



Assessment of B.C. Apple & Sweet Cherry Varieties

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Steering committee members reviewed and commented on an earlier draft of this report. However the analysis, findings and conclusions are those of the authors.

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Introduction

This report is the first of two reports that evaluate apple and sweet cherry variety needs and opportunities for tree fruit growers in British Columbia (B.C.). The reports were commissioned by the B.C. Ministry of Agriculture and funded by Agriculture and Agri-Food Canada and the B.C. Ministry of Agriculture through *Growing Forward 2*, a federal-provincial-territorial initiative.

This report is a precursor to a forthcoming report that takes a strategic review of longer term variety development to address long term needs in the B.C. tree fruit industry.

The authors of this report are Globalwise Inc., an economic consulting company in Vancouver, Washington in association with Belrose, Inc., Pullman, Washington. Globalwise and Belrose conduct a broad spectrum of economic analysis in the food and agriculture industries.

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Purpose of Study and Scope of Work

The current phase of the project examines the major worldwide variety trends for apples and sweet cherries. This examination is conducted with particular regard to the structure and conditions in the B.C. tree fruit industry and the prospect for B.C. growers to maintain or gain access to these varieties. The report also covers marketing information gathered from Canadian retailers who are key customers of B.C. tree fruits. Finally, the analysis also covers the B.C. replant program guidelines and recommendations for the new provincial program which has just been announced and will be available over the next seven years.

Apple Variety Trends among Major B.C. Competitors

Knowledge of variety trends among major competitors is valuable for strategic planning by the B.C. apple industry for a number of reasons. Changes in the share of different varieties tend to respond to changes in market preferences. The rapidity of change tends to be related to the size of the price premiums that newer varieties can obtain. In turn, the lack of rapid change can indicate the presence of obstacles to innovation in different countries.

The nature of changes in apple varieties is also becoming more complex. In the 1960s and 1970s, the major change was the widespread adoption of the green-skinned Granny Smith variety. It joined publicly available apples with solid red skins (like Red Delicious) and solid yellow skins (like Golden Delicious). In the 1980s and 1990s, an array of attractive bi-colored varieties (such as Gala, Fuji, Jonagold and Braeburn) became publicly available, and captured a significant share of sales from the red-yellow-green triumvirate.

While the Granny Smith and the bi-colored varieties initially earned a substantial premium, that premium gradually eroded as numerous supplying districts increased the volume placed on world markets. Such a premium was needed to cover the added costs involved in developing and

commercializing a new variety. A consensus developed within the industry that the average price of established varieties was not sufficient to sustain the industry, and that the only way to preserve an adequate price premium was through management of supply, tightly controlling the planting, production, marketing and promotion of future new varieties.

The New Zealand apple industry has long been a pioneer in exploring the potential in the world market for new apple varieties. After the United Kingdom, in 1973, joined the European Economic Community (later renamed the "European Union", or "EU" for short) New Zealand faced both loss of its Commonwealth preferences in the UK market, and higher tariffs in the EU market. It was clear that the returns from existing varieties like Red Delicious and Golden Delicious would not be sufficient to offset the higher tariffs and the severe transportation cost disadvantages faced by New Zealand in European markets.

To meet this challenge, New Zealand's then monopoly marketing board, its leading horticultural research institution, HortResearch that focused solely on horticultural products, the state-funded network of extension agents, and the New Zealand apple industry, worked together to find and adapt new varieties such as Granny Smith from Australia, Fuji from Japan, and Gala and Braeburn, discovered in New Zealand orchards. That effort paid rich dividends for the New Zealand apple industry in the 1980s and 1990s. However, by the end of the 1990s, it was clear that many major competitors had expanded production of those varieties and had eroded the needed price premiums.

The New Zealand apple industry decided that it needed to develop further new varieties for which the intellectual property could be protected, so production could be limited, and that it needed to use targeted branding and promotion to ensure adequate price premiums for the controlled supply. The New Zealand Apple and Pear Marketing Board developed an umbrella brand, ENZA, under which the new varieties would be promoted globally. The Marketing Board changed its own name to ENZA Limited, to emphasize the new, branded approach.

However, executing that strategy was derailed when the ENZA Limited monopoly was disbanded by the New Zealand government in 2002. A private company, ENZA Limited, took over the rights to the varieties then in development, including those later marketed under the Jazz™, Envy, and Pacific Series trademarks. About one hundred independent, private exporters emerged to compete with the privatized ENZA Limited. HortResearch lost the substantial subsidies that it had enjoyed from the monopoly board. The Extension Service was privatized. Subsequently, in a budget-cutting move, HortResearch was absorbed into the Plant and Food Research Company, which had responsibility for multiple agricultural products. It became clear that the New Zealand pipfruit (apple and pear) industry alone could no longer sustain the costs of developing and commercializing new varieties for its exclusive use.

At this juncture, a private company, Prevar™ Limited, was set up to manage the varieties developed by Plant and Food Research. Plant & Food Research provided 10 percent of the necessary capital, while two industry bodies, Pipfruit New Zealand, and Apple and Pear Australia Limited, provided 45 percent each. Plant & Food Research breeds new apple and pear cultivars under Prevar's guidance. New Zealand and Australian growers get first rights to Prevar cultivars. However, it is recognized that cultivars may have to be grown in a number of countries to ensure adequate year-round supplies. The new cultivars are globally tested through members of the Associated International Group of Nurseries (AIGN), which now includes nurseries in 10 countries in Africa, Australia, Asia, North and South America and Western Europe. Prevar cultivars, such as Sweetie and Rockit apples, and PiqaBoo

pears, are in the process of global rollout. At this stage, the volume grown in individual countries is too low to be reported in production statistics.

A further problem in analyzing apple variety trends is that different countries provide different historical series on individual varieties. For example, in New Zealand and South Africa, annual data series are available for the area planted to different varieties. In Chile, annual data are only available for the varieties exported fresh. In European countries, data are available for the total volume produced of each variety. In the following tables, the absolute data for each country, and the percentage contributed by each variety are reported. These are believed to be reliable indicators of the major trends in varieties planted and produced in each country.

Data are presented for three Southern Hemisphere countries, New Zealand, Chile and South Africa, that are important exporters of fresh apples to the Northern Hemisphere; for Washington State, which is the immediate neighbor, and direct competitor, to B.C. in Canada and the United States, and finally, for the three largest apple producing and exporting countries in Europe, Poland, Italy and France, that focus primarily on the changing demands for different varieties in European markets. In general, data cover the 10 most recent seasons, 2004 to 2013.

Table 1 shows the area planted to major apple varieties in New Zealand. Total area planted to apples fell by over 20 percent between 2004 and 2013 as New Zealand struggled to adjust to the end of its monopoly board and as the strength of the New Zealand dollar reduced returns to growers. Gala and Braeburn remained the leading varieties, despite the fact that Braeburn area fell by 56% and Gala area by 31% in the decade. Notable acreage increases were for Jazz (up 200%), Pacific Queen (up 77%) and Cripps Pink/Pink Lady (up 27%). Interestingly, two of the Pacific Series had big acreage declines, Pacific Beauty by 74% and Pacific Rose by 54 %.

Table 1. New Zealand: Apple Area Planted, by Variety and Marketing Year, 2004-2013 (hectares)

| Variety/ type | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 |
|----------------|--------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Braeburn | 3,159 | 2,464 | 2,484 | 2,246 | 2,034 | 1,869 | 1,740 | 1,589 | 1,504 | 1,381 |
| Gala | 3,393 | 2,872 | 2,893 | 2,669 | 2,538 | 2,417 | 2,423 | 2,369 | 2,386 | 2,337 |
| Cox | 401 | 354 | 314 | 295 | 281 | 248 | 236 | 203 | 178 | 150 |
| Fuji | 1,018 | 875 | 836 | 829 | 899 | 931 | 970 | 934 | 905 | 832 |
| Granny Smith | 374 | 322 | 294 | 286 | 282 | 267 | 256 | 256 | 246 | 240 |
| Cripps Pink | 349 | 287 | 248 | 285 | 353 | 397 | 434 | 446 | 459 | 443 |
| Jazz | 289 | 440 | 576 | 768 | 917 | 977 | 983 | 943 | 905 | 869 |
| Pacific Beauty | 351 | 250 | 177 | 162 | 149 | 135 | 127 | 120 | 113 | 92 |
| Pacific Queen | 351 | 306 | 223 | 212 | 220 | 263 | 291 | 351 | 456 | 622 |
| Pacific Rose | 819 | 642 | 529 | 454 | 424 | 416 | 399 | 396 | 390 | 379 |
| All Other | 257 | 184 | 192 | 333 | 388 | 712 | 611 | 717 | 829 | 1084 |
| Total Apple | 10,761 | 8,996 | 8,766 | 8,539 | 8,485 | 8,632 | 8,470 | 8,324 | 8,372 | 8,429 |

Source: USDA, FAS, GAIN Report, No NZ1415. New Zealand Fresh Deciduous Fruit Annual.

Table 2 shows how the New Zealand apple industry has reduced its dependence on the Gala and Braeburn varieties. Their share of planted acreage fell between 2004 and 2013 by about 4% and 13% respectively (table 2). The biggest gains in market share were for Jazz, Pacific Queen and Cripps Pink/Pink Lady. Cox's Orange, Pacific Beauty and Pacific Rose all suffered substantial losses in market share. There was a notable rise in the share of acreage accounted for by all other varieties. In the New Zealand context, most of these other varieties are likely to be new cultivars that are in the early stages of commercialization. Almost 13 percent of New Zealand apple acreage in 2013 was devoted to these emerging varieties, but only about 7 percent of New Zealand exports. Thus, exports of newer varieties can be expected to increase quite rapidly in the next few years.

Table 2. New Zealand: Apple Area Planted, by Variety and Marketing Year, 2004-2013 (percent)

| Variety/ type | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 |
|----------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Braeburn | 29.4 | 27.4 | 28.3 | 26.3 | 24.0 | 21.7 | 20.5 | 19.1 | 18.0 | 16.4 |
| Gala | 31.5 | 31.9 | 33.0 | 31.3 | 29.9 | 28.0 | 28.6 | 28.5 | 28.5 | 27.7 |
| Cox | 3.7 | 3.9 | 3.6 | 3.5 | 3.3 | 2.9 | 2.8 | 2.4 | 2.1 | 1.8 |
| Fuji | 9.5 | 9.7 | 9.5 | 9.7 | 10.6 | 10.8 | 11.5 | 11.2 | 10.8 | 9.9 |
| Granny Smith | 3.5 | 3.6 | 3.4 | 3.3 | 3.3 | 3.1 | 3.0 | 3.1 | 2.9 | 2.8 |
| Cripps Pink | 3.2 | 3.2 | 2.8 | 3.3 | 4.2 | 4.6 | 5.1 | 5.4 | 5.5 | 5.3 |
| Jazz | 2.7 | 4.9 | 6.6 | 9.0 | 10.8 | 11.3 | 11.6 | 11.3 | 10.8 | 10.3 |
| Pacific Beauty | 3.3 | 2.8 | 2.0 | 1.9 | 1.8 | 1.6 | 1.5 | 1.4 | 1.3 | 1.1 |
| Pacific Queen | 3.3 | 3.4 | 2.5 | 2.5 | 2.6 | 3.0 | 3.4 | 4.2 | 5.4 | 7.4 |
| Pacific Rose | 7.6 | 7.1 | 6.0 | 5.3 | 5.0 | 4.8 | 4.7 | 4.8 | 4.7 | 4.5 |
| All Other | 2.4 | 2.0 | 2.2 | 3.9 | 4.6 | 8.2 | 7.2 | 8.6 | 9.9 | 12.9 |
| Total Apple | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |

Table 3. Chile: Apple Exports, by Variety and Marketing Year, 2004-2013 (1,000 boxes)

| Variety/ type | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 prel. |
|----------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|---------------|
| Red Delicious | 8,245 | 9,843 | 9,497 | 9,838 | 7,651 | 9,650 | 9,021 | 7,093 | 6,944 | 4,546 |
| Braeburn | 1,705 | 2,044 | 2,057 | 1,579 | 1,709 | 1,590 | 1,158 | 1,240 | 1,154 | 872 |
| Gala | 11,387 | 14,883 | 17,073 | 16,168 | 15,282 | 19,735 | 21,742 | 17,503 | 21,062 | 17,403 |
| Fuji | 2,864 | 3,494 | 3,679 | 3,159 | 2,044 | 4,250 | 4,146 | 3,352 | 3,545 | 3,137 |
| Granny Smith | 6,856 | 7,063 | 7,194 | 7,453 | 6,173 | 6,883 | 6,035 | 6,116 | 6,510 | 4,278 |
| Cripps Pink | 2,075 | 2,592 | 2,952 | 3,119 | 2,964 | 3,922 | 4,515 | 4,583 | 5,547 | 5,300 |
| Jonathan | 157 | 159 | 182 | 132 | 169 | 167 | 76 | 90 | 83 | 44 |
| Elstar | 21 | 13 | 12 | 9 | 24 | 24 | 34 | 36 | 38 | 38 |
| Jazz | 0 | 0 | 0 | 0 | 0 | 24 | 32 | 63 | 65 | 82 |
| Ambrosia | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 84 | 159 |
| Raku Raku Fuji | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 347 | 751 | 850 |
| All Other | 862 | 936 | 707 | 614 | 1,316 | 713 | 836 | 1,263 | 617 | 709 |
| Total Apple | 34,172 | 41,027 | 43,353 | 42,071 | 37,332 | 46,958 | 47,595 | 41,687 | 46,400 | 37,418 |

Source: EXIMFRUIT Chile, annual editions.

