



Current Trends in Organic Tree Fruit Production

CSANR Report No. 4
May 2002

David Granatstein and Elizabeth Kirby
Center for Sustaining Agriculture and Natural Resources
Wenatchee, WA

Introduction

Organic farming experienced dramatic expansion in all crops during the 1990s, including tree fruit. Growers had access to new biological pest control techniques, more choices of organically approved inputs, and an expanding information base. While organic production is easier in some climates for certain crops, it is clear that there is no fundamental biological obstacle to this farming system. In some cases, pest management and soil quality have been clearly enhanced by organic farming, and organic foods often bring a premium price that makes organic production an attractive economic choice for growers.

Organic fruit production is the largest segment of organic farming in Washington State by acreage and farm-gate value. With depressed prices for conventional apples and pears, many growers have considered organic production as an alternative. Dramatic swings in organic tree fruit acreage in the state have occurred several times during the past decade, with changes exceeding 200% per year (increase or decrease) on several occasions.

Reliable statistics on organic tree fruit were mentioned as a key information need by growers responding to a 1994 organic apple survey (Cornwoman and Granatstein, 1999). However, the availability of statistics on the organic farming sector has lagged behind the increase in acreage. This report is the second part of a continuing effort to provide statistical information on production of organic tree fruits for the fresh market to help growers and others make more informed decisions. The data presented here should be considered as estimates, given that information was derived from many sources with differing levels of comprehensiveness and reliability. Some estimates are very accurate, while others less so. As more accurate data become available, updates will be created and posted on-line. This report and related information on organic tree fruit production can be found on-line at <http://organic.tfrec.wsu.edu/OrganicIFP/Home/Index.html>.

The Appendix contains the same data, in table format, as presented in the figures so they are quickly available in numeric form; the figures provide a more useful view of certain trends over time. A few supplemental tables on price premiums are also included in the Appendix.

International Trends

Organic tree fruit production around the world, as in the U.S., continues to expand annually (Table 1). Production acreages are estimates based on communications with various organic certification organizations and industry members¹. Highly accurate numbers are difficult to obtain due to varying or incomplete reporting systems. The United States leads in world acreage of organic apples at 17,272 acres in 2001. Italy, Germany, France, Switzerland, and Austria are the leading European producers of organic tree fruit, grown for both the fresh and juice markets. European estimates were provided by M. Kelderer (Laimburg, Italy) for the year 2000. Canada has a modest size but well-established organic tree fruit sector primarily based in the Okanagan Valley of British Columbia, a semi-arid climate (data provided by L. Edwards, Certified Organic Associations of British Columbia). Turkey has commercial organic tree fruit production but no data were provided from the identified certifiers. New Zealand, Chile and Argentina are all expanding organic acreage primarily aimed at the export market to fill the counter-season fresh market niche in North American and European markets. New Zealand has an active research program focused on developing organic production; acreage data were obtained from BioGro-New Zealand. No data were available for organic production in China, the world's largest apple producer.

Table 1. Estimated worldwide acreage of certified organic apples and pears. 2001.

	Apple (ac)	Pear (ac)
U.S.	17,272	2,798
Europe*	8,675	3,665
New Zealand	2,873	163
South America	1,385	932
Canada	800	60
Total	31,005	7,618

*Europe data is from 2000.

Argentina had an estimated production of 800 acres organic apples and 900 acres of organic pears in 2000 (reported by E. Sanchez, INTA, Rio Negro). Organic production of all crops has been growing dramatically in Argentina. Argencert, a certification organization, estimates an 1,100% increase of total land in organic production in the last four years to over 7 million acres in 2000 (L. Montenegro, 2001). Much of that land is pasture, but 590,000 acres are in crop production. Organic cropland tripled between 1999 and 2000. Organic vegetable production increased 227% over 4 years. Tree fruit production also experienced similar rapid growth; updated figures should be available in 2002. About 78% of Argentine organic products were exported in 2000. Europe imported 80% of the goods, especially fruits and vegetables, while the U.S. imported about 11%.

As of 2001, Chile more than doubled its organic apple production to 580 acres, up from 235 acres in 1998 and has a projected production of 2,112 acres of apples by 2005 as illustrated in Table 2 (P. Ceroni Gaete, 2002). Organic production of other tree fruits is also expected to continue to grow, with Chilean organic cherry production currently estimated at 186 acres. About 70% of Chile's organic commodities are sold for export, with 57% exported to the United States, 35% to Europe, 8% to Japan, and <1% to Canada.

¹ Numbers include fruit grown for both the fresh and processing markets; break down figures for fresh and processing are not available for this report.

Table 2. Recent and projected growth of organic apple acreage in selected locations.

	acres		
	Washington State	Chile	New Zealand
1998	1801	235	
1999	2334		
2000	4228	356	1200
2001	6540	580	2873
2002*	8240	1124	
2003*	9951	1519	
2004*		1815	
2005*		2112	

*Projected figures.

With the adoption of the National Organic Standards (effective in October 2002), organic products exported to the U.S. will need to be certified by a USDA accredited organization. This requirement may make it more difficult, temporarily, for some growers to export to the U.S.

National Trends

The first study of trends in organic tree fruit production in the U.S. was completed in 1999 (Granatstein, 2000). Washington, California, and Arizona dominated the production, representing about 80% of the organic apples in the country. Updated reporting indicates that Colorado's tree fruit industry has also shifted to more organic production to remain competitive and utilize its climatic advantage. Apple scab continues to be the main impediment to successful organic production in more humid regions; some insect pests also limit production.

Total U.S. organic apple acreage increased from 12,770 acres in 2000 to 17,272 acres in 2001 as transitional trees became eligible for certification (Table 3). Washington State continues to lead organic apple production with 6540 acres representing 38% of the acres in the U.S, with another 3400 acres in transition. California, Arizona and Colorado also continue as major producers with 26%, 16%, and 9% of the apple acreage, respectively. Currently there is no means to separate out the volume of organic fruit going to fresh market or to processing. However, personal contacts in California and Arizona suggest that significant amounts of their organic apple production do go to processing, whereas the Washington crop is primarily aimed at the fresh market.

Washington acreage statistics were derived from the Washington State Department of Agriculture (WSDA) Organic Food Program records and are therefore accurate. Colorado, Idaho, Iowa, Nevada, Texas and Virginia also have a state certification system; additionally, Colorado has a significant amount of organic apple acreage certified by Oregon Tilth. In California, all organic acreage is required to be reported to the California Department of Food and Agriculture (CDFA), including all certified acreage. Although California does not require all organic acreage to be certified, it is estimated that 90% of the total is certified by private organizations (Ray Green, CDFA). Arizona acreages were reported by Robert Call, University of Arizona Cooperative Extension and are limited to the southwest region of Arizona.

Table 3. Estimated U.S. certified organic tree fruit* production in acres. 2001.

	Apples	Pears	Cherries	Stone	All Fruit
Total U.S.	17,272	2,798	727	3,589	24,735
Washington	6540	1308	303	285	8436
California	4529	842	179	3112	8662
Arizona	2800		30		2830
Colorado	1535	100	133	155	1923
Idaho	503			3	506
Oregon ¹	350	500	25		1180
Wisconsin	163	16	1		188
Michigan	163		50	2	215
Vermont	225				237
Pennsylvania ²	150				150
New York	130	20	4		154
Nevada	55				55
Virginia	50				50
Ohio	30				34
Iowa ³	30				50
Arkansas	18		2		20
Texas	1	12		32	45

* Only includes pome fruits and stone fruits.

^{1,2} Figures are from 2000.

³ Estimated by M.Wills (Iowa Dept. of Agriculture and Land Stewardship).

Utah, Oklahoma, New Hampshire and New Mexico have state certification programs but reported that they had not certified any tree fruit acreage. Kentucky, Maryland, and Louisiana also have state certification programs but did not provide information.

Producers in many states are certified primarily by private organizations. Vermont, New York and Pennsylvania data were obtained from Northeast Organic Farming Association (NOFA) chapters. Oregon Tilth reported Oregon acres in 2000. Midwest Organic Services Association provided data for Wisconsin. Global Organic Alliance, Demeter, Organic Crop Improvement Association Chapter #3, and the Ohio Ecological Food and Farm Association provided data for Michigan and Ohio. Arkansas data were from Ann King, Arkansas Certified Organic, Inc.; California Certified Organic Farmers and Pacific Coast provided valuable California numbers.

