

World Apple Production And Outlook

Background Report no. 1

**Prepared for
Growing With Care Committee**

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1 Introduction

This is the first background document ¹ that has been prepared for Part I of the Growing With Care Committee's process of developing a marketing strategy for Integrated Fruit Production (IFP) grown apples and pears from the Okanagan.

KPMG Consulting's sub-contractors, Calissi Consulting Inc. and Crane Management Consultants Ltd., undertook the primary research and the report was drafted by Calissi Consulting Inc., Crane Management Consultants Ltd., and Stratigis Management Consulting Ltd.

The objectives of this report are to develop and present the following.

- Conventional apple production data on a worldwide basis
- Organic apple production data on a worldwide basis
- Integrated Fruit production (IFP) apple production data on a worldwide basis
- Outlook for the global industry using a competitiveness strategy framework.

The research process consisted of the following.

- phone interviews and e-mail exchanges with persons who are knowledgeable about worldwide apple production
- collecting and analyzing print and Internet materials on the report's subject areas

¹ Report no.1 – World Apple Production and Outlook
Report no.2 – Survey of Consumers: IFP Grown Apples
Report no. 3 – Survey of Produce Trade: Marketing of IFP Grown Apples
Report no. 4 – Strategic Review of Eco-Branding and Eco-Labeling of Apples
Trip report – Interviews with UK Apple Industry Representatives

2 Production

2.1 World Apple Production

Apples are produced in temperate climate² regions of the world. Countries reporting apple production include most European countries, Canada, United States, Russia, Brazil, Chile, Argentina, China, Iran, South Africa, North Korea, and New Zealand. The producing regions are usually situated near large bodies of water, such as inland lakes, major rivers, or sheltered marine bays. Other countries that have climate limitations report apple production in limited quantities, such as Mexico. The following table shows apple production by global regions at selected intervals over the past two decades.

Exhibit - World Apple Production by Region ('000 metric tonnes)

Region	Average 1979 - 81	Average 1989 - 91	Average 1992- 94	Average 1996 - 98	Prelim. 1999
Europe (exc. FSU)	13,331	13,302	14,067	14,001	14,047
North America	4,491	5,472	6,030	5,833	5,714
South America	1,436	2,471	2,673	3,083	3,440
Africa	532	915	1,340	1,526	1,546
Oceania	528	688	786	853	836
Former Soviet Union (FSU)	6,285	5,520	4,984	4,628	3,515
China	2,746	4,469	8,928	17,926	22,010
Other Asia (exc. FSU)	5,122	7,483	9,465	9,083	9,095
World	34,471	40,320	48,273	56,933	60,203
World (exc. China)	31,725	35,851	39,345	39,007	38,193

Source: World Apple Review

The above table illustrates two aspects of world apple production.

- First is that China has emerged as a major player in world apple production during the 1990s. It is difficult to fully understand how China's production will impact the apple market, since the quality of Chinese apples is considered to be poor. It may be that the Chinese industry will gain market share in the processing and low quality fresh market rather than higher grades of apples. It is also difficult to pinpoint China's historical impact because its record keeping is notoriously poor so it may have played a larger role in apple production than reported in the past. In

² Commercial production is limited to specific growing regions within these temperate areas. Production of commercially acceptable varieties, with adequate yields is specific to climates which require adequate growing days, with winters that are neither too cold (e.g. warmer than -30 Celsius) but with adequate days of freezing weather (i.e. chilling units). In addition, summer temperature must not be too hot, too cold in the spring during flowering, and weather must not be too extreme (e.g. not too windy).

addition, their more recent figures may be overstated to the FAO, so as to better secure funding for the apple industry from world lending organizations like the World Bank. Nevertheless, even if the statistics are grossly overstated, the significant magnitude of China's production will influence world apple trade for a considerable time.

- Second, if China production is removed from world statistics, world apple production has increased about 20% in the last two decades.

South American production has roughly doubled over the past two decades. Production from South American countries influences eastern North American markets (because of the conferencing of shipping from Chile through the Panama Canal) and European markets. The effects on BC production lie with potential oversupply in Eastern Canadian and US markets for BC apples.

Other than in China and South America, world apple production has not grown significantly. Some regions are reporting a decline in apple production. For example, the former Soviet Union (FSU) once thought to be the largest apple producing country in the world is reporting declines in production.

The next table presents percentage distribution of apple production by region for selected intervals over the previous two decades.

Exhibit - World Apple Production by Region (percent of total)

Region	Average 1979 - 81	Average 1989 - 91	Average 1992- 94	Average 1996 - 98	Prelim. 1999
	%	%	%	%	%
Europe (exc. FSU)	38.7	33.0	29.1	24.6	23.3
North America	13.0	13.6	12.5	10.2	9.5
South America	4.2	6.1	5.5	5.4	5.7
Africa	1.5	2.3	2.8	2.7	2.6
Oceania	1.5	1.7	1.6	1.5	1.4
Former Soviet Union	18.2	13.7	10.3	8.1	5.8
China	8.0	11.1	18.5	31.5	36.6
Other Asia (exc. FSU)	14.9	18.6	19.6	16.0	15.1
World	100.0	100.0	100.0	100.0	100.0
World (exc. China)	92.0	88.9	81.5	68.5	63.4

Source: World Apple Review

Because of China's rise in apple production, there has been a shift in dominance. Major players, like the former Soviet Union, have become a minor player. Even though Europe and North America have increased production, their share as a portion of world production has declined.

2.2 World Exports and Imports

Export and import market shares have changed along with the production share changes. Southeast Asian markets (e.g. Taiwan, Philippines, Singapore), always thought to be stronghold markets for North American and New Zealand apples, have been penetrated by Chinese apples. The market displacement, coupled with a rise in production, has resulted in a “rubbing of shoulders” as exporting countries look for new markets, at home and abroad. Although China is a large producer of apples, it is also a heavily populated country and is not a major exporter of apples. Compounding China’s large domestic consumption is its poor infrastructure for handling, storing, grading and transporting apples. It is anticipated that these infrastructure elements will improve over time.

Although BC does export a significant portion of their fruit, it is not a large player in the world export markets and Canada, as a whole, does not rank in the top ten exporting countries. Canada is a significant importer of apples, especially from the US and Chile.

Exhibit - Top Ten Fresh Apple Importers and Exporters, 1998 (by volume and value)

Rank	Country	Exporters		Country	Importers	
		Volume (tonnes)	Value (\$'000 US)		Volume (tonnes)	Value (\$'000 US)
1	France	766,207	488,559	Germany	707,763	438,656
2	U.S.	582,234	350,454	U.K.	460,369	390,920
3	Chile	575,601	233,443	Russian Fed.	358,758	137,892
4	Italy	540,138	258,773	Belgium- Luxembourg	248,411	204,954
5	Netherlands	338,901	186,582	Netherlands	235,922	163,745
6	Belgium- Luxembourg	335,470	238,857	China ³	158,812	113,032
7	New Zealand	291,720	204,083	U.S.	141,971	95,390
8	South Africa	242,000	124,470	Spain	132,909	79,463
9	Argentina	227,520	118,093	Brazil	126,186	55,433
10	Iran	190,000	30,000	Canada	115,278	84,749
na	Canada		42,842			
na	BC		31,613	BC		23,813
	Top Ten	4,089,791	2,283,314	Top Ten	2,686,379	1,76,234
	Total World	5,176,391	2,660,958	Total World	4,506,625	2,807,216
	(Top Ten %)	79.0	83.9	(Top Ten %)	59.6	62.8

Source: World Apple Review

Ten countries account for about 80% of apple exports. Imports are not as dominated by a block of countries; ten countries account for roughly 60% of worldwide imports. The top ten importing nations have their own domestic apple production; they have large domestic markets and there is some specialization by variety in apple production. For example, the Pink Lady variety has a long growing season and is slower to go dormant, which limits its growing regions.

Within Europe, there is a huge trade in apples, as is evident by the preceding list of importing and exporting countries. Canada is also a major importer of apples, ranking

³ Includes Taiwan

in the top ten, and has always been considered a net importer of apples. The table below illustrates Canadian imports. BC is a significant exporter, given its small production base.

Exhibit - Top Ten Apple Producing Countries (by volume, 1990, 1995 and 1999)

Country	Production			Rank 1999
	1990	1995	1999	
		(1,000 mt)		(#)
China	4,332	14,017	22,010	1
United States	4,380	4,801	4,852	2
France	2,326	2,516	2,643	3
Turkey	1,900	2,100	2,500	4
Italy	2,050	1,940	2,416	5
Germany	2,222	1,415	2,062	6
Iran	1,524	1,824	1,944	7
Poland	812	1,288	1,604	8
Country	1990	1995	1999	Rank 1999
Russian Fed.	n.a.	1,200	1,330	9
India	1,094	1,200	1,321	10
Chile	700	850	1,165	11
Argentina	975	1,146	1,056	12
Brazil	543	664	944	13
Japan	1,053	963	941	14
TOP TEN	21,856	32,301	42,682	-
(% of Total)	(53.9)	(65.1)	(70.9)	-

Source: World Apple Review

Among new and emerging apple producing countries, Turkey, Iran and Poland are making strides in apple production. These countries have seen a recent liberation in their ability to trade in the world, and combined with currency exchange rate advantages have made apple growing and exporting advantageous. In particular, exports of apples from former eastern European bloc countries to western European nations are becoming more prominent.