Since the apple industry in Chile is geared primarily to exports, the volume of each variety exported is a very good indicator of the trends in varieties produced (table 3). In the last decade, the volumes of Red Delicious and Granny Smith type apples have continued their long-term decline. They have been replaced by bi-colored varieties like Gala and Fuji (including the Raku Raku Fuji strain), and less and less by Braeburn. The biggest volume growth has been in the Cripps Pink/Pink Lady variety. However, adoption of distinct new varieties has been slow.

**Table 4. Chile: Apple Exports, by Variety and Marketing Year, 2004-2013
(percent)**

| Variety/ type | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 prel. |
|----------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|---------------|
| Red Delicious | 24.1 | 24.0 | 21.9 | 23.4 | 20.5 | 20.6 | 19.0 | 17.0 | 15.0 | 12.1 |
| Braeburn | 5.0 | 5.0 | 4.7 | 3.8 | 4.6 | 3.4 | 2.4 | 3.0 | 2.5 | 2.3 |
| Gala | 33.3 | 36.3 | 39.4 | 38.4 | 40.9 | 42.0 | 45.7 | 42.0 | 45.4 | 46.5 |
| Fuji | 8.4 | 8.5 | 8.5 | 7.5 | 5.5 | 9.1 | 8.7 | 8.0 | 7.6 | 8.4 |
| Granny Smith | 20.1 | 17.2 | 16.6 | 17.7 | 16.5 | 14.7 | 12.7 | 14.7 | 14.0 | 11.4 |
| Cripps Pink | 6.1 | 6.3 | 6.8 | 7.4 | 7.9 | 8.4 | 9.5 | 11.0 | 12.0 | 14.2 |
| Jonathan | 0.5 | 0.4 | 0.4 | 0.3 | 0.5 | 0.4 | 0.2 | 0.2 | 0.2 | 0.1 |
| Elstar | 0.1 | 0.0 | 0.0 | 0.0 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 |
| Jazz | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.1 | 0.1 | 0.2 | 0.1 | 0.2 |
| Ambrosia | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.2 | 0.4 |
| Raku Raku Fuji | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.8 | 1.6 | 2.3 |
| All Other | 2.4 | 2.3 | 1.7 | 1.5 | 3.5 | 1.1 | 1.6 | 3.0 | 1.3 | 2.0 |
| Total Apple | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |

Table 4 shows the share of Chilean apple exports accounted for by the major varieties. In the last decade, the share for Red Delicious and Granny Smith fell by 20 percent. In 2013, Gala alone accounted for close to half of all Chilean apple exports. Fuji (including the Raku Raku strain) was set to overtake Red Delicious. Cripps Pink/Pink Lady was the only other variety that enjoyed substantially increased market share. Jazz and Ambrosia were the only newer varieties identified separately. As managed varieties, their share growth was artificially limited.

**Table 5. South Africa: Apple Area Planted, by Variety and Marketing Year,
2004-2013 (1,000 hectares)**

| Variety/ type | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 prel. |
|------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|---------------|
| Red Delicious | 3,858 | 3,520 | 3,565 | 3,474 | 3,480 | 3,439 | 3,330 | 3,293 | 3,306 | 3,165 |
| Golden Delicious | 4,898 | 4,658 | 4,866 | 5,224 | 5,273 | 5,335 | 5,368 | 5,379 | 5,433 | 5,569 |
| Braeburn | 643 | 649 | 685 | 689 | 699 | 720 | 752 | 749 | 734 | 736 |
| Gala | 2,341 | 2,416 | 2,528 | 2,804 | 2,904 | 2,986 | 3,159 | 3,289 | 3,431 | 3,576 |
| Fuji | 712 | 767 | 825 | 898 | 1,014 | 1,195 | 1,364 | 1,547 | 1,694 | 1,852 |
| Granny Smith | 5,871 | 5,445 | 5,259 | 5,118 | 5,057 | 4,954 | 4,782 | 4,687 | 4,475 | 4,217 |
| Cripps Pink | 1,308 | 1,339 | 1,382 | 1,452 | 1,481 | 1,629 | 1,925 | 2,043 | 2,080 | 2,210 |
| Cripps Red | 322 | 370 | 367 | 429 | 436 | 446 | 441 | 427 | 427 | 519 |
| Kanzi | 0 | 0 | 0 | 1 | 1 | 2 | 21 | 60 | 113 | 165 |
| All Other | 1,373 | 1,610 | 1,157 | 437 | 391 | 394 | 412 | 446 | 473 | 492 |
| Total Apple | 21,326 | 20,774 | 20,634 | 20,526 | 20,736 | 21,100 | 21,554 | 21,920 | 22,166 | 22,501 |

Source: Hortgro Tree Census, 2013

Unlike New Zealand and Chile, South Africa has a large domestic market and increasing sales in low-income, emerging markets in Africa. Table 5 shows the area planted to major varieties. Unlike New Zealand, total area planted to apples has increased modestly (by 5.5%) in the last decade. While Red Delicious and Granny Smith area planted has been falling, that of Golden Delicious increased by 13.6% in the decade. There were also substantial increases for Gala, Cripps Pink/Pink Lady, Fuji, Braeburn and Cripps Red (Sundowner). The only newer variety reported separately was the club variety, Kanzi.

Table 6. South Africa: Apple Area Planted, by Variety and Marketing Year, 2004-2013 (percent)

| Variety/ type | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 prel. |
|------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|---------------|
| Red Delicious | 18.1 | 16.9 | 17.3 | 16.9 | 16.8 | 16.3 | 15.4 | 15.0 | 14.9 | 14.1 |
| Golden Delicious | 23.0 | 22.4 | 23.6 | 25.5 | 25.4 | 25.3 | 24.9 | 24.5 | 24.5 | 24.8 |
| Braeburn | 3.0 | 3.1 | 3.3 | 3.4 | 3.4 | 3.4 | 3.5 | 3.4 | 3.3 | 3.3 |
| Gala | 11.0 | 11.6 | 12.3 | 13.7 | 14.0 | 14.2 | 14.7 | 15.0 | 15.5 | 15.9 |
| Fuji | 3.3 | 3.7 | 4.0 | 4.4 | 4.9 | 5.7 | 6.3 | 7.1 | 7.6 | 8.2 |
| Granny Smith | 27.5 | 26.2 | 25.5 | 24.9 | 24.4 | 23.5 | 22.2 | 21.4 | 20.2 | 18.7 |
| Cripps Pink | 6.1 | 6.4 | 6.7 | 7.1 | 7.1 | 7.7 | 8.9 | 9.3 | 9.4 | 9.8 |
| Cripps Red | 1.5 | 1.8 | 1.8 | 2.1 | 2.1 | 2.1 | 2.0 | 1.9 | 1.9 | 2.3 |
| Kanzi | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.1 | 0.3 | 0.5 | 0.7 |
| All Other | 6.4 | 7.8 | 5.6 | 2.1 | 2.2 | 1.9 | 1.9 | 2.0 | 2.1 | 2.2 |
| Total Apple | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |

The share of area planted fell in the decade by 4 percentage points for Red Delicious and almost 9 percentage points for Granny Smith. Golden Delicious continued to account for almost one quarter of area planted. Gala and Fuji both gained about 5 percentage points and Cripps Pink/Pink Lady about 4 percentage points in the decade. The Kanzi share remained less than one percent in 2013. The Hortgro Tree Census also shows the age distribution of orchards by variety. The average share of all trees aged 0-3 years was 11%, but it was 14.4% for Gala/Royal Gala, 17.1% for Cripps Red, 23.3% for Fuji, and 83.6% for the club variety Kanzi. Thus, these varieties are likely to increase their share of South African apple production in the near future.

Table 7. Washington State: Fresh Apple Shipments, by Variety and Marketing Year, 2004-2013
(thousand 40-lb packed boxes)

| Variety/ type | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 prel. |
|------------------|---------|---------|--------|--------|---------|---------|---------|---------|---------|---------------|
| Red Delicious | 39,090 | 33,612 | 35,417 | 32,432 | 34,087 | 35,123 | 33,885 | 32,862 | 39,253 | 34,485 |
| Golden Delicious | 13,788 | 14,219 | 10,188 | 10,695 | 12,949 | 10,612 | 10,815 | 9,880 | 12,195 | 8,928 |
| Braeburn | 3,455 | 3,253 | 3,506 | 3,371 | 3,425 | 3,295 | 3,349 | 2,338 | 2,795 | 1,922 |
| Gala | 15,438 | 16,735 | 15,658 | 18,895 | 20,328 | 19,481 | 22,108 | 23,226 | 26,060 | 24,361 |
| Fuji | 13,604 | 12,879 | 12,339 | 12,138 | 15,146 | 13,148 | 15,303 | 13,951 | 20,346 | 14,589 |
| Granny Smith | 12,878 | 13,105 | 13,987 | 13,013 | 15,209 | 12,810 | 13,180 | 13,462 | 13,909 | 16,150 |
| Cripps Pink | 2,074 | 2,107 | 1,907 | 2,440 | 2,337 | 2,876 | 2,982 | 2,680 | 3,448 | 3,818 |
| Honeycrisp | n.a. | 456 | 549 | 1,178 | 1,570 | 1,916 | 2,820 | 3,723 | 5,061 | 4,517 |
| Jonagold | 1,083 | 1,192 | 1,199 | 977 | 1,073 | 1,008 | 1,073 | 924 | 965 | 910 |
| Cameo | 1,327 | 1,340 | 1,339 | 1,223 | 1,332 | 1,016 | 831 | 587 | 689 | 507 |
| All Other | 2,134 | 1,918 | 1,789 | 2,102 | 2,210 | 2,311 | 2,901 | 5,115 | 3,575 | 5,478 |
| Total Apple | 104,957 | 100,816 | 97,878 | 98,464 | 109,666 | 103,596 | 109,247 | 108,748 | 128,296 | 115,665 |

Source: Washington Growers Clearing House, annual reports

Washington State is the neighbor, and major competitor, to B.C. in the Canadian and U.S. markets. As such, its variety trends are particularly relevant to the B.C. apple industry's future strategy. Table 7 shows Washington State's fresh apple shipments by major variety in thousand 40-lb packed boxes for the 2004-2013 marketing years. In the year of highest shipments (2012-13) volume was over 30 million boxes (31%) higher than in the year of lowest shipments (2006-07). Year-to-year variations tend to obscure trends. However, the most consistent gains have been for the Gala, Cripps Pink and Honeycrisp varieties, and the most consistent declines for Golden Delicious, Braeburn and Cameo. The trends for Fuji and Granny Smith have been more erratic, but both set new record for shipments in either 2012-13 or 2013-14.

Table 8. Washington State: Fresh Apple Shipments, by Variety and Marketing Year, 2004-2013
(percent)

| Variety/ type | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 prel. |
|------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|---------------|
| Red Delicious | 37.2 | 33.3 | 36.2 | 32.9 | 31.1 | 33.9 | 31.0 | 30.2 | 30.6 | 29.8 |
| Golden Delicious | 13.1 | 14.1 | 10.4 | 10.9 | 11.8 | 10.2 | 9.9 | 9.1 | 9.5 | 7.7 |
| Braeburn | 3.3 | 3.2 | 3.6 | 3.4 | 3.1 | 3.2 | 3.1 | 2.1 | 2.2 | 1.7 |
| Gala | 14.7 | 16.6 | 16.0 | 19.2 | 18.5 | 18.8 | 20.2 | 21.4 | 20.3 | 21.1 |
| Fuji | 13.0 | 12.8 | 12.6 | 12.3 | 13.8 | 12.7 | 14.0 | 12.8 | 15.9 | 12.6 |
| Granny Smith | 12.3 | 13.0 | 14.3 | 13.2 | 13.9 | 12.4 | 12.1 | 12.4 | 10.8 | 14.0 |
| Cripps Pink | 2.0 | 2.1 | 1.9 | 2.5 | 2.1 | 2.8 | 2.7 | 2.5 | 2.7 | 3.3 |
| Honeycrisp | n.a. | 0.5 | 0.6 | 1.2 | 1.4 | 1.8 | 2.6 | 3.4 | 3.9 | 3.9 |
| Jonagold | 1.0 | 1.2 | 1.2 | 1.0 | 1.0 | 1.0 | 1.0 | 0.8 | 0.8 | 0.8 |
| Cameo | 1.3 | 1.3 | 1.4 | 1.2 | 1.2 | 1.0 | 0.8 | 0.5 | 0.5 | 0.4 |
| All Other | 2.0 | 1.9 | 1.8 | 2.1 | 2.0 | 2.2 | 2.7 | 4.7 | 2.8 | 4.7 |
| Total Apple | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |

An analysis of the share of shipments confirms those findings (table 8). Both Red Delicious and Golden Delicious shares have fallen significantly, while those of Braeburn and Cameo have also fallen relatively fast. The big market share gainers have been Gala and Honeycrisp. Cripps Pink/Pink Lady had its highest share to date in 2013-14.

