World Kiwifruit Review

2013 Edition

A publication of Belrose, Inc.
Publishers of the World Apple Report

1045 N.E. Creston Lane, Pullman, WA 99163-3806, USA

TEL: (509) 332-1754 FAX: (509) 334-5209 MOBILE: (509) 432-5258
E-MAIL: belrose@pullman.com WEB SITE: www.e-belrose.com

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FOREWORD

This sixteenth annual edition of the **World Kiwifruit Review** was being prepared as the kiwifruit industry grappled with one of the greatest challenges in its half century of commercial history. The bacterial disease pseudomonas syringae pv actinidiae (PSA) is now present in many producing countries. It has had a devastating effect on the golden cultivar, Hort 16A, particularly in New Zealand where production of that cultivar could well cease in the near future. However, it has also affected other established cultivars. In addition, it is still uncertain how resistant to PSA some newer cultivars may be.

The economic fallout from PSA has affected ownership, operations and future planning for the entire industry. Many entities, from producers and investors in orchards, to suppliers of finance and production inputs, to organizations that pack, store, export and import kiwifruit, have been trying to realign their businesses to cope with the new realities. So far, reductions in supplies have been little different from those that would have occurred in a normal down year, so reactions from retailers and consumers have been muted. However, the loss of an entire cultivar like Hort 16A, or persistent reductions in total kiwifruit supplies, could change the thinking of both retailers and consumers about where kiwifruit fits in their merchandising and consumption plans.

The net effect of this turmoil has been to increase the uncertainty surrounding the entire kiwifruit business. Industry participants must cope with this heightened uncertainty at the same time that they face the normal challenges of delivering high quality product at reasonable prices in ever-changing market environments. We have tailored this edition of the World Kiwifruit Review so the information it provides can be pertinent in helping organizations develop long-term strategies to survive the current crisis.

Desmond O'Rourke
President, Belrose, Inc.

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We are once again deeply indebted to Jean-Michel Fournier, Director, Bureau National Interprofessionel du Kiwi (BIK), Toulouse, France, for providing much valuable information and continuing assistance in completing this edition of the World Kiwifruit Review.

Rebuilding the Kiwifruit Industry post-PSA

The PSA-crisis has forced the kiwifruit industry around the world to re-examine every aspect of its operations with the goal of rebuilding an industry that can overcome the challenges PSA has brought.

The basis for any rebuilding program has to be an objective assessment of the PSA challenges, in particular, what contributed to the severity of the PSA disruptions, and what can be done to alleviate or overcome them.

There appear to be three main ways to overcome the bacteria and its variants. The first, and most obvious, but also proving very difficult, is finding a treatment (for example, a chemical spray) that can be applied to existing vines to knock out the bacteria before it damages the vines.

The second is to find new cultivars that are both resistant to PSA and also have the storage and handling characteristics, and consumer appeal, of the existing cultivars. Ideally, these new cultivars would have the same consumer appeal as Hort 16A, with its ability to attract price premiums, but, at this juncture, most producers would settle for a new cultivar that could hold its own against the mass-market Hayward green kiwifruit. However, under normal circumstances, successful commercialization of a new cultivar is a decade-long process. Various teething problems have to be overcome in growing, harvesting, storage, packing, transportation and distribution before a new cultivar performs consistently at a high level.

The process of developing new cultivars can be speeded up by the use of genetic engineering techniques. However, for many years, the New Zealand kiwifruit industry has had a vigorous anti-GM stance. It does not have a pipeline of genetic materials that could be rapidly inserted into its breeding programs. In addition, reversal of its anti-GM stance could give critics in many countries, including many key European markets, an excuse to disparage New Zealand kiwifruit.

The third response to PSA would involve radical changes in orchard locations, architecture, operations and management in order to reduce the risk of similar challenges in the future. In the past, the warm, humid climate of New Zealand's Bay of Plenty gave that region a large comparative advantage over other kiwifruit

growing regions in New Zealand in yield and quality. However, the result was a high concentration of kiwifruit orchards in a small geographic area. That enabled the PSA infection to spread rapidly. This situation is not unique to kiwifruit production. It applies to intensive production of all crops and animals. When a large number of similar species are concentrated in one district, greenhouse, feedlot, etc., infections can spread very rapidly through movement of air, humans, machines, etc.

The kiwifruit industry in the Bay of Plenty, and in other areas of concentrated production, will continue to be at high risk of contamination from future bacterial or other biological threats. A number of ways to mitigate that risk have been debated. In New Zealand, the easiest would be dispersal of kiwifruit production more widely across different growing areas. However, that would cause further major losses for the Bay of Plenty economy, would require large, new investments in other growing areas and would tend to lead to lower average yields in New Zealand as kiwifruit production was relocated to areas with lower comparative advantage in kiwifruit than the Bay of Plenty.

Another approach would be to grow kiwifruit within contained systems, such as greenhouses, where processes of contamination could be more tightly controlled. However, the additional structures and control systems needed to implement sterile, greenhouse production would greatly add to the costs of production.

Even within current production areas, growers and researchers are rethinking many of the practices that were developed in the past to secure higher yields or larger sizes. For example, cuts incurred in pruning of limbs or vines or in the scoring of trunks to improve yields provided a pathway for the bacteria to enter the plant. The use of contractors for pollination, fertilization, spraying, and other activities helped lower costs, but was a source of infection from one orchard to the next. The international links for supplies of plant material, pollen, etc., allowed producers to improve production, but also opened the door to invasion of undesirable foreign species. The spread of infections could be reduced if blocks of kiwifruit were interspersed with other crops, or if large blocks of the same cultivar were intermixed with other cultivars. Another, longer-term solution would be to move from permanent perennial plantings to annual migratory plantings. However, that would involve extensive research and development work.

The fact that PSA has had so much greater an impact on production of golden kiwifruit than on green kiwifruit will alter the revenue flow for many producers and for the entire industry. In New Zealand, between 2006 and 2011, the orchard gate return for Zespri™ Gold was NZ$6.33 per tray equivalent, 68 percent greater than that for Zespri™ Green, because average yields and average prices of golden kiwifruit were substantially higher than for green kiwifruit. To make up some of the revenue lost as more gold kiwifruit plantings are removed, producers will have to place much greater emphasis on getting higher yields from their green kiwifruit plantings. Getting higher yields usually requires increased expenditure on improved materials, and on technology, knowledge and managerial inputs.

At the same time, the threat of PSA means that producers even of green kiwifruit will have to take control and preventative measures against PSA for years to come. The range of estimates for these added costs is NZ$1,000-2,000 (US$ 800-1,600) per hectare. These twin pressures on the cost and revenue sides mean that investment in many marginally profitable blocks will become more difficult to justify. Similar effects, although in a more muted form, are likely to occur in Italy, Chile and other major producing countries.

There will be equally dramatic effects of PSA in the global marketplace. In the short-run, the total volume of kiwifruit placed on world markets is likely to continue to shrink until the PSA outbreak is brought under control. Such shrinkage has occurred in the past between one year and the next due to normal cycles of supplies triggered by alternate bearing or adverse weather events. When volume is reduced temporarily, producers generally enjoy higher prices. Both retailers and consumers are accustomed to adjusting to such downward swings in supplies and upward swings in prices from one season to the next. When the next upswing occurs, they rapidly return to previous buying habits.

However, if the decline in kiwifruit supplies persists for a number of years, retailers and consumers are likely to make lasting downward adjustments in their demand for all kiwifruit. Retailers will be forced to find other fruits to occupy the shelf space relinquished by kiwifruit, and will divert more of their merchandising and promotion efforts to those more plentiful fruits. Consumers' buying habits will also tend to shift from kiwifruit to other substitute fruits. Past trends suggest that world supplies of competing fruits are likely to continue to grow in the next few years, and that consumers will not lack for attractive, alternative fruits.

The fallout from PSA is likely to have a differential effect on the major kiwifruit producing and exporting countries. The effects are likely to be most extreme in the New Zealand industry, where its Zespri™ Gold product will be gone from the market by 2014. New Zealand stands to lose its most profitable markets in Japan and Taiwan, where Zespri™ Gold has been extremely successful, and potential new markets for Zespri™ Gold that were being developed in China and other fast-growing economies. New Zealand is gambling that consumers in those markets that were fans of Zespri™ Gold will be willing to revert back to consuming Zespri™ Green, or will willingly substitute golden cultivars, such as Gold3.

For other major competitors like Italy and Chile, the decline in total supplies and in supplies of golden kiwifruit will be more muted. In the short-run, they may benefit from higher prices because of reduced New Zealand supplies. However, any reductions in their average production could contribute to a longer-lasting reduction in total kiwifruit supplies and help to alter the long-term behavior of retailers and consumers as described above.

If supplies of all three major exporters were curtailed for several years, it could also temporarily reverse the recent situation where fresh kiwifruit has been available for twelve months each year. With assurance of continuous supplies, retailers could plan on allocating shelf space on a continuing basis to fresh kiwifruit. However, any break between Northern and Southern Hemisphere supplies could mean that kiwifruit would lose its dedicated shelf space and would have to make special efforts to win that space back as each new season began.

Any reductions in supply would also alter both the scale and the focus of promotional programs for individual exporters and for the industry as a whole. In general, the scale of a promotional program depends on the total volume of member fruit and on the charges levied on members per unit of fruit sold. If the total volume falls, promotional expenditures can only be maintained if higher levies are charged per unit. In the case of New Zealand, the Zespri organization maintained its promotional expenditures in the short run by reducing its margins in the hope that the PSA crisis would be brought under control relatively quickly. However, that is no longer a valid expectation. On the other hand, the current economic stress in the industry means that it would be difficult to increase per unit promotional charges.

Both Italy and Chile face similar prospects that the upward trend in kiwifruit production and exports will be halted, at least temporarily, and that the total funds available for promotion will also be trimmed. While other minor producers, such as France, Greece, Spain and the United States, will probably face little change in volume or promotional support in the short run, global promotional funding for kiwifruit is likely to be reduced by the troubles in New Zealand, Italy and Chile.

The focus of promotional programs for kiwifruit are also likely to change in the short-run because of the fallout from PSA. Exporters will face difficult choices in allocating expenditures to different products and different countries. With the collapse of supplies of Zespri™ Gold, New Zealand will have to re-orient its programs in countries like Japan and Taiwan. It will have to choose how much to emphasize the merits of its standard Hayward cultivar, sold as Zespri™ Green, and how much to spend in trying to establish demand for its newer, relatively untested, golden cultivars. Its decisions will be strongly influenced by the needs of its major importers, wholesalers and retailers in these and other markets for whom Zespri™ Gold was a very profitable product. What can be done to support the revenues of these intermediaries so they will remain receptive to any other cultivars that emerge from the New Zealand breeding program?

Italy and Chile will have little choice but to focus most of their promotional efforts on the Hayward cultivar. However, they will have to decide how much to invest in promotion of their newer cultivars. If the gap between supplies from the Northern and Southern Hemispheres widens as expected, both may want to place more effort behind promotion of early cultivars, presuming that those cultivars do not also succumb to damage from PSA.

The rebuilding of the kiwifruit industry after PSA is taking place against a background of major disruptions in the world economy that also need to be taken into account. In North America, overall consumer purchasing power has been hurt by the Great Recession and its aftermath, but spending on fresh fruit has continued to grow. In contrast, many countries in Europe have been wracked by government debt problems and widespread unemployment, and per capita consumption of all kinds of fresh fruit have continued to decline. Retailers have increasingly competed with price discounts and special offers.

In contrast, the Russian Federation, and many developing economies in Asia, have rebounded quickly from recession, and demand for fresh fruits has continued to grow. Russia has become a member of the World Trade Organization, thus committing to lowering barriers to imports further, and many Asian countries are actively pursuing bilateral or multilateral agreements that would reduce their import barriers to fresh fruit.

In all these markets, the kiwifruit will continue to compete for its share of retail and consumer spending against a wide array of fruits, both traditional and new, with many different attributes.

The remainder of this issue of the World Kiwifruit Review systematically documents the various aspects of fruit markets that the kiwifruit industry needs to consider in formulating its future strategies. For convenience, the Review is divided into seven main sections:

I. Production of Kiwifruit.
II. Trade in Fresh Kiwifruit.
III. Consumption of Fresh Kiwifruit.
IV. Prices of Fresh Kiwifruit.
V. Analyzing Demand for Fresh Kiwifruit.
VI. Marketing Initiatives.
VII. Strategic Issues.

Each section looks backward at past trends and forward to emerging trends that can alter the potential of the global kiwifruit industry. It looks at international, national, regional and local forces for change. Every effort has been made to ensure the accuracy of the data provided, to present it in a format that is useful to executives, and to note known inconsistencies. We hope that the resulting document will be a unique resource for members of the kiwifruit industry as they face the momentous task of rebuilding their wounded industry.

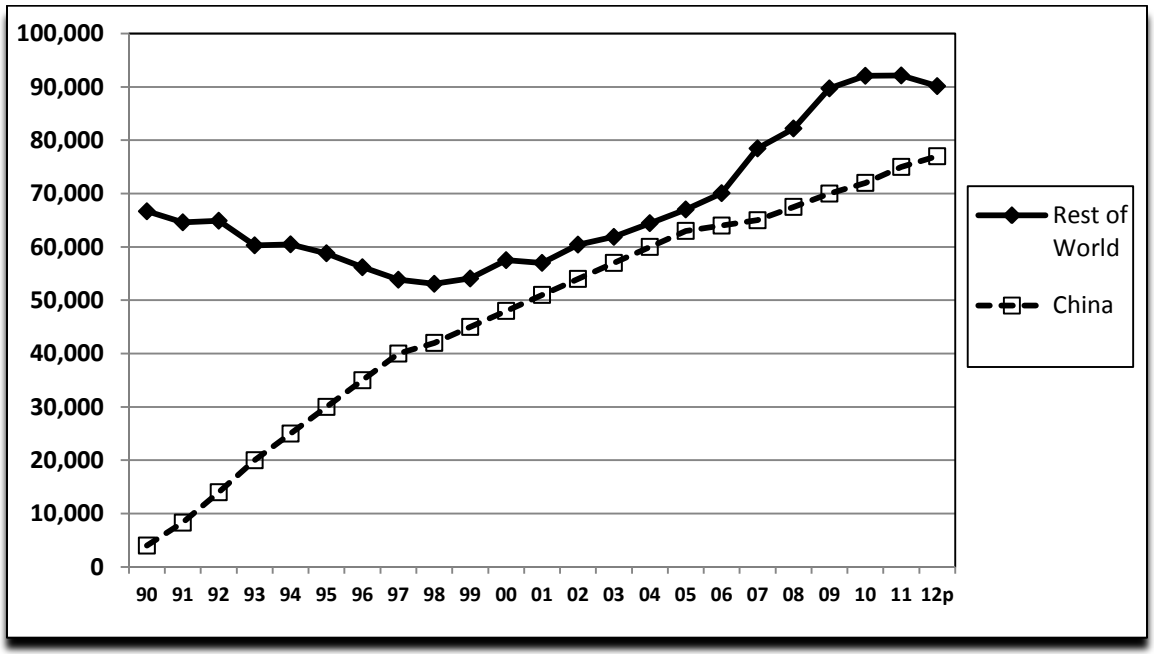
I. Production of Kiwifruit

What PSA Has Wrought

Official data from UN,FAO confirm that in the world excluding China, the long expansion in kiwifruit harvested area, that began in 1998, has begun to taper off, at least for now. Preliminary estimates suggest that harvested area actually declined in 2012, and more declines can be expected in 2013. So far, expansion of kiwifruit area in China does not appear to have been affected by PSA.

In the past, harvested area of kiwifruit has been highly correlated with the planted area. The main deviations were due to new plantings that had not yet come into production, or by existing bearing area where crops were not harvested because of weather damage. PSA has greatly complicated the measurement of harvested area, because PSA can cause the removal of fruiting wood on vines, or of entire plants, or of entire blocks. Thus, existing blocks may have had their productivity permanently compromised.

World: Area Harvested of Kiwifruit, 1990-2012
(Hectares)



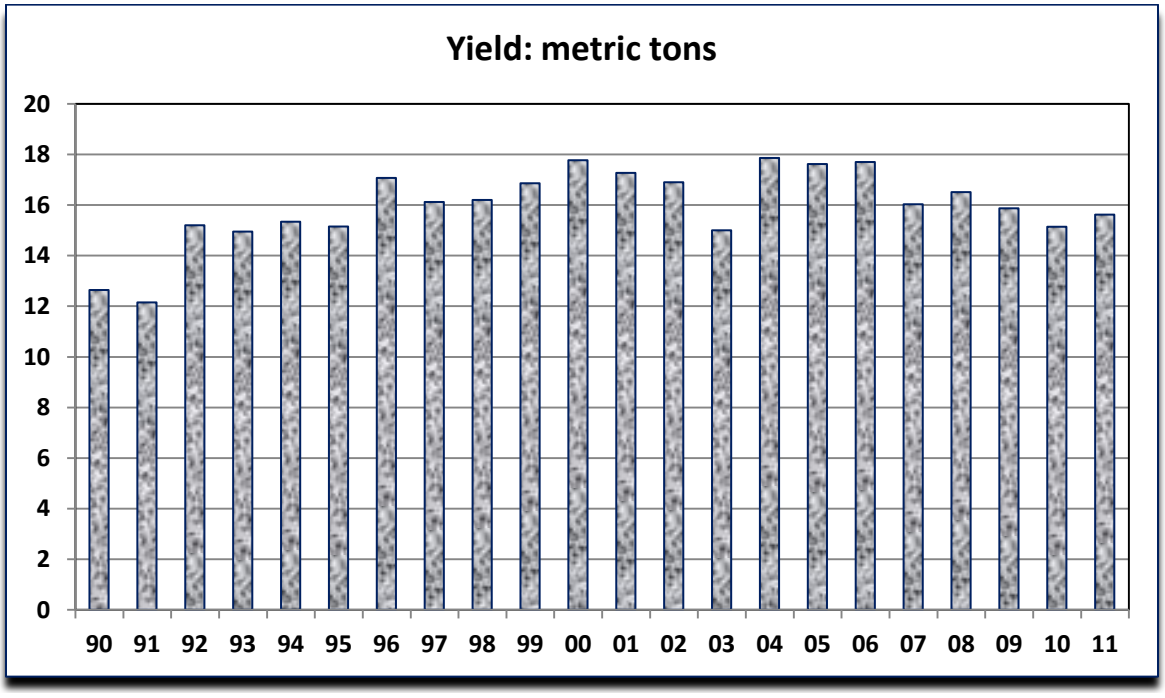
Past Yield Trends No Longer Reliable

Data on yield per hectare harvested has been available from UN,FAO on all kiwifruit producing countries except China. The chart below shows that average yields were generally on a long upward trend during the 1990s, when producers were removing their less productive acreage after disastrous seasons in the early 1990s. Yields averaged close to 18 metric tons per hectare in the year 2000, and almost reached that level again in 2004 and 2005, but have been on a downward trend since. Part of that can be ascribed to the rapid expansion of area between 2006 and 2009, as younger plantings had yet to reach full bearing.