2.3 World Varietal Trends

Historically, varieties in each apple growing regions were chosen according to specific growing requirements and regional market demand. Shorter season, winter hardy varieties were found in colder growing regions like Canada and the northeastern US. Warmer regions with longer growing seasons grew varieties that finished well and were less winter hardy. Hence, McIntosh apples were produced in one part of North America, and Red Delicious in other parts, Cox Orange Pippin in Europe and so on.

As markets became well stocked with traditional varieties, growers have looked to differentiate their product line. Introduced were varieties like Granny Smith, Elstar, Gala, and Fuji. In fact, farm gate prices for these were often ten times higher than traditional varieties when the first cartons hit the marketplace, so new plantings of apples over the past ten years became focused on new varieties. The following table

shows current and projected volumes by variety for worldwide production excluding China.

Exhibit - Varietal Trends: Major Producing Countries excluding China ('000 metric tons)

Variety	1998 Actual	2003 Projected	2008 Projected
Red Delicious	5,457	5,740	5,677
Golden Delicious	4,707	5,110	5,153
Granny Smith	1,639	1,683	1,676
Gala	1,367	1,932	2,320
Fuji	1,343	1,541	1,638
Jonagold	922	1,037	1,077
Idared	839	978	978
Jonathan	699	683	681
Rome Beauty	560	607	589
McIntosh	494	566	538

Variety	1998 Actual	2003 Projected	2008 Projected
Braeburn	381	578	790
Elstar	365	431	439
Gloster	227	231	232
Cox's Orange	211	231	205
Jonagored	149	200	235
Pink Lady	23	92	175
All Other	6,930	7,491	8,026
Total	26,313	29,131	30,429

Source: World Apple Review

2.4 Canadian Production

Canadian apple production is based in British Columbia, Ontario, Quebec, Nova Scotia and New Brunswick. Production is regionalized in “pockets” where winter temperatures are moderated, typically around large bodies of water. More southern growing regions rely on specific microclimates to provide cooler temperatures, as apples generally do not perform well in regions where temperatures exceed 30 degree Celsius. Hence, orchardists search for microclimates that offer a respite from generally prevailing hot temperatures.

Canada’s apple production base is 28,844 hectares (1999), producing 541,096 metric tonnes. The farm gate value in 1999 amounted to \$208 million, averaging \$178,177 per farm. BC’s apple industry ranks as number two (behind Ontario) with 30% of national apple farm gate receipts. Recent Canadian apple production by province is presented in the upcoming table.

Exhibit - Apple production and Farm Value by Province (1994-1999 average)

Province	Production (tonnes)	Farm Gate Value (\$'000)
Canada	541,096	178,177
British Columbia	151,595	54,073

Ontario	247,455	83,025
Quebec	88,718	27,475
New Brunswick	3,917	2,010
Nova Scotia	47,486	11,729

Source: Statistics Canada

2.5 Canadian Exports

The United States continues to be Canada's largest export market. Exports to that country have increased over the past decade. The overall value of exports peaked in 1996. The downfall in Asian economies (Singapore, Indonesia, Philippines) and consequent decline in their currency values has led to reduced exports to these countries from North America and New Zealand. Much of the growth in sales of new apple varieties, such as Fuji and Gala, were dependent upon exports to those countries. As a result, exports from Canada to South East Asia have declined since 1996/1997. Concurrently, exports from the US and New Zealand to South East Asia also dropped, leaving more of a reliance upon domestic markets. These conditions made it more difficult to export to the USA, since markets were now flooded with more American and New Zealand apples. However, even with the down turn in some of these exports markets, Canadian exports maintained an overall increase over the 10-year period of 20%.

Most of Canada's export increase has been with the USA, Indonesia, Philippines and Mexico. Trade with the United Kingdom has varied, but has remained stable over time. Canadian exports vary as the annual Canadian apple yields vary, and as Canadian exporters constantly search for higher priced markets. Often the price of apples in a country like the UK may vary as their own domestic production varies and as imports to the UK from other regions vary. Canadian apple exports by destination are shown in the next table.

Exhibit - Canadian Apple Exports (\$'000)

Country	1992	1993	1994	1995	1996	1997	1998	1999	2000
USA	23,493	12,578	20,646	32,678	40,621	33,569	31,169	32,058	33,029
United Kingdom	9,529	3,674	3,097	5,558	5,878	5,430	6,277	7,345	8,871
Philippines	3,649	2,040	5,332	7,200	11,085	7,248	5,133	5,106	6,219
Mexico	108	135	685	0	0	336	2,473	3,232	2,967
Indonesia	902	4,041	3,605	2,271	2,192	2,841	188	1,615	1,417
Columbia	0	443	458	616	298	509	191	305	532
Costa Rica	0	0	49	1933	141	16	11	84	35
Honduras	0	0	0	14	19	0	56	205	314
Cuba	64	77	77	35	120	280	372	638	299
Singapore	571	1,330	1,748	1,355	1,056	796	779	71	177
Sub-total	38,317	34,539	35,699	49,955	61,409	51,026	46,651	50,662	54,180
Others	10,103	6,176	8,976	9,639	8,826	4,634	3,444	2,258	731
Total	48,500	40,716	44,674	59,594	70,235	55,661	50,094	52,920	54,911

Source: Statistics Canada

The farm gate value of Canadian apples (1999) is \$208 million. If that value is brought up to a wholesale (packed) value, the estimated value of Canadian production is roughly \$350 million. Based on this figure, an estimated 15% of apples produced in Canada are exported (based on value). BC exports \$34 million in apples annually, exporting roughly 1/3 of its production, and making up about 2/3 of Canada's exports. BC comprises 23% of the value of Canada's apple production, and relies more heavily on exports than do other producing provinces. The following table shows the trend in Canadian apple exports.

Exhibit - Exports of British Columbia Apples (\$'000)

	1992	1993	1994	1995	1996	1997	1998	1999	2000
USA	11,660	11,603	12,428	20,259	22,460	19,008	19,836	20,336	21,200
Philippines	3,596	2,040	5,319	7,166	11,031	7,248	5,133	5,106	6,218
Mexico	108	1,355	685	0	0	336	2,456	3,232	2,951
Indonesia	903	3,897	3,605	2,271	2,192	2,802	189	1,615	1,417
Columbia	0	292	306	184	144	259	174	64	472
Costa Rica	0	0	36	81	60	0	0	0	326
Singapore	556	1,330	1,748	1,356	1,035	778	740	61	177
Guatemala	0	0	0	0	0	0	0	115	97
Panama	0	0	0	0	0	0	0	0	94
Iceland	310	111	181	207	106	129	95	170	83
Sub-total	17,133	20,630	24,308	31,525	37,029	30,561	28,623	30,699	33,832
Others	14,404	7,448	9,628	8,813	8,150	4,117	2,931	1,255	187
Total	31,537	28,078	33,936	40,337	45,178	34,677	31,554	31,955	34,020

Source: Statistics Canada

Exports of BC apples to the USA have increased by 86% over the past decade. Asian countries have provided a significant export market in the past. This market has declined since the collapse of their currencies and the entrance of Chinese apples. Mexico has developed as a new market for BC apples. Trade restrictions with Mexico and the US have allowed a marketing window for BC apples (which does not have the trade restrictions). BC has traded with more countries in the past, but exports now are concentrated in the USA, South East Asia and Mexico.

2.6 Canadian Imports

Canada continues to be a net importer of apples. Despite an increase in Canadian apple exports the trade deficit in apples has increased from \$39 million in 1991 to \$69 million in 2000. The following table presents recent import data by country.

Exhibit - Imports of Apples to Canada (\$'000)

Origin	1992	1993	1994	1995	1996	1997	1998	1999	2000
USA	66,108	65,092	75,123	77,108	82,614	86,961	93,040	86,821	92,310
New Zealand	9,100	8,986	7,846	7,479	11,794	10,671	11,578	16,123	14,426
Chile	9,182	7,350	5,369	5,558	9,900	6,430	8,891	10,157	9,412
South Africa	1	0	10,634	18,714	10,298	10,894	11,180	10,402	5,371
Argentina	1,600	450	298	764	211	441	166	159	647
France	0	0	145	0	174	31	10	0	634
Thailand	23	9	9	45	1	4	93	162	124
Netherlands	0	0	3	0	0	0	0	67	79
Uruguay	0	0	18	71	6	0	0	0	50
Taiwan	0	0	0	0	0	1	27	11	47
Sub-total	86,015	81,888	99,447	110,000	115,000	115,000	125,000	125,000	123,000
Others	469	319	116	70	120	152	390	234	159
Total	86,484	82,207	99,562	110,000	115,000	115,000	125,000	126,000	123,000

Source: Statistics Canada

Overall, imports of apples to Canada have increased by 45% over the past 10 years. The majority of the increase has come from the USA (41% increase), New Zealand (77% increase), Chile (3% increase) and South Africa (a new entrant since 1991). Canada is considered to be a highly priced market, particularly Eastern Canada. Exporting countries view Canada as a profitable place to market apples. As well, increases in imports from the USA, South Africa and New Zealand have helped fulfill increased Canadian demand for varieties like Gala, high quality Red Delicious and Granny Smith. Canadian supply has traditionally been a McIntosh industry. With increased demand for new varieties, imports have increased, accordingly.