Fresh shipments of all other varieties rose in the three most recent seasons, but still accounted for less than 5 percent of total fresh shipments. In addition, included in these other varieties were small volumes of older varieties like Rome, Jonathan, Winesap and McIntosh. Data on the most important newer varieties are presented in table 9. Most of these varieties are managed by a single licensee in Washington State. Total shipments in the last two seasons topped 3 million 40-lb boxes, and accounted for between 2 and 3 percent of all Washington State fresh shipments. No data are yet available for a large number of other sponsored varieties that are in the early stages of expansion, such as Aurora Golden Gala™, Envy, Kanzi, Koru, Opal, Rubens and Sweetango™. They come from well-established breeding programs and are being managed by large, integrated grower-packer-marketers.

Table 9. Washington State: Fresh Apple Shipments, Newer Varieties, Marketing Year, 2005-2013 (thousand 40-lb packed boxes)

| Variety/ type | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 prel. |
|---------------|------|------|------|-------|-------|-------|-------|-------|---------------|
| Ambrosia | 0 | 31 | 75 | 152 | 217 | 324 | 569 | 591 | 741 |
| Gingergold | 260 | 179 | 178 | 249 | 177 | 265 | 163 | 344 | 86 |
| Jazz | 28 | 56 | 213 | 169 | 229 | 501 | 983 | 1,164 | 1,065 |
| Lady Alice | 0 | 0 | 0 | 0 | 32 | 66 | 120 | 134 | 159 |
| Pacific Rose | 148 | 188 | 242 | 231 | 241 | 222 | 372 | 463 | 578 |
| Pinata | 0 | 0 | 32 | 101 | 93 | 175 | 194 | 295 | 315 |
| Sonata | 0 | 0 | 0 | 0 | 1 | 2 | 4 | 2 | 0 |
| Sonya | 0 | 0 | 50 | 133 | 95 | 103 | 153 | 67 | 70 |
| Starkrimson | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 2 | 1 |
| Sunrise | 1 | 1 | 1 | 0 | 0 | 0 | 1 | 1 | 0 |
| Total New | 437 | 455 | 791 | 1,034 | 1,085 | 1,658 | 2,561 | 3,063 | 3,015 |

Variety trends from three major European suppliers are presented below. France and Italy are long-established exporters of high-quality fresh apples to European and world markets. Poland's apple production has expanded rapidly in recent years. It gained entry to the European Union, and free access to EU markets, in 2004. It became the world's largest exporter of fresh apples in 2012. It gained access to the Canadian market in late 2014. Decisions by Poland on its apple varieties have the potential to affect markets around the world.

Apple production data by variety are presented below for France and Italy for the marketing years from 2004 to 2013. In general, the apple industry in France has been shrinking in both area planted and production for the last two decades (table 10). Production was also affected by severe weather in 2006 and 2012. A shrinking industry is not a favorable environment for investment in new varieties. The major exception has been for Cripps Pink/ Pink Lady. France has been an important player in the global strategy of Apple and Pear Australia Limited (APAL) for expansion of the premium-priced Pink Lady apple brand in Europe. That is why the Cripps Pink/Pink Lady variety has continued to expand

while the total French industry has shrunk. France continues to rely heavily on old stalwarts such as Golden Delicious, Gala and Granny Smith, while production of other older varieties has remained stable. Other new varieties (listed in the footnote) remain a small part of total French apple production. Many of these varieties come from indigenous European breeding programs.

**Table 10. France: Apple Production, by Variety and Marketing Year, 2004-2013
(1,000 metric tons)**

| Variety/ type | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 prel |
|-----------------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
| Red Delicious | 109 | 99 | 84 | 75 | 61 | 74 | 67 | 82 | 47 | 61 |
| Golden Delicious | 658 | 660 | 581 | 616 | 543 | 605 | 564 | 581 | 336 | 518 |
| Braeburn | 154 | 167 | 141 | 144 | 115 | 118 | 94 | 102 | 61 | 85 |
| Gala | 283 | 305 | 272 | 290 | 266 | 261 | 246 | 269 | 226 | 236 |
| Fuji | 32 | 42 | 41 | 49 | 49 | 68 | 62 | 63 | 44 | 71 |
| Granny Smith | 180 | 185 | 173 | 174 | 172 | 186 | 183 | 210 | 147 | 170 |
| Cripps Pink | 54 | 65 | 66 | 73 | 70 | 82 | 89 | 92 | 78 | 83 |
| Elstar | 29 | 31 | 26 | 24 | 17 | 18 | 15 | 17 | 14 | 14 |
| Jonagold | 34 | 34 | 25 | 28 | 22 | 20 | 15 | 14 | 6 | 12 |
| Other New Varieties * | 0 | 16 | 15 | 14 | 30 | 50 | 57 | 59 | 50 | 55 |
| All Other | 176 | 166 | 161 | 189 | 183 | 169 | 187 | 212 | 160 | 202 |
| Total Apple | 1,709 | 1,770 | 1,585 | 1,676 | 1,528 | 1,651 | 1,579 | 1,701 | 1,169 | 1,507 |

Source: Prognosfruit, annual reports.

* Includes Ariane, Belgica, Cameo, Diwa, Greenstar™, Honey Crunch™, Jazz, Junami™, Kanzi, Mariac, Rubens, Tentation, Wellant, etc.

Table 11 shows the share of French apple production contributed by the different major varieties. There has been a gradual erosion of the market share for Red Delicious, Golden Delicious, Braeburn, Elstar and Jonagold. Gala and Granny Smith have maintained their market shares. Market shares have increased for Fuji, Cripps Pink/Pink Lady, other new varieties, and (surprisingly) all other varieties. The combined share of all new varieties remains less than 5 percent. The combined share of all other (older) varieties actually increased by 3 percentage points between 2004 and 2013, indicating that production of these varieties has held up while overall French apple production has been falling.

**Table 11. France: Apple Production, by Variety and Marketing Year, 2004-2013
(percent)**

| Variety/ type | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 prel |
|--------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|--------------|
| Red Delicious | 6.4 | 5.6 | 5.3 | 4.5 | 4.0 | 4.5 | 4.2 | 4.8 | 4.0 | 4.0 |
| Golden Del. | 38.5 | 37.3 | 36.7 | 36.8 | 35.5 | 36.6 | 35.7 | 34.2 | 28.7 | 34.4 |
| Braeburn | 9.0 | 9.4 | 8.9 | 8.6 | 7.5 | 7.1 | 6.0 | 6.0 | 5.2 | 5.6 |
| Gala | 16.5 | 17.2 | 17.2 | 17.3 | 17.4 | 15.8 | 15.6 | 15.8 | 19.3 | 15.7 |
| Fuji | 1.9 | 2.4 | 2.6 | 2.9 | 3.2 | 4.1 | 3.9 | 3.7 | 3.8 | 4.7 |
| Granny Smith | 10.5 | 10.5 | 10.9 | 10.4 | 11.3 | 11.3 | 11.6 | 12.3 | 12.6 | 11.3 |
| Cripps Pink | 3.2 | 3.7 | 4.2 | 4.4 | 4.6 | 5.0 | 5.6 | 5.4 | 6.7 | 5.5 |
| Elstar | 1.7 | 1.8 | 1.6 | 1.4 | 1.1 | 1.1 | 0.9 | 1.0 | 1.2 | 0.9 |
| Jonagold | 2.0 | 1.9 | 1.6 | 1.7 | 1.4 | 1.2 | 0.9 | 0.8 | 0.5 | 0.8 |
| Other New Varieties * | 0.0 | 0.9 | 0.9 | 0.8 | 2.0 | 3.0 | 3.6 | 3.5 | 4.3 | 3.6 |
| All Other | 10.3 | 9.4 | 10.2 | 11.3 | 12.0 | 10.2 | 11.8 | 12.5 | 13.7 | 13.4 |
| Total Apple | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |

* Includes Ariane, Belgica, Cameo, Diwa, Greenstar, Honey Crunch, Jazz, Junami, Kanzi, Mariac, Rubens, Tentation, Wellant, etc.

**Table 12. Italy: Apple Production, by Variety and Marketing Year, 2004-2013
(1,000 metric tons)**

| Variety/ type | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 prel |
|------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|--------------|
| Red Delicious | 276 | 260 | 253 | 249 | 243 | 269 | 245 | 253 | 191 | 223 |
| Golden Delicious | 947 | 946 | 879 | 1,110 | 961 | 979 | 947 | 1,021 | 909 | 958 |
| Braeburn | 85 | 73 | 78 | 93 | 87 | 97 | 97 | 102 | 78 | 79 |
| Gala | 225 | 261 | 262 | 263 | 299 | 324 | 302 | 318 | 274 | 292 |
| Fuji | 62 | 87 | 91 | 136 | 142 | 154 | 163 | 164 | 129 | 170 |
| Granny Smith | 85 | 92 | 94 | 99 | 99 | 115 | 113 | 122 | 94 | 120 |
| Cripps Pink | n.a. | n.a. | n.a. | n.a. | n.a. | 80 | 70 | 92 | 65 | 68 |
| Morgenduft | 126 | 123 | 119 | 88 | 91 | 67 | 81 | 61 | 53 | 66 |
| Jonagold | 40 | 40 | 30 | 30 | 24 | 24 | 14 | 17 | 11 | 10 |
| Annurca | 55 | 68 | 56 | 51 | 45 | 35 | 34 | 35 | 35 | 40 |
| All Other * | 131 | 135 | 129 | 77 | 173 | 93 | 113 | 108 | 100 | 122 |
| Total Apple | 2,032 | 2,085 | 1,991 | 2,196 | 2,164 | 2,237 | 2,179 | 2,293 | 1,939 | 2,148 |

Source: Prognosfruit, annual reports.

* Includes Cripps Pink, 2004-2008

In contrast to France, production of apples in Italy has generally moved higher over the last decade (table 12). Production of Golden Delicious and Braeburn has remained stable, while that of Red Delicious, Morgenduft, Jonagold and Annurca has declined. Gala, Fuji, Granny Smith and Cripps Pink/Pink Lady have all experienced some growth over the decade. The "All Other" category included Cripps Pink/Pink Lady between 2004 and 2007. However, that category has remained small. It includes an unknown mix of newer and older varieties

Table 13. Italy: Apple Production, by Variety and Marketing Year, 2004-2013 (percent)

| Variety/ type | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 prel |
|---------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|--------------|
| Red Delicious | 13.6 | 12.5 | 12.7 | 11.3 | 11.2 | 12.0 | 11.2 | 11.0 | 9.9 | 10.4 |
| Golden Del. | 46.6 | 45.4 | 44.1 | 50.5 | 44.4 | 43.8 | 43.5 | 44.5 | 46.9 | 44.6 |
| Bræburn | 4.2 | 3.5 | 3.9 | 4.2 | 4.0 | 4.3 | 4.5 | 4.4 | 4.0 | 3.7 |
| Gala | 11.1 | 12.5 | 13.2 | 12.0 | 13.8 | 14.5 | 13.9 | 13.9 | 14.1 | 13.6 |
| Fuji | 3.1 | 4.2 | 4.6 | 6.2 | 6.6 | 6.9 | 7.5 | 7.2 | 6.7 | 7.9 |
| Granny Smith | 4.2 | 4.4 | 4.7 | 4.5 | 4.6 | 5.1 | 5.2 | 5.3 | 4.8 | 5.6 |
| Cripps Pink | n.a. | n.a. | n.a. | n.a. | n.a. | 3.6 | 3.2 | 4.0 | 3.4 | 3.2 |
| Morgenduft | 6.2 | 5.9 | 6.0 | 4.0 | 4.2 | 3.0 | 3.7 | 2.7 | 2.7 | 3.1 |
| Jonagold | 2.0 | 1.9 | 1.5 | 1.4 | 1.1 | 1.1 | 0.6 | 0.7 | 0.6 | 0.5 |
| Annurca | 2.7 | 3.3 | 2.8 | 2.3 | 2.1 | 1.6 | 1.6 | 1.5 | 1.8 | 1.9 |
| All Other * | 6.4 | 6.5 | 6.5 | 3.5 | 8.0 | 4.2 | 5.2 | 4.7 | 5.2 | 5.7 |
| Total Apple | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |

* Includes Cripps Pink, 2004-2008

Table 13 shows trends in major varieties as a share of total apple production in Italy. In general, the changes have been quite modest. The most notable have been gradual declines in the share for Red Delicious, Elstar, Jonagold and Annurca, a strong increase in the Fuji share, and modest upward trends for Gala and Granny Smith. The share of all other varieties has remained consistently below 6 percent in recent years. It is safe to say that Italy has had difficulty in finding newer varieties that can compete against existing varieties in its unique growing areas.