Since 2010, PSA has certainly contributed to reduced yields on blocks that have been compromised by the bacteria. The effect is compounded by the fact that golden kiwifruit, especially Hort 16A, had substantially higher yields per hectare than green kiwifruit, but those cultivars have been particularly hard hit by the scourge of PSA. Until the world kiwifruit industry is able to overcome the PSA problem, it appears unlikely that average yields can again approach the 18 metric ton level.

World, excluding China: Average Yields of Kiwifruit, 1990-2011

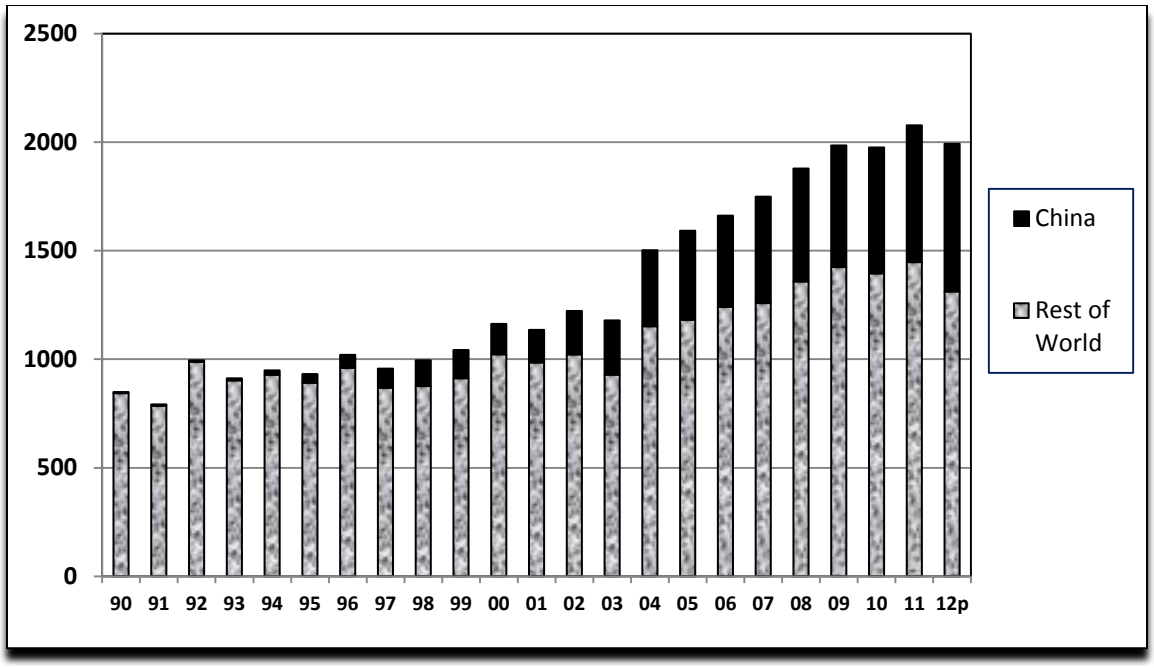
(metric tons per hectare)



Future Production Uncertain

World production of kiwifruit outside China increased in each year between 2003 and 2009, when it exceeded 1.4 million metric tons for the first time. It again topped that mark in 2011. However, because of the combined effects of PSA and of unfavorable weather conditions, production in 2012 was expected to fall by about 10 percent. In the same period, production in China has continued its steady upward march. It was expected to reach 680,000 metric tons in 2012, twice the level achieved 8 years earlier. Total world production (including China) topped 2 million metric tons for the first time in 2011.

World: Production of Kiwifruit, 1990-2012
(1,000 metric tons)



Without the presence of PSA, world kiwifruit production would have been expected to continue its upward climb. In New Zealand, hardest hit by PSA, the industry expects to be able to replace Hort 16A with newer cultivars, and to be back on its former growth path by 2016. However, that is dependent on how rapidly the new cultivars can win customer acceptance and how well they can resist PSA. The threat of PSA to kiwifruit production in other major producing countries, such as Italy and Chile, is also unclear. Given these uncertainties, it may take years for kiwifruit production outside China to resume its growth path.

Kiwifruit's Place in the Global Fruit Spectrum

The kiwifruit remains a small niche in a large, diversified and growing global fruit complex. World production of the major deciduous, vine, citrus, tropical and berry fruits (but excluding watermelons and other melons) grew from 314 million metric tons in 1983-85 to 467 million in 1999-2001, an increase of 48.7 percent, and by a further 30.6 percent to 610 million in 2009-2011. Excluding China, kiwifruit production averaged less than 1.4 million metric tons. Growth of fruit production far outpaced the growth of world population. As the table below shows, per capita supplies of all fruit grew by 19.2 percent from 1983-85 to 1999-2001 and by a further 15.7 percent by 2009-2011. Although per capita supplies of kiwifruit (excluding China) grew even faster in both periods, by 2009-2011, kiwifruit still represented only 0.21 percent of per capita world fruit supplies.

World: Per Capita Production of Major Fruit Groups, 1983-85, 1999-2001 and 2009-2011

Fruit Category	1983-85	1999-2001	2009-2011	'09-11 v 99-01
	(kg)	(kg)	(kg)	(% Change)
Apples	8.22	9.51	10.46	+ 10.0
Other Deciduous	6.22	7.68	9.73	+ 26.7
Total Deciduous	14.44	17.19	20.19	+ 17.5
Total Grapes	12.32	10.20	9.89	- 3.0
Oranges	9.07	10.13	9.95	- 1.8
Other Citrus	5.05	7.02	8.19	+ 16.7
Total Citrus	14.12	17.15	18.14	+ 5.8
Bananas	8.41	10.92	15.06	+ 37.9
Other Tropical	13.88	16.04	19.59	+ 22.1
Total Tropical	22.29	26.96	34.65	+ 28.5
Other Fresh Fruit	n.a.	3.78	4.21	+ 10.8
Total Berries	0.80	0.93	1.09	+ 17.2
Kiwifruit	0.09	0.16	0.21	+ 31.3
TOTAL FRUIT	64.06	76.37	88.39	+ 15.7

PSA is likely to reduce the growth potential for world production of kiwifruit for several years. In the meantime, there is no reason to expect that the supply of competing fruits will slow down in the near future. Only two major fruits, grapes and oranges, have experienced declines in per capita supplies in the last decade. Per capita supplies increased by over 15 percent for other deciduous fruits, other citrus fruits, bananas, other tropical fruits and all berries combined. The slowest per capita growth was 10 percent or greater for apples and for other fresh fruits not specified separately.

A number of factors are driving the expansion in fruit production. On the supply side, intensive production of fruits depends on the ability of farmers to access capital for development of orchards or plantations. The much higher average gross returns in perennial crops, and the potential for large net returns, provide a major incentive for individual farmers to convert land from annual to perennial crops. As producers of annual crops, such as grains, have become larger, many have been able to accumulate or borrow funds to invest in perennial crops. In addition, international and national development agencies favor perennial crop development because of the high returns per hectare that can be generated. Since the supply of arable land is many times that currently in perennial crops, there will continue to be opportunities for both private entrepreneurs and public agencies to convert more land to perennial crop production. The major constraints will be access to adequate water and harvest labor.

On the demand side, the array of factors stimulating increased production are even more diverse. One has been the normal response of consumers as they become more affluent. They both seek to consume a wider range of fruits, and also become more receptive to greater diversity within each fruit category. Thus, they are much more willing to try new, or exciting fruits. In the temperate Northern Hemisphere countries, many of these fruits tend to be tropical in origin. In tropical countries, demand for temperate fruits, like apples and pears, tends to rise. Improved transportation and storage have made it easier to move perishable products over long distances. Consumers have also been receptive to innovation within traditional categories, for example, the introduction of bi-colored apples, seedless grapes or donut peaches. A number of other factors have speeded up acceptance of new or exotic fruits, including increased foreign travel, increased immigration, and the influence of celebrity chefs and food-oriented programs on television, newspapers, magazines and the internet.

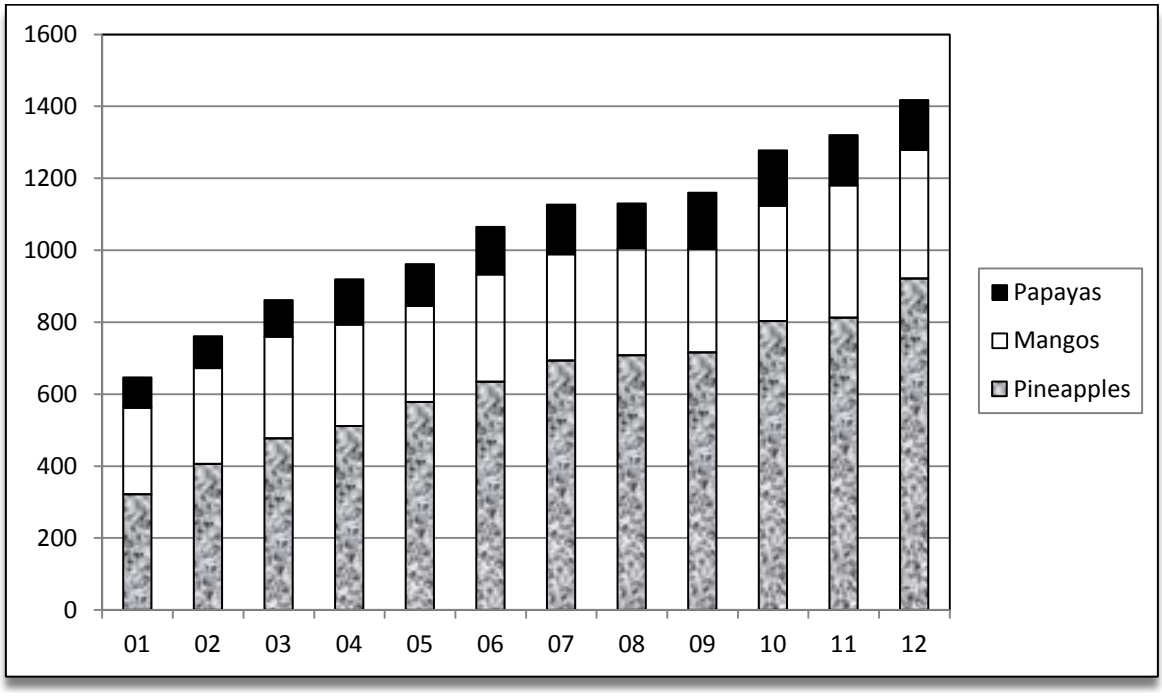
Preferences within fruit categories have also been influenced by two major societal developments. The increasing mobility of consumers has led to more eating on the run. The need for convenience has worked in favor of fruits or snacks that can be eaten whole, and has worked against those that create a mess while eating, or a disposal problem after eating. The former include items like table grapes, blueberries and sweet cherries. The latter include many of the traditional fruits like apples, pears, peaches and oranges. Second, as populations in developed countries have aged, they have become more concerned about improving health and fitness, slowing the aging process, or warding off diseases associated with aging, such as heart attacks, diabetes, cancer or premature senility.

While there is general agreement within the medical establishment that consumers need to exercise regularly, limit their total caloric consumption, and eat a balanced diet high in dietary fiber, fruits and vegetables, most consumers have found it difficult to alter their lifestyles sufficiently to meet the establishment's prescription. Indeed, the official message continues to be drowned out by a torrent of advice from unofficial "experts" that have created entire industries out of offering quick avenues to health, fitness and longevity. These range from exercise machines to meditation, to secret herbal formulas, to stomach stapling or surgical removal of excess fat.

The food and beverage sector has also developed alternative recipes for achieving health, fitness and longevity. Different fruits have been cited for containing properties that contribute to longevity or fight one of the dreaded diseases. Indeed, many fruit organizations have hired teams of researchers to identify the attributes of their fruits and try to establish a link between those properties and health. Unfortunately, the plethora of such studies has probably brought more confusion than enlightenment to consumers. Confused consumers have been vulnerable to persuasion by unofficial food and beverage "experts" that have succeeded in breaking through the clutter with simple, credible messages about this or that fruit. One of the most persistent has been the touting of so-called "super fruits," that can deliver exceptional health benefits at low cost and effort. Blueberries have been often cited as a super fruit because they can deliver healthy anti-oxidants in bite-size proportions. However, different experts cite different lists of super fruits. Some lists even include kiwifruit. It has been difficult to separate bogus from science-based links between fruits and health.

While the rationality of consumer fruit choices may be questioned, there is little doubt that these various influences have changed, and will continue to change, per capita consumption of different fruits. Not alone have consumers become convinced of the merits of eating specific fruits for particular purposes, but they want those fruits to be available on demand. To cater to those wants, retailers have made strenuous efforts to stock all the major fruits, and many minor fruits, twelve months a year. They have expanded their global supply chains to ensure unbroken inventories. This means that every fruit faces increased competition in its traditional season. In response, individual firms, and entire fruit commodities, have tried to lengthen their harvest seasons or build international alliances to ensure twelve-month supplies. As a result, international trade has increased both in off-season supplies of traditional fruits like apples, pears and berries, and in supplies of tropical, exotic or specialty products that can only be grown in other countries. This has been particularly true for the more affluent economies in western Europe and North America. For example, the following charts show trends in imports of the major fresh tropical fruits by the United States and the EU-15 between 2001 and 2012.

United States: Imports of Fresh Pineapples, Mangos and Papayas, 2001-2012
(1,000 metric tons)

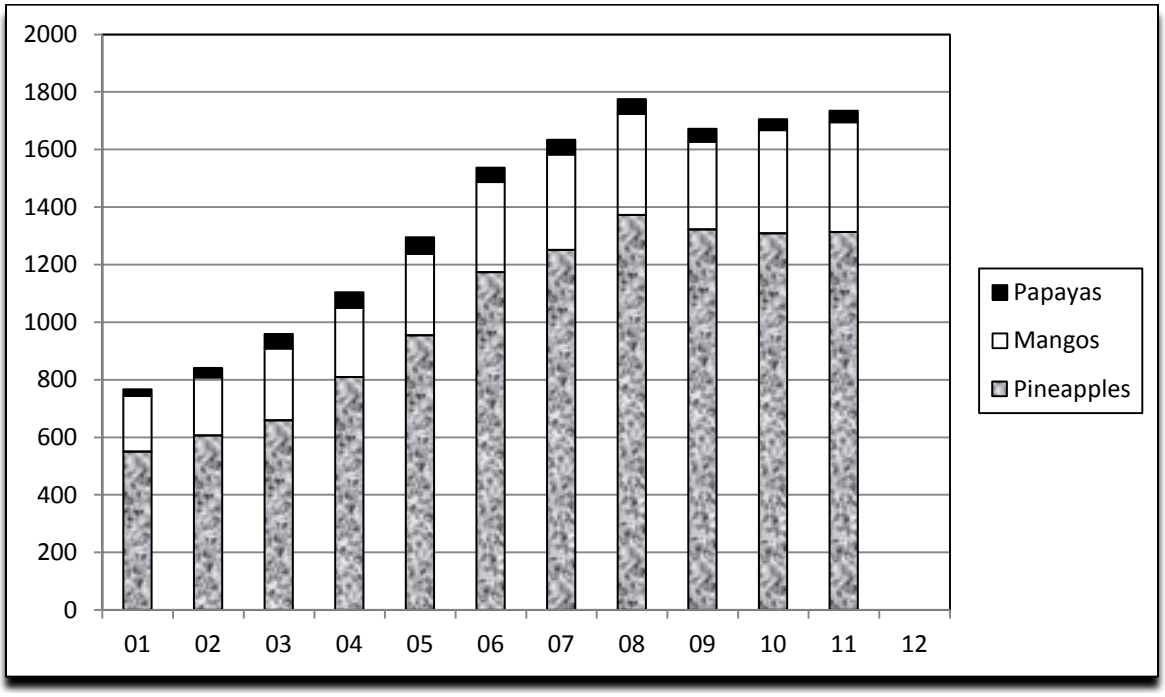


Imports of tropical fruits into the United States began to grow rapidly in the 1990s. That strong upward growth continued for all three fruits into the next decade. Imports of fresh pineapples continued to set new records each year through 2012. Imports of fresh mangos dipped modestly in 2009, before growth resumed in 2010 and 2011. Imports of fresh papayas were slowed most by the Great Recession in 2008, bounced back in 2009, but slipped again in 2010, 2011 and 2012. Growth in combined imports of all three tropical fruits was miniscule in 2008 and 2009, but resumed its strong upward path after 2009. Total imports topped 1.4 million metric tons for the first time in 2012.

Imports of the three tropical fruits by the EU-15 followed the same upward path as those in the United States, setting new records each year until 2007. However, combined imports fell in 2009, and had not regained the 2008 level by 2012. EU-15 imports of fresh mangos/guavas set new records in 2010 and 2011, but those of fresh pineapples and fresh papayas remained substantially below past peak levels. Clearly, the Great Recession curtailed diversification of demand for fruits more severely in the EU-15 than in the United States.

EU-15: Imports of Fresh Pineapples, Mangos and Papayas, 2001-2012

(1,000 metric tons)



There is limited information available on how demand for fresh kiwifruit has been affected by trends in availability, imports and consumption of other fruits. In general, when the total demand for fresh fruits is expanding, it is easier for any individual fresh fruit to expand. However, when the total volume is contracting, as it has in the EU-15, it tends to put all fresh fruits under pressure. Sellers of fresh kiwifruit were reporting more difficult marketing conditions in the EU-15 because of the effects of the Great Recession and its aftermath on consumers.

Leading Kiwifruit Producing Countries

Data available from UN,FAO and from private sources indicate that, in the last decade, China has moved substantially ahead of Italy and New Zealand as the leading world producer of kiwifruit. While total world production of kiwifruit rose by almost 72 percent between 2000-03 and 2010-13, China has accounted for more than 55 percent of that increase. In 2010-13, Chile retained its position in fourth place, but Greece had moved ahead of France into fifth place due to a recent large surge in production. Iran, the United States and Japan have also remained in the top ten throughout the decade with Iran replacing Japan in seventh place. Turkey entered the rankings in tenth place in 2010-13, replacing South Korea. Production in South Korea has also been surpassed by that in Spain and Portugal, which have had substantial increases in production. Among the top ten countries, only France and Japan recorded decreases in production between 2000-03 and 2010-13, of 12.9 percent and 30.4 percent respectively.