Much of this is attributable to an increase in imports from the USA and New Zealand. Granny Smith, Red Delicious, Golden Delicious and to a lesser extent Fuji, Gala, Braeburn and McIntosh are the main import varieties. The following table illustrates the gap between Canadian retail demand and Canadian by apple variety.

Exhibit – Canadian Supply of Canadian Market by Variety

Variety	Canadian retail demand by variety	Canadian supply of Canadian demand
	%age share	%age share
McIntosh	25	40
Gala	14	< 5
Granny Smith	13	< 5
Red Delicious	12	17
Golden Delicious	9	< 5
Spartan	7	9

Source: AC Neilson and Agriculture & Agrifood Canada

2.7 Integrated Fruit Production (IFP)

2.7.1 Europe

Currently an estimated 50% (790,000 acres) of the apple and pear acreage in Western Europe is managed under IFP programs. The proportion of a country's pomefruit acreage that is grown under an IFP regimen ranges from less than 1% in Spain to almost 90% in Italy and Austria. Following is a table that presents pomefruit acreage based on a survey of 1997 production in selected countries.

Exhibit - Pomefruit Integrated Fruit Production in Selected Areas – 1997 (ha)

Country	Actual Production Area ⁴	% of Actual Area Surveyed for study	Total Surveyed Area	Conventional Production Area	IFP Production Area	IFP as %age of actual production area
	ha	%	ha	ha	ha	%
Argentina	67,011	52.9	35,500	35,104	396	1.1
Australia	27,215	55.1	15,000	3,000	12,00	80.0
Austria	19,500	36.4	7,091	1,061	6,030	85.0
Croatia	8,300	16.4	1,360	540	820	60.3
Denmark	2,475	6.1	1,522	852	670	44.0
Germany	88,200	36.2	31,933	5,134	26,042	81.5
Great Britain	16,100	83.7	13,473	3,289	10,184	75.6
Italy ⁵	109,980	49.9	54,890	22,699	32,191	58.6
Norway	2,278	85.1	1,940	1,874	66	3.4
Poland	183,300	77.5	142,000	136,900	5,100	3.6
Portugal	36,822	21.7	8,000	7,650	350	4.4
Slovenia	16,700	18.4	3,068	1,868	1,200	39.1
Spain	90,575	19.0	17,243	16,643	600	3.5
Switzerland	14,200	35.9	5,094	778	4,316	84.7

Source: Dickler, E., Survey on Integrated Fruit Production 1999; FAO Statistics

Integrated Fruit Production (IFP) developed in Europe because of restrictions in pesticide availability, combined with European Union financial incentives for producers and growing consumer concern over agricultural practices and food safety. It was originally called Integrated Plant Protection in Europe in the 1950s, but did not experience much growth until the late 1980s.

The distinct difference between North American and European farmers in terms of adopting environment friendly farming practises has been the availability of financial incentives coordinated through the European Union. Canadian and American producers do not have similar programs available to them.

EEC Regulation No 2078/92, of 30 June 1992, introduced financial compensation for farmers to encourage them to adopt environment-friendly farming practices. The "agri-

⁴ Based on FAO data for 1997

⁵ In the south Tyrol region of Italy, IFP programs have been in place since 1988-89 and it produces approximately 40% of the western Europe apple crop.

environmental" regulation requires Member States to draft concrete programs that are tailored to suit their specific agricultural and environmental situations.

Aid has been provided on a per hectare (ha) or per livestock unit (LU) basis and is designed to compensate farmers for extra costs incurred in consequence of program participation, and/or for yield lost. Aid expenditure was co-financed by the Community and Member States, in proportions of 75 %/25 %, respectively in poor regions of the European Union, and 50 %/50 % in more prosperous regions.

On average, the programs covered one in seven farms, accounting for 20% of European farmland. This figure is to some extent attributable to the high levels of participation in a few Member States - 78% of the farms in Austria, 77% in Finland and 64% in Sweden. Luxembourg (60%) and Portugal (30%) had higher coverage than the EU average. It is less than 7% in Belgium, Greece, Spain and Italy. When the program was brought forward in 1992, the target was 15% of European farmland by 2000, which has been achieved ahead of schedule [European Communities Commission 2000].

Under the EU's "Agenda 2000" farm reform, approved two years ago, governments are allowed to use up to a fifth of the direct farm aid they receive from the EEC to promote environmentally-friendly farming and rural development.

The progress of IFP is seen as moving forward again as a result of twenty major European food retailers uniting to write their own production guidelines in 1998. Their organization is called EUREPGAP. European orchardists and wholesalers selling to these retailers must obtain certification from an approved EUREPGAP certification organization within a specified time period, two years in the case of the large UK retailer Sainsbury. The first phase of EUREPGAP's requirements are oriented towards bringing producers into compliance with current national standards⁶. The second phase is expected to specify IFP standards. The progress of EUREPGAP has left regions like Spain and southern France scrambling in the past year, developing programs and guidelines. In addition, growers in Argentina, Chile, South Africa, New Zealand and Eastern Europe, who sell to these EUREPGAP retailers are developing or have introduced IFP guidelines. They are concerned that these markets could be lost without IFP certification.

2.7.2 New Zealand

For the 1996-97 season, the New Zealand Apple and Pear Marketing Board⁷ introduced a pilot IFP program, which has since been implemented throughout its growing regions. The first IFO planning meeting was held in November 1995. The spur for introducing the program was several European supermarket chains advising ENZA, the main fruit export agency, that it should begin supplying IFP product by 1997 or face loss of its preferential supplier status. By 1999, growers were expected to keep a pest control record book. The 2000-2001 export apple crop is reportedly fully IFP compliant.

⁶ The national standards may already be consistent with IFP practices.

⁷ At the time, the board had the legal authority to acquire and sell all apples and pears exported from New Zealand. In 2000, other agencies were allowed to bypass it and could export apples and pears after receiving permission from a separate body, the Apple and Pear Export Permit Committee

At the outset, the New Zealand program allowed for an IFP Transition Program for growers producing for the US market so that they could have additional organo-phosphate sprays to prevent quarantine protection⁸. The New Zealand program dropped the transition element to achieve its objective of meeting US phytosanitary requirements under a single standard for the 2000-01 season. The New Zealand industry was able to convert its full export crop to an IFP growing system in a remarkably short time, over three growing seasons.

2.7.3 USA

2.7.3.1 Oregon

In the US, only Oregon State has an IFP program in place. Oregon has 7,500 acres of sweet cherries under its IFP program, accounting for 75% of sweet cherry acreage in Oregon. It is modeled after the system in South Tyrol, Italy and is called the Integrated Cherry Production program. The operator is Oregon State University Extension Service, which works in conjunction with growers and processors. Growers receive training on pest management, threshold level, and softer pest control programs.

In 1995, the University of Oregon research station introduced a pilot project that has since been taken over by the Hood River Grower-Shipper Association and its apple, pear and cherry growers. It is a small program, with one salaried employee and a volunteer steering committee. It is a self-declaration program; there is no outside certification. The eco-labels appear on Hood River boxes, but not on each fruit item.

2.7.3.2 Michigan

Michigan is talking about an IFP program, but currently only has an IPM (Integrated Pest Management) program in place. Like Oregon, this program is operated by Michigan State University and works with growers and processors, offering training on pest management. Various American states have integrated pest management programs in place, but they are less involved than the IFP standards.⁹

2.7.3.3 Responsible Choice

The privately owned packinghouse Stemilt, based in Washington State, created its Responsible Choice program in 1993-94. It was originally to be called the “Kem-Kleen” program and was the organization’s response to the 1989 consumer criticism about the use of the Alar growth regulator.

⁸ Regions exporting to the US and Europe face differing quarantine entrance requirements. The US has zero tolerance quarantine requirements for pests and diseases on imported fruit whereas European Union standards are laxer, reflecting the compromises of its federation structure and consumer desires for fruits treated with less chemicals. The differing requirements are reflected in the low penetration of IFP programs in the US and Canada and the high penetration in Europe.

⁹ The difference being that an IPM program uses some biological control to keep pest levels in place. An IFP program restricts the use of certain pesticides, fertilizer use, and other orchard management practices, and requires growers to submit farm records. These records not only include a diary of management activities, but also document reasons for deciding on each management decision (e.g. the why did they need to apply a pesticide).

