



Horticulture Facts and Figures 1999

Fruit, flowers and vegetables

Hort + Research

The Horticulture and Food
Research Institute of New Zealand Ltd

Horticultural exports have steadily increased in value over the past two decades contributing strongly to export earnings, to employment and to the well-being of rural communities. A summary of these achievements, for the key fruit, vegetable and cutflower sectors of the horticulture industry, is presented in this publication.

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Hort + Research

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Highlights

Horticulture ranks as a significant export industry 2

International trade

Horticulture builds the New Zealand profile overseas 4

Sector Profiles

Apples 6

Kiwifruit 8

Wine 10

More fruits 12

Flowers, plants and seeds 13

Fresh vegetables 14

Processed vegetables 15

Economic contributor to the regions

Horticulture is vital to the economy of many regions 16

Crops are specific to regional climates and soils 17

Investment in the horticultural industries 18

Sustainable production and market access

Sustainability and renewable resources 20

Nutritional value

Fruit and vegetables add value to daily health 22

... with 5 servings a day 23

International competitiveness

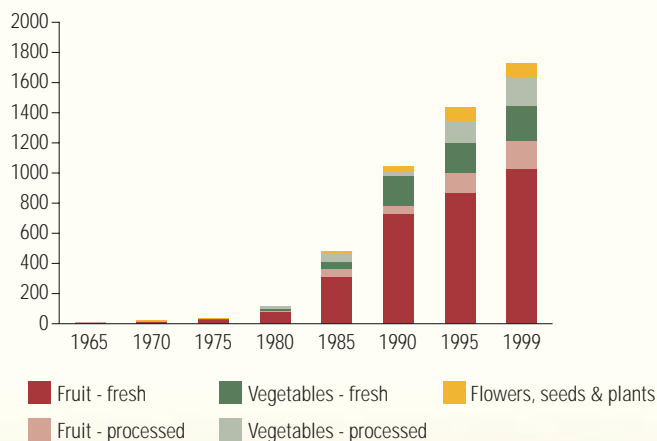
Market strengths in horticulture 24

For more information

Sources 25

Horticulture ranks as a significant export industry

Horticultural exports
(\$ million, fob, 1999)



Source: Statistics NZ



Horticultural exports (\$ million, fob)

Year ended June	1965	1975	1985	1995	1999
Fresh fruit					
Apples	5.0	19.3	108.2	482.1	488.3
Kiwifruit		2.9	171.9	320.8	473.8
Other fresh fruit	0.6	0.8	28.4	66.0	94.8
Total fresh fruit	5.6	23.0	308.5	868.9	1,056.9
Processed fruit					
Jams		0.4	1.7	20.3	16.4
Juices - fruit and vegetable		0.1	9.6	34.6	20.0
Other processed fruit	0.1	1.3	38.6	34.2	20.4
Total processed fruit	0.1	1.8	49.9	89.1	56.8
Fresh vegetables					
Onion	0.2	1.2	17.7	92.6	101.0
Squash			14.6	57.7	59.9
Other fresh vegetables	0.7	1.9	11.6	43.9	71.1
Total fresh vegetables	0.9	3.1	43.9	194.2	232.0
Processed vegetables					
Peas (frozen)	0.5	1.5	22.0	34.0	40.9
Vegetables (frozen mixed)			4.6	25.6	25.9
Sweetcorn (frozen/canned)	0.2	0.8	9.5	25.1	37.8
Other vegetables	0.8	2.4	20.9	66.4	66.0
Total processed vegetables	1.5	4.7	57.0	151.1	170.6
Wine		0.1	3.0	42.0	125.5
Flowers		0.2	7.6	49.8	46.0
Seeds, plants and foliage	0.1	0.6	11.3	21.7	53.0
Total exports in current \$	8.2	33.5	481.2	1,416.8	1,740.8
Horticultural exports as % of NZ produce exports.					
		2.0	4.4	7.0	7.7

Source: Statistics NZ

For more information try www.hort.cri.nz

- Horticultural exports have grown from \$100 million to over \$1.7 billion in less than 20 years. In 1999 the size of the overall horticultural industry (export plus domestic) exceeded \$2.8 billion.
- Horticultural exports were 7.7% of all New Zealand primary produce exports in 1999.
- Horticultural exports have grown steadily from 1970 (1.8% of agricultural exports) through to 1999 (13.6% of agricultural exports).
- Apples and kiwifruit each represented 28% of our horticultural exports, followed by fresh vegetables (13%) and processed/frozen vegetables (11%).
- New Zealand horticulture is driven by exports not domestic sales.

Export destinations for New Zealand horticultural products - trends of the 1990s

- Fruit, vegetables and flowers were exported to 110 countries around the globe in 1999. This is an increase from 83 countries in 1990. Total exports exceeded \$1.75 billion in 1999.
- Exports to 41 countries (27 in 1990) exceeded \$1 million in 1999 and of these 15 countries (5 in 1990) exceeded \$10 million.
- Japan, European Union, UK, USA and Australia are the primary export markets. All have grown during the 1990s.
- Taiwan, Germany, Hong Kong, Netherlands, Singapore, Malaysia, Spain and Italy are all growing markets.