The situation in Poland differs markedly from that in France and Italy in numerous ways. The apple industry in Poland developed within the Russian dominated COMECON (communist economic) system, where Poland was designated as a major supplier of processed apple products and fresh apples to the members of the group. Historically, the selection of varieties was influenced by the needs of those markets. In addition, the system had little interest in experimenting with the flood of newer varieties emerging from western breeding programs. As Poland broke away from the COMECON system and sought entry into the European Union in 2004, that mind-set gradually changed. As a result, Poland's plantings now include a wide array of legacy varieties. However, there has been insufficient capital available from either private or EU sources to fund large conversions of apple area to newer varieties.

Table 14 shows the area harvested, production and yield per hectare of the major apple varieties produced in Poland in the 2011, 2012 and 2013 marketing years. The list includes varieties that would be recognizable in the eastern provinces and states of North America, such as Idared, Jonagold, Cortland, Jonathan, Spartan and McIntosh, and six others that would be less familiar, Champion, Ligol, Gloster, Lobo, Antonowka and Elstar. Gloster and Elstar have been popular in the past in Western Europe. In addition, three varieties, Red Delicious, Golden Delicious and Gala, still have a worldwide following. The area harvested and production of all other varieties was larger than the total for many other apple producing countries, an indication of the huge productive potential of Poland's apple industry. Yields per hectare tended to be low, averaging only 16 metric tons per hectare in the best year, 2013. The best performing varieties in terms of average yields were Golden

Delicious and Gloster. However, Gala and Idared had the biggest improvements in yields between 2011 and 2013.

Table 14. Poland: Apple Area Harvested, Production and Yield, by Variety and Marketing Year, 2011-13 (absolute values)

| Variety/ type | 2011 | 2012 | 2013 | 2011 | 2012 | 2013 | 2011 | 2012 | 2013 |
|---------------|---------------------|---------|---------|----------------------|---------|---------|-------------------|------|------|
| | Area Harvested (ha) | | | Production (1000 mt) | | | Yield per ha (mt) | | |
| Red Delicious | 5,372 | 2,800 | 3,300 | 65.0 | 41.4 | 41.7 | 12.1 | 14.8 | 12.6 |
| Golden Del. | 7,796 | 7,800 | 7,900 | 139.1 | 132.8 | 139.2 | 17.8 | 19.2 | 17.6 |
| Gala | 4,750 | 6,900 | 6,900 | 55.3 | 113.8 | 117.7 | 11.6 | 16.5 | 17.1 |
| Idared | 28,128 | 37,700 | 36,900 | 352.8 | 538.9 | 600.3 | 12.5 | 14.3 | 16.3 |
| Champion | 18,261 | 20,300 | 21,700 | 280.8 | 338.0 | 364.7 | 15.4 | 16.7 | 16.8 |
| Jonagold | 20,766 | 18,100 | 18,800 | 296.4 | 284.3 | 303.7 | 14.3 | 15.7 | 16.2 |
| Ligol | 7,675 | 14,600 | 13,600 | 114.6 | 223.8 | 244.0 | 14.9 | 15.3 | 17.9 |
| Gloster | 11,157 | 10,100 | 10,500 | 202.6 | 165.6 | 181.9 | 17.5 | 16.4 | 17.3 |
| Cortland | 15,665 | 9,400 | 9,600 | 202.5 | 131.5 | 145.4 | 12.9 | 14.0 | 15.1 |
| Lobo | 14,078 | 8,100 | 8,300 | 194.1 | 112.7 | 122.4 | 13.8 | 13.9 | 14.7 |
| Antonowka | 3,595 | 5,600 | 4,400 | 40.4 | 59.5 | 61.0 | 11.2 | 10.4 | 13.9 |
| Jonathan | 4,700 | 4,700 | 4,700 | 50.0 | 59.3 | 61.3 | 10.6 | 12.6 | 13.0 |
| Spartan | 4,359 | 4,400 | 4,100 | 56.4 | 54.0 | 62.1 | 12.9 | 13.5 | 15.1 |
| Elstar | 5,861 | 3,500 | 4,100 | 91.1 | 63.1 | 62.2 | 15.5 | 18.0 | 15.2 |
| McIntosh | 4,216 | 3,200 | 3,100 | 48.6 | 42.8 | 44.5 | 11.5 | 13.4 | 14.4 |
| All Other | 27,147 | 37,500 | 35,500 | 353.4 | 515.8 | 547.9 | 13.0 | 13.8 | 15.4 |
| Total Apple | 183,526 | 194,700 | 193,400 | 2,493.1 | 2,877.3 | 3,100.0 | 13.6 | 14.8 | 16.0 |

Source: USDA, FAS, GAIN Report No PL1414, October 2014

Table 15 shows the share of each variety in area harvested and in production in Poland in the three marketing years, and how the yield for each variety performed relative to the average yield. No single variety in Poland accounted for more than 20 percent of total area harvested or production, and only three, Idared, Champion and Jonagold, exceeded 10 percent in any year. Eight other varieties accounted for less than 5 percent of either area harvested or production in any year. Many other varieties were included in the "All Other" category, which accounted for more than one-sixth of all production. This is one more indicator of the diversity of Poland's choices of apple varieties.

Table 15. Poland: Apple Area Harvested, Production and Yield, by Variety and Marketing Year, 2011-13 (percent)

| Variety/ type | 2011 | 2012 | 2013 | 2011 | 2012 | 2013 | 2011 | 2012 | 2013 |
|---------------|---------------------|-------|-------|----------------------|-------|-------|-------------------|-------|-------|
| | Area Harvested (ha) | | | Production (1000 mt) | | | Yield per ha (mt) | | |
| Red Delicious | 2.9 | 1.4 | 1.7 | 2.6 | 1.4 | 1.3 | 89.0 | 100.0 | 78.8 |
| Golden Del. | 4.2 | 4.0 | 4.1 | 5.6 | 4.6 | 4.5 | 130.9 | 129.7 | 110.0 |
| Gala | 2.6 | 3.5 | 3.6 | 2.2 | 4.0 | 3.8 | 85.3 | 111.5 | 106.9 |
| Idared | 15.3 | 19.4 | 19.1 | 14.2 | 18.7 | 19.4 | 91.9 | 96.6 | 101.9 |
| Champion | 10.0 | 10.4 | 11.2 | 11.3 | 11.7 | 11.8 | 113.2 | 112.8 | 105.0 |
| Jonagold | 11.3 | 9.3 | 9.7 | 11.9 | 9.9 | 9.8 | 105.1 | 106.1 | 101.3 |
| Ligol | 4.2 | 7.5 | 7.0 | 4.6 | 7.8 | 7.9 | 109.6 | 103.4 | 111.9 |
| Gloster | 6.1 | 5.2 | 5.4 | 8.1 | 5.8 | 5.9 | 128.7 | 110.8 | 108.1 |
| Cortland | 8.5 | 4.8 | 5.0 | 8.1 | 4.6 | 4.7 | 94.9 | 94.6 | 94.4 |
| Lobo | 7.7 | 4.2 | 4.3 | 7.8 | 3.9 | 3.9 | 101.5 | 93.9 | 91.9 |
| Antonowka | 2.0 | 2.9 | 2.3 | 1.6 | 2.1 | 2.0 | 82.4 | 70.3 | 86.9 |
| Jonathan | 2.6 | 2.4 | 2.4 | 2.0 | 2.1 | 2.0 | 77.9 | 85.1 | 81.3 |
| Spartan | 2.4 | 2.3 | 2.1 | 2.3 | 1.9 | 2.0 | 94.9 | 91.2 | 94.4 |
| Elstar | 3.2 | 1.8 | 2.1 | 3.7 | 2.2 | 2.0 | 114.0 | 121.6 | 95.0 |
| McIntosh | 2.3 | 1.6 | 1.6 | 1.9 | 1.5 | 1.4 | 84.6 | 90.5 | 90.0 |
| All Other | 14.8 | 19.3 | 18.4 | 14.2 | 17.9 | 17.7 | 95.6 | 93.2 | 96.3 |
| Total Apple | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |

Relative yields per hectare for each variety are shown for each year as a percent of the average for Poland. Two varieties, Golden Delicious and Gloster, consistently performed above average, while four others, Antonowka, Jonathan, Spartan and McIntosh, consistently performed well below average. The “All Other” variety category performed slightly below average in each year. However, without more information on the role of these different varieties in farm business plans, in potential markets, and on prices, it is not possible to fully explain why Polish apple growers continue to produce many under-performing varieties.

The Apple No Longer Just a Commodity

For much of modern times, apples have been treated as commodities, that is, the offerings of Red Delicious, McIntosh or Gala from any one grower or marketer were considered as indistinguishable from those of any other grower or marketer. This meant that prices were quite sensitive to the total supplies available in any season. In addition, as production of all apples increased, it put downward pressure on all apple prices. Many states, provinces and countries used generic marketing programs funded by growers in an attempt to gain a geographic price advantage by promoting the message that their apples were superior in firmness, color, taste or other intrinsic attributes.

Numerous research studies indicated that these generic programs were successful in returning more to growers than they cost. However, they had one fatal flaw. In down years, growers got little consolation in knowing that they still lost money, even though generic promotional programs reduced the size of the loss. Generic programs gradually lost favor as the number of small growers eroded and as more and more apple production moved into the hands of large, integrated grower-packer-marketers. Such firms increasingly believed that they could capture more of the benefits within their own firm by spending the same amount of funds on promoting their proprietary brands rather than participating in industry-wide promotions.

In the 1980s and 1990s, as previously noted, leaders in the apple industry began to argue that the way to combat falling prices was to introduce patented or trademarked varieties under which the supply could be controlled so that prices did not become depressed. A strong advocate of this approach was the New Zealand Apple and Pear Board, which had a monopoly over export marketing of all apples from New Zealand. They rebranded the New Zealand Apple and Pear Board as ENZA Limited, and introduced the concept of selling all New Zealand apples under the ENZA brand, and of developing and commercializing new varieties for which they could control worldwide production and marketing. ENZA Limited introduced the Pacific Series of apples in the mid-1990s, and the Jazz variety in the early 2000s with plans to throw the full weight of the New Zealand industry behind this strategy. However, before the strategy could be fully implemented, ENZA Limited lost its monopoly marketing authority. Through a series of financial deals, ENZA Limited emerged as a private company. It was able to retain exclusive, world licensing rights to the Pacific Series and Jazz varieties. However, it now had to compete against many other private New Zealand exporters in world markets.

In Australia, a very distinctive apple, Cripps Pink, had emerged from the breeding program in Western Australia in the 1970s. As its unique appeal became better known, the lead deciduous fruit body in Australia, Apple and Pear Australia Limited (APAL), gained the licensing rights to market the variety as Pink Lady™ around the world. The Pink Lady Association attempted to limit production to a few areas in the world that they deemed likely to replicate the quality characteristics found in Western Australia. They also determined who might pack and market the Pink Lady™ in specific world regions, and set very stringent standards for production, packing and marketing. They also designed a unique logo and marketing campaign aimed at young, affluent, upwardly mobile women. This was probably the first new apple variety that was targeted to a particular consumer segment. Although the Pink Lady program was ultimately very successful, it had to overcome various attempts by growers, marketers and retailers to circumvent its licensing arrangements.

The experiences of ENZA Limited and of APAL led later sponsors of new varieties to set up even stricter legal controls of production, packing and marketing of their new varieties. They carefully selected names, brands and trademarks and developed packaging and promotional programs tailored to specific target audiences. Major marketers of apples competed to win regional or national rights to market the hottest new varieties.

It has become increasingly difficult to make any new variety stand out from the pack.