Production of kiwifruit among the top five producing countries increased even faster than world production, largely due to the increase in China. As a result, the concentration of kiwifruit production among the top five, already at a high level in 2000-03, increased to 87.4 percent of world production in 2010-13. The share accounted for by the second five fell from 13.6 percent to 8.0 percent in the decade, indicating the relatively weaker influence of these second-tier producing countries on world markets. However, absolute volumes of kiwifruit production increased in three of the second tier producing countries, Iran, the United States and Turkey. Production also increased in Spain and Portugal, which did make the top ten in 2010-13, but fell by 23.8 percent in South Korea, which had been in the top ten a decade earlier.

Top Ten Kiwifruit Producing Countries, by Rank and Tonnage, 2000-2003 and 2010-2013

Rank	Country	2000-2003	Rank	Country	2010-2013
1	Italy	351,458	1	China	630,000
2	New Zealand	245,399	2	Italy	399,870
3	China	163,333	3	New Zealand	364,436
4	Chile	126,167	4	Chile	232,035
5	France	80,000	5	Greece	133,903
6	Greece	56,200	6	France	69,705
7	Japan	41,967	7	Iran	31,118
8	United States	25,976	8	United States	30,361
9	Iran	20,778	9	Japan	29,228
10	South Korea	13,775	10	Turkey	27,928
-	Top Five	966,357	-	Top Five	1,760,244
-	Percent	82.4	-	Percent	87.4
-	Top Ten	1,125,053	-	Top Ten	1,921259
-	Percent	96.0	-	Percent	95.4
-	TOTAL	1,172,514	-	TOTAL	2,014,061

When the growth of kiwifruit production in China is taken into account, the share of Southern Hemisphere production in world supplies has fallen substantially. However, virtually all Chinese kiwifruit production is absorbed within China and has no effect on markets outside China. Northern and Southern Hemisphere suppliers continue to compete for markets in the rest of the world. There, the share of production supplied by the two leading Southern Hemisphere suppliers, New Zealand and Chile, rose from 36.8 percent in 2000-03 to 43.1 percent in 2010-13. Actual volume of production increased by 224,000 metric tons. During the same period, production by the five leading European suppliers increased by only 139,000 metric tons. Faster growth of Southern Hemisphere supplies was leading to increased off-season competition in Northern Hemisphere markets, especially in years when Italy had a large crop. However, current and potential future crop damage due to PSA could reduce the concern about seasonal gluts for several years.

Future World Kiwifruit Supplies

In normal circumstances, production of perennial crops like kiwifruit rarely follow a straight-line path of either growth or decline, but tend to change sporadically over time for a number of reasons. First, new planting decisions tend to be triggered by the producer's price and/or profit experience in several previous years. In general, a past run of profitable years will provide a greater incentive for new plantings than wide profit swings from year to year. In addition, most analyses of supply response suggest that, the more recent the year, the stronger the price experience in that year influences new planting decisions. After the decision to plant a new block is made, it then takes several years before the stream of production from that block reaches its maximum level. Thus, for example, profit experience in 2010 may still be affecting planting decisions in 2015 and actual production in 2020.

Decisions to remove blocks tend to be even more complex. A producer will often retain a block in production if the variable costs are covered in any season, in the hope that in a future year fixed costs will be covered and profits will return. The forces of inertia also kick in. It is easier to keep a marginal block in production than incur the expense and effort of removing or replacing it.

While it is not possible to predict the supply response of an individual producer, the aggregate behavior of producers in a producing district or country tends to change slowly, and in a relatively predictable way based on past price and profit experiences. For example, when prices tumbled in the early 1990s, it took almost a decade for plantings to be reduced to a level where kiwifruit production was again profitable. It then took a number of profitable years for producers to increase plantings and gradually increase production. As those new plantings were generally profitable, producers speeded up additional plantings. Thus, had PSA not intervened, one would have expected world kiwifruit production to continue on an upward path until it met a series of economic reversals. In past issues of the World Kiwifruit Review, it was possible to forecast the likely future path of kiwifruit production in individual countries and for the world as a whole. A number of forces were leading to further increases in production, including an overall increase in new plantings, a higher proportion of new plantings in higher-yielding Golden cultivars, and vigorous efforts by producers in many countries to lower average costs by generating higher average yields from existing plantings.

The economic shock resulting from PSA has been somewhat similar in its effects to the typical economic shock that would have resulted from sharp declines in market prices. For example, it has led to a decline in current orchard incomes, and reduced the financing available to producers from their own resources. However, it has also had a number of unique features. First, it threatens to wipe out the most profitable, highest-yielding Golden cultivar, so producers face both a decline in average prices and a decline in volume produced. In the case of a normal price decline, the integrity of the product would not have been placed in jeopardy. Second, PSA has severely damaged the asset values of the orchards affected, reducing producers' capital base, and the collateral available to either secure operating finance or to borrow capital for redevelopment. Even if capital for redevelopment were to be made available on special terms by private or public financial institutions, there is considerable uncertainty about the price, yield and profit potential of alternative cultivars that might replace the Golden cultivars. The greater the uncertainty, the more reluctant producers or outside investors will be to consider re-development. Finally, the need to take protective measures against PSA will add to the annual cost of production of all kiwifruit cultivars until resistance can be built into the actual plants. Few believe that resistance will be developed any time soon.

Before it was known how widespread the impact of PSA could become, the World Kiwifruit Review used area and yield trends to forecast that the world kiwifruit industry could produce over 2 million metric tons on the area planted in 2010-11. Additional plantings after 2010-11 would have added to that productive potential. The world kiwifruit leaders assembled for the 2010 meeting of the International Kiwifruit Organization (IKO) independently developed a consensus forecast that world production outside China would increase to 1.673 million metric tons by 2013, and that Chinese production would increase to 550,000 metric tons, giving a world total in 2013 of 2.223 million metric tons. In 2012, the IKO adjusted its 2013 forecast for the world outside China down to 1.428 million metric tons, an almost 15 percent reduction from the 2010 forecast. About one third of that reduction was forecast to occur in New Zealand, then hardest hit by PSA. However, the IKO also raised its forecast of production in China to 710,000 metric tons, largely due to dramatic increases in supplies of golden-fleshed and red-fleshed cultivars. Thus, total world kiwifruit production in 2013 was forecast to decline by only about 4 percent from the 2010-11 level.

Since the 2012 IKO forecasts were made, the number of cultivars, districts and countries in which PSA has been detected has continued to grow. Before the full extent of the problem in New Zealand became apparent, the Zespri organization was forecasting that production there could bounce back to pre-PSA levels by 2016, and resume its past growth trajectory thereafter. PSA infestations in Chile have also become more widespread. Thus, under normal weather conditions, it appears likely that the level of production of kiwifruit outside China will grow little in the immediate future. That should help to strengthen prices for those producers who are able to maintain production, and encourage them and outside investors to continue to believe in the future of the industry. However, until the PSA problem is resolved, and the uncertainty due to PSA removed, there will be little incentive for further expansion of plantings.

Which Cultivars Will Replace Golden?

For much of its history, the commercial kiwifruit industry was dominated by a single cultivar, the green-fleshed Hayward. Originally commercialized in New Zealand from Chinese plant materials brought there in 1904, Hayward was gradually improved over the years. After New Zealand began to export Hayward successfully, competitors also adopted it, and it became the global standard for kiwifruit, similar to the role of the Cavendish cultivar in bananas. However, when kiwifruit prices tumbled in the early 1990s, some critics argued that the Hayward had lost its exotic appeal and had become commoditized. This meant that further increases in production would lead to further deterioration in prices.

In response, kiwifruit breeders around the world intensified their search for alternative cultivars. Early efforts were focused within the Actinidia deliciosa species, the same species as Hayward, seeking earlier or later-harvested green kiwifruit that could reduce the problem of seasonal gluts. Success in that effort was slow in coming. At the same time, a number of other developments encouraged a much broader effort to find and commercialize new cultivars. One was the passage of national and international laws providing intellectual property rights for plant materials. These allowed breeders to patent new cultivars, and control their exploitation, just like any non-agricultural invention. Even more important for kiwifruit, was the gradual opening up of China to the outside world, since China had an enormous store of kiwifruit genetic material.

While more than 60 species of the genus Actinidia have been identified, only a few besides Actinidia deliciosa have so far proved of economic importance either independently or in crosses with other species. Breeders in New Zealand focused heavily on the potential of Actinidia chinensis which had yellow flesh color. Cultivars were also subjected to scientific consumer testing by HortResearch scientists. One outstanding cultivar, originally dubbed Hort 16A, emerged from that work. In the 1990s, the New Zealand kiwifruit industry had also been examining what other steps might be taken to escape the commodity trap described above. The result was Zespri™ International, a single-desk, market-oriented organization, that aimed to sell premium product under the Zespri™ brand, a brand that would distinguish New Zealand kiwifruit from that of other countries. Fairly quickly, three products came to dominate the Zespri offering, Zespri™ Green (the original Hayward cultivar), Zespri™ Gold (the yellow-fleshed Hort 16A), and Zespri™ Green Organic, catering to the organic niche. To serve markets twelve months a year, the Zespri organization licensed producers in other countries to grow Zespri™ Green and Zespri™ Gold to its strict specifications.

In the decade or more after it was launched, Zespri™ Gold was recognized as one of the most successful new product developments within the fruit world. The product was quite distinct from the standard green Hayward. It found strong acceptance among consumers. Zespri maintained strict control of quality standards from orchard to packing, storage and transportation. The granting of production licenses was managed to ensure steady growth in availability. In turn, Zespri™ Gold was introduced gradually to new markets only as the volume of production increased. Eventually, Zespri™ Gold outstripped Zespri™ Green in yield per hectare and in returns per tray. By 2010, it had reached 25 percent of New Zealand kiwifruit production and was returning twice as much per tray to the orchard as Zespri™ Green. The value of new licenses to produce Zespri™ Gold, and of existing Gold orchards soared.

The success of Zespri™ Gold further stimulated the search for additional, new kiwifruit cultivars. Despite the fact that the process of internationalizing patented and branded kiwifruit has been long and difficult even for New Zealand, the Zespri program has become the model for almost all of the new kiwifruit cultivars that have been developed in other countries. Their sponsors have also sought to develop multinational supply chains for their new cultivars.

Despite the success of the golden kiwifruit within the Zespri program, at the peak of its expansion in 2011, golden kiwifruit accounted for not much more than 8 percent of all kiwifruit produced outside China. Other green and golden varieties (excluding Hort 16A) accounted for less than 2 percent of production outside China. Thus, despite the numerous efforts to introduce new cultivars, the Hayward green continued to account for about 90 percent of total kiwifruit production outside China. Given the distinct possibility that Hort 16A may be abandoned within the next two years because of its extreme sensitivity to PSA, this represents a severe setback to efforts to expand the consumer appeal of kiwifruit.

There are two possible ways by which that gap can be filled. Zespri had been taking its normal, measured approach to introducing a number of new cultivars that would complement its existing green and golden cultivars. The most promising, still known by their development name, were Gold 3 and Gold 9, and Green 14. Zespri has gambled on speeding up the issuance of licenses for these three cultivars. It is hoping that by 2015, G3 will have filled the market gap vacated by the demise of Hort 16A. To achieve this, the New Zealand kiwifruit industry will, more rapidly than normal, have to overcome any teething problems that might emerge in the orchard, packing house, storage or transportation as production of G3 and G9 is ramped up. In addition, consumers and retailers will have to be rapidly persuaded that new golden cultivars are equal to or superior to Hort 16A. While surveys of consumer buying intentions have been favorable, there are often hitches in translating buying intentions into continuous, widespread purchases. There is also the not inconsequential problem that the new cultivars may not be as resistant to PSA as originally hoped.

The shortfall in new cultivars can also be filled if existing cultivars in other countries can capitalize on the market opportunities created by the decline in Zespri™ Gold supplies. For example, Jingold™, from the Summerfruit consortium and Soreli from the Vivai group, both headquartered in Italy, are now being produced in a number of countries. Enza Limited has the rights to a gold cultivar from China, that is presently being produced in Chile. Enza Limited has been taken over by a larger German agribusiness, BayWa, with the express intention of exploiting Enza's intellectual property more aggressively in Asia. However, PSA has been reported in some plantings of Jintao™ in both Italy and Chile, while Enza's gold cultivar has experienced some problems in production.

Production of early green kiwifruit such as Green Light from the Viva group, or Summerkiwi™ from the Summerfruit consortium could also be expanded. Production of these early green cultivars has been expanding. However, they tend to complement the green Hayward rather than reach new customers as would a golden kiwifruit. Work is also continuing on commercializing red-flesh cultivars. However, it is still too early to say how much such cultivars can extend demand for fresh kiwifruit.

One of the unknown factors in the emergence of new cultivars will be what occurs in China. The Chinese government and the Chinese kiwifruit industry are very aware of the tremendous resources of kiwifruit germ plasm that exist in China, both in the wild, in research plots, and in the expanding commercial industry. They are unhappy that other countries for so many decades benefitted commercially from those resources while the Chinese industry was still small and disorganized. For decades after World War II, Chinese scientists and agribusinesses were isolated from the rest of the world, and were bypassed by much of the technological progress in world agriculture.

In their efforts to catch up, the Chinese authorities have invested heavily in training scientists and in developing world-class research facilities both to improve the competitiveness of existing kiwifruit operations and to develop new cultivars in which China would have an unique advantage. The Chinese have also been willing to form partnerships with foreign breeders, other plant scientists and international agribusinesses in order to speed up the development of the Chinese kiwifruit industry. Some of the newer cultivars discussed above have been the result of such partnerships. So far, the Chinese efforts have not produced a major winner like Hort 16A. However, given the richness of their germ plasm resources, the arrival of such a winner would not be a surprise.

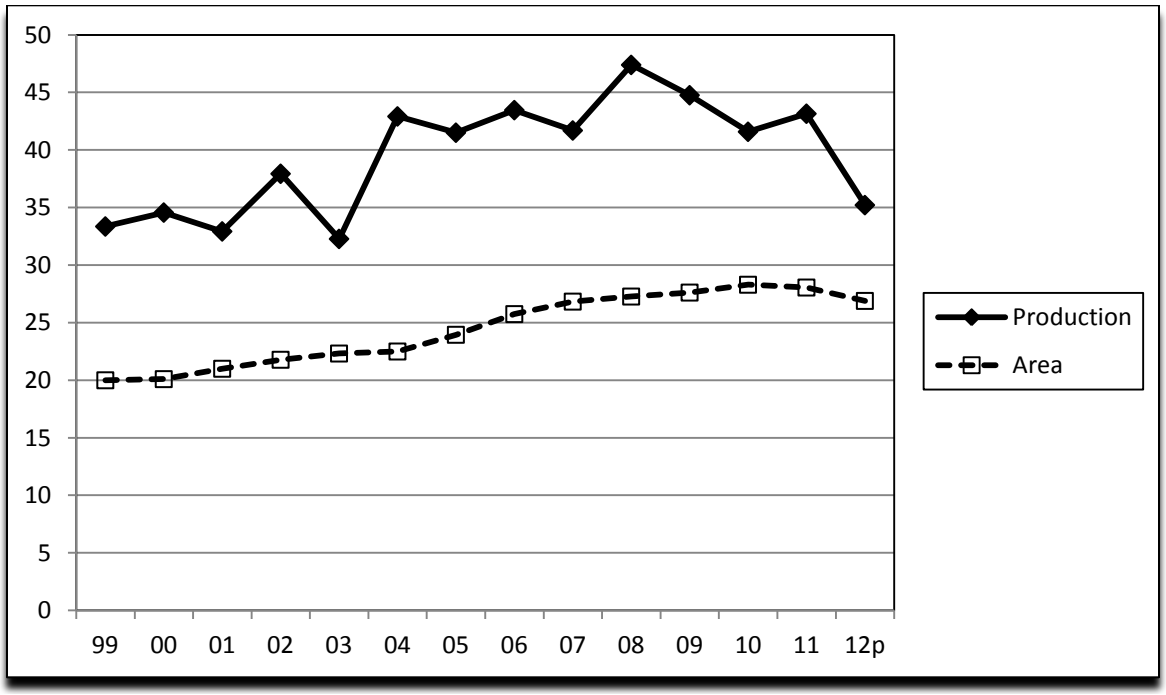
Given the many challenges and uncertainties discussed above, it seems likely that the cultivar mix in kiwifruit will remain in turmoil for several years. Many question marks surrounding replacement cultivars will need to be answered either positively or negatively before new winners and losers emerge. In the meantime, maintaining quality standards for the, still dominant, green Hayward kiwifruit will be particularly important in retaining the loyalty of kiwifruit consumers and retailers during this difficult transition.

Pause in Italy

The positive trends in area planted (shown), area harvested and production of kiwifruit in Italy appear to have come to an end, at least for now. Bearing area has been reduced by the removal of most of the Hort 16A plantings that were approved by Zespri in the past, due to the damage caused by PSA. PSA has also caused varying levels of damage in the main Italian kiwifruit producing regions.