- Horticulture is a \$1.75 billion export industry for New Zealand, representing about 7% of all exports.
- New Zealand exports diverse products into diverse markets. The diversity of products into Japan and Australia should be noted. New Zealand apples have just gained entry into Japan, but they are still banned from entry into Australia.
- Kiwifruit has recently regained access to the USA market.
- Japan is the dominant market for flowers and the UK for wines.

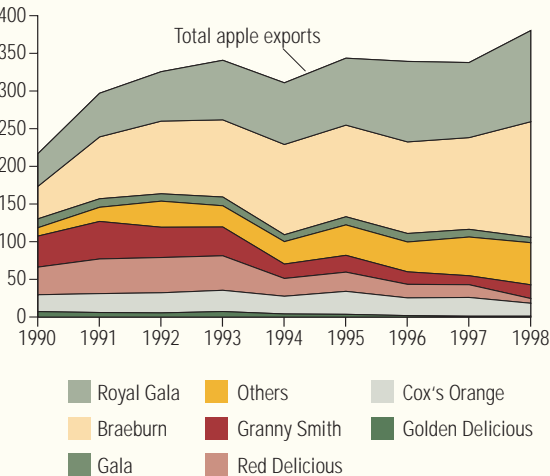
Source: Statistics NZ; countries shown are those defined as the export destinations. Note, for example, that there are exports to the European Union as well as direct exports to countries within the EU such as the UK and Germany. Values following the destination country are for 1999 and, in brackets, 1990.



Data for each crop (\$NZ million, fob) are for year ending 30 June 1999. Entries only included if export value exceeds \$NZ 5 million.

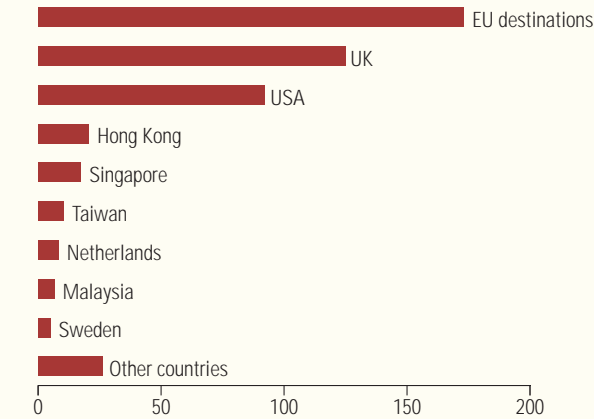
Apples

Revenues from apple exports, by variety
(\$ million, fob)



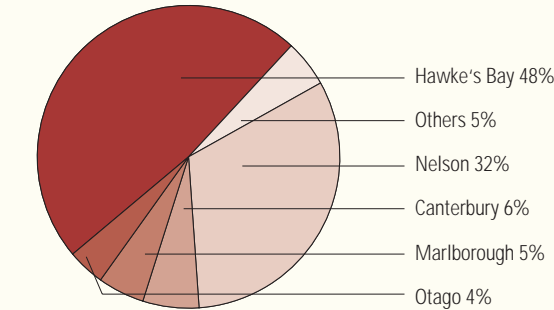
Source: Statistics NZ

Apple exports
(\$million, fob)



Source: Statistics NZ

Export crop submitted by growing area



Source: Annual Report 1998, New Zealand Apple and Pear Marketing Board

- In 1998/99 apples valued at \$488 million (fob) were exported to 51 countries.
- New apple varieties such as Braeburn, Royal Gala and Pacific Rose have been introduced to the international market during the past twenty years.
- These are complemented by innovative quality management systems that have enabled NZ apples to obtain a premium on most markets.
- Older varieties such as Granny Smith and Red Delicious are being phased out of production.
- European Union, USA and UK are the dominant export markets.

For more information try www.enza.co.nz



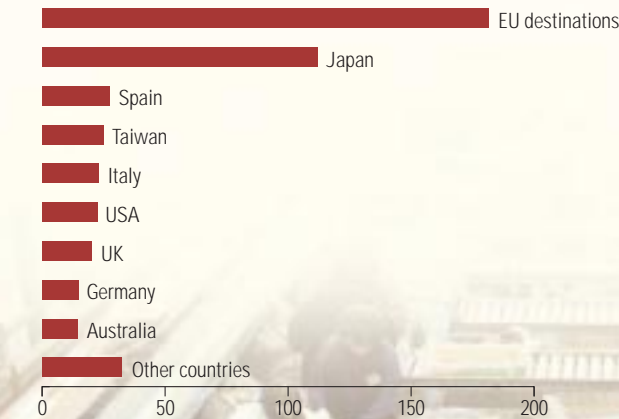
Kiwifruit

Kiwifruit industry statistics

Season	1992	1993	1994	1995	1996	1997	1998
Crop volumes (million)							
Trays submitted	67.7	55.3	55.8	58.7	63.1	60.6	63.1
Trays sold	52.3	49.2	49.9	46.7	56.2	56.2	59.4
General Statistics							
Yield (trays/ha)	4,636	4,516	5,492	5,756	6,110	5,919	6,305
Area planted (ha)	14,594	12,256	10,161	10,210	10,329	10,243	10,015
Growers (no.)	3,327	2,748	2,335	2,205	1,596	1,766	1,657
Packhouses (no.)	349	252	190	148	137	126	118
Coolstores (no.)	180	146	125	119	108	111	106