- Jazz capitalizes on the links of its name to stirring music, and stresses its tangy-sweet taste.
- Pink Lady uses its pink heart logo and feminine promotional materials to woo females.
- Kanzi from Belgium claims to be "sensual, sweet and seductive by nature."
- Joya from France claims to be "the apple for teenagers seeking thrilling experiences."
- Sweetango, from the Minnesota breeding program that brought us Honeycrisp, has used social media to appeal to the "in" crowd.
- Pinata boasts of "its unique tropical flavor and culinary attributes."
- Opal uses a non-GMO certification to highlight its natural non-browning attributes.
- Ambrosia, say its promoters, is aptly named "Food of the Gods".
- Kiku Fuji claim to be 20 percent sweeter than standard Fuji.

These are just a small sampling of the claims that are being promoted. In all cases, the named varieties are being supported by strong marketing organizations with established ties with numerous, major retailers.

B.C. Apple Variety Trends

Table 16 shows the trends in B.C. apple varieties from 2004 to 2014. Production gapped down from 2007 to 2008 in all varieties with production rising generally since the low point in 2008. Gala is the leading variety produced in B.C. Ambrosia, which is the second leading variety is the most preferred variety by customers. Ambrosia production is currently about one-fourth the production of Gala. McIntosh and Spartan production have remained quite steady since 2008.

Table 16. British Columbia: Apple Production, by Variety and Marketing Year, 2004-2014
(thousand 42-lb.packed boxes or equivalent)

| Variety/ type | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 |
|-------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| McIntosh | 1,419 | 1,306 | 865 | 865 | 367 | 320 | 380 | 355 | 448 | 320 | 369 |
| Red Delicious | 1,239 | 1,156 | 956 | 1,020 | 366 | 253 | 300 | 285 | 326 | 255 | 294 |
| Golden Delicious | 574 | 525 | 295 | 314 | 135 | 149 | 168 | 135 | 164 | 121 | 139 |
| Gala | 1,721 | 1,805 | 2,162 | 2,206 | 1,268 | 1,139 | 1,373 | 1,410 | 1,749 | 1,360 | 1,600 |
| Fuji | 336 | 312 | 260 | 240 | 93 | 73 | 132 | 108 | 132 | 119 | 140 |
| Spartan | 1,123 | 1,093 | 970 | 1,013 | 402 | 415 | 523 | 445 | 485 | 383 | 440 |
| Honeycrisp | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 50 | 51 | 60 |
| Granny Smith | 88 | 123 | 133 | 148 | 77 | 74 | 80 | 82 | 94 | 85 | 98 |
| Ambrosia | 0 | 188 | 400 | 513 | 271 | 276 | 372 | 403 | 597 | 400 | 460 |
| All Other - Fresh | 427 | 507 | 134 | 116 | 83 | 52 | 75 | 71 | 76 | 63 | 75 |
| Juice | 0 | 0 | 0 | 0 | 0 | 828 | 816 | 1,110 | 1,370 | 680 | 782 |
| Total Apple | 6,928 | 6,829 | 6,203 | 6,463 | 3,056 | 3,579 | 4,503 | 4,394 | 5,491 | 3,838 | 4,457 |

Source: B.C. Tree Fruit Growers Association based on data from B.C. fruit packers.

Lessons Learned from Apple Variety Trend Analysis

A number of lessons can be gleaned from the previous survey of trends in apple varieties in major producing countries.

1. The last major shift in apple varieties occurred when bicolored varieties like Fuji, Gala and Braeburn took market share away from old favorites like Red Delicious, Golden Delicious and Rome. Many of these new varieties became available in an era when the average size of food stores was getting bigger, the average shelf space available for produce items was expanding, and consumers were becoming much more willing to experiment both with new categories of fruits and vegetables and with greater choices among categories. While consumer acceptance of greater product diversity remains strong, retailers are no longer expanding the average size of stores. Indeed, the trend appears to be towards smaller stores with less shelf space for produce. To win acceptance with retailers, any new variety must be distinctly superior to the many excellent varieties that are already available twelve months a year.
2. On the production side, there are strong forces of inertia that are slowing another, similar, significant shift in apple varieties. One major obstacle is the high cost of establishing new varieties

at the recommended densities, and with the full complement of orchard protections, such as wind machines, overhead sprinklers, hail nets, etc. A minimum estimate for such costs is \$25,000 per acre. Many independent growers lack access to the capital needed for such investments. Independent orchard operations (that is, those not affiliated with packing or marketing operations) have not been sufficiently profitable to generate the needed capital internally, or to attract funds from private lenders. In addition, global recession has reduced the willingness and ability of governments to provide public funds for orchard renewal. Increasingly, new variety introductions are being dominated by integrated grower-packer-marketers that can acquire the capital needed to develop new varieties.

3. There continue to be a steady stream of improved strains of established varieties, like Fuji and Gala, with which growers are already familiar, that can be adopted at lower cost and risk than completely new varieties. Since surveys consistently report that overall retailer and consumer satisfaction with the current selection of apple varieties is high, retailers have little urgency to welcome new varieties.
4. There is a staggering array of new varieties on offer from universities, government institutes and private breeders in many different countries. It is difficult for growers to get good comparative data about each variety on such basic measures as sensitivity to weather, disease or insects, potential yield per acre, packout of desirable sizes and grades, relative appeal to retailers or consumers, or relative prices. It is even more difficult for the individual grower to evaluate how any of these varieties might perform on his or her orchard site. This lack of information significantly increases the risk of any producer's investment in a new variety.
5. Few new varieties are being released as public varieties. Most are now being managed under some type of club system where the grower must obtain a license to grow the new variety. Many club managers discriminate in terms of which countries, growing districts or individual orchardists will be permitted to apply for a license. Even when granted a license, the grower is required to pay fees for trees, volume produced, and marketing and promotion costs. Such costs are in addition to the normal establishment costs discussed in point 2 above.
6. To justify incurring these costs, the grower expects to earn a premium price that will more than compensate for the higher costs and risks involved in growing a new variety. While sponsors of new varieties can claim that their variety will generate a substantial price premium, sponsors will not guarantee that such premiums will be achieved in any specific location. Thus, the grower is not able to shift part of the risk to the variety sponsor.
7. One of the most successful managed varieties, Pink Lady, has had to overcome many obstacles before achieving its current success. It has a distinctive appearance, and an attractive name. It provides 12-month supplies through allocation of production rights to a limited number of suitable producing districts. Its marketing and promotional materials present a uniform image regardless of the source of the product. However, its sponsors, Apple and Pear Australia Limited (APAL), have been forced to invest heavily in legal actions to defend Pink Lady's intellectual property from imitators.

8. Few of the new, managed varieties have yet reached the scale where their production is identified separately in official or industry statistics. Most variety managers prefer to keep this information secret for competitive reasons. Thus, it is difficult for other growers, packers or marketers to know how successful the management of different clubs have been. Word of mouth claims can be difficult to verify. Existing club varieties have generally maintained premium prices that allow recovery of the additional royalty, licensing, and promotion fees. While the club concept is establishing new varieties they are not necessarily superior to current offerings. There is also the practical limit to the number of club varieties that will be accepted at retail. Overcrowding of the marketplace with club varieties could be another issue. Growers should therefore monitor the marketplace and not assume that a club variety is a winning choice.
9. There are few objective studies that explain why some new varieties have been more successful in some markets than in others. For example, Honeycrisp has been extremely successful with consumers and retailers in North America, but not yet in Europe. Pink Lady has been much more successful in the United Kingdom than in continental Europe.
10. Many sponsors boast about the superior taste of their new variety. The taste profiles of individual apples can be quite different. However, it is extremely difficult to predict which consumers, or how many consumers, will prefer the taste profile of Variety A over that of Variety B, or how much more they will be willing to pay for Variety A over Variety B. Similar comments apply to gradations in external appearance such as shape, skin color, or mottles or stripes on the skin surface.
11. In choosing a new variety, growers need to take into account the general conditions in their industry and the potential markets available. Innovation will tend to be easier in an industry that is expanding, compared to one that is contracting. Growers also face numerous constraints on what they can grow successfully due to their soil, climate, number of frost free days, exposure to wind, rain, snow and hail, leased versus owned land, full or part-time commitment to the orchard, and management and skill limitations. They also need to keep in mind the likely market opportunities. For example, to maintain the needed price premiums, New Zealand growers are attempting to switch their focus from the stagnant European market to meeting the evolving tastes of Asian consumers. Italy's varietal choices have been formed by the need to meet the preferences of consumers in its major market, Germany. However, physical conditions in its main growing area in South Tyrol have limited Italy's ability to alter its variety mix as consumer preferences change. South African growers sell in both premium markets in Europe and price-sensitive markets in Africa. In choosing a new variety, B.C. growers need to focus first on the needs of the consumers in British Columbia, then on those in other Canadian provinces, and finally on potential export markets. They also need to be aware of the constraints placed on their choice of new varieties by growing conditions in the Okanagan.
12. In the future, new varieties will only be successful if they have the strong cooperation and commitment from a group of producers, their related packers and marketers, the suppliers of appropriate rootstocks and trees, and the support of local research, extension and field services staff.

Essential Characteristics of Any Apple Variety

Given the competition in today's marketplace, in the foreseeable future, any apple variety, whether established or new, in a B.C. grower's portfolio, will need to meet a few key criteria if it is to ensure net returns to the grower that will provide an adequate return to the land, capital and management employed in the orchard and leave sufficient surplus for regular orchard renewal.

For most varieties, this will mean:

1. Yields at full bearing must be between 45 and 60 bins per acre, depending on variety.
2. The fresh packout of at least 80 percent Extra-Fancy grade. This could be lower for a variety likely to get an exceptional price premium, as in the case of Honeycrisp.
3. Of those fresh market apples, most of the packout must be in the preferred size ranges between size 72 and size 113.

High yields per acre are needed to keep unit costs of production comparable with those of major foreign competitors. High packouts of preferred sizes are needed to boost sales revenues. The only sure way to sustainability in the apple business is to have below average unit costs, and above average unit returns, especially at the low point of price cycles.

Access to New Apple Varieties for B.C. Growers

While numerous new varieties are commercialized every year, many are being released under various restrictions and conditions that make it difficult for B.C. growers to gain access to them. The different restrictions and conditions are dependent on the goals of the breeders and of the managers they select to commercialize their new varieties. Four different approaches to new variety releases are discussed below.

Global Meritocracy

Breeders and sponsors of new varieties that believe their new cultivar represents very valuable intellectual property have tended to impose the strictest terms. The leading generators of new apple varieties include organizations like Prevar (New Zealand), Apple and Pear Australia Limited (APAL), Better3Fruit (Belgium), CIV (Italy) and Summerland Varieties Corporation, (SVC) (Canada). There are also numerous international alliances focused on commercializing new varieties, including the Pink Lady Alliance, the Associated Independent Group of Nurseries (AIGN) and the International Network of Nurseries (INN). The result is an intricate network of affiliations for introducing new varieties.

In general, these organizations and alliances prefer to license production, packing and marketing rights to selected leading integrated grower-packer-marketers in major producing countries. They prefer alliances with firms that can control all aspects of planting, packing, storing and marketing, and that can afford hefty down payments and ongoing fees for exclusive rights to the new variety. Preferred partners include cooperative-type organizations like VOG (Italy) and Blue Whale (France), and private companies like Dutoit Group (South Africa), Yum Brands (New Zealand), Stemilt and Rainier (Washington State), Riveridge Produce Marketing (Michigan), and New York Apples Sales (New York). In turn, these major marketing organizations compete against each other for the exclusive rights to the most promising new cultivars for countries or regions. The bidding for such affiliations can cost millions of dollars over a decade.

For B.C. growers to gain access to such cultivars in the face of global competition, they would have to generate the substantial funds needed to win the rights for Canada, commit to devoting a minimum number of acres to the new variety, and generate continuing funds for initiating and maintaining marketing and promotional programs for the new cultivar. Under the present structure of the B.C. apple industry, it would be difficult (although not impossible) to meet those funding and acreage goals. However, there is a precedent in the promotional funds for Ambrosia.

Exceptions for Domestic Producers

The one exception that the major breeders-sponsors make to a global meritocracy is that they will usually give a time advantage, or more favorable terms, to domestic producers. In some cases, for example in New Zealand, they grant exclusive rights to a large domestic organization based on a bidding process. In other cases, they make the new variety available first to individual domestic producers. Canadian producers have preferential access to new varieties from Agriculture and Agri-Food Canada (AAFC). However, the value of these concessions to B.C. producers over the years depends on SVC's ability to sponsor a steady stream of high-quality, new varieties. For AAFC and SVC, as for all their major international competitors, the probability is low of finding even one winning new variety per decade that is capable of taking market share away from established varieties.