Participants include approximately 400 Washington state producers. The distribution of sales is 55% domestic and 45% export.

The label represents a philosophy rather than a pass/fail certification system. It is a “cousin” to the European IFP guidelines, but is less strict; it is not a pass/fail system. The program gives points for each pesticide used on a particular crop based on eight attributes including pesticide efficacy, leaching potential, pre-harvest interval, soil half-life, and biological disruption. Although not incorporated into the point system, growers are encouraged to reduce the use of irrigation water and to use smaller fertilizer applications. It is a self-declaration program; an outside organization does not certify compliance. Individual fruit items are labelled. In the past few years, Stemilt has de-emphasized the program because low apples prices have made it more difficult for the firm to carry out environmentally friendly projects.

Stemilt provides technical assistance to growers. A nine member staff works one-on-one with growers and there are grower meetings and newsletters. Stemilt also tests new growing techniques.

2.7.3.4 Core Values

The Core Values program was created in 1996 under the leadership of northeastern apple growers and the consumer group, Mothers and Others for a Liveable Planet. The Core Values program requires growers to follow the Northeastern Stewardship Alliance (NESA) Guidelines. Like Stemilt’s program, Core Values uses the European system of Integrated Fruit Production.

The guidelines require an up-to-date training of farm managers in all aspects of IFP and their attendance at regular training, updating and review meetings. They also require the minimization of herbicide use by using alleyways or travel lines between tree rows, pruning and training trellises, using chemicals based on the lowest ecological disruption, keeping sprayers maintained, and only labelling fruit of high quality.

In addition to following the guidelines, farmers must demonstrate that they are protecting the integrity of the orchard environment, working towards improving their crop quality, keeping an accurate log book of all major farm activities throughout the year and attending regular NESA grower meetings. They must turn in their logbooks to the Alliance and permit at least one scheduled visit by representatives of the NESA for educational purposes.

Core Values has no formal certification process, but it is considering basing standards on a point system.

2.7.3.5 California Clean Growers

California Clean Growers (CCG) supports farmers who abide by the following guidelines: 1) use of ecologically sound practices, 2) strengthening farm soils through programs of natural enrichment, 3) arrangement of farms in ways that encourage wildlife to take up refuge, 4) encouragement of natural biological pest controls, 5) creation of good working conditions for workers, 6) commitment to deliver produce with superior taste and nutrition, and 7) good communications with consumers

(California Clean Growers Marketing Group). They have more of a philosophical based program than the others and this philosophy in part revolves around the lifestyle of small farmers. Therefore, their criteria go well beyond set procedures that a grower must follow.

CCG emphasizes farmer participation in creating and maintaining the objectives set forth as well as participation in the organization's development. They have developed general growing practices that cover all crops and help farmers achieve the guidelines. These include growing varieties of produce, which have a record of natural disease and pest resistance, using crop rotations. Staying as diversified as possible in crops and habitat, continually striving to build a balance in the soil, using cover crops whenever possible, and only intervening with a farm's natural ecology when necessary. They generally prohibit any material or practice that is known to be hazardous to public health. Several of the practices set forth are quite general and make environmental assessment of CCG farmers a more difficult task than those who follow more clearly defined standards of other programs.

2.7.3.6 Massachusetts IPM – Partners With Nature

Partners With Nature is a Massachusetts state-level program that recognizes state farmers who practice IPM. Program standards are based on the Massachusetts Integrated Pest Management Guidelines. These guidelines cover several different crops and were developed in conjunction with farmers. During their development, crop specialists were consulted to assist with standard formation, and specialists in the field and growers then reviewed these.

For each crop, guidelines are specified for every aspect of production addressed under IPM. A point system exists for each set of guidelines and corresponds to whether or not an included guideline was followed that is specific to that crop. In order to qualify, farmers must attain 70% of the possible points for that crop. Points must be earned in each specified category, and written records must document practices. Examples of production categories for apples include soil and nutrition management and cultural practices, pesticide application and records, insect management, disease management, weed management, vertebrate management, weather and crop monitoring and education. Under such a system, Partners encourages the best know management practices with some flexibility given to the farmer in how they earn the required percentage of total points.

2.7.3.7 Wegmans Food Stores

New York IPM guidelines are currently being used in the marketplace at Wegmans Food Stores through the collaboration of several different parties.

Wegmans started its IPM label program as a joint project with Cornell Univeristy's IPM program, local fresh market growers and Comstock Michigan Fruit, now known as Agrilink. In 1996, its first year, Wegmans had fresh market sweet corn; a line of processed vegetables was introduced in the second year. The canned vegetables were supplied by Comstock, using local processing growers primarily in New York. A second supplier of the canned vegetables was Friday Canning in Wisconsin, and the University of Wisconsin worked with Cornell's IPM program to come up with an

equivalent program for that state. Wegmans has discontinued the line of canned vegetables, but many of them have been replaced with IPM labelled frozen product. It markets the products under the tag line of ‘Food you feel good about’.

Wegmans started with a licensing agreement to use the Cornell logo, but never actually paid any royalties. It developed a Wegmans IPM logo, which it has been using because the retailer felt that it didn't make a lot of sense to use a Cornell logo with the NY state outline when Wegmans was sourcing some products from Wisconsin and Pennsylvania [pers. comm. Bill Pool, Wegmans].

Wegmans also has some local NY growers providing fresh sweet cherries and asparagus grown with the Cornell IPM protocols and is working with the IPM programs at Penn State and Rutgers to expand the offering of fresh market IPM products from local growers in those market area as well.

2.7.4 Canada

2.7.4.1 Ontario

In Canada, Norfolk Growers in Simcoe Ontario have an Integrated Fruit Production program. Growers produce IFP fruit using the Tyrol system, and the fruit is marketed in a few southern Ontario Sobeys stores, using a Worldwide Fund for Nature (WWF) logo and described as ecologically grown fruit (not as IFP grown).

2.8 Organic Production

With the continuing success of organic orcharding, more mainstream growers are accepting organic production as a viable alternative and experimenting with it. This has led to an increase in public and private research on production methods that fit organic systems, and to more educational opportunities for growers to learn about organic production. As more “soft” pest management tools are developed, companies are looking at separate formulations that can meet the strict organic standards. One example is the new biopesticide *Success*, a microbial fermentation product. The active ingredient is suitable for organic but not the inert ingredients. The manufacturer is developing a formulation that will meet organic certification.

2.8.1 USA

Washington, California and Arizona comprise the majority of organic tree fruit production in the US. Organics only represent a small portion of tree fruit production. In Washington state, organic tree fruit production represents roughly one to two percent of total tree fruit production. The following table shows an estimate of American organic tree fruit acreage prepared by a Washington State University researcher.

Exhibit - Estimated 1998 U.S. Organic Tree Fruit Acreage

State	Apples	Pears	Cherries	All Fruit
Total US	9,275	2,005	413	14,169
Washington	1,809	449	95	2,466
Wash. Transition	2,672	169	90	2,930

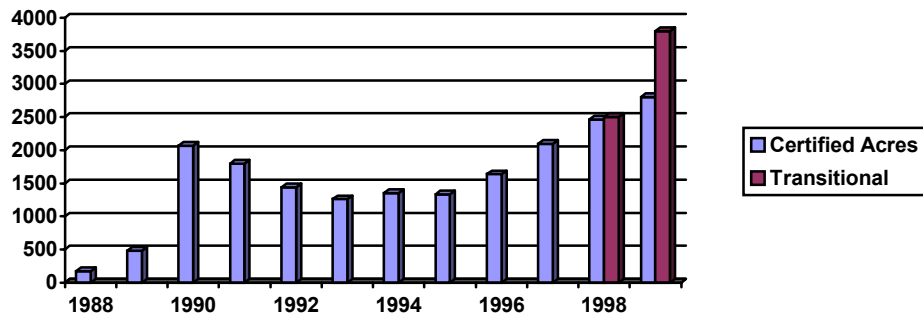
California	1,540	800		4,130
Arizona	2,000 (est.)		30	2,060
Colorado	374	87	173	869
Oregon	350	500	25	1,180
Wisconsin	300			300
Pennsylvania	150			150
Virginia	54			54
Michigan	20			20
New York	10			10

Source: Center for Sustaining Agriculture and Natural Resources, Washington State University

The trends in production vary between states. California, for example has seen a decline in organic acreage from a high of 1,700 acres in 1991 to its present 1,500 acres. Washington has experienced increases and decreases in organic tree fruit production. The Alar scare in the late 1980s triggered a rise in organic production. Organic production lost momentum for several years, but regained ground as growers were looking toward organic apples as a premium priced market. During the mid to late 1990s organic growers reported receiving price premiums of 50-100% higher than conventional apples. In August 1999, Stemilt Growers of Wenatchee, WA announced that it would pack apples and pears for Natural Selection, the largest American supplier of organic salads and produce, and convert almost 500 acres of orchards to organic production over a two-year period [Natural Foods Merchandiser March 2001].

The following bar graph shows the trend in organic tree fruit acreage in Washington state.