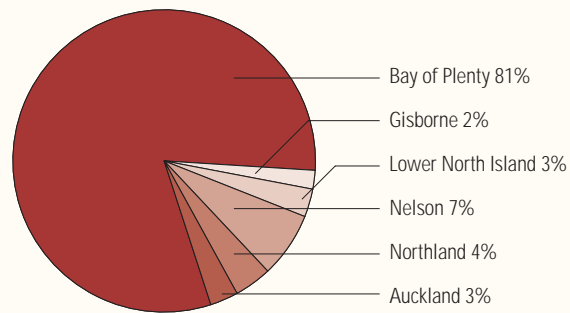
Source: Annual Report 1998, 1999, Kiwifruit New Zealand

Kiwifruit exports (\$ million, fob)



Source: Statistics NZ

Regional production of kiwifruit



- In 1998/99 kiwifruit valued at \$473 million (fob) was exported to 42 countries.
- New Zealand is a dominant player in the global kiwifruit market.
- European Union and Japan are the dominant New Zealand export markets for kiwifruit.
- New Zealand (36%), Italy (36%) and Chile (19%) are the largest exporters of kiwifruit.
- Rationalisation of the number of orchards, packhouses and coolstore operations during the 1990s has improved the industry's viability and there have been efficiency gains in growing methods.

For more information try www.zespri.com

Grape and wine production

Variety	Vineyard area (ha)			Production (tonnes)		
	1990	1999	% change	1990	1999	% change
Muller Thurgau	1,306	445	-66%	25,767	8,941	-65%
Chardonnay	689	2,309	235%	6,026	17,823	196%
Sauvignon Blanc	427	1,732	306%	4,659	20,580	332%
Cabernet Sauvignon	396	571	44%	3,148	3,723	18%
Riesling	282	378	34%	3,658	3,462	-5%
Muscat Varieties	225	161	-28%	6,881	3,885	-44%
Chenin Blanc	208	133	-26%	3,652	2,099	-43%
Pinot Noir	178	741	316%	1,425	4,844	240%
Merlot	96	476	396%	1,062	3,252	206%
Other	1,169	1,214	45%	13,666	11,943	-13%
Total	4,976	8,160	167%	69,944	80,552	12%

- The number of wineries has increased from 131 in 1990 to 334 in 1999.
- Vineyard producing area has increased from 4880 ha in 1990 to 8160 ha in 1999. The planted vineyard area is now 11,187 ha.
- The modest increase in production during the 1990s reflects the change from high yielding varieties to high quality and lower yielding varieties and the young age of newly planted vines.
- Exports have risen to \$125.5 million in 1999, up from \$18.4 million in 1990. Approximately 27% of the wine production is exported.

Regional Councils	Vineyard area (ha)			Production (tonnes)		
	1990	1999	% change	1990	1999	% change
Auckland	310	349	13%	1,818	1,224	-33%
Waikato/Bay of Plenty	126	131	4%	681	552	-19%
Gisborne	1,422	1,368	-4%	24,255	22,133	-9%
Hawke's Bay	1,328	2,011	51%	20,302	16,472	-4%
Wellington	74	235	220%		607	na
Tasman	45	191	320%		1,383	na
Marlborough	1,423	2,997	110%	21,385	29,229	37%
Canterbury	111	384	250%		1,551	na
Otago	19	244	1180%		1,094	na
Other	16	250	1460%	441	55	-88%
Total	4,880	8,160	67%	68,882	77,300	12%

Source: Wine Institute of NZ Inc., Annual Report, June 1999.