Not all certifiers have records for individual tree fruit crops readily available. Acreages for some states may be underestimated where certifiers did not provide data.

Washington State Trends

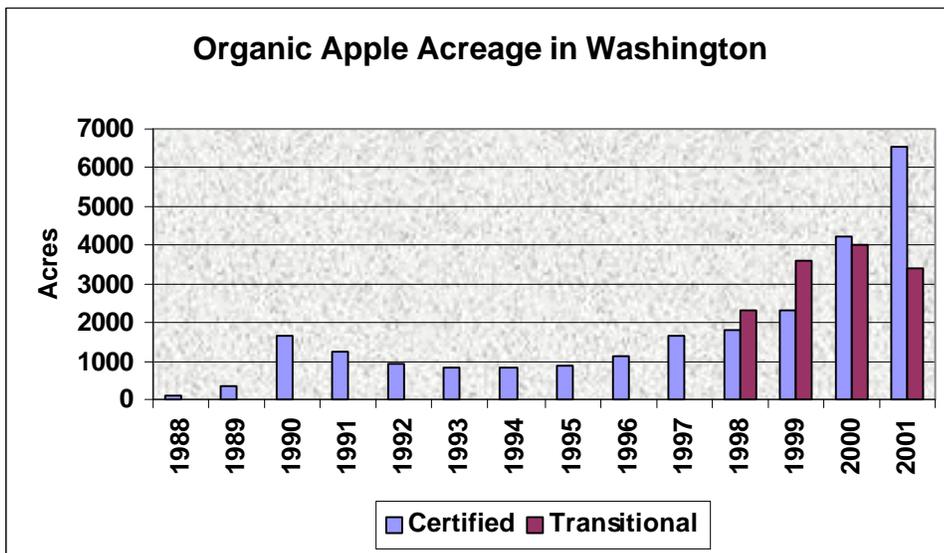
Organic farming in Washington State has grown dramatically in size and scope during the 1990s. Two main factors are responsible: steady growth in the markets for organic foods have maintained a premium price to growers, and growers considered organic production as a way to prepare for loss of production tools such as pesticides. The advent of pheromone mating disruption as an effective and

available control technique for codling moth, the primary pest of apples in Washington, removed a major barrier to organic production. As a result, organic apple acreage has increased dramatically. Many growers are considering or implementing organic production to offset low apple prices in the conventional market. However, a major increase in supply of organic fruit could easily overshoot demand and depress organic fruit prices, as happened in 1990 after the Alar incident. This has probably already occurred for organic Red Delicious apples.

Washington State is the largest producer of apples, pears, and sweet cherries in the U.S. From discussions with organic certifiers across the country, the semi-arid regions of the West have a major climatic advantage for producing organic tree fruit. Both Michigan and New York are major apple producers but have little organic acreage due to difficulties controlling pests (both fungal and insect).

Organic apple acreage in Washington has more than tripled from 1800 acres in 1998 to over 6540 acres in 2001, with another 3411 acres in transition to organic. The trends in organic tree fruit production in Washington over the past 10 years are illustrated in Figure 1 and Table A1.

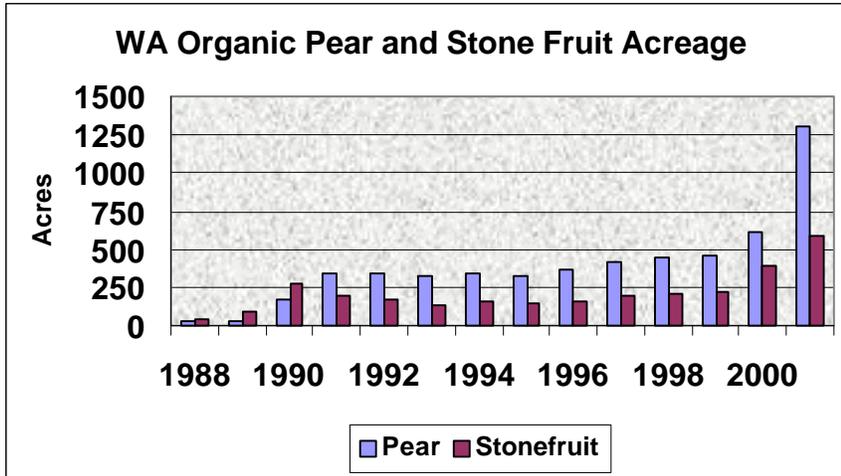
Figure 1.



The effect of the Alar incident (1989) is clearly reflected in the Washington data. Growers were motivated to try organic production in 1990 due to low demand and prices for conventional apples. At the time, the organic program rules required only a 1-year transition period, but the rule was slated to change to a 3-year transition by 1992. Thus, many growers withheld conventional treatments after harvest in 1989 and, by following the organic production regime, had a certified crop by autumn 1990. Significant attrition of these new organic growers occurred in 1991 and 1992, mainly due to problems controlling codling moth in apples and reduced prices for organic apples caused by the rapid increase in supply.

Washington organic pear acreage also increased after 1990 with no significant drop-offs. This may be due to a few larger pear growers who have maintained stable production (Figure 2). In 2001, there were significant increases in organic pear acreage as transitional acres became eligible for certification. Apple acreage increased by 55% from 2000, pear acreage more than doubled (111%) to 1308 acres, and soft fruit acres increased by 53% (Table A1).

Figure 2.



While the growth of organic tree fruit acreage in Washington has been substantial, it once only represented a small fraction of the total fruit acreage. By 2001, organic apple acreage in Washington State represented about 3.9% of total apple acreage, while organic pear acreage was 5.2% of the total pear acreage (Table 4).

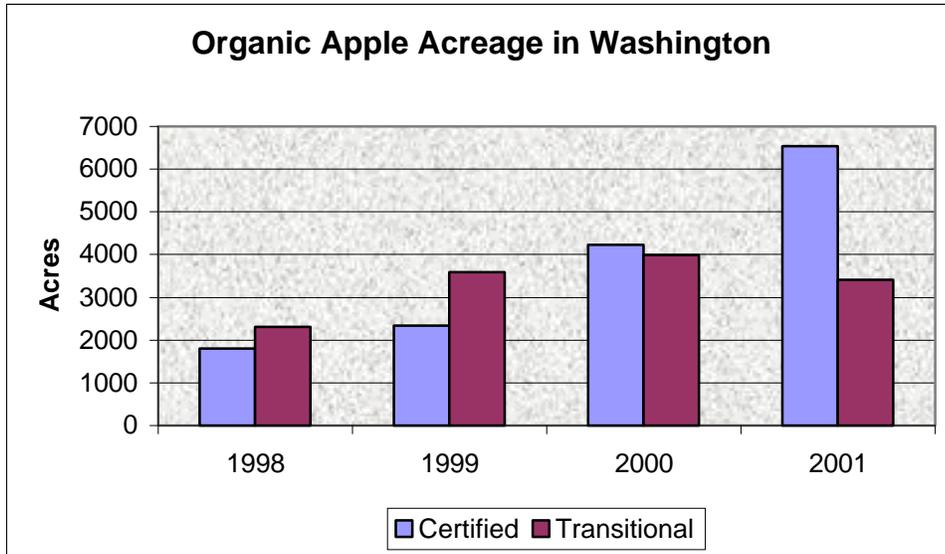
Table 4. Organic orchard acreage as a percent of total Washington apple or pear orchards.

	<u>Apple</u>	<u>Pear</u>
1996	0.68	1.49
1997	0.96	1.68
1998	1.05	1.84
1999	1.36	1.87
2000	2.48	2.54
2001	3.90	5.27
2003*	4.70	6.80

* Assuming all acres currently in transition become certified and acreage remains stable.

These are now significant components of the tree fruit industry and are leading to expanded interest and support from public and private entities for research (Granatstein, 2001), education, new production tools, and promotion. The percentage of apples increased appreciably as transitional acreage became certified (Figure 3) and total apple planting slowed due to poor economic conditions.

Figure 3.



Industry representatives estimate that some 20,000 acres of apples were taken out of production in Washington State between 1999-2001 in response to a dramatic price downturn and excess crop. Perhaps these losses have been offset by new plantings, or have not yet shown up in the statistical surveys. The USDA-National Agricultural Statistics Survey (NASS) records show only a loss of 4000 acres of bearing apple ground during this period in Washington (Table 5).

Table 5. USDA-NASS Total bearing tree fruit acreage data for Washington State.