Italy: Kiwifruit Area and Production, 1999-2012

(1,000 hectares and 10,000 metric tons)

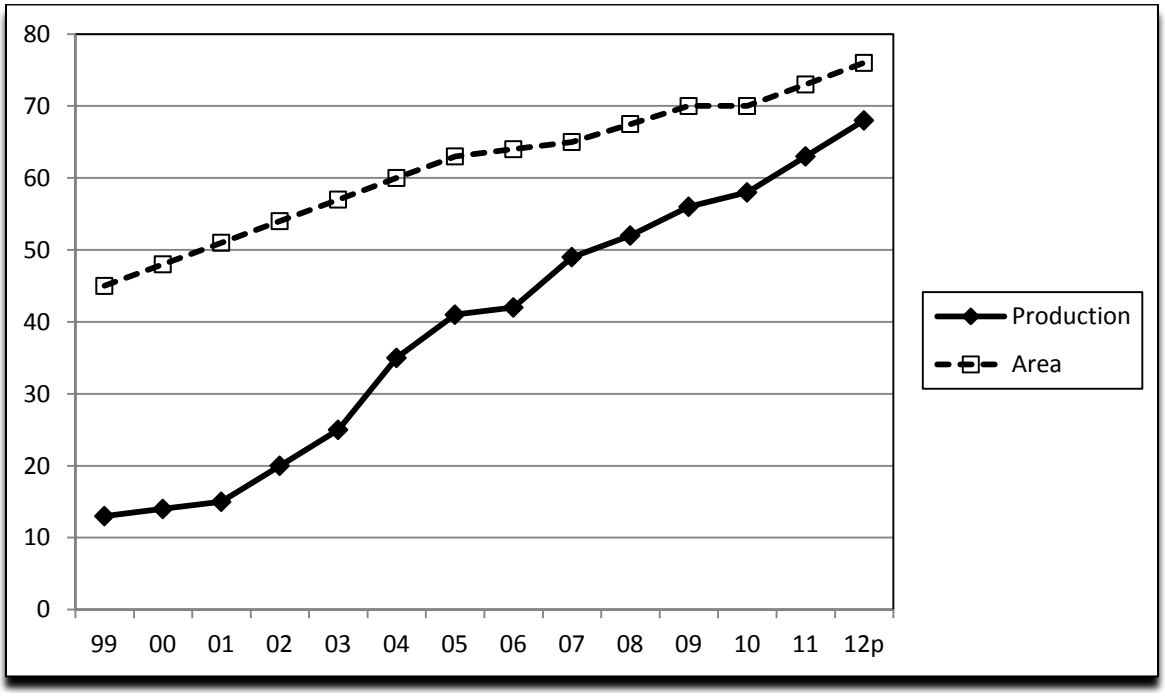


Not all of the recent decline in kiwifruit production can be attributed to PSA damage. Much of the decline in production in 2012 has been attributed to unfavorable weather conditions and the effects of the off-year in the alternate bearing cycle. In addition, it appears that official estimates of production occasionally underestimate actual production. While damage from PSA will continue to reduce production of gold kiwifruit, Italy continues to experiment with other new cultivars. It is likely that Italian kiwifruit production can revert to the 500,000 metric ton level in future. This will keep competitive pressure on its European and international rivals.

China Expansion Continues

The limited data available suggest that the long-term expansion of the kiwifruit industry in China is continuing. While the area planted is estimated to have reached 76,000 hectares in 2012, production estimates have been revised upwards as information has become available on cultivars other than green cultivars produced in China. For example, it is estimated that in 2012, China produced 500,000 metric tons of green kiwifruit and another 180,000 metric tons of gold- and red-fleshed kiwifruit.

China: Kiwifruit Area and Production, 1999-2012
(1,000 hectares and 10,000 metric tons)



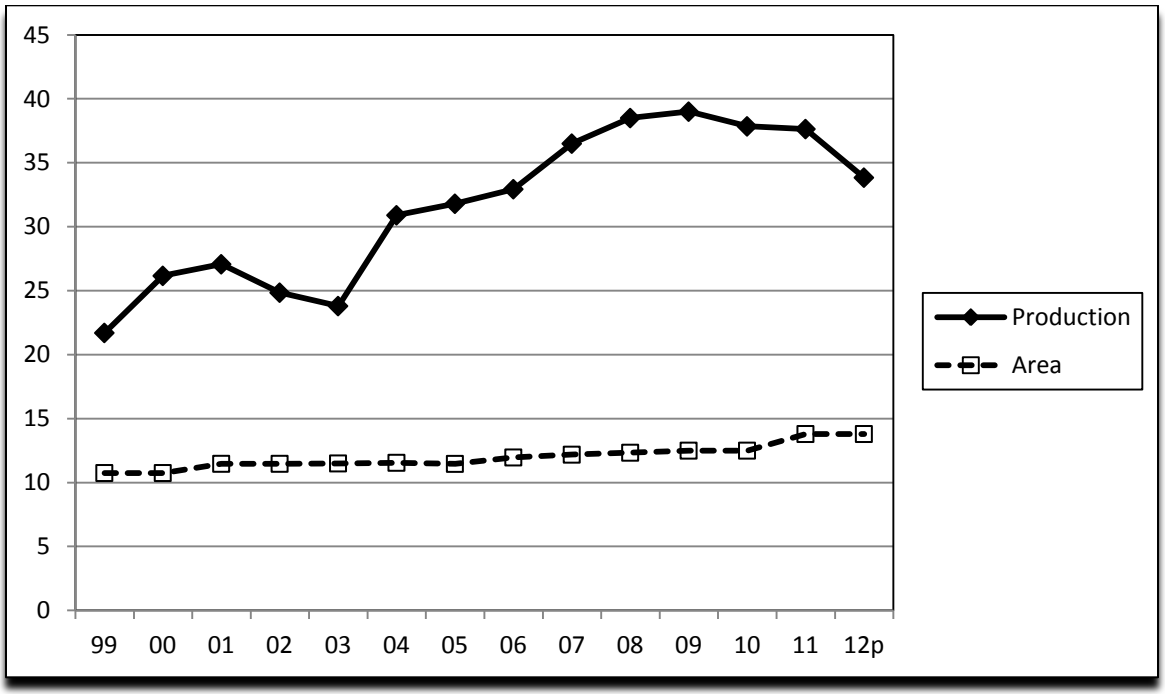
There is no evidence that the growth in the Chinese kiwifruit industry is likely to taper off any time soon. Because of a burgeoning middle class, domestic demand has been booming. Average yields appear to be low by international standards, but have been rising. Efforts by government, industry leaders and research agencies to exploit the full potential of Chinese kiwifruit are still in their early stages. For these reasons, it is likely that both area and production of kiwifruit in China will continue to increase.

New Zealand Resets

In the recent past, New Zealand was able to control the area planted to the more desirable golden kiwifruit through its licensing system. As a result, total area planted and harvested grew slowly, but steadily, over time. Production grew more rapidly, both due to increased productivity in existing Hayward plantings, and as the share of the higher-yielding golden plantings increased over the last decade.

New Zealand: Kiwifruit Area and Production, 1999-2012

(1,000 hectares and 10,000 metric tons)

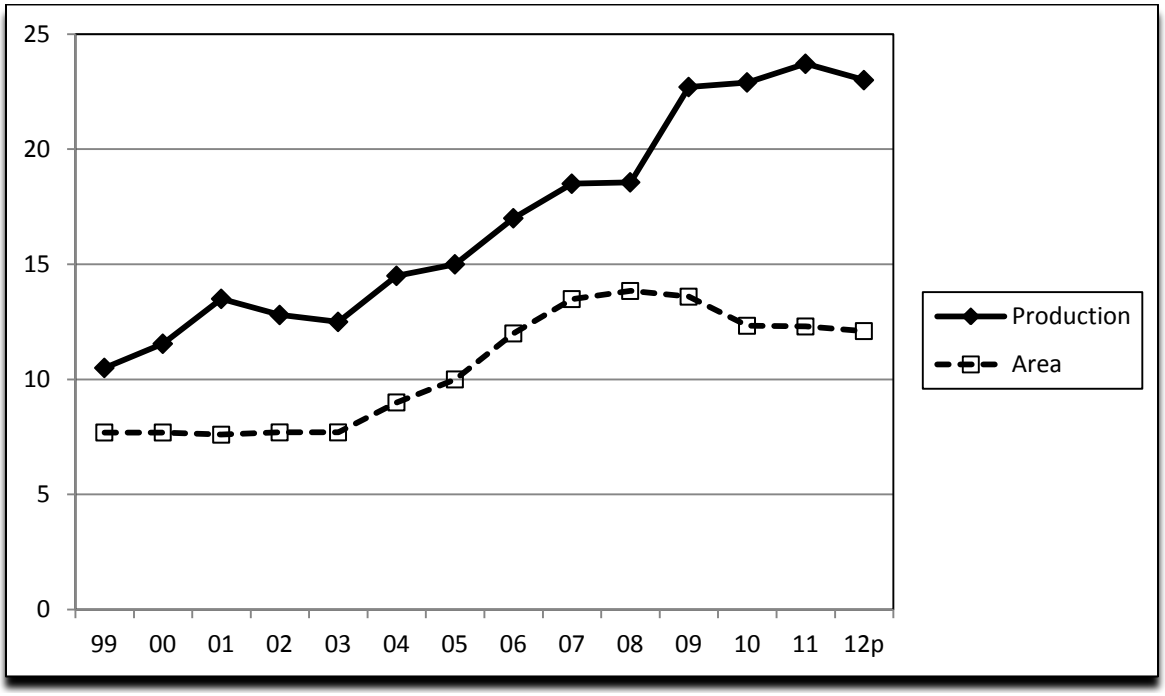


While the chart shows no change in the area planted between 2011 and 2012, that is misleading because by 2012, so much of the planted area had been compromised by the PSA bacteria. Thus the productivity of many orchards in 2012 was considerably lower than in 2010 or 2011 because of the PSA damage. The effective bearing area in 2012 was substantially lower than in 2011, and is likely to fall further in 2013 and 2014, but the precise difference cannot yet be measured. Under Zespri plans for re-setting the industry, the bearing area in Hort 16A should be replaced by 2015. However, there is no assurance that Zespri's target will be reached. Thus, New Zealand kiwifruit production is likely to remain below recent peaks for several years.

Chile Hits Roadblock

After languishing below 8,000 hectares for almost a decade, plantings of kiwifruit surged in Chile between 2003 and 2008. Higher returns in kiwifruit relative to alternative crops brought acreage back into production. In addition, Chile had become a preferred Southern Hemisphere partner for many sponsors of new cultivars that were trying to build a twelve-month supply system. Production of kiwifruit rose even more rapidly than planted area. By 2009, it was more than double the level achieved in 1999.

Chile: Kiwifruit Area and Production, 1999-2012
(1,000 hectares and 10,000 metric tons)



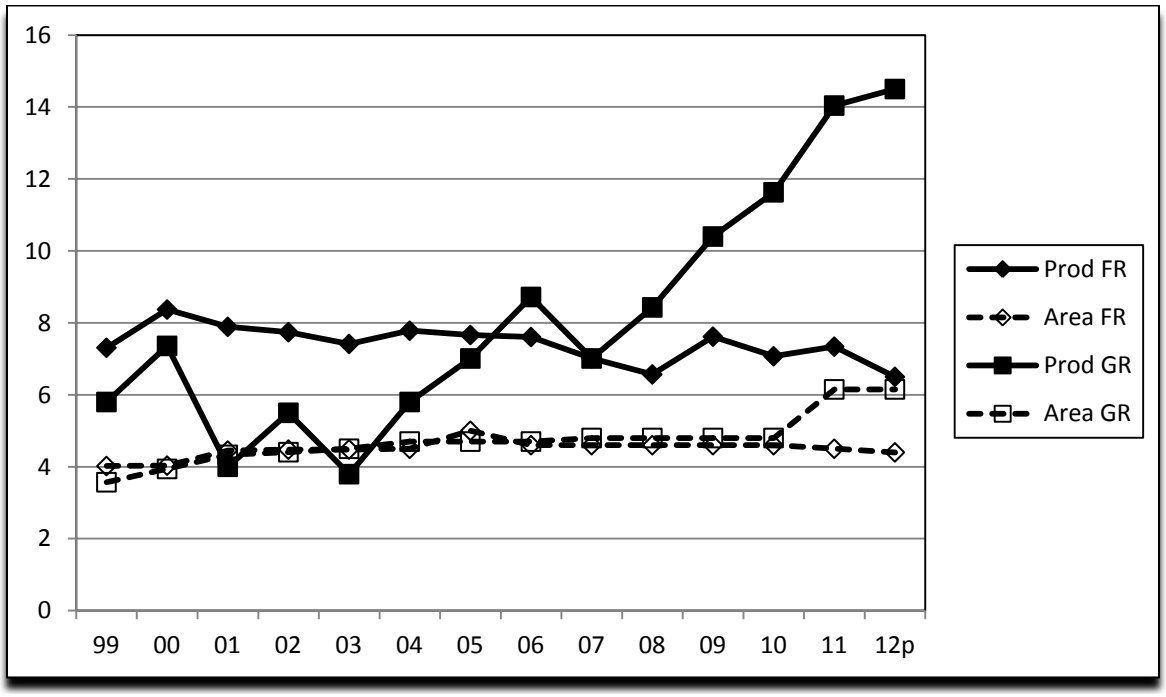
However, in recent years, the strength of the Chilean currency, buoyed by the high price of copper, has been a disincentive for further expansion of area. In addition, by the end of 2012, PSA infections had been reported in about 10 percent of Chilean plantings, including among some of the newer cultivars. Until the PSA outbreak can be brought under control, and exchange rates move more favorably for Chilean exporters, further expansion of kiwifruit area will be inhibited.

France and Greece Diverging Further

For most of the last decade, the area of kiwifruit in France and Greece was very similar, averaging about 4,500 hectares. However, recently they have moved in the opposite direction with Greece showing a sharp increase and France a slight decline. In contrast, the pattern of production has been quite dissimilar. While French production has remained very stable from year to year with a slight long-term downward trend, Greek production has been highly erratic from year to year, but with a strong upward trend since 2008.

France and Greece: Kiwifruit Area and Production, 1999-2012

(1,000 hectares and 10,000 metric tons)



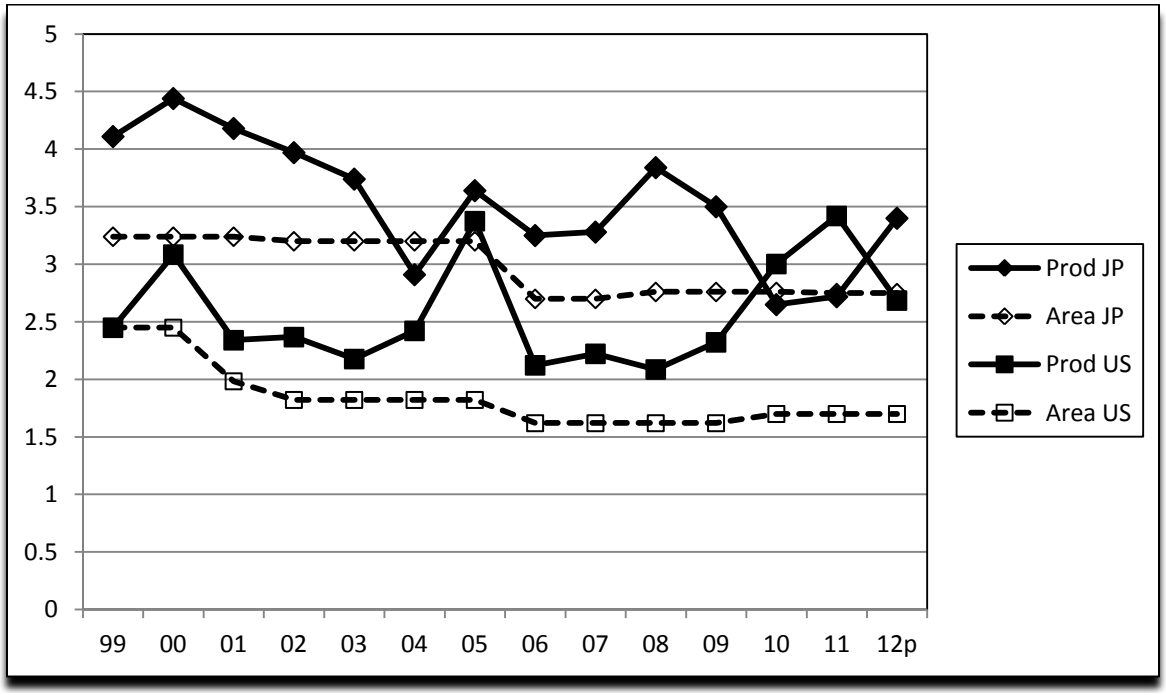
The entire fruit industry in France has been pressured by higher costs and non-farm competition for resources. The kiwifruit industry has resisted better than most other fruits, but needs premium prices to ensure its survival. These have become more difficult to obtain as the recession in Europe drags on. Greece has faced a severe debt crisis that has sharply curtailed employment and consumer purchasing power. The Greek kiwifruit industry views expansion of exports as critical. Any slowdown in global kiwifruit production as a result of PSA could provide much-needed breathing room for both the French and Greek industries.

Different Trends in Japan and the United States

Both Japan and the United States have seen the area in kiwifruit fall substantially in the last decade. However, in the United States, most of the decline occurred in the early 2000s, while in Japan, a sharp drop occurred after 2005. In Japan, the long-term trend in production has been downward, while in the United States, there have been gaps of more than 50 percent between the years of high production (2000, 2005 and 2011) and most other years.

Japan and United States: Kiwifruit Area and Production, 1999-2012

(1,000 hectares and 10,000 metric tons)



The entire Japanese fruit industry has been shrinking due to deflationary demand conditions and the aging farm population. It will be difficult for the kiwifruit industry to resist those negative forces. In contrast, the California fruit industry, where U.S. kiwifruit is produced, is vibrant and progressive, and can rapidly exploit any emerging opportunities. If kiwifruit offer better profit opportunities than alternative crops, more kiwifruit will be grown. However, kiwifruit have a comparative advantage over competing crops in only a few districts.

Opportunities in Minor Producing Countries

There has been some change in the role of minor kiwifruit producing countries in recent years. The area harvested of kiwifruit has continued to expand in Portugal, Spain, Iran and Turkey. Production has doubled in Portugal and Spain in the last decade, risen by about 50 percent in Iran, and quadrupled in Turkey. Production from Portugal and Spain must compete within the European Union against that from Italy, France and Greece, so it has to meet international standards for yield, quality and return on investment. Most production in Iran and Turkey appears to remain within country, and so has little influence on the world market. There is little known about quality or about how competitive their product might be in world markets. Another, long-time producer of kiwifruit, Australia, has seen its small area continue to erode.