For more information try www.nzwine.com

Other fresh and frozen fruits

Sales value (\$m)

Crops as at 30 June 1997	Growers (no.)	Planted area (ha)	Crop per grower (ha)	Production (tonnes)	Domestic 1997	Export 1999
Avocado	606	1,210	2.0	4,200	5.1	19.5
Citrus	500	1,800	3.6	28,000	23.0	8.4
Grapefruit		108			na	0.1
Lemons		310			na	0.8
Mandarins		598			na	7.4
Oranges		569			na	0.2
Tangelos		216			na	na
Persimmon	105	270	2.6	2,000	0.3	9.7
Melons	na	na		na	na	5.9
Feijoa	425	225	0.5	800	1.4	0.3
Tamarillo	200	300	1.5	1,300	2.0	0.7
Passionfruit	100	38	0.4	242	0.6	0.6
Pears	na	na	na	na	na	12.6
Nashi	150	170	1.1	3,000	2.6	0.4
Berryfruit					25.4	24.0
Blackcurrants	50	710	14.2	3,320	0.5	0.1
Boysenberries and Raspberries	107 85	206 247	1.9 2.9	2,886 1,200	5.8	6.1
Blueberries	78	263	3.4	1,000	3.3	5.4
Strawberries	169	193	1.1	6,220	15.8	12.4
Summerfruit					24.4	11.0
Apricots		792		3,000	na	4.0
Cherries		365		2,000	na	5.4
Nectarines - white/yellow		602		5,000	na	1.4
Peaches - white/yellow		814		8,000	na	0.1
Plums		326		1,500	na	0.1
Total Fresh Fruit	2,575	10,331			84.8	94.8
Processed Fruit						
Jams, jellies					na	16.4
Apple juice		<i>Fruit used for processing is produced on the orchard areas described above</i>			na	17.7
Fruit juices					na	2.3
Other processed					na	20.4
Total Processed					na	56.8

Sources: Statistics NZ: New Zealand Fruitgrowers Federation: 'The New Zealand Fruit Industry - An Investment for the Future', November 1998

- Berryfruit exports equal \$24.0 million, strawberries being the dominant berryfruit.
- Avocado exports (\$19.5 million) are expanding.
- The persimmon, citrus and summerfruit exports are of similar value (\$8.5 to \$11.0 million).
- The size of the domestic markets for citrus, berryfruit and summerfruit in 1997 were similar (\$23.0 to \$25.4 million).

Exports of flowers, plants and seeds (\$ million, fob)

	1985	1990	1995	1999
Cut flowers				
Orchids	2.8	8.2	14.6	20.1
Roses	0.9	1.3	1.1	0.3
Proteaceae	0.3	0.5	1.5	1.5
Zantedeschia		1.9	6.6	9.2
Sandersonia		0.2	5.6	2.7
Lilium			1.5	2.2
Other	3.7	6.5	18.8	10.0
Plants				
Live plants	6.3	2.5	3.5	5.3
Foliage	2.9	0.7	0.2	0.4
Seeds, bulbs				
Flower seeds	0.5	<0.1	0.3	3.2
Vegetable seeds	1.2	2.1	7.3	15.2
Bulbs, tubers, corms	0.4	2.0	6.3	9.6
Sphagnum moss		11.0	17.3	13.3
Hops		1.4	6.8	6.0
Total	19.0	26.2	91.4	99.0

Source: Statistics NZ

- Exports of cut flowers have increased from \$7.7 million in 1985 to \$46.0 million in 1999. There are significant exports to Japan of orchids (\$15.0 million), zantedeschias (\$5.8 million) and sandersonias (\$2.5 million).
- The exports of bulbs and vegetable seeds have also increased.
- The domestic market for cut flowers is estimated to be \$50 million.
- Sphagnum moss exports to Japan have been significant during the past decade.



Fresh vegetables

Sales value (\$m)

Crops as at 30 June 1997	Growers (no.)	Planted area (ha)	Crop per grower (ha)	Production (tonnes)	Domestic 1997	Export 1999
Asparagus	390	3,000	7.7	5,495	6.2	10.7
Beans	180	1,050	5.8	7,595	6.0	0.4
Cabbage, cauliflower	252	3,778	15.0	32,696	58.1	0.7
Capsicums	198	130	0.7	33,628	11.6	na
Carrots	170	1,300	7.6	107,204	27.3	15.6
Cucurbits	427	2,270	5.3	>244	42.0	1.4
Garlic	15	139	9.3	1,042	3.7	3.6
Kumara	105	1,020	9.7	13,100	22.1	na
Lettuce	230	905	3.9	>60	30.5	0.5
Onions	183	4,704	25.7	168,944	18.3	101.0
Peas	900	9,500	10.6	52,000	na	na
Potatoes	470	14,152	30.1	494,124	92.5	19.1
Squash	203	7,155	35.2	108,542	11.0	59.9
Sweetcorn	400	6,000	15.0	100,000	na	3.5
Tomatoes	760	2,157	2.8	64,887	90.5	0.9
Other vegetables	1,000	20,000	20.0	>1,647	>184.0	14.7
Total	5,883	77,260			419.9	232.0

Sources: Statistics NZ; New Zealand Vegetable & Potato Growers Federation: 'Strategic Direction for Vegetable Research - 1997/98'. 1998.

- Export value of fresh vegetables has risen from \$199 million in 1990 to \$232 million in 1999.
- Onions and squash are the primary export vegetables, but potatoes, carrots, asparagus, garlic and sweetcorn are also significant.
- Cabbages, cauliflowers, carrots, cucurbits, lettuce, potatoes and tomatoes are significant vegetables on the domestic market.

