgate value of organic wine grapes was under-reported, as some large grower/processors reported only a processed wine value that was not included in farmgate sales. Reported sales values represented just 55% to 65% of the wine grape acreage, annually. NASS (2017a) reported Washington organic wine grape value at \$9.3 million in 2016, based on 5,337 tons production.

Table 4. Washington wine grape acreage, production and value, 2009-2012.

Wine Grapes	Organic				NASS-WA ¹			
	2009	2010	2011	2012	2009	2010	2011	2012
WA Acres ²	969	868	1,066	911	36,000	39,000	41,000	43,000
Reported Acres ³	834	1,010	1,013	783	--	--	--	--
Production (ton)	2,952	3,421	1,729	2,973	156,000	160,000	142,000	188,000
Crop Year Value (\$mill) ⁴	1.95	2.27	1.88	2.43	154.28	166.40	140.15	195.52
Sales Year Value (\$mill) ⁴	0.80	2.66	2.11	1.90	--	--	--	--

¹NASS (2012b; 2014a) values represent all wine grapes (conventional + organic); ²includes acreage from WSDA site acreage data and acreage reported by any additional certifiers; ³includes acreage compiled from WSDA-certified producer organic income and production data; ⁴includes only reported farmgate sales values; no values were reported for ~35-40% of total reported annual production.

Cabernet Sauvignon, Merlot, Chardonnay and Riesling are the leading Washington wine grape cultivars (conventional + organic) and were grown on 75% of wine grape acres in 2011. Red cultivars had 57% of total state acreage while white cultivars had 43% (NASS 2011).

White Riesling dominated organic wine grape acreage historically but Riesling acreage declined during the 2009-2015 period while organic Cabernet Sauvignon acreage rapidly expanded (Figures 2, 3). The percent of organic red cultivar acreage increased from 24% to 60% of the total organic wine grape acreage from 2009 to 2015, while white cultivar acreage decreased from 76% to 40% of the total organic wine grape acreage.

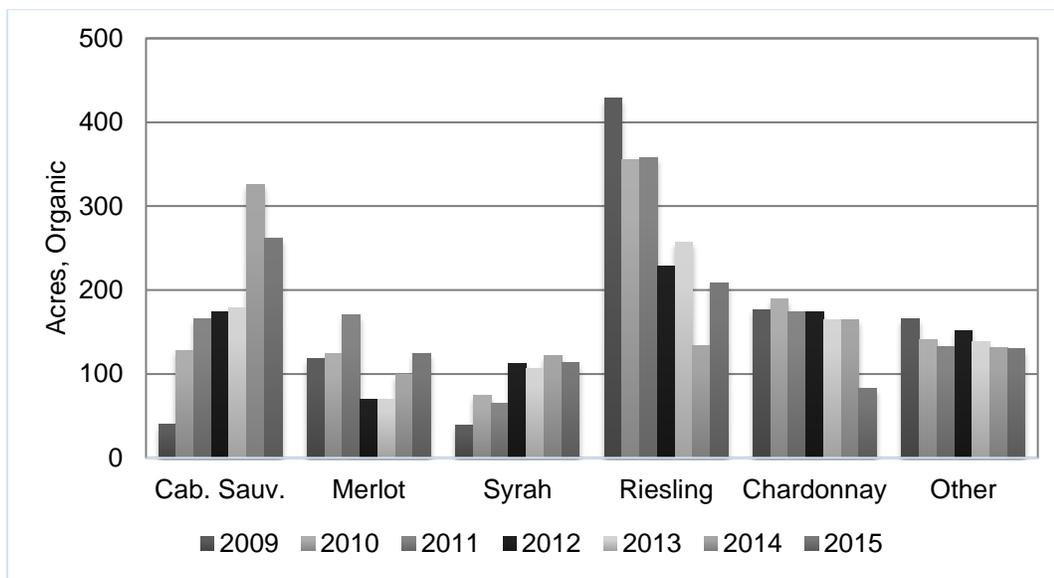


Figure 2. Washington organic wine acreage specified by cultivar, 2009-2015.