Exclusive Rights to Local Producers

Many small growers believed that the global meritocracy system had the effect of excluding them from access to the best new varieties. As a result, they have supported a policy of making new varieties developed by local, publicly-funded programs available only to local growers, at least in the early years of commercialization. Both Washington State University and Cornell University in New York State have introduced two new apple cultivars under this system.

The first introduction in Washington State, WA2, is being quietly allowed to expire without being given a commercial name (just another indication of the uncertainty involved in any new apple variety). The second introduction, WA38, has belatedly been given a commercial name, Cosmic Crisp, but the marketing rights have not yet been assigned. As a result, the large integrated grower-packer-marketers in the state have been reluctant to make a major commitment to Cosmic Crisp, and have continued to aggressively bid for exclusive rights to other new offerings from the major global breeding programs discussed above.

In contrast, prior to the release of their new varieties, the New York apple industry in 2010 set up a special voluntary grower organization, New York Apple Growers (NYAG), LLC. Members of NYAG who paid the requisite fee would be entitled to access to the new varieties, and would be participants in decisions on future commercialization. NYAG has 145 grower members in the state of New York, representing about 60 percent of the state's apple production. This indicates that members are generally larger growers. Two named varieties, SnapDragon® and RubyFrost® have now been released. However, it is too early to say how these will compete against the many established New York apple favorites like Cortland, Empire, Honeycrisp, Jonagold and McIntosh, and the many, other established internationally-recognized varieties.

Innovation by Branding

Not all innovation requires a completely new variety. An alternative approach has been branding of improved strains of existing varieties. The most advanced example is the Kiku® brand, initially applied to a highly-colored Fuji selection, Fubrax, managed by the Braun organization in Italy. The rights to grow, pack and market Kiku Fuji have now been sold in many countries. So far, the price

premium received for Kiku Fuji over standard Fuji has continued to be greater than the licensing fees. This branded approach is being imitated for new strains of other top varieties.

However, the branding approach has common characteristics with the professional introduction of a completely new variety. A substantial entry fee is charged to participating growers, packers and marketers. Production rights are limited in both volume and area. Quality standards are set for any apple sold under the brand at a level superior to the existing variety. Finally, participants must agree to pay promotional fees to cover the costs of marketing and promotion for the branded product. The ultimate goal is to distinguish the branded product in the marketplace so it can deliver a premium price.

Sweet Cherry Variety Trends among Major B.C. Competitors

The information on trends in varieties of sweet cherries is much more limited than in the case of apples, partly because as a relatively minor crop, sweet cherries receive little attention from official statistics agencies. This lack of information is less of a problem because, in many countries, there has been little innovation in sweet cherry varieties. It is less of a problem in B.C. because B.C. has been among the global leaders in introducing successful new varieties of sweet cherries. While the characteristics of individual sweet cherry varieties are important to growers, packers and marketers, most retailers and consumers can only differentiate between red sweet cherries (like Bing) and blonde sweet cherries (like Rainier). Unlike apples, marketing support for individual sweet cherry varieties does not appear to be desirable or effective.

In Washington State, just 6 varieties (Bing, Sweetheart™, Rainier, Skeena, Chelan and Lapins) accounted for 90 percent of the sweet cherry acreage in 2011. Total Washington State acreage more than doubled between 1986 and 2001. In the next two five year intervals, the rate of growth slowed from 24.1% in the 2001-06 period to 5.9% in the 2006-11 period. In the 2006-11 period, the acreage of Bings, Lamberts, Vans and Selah all declined. However, this was offset by solid percentage gains for established varieties like Rainier, Chelan, Skeena and Sweetheart, and by large percentage increases for newer varieties like Cristalina™, Early Robin, Santina, Sonata and Staccato™. Six of these varieties, Cristalina, Santina, Skeena, Sonata™, Staccato and Sweetheart, came from the Summerland breeding program, and accounted for about one third of Washington State sweet cherry acreage in 2011.

Table 17. Washington State, Sweet Cherry Acreage, by Variety, Census Years, 1986-2011
(acres)

| Variety | 1986 | 1993 | 2001 | 2006 | 2011 | 2011 v 2006 | 2011 |
|-------------|---------|---------|---------|---------|---------|----------------|--------|
| | (Acres) | (Acres) | (Acres) | (Acres) | (Acres) | (% change) | (%) |
| Attika | - | - | - | 34 | 57 | + 67.6 | 0.15 |
| Benton | - | - | - | 176 | 457 | +159.7 | 1.20 |
| Bing | 9,895 | 12,400 | 18,800 | 19,675 | 16,509 | - 16.1 | 43.31 |
| Chelan | - | - | 1,000 | 2,009 | 2,516 | + 25.2 | 6.60 |
| Cristalina | - | - | - | 50 | 163 | +226.0 | 0.43 |
| Early Robin | - | - | - | 44 | 199 | +352.3 | 0.52 |
| Index | - | - | - | 29 | 39 | + 34.5 | 0.10 |
| Lambert | 1,455 | 900 | 900 | 540 | 317 | - 41.3 | 0.83 |
| Lapins | - | - | 1,900 | 1,531 | 2,022 | + 32.1 | 5.30 |
| Rainier | 815 | 1,400 | 3,200 | 3,605 | 4,003 | + 11.0 | 10.50 |
| Regina | - | - | - | 55 | 100 | + 81.8 | 0.26 |
| Santina | - | - | - | 35 | 253 | +622.9 | 0.66 |
| Selah | - | - | - | 95 | 84 | - 11.6 | 0.22 |
| Skeena | - | - | - | 1,492 | 2,576 | + 72.7 | 6.76 |
| Sonata | - | - | - | 98 | 172 | + 75.5 | 0.45 |
| Staccato | - | - | - | - | 199 | n.a. | 0.52 |
| Sweetheart | - | - | 1,000 | 4,401 | 6,569 | + 49.3 | 17.23 |
| Tieton | - | - | - | 553 | 577 | + 4.3 | 1.51 |
| Van | 1,035 | 950 | 1,000 | 615 | 473 | - 23.1 | 1.24 |
| Other | 725 | 850 | 1,200 | 733 | 831 | + 13.4 | 2.18 |
| TOTAL | 13,925 | 16,500 | 29,000 | 36,000 | 38,115 | + 5.9 | 100.00 |

Source: USDA, NASS. Washington Tree Fruit Acreage Report 2011.

The most recent data for sweet cherries for the state of Oregon are for the year 2006. Unfortunately, data are presented in terms of number of trees, not acres, as in Washington State. In 2006, the six leading varieties in Oregon were Bing (27.7% of all trees), Sweetheart (15.5%), Royal Ann (13.0%), Lapins (10.9%), Skeena (7.5%) and Rainier (5.1%). Oregon state was also showing increased plantings of newer varieties like Sandra Rose, Skeena and Sonata from the Summerland breeding program, and Selah and Tieton from the Prosser, Washington breeding program.

A complication in plantings of sweet cherries is that sweet cherries lag the apple industry in the availability of modern rootstocks suitable for planting at greater densities than has been traditional. There is considerable experimentation going on in finding rootstocks that can replace the traditional Mazzard rootstock which was compatible with all sweet cherry scions, and in planting sweet cherries under different training systems. There have been numerous experiments with different cultivars in combination with various Colt, Gisela, Krymsk, Maxma and Weiroot rootstocks, depending on the size of tree demanded. There have also been experiments with various training systems such as central leader, Spanish bush, spindle systems, and the Kym Green Bush (KGB) multi-leader system. Much remains unknown about the effects of various combinations of cultivars, densities, rootstocks and

training systems under different soil and site conditions. However, the choice of rootstocks needs to be considered in any applications related to replanting sweet cherries.

Supply Side Conditions for Marketing Sweet Cherries

In the case of sweet cherries, production in B.C. is dominated by a small number of large growers with their own packing and marketing facilities. These operators have also dominated replantings of sweet cherries. They are large enough to tap the various economies of scale that are available in sweet cherry production and marketing. They are current on the latest best practices in the global sweet cherry industry, and they have the finances to support timely orchard renewal programs.

Generally, B.C. cherry growers need the harvest volume of at least 75 to 100 acres before they have the economic size justify building and operating a cherry packing facility. Most growers will consider such an undertaking if they are mainly packing their own fruit. Adding the packing function also means having a specific marketing approach. Most packers also do their own marketing due to the perishability of cherries.

In general, these operators have set very high quality standards for their sweet cherries. Since most production is from their own orchards, they can exercise tight quality controls at every stage of production, harvesting, packing and marketing. One natural advantage sweet cherry producers in the northern Okanagan Valley is the narrower variation in temperatures in the growing season which enhances cherry quality. Some growers are adding orchards at select sites at higher elevations to reduce the negative effects of summer heat but this also means there is greater risk of crop loss from damaging frosts.

Climatic advantages in the Okanagan Valley have helped growers and packers in B.C. build a high-quality image in both domestic and export markets for their fruit. These operators are large enough to establish continuous marketing programs with major buyers in Canada and in export markets. These marketers point out that they need to produce early, mid and late season cherries to offer a continuous supply to their customers. Such continuity is essential, because buyers will quickly switch loyalty to other suppliers if they cannot get supplies from their Canadian supplier. The leading sweet cherry producer, David Geen, has about 600 acres of sweet cherries with primary focus on key export markets. Other large vertically integrated grower-packers generally follow the same marketing strategy. Many cherry growers report that they are very encouraged by the emerging marketing opportunities in China.

BCTFC sees its future in supplying high quality sweet cherries to both domestic and export markets. Its goal is a 50-50 split between domestic and export sales of the sweet cherries it handles. It sees big opportunities for growth of sweet cherry sales in countries like China and Japan. However, it will still face the challenge of having to source sweet cherries from numerous small growers with erratic harvest timing and varied quality. It will be a challenge to assure continuity of supply of sweet cherries of a high quality. Given that reality, it believes that any new sweet cherry varieties should first be of superior quality so they can be sold head-to-head with sweet cherries from Washington State throughout the season.

Structural Issues in the B.C. Fruit Industry

The present structure of the B.C. fruit industry has a major influence on the access it can obtain both to existing and to new cultivars, particularly in apples. There are also inherent conflicts in goals within

different sectors of the industry and between different sectors that need to be addressed for the industry to access and manage the optimal mix of varieties for today's markets.

Growers

The number of fruit growers in the Okanagan Valley continues to fall, from 575 in 2012 to 523 in 2014, a decline of 9 percent. Over the same two year period acreage appears to have stabilized. Based on published information and comments of numerous interviewees, growers vary widely in size, location (north or south), full-time/part-time status, orchard ownership (owned or leased ground), skill level in production, and knowledge of the demands of the markets. Growers face institutional constraints in gaining economies of scale by adding to their orchard holdings. Lack of scale makes the B.C. fruit industry less attractive as a licensee for new varieties from other global breeding and commercialization programs.

Some industry contacts suggested that only about 200 of the 523 growers are internationally competitive operators. This means that significant tonnage of poor quality is produced each year which harms the reputation of B.C. tree fruits and causes reduced income to the better growers in some cases.

Past replant programs have played a major role in helping the B.C. apple industry convert apple orchards to more modern and productive varieties. For example, the combined share of production of McIntosh, Red Delicious and Spartan has fallen from 54.1% in 1996-98 to 24.0% in 2012-14, while the combined share of newer varieties like Gala, Ambrosia and Honeycrisp has risen from 5.1 percent to 46.0 percent. Few producing districts in the world have achieved that rate of replacement. However, there has been some slippage when some newer varieties did not perform as well as expected because of inherent flaws in the variety or mistakes by growers in choice of site, or in management of unfamiliar varieties.

Accordingly, there was general agreement among interviewees that future applicants for replant funding be provided with more information on the production and marketing implications of variety choice, and be monitored more closely by horticultural professionals during the early years of their replanting efforts.

Breeding Program

Dr. Cheryl Hampson is in charge of both apple and sweet cherry breeding programs at Pacific Agri-Food Research Centre (PARC) in Summerland. The goal is to find cultivars that are superior to those currently available. For sweet cherries, the goal has been to find cultivars that are self-fertile, productive, and that excel in fruit quality, with a range of harvest seasons from early to late. For apples there may be 30,000 first stage crosses with one tree each. Only one percent will be propagated to stage 2. In stage 2, there may be 500 crosses at any time, each with 4 to 8 trees. All of these numbers are considerably smaller for sweet cherry breeding. From these, only one every 2 to 3 years will qualify to go to SVC for further testing. Stage 3 involves grower testing in B.C., other Canada and internationally. It takes 4 years to get fruit to evaluate and a further 4 to 5 years before making a decision to commercialize. The main focus is on testing in the B.C. climate.

Even in the early commercialization stage, much still needs to be learned about the tree's growth habits, responsiveness to cultural practices, productivity, quality, consistency (in color, size, taste, etc.), and ease of storing and handling. After all this effort, the odds of finding a successful new, commercial variety are less than one-tenth of one percent.