Processed vegetables*

Sales value (\$m)

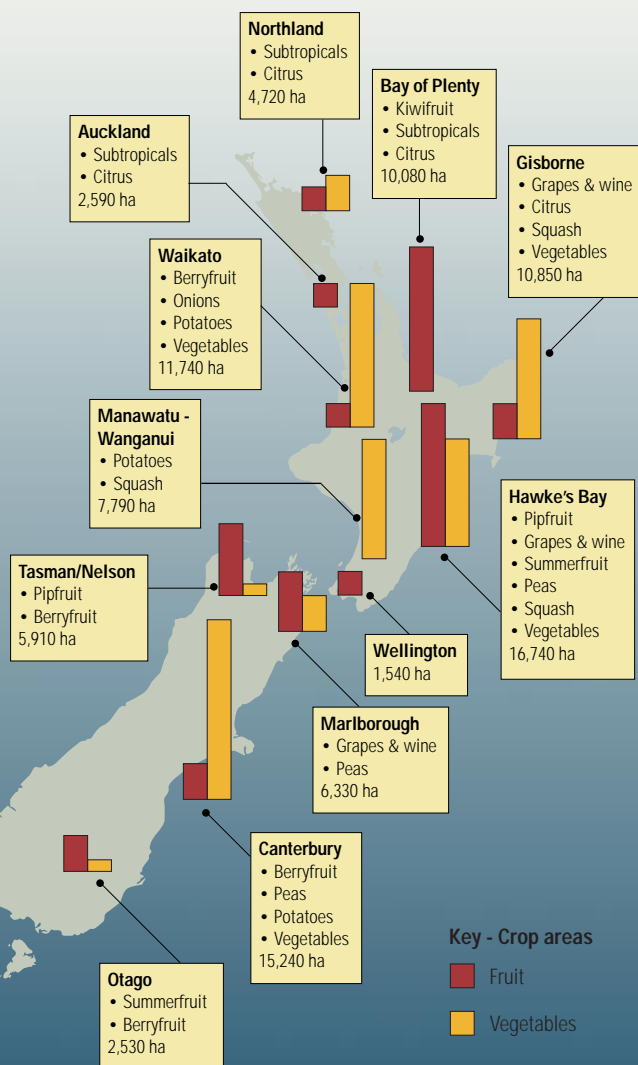
Crops as at 30 June 1997	Production (tonnes)	Domestic 1997	Export 1999
Asparagus	2,325	na	8.1
Beans	7,500	na	15.7
Capsicums	1,681	0.5	na
Carrots	45,000	8.0	0.7
Kumara	500	0.3	0.3
Peas	26,072	na	40.9
Potatoes	201,367	130.0	16.2
Sweetcorn	21,668	na	44.0
Tomatoes	35,000	na	2.5
Mixed vegetables	na	na	25.9
Dried vegetables	na	na	4.0
Other vegetables	na	na	12.3
Total		138.8	170.6

Sources: Statistics NZ; New Zealand Vegetable & Potato Growers Federation: 'Strategic Direction for Vegetable Research - 1997/98'. 1998.

*Vegetables used for processing are produced from the farm areas described in the previous table.

- Export value of processed vegetables has risen from \$31 million in 1990 to \$171 million in 1999.
- Processed peas, sweetcorn and mixed and dried vegetables are the significant exports. Processed asparagus, beans, and potatoes also contribute.
- There is significant export of dried legume grains.

New Zealand horticulture - regional location of crops



Crop is named when the regional area exceeds 10% of the national crop area. Some 26,910 ha of crops could not be assigned to specific regions.

Sources: New Zealand Fruitgrowers Federation: 'The New Zealand Fruit Industry - An Investment for the Future', November 1998; Statistics New Zealand: New Zealand Vegetable & Potato Growers Federation: 'Strategic Direction for Vegetable Research - 1997/98'. 1998: MAF Farm Monitoring Reports. 1999.

Distribution of fruit and vegetables by Regional Councils (ha)

Regional Council	Pipfruit	Kiwifruit	Grapes	Summerfruit	Subtropical	Berryfruit	Citrus	Total fruit	Onions	Peas	Potatoes	Squash	Other	Total vegetables
Northland	134	652			536		718	2,084					2,637	2,637
Auckland	722	657	349	201	336	119	202	2,586						
Waikato	825	853		104	144	309	52	2,287	5,000			2,590	2,927	10,517
Bay of Plenty	241	7,940	131	37	998		501	9,848	188			41		229
Gisborne	310	286	1,368	28	128		576	2,696				3050	5,100	8,150
Hawke's Bay	6,591	291	2,011	899	91	32	55	9,970		1,294	349	2370	2,752	6,765
Manawatu-Wanganui									102	827	3,059	1398	2,400	7,786
Wellington	673	358	235	118	64	78	15	1,541						
Tasman	3,833	813	191	53	11	251	7	5,159		159	75		515	749
Marlborough	758	25	2,997	213	7		3	4,003	1,029				1,293	2,322
Canterbury	1,969		384	218		486		3,057	5,026	3,129			4,026	12,181
Otago	933		244	985		56		2,218		126	188			314
Other			250			250	482	197	691	337	5,751		7,458	
Total	16,989	11,875	8,160	2,900	2,315	1,331	2,129	45,699	5,772	8,658	10,122	7,155	27,401	99,108

Sources: New Zealand Fruitgrowers Federation: 'The New Zealand Fruit Industry - An Investment for the Future', November 1998; Statistics New Zealand: New Zealand Vegetable & Potato Growers Federation: 'Strategic Direction for Vegetable Research - 1997/98'. 1998: MAF Farm Monitoring Reports. 1999.