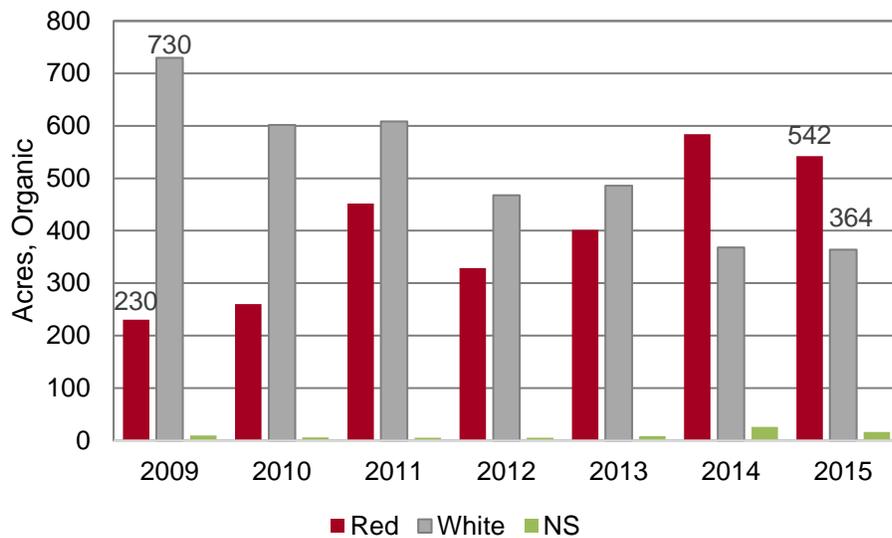


Figure 3. Red and white Washington organic wine acres (by site), 2009-2015. NS=not specified.

Wine grapes are harvested according to target quality standards rather than maximum quantity. Yields also vary with cultivar, color (white wine grapes are generally harvested at higher yields than reds), spacing, age of vines, and target market. Contracts of 5-6 ton/ac for white grapes and 4-5 ton/ac for red wine grapes are typical in Washington (M. Moyer, pers. comm.). NASS wine grape yield averaged 4 ton/ac over the 2009-2012 period (Table 5a), on the low end of standard contracts. NASS yield values segregated for red and white wine grapes were not available for reference.

Calculated MAY values for organic wine grapes (pooled for red and white) averaged 3.2 ton/acre from 2009 to 2012 (Table 5a). Organic MAY values were lower than the NASS 4-year average, possibly reflecting organic growers' challenge to provide adequate vine nutrition. However, it may also be that organic grapes are typically targeted for lower yield, higher value boutique wines in comparison to either standard contract yields, or that the NASS yields include a higher proportion of bulk-wine yield observations. In this case, one would expect to see substantial price premiums for the organic grapes, which were not evident from the WSDA data. The lower yielding organic grapes received marginally

higher (11%) average MAP (\$1128/ton compared to NASS average of \$1014/ton) which resulted in higher organic MAR values. Prices were pooled over all varieties (Table 5a).

The average 4-year GAY (2.8 ton/ac) was lower than MAY, indicating that some smaller scale producers were harvesting lower yields (Table 5b). GAPs were somewhat higher than market values; price did not compensate for lower yield however, resulting in GAR values that were 13% below NASS values.

Looking at individual grower data, derived yield observations ranged from less than 1 ton/ac to more than 7 ton/acre, indicating that growers can achieve organic yields that meet standard contracts; nearly 30% of GAY observations were at or above 4 ton/ac. Deleting yield observations of 1 ton/ac or less from the data set, increases the mean and median GAY to 3.5 ton/acre and 3.3 ton/ac, respectively.

Table 5a. Washington wine grape **market average** yield, price and gross revenue per acre, 2009-2012.