Exhibit - Organic Tree Fruit Acreage Trends In Washington State



Source: Center for Sustaining Agriculture and Natural Resources

Until 1998, Washington organic producers did not need a three-year transition period, but rather only a one year period. This has curtailed the acreage of certified organic production. Consequently there is a backlog of transitional acreage, which has the potential to more than double the current acreage over the next few years. The majority of certified and transitional acres are Red Delicious apples, with approximately 900 acres of certified and 2,000 acres of transitional production (1999).

Organic farming is still a small part of U.S. agriculture, with about 0.2% of U.S. cropland certified organic in 1997, compared with 1.5% in Europe," the USDA revealed in a study released this year.

2.8.2 Canada

BC's organic tree fruit production is estimated at 1,000 acres (Source: conversations with certifying agencies). Unfortunately, Canadian production is divided among many small regions and certification programs, and it is difficult to find accurate information on organic tree fruit production.

2.8.3 Europe and New Zealand

According to the Center for Sustainable Agriculture, tree fruit producers in other countries are also exploring organic production. New Zealand has an active research program focused on developing organic production to serve export markets. Argentina and Chile are both expanding organic acreage that is aimed at the export market. Argentina estimates organic apple production at 800 acres. In Argentina, a major fruit company has a 50-hectare organic apple block within their 700-hectare farm, and production costs are nearly identical with conventional production. France has about 4,000 hectares of organic apple production, and Italy and Poland are reporting shifting thousands of hectares into organic production. David Granatstein at Washington State University estimates world organic apple production to be 18,630 acres and pears to be 6,275 acres.

Part of the high growth rates for organic food in Europe is driven by legislation that is requiring a portion of farm land to be dedicated to organic production and that a portion of food sales be organic. Some non-European countries believe that this legislation is no more than a "green" trade barrier. The next table presents some plans and targets for organic production by European country.

Exhibit - Action Plans in Europe

Country	Name of Program	Target Year	Important Targets
Denmark	Action Plan II Developments in Organic Farming February 1999	2005	10% Organic Farmers 20,000 Ha more than 1999 Tripling of Ecological Production
France	1998 – 2002 five year plan	2005	2010 France as a leading Organic Producer Conversion of 1 million ha and 25,000 farmers to Organics by 2005
Netherlands		2005/2010	5% organic base land until 2005 10% organic base land until 2010
Norway	Plan of Action for the Development of Organic Agriculture	2009	10% organic land base
Sweden	Action Plan 2000	2000	10% organic land base
Wales	Welsh Agrifood Action Plan for the Organic Sector March 1999	2005	10% organic land base Development of a national organic centre

Source: <http://www.organic-europe.net>

3 Outlook¹⁰

3.1 Introduction

Apple prices in the late 1980s and early 1990s were considered to be low for most traditional varieties. However, new varieties like Gala and Fuji were highly priced, and apple farmers in BC and around the world planted them. Demand was strong, especially in Taiwanese, Indonesian, Philippino, and Malaysian markets. During this period, their economies were strong, incomes were rising, and their currencies were appreciating against the US dollar. Almost all of the world's exports of these varieties were destined for those markets. Any region in the world that could grow an apple tree, planted Gala. As a result, supply began to catch up with demand, thereby steadily eroding prices of the new varieties.

However, when these economies weakened, their currencies depreciated against the US and Canadian dollars. Consequently, demand for North American and New Zealand apples fell in those markets. Coupled with increased exports of Chinese Fuji, these markets were no longer importing large quantities from North America and New Zealand. The changes in the offshore markets made Gala and Fuji producers and distributors turn to the Canadian and American markets, which were supplied by traditional varieties. Per capita consumption was stagnant or declining slightly in the Canadian and American markets so the new varieties, which previously were little marketed in North America, had to displace traditional apples. The end result was an increase in supply, not matched by demand, and falling prices for producers.

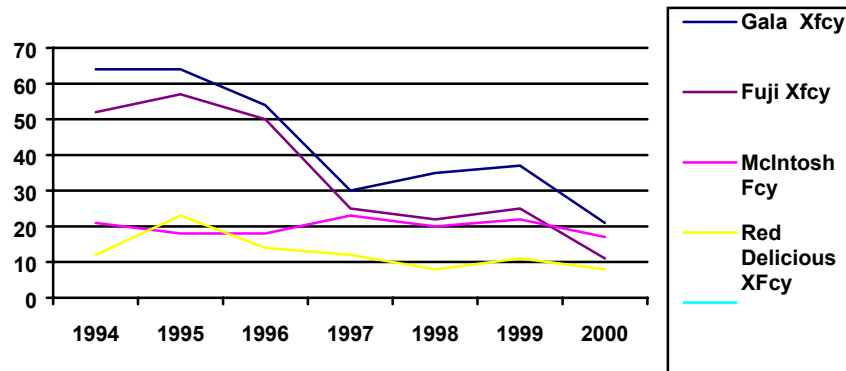
In British Columbia, this situation affected new and traditional varieties as follows.

- Displaced Washington Red Delicious made it difficult to market BC Red Delicious.
- Exports of McIntosh to California, thought to be a specialty apple in that market, were largely displaced by increased penetration of Gala.
- BC Spartans had increased market pressures, since there were now more McIntosh on the market and the two varieties compete for similar shelf space. Spartan is usually held in storage and marketed once McIntosh supplies have diminished.

¹⁰ This section is a qualitative examination of key trends in world apple markets. The analytical framework is based on the competitive strategy model of Harvard Business School's Michael Porter. Within this framework industry structure and profitability is based on five competitive forces: rivalry among existing competitors, economic power of buyers, economic power of suppliers, threat of new entrants, and threat of substitute products. The section closes with a summary outlook.

The following line graph tracks the precipitous decline in recent BC farm gate apple prices. Estimates from the Okanagan Valley Tree Fruit Authority and Washington State University have suggested that farm gate prices need to be higher than 30 cents per pound to make it economically feasible to plant an apple orchard. All varieties are below the 30 cents level, including Gala and Fuji.

Exhibit - Recent BC Farm Gate Apple Prices (nominal values)



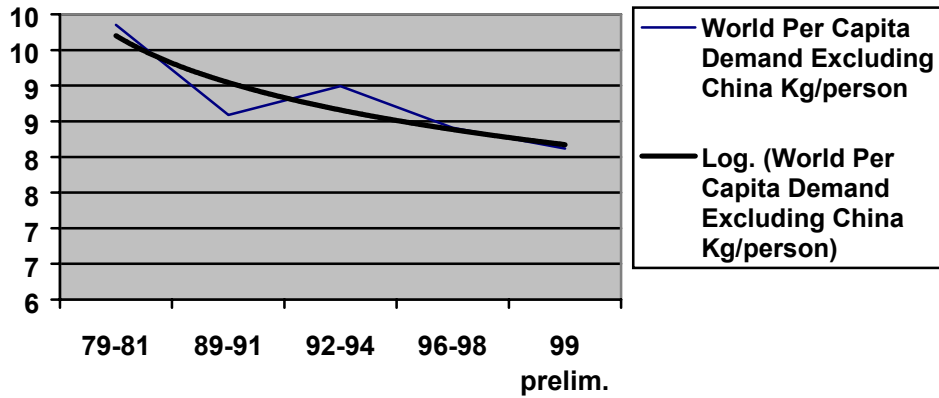
Source: Okanagan Valley Tree Fruit Authority

In 2000, Dr. Desmond O'Rourke of Belrose, Inc. estimated that southeast Asian economies would improve and apple exports to those countries would increase to historical levels. He felt it would take until 2003 for this turnaround to take place (personal communication). Dr. O'Rourke now feels that a turnaround is further off in the future, citing the two following reasons.

- Political unrest in Indonesia will keep its economy and currency at a low ebb.
- Malaysian export earnings depend heavily upon its technology sector. The decline of the technology sector in 2000 has weakened its economy and there are no prospects for a near term recovery.

Another important note from Dr. O'Rourke is that his research is now showing that worldwide per capita demand for apples is declining, except in China. Apples compete with other fruits, such as bananas and mangos. Decreased per capita demand for apples, coupled with increased supply in the North American markets, will have a longer-term impact on pricing of conventionally grown apples. The following is a line graph that shows the declining trend in per capita worldwide apple consumption.

Exhibit - Trend in Per Capita World Apple Demand (excluding China)



Source: FAO and World Apple Review data

Estimated per capita consumption within western Europe slipped from 20.12 kg in 1990 to 18.31 by 1999. In Canada, it rose slightly from 11.64 kg to 11.76 kg over the same period and in the USA it fell slightly from 9.00 kg to 8.83 kg.

3.2 Rivalry Among Industry Competitors

World apple production and trade is intensely competitive. Modern communications make it easy for buyers to receive price quotes from several producing regions. Consequently, producing regions must often match or better prices to compete in the market. There is evidence of a leader/follower market structure in some markets. For example, Washington state is often cited as a price leader in the Red Delicious market. The state's apple industry leads the market, with competing regions reacting to its actions.