	Acres			
	Apple	Pear	Cherry	Peach
1999	172000	24400	18000	2500
2000	170000	24400	18000	2500
2001	168000	24800	22000	2700

While conventional pear acreage appears to be stable in Washington, organic pear acreage expanded dramatically from 1999 to 2001, and total organic cherry acreage is rapidly increasing in the state (Figures 4 and 5, and Table A2). However, cherry fruit fly control remains a major barrier to expansion of organic cherry production. The availability of new organically approved pest controls for cherry fruit fly in the next few years could remove this barrier.

Figure 4.

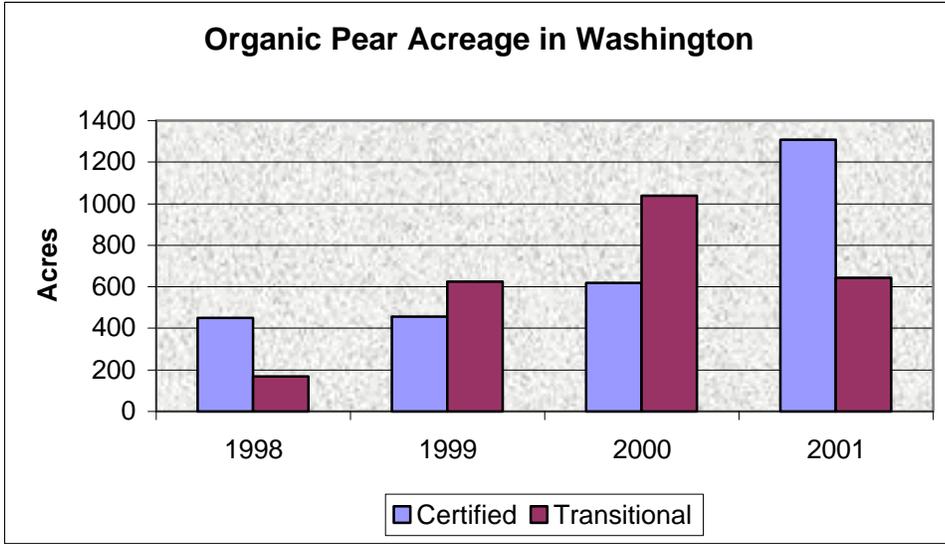
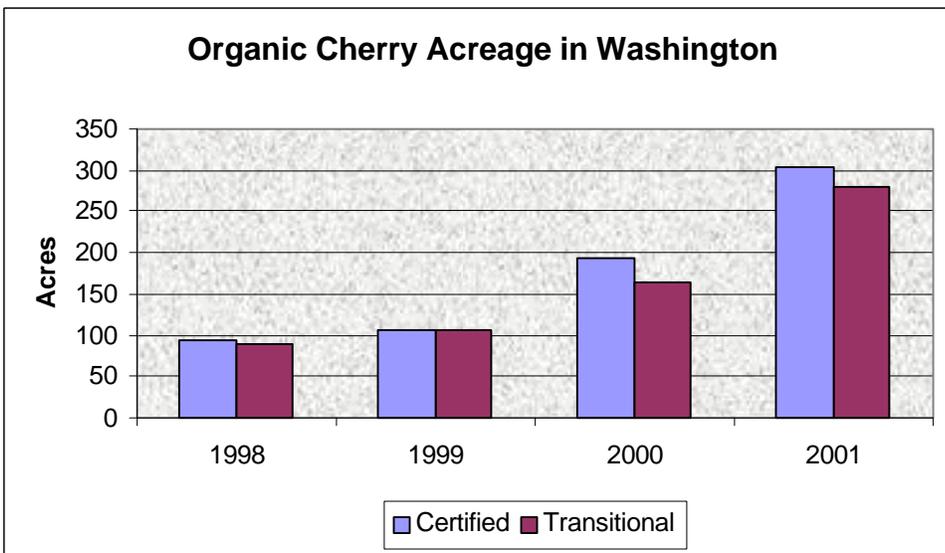


Figure 5.

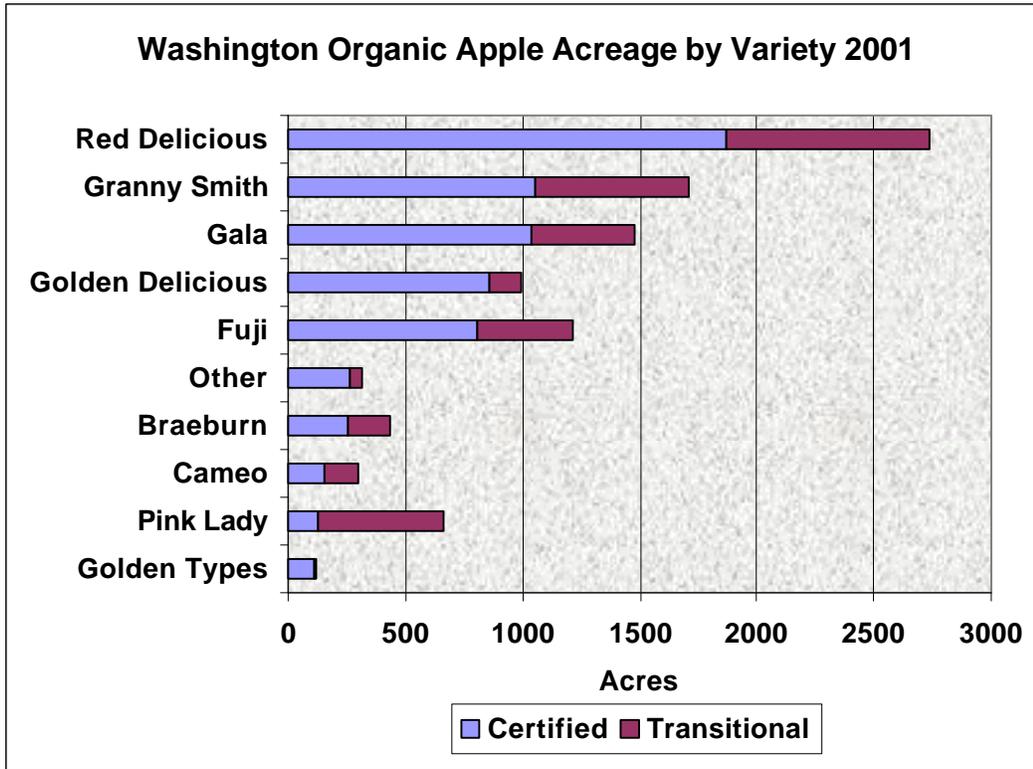


Fruit Varieties

In 1998, the WSDA began to request specific fruit varietal information as part of the organic farm application. These data are presented for apples and pears in Figures 6 and 7. Red Delicious is the leading organic apple variety by acreage, and will continue to be so based on the large acreage in transition (Figure 6 and Table A3). Certified Granny Smith acreage doubled from 2000 to 2001 with many transitional acres becoming eligible. Acres of Gala and Fuji also nearly doubled in the 2001 crop season and it appears that acreage will continue to grow significantly for each of these varieties. Transitional acres of Pink Lady indicate this variety may have significant growth of certified acreage by 2003. Conversations with growers indicate that Gala and Golden Delicious are relatively amenable varieties for organic production, while Fuji can be problematic. To date, no specific varieties have been developed for organic production. Scab-resistant varieties from the East Coast (e.g., Liberty) are available but generally not necessary in the semi-arid fruit districts. British Columbia organic growers