Wine Grapes, All	Organic				NASS-WA ¹			
	2009	2010	2011	2012	2009	2010	2011	2012
Market Average (MA)	2009	2010	2011	2012	2009	2010	2011	2012
Yield (ton/ac)	3.59	3.42	2.03	3.83	4.33	4.10	3.46	4.37
Price (\$/ton)	1,028	1,041	1,308	1,134	989	1,040	987	1,040
Revenue (\$/ac)	5,564	4,302	4,067	4,494	4,286	4,267	3,418	4,547

¹NASS (2012b; 2014a) values represent all juice grapes (conventional + organic).

Table 5b. Washington wine grape **grower average** yield, price and gross revenue per acre, 2009-2012.

Wine Grapes, All	Organic				Organic 4 Year			
	2009	2010	2011	2012	Mean	Median	S.D. ²	n ³
Grower Average (GA)	2009	2010	2011	2012	Mean	Median	S.D. ²	n ³
Yield (ton/ac)	3.32	2.55	2.32	3.10	2.82	2.52	1.80	59
Price (\$/ton)	1,118	1,047	1,360	1,606	1,310	1,141	623	47
Revenue (\$/ac)	3,997	3,029	3,323	3,934	3,577	3,493	1,798	49

²S.D.=standard deviation; ³n=number of observations

White and red wine grapes showed differences in yield and price (Tables 6a, 6b). As expected, the 4-year average organic white wine grape MAY (3.8 ton/ac) exceeded the red wine grape MAY (2.7 ton/ac). However, the annual number of observations for organic wine grapes by color or variety was often low (e.g., less than 10). Both organic MAPs and NASS prices for pooled white cultivars were lower than for red wine grapes. NASS white wine grape prices ranged from \$794-844/ton during the

2009-2012 period, and were typically 30% less than prices for reds which ranged from \$1,200-1,241/ton. Organic MAPs showed a different and less stable pattern; 4-year average MAPs showed less spread between organic white and red wine grapes, with whites at \$1,067/ton and reds at \$1,246/ton, a difference of 14%. Annual organic white wine grape MAPs showed greater variability than reds and ranged from \$897-1,427/ton. Organic white wine grape MAPs were 30% greater than NASS prices over the 4 years. In contrast, the derived organic red wine grape MAPs were higher than NASS prices in only 2 of 4 years, suggesting that growers did not earn much of an organic premium on red wine grapes. However, GAPs (data not shown) showed that 50-78% of the organic red wine grape price observations exceeded NASS prices, depending on year. Average annual premiums ranged from 0% to 23%, across growers, and ranged from -36% to 48% for individual observations. Low prices received may have reflected grape quality issues. With potential lower yield, organic red wine grapes require greater premiums than white, thus production appears more difficult from a profitability standpoint. Cultivar is likely an important factor in profitability. For example, based on a small set of observations segregated by cultivar, organic Cabernet Sauvignon MAPs were higher than NASS prices in 3 of 4 years, compared to Merlot MAPs which were lower than NASS prices in 3 of 4 years. NASS (2017a; 2017b) prices for organic Washington wine grapes were \$1756/ton in 2016 compared to \$1160/ton for all Washington wine grapes, representing a 50% price premium for organic. The organic wine grape prices, derived from reported yields and sales, are presented for illustration purposes in the absence of other publicly available organic price data. The low number of observations, especially for red and white wine grapes, and lack of further information on quality, call for caution in their interpretation.

Table 6a. Washington white wine grape market average yield and price, 2009-2012.

White	Organic				NASS-WA¹			
Market Average (MA)	2009	2010	2011	2012	2009	2010	2011	2012
Yield (ton/ac)	4.39	3.92	2.15	4.77	--	--	--	--
Price (\$/ton)	1,000	897	1,427	946	813	830	794	844
Riesling (\$/ton)	1,064	955	1,439	843	781	789	784	783

¹NASS (2014b) values are for all wine grapes (conventional +organic).

Table 6b. Washington red wine grape market average yield and price, 2009-2012.