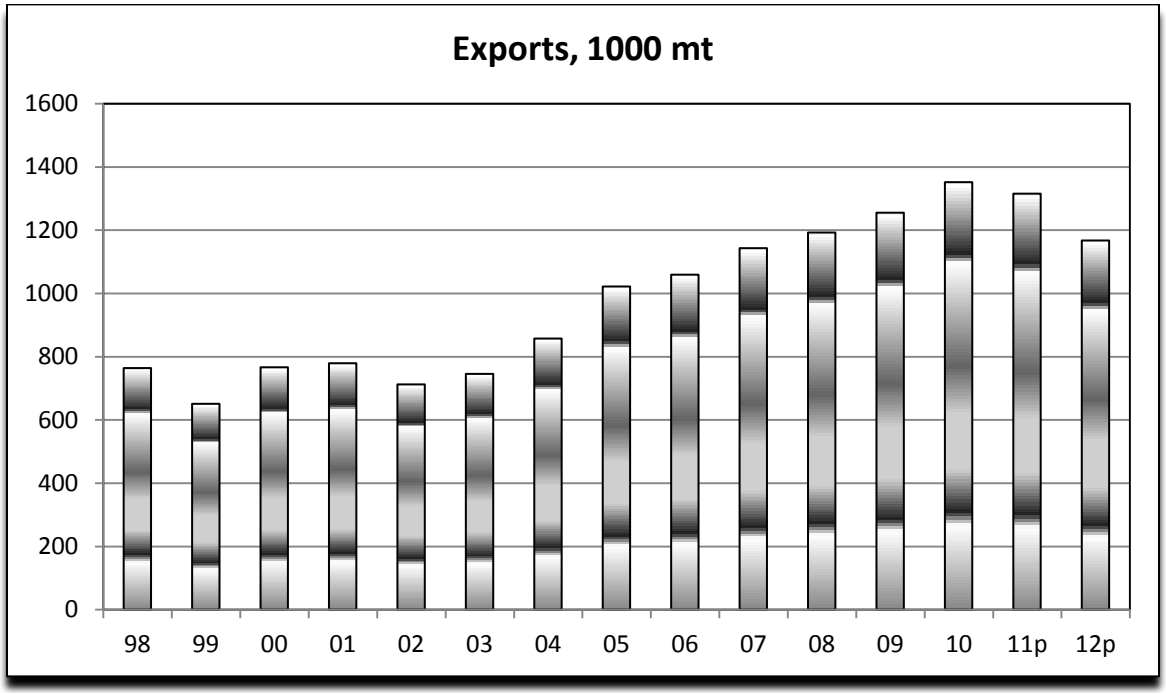
UN,FAO reports small areas of kiwifruit plantings in Bulgaria, Canada, Cyprus, Israel, Kyrgyzstan, Slovenia, Switzerland and Tunisia. However, annual production has generally been less than 500 metric tons. Only in Israel has production ever exceeded 5,000 metric tons (in 2004 and 2006). There have also been unofficial reports of small kiwifruit plantings in Argentina, Brazil, South Africa, Mexico, Georgia and India. Because of limitations of suitable soil, climate, infrastructure or other factors, none of these countries appears likely to become a significant factor in world kiwifruit production in the near future.

II. Trade in Fresh Kiwifruit

Kiwifruit Export Growth Trimmed

The volume of world exports of fresh kiwifruit was on a strong upward trend between 2002 and 2010. During that period, exports grew by almost 90 percent to 1.35 million metric tons, an annual average growth rate of about 10 percent. Preliminary data suggest that the volume declined by 2 to 3 percent in calendar year 2011, and may have fallen by a further 10 percent in 2012 due both to negative weather and to the impact of PSA. Data for the chart below were drawn from the UN,FAO FAOSTAT database for 2010 and prior years. Data for 2011 and 2012 are still preliminary based on estimates made by Belrose, Inc. from miscellaneous data sources.

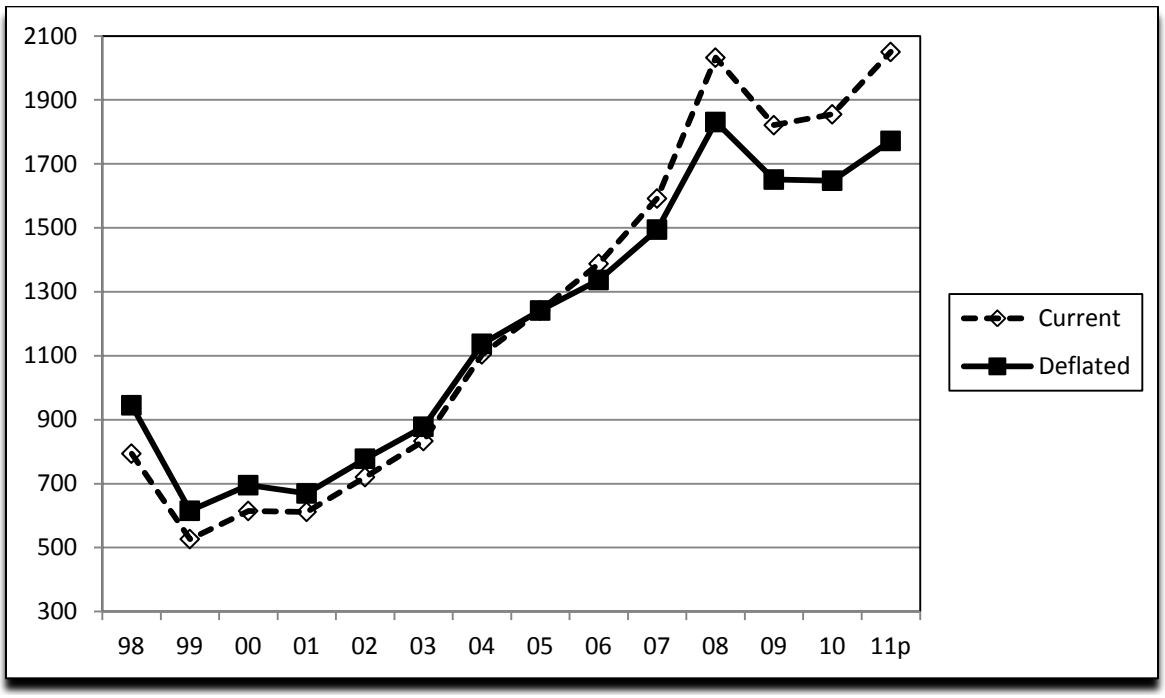
World: Volume of Exports of Fresh Kiwifruit, 1998-2012
(1,000 metric tons)



Exports continue to play a crucial role in the prosperity of the industry. Excluding China, up to 80 percent of production regularly enters international trade.

The chart below shows the value of world kiwifruit exports both in terms of current U.S. dollars (dotted line) and deflated U.S. dollars (solid line) for the years from 1998 to 2011. To aid in comparison over time, the U.S. Consumer Price Index to base 2005 = 100 was used as a deflator. Data for 1998-2010 were drawn from FAOSTAT, while the 2011 data was a Belrose, Inc. estimate based on miscellaneous sources.

World: Value of Exports of Fresh Kiwifruit, 1998-2011
(Current, US$1,000, Deflated, by US,CPI, 2005=100)



The value of world kiwifruit exports rose strongly in both current and deflated dollars between 2001 and 2008. Current value rose by over 3.3 times in seven seasons, and topped $2 billion for the first time in 2008. Even after deflation, the real value of world kiwifruit exports rose by more than 2.7 times, a remarkable achievement. However, while the volume of exports continued to rise in 2009 and 2010, the value fell back from the record 2008 levels. Preliminary estimates for 2011 suggest that the value had regained the 2008 level in current dollars, but was about 3 percent below the 2008 record in deflated terms. These results suggest that continued expansion of kiwifruit exports had been leading to increased price resistance in recent years.

Export and Import Dependence

The major kiwifruit producing countries vary in their dependence on exporting and importing. That dependence has continued to change over time. Export dependence was measured as the percent fresh exports were of domestic consumption, and import dependence as the percent fresh imports were of domestic disappearance. These are reasonably reliable indicators, as little product is retained for processing. Data in the table below are for the three-year averages, 2000-03 and 2010-13. Countries were ranked by their dependence in 2000-03.

Selected Kiwifruit Producing Countries: Export and Import Dependence, 2000-2003 and 2010-2013

Export Dependence			Import Dependence		
Country	2000-2003	2010-2013	Country	2000-2003	2010-2013
New Zealand	98.6	93.3	Spain	110.7	94.8
Chile	95.1	83.8	Australia	93.3	87.5
Italy	74.6	81.1	United States	77.3	73.5
Australia	71.1	11.7	Portugal	53.2	38.5
Spain	67.7	62.9	Japan	50.7	68.7
Greece	45.2	79.4	France	42.9	55.0
United States	45.1	32.1	South Korea	34.7	73.7
France	36.2	32.9	Italy	29.9	38.4
Portugal	4.4	25.2	Greece	4.9	19.1
South Korea	0.2	0.0	China	2.3	6.2
China	0.1	0.3	New Zealand	1.9	2.4
Japan	0.1	0.0	Chile	0.0	0.0

Not surprisingly, New Zealand, Chile and Italy were the most consistently export dependent. Both Greece and Portugal became more export dependent in the last decade as their production has grown. The United States and France became moderately less export dependent, while Australia's export dependence dropped dramatically. Exports remained of negligible importance for the major Asian producing countries, China, Japan and South Korea. Spain was both heavily export and import dependent, reflecting its role as a conduit for re-exports. Australia, the United States, France and Japan were the most consistently import dependent. Import dependence increased markedly in South Korea and Greece, and decreased markedly in Portugal. It increased modestly in Italy and China. Even the largest producing countries need to import off-season supplies of fresh kiwifruit.

World Patterns in Fresh Kiwifruit Trade

The data presented so far show broad trends in overall trade in fresh kiwifruit. They do not show how different suppliers compete in different markets. In this section, we look at the major trade flows in fresh kiwifruit for calendar year 2011. The table on the next page gives best estimates of the volume of fresh kiwifruit shipped from nine major exporters to the chief importing countries and regions. The table updates those for previous calendar years shown in prior editions of the World Kiwifruit Review, so it can be used for comparisons over time. The nine exporting countries include five European exporters, Italy, Greece, France, Spain and Portugal, two Southern Hemisphere exporters, New Zealand and Chile, and two marginal exporters, the United States and China. The table is called a partial global trade matrix because it excludes known exporters like Iran. However, it includes at least 95 percent of known trade in fresh kiwifruit.

The table does not purport to be an exact summary of major trade flows in fresh kiwifruit. Different sources give slightly different measures of the trade between specific origins and destinations. Some of this is due to normal revisions that occur as data reports are compiled. The major weakness arises for trade affecting the 27 member countries of the European Union. Since there are no longer customs declarations on many land borders within the EU-27, it is difficult to know the final destination of many shipments. For example, 80 percent of New Zealand exports of fresh kiwifruit to the EU-27 pass through Belgium en route to Germany and other central European countries, but such re-exports are not precisely captured in the reported data. As a result, the volume destined for Belgium is overstated, and the volume destined for countries like Germany is understated. However, the matrix should give a useful picture of the volume of fresh kiwifruit shipped to different regions and of the relative importance of different suppliers in many countries and regions.

Reported global trade in fresh kiwifruit reached 1.25 million metric tons in calendar year 2011, about 5 percent higher than in calendar year 2010, and almost 7 percent higher than in calendar year 2009, using the same methodology. Lower exports for the major European exporters were more than offset by increases in total Southern Hemisphere exports. Not surprisingly, total imports by the EU-27 were lower in 2011, while the volume of imports was higher in all other regions.

World: Fresh Kiwifruit, Partial Global Trade Matrix, 2011
(metric tons)

Exporters

Importers ↓	IT	GR	FR	SP	PR	NZ	CL	U.S.	CN	Other*	TOTAL
Canada	8,587	102	270	0	0	1,409	3,358	1,981	0	0	15,707
Mexico	0	0	0	0	0	3,232	4,833	4,545	0	0	12,610
U.S.	14,691	180	22	86	0	20,334	22,180	0	0	29	57,522
N. America	23,278	282	292	86	0	24,975	30,371	6,526	0	29	85,837
S. America	17,559	0	39	37	210	0	n.a.	170	0	0	17826
C. America	141	0	0	20	0	0	n.a.	205	0	0	366
S/C America	17,700	0	39	57	21	0	27,420	375	0	0	45,612
Belgium	8,376	386	4,723	32	0	101,727	332	0	0	6,639	122,215
France	20,709	1,435	0	3,514	124	272	3,563	0	0	22,207	51,824
Germany	63,392	4,746	2,973	964	0	0	628	0	0	39111	111,811
Italy	0	1,349	254	828	0	16,955	23,682	0	0	4,821	47,889
Netherlands	8,532	1,563	1,510	163	10	0	22,732	0	52	47,318	81,880
Spain	37,204	2,125	3,723	0	6,880	38,945	14,960	0	16	13,948	117,801
U.K.	15,375	595	487	1,016	322	0	7,772	0	16	6,190	31,773
Other EU-15	22,760	152	674	4,039	30	0	4,082	137	0	16,245	48,119
EU-NMS	51,333	13,336	1,620	1,883	0	103	423	0	0	24,098	92,796
EU-27 Total	227,681	25,687	15,964	12,439	7,366	158,002	78,174	137	84	180,577	706,111
Russia	16,483	21,838	55	2	0	1,276	16,082	25	940	0	56,701
Other Europe	6,578	11,388	280	0	0	0	0	0	0	0	19,246
Russ/Oth Eur	24,061	33,226	335	2	0	1,276	16,082	25	940	0	75,947
Middle East	10,531	4,853	65	0	13	3,635	10,737	0	68	0	29,902
Africa	5,994	378	477	3869	94	0	0	0	0	0	10,812
China	1,506	39	1,291	0	0	29,153	11,122	0	0	1	43,112
Hong Kong	4,644	157	2,039	0	0	n.a.	n.a.	0	0	0	22,834
Japan	0	0	0	0	0	63,733	2,126	510	0	0	66,369
South Korea	0	0	0	0	0	25,743	4,056	119	0	0	29,918
Taiwan	2,514	0	1,966	0	0	26,124	292	71	589	0	31,566
Other Asia	3,946	0	360	0	0	25,917	6,246	0	211	0	20,686
Asia, Total	12,620	196	5,656	0	0	170,670	23,842	700	800	1	214,485
Australia	4,576	0	714	0	0	15,337	17	15	0	0	20,659
New Zealand	457	0	0	0	0	0	0	58	0	71	586
Oceania Total	5,033	0	714	0	0	15,337	17	73	0	71	21,245
All Other	31,886	1,236	0	0	0	17,603	0	0	0	0	60,725
TOTAL	358,784	65,858	23,542	16,453	7,494	401,498	186,643	7,836	1,892	180,678	1,250,678

* Other includes origins not known.

Exporters: IT=Italy, GR=Greece, FR=France, SP=Spain, PR=Portugal, NZ=New Zealand, CL=Chile, U.S.=United States and CN=China.

The table below shows how the share of global imports has varied by region since 2007. Declines have occurred primarily in the developed world. The share accounted for by the European Union has fallen about 10 percent, that of Oceania has fallen by 0.4 percent, and that of North America has been stable at just below 7 percent. In contrast, the shares in Asia, Russia and other Europe, South and Central America, the Middle East, Africa and all other countries have risen. This trend has encouraged major exporters to try to diversify their exports away from Europe and towards developing countries, particularly those in East Asia.

Major Importing Regions: Share of Global Trade in Fresh Kiwifruit, 2007-2011

(percent)

Importing Region	2007	2008	2009	2010	2011
	(%)	(%)	(%)	(%)	(%)
North America	6.9	6.9	6.7	6.9	6.9
South & Central America	1.8	1.7	2.8	3.4	3.6
EU-27, Total	66.5	67.8	65.9	62.7	56.5
Russia/ Other Europe	5.7	5.4	5.8	6.1	6.1
Middle East	1.5	1.3	1.5	1.9	2.4
Africa	n.a.	n.a.	n.a.	0.5	0.9
Asia, total	14.5	14.4	14.2	15.3	17.1
Oceania, total	2.1	1.8	1.9	1.8	1.7
All Other	1.0	0.7	1.2	1.3	4.9
TOTAL	100.0	100.0	100.0	100.0	100.0

The table below shows the changes in the sources of supplies of the major importing regions between 2010 and 2011. In 2010, EU exporters were the major sources of supply in Russia/Other Europe and the Middle East and the dominant supplier to Africa. Southern Hemisphere exporters were the major sources of supply for North America, South and Central America, Asia and Oceania. The competition for market share between EU-27 and Southern Hemisphere suppliers was most intense in the EU-27, the Middle East and in other minor importing countries. The changes between 2010 and 2011 were relatively minor, largely reflecting changes in the total supplies available from each source.

Major Importing Regions: Regional Sources of Fresh Kiwifruit, 2010 and 2011

(percent)

EXPORTING REGION

Importing Region	EU-27	EU-27	S Hemi	S Hemi	Other	Other
	2010	2011	2010	2011	2010	2011
	(%)	(%)	(%)	(%)	(%)	(%)
North America	25.2	27.9	66.5	64.5	8.3	7.6
South & Central America	30.7	39.1	68.8	60.1	0.5	0.8
EU-27, total	45.8	40.9	35.3	33.4	18.9	25.6
Russia/Other Europe	78.3	75.9	20.5	22.9	1.2	1.3
Middle East	55.4	51.7	44.0	48.1	0.6	0.2
Africa	100.0	100.0	0.0	0.0	0.0	0.0
Asia, total	8.9	8.6	87.6	90.7	3.6	0.7
Oceania, total	28.2	27.1	70.1	72.3	1.7	0.7
All Other	82.8	54.5	15.5	45.5	1.7	0.0
TOTAL	40.8	37.8	46.1	47.0	13.1	15.2

The table below shows the share of global exports of fresh kiwifruit accounted for by the nine major exporters. These data were derived from the estimated partial global trade matrices for the years between 2007 and 2011. Shares for the three leading exporters, Italy, New Zealand and Chile, have remained quite stable, despite year to year changes in production and exports of each country. Italy and New Zealand have traded places from year to year as the world's top fresh kiwifruit exporter. The impact of PSA is likely to continue to alter that relationship for several years in the future. The biggest relative change has been for Greece, whose share of global exports almost doubled between 2007 and 2010, before falling back slightly in 2011. For minor exporters, changes in their shares of global trade were more modest in absolute terms, with the shares of Spain and Portugal rising, and France's share falling. However, the shares for Portugal, the United States and China have continued to be less than one percent. The share of exports assigned to all other suppliers may be a serious over-statement. Many of these exports derived originally from one of the big three, Italy, New Zealand and Chile. However, their true origins have been lost as they traversed countries such as Belgium that are not themselves producers of kiwifruit, but are major sources for re-exports. Sourcing is even more obscured by the fact that major exporting countries like Italy and France are also major importers.