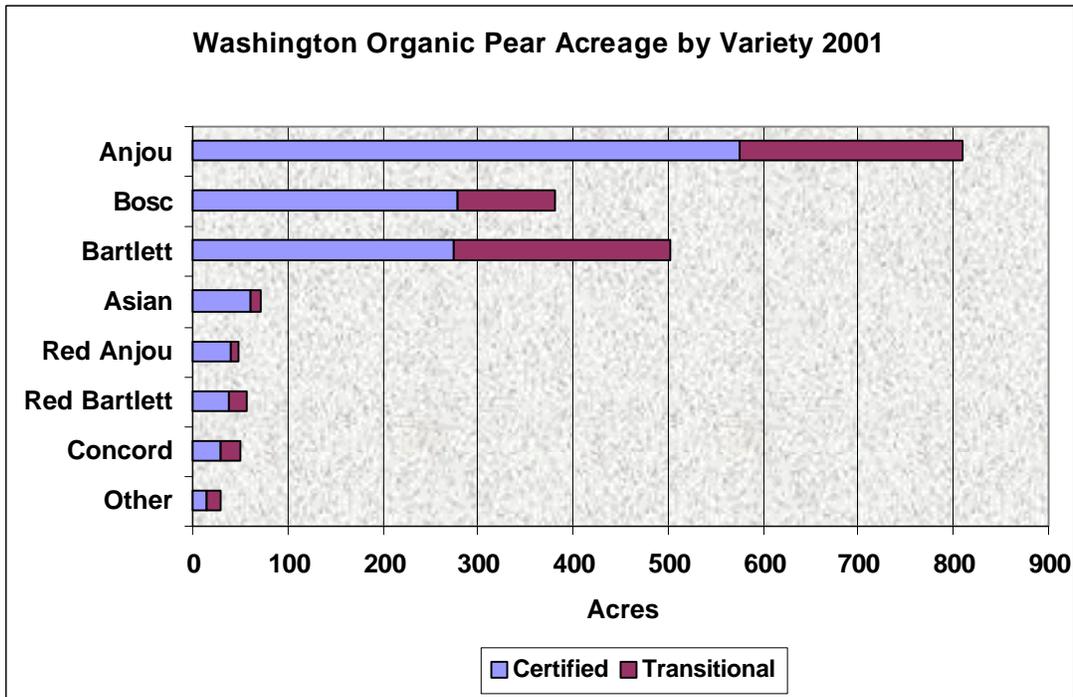
report that they are evaluating a new apple variety (Ambrosia) that shows particular promise for organic production.

Figure 6.



For pears, the Anjou variety, a winter pear, accounts for the majority of organic pear acreage (44%), with 578 acres certified and 235 acres in transition. Bosc and Bartlett each account for nearly 280 certified acres, or 21%, each. There are 229 acres of Bartlett in transition, indicating that this variety will have more certified acreage by 2003 than Bosc. (Figure 7 and Table A4). In soft fruit, growers are transitioning more acres to cherries, but little new acreage appears to be coming in for the other fruit types. Not all cherry growers reported varieties, but for those reported, Bing was the dominant variety.

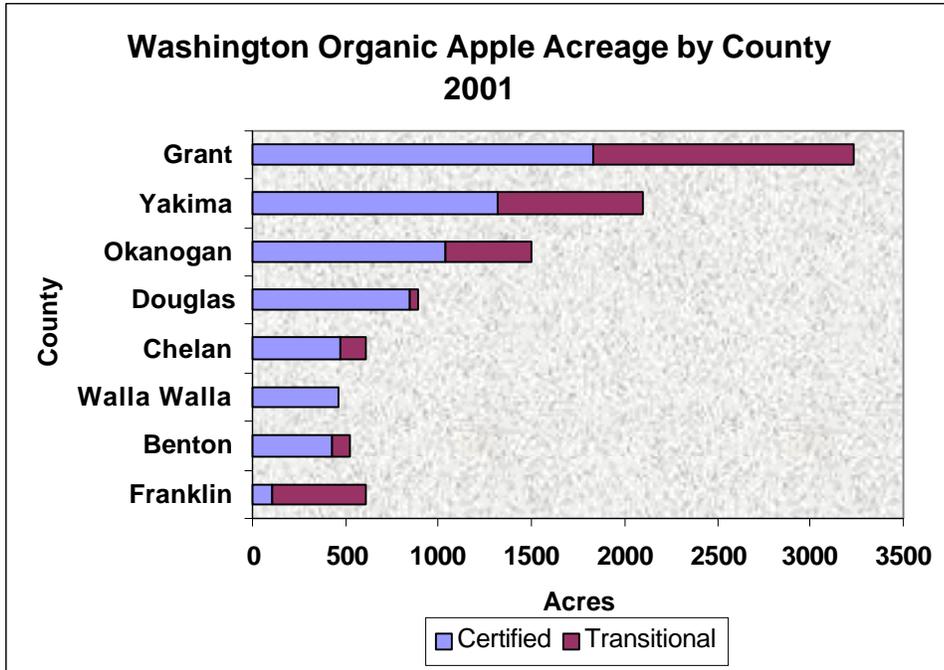
Figure 7.



County Data

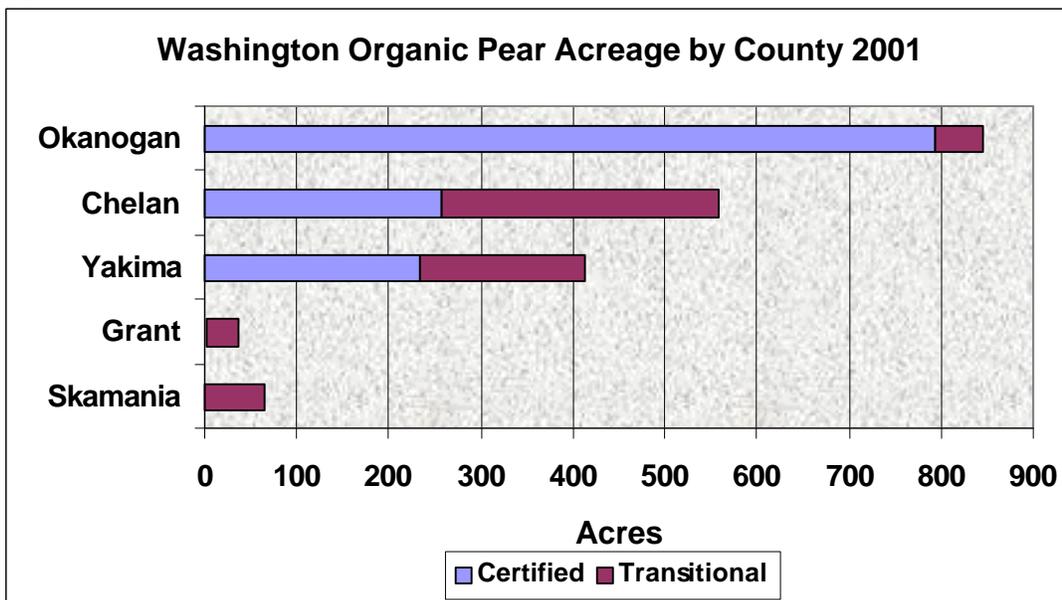
Washington State's tree fruit production is concentrated in the central, semi-arid irrigated region of the state. The same region accounts for the majority of the organic tree fruit acreage, as well as the majority of all organically-farmed land. According to the 2001 WSDA Organic Food Program records, Grant, Yakima and Okanogan counties account for 64% of Washington certified organic apple acreage (Figure 8 and Table A5). Douglas County has 13%, while Chelan, Walla Walla and Benton each have around 7%. Franklin County accounts for 1.6%. Grant County currently dominates organic apple production with 1829 certified acres, and it appears that this trend will continue as Grant County has an additional 1400 acres of apples in transition.

Figure 8.



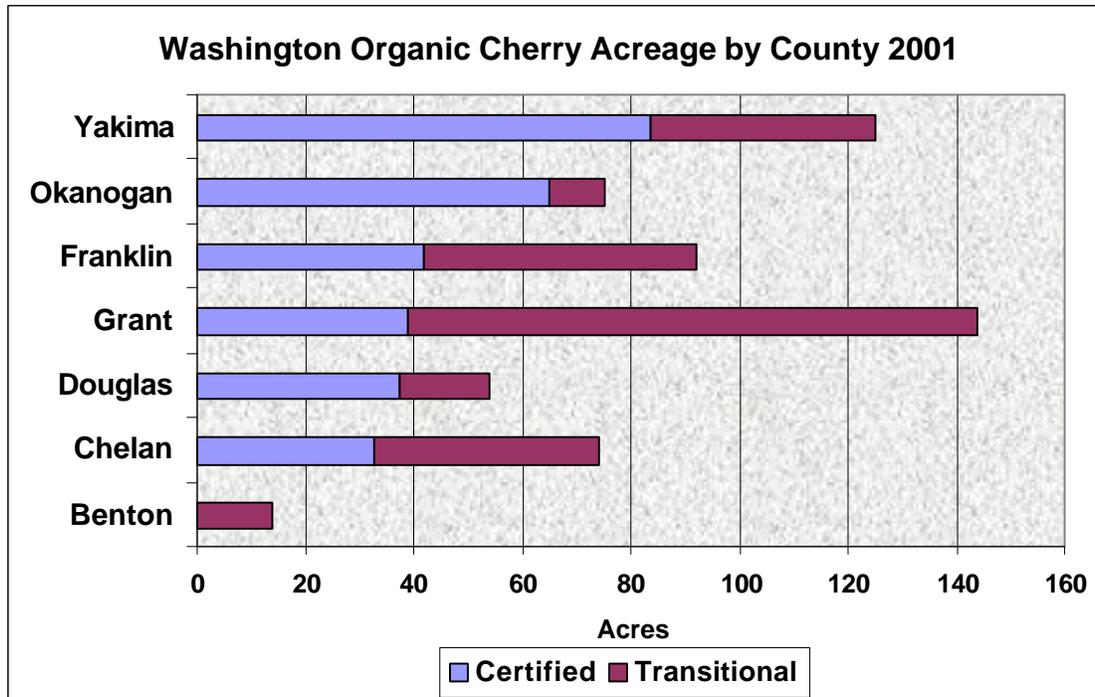
Most of Washington’s organic pears are produced in Okanogan, Chelan and Yakima counties, with 794, 258, and 233 acres, respectively, certified in 2001 (Figure 9 and Table A6). Chelan County has the potential to more than double its certified pear acreage by 2003, with over 300 acres in transition.