Red	Organic				NASS-WA ¹			
	2009	2010	2011	2012	2009	2010	2011	2012
Market Average (MA)	2009	2010	2011	2012	2009	2010	2011	2012
Yield (ton/ac)	1.92	2.72	3.09	3.02	--	--	--	--
Price (\$/ton)	1,162	1,361	1,099	1,361	1,200	1,241	1,224	1,235
Cab Sauvignon (\$/ton)	1,420	1,330	1,285	1,477	1,276	1,297	1,312	1,337
Merlot (\$/ton)	1,062	793	1,052	1,240	1,088	1,160	1,117	1,104
¹ NASS (2014b) values are for all wine grapes (conventional + organic).								

Profitability and Risk

This report has summarized typical values for some of the components of profitability: yield, price, and gross revenue (2009-2012) for organic juice and wine grape production in Washington. No data were available from organic grape growers on actual costs of production, which are necessary to determine profitability. Instead, the Northwest Grapes Cost-of-Production Calculators (WAWGG 2017) were used to estimate costs for juice grapes and wine grapes under both conventional and organic management.

The calculators allow users to predict total annual production costs from establishment (Year 1) to full production (Year 4) with options to input their personal operation criteria and costs, or to use pre-set default costs. These calculators replaced earlier grape enterprise budgets and were based on the work of Ball et al. (2004) and Ball and Folwell (2003). It is possible to combine these cost estimates with the price and yield data summarized in this report to estimate some measure of profitability for organic juice and wine grapes. However, there is too much variability in costs, prices, and yields across farms and over time to report these values with enough confidence. Our objective will be to summarize costs, and provide a description of price and yield variability so that an individual can provide their own profitability assessment. Costs of Production for Projecting Profitability for Juice Grapes

Production costs for juice grapes using the 2014 Cost-of-Production Calculator default values are presented in Table 7 for a year in full production (Year 4 and beyond). The calculator estimated Year 4 variable costs and total costs to be 13% and 10% more, respectively, for organic juice grape production than for conventional production, with the assumed yields and prices listed. Major areas of increased

cost for organic juice grape production included fertility (compost and foliar feeds added \$168/ac) and a legume cover crop (+\$84/ac). Weed control costs were similar (herbicide vs. cultivation), and the organic budget did not include any insecticides or fungicides. When using the calculator, if different yield levels are used to estimate net returns, this will lead to changes in harvest costs and resulting total cost of production. Based on the default values in the calculator, juice grape production under either management system would not be profitable.

Table 7. Comparative default costs (\$/ac), yields and prices for conventional and organic juice and wine grapes in Washington.

	Juice Grapes		Wine Grapes	
	Conventional	Organic	Conventional	Organic
Variable costs	1458	1642	1995	2570
Fixed costs, cash	811	860	988	1048
Fixed costs, non-cash	376	414	634	801
Total costs	2645	2917	3617	4419
Yield (ton/ac)	10	9	4	4
Price (\$/ton)	180	220	1000	1000
Gross revenue (\$/acre)	1800	1980	4000	4000
Values from Northwest Grapes Cost of Production Calculators using 2014 default costs, yields, and prices for Year 4.				

Costs of Production for Projecting Profitability for Wine Grapes

Estimates of 2014 production costs for wine grapes using the Cost-of-Production Calculator default values are presented in Table 7 for a year in full production (Year 4 and beyond). The calculator estimated Year 4 variable costs and total costs to be 29% and 22% more, respectively, for organic wine grape production than for conventional production, with the assumed yields and prices listed. No grape type (red vs. white) or variety was specified by the calculator.