Note: The areas shown in this and the following table may differ from those presented in statistics from the various industry sectors. Differences among various sources are due to a number of factors including the year of data collection, domestic versus export supply and productive versus planted area.

Investment in the horticultural industries

Estimated investment in horticulture

	Crop area (ha)	On-farm (\$million)	Off-farm (\$million)
Cabbages, cauliflowers	3,778	36	36
Grapes and wine	8,160	326	979
Kiwifruit	11,875	860	172
Onions	5,772	55	55
Other fruit	8,675	304	304
Other vegetables	28,764	273	273
Peas, beans and sweetcorn	16,550	157	314
Pipfruit	16,989	595	595
Potatoes	10,122	96	192
Squash	7,155	68	68
Tomatoes	1,707	16	32
Total	119,547	2,786	3,020

Sources: New Zealand Fruitgrowers Federation: 'The New Zealand Fruit Industry - An Investment for the Future', November 1998; MAF Farm Monitoring Reports, 1999.

- Horticultural enterprises represent a significant capital investment in land, buildings and equipment on farms and orchards (approx. \$3 billion).
- The off-farm capital investment to package, process and transport the products to the nearest port and/or domestic market is similar to the on-farm investment (approx. \$3 billion).
- The ratio of on-farm to off-farm investment varies across the individual sectors. Kiwifruit off-farm investment is about 20% on-farm investment, whereas wine approaches 300% of on-farm investment.
- Horticultural enterprises operate at many scales. Off-orchard packhouses allow small holdings to be economic for growers. This resource encourages new grower entrants.

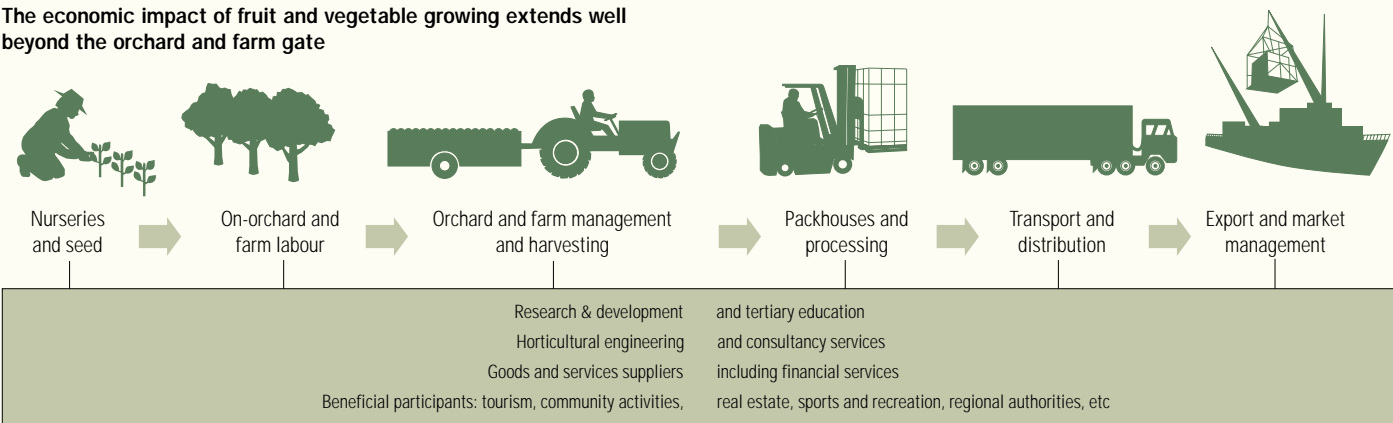
Horticulture provides diverse employment for those living in the regions

Regional Employment	People employed	% Rural workforce
Northland	2,414	21
Auckland	5,626	48
Waikato	3,704	13
Bay of Plenty	4,925	46
Gisborne	1,715	44
Hawke's Bay	6,699	58
Manawatu-Wanganui	2,134	15
Wellington	874	18
Tasman	4,332	65
Marlborough	1,530	48
Canterbury	5,980	31
Otago	1,929	21
Other	1,225	6
Total	43,087	27