Figure 9.



Yakima, Okanogan, Franklin, Grant, Douglas and Chelan are the primary organic cherry producing counties (Figure 10 and Table A7). Grant County has more than 100 acres of cherries in transition and may become the leader by 2003, followed closely by Yakima County.

Figure 10.



Number and Size of Orchards

The number of orchards with certified organic tree fruit has been steadily increasing in Washington State since 1993, reflecting the trends in increased acreage (Table 6). In 1993, an estimated 57 orchards produced organic fruit in the major fruit growing regions. By 2001, 141 orchards produced organic fruit. Large increases in the certified organic acreage per farm are also evident. The average number of acres of organic fruit per orchard more than doubled from 23 acres in 1998 to 49 acres in 2001. This is a result of larger scale orchards entering organic production, as well as increasing conversion and certification of acres on mixed (organic/conventional) farms.

Table 6. Estimated certified organic orchard number and acreage in selected Washington State counties: 1993, 1998 and 2001.

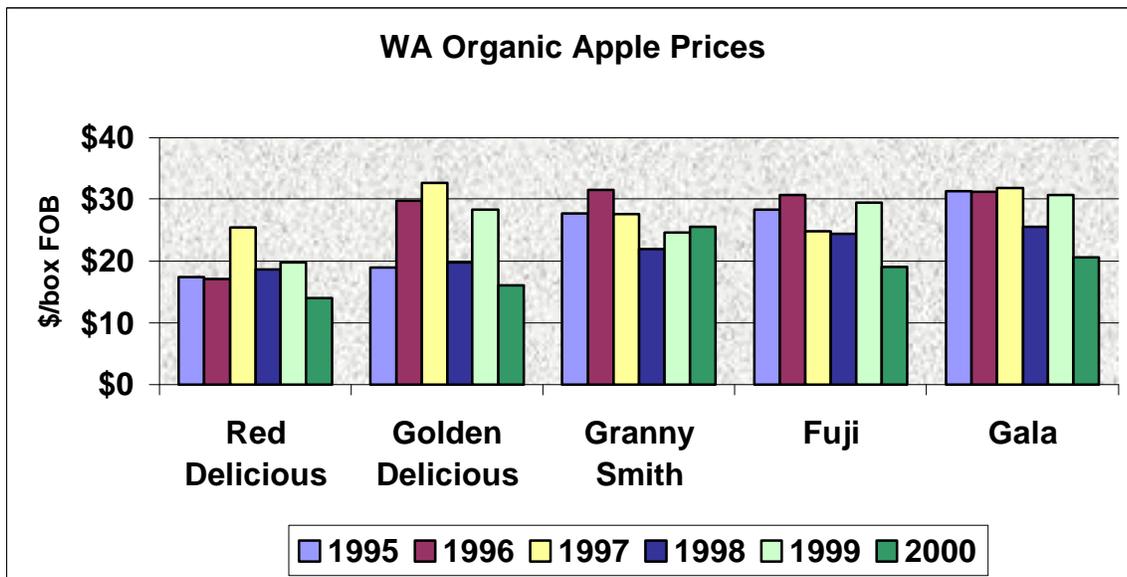
County	No. of orchards			avg. acres / orchard		
	1993	1998	2001	1993	1998	2001
Benton	1	3	4	9	43	42
Chelan	18	24	25	16	15	28
Douglas	8	12	14	21	19	64
Franklin		1	5		16	38
Grant	5	14	22	54	38	70
Okanogan	14	20	21	30	32	49
Stevens	4	5	3	7	7	12
Walla Walla		4	5		24	96
Yakima	7	24	42	10	16	44
Totals/Avg	57	107	141	21	23	49

Organic Fruit Price Trends

Many growers have entered organic fruit production due to the price premiums received for certified organic product. However, accurate price information for organic fruit has been difficult to develop. Prices can vary dramatically among warehouses depending on who their customers are, what type of fruit they are selling, and whether a broker is involved. The Washington Grower's Clearinghouse Association tracks volume movement and price for apples and pears, and began tracking organic apple and pear prices in 1996. Warehouse participation for organic sales was limited initially but has been steadily increasing. Therefore, the more recent price information should be more representative, but it is still not possible to determine what percent of organic fruit volume is represented by this price information. In addition, an undetermined amount of organic fruit is sold on the conventional market each year. Thus, the price information is best used to look for general trends.

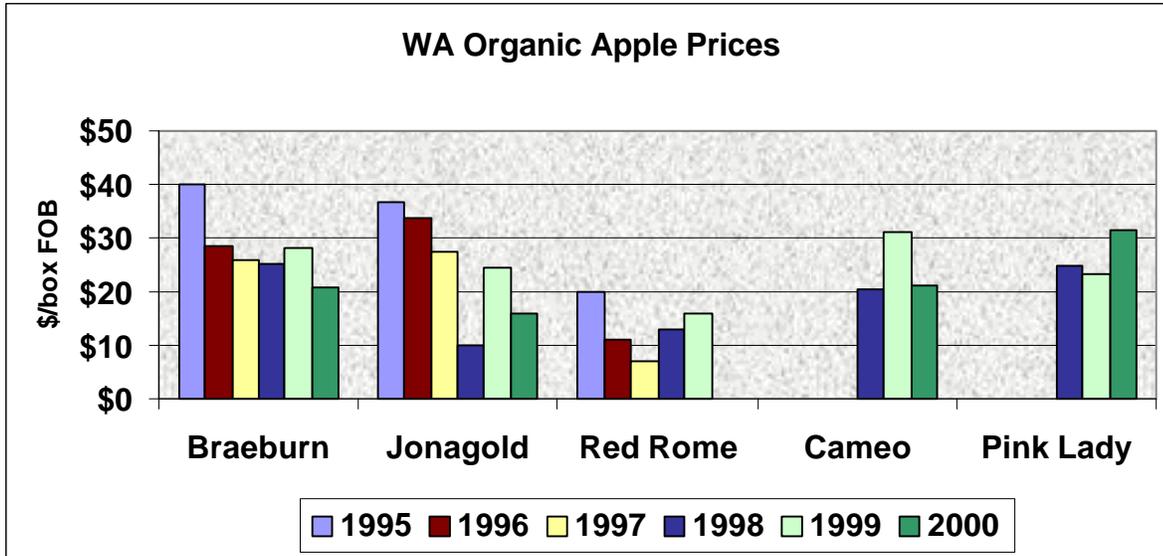
Price premiums for organic fruit have declined somewhat over the years. Multi-year average annual price trends for 10 apple varieties are presented in Figures 11a, 11b, and Table A8. For this report we are using market-year (September-August) average prices across size and grade. The dominant organic variety, Red Delicious, has received lower prices than most of the other varieties, averaging \$18.70/box (FOB) over six crop seasons (1995-2000). Average Gala and Braeburn prices for that period were over \$28/box, with Fujis and Granny Smith above \$26/box, and Golden Delicious and Jonagolds over \$24/box. Three year Pink Lady and Cameo average prices were \$26.68 and \$24.29/box, respectively. Romes averaged \$13.36/box. Red Delicious and Golden Delicious prices in 2000 were similar to 1995 prices. Granny Smith, Fuji, Gala and Braeburn prices have declined from the higher premiums of earlier years.

Figure 11a. Organic apple prices by variety in Washington State. 1995 -2000.



Data from WA Growers Clearinghouse.