The main increased costs for organic wine grapes included fertility (\$78/ac more for bloodmeal), fungicides (\$300/ac more for oil, Sonata, and compost tea, with the latter being the largest cost increase), and insecticides (\$186/ac more for using Aza-Direct rather than Provado). Vineyard floor

management costs were similar (weed control, cover crop management). Based on the calculator default values, which were the same for both conventional and organic wine grape production, conventional production would be profitable while organic production would not (Table 7). From the 2009-2012 grower data, organic wine grapes had lower yields and higher prices than in the calculator, which led to greater gross revenue per acre. However, the greater revenue did not compensate for the higher production costs. The NASS (2017a) price for organic wine grapes in 2016 was reported as \$1756 per ton, compared to the \$1000 per ton default calculator price. The USDA index of production costs (NASS 2017c) indicates that costs rose by 5% from 2011 to 2016.

Several other published studies compare conventional and organic wine grape production in different regions of the world. Johansen (2010) found that profitability between organic and conventional Cabernet Sauvignon wine grapes grown in San Luis Obispo County, CA, was equal if the organic grapes received a premium of just over 1%. Total operating costs for organic were estimated to be slightly lower (\$130/ac) than conventional. Organic had higher costs for compost and other fertilizers, and for weed control (machine time), but lower costs for fungicides. Organic yields were estimated to be 3% lower than conventional.

A South Australia vineyard company with both conventional and organic wine grapes on the same farm compared yields and economics from 1992-2006 (Wheeler and Crisp 2011). Organic yields averaged 9% lower than conventional, but the difference was not significant. Organic red grape yields averaged 15% lower, while organic white grape yields were 5% lower. However, the authors state that in later years, after more experience growing organic wine grapes, these often yielded the same as or more than their conventional counterpart. Total variable costs per hectare were 11% higher for all organic wine grapes (10% for red grapes, 12% for white grapes). Labor was generally significantly higher for organic management. Grape quality was also evaluated, with a significantly higher score for organic red grapes and a significantly lower score for organic white grapes, which could influence the selling price.

In the more humid environment of New York State, White (1995) estimated average organic grape growing costs to be 79% higher than conventional for Concord, and 69% and 91% higher for Elvira and Seyval Blanc (*Vitis* hybrid wine grape varieties). Organic generally had lower spray costs except in a wet year, while chicken manure for fertility and tillage and hand hoeing for weed control added substantial cost. Conventional grapes out-yielded organic for all varieties in all years. Only organic Elvira grapes had a positive return to management of \$35/ac, much lower than the \$370/ac for conventional Elvira grapes.

Variability of Yield, Price, and Revenue

The calculation of grower average data allowed for the examination of yield, price, and revenue variability for organic juice grapes and wine grapes (Figure 4). A good way to comprehend variability is to visually inspect a type of graph called a histogram. Histograms display the percentage of all reported values that occur within a specific range. The x-axis provides the range and the height of the bar communicates the percentage. Histograms were created for price, yield, and gross revenue for organic juice and wine grapes in Figure 4. The data in Figure 4 can be compared with the grower average and market average values in Tables 3 and 5, as well as with values from the calculator, either the default (Table 7) or your own.

An informative characteristic of a histogram to evaluate is whether the most common range of values is generally in the middle of all observed values. For example, the most common organic juice grape yield range was 6.1-9 tons/acre, midway between the highest and lowest observed values. This means that the grower average yield (7.8 ton/acre from Table 3b) is also the most likely yield a producer might achieve. In contrast, the most common organic wine grape yield was in the lowest observed range (0-2 tons/acre). Thus, there is a greater chance that producers might achieve a yield that is less than the grower average (2.8 ton/acre from Table 5b).

Juice Grape Variability

Organic juice grape yields similar to conventional appear to be achievable. From the grower data, 28% of yield observations were at 10 tons/acre or more. No yield observations exceeded 15 tons/acre.

Organic juice grape prices were most common for the \$201-300 per ton range (46% of observations), which is higher than the calculator default of \$220 per ton but lower than the market average price of \$306 per ton. A few growers received very high prices that most likely do not reflect the typical contract prices available. Some 27% of observations were in the \$300-400 per ton category. Similar to price, a few producers achieved very high gross revenues per acre, which probably represents marketing outside the normal contract market. Just over one-third of observations were \$1001-2000 per acre while another 27% were \$2001-3000 per acre. For reference, the default calculator total cost of production was \$2917, and 27% of revenue observations exceeded this.