Major Exporters: Share of Global Trade in Fresh Kiwifruit, 2007-2011
(percent)

Exporter	2007	2008	2009	2010	2011
	(%)	(%)	(%)	(%)	(%)
Italy	31.1	28.6	32.7	31.0	28.7
Greece	3.4	3.5	4.7	6.2	5.3
France	2.7	2.4	1.9	2.2	1.9
Spain	1.0	0.9	1.0	1.0	1.3
Portugal	0.3	0.1	0.3	0.5	0.6
New Zealand	32.5	35.1	30.7	30.8	32.1
Chile	14.9	14.9	15.5	15.2	14.9
U.S.	0.7	0.6	0.5	0.7	0.6
China	0.3	0.2	0.1	0.2	0.2
All Other	12.9	13.7	12.6	12.2	14.4
TOTAL	100.0	100.0	100.0	100.0	100.0

Clearly, Italy, New Zealand and Chile remain the major contenders for market share in many different regions. The table below shows how the share of imports supplied by each has varied in the three most important importing regions between 2004 and 2011. Changes in relative exchange rates between the U.S. dollar, New Zealand dollar, euro and Chilean peso, are thought to affect which major regions these different exporters choose to supply in any period, but the actual linkages are difficult to trace.

Italy has remained the lead supplier of fresh kiwifruit imports to the EU-27, with a one-third share of imports. In contrast, the shares supplied by both New Zealand and Chile have declined over time. New Zealand's average share in 2010 and 2011 was almost 8 percentage points lower than in 2004 and 2005, while Chile's was 2.4 points lower. The share of all other suppliers showed a major increase, due partly to the increased importance of exports from Greece. New Zealand remained the dominant supplier in Asia, with its share averaging over 80 percent for the eight years. In contrast, both Italy and Chile had increased their market share in Asia, partly at the expense of other minor suppliers. Chile continued to be the leading supplier in North America, although New Zealand had a larger share in one year, 2008. However, between 2004 and 2011, Italy had a notable increase of 9 percentage points in its share of North American imports.

Major World Regions: Market Share of Major Suppliers, 2004-2011
(percent)

Region	Supplier	2004	2005	2006	2007	2008	2009	2010	2011
EU-27	Italy	31.6	32.5	38.6	36.2	32.7	38.7	36.9	32.2
	New Zealand	31.2	29.9	23.4	24.9	26.7	22.6	23.4	22.4
	Chile	15.4	12.3	13.1	12.9	13.8	13.3	11.9	11.1
	All Other	21.8	25.3	24.9	26.0	26.8	25.4	27.8	34.3
Asia	Italy	3.4	3.8	4.7	4.5	5.1	6.9	6.2	5.9
	New Zealand	81.1	81.5	77.1	79.0	85.5	82.0	80.7	79.6
	Chile	7.6	10.2	10.4	8.9	5.7	7.2	6.9	11.1
	All Other	7.9	4.5	7.8	7.6	3.7	3.9	6.2	3.4
N. America	Italy	18.1	23.6	18.3	23.3	26.3	22.4	24.3	27.1
	New Zealand	26.3	26.7	22.4	28.4	34.1	33.2	28.7	29.1
	Chile	36.3	39.9	44.9	37.7	30.5	33.8	37.8	35.4
	All Other	19.3	9.8	14.4	10.6	9.1	10.6	9.2	8.4

Italy's Solid Export Performance

Italy continues to have a unique position as an exporter of fresh kiwifruit. It remains one of the world's largest producers, but is also uniquely located close to some of the richest markets in the world, such as France and Germany. However, it also has faced severe challenges from recent economic malaise in both its domestic market and in neighboring markets throughout Western Europe. For example, its exports to EU-27 countries exceeded 262,000 metric tons in both 2008-09 and 2009-10, but have fallen by 7 percent in the two most recent seasons. This has occurred despite the fact that all its key markets in the EU-27 use the euro currency, so exchange rates have no impact on sales. Indeed, Italy has increased sales more rapidly to minor markets in the EU-27.

In contrast, in recent years, the euro has remained strong against the currencies of many other countries, making exporting more difficult. Despite that obstacle, Italy has taken an aggressive stance in expanding its exports in other regions. It has made notable gains in North America, Central and South America, the Middle East, Asia and other minor markets.

Italy: Fresh Kiwifruit Exports, by Destination, 2006-07 to 2011-12
(metric tons)

Destination	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12
Germany	70,402	57,784	66,729	72,271	63,003	48,588
Spain	45,724	39,711	52,075	41,950	45,374	35,249
France	23,137	23,775	31,631	25,780	21,348	31,969
U.K.	19,708	15,984	18,467	15,886	14,431	13,556
Netherlands	18,501	14,618	16,959	14,241	13,261	14,991
Other EU-27	79,957	66,390	77,024	92,381	87,289	97,374
Subtotal EU-27	257,429	218,262	262,885	262,509	244,706	241,727
Russia	19,544	15,504	13,336	17,867	15,854	14,728
Other Europe	15,480	11,108	12,715	13,824	12,253	11,898
Russia/Oth Europe	35,024	26,612	26,051	31,691	28,107	26,626
United States	11,538	8,928	12,960	13,259	10,178	13,928
Canada	6,673	4,825	6,350	9,914	8,001	9,074
North America	18,212	13,753	19,310	23,173	18,179	23,002
C & S America	5,850	4,500	5,403	11,179	12,726	19,177
Middle East	5,511	4,952	5,311	8,842	9,002	17,789
Asia	7,070	6,272	9,569	11,534	13,217	12,314
Oceania	5,530	3,592	4,575	6,336	5,702	6,413
All Other	2,068	1,841	2,336	4,420	4,880	11,619
TOTAL	336,694	279,784	335,440	359,684	336,519	358,667

New Zealand Awaits Other Shoe

In popular language, someone who is expecting a bad event to occur is said to be "waiting for the other shoe to drop." New Zealand exporters of fresh kiwifruit have known since late 2010 that PSA could be a serious threat to production and exports, but have been waiting for the other shoe to drop in terms of how much production and exports will be hurt. Preliminary figures for the 2012 calendar year suggest that the volume of product available for export fell by over 10 percent in 2012, with the most serious decline (about 27 percent) occurring in availability of golden kiwifruit.

New Zealand: Fresh Kiwifruit Exports, by Destination, 2006-2012
(metric tons)

Destination	2006	2007	2008	2009	2010	2011	2012p
Italy	17,079	18,526	17,523	15,671	16,912	17,015	15,489
Spain	35,624	44,805	48,723	43,015	47,530	44,262	39,125
U.K.	5,230	6,813	590	537	148	n.a.	n.a.
Other EU-27	111,670	106,975	127,532	115,795	110,404	116,883	104,851
Subtotal EU-27	169,603	177,119	194,368	175,018	174,923	178,160	159,465
Russia	344	771	395	496	746	1,276	n.a.
United States	12,595	18,789	21,392	21,719	17,985	20,649	11,624
Canada	319	727	1,186	643	2,852	1,409	1,964
Mexico	1,378	1,612	2,793	3,763	2,830	3,232	n.a.
Subtotal N America	14,292	21,128	25,371	26,125	23,667	25,290	n.a.
China	5,869	6,693	16,110	21,664	25,329	32,956	32,515
Japan	54,815	57,937	58,916	57,903	61,346	63,733	59,806
South Korea	20,831	25,885	26,543	22,070	23,939	25,743	20,274
Taiwan	14,088	16,754	18,619	19,652	20,537	26,124	27,434
Other Asia	9,870	14,024	12,245	16,006	16,835	22,114	17,857
Subtotal Asia	105,473	122,393	132,433	137,295	147,986	170,670	157,886
Middle East	3,174	4,499	4,998	3,815	2,260	3,635	n.a.
Oceania	15,120	19,180	15,175	15,344	15,316	18,062	n.a.
All Other	2,120	2,826	4,027	2,933	3,628	4,405	n.a.
TOTAL	310,126	347,916	376,767	361,026	368,526	401,498	356,419

p: January-October 2012.

Exports to the EU-27 might have been expected to fall in any case because of the weaker economies in Europe. However, exports also fell by 44 percent to the United States. New Zealand kiwifruit normally sell at a premium to Chilean kiwifruit in that market. That premium was 37.5 percent in 2011. In 2012, it increased to 121.4 percent. There was also a small reduction in exports to some key markets in Asia, such as Japan and South Korea, where reduced supplies of golden kiwifruit was a factor. If export supplies continue to fall, Zespri will have a difficult task in balancing the needs of different customers with the availability of different cultivars.

Chile Seeks New Markets

Chile has been trying to reduce its dependence on the faltering European market by expanding exports to other markets. It has had most success in North America, the Middle East, and Asia, especially China and South Korea. Those efforts of diversification are likely to intensify as Chilean supplies increase.

Chile: Fresh Kiwifruit Exports, by Destination, 2006-2012
(metric tons)

Destination	2006	2007	2008	2009	2010	2011	2012p
Italy	28,070	29,863	27,930	32,821	27,920	23,785	23,354
Netherlands	21,200	21,440	31,674	24,903	22,198	19,868	23,452
Spain	16,392	19,135	17,135	19,276	19,475	14,611	16,027
U.K.	8,471	8,148	8,813	8,884	7,380	7,795	8,163
Other EU-27	12,297	13,656	15,052	16,295	12,212	11,342	10,560
Subtotal EU-27	86,430	92,242	100,604	102,179	89,185	77,401	81,556
Russia	5,309	8,627	11,389	11,899	14,116	16,061	15,713
United States	21,705	21,484	17,251	19,853	22,480	22,216	28,670
Canada	3,099	3,077	2,434	3,437	3,841	3,358	3,709
Mexico	4,222	4,164	3,013	3,314	4,791	4,811	5,206
Subtotal N America	29,026	28,725	22,698	26,604	31,112	30,385	37,585
C & S America	9,534	12,990	12,158	23,293	26,377	26,610	21,664
China	0	0	0	0	499	2,130	6,893
Japan	1,878	2,207	926	935	1,726	2,126	2,273
South Korea	8,435	6,947	2,546	5,428	5,806	4,056	7,336
Taiwan	886	665	638	804	76	291	871
Other Asia	3,578	3,914	3,840	5,587	4,475	6,269	3,205
Subtotal Asia	14,777	13,733	7,940	12,754	12,582	14,872	20,578
Middle East	2,306	2,978	3,880	4,752	7,779	8,220	8,180
Oceania	0	13	0	0	0	17	31
All Other	63	878	1,583	1,290	719	4,565	2,294
TOTAL	147,455	160,186	160,252	182,771	181,870	178,131	187,601

Greece Enjoys New Opportunities

Greece has been able to benefit from increased export opportunities as its production continued to increase at the same time that production elsewhere in Europe was falling. In 2012, Greece made large gains in sales in the EU-15 countries that have tended to seek higher-quality, more expensive fresh kiwifruit. Exports also rebounded near to the record 2010 levels in the EU-27's new member states (NMS) and increased by over 50 percent to Russia. Both of these are markets where the demand has tended to be strongest for lower-priced fresh kiwifruit. Greece has also been successful in expanding exports to numerous countries in the Middle East, Asia and other minor markets.

Greece: Fresh Kiwifruit Exports, by Destination, 2006-2012
(metric tons)

Destination	2006	2007	2008	2009	2010	2011	2012p
EU-15	8,063	5,709	8,367	5,660	13,417	8,468	20,882
NMS	9,278	7,220	8,509	11,064	20,553	14,192	20,169
Subtotal EU-27	15,351	12,929	16,876	16,724	33,970	22,660	41,051
Russia	5,921	9,983	12,289	15,419	16,568	21,838	33,626
Other Europe	6,926	7,045	6,352	10,769	18,648	15,307	15,941
Russia/Oth Europe	12,847	17,028	18,641	26,188	35,216	37,145	49,567
United States	260	747	169	92	109	163	259
Canada	326	612	100	63	170	102	362
N America	586	1,361	269	155	279	265	621
Subtotal Asia	0	0	93	236	446	551	1,650
Turkey	986	1,542	1,491	3,457	1,841	1,887	1,772
Other Middle East	198	379	246	795	2,142	2,965	3,640
Middle East, Total	1,184	1,921	1,737	4,252	4,274	4,852	5,412
All Other	387	100	96	395	3,972	385	6,279
TOTAL	30,355	33,339	37,712	47,950	74,201	65,858	104,580

France Looks Outward

Faced with the much larger volume of fresh kiwifruit available from Italy, French exporters have historically aimed to serve a higher-priced, quality-conscious niche in Western European markets. However, the Great Recession and its aftermath have severely constrained that niche. While total French exports of fresh kiwifruit fell 23 percent between 2006-07 and 2011-12, exports to the EU-27 fell by almost 42 percent. Exports to Spain, once the largest single export market for French kiwifruit, fell by 66 percent.

Despite the relative strength of the euro, French exporters have succeeded in expanding sales in Asia, Australia and other miscellaneous markets. Such markets are likely to become of increasing importance until European economies recover.

France: Fresh Kiwifruit Exports, by Destination, November-June Seasons, 2005-2012

(metric tons)

Destination	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12p
Germany	4,353	3,725	4,215	3,248	2,920	2,592	2,773
Spain	7,471	10,066	7,778	6,341	5,941	4,494	3,423
Belgium-Lux	4,210	5,520	4,735	5,519	5,821	3,752	4,876
Other EU-27	3,311	4,312	4,624	2,981	3,850	3,197	2,689
Subtotal EU-27	19,345	23,623	21,352	18.089	18,532	14,035	13,761
Canada	448	320	67	20	224	267	46
China	0	0	0	0	769	1,169	1,327
Hong Kong	179	56	74	327	202	715	2,246
Taiwan	2,091	2,280	1,082	1,800	3,217	2,495	1,790
Other Asia	0	70	250	327	375	590	332
Subtotal Asia	2,270	2,406	1,406	2,127	4,563	4,969	5,695
Australia	231	691	84	105	483	924	609
All Other	932	558	240	901	1,110	528	1,169
TOTAL	23,226	27,598	23,149	21,569	24,912	20,723	21,280

China Imports Surge

Despite the fact that China is the world's largest producer of commercial kiwifruit, its export prowess has continued to fade, while its imports of fresh kiwifruit have continued to grow rapidly. Imports grew by a further 20 percent in calendar year 2012, and were about ten times as large as in 2004, less than a decade ago. Imports from the Southern Hemisphere were dominant, suggesting that they are primarily used when Chinese supplies are not available. New Zealand has continued to be the leading source of imports, accounting for over 70 percent in 2012, while Chile has continued in second place with over 20 percent. However, France and Italy gained entry to the Chinese market in 2009 and Greece in 2011. Together, these three suppliers accounted for 6.5 percent of 2012 imports. A number of reasons contributed to the decline in Chinese fresh kiwifruit exports. First has been the spectacular growth of domestic demand for all fruits as Chinese incomes have soared. Another has been the difficulty in meeting the export quality standards set by major competitors. At this point, it has been more prudent for Chinese shippers to focus their efforts on meeting the needs of the growing domestic market than on expanding exports.

China: Imports and Exports of Fresh Kiwifruit, 2003-2012
(metric tons)

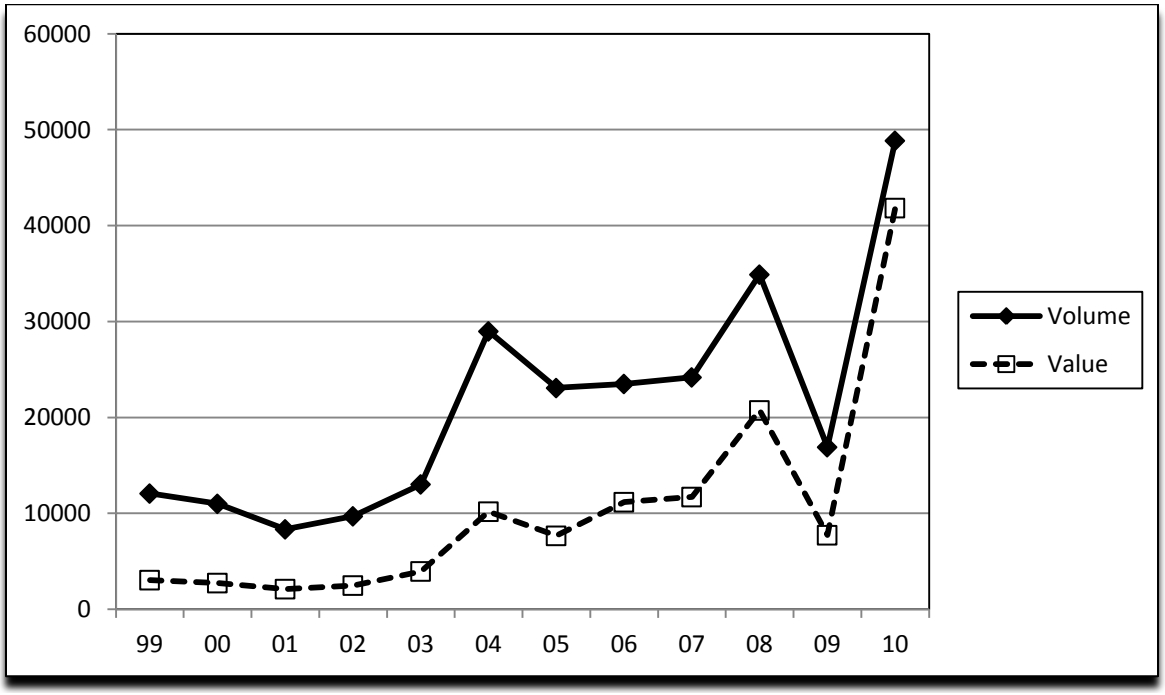
Partner	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Total Imports	2,975	5,235	6,730	10,507	13,554	18,769	26,830	33,161	43,112	51,955
N Zealand	2,649	4,155	5,467	9,054	11,485	16,156	22,034	25,472	29,153	36,930
Chile	325	1,080	1,264	1,453	2,069	2,613	4,705	6,093	11,122	11,652
France	0	0	0	0	0	0	19	865	1,291	1,222
Italy	0	0	0	0	0	0	71	731	1,506	1,284
Greece	0	0	0	0	0	0	0	0	39	868
Total Exports	1,545	5,115	4,487	4,137	3,748	1,669	1,749	2,041	1,891	934
Cent Plan	285	1,069	1,089	524	551	761	618	876	940	552
NE Asia	729	1,526	1,747	2,020	2,091	544	662	559	603	193
SE Asia	196	680	290	150	69	22	37	289	179	159
Europe	48	683	342	139	131	110	209	169	84	13
N America	280	739	741	757	327	46	15	10	0	0
Middle East	0	379	278	369	222	167	162	135	67	0
Other	7	40	0	178	357	19	46	3	18	17

Iran Surprises on Upside

Exports of fresh kiwifruit from Iran have been considered to be of dwindling importance since 2004. However, revised data from UN,FAO, shown in the chart below, suggest that Iranian exports of fresh kiwifruit have been on a long-term upward trend in both volume and value terms, and that volume reached almost 50,000 metric tons in 2010. The downturn in 2009 now appears as an aberration in an otherwise positive upward trend. In 2010, the average value per metric ton of Iranian fresh kiwifruit exports was $856.42, more than twice the normal level earlier in the decade. It is unclear what circumstances caused Iranian average prices to rise so steeply in 2010, or whether those circumstances will be repeated in future years. However, these data suggest that Iran could be a more important competitive force in the future, especially in nearby Middle Eastern markets.