Source: Statistics NZ

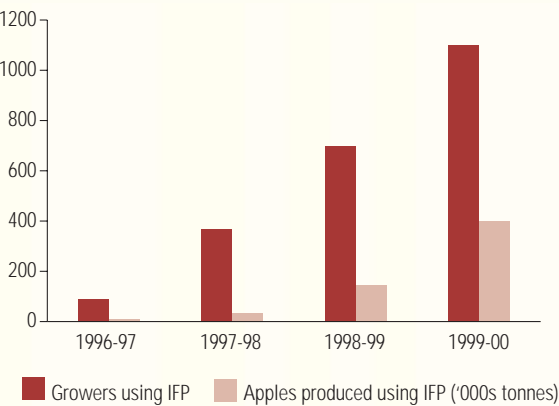


The economic impact of fruit and vegetable growing extends well beyond the orchard and farm gate



- Horticultural production systems are designed to minimise chemical residues. Integrated Fruit Production (IFP) and Integrated Pest Management (IPM) practices are widely used in fruit and vegetable production. Careful monitoring and 'trace-back' systems provide overall quality assurance.
- New Zealand has strict border protocols designed to reduce entry of unwanted pests and diseases.
- New Zealand exports to countries which have their own border controls with which we must comply. These are designed either to protect their crops and/or the health of their citizens.
- Market access issues arise where risks of disease and pest entry are raised as non-tariff barriers: eg Australia - fireblight risk prohibits apple imports; Japan codling moth risk restricts apple imports; USA leafroller and mealybug risks restrict apple imports.

Uptake of Integrated Fruit Production (IFP) by apple growers



Integrated winegrape production

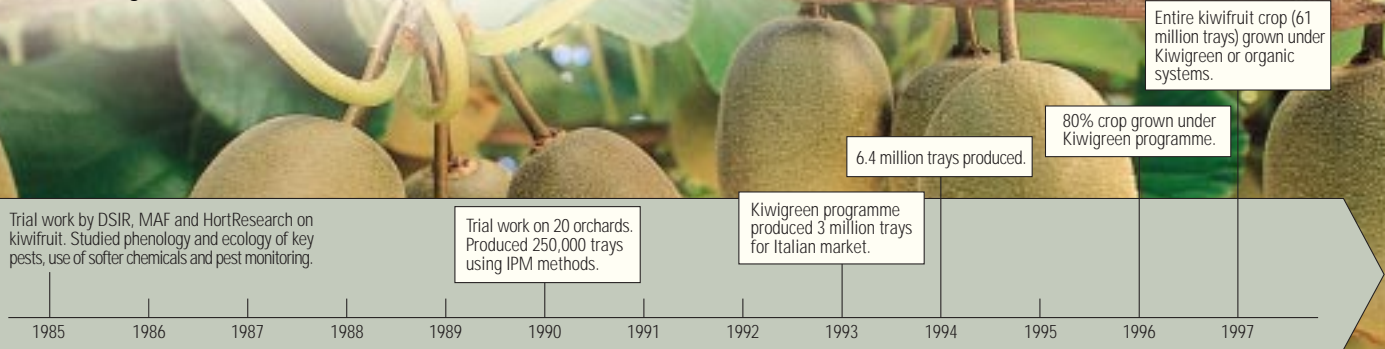
- Winegrowers reduce chemical usage through the NZ Integrated Winegrape production scheme. Over 140 vineyards (over 60% of the total vineyard area) have elected to participate in this scheme in 1999/00.

Typically IFP Technology has enabled:

- 30% reduction in use of EDBC fungicides
- 13% reduction in fungicide applications
- 50% reduction in insecticide use
- 75% reduction in OP insecticide use

Source: HortResearch, 1999.

Kiwifruit growers have adopted the Zespri Kiwigreen Programme, which is designed to minimise chemical residues on kiwifruit.

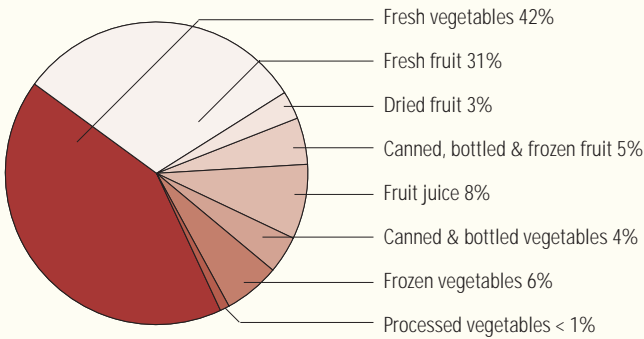


The four food groups and the nutrients they provide

Food Group	Nutrients	NZ's Food and Nutrition Guidelines Recommend...
Breads and Cereals	Protein, carbohydrate, vitamins, minerals.	6 servings a day
Fruit and Vegetables (includes fresh, frozen, canned, and dried)	Carbohydrate: especially complex (fruits may be high in simple carbohydrates or sugars). Dietary fibre: soluble and insoluble. Vitamins: especially A (yellow and green vegetables), C (dark green vegetables and most fruits, potatoes), and folic acid. Minerals: magnesium, potassium.	5 servings a day
Milk and dairy products	Protein, fat, vitamins, minerals.	2 servings a day
Lean meats, poultry, fish, etc.	Protein, fat, vitamins, minerals.	1 serving a day

Source: 'Food Health and Well-being for New Zealanders'. 1997

New Zealanders spend over \$1 billion on fruit and vegetables each year



Source: Statistics NZ. Household survey for year ended 31 March 1998. (Grapes for wine are not included in these data.)