Wine Grape Variability

Organic wine grape yields were skewed towards the lower end of the spectrum. Since yield is targeted to contract and quality specifications rather than maximum yield, drawing conclusions from the histogram is difficult. Organic wine grape yields were lower than conventional, and this clearly challenges profitability. Organic white wine grapes showed higher yields than reds, which fits with typical production goals (Table 6a, b). The most common price received fell between \$751 and \$1250 per ton (62%), and 64% of observations were above the \$1000 per ton default price in the calculator. There were 21% of price observations >\$1750/ton, which is the price reported for 2016 by NASS (2017a). The market average price for organic white wine grapes was 36% above the NASS price for all Washington white wine grapes, while the organic red grape price was 1% lower than the NASS price for all Washington red wine grapes. Several growers had notably low prices for red wine grapes, possibly reflecting quality problems, and these observations skewed the overall organic red grape price lower due to the low number of observations.

The histogram for gross revenue for organic wine grapes is particularly interesting because it shows that no value within the observed ranges is particularly likely. Thus it is important for a potential organic producer to assess where they expect to be on the range from \$0-\$6,000 per acre, and why. Grape variety and quality are two important factors. About 37% of observations were above the roughly \$4500 per acre cost of production estimated by the default calculator values, and the market average revenue was \$4607 per acre. There is opportunity to improve gross revenue with increased yield or quality. In eastern Washington, 5 ton/acre yields for organic wine grapes are achievable with improved production practices such as providing adequate vine nutrition (M Moyer, pers. comm.). Further analysis of variability of yield, price and revenue by year was limited by the low number of observations.