Producing countries vary in their competitiveness. Yields and costs are obvious factors, but infrastructure issues such as storage, packinghouses, transportation and available labour are key. Regions weak in one competitive factor may substitute other factors. For example, New Zealand, distant from all of its markets, has high transportation costs. To overcome this negative situation, the New Zealand industry invests heavily in branding and research and development, especially in new apple varieties. Historically, New Zealand has led the world in new apple variety development. The new varieties of the 70s and 80s, Gala, Braeburn and Granny Smith, came from there. More recently this industry has developed other new varieties, such as Pacific Rose and Southern Snap. Currently Gala, Fuji, Braeburn, Pacific Rose and Southern Snap make up over 80% of the volume of New Zealand's exports.

The following table presents a ranking of the top 15 producers on competitiveness criteria. Canada's rankings are as follows.

- Overall - no. 13
- Production efficiency – no. 17
- Infrastructure and inputs – no. 5
- Financial and markets – no. 11

It is worthwhile noting that Canada is ranked no. 17 in the important area of production efficiency, which suggests considerable potential for improvement. At the same time, it should be recognized that there are always regional variations in production efficiency within a country, so that British Columbia alone would not necessarily be ranked 17th when compared to the rest of the world. Austria, with a similarly developed economy and similar relationship to Germany as Canada has to the USA, ranked at the top of the production efficiency criteria.

Exhibit - Competitiveness Rankings of Major World Apple Suppliers, 2001

Rank	Overall	Production Efficiency	Infrastructure & Inputs	Financial & Markets
1	N. Zealand	Austria	Chile	N. Zealand
2	Chile	Netherlands	U.S.	Netherlands
3	Netherlands	N. Zealand	Argentina	Belgium
4	Austria	Brazil	N. Zealand	France
5	France	S. Africa	Canada	Chile
6	USA	Chile	France	Japan
7	Belgium	Belgium	S. Africa	USA
8	Australia	France	Australia	Australia
9	S. Africa	Germany	Italy	Italy
10	Japan	Australia	Turkey	UK
11	Argentina	Poland	Brazil	Canada
12	Italy	Italy	Austria	Austria
13	Canada	Japan	Belgium	Germany
14	Germany	US	Japan	Argentina
15	Brazil	Turkey	Germany	Spain

Source: Belrose, Inc. 2001

In recent years, changes to chemical regulations have affected apple marketing. For example, the US's desire to green-up agriculture is partially driven by consumer demand but is also a response to the Food Quality Protection Act (FQPA). This Act will (among many things) restrict the use of certain pesticides, which have been used in fruit production. Consequently, many American orchardists are rethinking their strategies for pest management, and are examining IFP as a production system.

Historically, the produce industry has not been characterized by sophisticated corporate marketing techniques. Producers have used sales offices, which adjusted prices according to supply and demand factors. Apples were held in storage and packed according to market demands. Informal marketing arrangements between producing regions were evident at times, based on captured geographic markets. Trade barriers have been used to control market access. An example is the SIMA trade barrier that Canada had with the US for many years.

With excess world supply and shrinking demand, rivalry has become more intense. Apples are particularly vulnerable to competitive rivalry. For example, consumers have

very little or no apple brand loyalty. Few apples are labelled and promoted based on a branding strategy. Apple producers also have little cohesion, and will split away from historical cartels. For example, a producer driven organization ENZA has been the main selling agency for New Zealand apples and viewed as a very effective competitor. With slipping apple prices, producers decided to privatize ENZA into ENZA Limited as of April 2000. Two private companies, GPG and FR partners went into the market in July and August 2000 and each acquired 18% of ENZA, buying shares from cash strapped smaller growers, thereby gaining control of the ENZA board.

In addition, some regions are more aggressive in the market place and are moving ahead faster in attempts to increase market share. For example, the Washington State Apple Commission, a well-funded producer organization having an annual budget in the \$50 million range, purchased retail shelf space in North America supermarkets over the past two years, a practice previously limited to packaged food items.

Suppliers will need to make changes to function in this new competitive environment. Part of the change will come in the form of new, differentiated products, where price competition is not the driving basis of competition. New apple varieties, reduced chemical products, packaging, and consistency of quality, brand image will be some of the ways to gain product differentiation in the minds of consumers.

The other half of the equation will be developing loyalty with retailers and their buyers. As retailers consolidate purchasing, they find it increasingly difficult to fine-tune their merchandizing. In the past, the store produce manager had a good sense of what sold well and the special interests of the store's customers. Today, the corporate produce buyer is not directly connected to each individual store, and is not as sensitive to demand issues, and changes in new products. It is becoming a supplier's task to provide the retailer with factual data on consumer demand. This value added component will become a key to winning over retail loyalty in the future.

3.3 Economic Power of Buyers

Widespread consolidation in the grocery industry, driven by expected efficiency gains from economies of size, has had a significant effect on the share of total grocery store sales accounted for by the largest food retailers. It also raises questions about long-term trends driving these changes and implications for consumers and for food market suppliers such as grower-shippers, food processors, and wholesalers. Suppliers worry that fewer and larger buyers could force prices lower for products. Retailers are likely to continue consolidating in order to maintain profitability as competition for the consumer dollar heightens.

In recent years, the US food retailing industry has undergone unprecedented consolidation and structural change through mergers, acquisitions, divestitures, internal growth, and new competitors. The USDA reported that between 1996 and 1999, almost 3,500 supermarkets were purchased and in 1998 two of the largest food retailing combinations in history were announced; the merger of Albertson's (the 4th largest) with American Stores (the 2nd largest) and the acquisition of the 6th largest, Fred Meyers, by the no. 1 chain, Kroger Company.

In Canada, food retailing is consolidated in few hands. Four food retailers dominate Western Canada: Real Canadian Super Store, Overwaitea, Safeway and IGA. A BC packinghouse manager observed that the number of major buyers in western North America has declined from 20 to eight in the past decade.

The following list illustrates the concentration of food retailers in Canada.

Sobeys

- Sobeys Maritimes
- Sobeys Quebec
- IGA Quebec, Ontario, Alberta, BC
- Sobeys Ontario
- Price Chopper Ontario

Loblaw, National Grocers, Western Grocers

- Atlantic Superstore Maritimes
- Provigo Quebec
- Maxi/Maxi & Co Quebec
- Loblaw Quebec
- Loblaw Ontario
- No Frills Ontario
- Zehrs Ontario
- Fortino's Ontario
- Real Canadian Super Store Manitoba, Saskatchewan, Alberta, BC
- Extra Foods Manitoba, Saskatchewan, Alberta, BC

Safeway Manitoba, Saskatchewan, Alberta, BC

A&P

- A&P excel Food Basics Ontario
- Food Basics Ontario

Federated Co-op Prairies

Calgary Co-op Alberta

Overwaitea Manitoba, Saskatchewan, Alberta, BC

Metro

- Metro Quebec
- Super C Quebec

Consolidating food retailers often cite the potential for lower costs as an incentive for becoming larger. They expect to decrease costs through supply-chain management

practices and coordinated activities that generate operating, procurement, marketing and distribution efficiencies. Expected efficiency gains and lower investment requirements will allow them to maintain profitability while keeping prices competitive with mass-merchandisers, warehouse club stores, and other emerging and potential rivals.

To reduce operating costs, large retailers are centralizing management and control at corporate headquarters. New information technologies such as company wide satellite and Internet communication systems, and store checkout scanner data, allow for centralization of many management activities that previously were the responsibility of the store managers. The availability of timely and detailed information at headquarters also allows for effective control of operations over relatively large geographic areas. For example, Safeway carries out central buying for western Canada in Calgary. There is an unsubstantiated rumour in the food business that Safeway wishes to further consolidate by centralizing North American buying in one location, thought to be Phoenix, Arizona.

Consolidation of retail grocers also allows for greater efficiencies in purchasing retail products from suppliers. When retailers can buy higher volume from individual suppliers and distributors, they can negotiate lower wholesale prices and, in turn, improve their margins. In return, retailers are able to offer exclusive procurement agreements, with potential benefits to suppliers and distributors such as partnering, long-term agreements, and other strategic alliances. Retailers also gain a more reliable source of supply, and over time, can develop a higher quality and more uniform product, especially for perishable products such as fresh meat and produce.

Food retailer consolidation, as well as the success of mass merchandisers, such as Wal-Mart and Target, will likely benefit global, integrated producer-suppliers, such as ENZA, Dole and Del Monte Fresh Produce, that can offer year-round, regular deliveries of high quality fresh produce, especially to nationwide retailers that depend on uniform fresh produce quality throughout their operations.

Consolidation has also resulted in declining importance of wholesale markets as a distribution channel, as larger retailers have increasingly demanded direct-to-store delivery by their suppliers, as well as other value-added services.