Analysis of typical fruits and vegetables

	Dietary Fibre (g)	Vitamin A equiv. (µg)	Vitamin C (mg)
Apples	**	*	*
Apricots	**	**	*
Avocados	**	**	*
Cabbage (raw)	**	*	**
Carrot (raw)	**	***	*
Kiwifruit (raw)	**	*	***
Onions (raw)	**	*	*
Oranges (raw)	**	*	**
Pears	**	*	*
Peas (boiled)	***	**	**
Potatoes (fries)	**	*	*
Strawberries	**	*	**
Sweetcorn (boiled)	**	**	*
Tomatoes	**	**	*
Key	* Low ** Medium *** High	below 1.0 1.0 to 4.0 Over 4.0	<30 30 to 200 Over 200
			5 to 20 21 to 60 Over 60

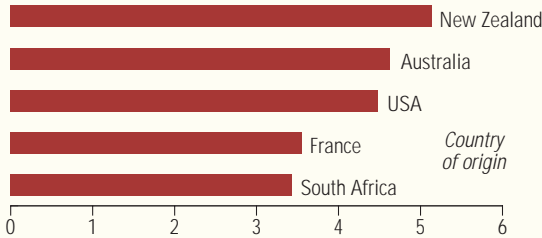
Analysis of typical fruits and vegetables

Constituents contained within 100 gm portions	Dietary fibre (g)	Energy (kJ)	Total Fat (g)	Vitamin A equiv. (µg)	Vitamin C (mg)	Potassium (mg)
Apples	2.0	212	0.1	2	5	107
Apricots	2.1	139	0.1	35	12	335
Avocados	1.5	875	22.6	49	9	470
Cabbage (raw)	3.8	72	0.1	5	45	320
Carrot (raw)	3.3	110	0.2	1730	6	260
Kiwifruit (raw)	1.6	192	0.6	10	93	236
Onions (raw)	1.7	114	0.1	2	5	125
Oranges (raw)	2.0	151	0.1	21	52	145
Pears	2.4	225	0.1	3	5	83
Peas (boiled)	7.2	211	0.4	76	20	155
Potatoes (fries)	3.7	1010	13.9	1	10	520
Strawberries	2.2	77	0.1	1	45	130
Sweetcorn (boiled)	3.7	457	1.3	50	6	249
Tomatoes	1.2	52	0.1	58	18	200

Source: 'The Pacific Islands Food Composition Tables', Crop & Food Research, Palmerston North. 1993

Market strengths in horticulture

Sources:

UK average wine price
(£ per bottle)

Source: Wine Institute of NZ, Annual Report, June 1998

- Premium prices are received by New Zealand white wines in UK, which is our largest market.
- New Zealand first exported kiwifruit during the 1950s. Today's fruit crops have the highest yields. New 'Zespri Gold' yellow kiwifruit obtain a significant price premium.
- Brands play a key role in marketing horticultural products.

Annual report / Kiwifruit New Zealand 1998, 1999, 1998, 1999

Annual report / New Zealand Apple and Pear Marketing Board 1998, 1998

Annual report / Wine Institute of New Zealand 1999, 1999

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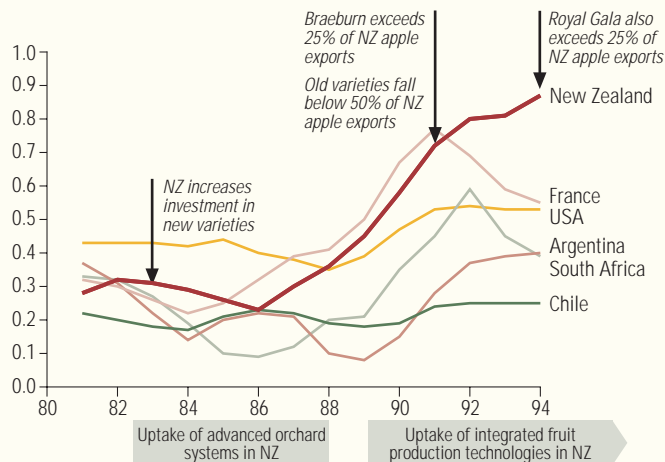
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International performance of New Zealand apples

Prices obtained for export apples (rolling 3 year averages, \$US/kg)



Source: Rabobank International

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Horticultural
Exporters
Council Inc



New Zealand Horticulture
Export Authority



*New Zealand Fruitgrowers
Charitable Trust*