Iran: Volume and Value of Fresh Kiwifruit Exports, 1999-2010

((1,000 metric tons and $1,000)



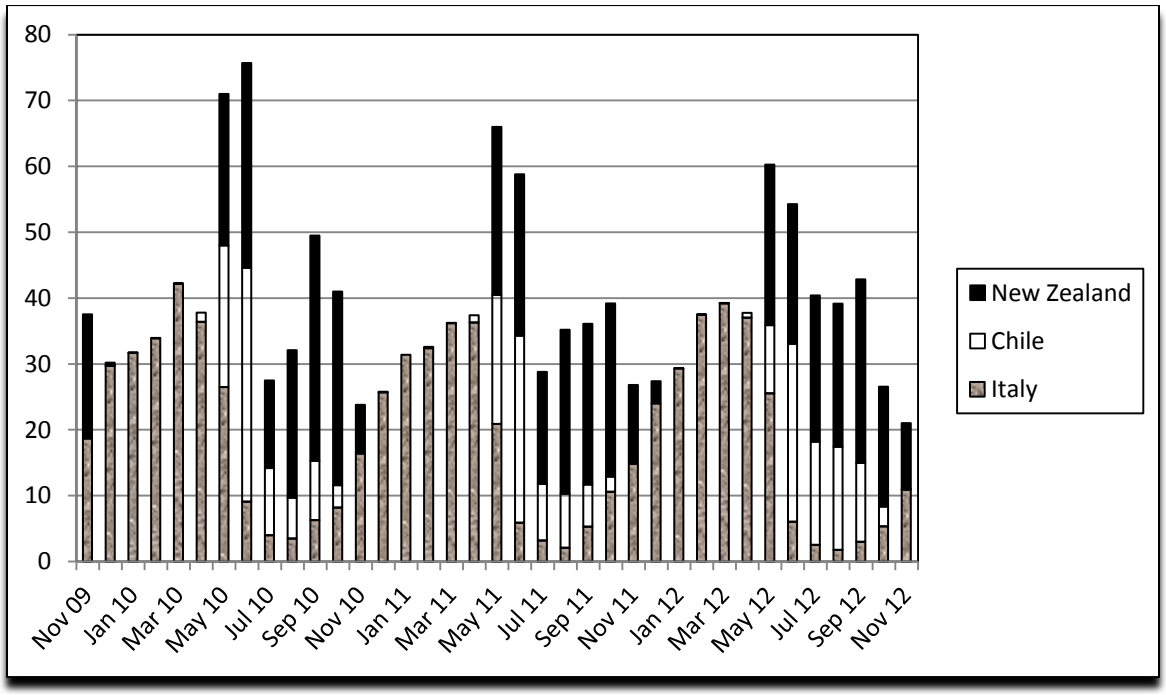
Some other minor exporters, including Spain, Portugal and the United States sell mostly in neighboring markets. None appears to have the potential that Iran has to be a disruptive force in global markets in the near future.

Influence of Seasonality on Fresh Kiwifruit Trade

As kiwifruit production expanded in both the Northern and Southern Hemispheres, there was growing concern that supplies from both hemispheres would increasingly overlap, particularly in the richer Northern Hemisphere markets. That problem was expected to intensify as suppliers introduced kiwifruit cultivars that could be harvested earlier than the standard Hayward variety. Indeed, it appeared that such overlaps were becoming a problem in European Union markets in 2009, when a record total of 90,000 metric tons was imported from Italy, Chile and New Zealand in May 2009. However, the overlaps have become less problematic since then, partly because Southern Hemisphere exporters had become more aggressive in expanding in Asia and elsewhere. The chart below shows that the overlap for fresh kiwifruit imports from the three major exporters declined in the peak month of May in 2010, 2011 and again in 2012. A similar downward trend was found for the minor peaks that normally occur later in each calendar year.

EU-27: Monthly Volume of Imports of Fresh Kiwifruit from Italy, Chile and New Zealand, Nov 2009-Nov 2012

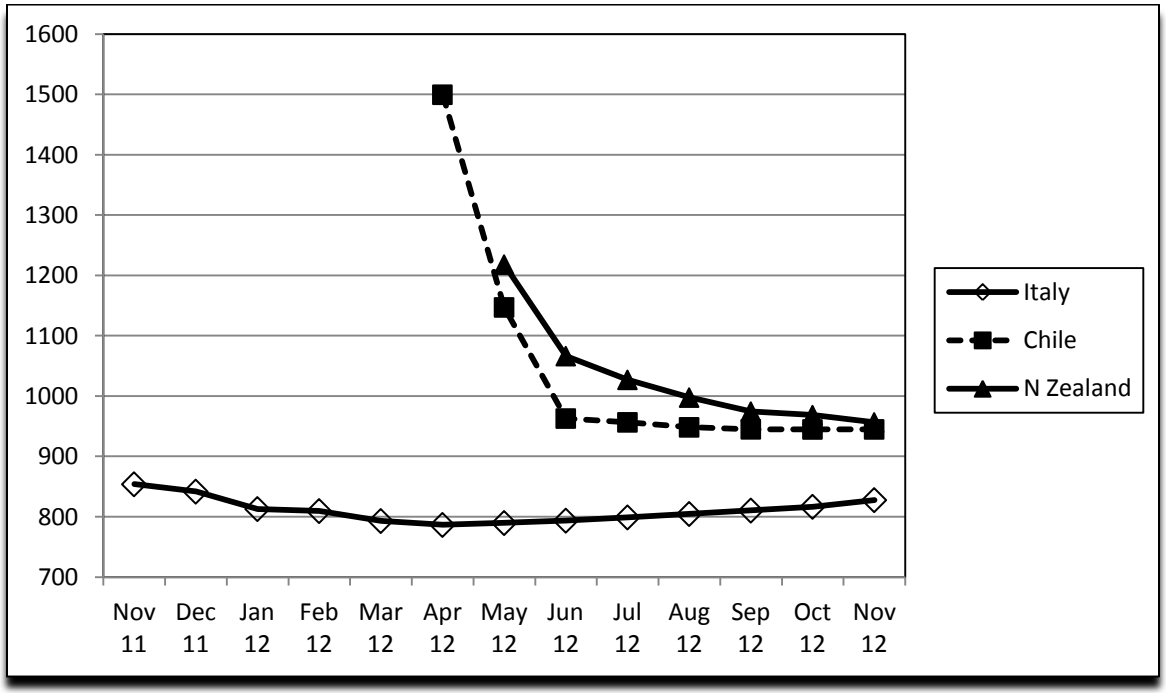
(1,000 metric tons)



In previous issues of the World Kiwifruit Review, we examined monthly variations in average import prices of the three major suppliers to the EU-27. However, much of the price fluctuations appeared to be due to temporary factors such as timing or quality. To reduce these temporary effects, we analyzed the moving average price of imports from Italy, Chile and New Zealand for the most recent 2011-2012 season. The results are shown in the chart below. The moving average price of Italian imports was €853.92 per metric ton in November 2011, reached its low point of €786.55 in April 2012, and rose steadily for the rest of the season. Average import prices for both Chile and New Zealand earned large early season premiums. Moving average prices for Chile fell to €962.88 per metric ton by June 2012 and remained close to that level for the rest of the season. Moving average prices for New Zealand fell rapidly between May and June 2012, and then gradually fell through November 2012, when the price premium for New Zealand kiwifruit over Chilean kiwifruit had dissipated. These moving average data suggest that the greatest competition was between Chilean and New Zealand supplies.

EU-27: Monthly Moving Average Prices, 2011-12 Seasons for Italy, Chile and New Zealand

(euros per metric ton)



In previous issues of the World Kiwifruit Review, we have also compared average import prices into the EU-27 of Chilean and New Zealand kiwifruit, as reported by the European Union's Comext database. The table below shows data for 14 calendar years between 1999 and 2012. Each supplier had a price advantage in exactly half the years studied. Between 1999 and 2002, price advantage alternated between the two suppliers. For four consecutive years, from 2003 to 2006, New Zealand kiwifruit had a very substantial price advantage. The price advantage, although relatively smaller, swung in favor of Chile for the next five years. New Zealand regained a slight edge in 2012. Unfortunately, no data are available on the varieties, sizes or qualities included in these averages, so it is difficult to explain why they occurred, or to predict future potential price advantages. However, the table shows how close the rivalry between Chile and New Zealand has become in EU-27 markets.

EU-27: Comparison of Annual Average Import Prices of Fresh Kiwifruit from Chile and New Zealand, 1999-2012

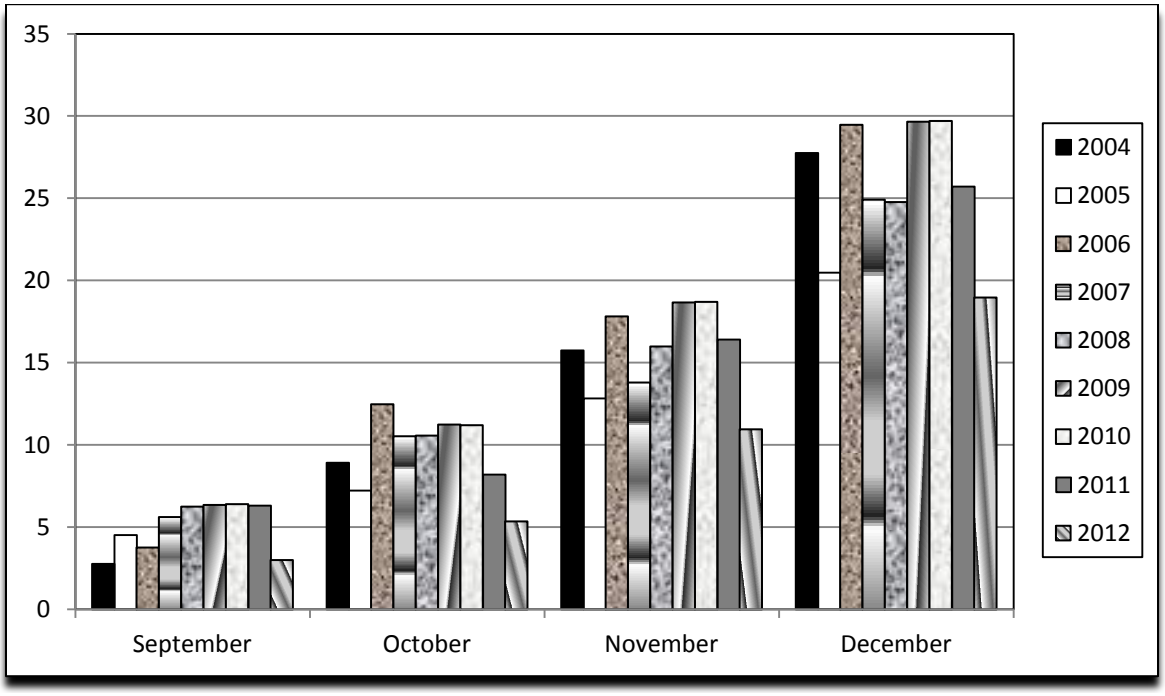
(euros per metric ton)

Calendar Year	Chile Price	New Zealand Price	New Zealand Premium	New Zealand Premium
	(€/mt)	(€/mt)	(€/mt)	(%)
1999	950.48	1,051.23	100.75	+ 10.6
2000	976.97	974.71	- 2.26	- 0.2
2001	1,020.15	1,021.61	1.46	+ 0.1
2002	1,050.52	1,040.74	- 9.78	- 0.9
2003	973.50	1,199.53	226.03	+ 23.2
2004	1,022.16	1,149.24	127.08	+ 12.4
2005	887.81	1,174.67	286.86	+ 32.3
2006	959.42	1,159.12	199.70	+ 20.8
2007	890.22	855.60	- 34.62	- 3.9
2008	1,005.86	919.43	- 86.43	- 8.6
2009	879.10	763.64	- 115.46	- 13.1
2010	838.94	821.21	- 17.73	- 2.1
2011	1,000.67	927.80	- 72.87	- 7.3
2012	944.86	956.47	11.61	+ 1.2

In previous issues, we have also examined the change in early-season supplies from Italy to EU-27 markets. The chart below shows EU-27 imports of fresh kiwifruit from Italy for the months of September, October, November and December for the years from 2004 to 2012. Clearly, there was a substantial increase in supplies in the months of September, October and November between 2004 and 2010. However, since 2010, that growth has stopped. This suggests that early-harvested kiwifruit have not met the hopes of their promoters. There is likely to be some re-evaluation of the merits of investing further in the commercialization of early-harvested kiwifruit. Any pause in growth of these supplies will further reduce the overlap problem in EU-27 markets and in other Northern Hemisphere markets.

EU-27: Imports of Fresh Kiwifruit from Italy, September to December, 2004-2012

(1,000 metric tons)



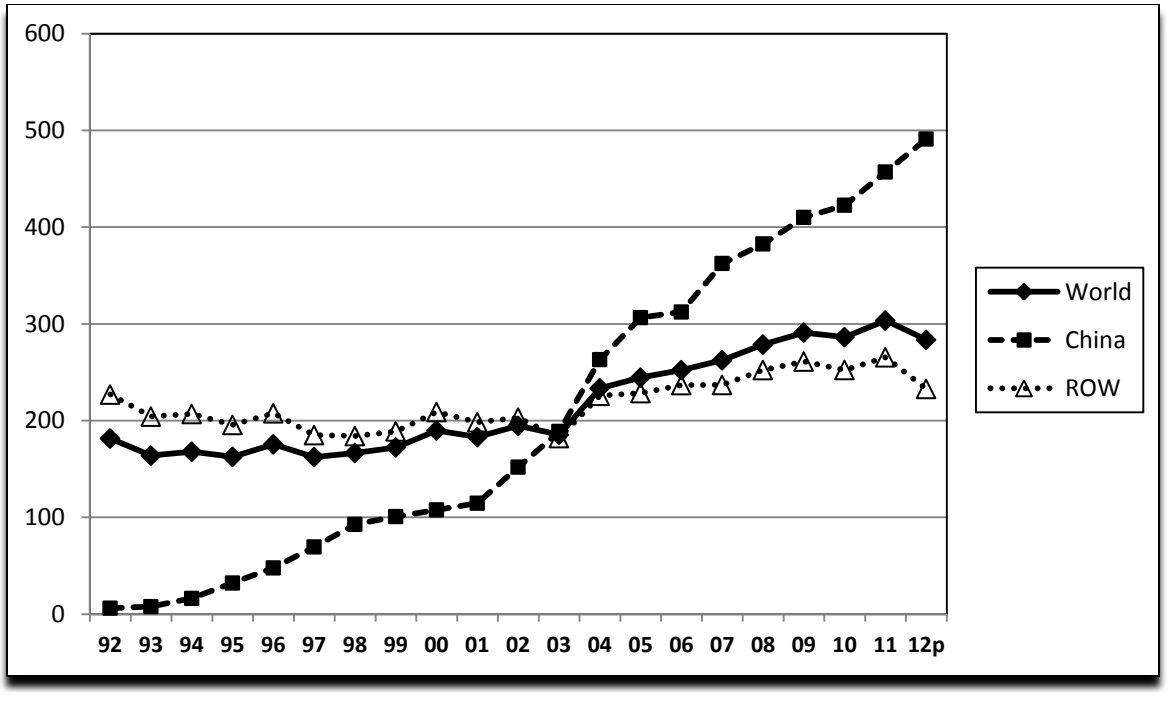
III. Consumption of Fresh Kiwifruit

Per Capita Availability of Kiwifruit Slows

World per capita availability of kiwifruit remained relatively flat around 200 grams per capita between 1992 and 2002. Since 2003, it has been on a steady upward path. However, that period of growth is likely to have ended in 2012-13 due to the ravages of PSA in the major exporting countries of Italy, New Zealand and Chile. Per capita supplies in the rest of the World, excluding China, have followed a similar path. Per capita supplies of commercial kiwifruit continued their steady upward rise in China in 2012-13. These are now more than twice the per capita supplies in the Rest of the World. Actual per capita supplies in China may be even higher because wild kiwifruit are still available in some regions in China.

World: Kiwifruit Availability, China and the Rest of the World, 1992-2012

(grams per capita)



PSA has also raised doubts about when world per capita availability of kiwifruit will resume growth. Some of the decline in supplies in 2012-13 resulted from reductions due to alternate bearing or adverse weather, but the reduction due to PSA alone was at least 50,000 metric tons. In the next season or two, the losses to PSA could approach 100,000 metric tons. That loss may not be offset by increased supplies from China. In any case, Chinese supplies are not likely to be available outside that country.

Supplies for Consumption, by Country

The table on the next page shows estimated domestic disappearance of kiwifruit, and disappearance per capita for 12 kiwifruit producing countries for the three-year periods, 1990-93, 2000-03 and 2010-13. Three-year periods were used to reduce the impact of temporary factors in any single season. The table also shows how changes in domestic production, imports and exports affected the level and trends in domestic disappearance. Since domestic disappearance is calculated as a residual, it is affected by any errors in data on production, imports or exports. Major exporting countries tend to be most often affected by such errors.

In 2010-13, only one country, New Zealand, recorded domestic disappearance greater than 3 kilograms per capita. Three countries, Spain, Chile and Greece, recorded per capita disappearance of between 2.5 and 3.0 kilograms. Two countries, France and Italy, recorded per capita disappearance between 1.5 and 2.0 kilograms. Australia's per capita disappearance hovered just above one kilogram. Two countries, South Korea and Japan, recorded per capita disappearance between 0.5 and 1.0 kilograms, while the two producing countries with the largest populations, China and the United States, recorded per capita disappearance of less than 0.5 kilograms.

For most producing countries, the trend over time in per capita disappearance was upwards. Eight countries recorded increases in per capita disappearance between 1990-93 and 2000-03, and also between 2000-03 and 2010-13. These were Australia, Chile, France, Portugal, Spain, South Korea, the United States and China. Three countries, New Zealand, Greece and Japan, recorded decreases in the first decade, but increases in the most recent decade. Italy, one of the world's largest kiwifruit exporters, was the only country to record a decrease in domestic per capita disappearance in each decade.