Organic food marketing is concentrated in natural foods stores, with 62% of organic products marketed in the US sold through this channel. Supermarkets account for 31% and 7% is sold through through direct marketing, e.g. box schemes or consumer supported agriculture (CSA). Texas-based Whole Foods Market and Colorado-based Wild Oats¹¹ are the no.1 and no.2, respectively, natural food store chains in North America. They account for an estimated 18% of total natural product sales of \$15.3 billion in 2000 [The Natural Foods Merchandiser June 2001].

¹¹ Wild Oats owns the five Capers stores in BC.

3.4 Economic Power of Suppliers

The supply of produce, except in a few categories, such as bananas and pineapples, is highly fragmented. Supplier-related pressures are minimal because fresh apples are perceived as standard commodities and are available in open markets from a large number of suppliers with ample production capability. In BC, there are two major market suppliers, BC Tree Fruits and ProFresh, and approximately 20 smaller suppliers. In the USA, there are hundreds of apple suppliers. In the past year, Washington State apple producers have attempted to set up a marketing cooperative to increase supplier power. The organizers have found it difficult to sign up growers, however. Apple suppliers are price takers in the classic sense.

3.5 Competition from Substitutes

Apples face considerable competition from fruit substitutes, fruits available year-round, such as apples, bananas and oranges, and seasonal fruit, such as peaches. Within the apple category, different varieties and production systems act as substitutes. For example, as mentioned earlier in this report, Gala competes with McIntosh in the California market, organic apples can substitute for IFP apples, etc.

The following table shows the increasing trend of per capita consumption of bananas and other fresh fruit and the stable trend for apples and oranges in the US.

Exhibit – US Per Capita Fruit Consumption Trends (lb. per capita)

Item	1980	1985	1990	1993	1994	1995	1996	1997	1998
Apples	8.35	7.53	8.53	8.35	8.88	8.57	8.62	8.35	8.71
Oranges	7.12	5.08	5.44	6.26	5.93	5.44	5.81	6.44	6.76
Bananas	9.43	10.66	11.07	12.16	12.72	12.43	12.70	12.62	12.97
Other fresh fruit	13.20	14.61	15.10	16.96	18.09	18.01	17.69	19.55	18.37
Total fresh fruit	38.10	37.88	40.14	43.73	45.62	44.45	44.82	46.86	46.81

Source: Belrose, Inc.

Another important influence has been the increasing use of convenience and quality as marketing tools. Perishable fruits, such as plums, pears, grapes and strawberries (to a certain extent), now compete with storable fruits almost year-round, becoming substitutes for apples, and eroding a competitive product advantage of storable fruits. Other convenience and quality examples are pre-packaged vegetables and fruits and vine ripe tomatoes. Although they are not direct substitutes for apples, their quality and convenience raise the bar as far as consumer acceptance and expectations in a supermarket's produce section.

With an over supplied apple market, retail producer buyers have been able to purchase high quality apples at medium quality prices. North American consumers now constantly see higher quality apples, once reserved for higher paying offshore markets,

on a regular basis in their favourite supermarket. This situation raises consumer expectations about apple quality.

Organic production is now a well-established concept in consumers' frame of reference and has become a generally accepted product differentiation.

The organic concept has set the standard for consumers wishing to buy products that contain reduced or no levels of pesticide residue. Some fruit processors, Heinz and Gerber for example, exclusively source organic fruit to make baby food.

The Organic Trade Association estimates 2000 organic food sales in the US to be about \$7 billion, up from \$1 billion in 1995. These gains are expected to be further consolidated since the US Food and Drug Agency approved, in December 2000, the use of a USDA label on food items that are 95% organic. The following table presents dollar volume sales for organic foods in the US.

Exhibit - Sales of organic products by commodity (US \$millions)

Commodity	1998	1999	2000	Percent Change 1998-2000
Fruits and Vegetables	3,486	3,904	4,294	24 ¹²
Milk Products	424	598	832	96
Frozen Goods	400	565	813	103
Refrigerated Products	274	329	401	46
Grain Products	201	278	400	99
Meat and Sausage	168	218	288	71
Convenience Products	145	196	269	86
Other	112	129	145	29
Baby Food	84	117	166	98
Juice	60	75	91	52
Beer and Wine	46	54	60	30
Total	5,400	6,463	7,759	44

Source: IFOAM

The largest increase in the value of organics in the US has been fruits and vegetables, growing by \$808 million over the past two years. Roughly 34% of the increase in organic food consumption has been fruits and vegetables. Other product groups have shown large increases as a percent of growth, many almost doubling their market position¹³.

While only a few major supermarkets in the US are actively promoting organic foods, the situation is different in Europe. Some countries (e.g., Denmark) have very active government support to expand organic production and increase market share. In Switzerland, where fruit from Integrated Fruit Production was the cutting edge for years, one supermarket chain is now moving to preferential sourcing of organic produce. Organic foods have not penetrated the food service market to any extent in the US, possibly offering an opportunity for IFP produce, but it is a price driven segment.

¹² Sales of natural and organic foods in American food stores have registered gains in excess of 20% in the past few years versus 2% for conventional food items.

¹³ Condiments – 400%; Frozen desserts – 200%; refrigerated juice and functional beverages – 100%; cheese and milk products – 70%; non-dairy beverages – 60%, SPINS, 52 week, scan sales increases, 2000

According to the ITC, trade in organic foods has become a major business on the global market. Trade with organic products is showing growth rates, which are rarely found in food markets. It is difficult to obtain data on organic tree fruit production, but the table below illustrates the size of the organic market for the world. Produce is a large slice of the organic market.

Exhibit - International Market for Organic Products

Country	Retail Sales (US \$millions)	Total Food Sales (%)	Yearly Expected Growth (%)	Forecast 2000 Retail Sales (US \$millions)
Germany	1,800	1.2	10	2,500
Italy	750	0.6	20	1,100
France	720	0.5	20-25	1,250
Great Britain	450	0.4	25-30	900
Switzerland	350	2	30-30	700
Netherlands	350	1	15-20	600
Denmark	300	2.5	30-40	600
Austria	225	2	15	400
Sweden	110	0.6	30-40	400
Other Europe ¹⁴	-	-	-	500
USA	4,200	1.25	15-20	8,000
Japan	1,200	-	-	2,500
Australia	-	-	-	170
New Zealand	-	-	-	59
Argentina	-	-	-	20,
China	-	-	-	12
Taiwan	-	-	-	10
Philippines	-	-	-	6
Total	-	-	-	19,727

Source: ITC and SOL – Survey.

The combination of consumer demand and legislation, along with a trend towards freeing up of international trade suggest an increase in the trade of “green” food products. Integrated Fruit Production fits into the consumer demand for “green” food, as shown by the EUREPGAP program, a consortium of major European retailers that require produce suppliers to meet their IFP standards.

At this time there is a distinct difference between North America and Europe in the market for IFP produce. Europe is far ahead in terms of production area and certification programs. In North America, IFP has a barely registered presence in either production area or certification and marketing systems. The trend in Europe is for IFP production to replace conventional production products, at least in the area of tree fruits.

In the mid 1990s, the New Zealand fruit industry anticipated the European trend towards IFP tree fruits and created its own IFP program. The 2001 export apple crop from New Zealand was grown in accordance with that industry’s IFP guidelines.

Fruit companies that compete with apples are also pursuing an “environmental” approach to increase market share in the European Union. Cincinnati, Ohio-based Chiquita uses a Rainforest Alliance “Eco Ok” certification as a marketing tool to position its products for greater acceptance on the European market. In 1995, Chiquita began marketing its product in Europe as the “better banana”. Part of this was due to

¹⁴ Belgium, Finland, Greece, Ireland, Portugal, Spain and Norway.

environmental consumer awareness with European consumers. Another reason Chiquita may have pursued its eco-label approach was to counter any “green” trade barriers. There are efforts underway in Europe to set aside quota for organically grown bananas. The EU has granted the Dutch firm Max Havelar licensing set-asides for Havelar-certified organic bananas for Africa and Caribbean countries.

The genetically modified (GMO) foods issue has a much higher profile in Europe than in Canada and the US, but it has begun to make inroads in North America. GMO versus non-GMO has become another point of product differentiation in Europe and will likely grow in prominence in North America.

Changes in agriculture towards a greener product may be more accelerated today than what would have occurred a decade ago. Retail consolidation and lifting of trade barriers, combined with the aforementioned changes already in place, has the potential to create a snowball effect.

3.6 Threat of Potential Entry

With Canada and the US open to apple imports, there is the threat of new competitors taking market share from BC apples. New Zealand and the USA are examples of two competitors that have moved into the Canadian market. Both used heavy promotional spending and new products (i.e. Gala and Granny Smith) to gain market share. Part of their brand image was in the new varieties themselves, offering apple varieties that the consumer had not seen or tasted to that point.

Related to trade are market access issues, including tariffs and Tariff Rate Quotas (TRQ). For example, tariffs for the European Community are complex; they change every month during the EU crop season and they differ for each apple variety. In the Americas, apple exports are subject to TRQ or high tariffs. As an example, in Mexico, apple export tariffs were set under a TRQ at 10% and above the TRQ at 20%. Canada’s TRQ is set at 1,216 metric tonnes. Under the North American Free Trade Agreement (NAFTA), TRQ and tariffs for Mexico will be eliminated by 2003. Tariffs for Argentina are 13% and Venezuela 15%. In addition to these tariffs, there are consumer and other taxes, which vary from 3% to 5%.