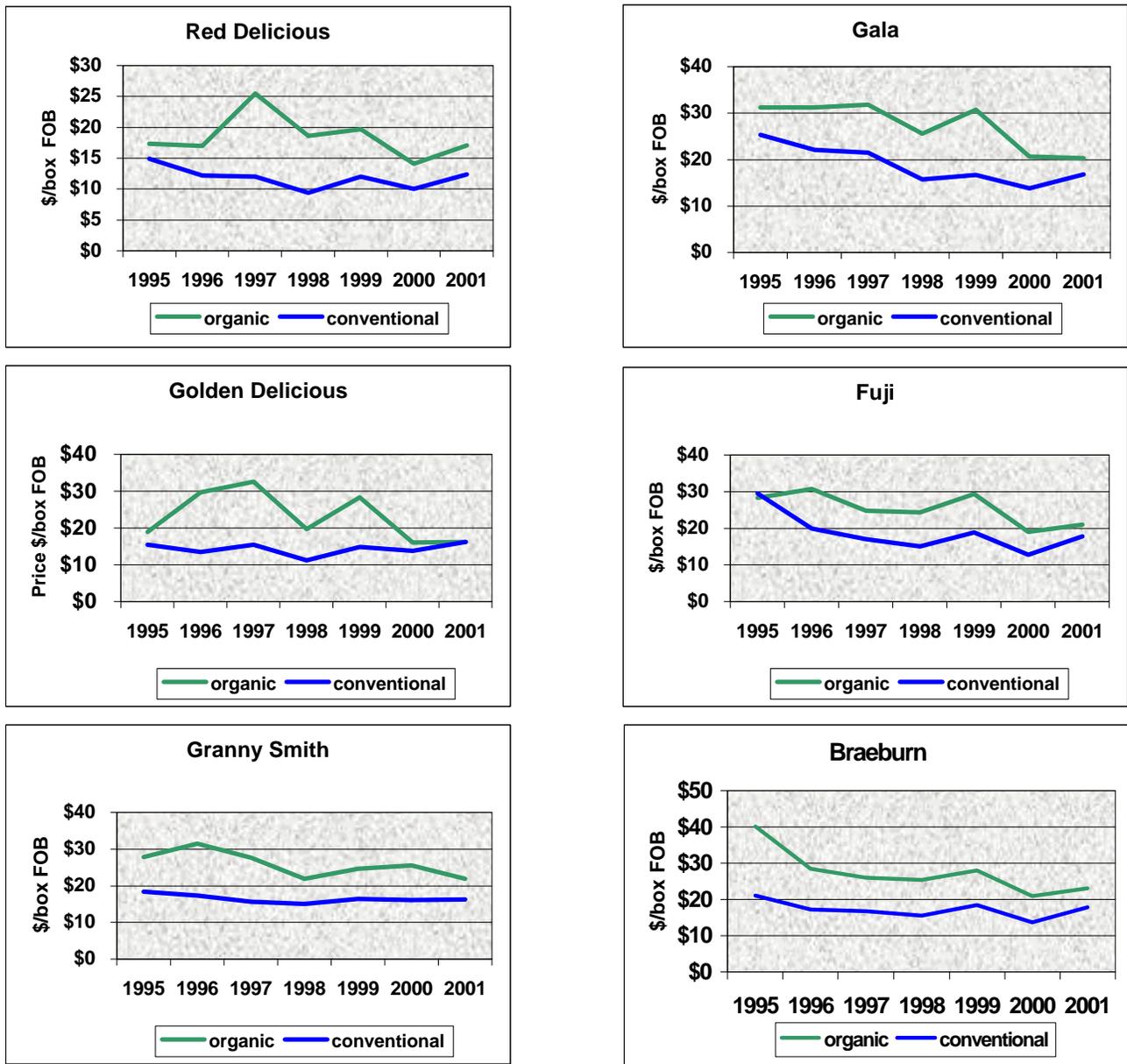
Figure 11b. Organic apple prices by variety in Washington State. 1995 -2000.



Data from WA Growers Clearinghouse.

Organic market prices have not been independent of conventional crop prices. The ups and downs in conventional market prices are reflected in organic prices as well. Over time, organic premiums have decreased in relation to conventional prices, bringing the prices closer together. Average annual price trends for organic and conventional are compared for six apple varieties in Figure 12. The price varies from year to year, and the direction of change is different depending on variety.

Figure 12. Comparison of organic and conventional apple prices by variety, 1995-2001. (2001 data through January 2002).

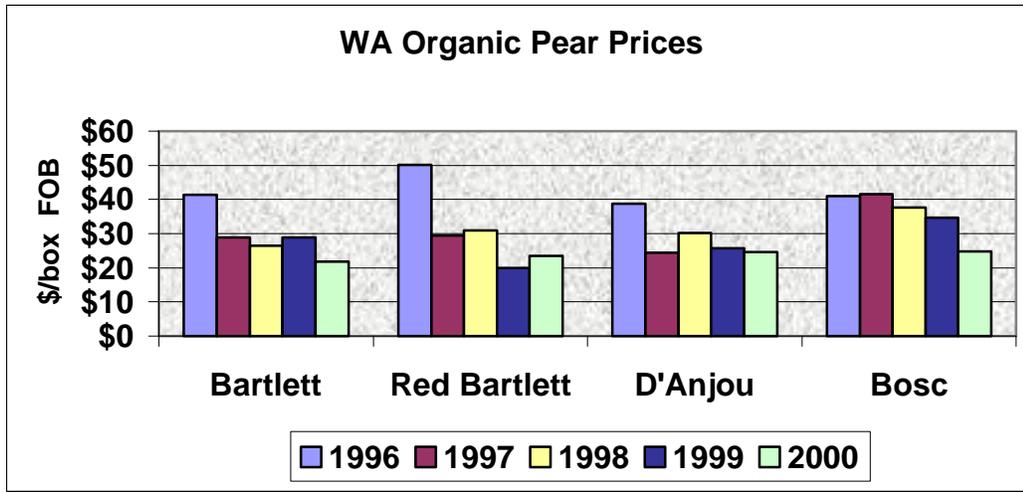


It is important to remember that price premium alone will not guarantee success for organic growers. Prices received by growers must exceed the cost of production in order to maintain profitability. With conventional prices often below the cost of production, a premium for organic does not guarantee that costs are met. Production costs for organic systems as compared with conventional vary with producer. Some organic growers estimate their production costs are 10–30% higher than conventional production costs (Cornwoman and Granatstein, 1999). Others find organic production less expensive over time. In a recent field comparison study of conventional, organic, and integrated apple production near Yakima, Washington (Glover et al., 2002), variable and fixed costs per acre per year were similar between conventional and organic for the third, fourth and fifth year after establishment. However, the authors estimated that organic fruit requires premiums of 12-14% over conventional prices to match the break even point of the conventional system, primarily due to the interest charges on establishment

costs and the slight delay of early production in the organic system. Annual premiums for organic apples tracked over six years are shown in Table A9.

Organic pear prices for 1996-2000 are illustrated in Figure 13. The Bosc variety has had the most stable price year to year, averaging at \$35.93/box (FOB). Red Bartlett, Bartlett and Anjou brought average prices of \$30.78, \$29.46, and \$28.75/box, respectively. Lower prices for Anjou probably reflect greater availability. Average prices for conventional pears ranged from \$14.38/box for Anjou, to \$19.23/box for Red Bartlett for the 1996-2000 period. Bosc and Bartlett prices averaged over \$16.00/box.