There is an inherent disconnect between the process for developing new varieties and the needs of B.C. Tree Fruits Cooperative and other independent marketers. Marketers need proven varieties to meet the immediate needs of their retail customers, whereas breeding programs cannot assure when proven new varieties may be ready for market.

Commercialization Program

SVC is owned by the B.C. Fruit Growers Association. SVC works with PARC in the various stages of commercialization, including product development and testing. The variety commercialization company manages all the intellectual property issues for the new cultivars, develops budwood, and arranges for test plantings. SVC also provides virus-free propagative tree fruit materials to testers around the world. It has recently begun to test the post-harvest characteristics of new cultivars compared to those of standard varieties. Our understanding is that Summerland Varieties is currently undergoing a change in strategic direction, but the future direction is not yet clear.

The B.C. commercialization programs serve different and at times opposing goals because they need to generate revenue from commercial cultivars that can be licensed profitably around the world, while also serving as an engine of innovation for the B.C. fruit industry. Their first role also makes them competitors of leading breeding and commercialization programs around the world, a role that may make foreign competitors more reluctant to license their new varieties in B.C.

Packing and Marketing of Apples

B.C. Tree Fruits Cooperative (BCTFC) is the dominant packer and marketer of apples produced in B.C. However, growers are free to market their apples through other packers, brokers or sales agencies. BCTFC is the price setter for the B.C. apple industry, and alternative marketers generally sell at a discount to BCTFC prices. However, BCTFC must also compete in Canadian and export markets against suppliers from Washington State, the Southern Hemisphere and Central and Eastern Canada. BCTFC tends to be strongest in nearby western Canadian markets.

Because the market is increasingly dominated by large, multi-store retailers, BCTFC must have a sufficient volume of every variety it handles to supply all the outlets of each retail customer for several months. In general, retailers do not want a variety that has limited availability. To meet retailer needs, BCTFC must remove all apples not meeting grade, size and condition standards for the fresh market while running its packing and storage facilities and marketing programs as efficiently as possible. For efficient, low cost operations, the cooperative needs reasonably high packouts. However, because of low packouts of marketable fruits, BCTFC has been forced to discontinue marketing of varieties like Aurora Golden Gala. Growers can be misled by relatively high FOB prices reported for individual varieties that are sold in low volumes. When difficulties in packing and storage, and low packouts, are factored in, the orchard return per acre for such varieties might be dismal despite higher FOB prices.

Ideally, given annual output of about 3 million fresh packs, BCTFC would like to offer retailers a choice among about seven varieties, including established varieties like Gala, Ambrosia, McIntosh, Spartan, Granny Smith, and Pink Lady and potential new varieties like Envy or early season Honeycrisp. Beyond that number, diseconomies of scale drive up packing costs, and the funds for marketing efforts get diluted.

BCTFC also sells to wholesalers and food service companies, but has a very small promotional budget compared to many of its competitors. The levy imposed on growers of Ambrosia continues to be

helpful in supporting promotion of that variety. An increasing cost of marketing has been the demand by every retailer for different SKUs, as they try to distinguish themselves from their retailer competitors.

BCTFC apple sales in Ontario and Quebec must generally wait until local supplies are near exhaustion, something that can vary from season to season. The export business is based on relationships. BCTFC does significant business in the United States with B.C. Gala, Ambrosia and McIntosh. At present, B.C. can sell Ambrosia in the United States, but the U.S. franchisee, CMI, cannot sell Washington-grown Ambrosia in Canada until 2016. Other export markets tend to be quite selective in terms of the variety and size they prefer.

BCTFC and Cawston Cold Storage are the two significant marketers of fresh apples that have controlled atmosphere storage. The remaining companies aim to be out of the market by the start of the calendar year following harvest. They tend to buy market share with lower prices. Both Fairview Orchards and Cawston Cold Storage pack about 10,000 bins of apples. The latter concentrates on organic apples, a niche BCTFC does not serve.

B.C. has a small product introduction and marketing program called “Born in B.C”. It is an effort to test market minor varieties of apples in consumer markets. As part of a larger overall effort to test varieties, this might help determine consumer appeal. Marketing efforts need to be coordinated and sufficiently funded to objectively evaluate expected market acceptance.

Role of Nurseries

Bylands is the major commercial nursery that is well equipped to supply fruit trees for either existing or new varieties in B.C. They play a critical role in any replant program. Since the nursery must propagate trees in anticipation of future demand, it is easy to miscalculate future needs, especially for new varieties. The situation is complicated by the fact that many producers want to propagate their own trees in order to save money. This raises the issue of whether the quality of privately-produced trees can match that of a professional nursery. Clearly, the quality of the trees planted can have long-term consequences for yield and quality for years to come.

Bylands also works closely with SVC to propagate trees for pre-commercial testing. The nursery is in close contact with the field staff of BCTFC and other commercial horticultural specialists in the region. Finally they also develop strong business relationships with growers who rely on them for quality trees.

Findings from Interviews with Canadian Retailers

Apples

The results from Canadian retailers interviewed are quite consistent. There are distinct trends for the varieties of apples. Apple buyers note the proliferation of apple varieties now sold at the retail level. Most of the large retailers report that they sell 20-25 varieties over the course of a season. There are a core of popular varieties, some emerging premium varieties and clearly declining “old line” varieties. While there are some differences among the retailers about what constitute core and premium varieties, there is little doubt about the declining varieties.

Gala is clearly the number one variety of apples sold in Canadian stores. Most retailers report that Gala demand is holding steady. Ambrosia is another favorite variety across all of the retailers interviewed. In Eastern Canada, McIntosh is a popular variety among some segments of consumers but

overall there is decline. Granny Smith is another popular variety but some report that it is probably showing signs of falling demand.

Among the premium brands, there is significant competition and fragmentation. The following varieties were mentioned: Pink Lady, Fuji, Honeycrisp, Envy, Jazz, and Pinata. These varieties are popular but there is no consensus on which are emerging as category leaders. Produce buyers also warn that they are constantly receiving other varieties to evaluate but the overall shelf space for apples as a fruit category is not increasing. This leads to the conclusion that if retailers are not there yet, they will soon be adding a variety by removing – or at least severely limiting -- an existing variety.

Apple varieties in clear decline in the Canadian market include Red Delicious and Golden Delicious. One retailer called these the “vanishing” varieties.

In terms of quality comparison, there is disagreement regarding how B.C. apples compare to the same variety from other sources. Part of the issue might stem from the fact that certain varieties offered by B.C. in the past have had quality problems; Sunrise and Nicola™ were mentioned. Aurora Golden Gala has had difficulty because it looks like the Golden Delicious. However B.C. is looked upon as having superior quality Ambrosia apples. Among some retailers B.C. Gala quality is considered superior. However, one retail buyer offered the observation that they see Gala starting to decline because B.C. quality has been slipping. This might be due to quality difficulties in the latest growing year.

When asked to indicate the newer varieties that are showing stronger demand, the buyers are often hesitant to offer an opinion. This appears to be based on the uncertain and changing taste of consumers and the knowledge that new varieties are steadily being introduced which can tip the scale against what might have been a good emerging variety.

All the retailers are in agreement that quality has to be exceptional for a variety to stand out. Honeycrisp offers the best recent example: its taste met the “wow” factor. Its name might have helped, but it has really delivered on quality. The two quality attributes of great importance are appearance and flavor. The retailers also point out that consumers are the ultimate judges of the winning varieties. This means that at all levels of the market chain, starting with growers and packers, close attention has to remain on the consumer and what they favor. If the variety has the quality to be exceptional it can still falter without specific effort to educate consumers and entice them to try it. Market support is critical for a successful variety to emerge. Large shippers know this and have marketing programs behind their new variety introductions. Ambrosia has this; and this is needed for future variety introductions too.

Retailers indicate they realize the B.C. industry cannot expend a large marketing budget of the size of some major exporters in order to expand sales of B.C. apple varieties. Some actions retailers suggested are: 1) Emphasize communications: what strengths do B.C. growers and packers have and what are the plans for the next 3 to 5 years? Share these initiatives so retailers can adjust and even support these plans. 2) Be open to hearing what retailers think about specific varieties and why they are doing well or not. If retailers have a problem, can the B.C. industry address it? 3) Offer some support for merchandizing and displays. This normally includes market funding but can be scaled back to targeted promotional materials and contributing display ideas. 4) Sampling needs to be offered with a new variety for it to succeed. This counteracts the nature of consumers to remain with the

familiar varieties. It is also a standard for the new exclusive club varieties offered by the large suppliers.

Sweet Cherries

None of the retailers emphasize or usually even identify the variety of sweet cherries they sell. At times, some retailers might note the main and better known varieties such as Bing or Lapins. The category is generally marketed as dark sweet cherries and the emphasis is on appearance and quality. As one buyer put it, “cherries are not like apples: a cherry is a cherry.” Retailers also think few consumers are knowledgeable about the varieties and do not care. For these reasons it appears the buyers themselves are not concerned with the varieties of cherries.

Retail buyers see the challenges of cherries with their perishability and susceptibility to weather factors. They tend to hold this fruit category to a generic quality standard. One buyer commented that the flavor difference among the main three or four varieties is not significant and there is no reason to name the varieties. One buyer remarked that “the shorter the cherry marketing season the better,” to indicate what a large problem the category posed for them.

One retailer said organic sweet cherries were a strong growth category. They wonder if B.C. growers can add this organic fruit to their market offerings.

The reputation of B.C. cherry quality is good among the retailers. However they also think B.C. growers seek premiums that are not justified. This is particularly true for the late season crop. The retailer rationale is consumers have seen the peak season with lower prices. They tolerate upward price movement late in the season but not the high levels some B.C. shippers expect. Increasing Washington cherry sales in Canada is affecting the late-season demand and price structure.

Promotion of cherries needs some of the same attention as discussed with apples. However there is less need to promote cherries as heavily as apples because the season is condensed and the whole category is marketed based on the quality of the crop and overall supply conditions. Price variability also plays a large role.

Replant Programs, Past and Future

Replant grants per acre of \$2,800 to \$7,500 cover only part of the cost of replanting. As a result, the grower has a strong incentive to get the maximum benefit out of the replant program. However, given the increasing competition in global markets, major effort is needed to ensure each grower's replant efforts are successful.

Members of the steering committee and other contacts suggested a number of possible criteria for future replant grants, for example:

1. Choice of variety is critical. There must be proven demand or a reasonable marketing plan by the applicant with specific explanation for how they intend to perform the marketing task. The variety must have demonstrated that it is conducive to efficient packing, storage and handling, and can retain high quality throughout the marketing system. The probability of success for the chosen variety is also critical. For example, the planting of a proven variety like Ambrosia would have much higher probability of success than the planting of a completely new variety whose fate under B.C. conditions is unknown. As previously noted, to remain competitive even in the Canadian

market in the face of rising retailer demands and increasing international competition, depending on apple variety, this will mean:

- a. Yields at full bearing between 45 and 60 bins per acre.
- b. Fresh packout of at least 80 percent Extra-Fancy grade; but this could be lower for a variety expected to get an exceptional price premium such as Honeycrisp.
- c. Of those fresh market apples, most of the packout must be in the preferred size ranges between size 72 and size 113.

Present market indications are that prospects will be best for established newer varieties like Ambrosia, Honeycrisp and Pink Lady and for red strains of Gala. However, growers should be permitted to try newer varieties with greater production and marketing risks if they believe those plantings can be economically sustainable. Variety choice must be appropriate to the conditions in individual orchards, which can vary widely across the B.C. fruit growing area. A fuller discussion of the variety choice will be included in our strategy report.

For sweet cherries our recommendations are:

- d. Average yield per acre of at least 8 tons
 - e. Average fresh packout of at least 80 percent
 - f. Of that 80 percent, for red sweet cherries 75 percent should be 10.5 row or larger; and for Rainier sweet cherries 85% should be 10.5 row or larger.
2. As a guide to growers selected for participation in the replant program, targets could be set for expected tree growth or canopy fill in the second and subsequent years after replanting. Another suggestion was that the applicant be required to attend a seminar that discusses the changes among consumers, retailers, packers and marketers that will affect competition for varieties planted in the next decade. It was also suggested that the grower returns from previous years should be reviewed.
 3. Another important factor is the constant need for growers to reassess what actions to take at each orchard site. Horticultural advisors should be encouraged to leave information on the importance of critical production factors such as infrastructure and the resulting loss of replanting investment if care is not taken.
 4. Consideration of site characteristics such as soil type, north-south orientation, slope, frost condition, etc.
 5. There was strong support for evaluations of items 2, 3, and 4 by a horticultural professional, both as part of the original evaluation of the application and to measure performance at different stages of the replant effort.
 6. It was strongly advised that a mentor be provided for growers that are either relatively new to the tree fruit industry, or whose past performance has been judged marginal.