In Asia, tariffs are 40% in Taiwan, 10% in Thailand and 5% in Indonesia. Markets in Asian countries have been decreasing significantly because of the financial situation of the last two years. Recently Japan lost its appeal of a WTO decision that it is an unfair trade practise to require fumigation of American apples entering Japan and an inspector be present during the fumigation. As the financial situation is starting to stabilize in this region, the Japanese market may become accessible to BC apples.

On February 8, 2000 the Canadian International Trade Tribunal rescinded the anti-dumping duty imposed on US Red Delicious apples imported into Canada. The Tribunal concluded that dumping is not likely to resume in the foreseeable future. Since February 1995, a dumping duty equal to the difference between the export price and the normal value was applied when the US f.o.b. export price to Canada fell below US\$12.99 per 42lb box.

Surprisingly, there is an inter-provincial trade barrier for apples. It is one of a number of regulated commodities in Canada having inspection requirements for inter-provincial and international movement. A Canadian Partners in Quality Program (C-PIQ), modelled after a program in the United States and instigated in response to concerns over increased inspection service costs, is being developed as an alternative to hands-on inspection services currently being offered by CFIA. Apple packinghouses across Canada participated in pilot projects on C-PIQ during the last crop year. The program will provide the industry with greater flexibility in shipping apples without any compromise in quality of the product and should help to reduce costs for BC sales into other provinces.

There are some non-trade barriers to entry into the apple market. An obvious one is that supplying the larger chains requires a consistent supply on a regular basis. To do this requires economies of size. Brand image is important in some markets. For example, the Washington State Apple commission, BC leaf logo, and ENZA logo are all strong marketing images in Taiwan.

Low trade barriers and some barriers to entry can benefit BC producers. BC has a brand image (in markets where branding is important) and has the benefits of economies of size.

3.7 Summary and Conclusions

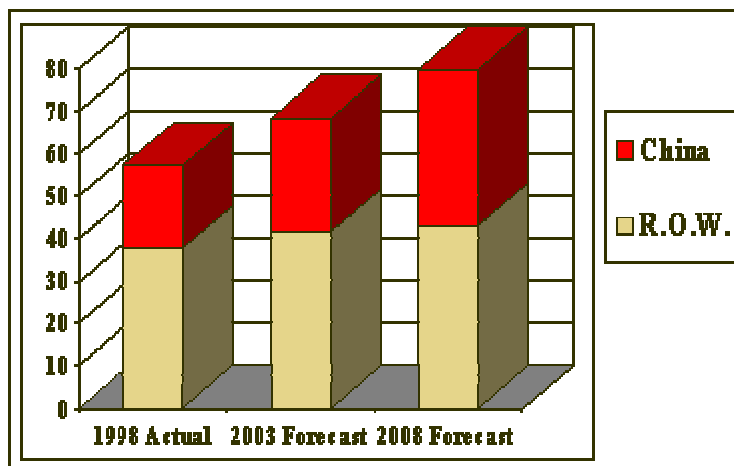
World apple production is expected to grow over the next decade. New varieties planted over the past five to 10 years will fuel the majority of growth. China is producing over one-third of the world's apples on over 50% of the world's apple production area, so there is ample room there for increased production through productivity improvements. Belrose, Inc. projects that China will be a permanent member of the world's top 10 club of apple exporters. China's 200,000 plus metric tonnes of exports represents about 1% of its total production.

The worldwide per capita consumption of apples (excluding China) has been declining in the 1990s and stable or slightly declining in western Europe, Canada and the US. This trend is largely in response to competition from perishable produce grown and shipped almost year round, and greater availability of exotic fruits and new varieties of other established fruits, such as oranges. Population growth mitigates this problem, but a resurgence in apple consumption will require a concerted effort by producers to raise per capita consumption.

The combination of increasing production and declining per capita consumption will lead to continued price stagnation, at least for conventionally grown apples.

The following bar chart is a projection of world production and shows an increasing trend.

Exhibit - World Apple Production Projection



Source: Belrose, Inc.

Belrose, Inc. projects that the world apple crop is likely to grow from 56.6 million metric tons in 1998 to 68.4 million metric tons in 2003, and 79.9 million metric tons in 2008, an increase of over 40%¹⁵ in the decade, representing an average annual increase of about 3.5%. Since world population is expected to grow at 1.5% per year, per capita supplies could increase by 2% per year, thereby worsening the current supply imbalance, according to Belrose, Inc.

The following table is a projection of percentage shares of apple varieties. It demonstrates the continuing trend of increased shares by the so-called new varieties, such as Gala, Braeburn, Idared and Fuji, and declines for Granny Smith, Jonathan, Rome, and Red and Golden Delicious. McIntosh is projected to slightly increase its share.

Exhibit - Major Varieties and their percentage shares of world production (excluding China)

Variety	2000	2005	2010
		(%)	
Delicious	20.70	19.00	17.91
Golden Delicious	19.33	18.30	17.21
Granny Smith	6.67	6.33	6.04
Gala/Royal Gala	6.55	7.67	8.57
Fuji	5.56	5.86	6.13
Jonagold	4.03	4.09	3.99
Idared	3.12	3.81	3.79
Jonathan	2.63	2.58	2.40
Rome Beauty	2.19	1.96	1.78
McIntosh	2.11	2.30	2.20
Braeburn	1.66	2.01	2.34
Elstar	1.60	1.73	1.77
Cortland	0.89	1.14	1.14
Cox's Orange	0.85	0.81	0.75
Gloster	0.81	0.77	0.71
Jonagored	0.77	0.84	0.94

¹⁵ A 12.7% increase in the rest of the world and a 99% increase in China.

Ohrin	0.66	0.62	0.61
Boskop	0.64	0.67	0.63
Spartan	0.60	0.63	0.58

Source: Belrose, Inc.

Given a worldwide increase in trade liberalization, hiding behind trade barriers to prop up a domestic industry is a much weaker option for apple producers in developed nations.

Variety development played a prominent role in sustaining the apple industries of developed nations during the 1980s and 1990s. This approach continues to have some appeal, but less so than in the past two decades.

Planting more Gala and Fuji is not as clear a choice today given depressed prices. The New Zealand industry is reporting that significant areas within orchards remain as bare land because producers are unsure about what to plant.

The New Zealand industry reported that its Pacific Rose variety did not perform well in 2000. New variety development comes with a long lead time as well as the combination of this factor and some consumer disinterest in new varieties makes this option less appealing today than a few years ago.

Growth in retailer consolidation should lead to new aggregations of producers but there is widespread evidence of producer resistance to competing on this basis. For example, a planned marketing cooperative in Washington has not got off the ground and the seemingly successful New Zealand centralized selling agency is coming under considerable criticism and there is a process underway to possibly disassemble this centralized export selling system

Appealing growth areas, from demand and supply standpoints, are clearly in organic production for European, US and Canadian markets and IFP production for Europe.

IFP production is best described as an opportunity in the USA and Canada, it is not a growth category. There are small pockets of IFP production in Canada and the US, creating supply side potential but North American demand for IFP products is unproven. Government financial incentives and retailer regulatory requirements for IFP practises, as implemented in Europe, are not on the horizon for either Canada or the US.

For IFP grown apples, on the demand side in North America, the picture is brightened by rising consumer concern with their health and wellness, led by the following factors.

- Increasing age of baby boomers
- Do-it-yourself health care is at an all time high
- Overwhelming belief that what you eat impacts health

And for IFP grown apples, on the supply side in North America, the picture is brightened by government de-registration of some agricultural chemicals, which is

forcing affected producers to consider non-chemical alternatives to control pests and weeds.

From a price management perspective, organics and IFP are thin markets (a less than 5% market share) so small increases in production could outstrip the rising demand, resulting in an oversupply, which depresses prices. The organics and IFP markets are poorly understood from a statistical standpoint and fragmented on the producer side for organic production, with many very small producers so it is difficult to manage supply to sustain prices. The booming demand has covered up these and other problems, such as poor organic product quality.

Nevertheless, the European, Canadian and American organic apple markets are seen as having tremendous growth prospects, both from growth in their current segment of consumers and from penetration of conventional apple consumers who become attracted through lower prices and better product quality.

In western Europe, IFP grown apples appear to be well down the path of taking over the position of conventionally grown apples. This is a point that is subject to further research in subsequent stages of this project. Whether a price premium can be sustained to account for the additional costs of IFP practices is an open question, which also will be explored later in this project. Retailer consolidation and their increased buying power will be an important factor in the price premium issue. Market concentration has facilitated the EUREPGAP initiative to force producers to adhere to a set of IFP standards.

The differences in phytosanitary import requirements between the US and some Asian countries and the European Union were not a barrier to the New Zealand industry implementing an IFP growing system for its full export crop over three growing seasons.