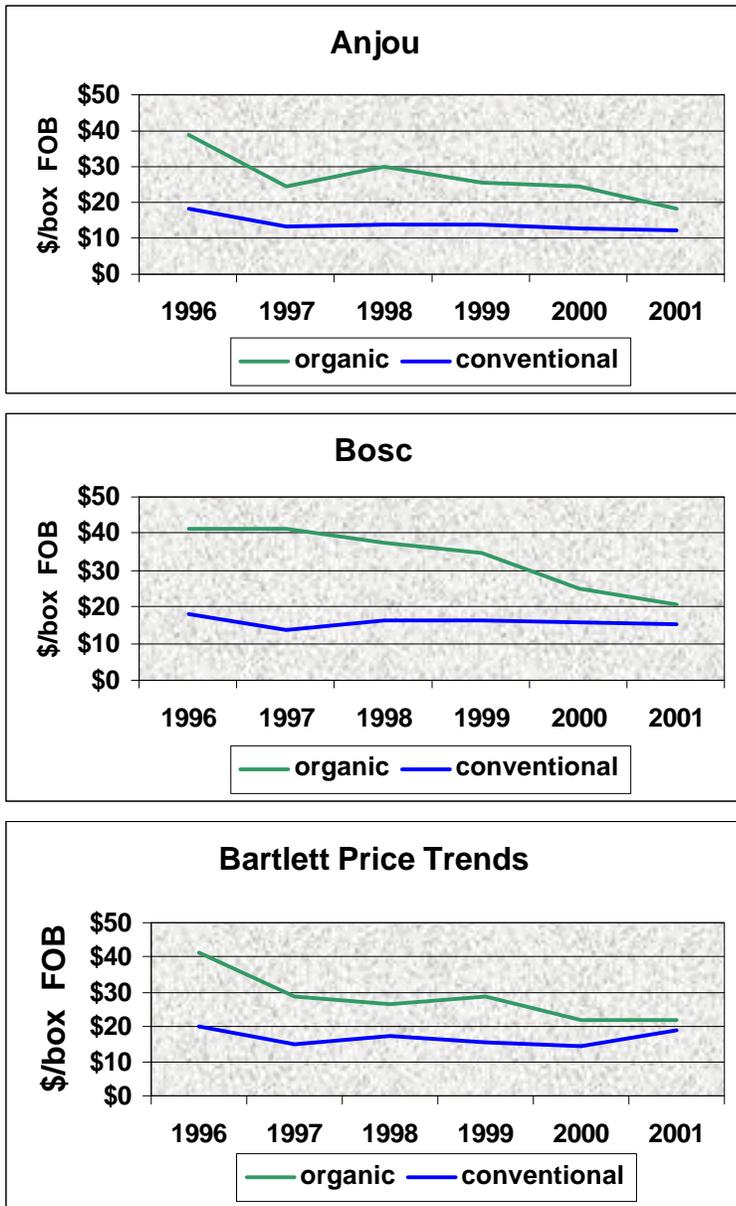
Figure 13. Organic pear prices by variety in Washington State. 1996-2000.



Data from WA Growers Clearinghouse.

Organic pears historically received significant premiums compared to conventionally grown pears (Tables A10 and A11). In 1996, organic Bosc, Anjou, and Bartlett sold for more than twice what conventional pears sold for (Figure 14). Although these premiums have been steadily declining, they were still notable last season, with the 2000 crop of Anjous selling at prices 96% higher than conventional. Bosc and Bartlett sold for 57% and 54% higher, respectively, than conventional. However, according to the Washington Grower’s Clearinghouse February 28, 2002 organic price report, prices for organic pears are mostly down from the same date a year ago. Although Bartlett appears stable at \$21.64/box, Red Bartletts are down \$2.30/box, Bosc are down by \$6.21/box, and Anjou down by \$7.72/box compared to the same time last year. Red Anjou are also down by \$5.24/box. These are significant price drops, indicating that the average price for the 2001 organic pear crop, including the previously stable Bosc, may be declining.

Figure 14. Comparison of organic and conventional pear prices by variety. 1996-2001. (2001 data through January 2002).



Summary and Conclusions

The organic food market continues to grow, with total sales of organic food growing by 20 to 30 percent per year. Consumer surveys indicate that more people are familiar with organic foods and more are purchasing them. For example, the Fresh Trends 2002 Profile of the Fresh Produce Consumer, a survey by Vance Publishing, found that the percentage of shoppers buying organic produce increased from 23% in 1996 to 34% in 2002. The same survey respondents indicated that apples are their top organic fresh fruit purchase.

For the past decade, the steady increase in demand for organic fruit has generally outpaced the increase in supply. The notable exception was in 1990, when there was a huge influx of new organic apple acreage following the Alar incident. Prices dropped dramatically as supply exceeded demand.

Expanded demand has been accompanied by expanded production, as evidenced by the substantial growth of organic tree fruit production since 1995 in Washington State, the U.S., and worldwide. Organic tree fruit acreage will continue to increase, both domestically and internationally. There will likely be some misalignments of supply and demand, as currently may be the case for some apple and pear varieties. The trends of packer and retail consolidation, and counter-seasonal competition, can be expected to impact organic tree fruit growers in the U.S. as well as conventional growers.

While price premiums for organic tree fruit appear to be declining, growers have an opportunity to increase profitability with organic production. Price premiums generally exceed the estimates for increased costs with organic production. However, determining a break-even point is farm specific and actual prices received by growers must exceed their cost of production (including returns to land and management) in order to remain financially viable. Thus, price premiums alone cannot guarantee profitability.

The availability of a range of organic fruit varieties, especially for apple, is a positive trend, as organic Red Delicious do not appear to appeal to organic consumers in the same proportion as in the conventional market. Packing houses report that organic fruit quality is consistently comparable to conventional product.

The growth of the organic tree fruit sector is eliciting more attention from the public and private agricultural support sectors. New biopesticides developed for the conventional market are being specially formulated for organic production (e.g. spinosad). Several research projects are exploring acceptable chemical thinning tools for organic growers, with the potential for significant cost savings in apples. A recent comparison of pest management systems for pears in Washington State found that an organic approach to insect pest management resulted in the least damage and lowest cost (Alway, 2001). With the recognition that organic systems may have something to offer all fruit producers, there is growing support for expanded research and education on these systems.

As market pressures increase, some organic growers are looking for ways they can further differentiate their fruit. Strategies include local and direct markets, gift packs, unusual varieties, and additional labels that further address environmental and social issues not covered by organic certification. Smaller growers will be in a better position to take advantage of these strategies. Thus, it is likely that mid-sized organic growers will feel the most pressure, just as with their conventional counterparts. In addition, new Federal farm policy recognizes the environmental benefits from certain production practices and organic growers are well-positioned to benefit from financial or policy incentives aimed at environmental stewardship in agriculture.

Acknowledgements

Support for this study came from Washington State University Cooperative Extension and Center for Sustaining Agriculture and Natural Resources. The authors extend a thank you to each of the individuals and organizations that provided data for this report. We also appreciate the manuscript reviews and helpful comments from Marcy Ostrom, Dave Muehleisen, Gene Kupferman, and Laura Van Wechel.

References

Alway, T. 2001. The WenatcheeValley Pear IPM Project: 1999-2001. Lessons from soft pest management programs. TC Alway Consulting, Peshastin, WA.

<http://organic.tfrec.wsu.edu/OrganicIFP/PestManagement/WVPP2001.pdf>

Cornwoman, M. and D. Granatstein. 1999. Organic apple production in Washington State: A 1994 Survey of Growers. Final report to Organic Farming Research Foundation, Santa Cruz, CA.

www.ofrf.org.

Gaete, Pablo Ceroni. 2002. Estructura y potencial exportador de la industria orgánica Chilena: puntos críticos para el desarrollo. Agrupación de Agricultura Orgánica de Chile A.G. – AAOCH Temuco, Enero 2002.

Glover, J., H. Hinman, J. Reganold, and P. Andrews. 2002. A cost of production analysis of conventional vs. integrated vs. organic apple production systems. XB1041. Washington State University Agricultural Research Center, Pullman, WA.

Granatstein, D. 2000. Trends in organic tree fruit production in Washington State: 1988-1998. Washington State University Cooperative Extension Bulletin EB1898E. Pullman, WA 99164. 22 pp.

<http://cru.cahe.wsu.edu/CEPublications/eb1898e/eb1898e.pdf>

Granatstein, D. 2001. Research needs for Washington organic apple orchardists. Proc. 1st National Organic Tree Fruit Research Symposium, Grand Junction, CO. p. 9-10.

Montenegro, Laura. 2001. Update of the Argentine organic production. Buenos Aires, September 2001.

Other Data sources

Washington Growers Clearinghouse Association, Robert Call (University of Arizona Cooperative Extension), CF Fresh, Agrupación de Agricultura Orgánica de Chile, HortResearch New Zealand, Linda Edwards (COABC, Canada), Franco Weibel (FiBL, Switzerland), Markus Kelderer (Centro di Sperimentazione Agraria e Forestale Laimburg, Italy), Enrique Sanchez (INTA, Argentina), and Jeff Moyer (Rodale Institute).