7. Growers should also be encouraged or even required to attend meetings such as PARC's Cherry Day to learn about the many cherry varieties available to learn more about their known characteristics. Grower sampling of varieties according to maturity date is also suggested.
8. Each time an acre of a variety is planted it adds to the supply of that variety that must be marketed. Growers should be encouraged to contribute funds to support marketing for that variety. Effective marketing support is a necessity in today's competitive environment.

Need for Closer Industry Cooperation and Communication

Given the intense competition under which the B.C. fruit industry must operate, and the constraints it faces in meeting international competition, it is critical for all the major players in the industry to pay close attention to changing consumer preferences and to the decision criteria retailers are using in choosing what varieties to stock for their competitive purposes. A few buyers for the major retail chains are key gatekeepers of what products are made available to consumers, and make the decisions on how prominently any item will be displayed and how strongly it will be promoted. The tree fruit industry is most likely to achieve prosperity when there is a common vision and greater unity about how to address the needs and wants of retailers and consumers.

Because the B.C. industry is small in comparison to other suppliers, they cannot be the low cost producer group. They must have fruit products that satisfy their customers to a degree that justifies premium pricing. This is not achieved when some parts of the industry are producing fruits that consumers do not value as much as other crops or the products are lesser quality. Everyone from growers to packers and marketers must come to grips with this to find the vision for the future.

More open discussion about the problems and opportunities will help achieve the vision of what the industry needs to do to achieve greater success. The replant program offers one of the best ways to ensure that better and more suitable fruits are available in the future from the B.C. tree fruit industry.

Conclusions

Apples

The apple industry has fundamentally restructured in the last 30-35 years. Instead of offering a few "commodity" varieties as in the past, the industry now offers consumers branded apples with controls over where the varieties are produced and requires producers to contribute marketing support to help boost demand. These controlled, "club" varieties are well suited to the large apple production areas where major grower-packer-marketers can most easily meet the requirements of the licensor.

Very few public varieties are being released. They also come with the risk that any grower worldwide has access so over-supply is a risk. These varieties also have no built-in market promotion support which can mean they are less likely to gain the needed consumer attention while club varieties receive continuous market support.

The B.C. region does not fit the characteristics of a primary producer of club varieties so the owners of these exclusive varieties are not likely to offer them in B.C. There is also the practical need for growers to test the yield and quality performance of a club variety that is not licensed for production

to B.C. growing conditions. Therefore in our view, for the next five to seven years at least, there is not much opportunity for the B.C. apple industry to secure a major club variety.

PARC and SVC are actively investigating new apple varieties. However, these organizations report that no highly promising varieties are on the verge of commercial introduction. This is due in part to the need for time to identify promising varieties, replicate the plant materials and conduct production and early consumer preference trials. Reaching commercial release is a ten year process or longer. These organizations play an important role in variety development and need support.

The situation is compounded by the fact that consumers are already seeing a proliferation of newer apple varieties in the last decade and there is every indication that more are in the offing as big industry players try to secure a stronghold in this major product category. Packers and marketers, especially BCTFC, as well as major retailers hold key positions in determining what consumers see and try. Retailers want the winning fruit varieties but are not anxious to be the testing grounds for little-known new product entrants. This view works back to the packers and marketers as well.

All of these conditions are challenges for B.C. At this time, the replant program is set to start and it will be a large factor in charting the destiny of B.C. and its apple sector. We think these are key elements of the replant program, with respect to apples, that should be applied:

1. Ensure that well qualified growers with proven ability to grow high quality fruit with accepted markets are the main participants. Less qualified growers need to show strong evidence that they are going to be improving their production base to participate.
2. Put guidelines in the program that describes principal production sub-areas where identified varieties are generally suited. If growers request funds to grow other varieties, require added explanation and justification.
3. Ensure that qualified third party horticultural specialists have reviewed the grower's production plans and made comments for selection committee review.
4. Growers that have demonstrated success in the early years of the replant program should be given preference in subsequent years.
5. Convene a meeting for all growers who wish to apply for replant grants to discuss: retailer and consumer trends, the need for scale in any marketing effort, the pros and cons of different varieties and review the ranking of apple varieties. This meeting could also feature a panel representing retailers, BCTFC, PARC/AAFC, SVC, breeders, nurseries, and horticultural experts from different regions, etc., to make brief presentations and then allow applicant questions and comments. Costs of conducting the meeting should be shared by the government and growers.

Beyond the replant program, there is need for the majority of growers, packers, marketers and even Canadian retailers to expand cross-communications and seek a more unified vision for what opportunities are ahead for B.C. apples. The industry has to capitalize on its uniqueness and strengths. This includes:

- Further solidify the B.C. position as the local supplier for western Canada, which also includes emphasis on ensuring the fruit is handled with great quality-saving care from the field to all final markets.
- Emphasize production expansion of Ambrosia apples, the current jewel among B.C. varieties and by far the main variety that is well suited to production here while also enjoying strong retail demand in Canada and elsewhere.
- Establish new and higher standards for receiving in-coming fruit at BCTFC, which might have the effect of excluding some growers from the cooperative.
- Establish a variety priority list that emphasizes major varieties that are best for the main retail and food service channels. Explain this with back-up data on market performance and widely communicate this so growers have greater awareness that BCTFC will emphasize these varieties in the next five or more years.
- Bring the main private industry groups together with government support to add financial resources for more focused evaluation of newer varieties in commercial packing, storing and distribution systems, and with different types of consumers.

Throughout this project, the Steering Committee has considered variety selection for the next 5 to 10 years for growers to consider as primary candidates. It has been determined that no new variety that is in development at PARC is suitable for near term release as a commercial variety. Furthermore it has been emphasized that getting a variety to commercial development is a long term process, usually taking ten or more years from research and initial variety selection to commercial evaluation. It is also thought that no club variety is actively being considered for introduction in B.C. With these conditions in mind, the following varieties offer general guidance for growers' consideration. Unique conditions for any apple grower may lead to the selection of other varieties.

Table 18. Recommended Apple Varieties for the Next 5-10 Years

| Variety | Key Comments |
|-------------------------|---|
| Ambrosia | A B.C. "original" that is well accepted in major Canadian and US markets. BCTFC and the main Canadian retailers concur that demand is greater than supply in Canada. It is a grower-friendly variety. Issues are a) B.C.'s supply preference in the Canadian marketplace will be removed in 2015 and b) the B.C. marketing levy for Ambrosia will be lifted in 2016 unless it is renewed. |
| Red Strains of Gala | Gala is the top selling variety in Canada and is popular in export markets as well. A deeper red colored Gala is considered a key to its expansion. One caution is that deeper red strains must not reduce storage life, which would make the fruit less acceptable at retail. |
| Honeycrisp | Demand for this variety has far exceeded expectations. The rapid supply growth is gradually bringing price premiums to an end however. Also the Honeycrisp is challenging to grow in much of B.C. so net grower returns after packout need close attention. |
| Red Strains of McIntosh | McIntosh with better appearance and higher yields would help revive this long-standing variety. It is primarily suited to the Canadian market. New high color strains could help revitalize this variety. One concern is that consumers most familiar with McIntosh are in the older age groups. |

New club varieties like Envy are worth further exploration. This requires further discussions with the owners of these varieties and growing trials to determine if the varieties have suitable yields and product characteristics in B.C. More horticultural knowledge is needed before such varieties can be recommended.

Salish™ is a newer commercial release that is not yet proven. The volume is quite low and further grower evaluation is warranted as well as more extensive consumer acceptance testing. Low marketing expenditures to date complicate a decision about the potential of Salish.

Sweet Cherries

The global demand for sweet cherries has been growing rapidly in recent years. Retailers and consumers have welcomed the longer availability of sweet cherries that is now possible with the newer varieties. The sweet cherry breeding program at PARC is the world leader in new variety development. A majority of the sweet cherries now being planted across the globe are using varieties that PARC has developed and SVC is licensing. While growers have ready access to a large number of varieties, they still seek new varieties to offer customers superior tasting and appealing fruit, and meet grower issues that include cold hardiness, extended storage quality and preferred harvest dates. Production risk is high for cherry growers and planting decisions are more complex for cherries than apples. While needing to accurately evaluate specific site characteristics when choosing varieties to be able to maximize quality and size, cherry growers must also closely consider the harvest timing at their orchard location for marketing and labor requirements.

New sweet cherry variety work is important but less emphasis is being given to cherries since they are a more minor crop than apples. The variety of sweet cherries is rarely displayed in retail stores, especially the mass market food chains in Canada and the U.S., but variety still plays a key role in successful marketing programs. This is because brand marketing and quality reputation is a direct result of variety along with handling and storage. Cherry marketers also report that export buyers are quite knowledgeable about varieties and this clearly enters their decision making in selecting suppliers.

Plant breeding has already extended the marketing period for B.C. and other major production areas into September. Although the Northern Hemisphere sweet cherry season now extends from May until mid-September, B.C. sweet cherry marketers still focus on the tail-end period of the season because it is very profitable for exports since other competitors are out of the markets.

The replant recommendations discussed above for apples generally also apply for sweet cherries. Variety choice is more complex for sweet cherries, and is strongly related to specific operators, marketing needs and site conditions and this probably necessitates a more detailed replant plan for cherries than for apples.

Growers must make very site-specific evaluations and address a wide range of factors. Probably one factor that growers have not been addressed sufficiently in the past is market acceptance. Customer requirements and preferences vary depending on whether growers sell sweet cherries via their own packing operation, that of other independent packers or the BCTFC. Market acceptance is more critical as the overall production of sweet cherries expands in B.C., Washington state and elsewhere.

During this project the intent was to provide a set of recommended sweet cherry varieties for the B.C. industry. However disagreement was found among growers, packers and others regarding those varieties to recommend. Instead of making recommendations, the following key characteristics of the major varieties are presented.

Cristalina™ – One of B.C.'s better early varieties that is more split-resistant than other early varieties. It has good flavor and firmness. It is also liked for filling a void in early cherry availability. This variety is generally grown in the south end of the Okanagan Valley.

Lapins – One of the first AAFC/PARC varieties to be widely planted before newer and generally better PARC varieties became available. Lapins is productive and self-fertile. In domestic markets, Lapins is under great market pressure in the July 15-August 4 period. One issue regarding the acceptability of Lapins is that older trees have declining production. In the case of older trees, replanting may make sense. They do fill a harvest window of 12 to 14 days after Bing. An alternative is Skeena for this harvest period.

Satin™ – Satin not self-fertile. Its maturity is comparable to Bing and Van. Although it has been available for many years it is not well known and little can be reported about its characteristics to guide growers for site selection.

Sentennial™ – One of the latest season varieties that is very firm. Growers report that other varieties have similar harvest timing, depending on the area. Generally this variety is reported to be less flavorful, but in certain cases this may be due to harvesting before full maturity. There are also reports of a tendency to have loose stems especially when left on the tree before harvest.

Skeena – This is a self-fertile variety with maturity comparable to Lapins. Fruit size is good, and the fruit is much firmer than Lapins. However, it is more susceptible to splitting than Lapins. Skeena is generally considered a good export variety.

Sonata™ – This is a self-fertile, mid-season selection. Taste is reported to be inferior to most other cherries. There are also differences of opinion as to the firmness of this variety.

Sovereign™ – Sovereign and Centennial are almost identical in maturity date. Virus-free wood for Sovereign has only become available recently, so viruses could be limiting production in some earlier plantings. Fruit size is larger than Sweetheart and similar to Staccato. Some reports are it is hard to get to crop so site selection needs very close attention.

Staccato™ – A generally well liked self-fertile variety that is harvested in early August depending on location. Like other late harvest varieties it is susceptible to slip-skin. In early production areas this variety is probably best for export as otherwise it is coming into market during the Washington glut supply period.

Suite Note™ – This variety was developed and released for commercial production in 2013 by the AAFC breeding program at Summerland. It is not self-fertile. It is an early season variety with good size and favorable stem characteristics. It may be quite susceptible to rain-splits.

Sweetheart™ – A very well-known and popular variety, especially in the mid-late season areas. It has very good storage life, which allows ocean shipping for export to Asia. It is self-fertile, very productive with the proper tree training and nutrient program.

The discussion of cherry varieties is not intended to substitute for thoughtful decision-making by growers. Variety selection is just one element of consideration. More data and analysis is also needed to determine the end of the economic life of current cherry tree plantings. Profitability from older trees with reduced yields and declining quality needs to be compared to replant costs and greater returns from tree replacement.

Programs that raise grower knowledge are an on-going task that will bring long-term rewards to the B.C. apple and sweet cherry industry.



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