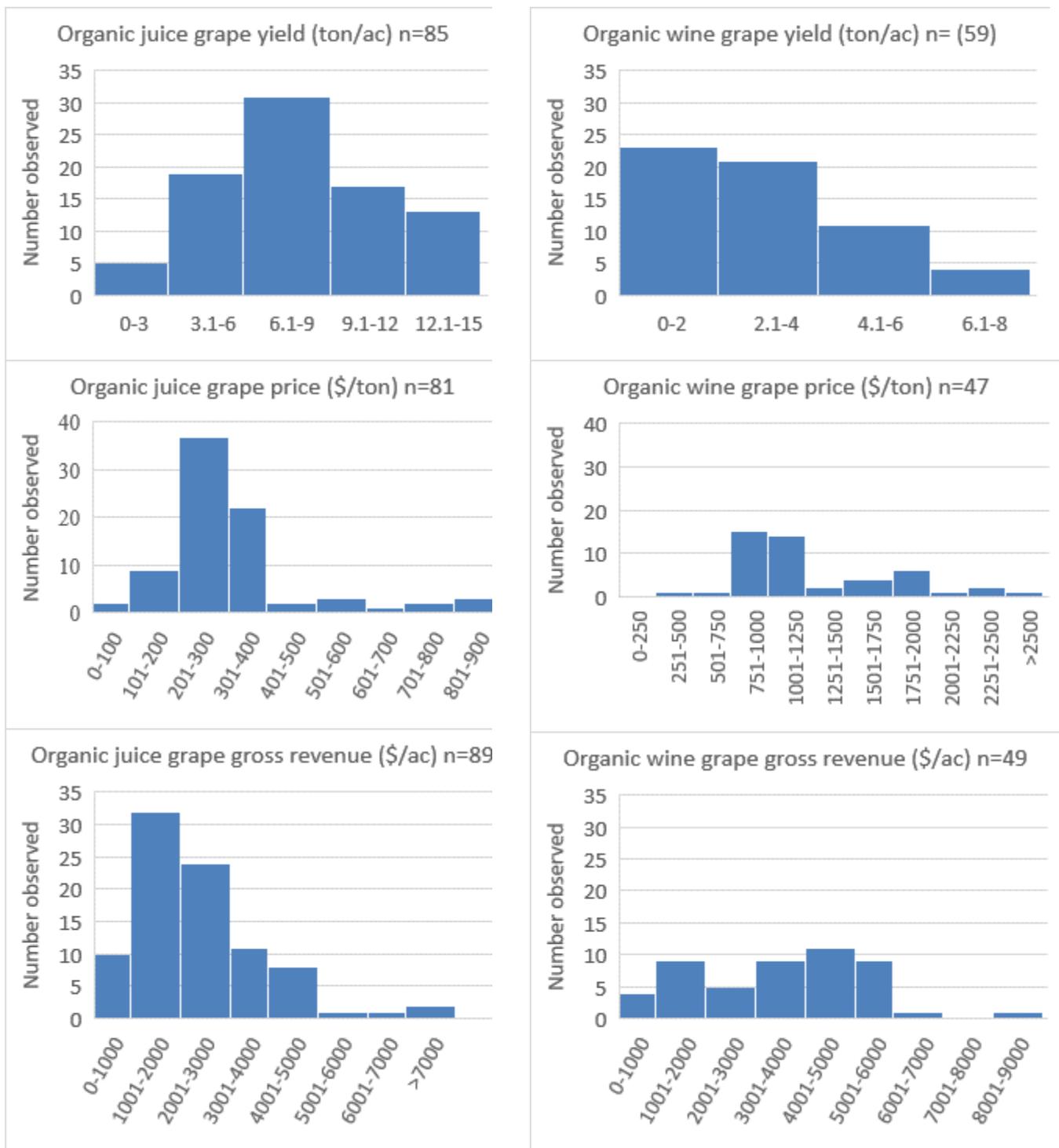


Figure 4. Variability in grower average yield, price, and gross revenue per acre for organic juice grapes and organic wine grapes in Washington State, 2009-2012. n = total number of observations.

Some organic growers may be able to boost yields to increase profitability, depending on the target market. There are opportunities to reduce production costs as well. There were no data on whether grapes grown under organic management tend to be used in more premium wines, and thus the profitability might hinge more on the finished wine price than on the production costs and returns. This apparently is the case for some California wineries (K. Klonsky, pers. comm.).

Conclusions

Washington is the nation's leading producer of organic juice grapes. Organics represent about 6% of all juice grape acreage in the state, and brings in more than \$3 million in farmgate sales annually. Organic management incurred 10% greater total production costs than conventional. Market average yields, prices and gross revenues for organic juice grapes exceeded those for conventional, but estimated production costs from the default calculator values still exceeded the revenue. About 27% of grower observations showed revenues greater than the estimated cost of organic production.

Organic wine grape acreage represents less than 2% of all wine grape acres in Washington State; the state is 2nd in U.S. organic wine grape production, currently valued at more than \$9 million, annually. California dominates the U.S. wine grape sector, including organic; certified organic production represents about 1% of all California wine grape production, with organic earning 3% of the total value (NASS 2016a; 2017a). However, an undetermined fraction of California wine grapes is grown using organic production methods but not certified as organic; some winemakers contract for high-quality organic grapes to produce premium wines not labeled as organic (K. Klonsky, pers. comm.)

Higher production costs and reduced yields for organic wine grapes appear to be challenges for profitability despite somewhat higher prices. Compost tea and an organic insecticide together account for \$500 of the \$700/ac difference in production costs for organic. Thus, examining alternatives to these two practices would be worthwhile, along with improved crop nutrition to boost yields. On average, organic white wine grapes appeared to receive a premium price in all four years, while average organic red premiums appeared to be affected by low prices received by just a few growers. The profitability discussion presented here does not account for those growers who also make wine from their organic grapes and potentially receive a premium for that product. Given that Washington wines are already sold as a premium product in the marketplace, the additional value of organic status is not guaranteed. Also, it is likely that a large portion of the organic wine grapes are used in wines that contain sulfites and thus do not meet the “organic” wine label standards which may influence the premiums.

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