State organic crop certification organizations: Washington State Department of Agriculture (Organic Food Program), Idaho Department of Agriculture, California Department of Food and Agriculture, Colorado Department of Agriculture, Iowa Department of Agriculture and Land Stewardship, New Hampshire Department of Agriculture, Nevada Department of Agriculture, New Mexico Organic Commodities Commission, Oklahoma Department of Agriculture, Plant Industry and Consumer Services, Texas Department of Agriculture, Utah Department of Agriculture, and the Virginia Department of Agriculture

Private certification organizations: American Organic Growers and Consumers, Argencert, Arkansas Certified Organics, Inc., Bio-Gro New Zealand, California Certified Organic Farmers, Carolina Farm Stewards, Demeter Association, Farm Verified Organic, Florida Certified Organic

Growers and Consumers, Georgia Organics, Global Organic Alliance, Indiana Certified Organic Inc., Midwest Organic Services Association, Mountain State Organic Growers Association, Northeast Farming Associations (CT, MA, NJ, NY, VT), Ohio Ecological Food and Farm Association, Oregon Tilth, Organic Certifiers, Organic Crop Improvement Association (MI#3, MN#1, MT#1), Organic Verification Organization of North America, Pacific Coast Organic Certifiers, and Pennsylvania Certified Organic. A few U.S. certifiers were not able to provide data; therefore the information presented can only be considered estimates.

Robert Call (University of Arizona Cooperative Extension), CF Fresh, Agrupación de Agricultura Orgánica de Chile, HortResearch New Zealand, Linda Edwards (COABC, Canada), Franco Weibel (FiBL, Switzerland), Markus Kelderer (Centro di Sperimentazione Agraria e Forestale Laimburg, Italy), Enrique Sanchez (INTA, Argentina), and Jeff Moyer (Rodale Institute).

Appendix.

Table A1. Changes in Washington certified organic tree fruit acreage. 1988-2001.

Year	Apples			Pears			Soft fruit		
	Apples (ac)	Annual Acreage Change	Annual % Change	Pears (ac)	Annual Acreage Change	Annual % Change	Soft fruit (ac)	Annual Acreage Change	Annual % Change
1988	109			29			36		
1989	365	256	235	31	2	7	85	49	136
1990	1632	1267	347	164	133	429	269	184	216
1991	1253	-379	-23	344	180	110	197	-72	-27
1992	930	-323	-26	336	-8	-2	173	-24	-12
1993	807	-123	-13	323	-13	-4	131	-42	-24
1994	849	42	5	339	16	5	161	30	23
1995	861	12	1	320	-19	-6	149	-12	-7
1996	1115	254	30	361	41	13	163	14	9
1997	1634	519	47	411	50	14	194	31	19
1998	1809	175	11	449	38	9	208	14	7
1999	2334	525	29	456	7	2	216	8	4
2000	4228	1894	81	619	163	36	385	169	78
2001	6540	2312	55	1308	689	111	588	203	53

Table A2. Organic and transitional tree fruit acreage in Washington State. 1998-2001.

WA Organic Apple Acreage (ac)

	1998	1999	2000	2001
Certified	1809	2334	4228	6540
Transitional	2308	3590	3997	3415
Total	4117	5924	8225	9955

WA Organic Pear Acreage (ac)

	1998	1999	2000	2001
Certified	449	456	619	1308
Transitional	169	624	1040	642
Total	618	1080	1659	1950

WA Organic Cherry Acreage (ac)

	1998	1999	2000	2001
Certified	95	107	193	303
Transitional	90	107	165	280
Total	185	214	358	583

Table A3. Washington organic apple acreage (in acres) by variety. 2000-2001.

Variety	2000			2001		
	Certified	Transitional	Total	Certified	Transitional	Total
Red Delicious	1512	984	2496	1872	864	2736
Granny Smith	452	625	1077	1053	651	1704
Gala	596	577	1173	1040	440	1481
Golden Delicious	603	304	907	860	131	991
Fuji	425	606	1031	807	408	1215
Braeburn	186	165	351	258	177	435
Cameo	93	350	443	151	146	297
Pink Lady	83	196	279	128	532	660
Golden Types				111	11	122
Other	209	71	280	260	51	310
Total	4159	3878	8037	6540	3411	9951

Table A4. Washington organic pear acreage (in acres) by variety. 2001.

Variety	Certified	Transitional	Total
Anjou	576	235	811
Bosc	279	102	381
Bartlett	274	229	503
Asian	60	11	71
Red Anjou	40	8	48
Red Bartlett	37	21	57
Concord	28	22	50
Other	14	15	29
Total	1308	642	1950

Table A5. Washington organic apple acreage (in acres) by county. 2001.

County	Certified	Transitional	Total
Grant	1829	1403	3232
Yakima	1321	774	2095
Okanogan	1037	461	1499
Douglas	848	39	887
Chelan	474	133	607
Walla Walla	464	0	464
Benton	432	91	522
Franklin	109	502	611
Others	26	9	35
Totals	6540	3411	9951

Table A6. Washington organic pear acreage (in acres) by county. 2001.

County	Certified	Transitional	Total
Okanogan	794	53	846
Chelan	258	301	559
Yakima	233	180	414
Grant	2	34	36
Skamania		65	65
Other	21	9	30
Totals	1308	642	1950

Table A7. Washington organic cherry acreage (in acres) by county. 2001.

County	Certified	Transitional	Total
Yakima	84	42	125
Okanogan	65	11	75
Franklin	42	50	92
Grant	39	105	144
Douglas	37	17	54
Chelan	33	42	74
Klickitat	2	0	2
Stevens	1	<1	2
Benton	0	14	14
Total	302	279	582

Table A8. Price trends for organic apples in Washington State (\$/box FOB) ¹

Variety	1995	1996	1997	1998	1999	2000	2001*
Red Delicious	\$17.32	\$17.02	\$25.45	\$18.59	\$19.69	\$14.06	\$17.07
Golden Delicious	\$18.93	\$29.75	\$32.60	\$19.70	\$28.28	\$16.04	\$19.20
Granny Smith	\$27.76	\$31.43	\$27.63	\$21.95	\$24.66	\$25.53	\$21.96
Fuji	\$28.31	\$30.70	\$24.79	\$24.41	\$29.37	\$19.02	\$20.97
Gala	\$31.25	\$31.22	\$31.81	\$25.55	\$30.70	\$20.62	\$20.26
Braeburn	\$40.14	\$28.50	\$26.05	\$25.37	\$28.04	\$20.87	\$23.09
Jonagold	\$36.54	\$33.86	\$27.49	\$10.09	\$24.57	\$15.80	\$19.26
Cameo				\$20.38	\$31.28	\$21.22	\$21.96
Pink Lady				\$24.98	\$23.47	\$31.60	\$32.24

¹ Prices are from WA Growers Clearinghouse.

* Through January 2002.

Table A9. Price premium for organic apples as a percent difference from conventional prices in Washington State. 1995-2000.

Variety	1995	1996	1997	1998	1999	2000
Red Delicious	16%	40%	111%	99%	63%	40%
Golden Delicious	23%	120%	112%	75%	90%	16%
Granny Smith	50%	81%	76%	53%	50%	58%
Fuji	-4%	54%	45%	66%	56%	50%
Gala	24%	41%	48%	65%	84%	50%
Braeburn	25%	-22%	55%	69%	52%	52%
Jonagold	78%	80%	70%	-10%	57%	16%
Cameo				1%	56%	45%
Pink Lady				8%	71%	91%
Red Rome	90%	65%	-49%	17%	18%	
<i>Average</i>	38%	57%	59%	44%	60%	47%

Table A10. Price trends for organic pears in Washington State (\$/box FOB).¹

Variety	1996	1997	1998	1999	2000	2001*
Bartlett	\$41.33	\$28.87	\$26.46	\$28.84	\$21.81	\$21.64
Red Bartlett	\$50.20	\$29.46	\$30.96	\$19.89	\$23.40	\$21.09
D'Anjou	\$38.67	\$24.50	\$30.20	\$25.73	\$24.64	\$18.49
Bosc	\$41.04	\$41.48	\$37.57	\$34.73	\$24.81	\$20.76
Red Anjou				\$25.51	\$27.97	\$20.40

¹ Prices are from WA Growers Clearinghouse.

*Through January 2002.

Table A11. Price premiums for organic pears as a percent difference from conventional prices in Washington State. 1996-2000.

Variety	1996	1997	1998	1999	2000
Bartlett	108%	91%	52%	89%	54%
Red Bartlett	142%	71%	61%	-6%	33%
D'Anjou	114%	84%	115%	85%	96%
Bosc	126%	203%	133%	110%	57%
<i>Average</i>	122%	112%	90%	69%	60%