Major Kiwifruit Producing Countries: Production, Trade and Domestic Disappearance, Selected Three-year Periods

Country	Period	Production	Imports	Exports	Domestic Disappearance	Domestic Disappearance
		(mt)	(mt)	(mt)	(mt)	(grams per capita)
Italy	1990-93	335,209	17,684	160,124	192,768	3,390.2
	2000-03	351,458	38,047	262,143	127,362	2,225.5
	2010-13	421,249	49,468	341,749	128,968	1,968.7
France	1990-93	64,263	32,028	20,540	75,750	1,330.1
	2000-03	80,000	38,391	28,937	89,454	1,505.8
	2010-13	66,573	54,657	21,919	99,311	1,687.9
Greece	1990-93	37,947	440	8,885	29,502	2,877.4
	2000-03	56,200	1,579	25,378	32,401	769.3
	2010-13	107,103	5,195	85,038	27,260	2,613.1
Spain	1990-93	5,966	36,471	969	41,469	1,063.7
	2000-03	13,628	92,043	9,230	96,441	2,363.4
	2010-13	17,864	120,638	11,239	127,263	2,908.0
Portugal	1990-93	5,863	7,776	410	13,229	1,329.4
	2000-03	9,238	10,058	405	18,891	1,820.0
	2010-13	20,634	9,663	5,194	25,103	2,829.7
United States	1990-93	36,560	14,987	5,281	46,266	180.9
	2000-03	25,976	48,444	11,721	62,699	219.6
	2010-13	30,361	57,031	9,760	77,632	232.6
China	1990-93	6,167	0	0	6,167	5.2
	2000-03	163,333	3,764	242	166,856	127.7
	2010-13	630,000	41,425	1,980	669,445	453.7
Japan	1990-93	56,200	49,795	0	105,995	863.8
	2000-03	41,967	43,135	40	85,062	675.7
	2010-13	29,228	64,276	5	93,499	727.2
South Korea	1990-93	6,714	1,696	0	8,410	194.0
	2000-03	13,775	7,293	23	21,045	455.4
	2010-13	10,491	29,438	3	39,926	816.1
Australia	1990-93	3,592	8,185	971	10,806	624.1
	2000-03	4,349	17,433	3,094	18,688	964.1
	2010-13	3,432	21,252	400	24,284	1096.4
Chile	1990-93	59,100	0	58,386	714	53.2
	2000-03	126,167	0	119,929	9,405	602.8
	2010-13	232,035	0	194,468	37,567	2,824.0
New Zealand	1990-93	258,000	0	212,000	46,000	13,337.2
	2000-03	245,399	357	241,938	18,698	4,985.2
	2010-13	399,170	650	372,301	27,518	5,637.8

As one might expect, changes in domestic production were major contributors to the increase in domestic disappearance in Italy, Greece, Portugal, Spain, China and Chile. However, this was not true for France, the United States, Japan and Australia. Imports played a surprisingly important role in these producing countries in increasing the domestic disappearance. Indeed, the long-term trend in imports was upwards in all countries. It was upwards in both decades in every country except Portugal and Japan. Imports were a more important contributor than domestic production in minor producing countries like Spain, the United States, Japan and Australia. While most countries need to import off-season supplies of fresh kiwifruit, these trends suggest that imports were complementary to, rather than competitive with, domestic production even during the producing season.

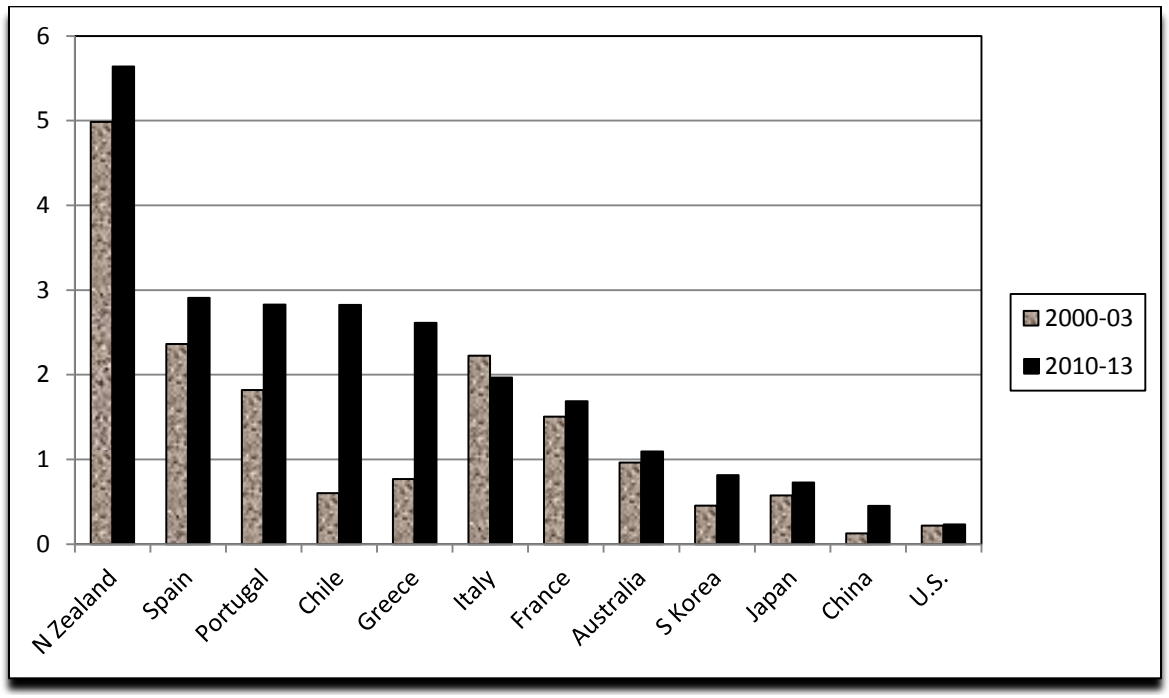
The trend in exports was not as clear. Exports increased in each decade for major producers like Italy, New Zealand, Chile and Greece, and for some minor exporters like Spain and China. However, the trend in exports was quite erratic for other countries. There is little doubt that a major producing country is less likely to retain kiwifruit for the domestic market if there are strong export opportunities.

The wide disparity between producing countries in per capita disappearance is shown dramatically in the chart on the next page. For simplicity, data are only shown for the two three-year periods, 2000-03 and 2010-13. The results are arrayed from left to right in terms of the level of per capita disappearance in 2010-13. New Zealand was a major outlier, with per capita disappearance in 2010-13 of over 5.6 kilograms. Four countries, Spain, Portugal, Chile and Greece, had similar levels of per capita disappearance that were about half that of New Zealand. Italy, France and the other countries shown had successively lower per capita disappearance in 2010-13. The lowest, that of the United States, was less than one-twentieth of that in New Zealand.

Remarkably, per capita disappearance was higher in 2010-13 than in 2000-03 in every producing country except Italy. The rate of growth was particularly impressive in Chile and Greece. It is possible that because of increased production, a larger volume of kiwifruit cannot meet tighter export standards and becomes available in the domestic market. Lowered trade barriers may also have made kiwifruit more accessible in many import markets.

Major Producing Countries: Per Capita Disappearance, 2000-03 and 2010-13

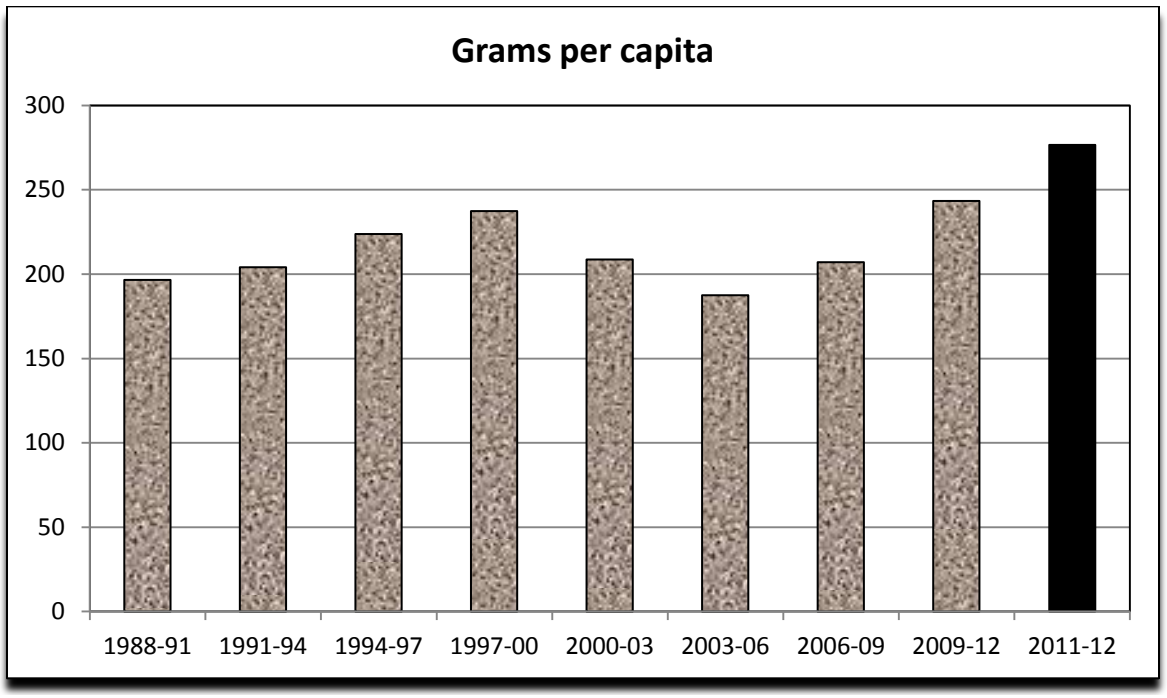
(kilograms per capita)



While per capita disappearance in China remains low, it has more than tripled in the last decade. However, by our estimates, that of the United States grew by less than 6 percent in the last decade. An alternative estimate of per capita consumption of fresh kiwifruit is available from USDA's Economic Research Service. ERS estimated U.S. per capita fresh consumption for 1990-93 of 198.1 grams and for 2000-03 of 208.7 grams. These are very similar to our estimates (shown previously) of per capita disappearance of 180.9 and 219.6 grams respectively. The chart below shows average per capita consumption of fresh kiwifruit in the United States for three-year October-September marketing years, between 1988-99 and 2011-12. Per capita consumption for the latest individual season, 2011-12, is shown in black. Clearly, U.S. per capita consumption of fresh kiwifruit moved in a narrow range around 200 grams for much of the last two decades. However, per capita consumption has moved to new levels in the last three seasons. Although U.S. per capita consumption of fresh kiwifruit remains very low compared to that of other producing countries, it is finally moving in a positive direction for both domestic and import suppliers.

United States: Per Capita Consumption of Fresh Kiwifruit, Three-year Periods, 1988-2012

(grams)



Consumption in Non-producing Countries

The previous section demonstrated that there has been a steady increase in per capita consumption of fresh kiwifruit in almost all the major kiwifruit producing countries. However, continuing increases in production were also forcing major producing countries to expand their sales to additional markets. In the past, the main target has been other high-income countries, especially nearby countries in Western Europe. However, since the Great Recession of 2008, many of those countries have faced lower incomes, higher unemployment and static or falling consumption of many items. At the same time, because economic recovery has been more rapid in many developing countries, they have become a natural target for export expansion. The table below shows the trend in per capita consumption of fresh kiwifruit in the non-producing countries of the European Union. It lists the older member countries (the EU-15) and the New Member States (NMS) separately.

Non-producing European Union Member Countries: Per Capita Consumption of Fresh Kiwifruit, 2002-2011

(Annual grams per capita)

Region	Country	2002-04 Average	2005-07 Average	2008-10 Average	2010	2011
EU-15	Austria	915	1,228	1,270	1,315	1,571
	Belgium	n.a.	1,897	2,239	1,692	386
	Denmark	680	774	992	1,115	705
	Finland	490	578	627	678	618
	Germany	1,081	1,397	1,371	1,405	1,254
	Ireland	609	852	970	915	857
	Luxembourg	1,539	1,529	2,102	2,174	2,178
	Netherlands	992	1,280	2,053	2,666	3,267
	Sweden	934	1,102	1,124	1,234	1,096
	United Kingdom	528	653	556	473	499
	Subtotal	849	1,121	1,173	1,193	1,110
EU-27,NMS	Bulgaria	316	421	232	319	347
	Cyprus	789	963	1,004	813	962
	Czech Republic	1,065	1,299	1,158	1,459	829
	Estonia	558	749	922	1,025	820
	Hungary	688	424	337	318	281
	Latvia	785	802	827	829	751
	Lithuania	503	370	354	561	143
	Malta	1,427	1,209	1,369	1,554	1,321
	Poland	421	661	590	655	569
	Romania	111	359	289	303	258
	Slovakia	709	1,174	975	1,244	815
	Subtotal	480	647	563	648	500

For non-producing countries, per capita consumption was estimated as imports minus exports of fresh kiwifruit divided by the relevant population. This method is fairly accurate for most countries, because imports tend to dwarf exports, so it is a reliable measure of the volume that is consumed in-country. However, the method is subject to wide errors for countries like Belgium, the Netherlands or Lithuania that tend to be a conduit for product being shipped onward to other destinations. Estimates for those countries need to be treated with caution.

In general, the long-term trend of per capita consumption of fresh kiwifruit in these EU countries has been upward, but some weaknesses were apparent in 2011. For all ten EU-15 countries listed, per capita consumption was higher in 2008-10 than in 2002-04. However, it was lower in 2011 than in 2010 in six of the eleven countries. It was higher in 2008-10 than in 2002-04 in eight of the eleven NMS countries, the exceptions being Bulgaria, Hungary and Malta. However it fell between 2010 and 2011 in nine of the eleven NMS countries. The exceptions that showed a gain were Bulgaria and Cyprus.

Among the non-producing EU-15 countries, estimated per capita consumption exceeded 2 kilograms in 2008-10 in Belgium, Luxembourg and the Netherlands, all countries with substantial pass-through trade. Per capita consumption exceeded 1 kilogram in three other countries, Austria, Germany and Sweden, and was close to 1 kilogram in Denmark and Ireland. The laggards were Finland and the United Kingdom with per capita consumption just above one-half kilogram. Among NMS countries, none had per capita consumption of fresh kiwifruit greater than 2 kilograms in 2008-2010, while only three, Cyprus, the Czech Republic and Malta, had per capita consumption above 1 kilogram. Cyprus and Malta are both popular tourist spots for more affluent visitors from Northern Europe. Four countries had per capita consumption of less than 0.5 kilograms, Bulgaria, Hungary, Lithuania and Romania. Average consumption in the NMS countries was less than half the average in the EU-15 countries. Many of the latter countries have only opened up their markets to fresh kiwifruit since their accession to the EU in 2004. Their consumers generally have lower incomes and less experience with fresh kiwifruit than their counterparts in the EU-15. However, much more research is needed to determine what are the main obstacles to increased per capita consumption of fresh kiwifruit in these countries.

A similar methodology to that described above was used to estimate per capita consumption of fresh kiwifruit in other non-producing countries and regions. The volumes of imports and exports of fresh kiwifruit were divided by the relevant populations, as reported in the FAOSTAT database. To conserve space, results are reported only for major regions and for selected countries with either large populations, high per capita incomes, or relatively high levels of per capita consumption of fresh kiwifruit.

Non-Producing Regions and Countries outside EU-27: Per Capita Consumption of Fresh Kiwifruit, 2002-2010

(Annual grams per capita)

Region	Country	2002-04 Average	2005-07 Average	2008-10 Average	2009	2010
Other West Europe	Iceland	862	870	713	678	684
	Norway	766	960	1,066	1,061	1,107
	Switzerland	1,397	1,396	1,599	1,668	1,646
	Subtotal	1,148	1,219	1,374	1,413	1,417
Russia/Other Europe	Russia	193	348	476	456	558
	Croatia	425	479	741	870	734
East Asia	Hong Kong	728	1,022	1,491	1,621	1,372
	Singapore	486	541	681	674	748
Middle East	Bahrain	2,381	1,911	1,733	2,301	2,695
	Saudi Arabia	324	287	283	150	416
	UA Emirates	1,002	783	1,237	553	1,808
	Oman	812	578	284	308	302
	Qatar	2,030	1,192	1,364	1,150	1,650
	Subtotal	164	191	202	193	260
Americas	Canada	452	82	644	642	667
	Mexico	73	90	96	95	110
	Argentina	81	116	198	221	246
	Brazil	31	38	76	83	105
	Colombia	21	33	46	45	59
Africa	All	5	14	20	21	25
C America/Caribbean	All	10	17	21	20	27
Southeast Asia	All	13	13	28	30	30
South Asia	All	0.2	0.9	1.5	1.4	1.6

All regions shown had higher per capita consumption of fresh kiwifruit in 2008-10 than in 2002-04. However, per capita consumption was lower in Iceland, and in four of the five Middle Eastern countries included. Iceland suffered a severe economic reversal after 2008.

Per capita consumption in 2010 was higher than in 2009 for most regions and countries. The exceptions were minor declines in Switzerland and Oman, and substantial declines in Croatia and Hong Kong. In 2008-10, six individual countries listed had estimated per capita consumption of fresh kiwifruit exceeding 1 kilogram. All of these were small, high-income countries. Four countries, Iceland, Croatia, Singapore and Canada, had per capita consumption between 0.5 and one kilogram. Three of these were relatively small countries.

For the remaining countries and regions listed, per capita consumption of fresh kiwifruit was relatively low. The highest was Argentina with 198 grams in 2008-10. Two larger Latin American countries, Brazil and Mexico, had per capita consumption below 100 grams. The average per capita consumption across Africa, Central America and the Caribbean, Southeast Asia and South Asia, with a combined population of over 2 billion people, was less than 30 grams. It remains a major challenge to encourage greater per capita consumption of fresh kiwifruit in this substantial segment of the world's population.

Producers and marketers face the same challenges in the non-producing countries of the European Union as in the many other non-producing countries around the world. The past level of receptiveness to eating fresh kiwifruit has often been inadequate. However, given the industry's limited resources, it needs to conduct detailed assessments of the potential in different markets so that it can focus its marketing resources more effectively going forward.

IV. Prices of Fresh Kiwifruit

Strong Prices More Important

Producers of any agricultural commodity need strong prices on a consistent basis if they are to (1) earn adequate current returns on their investments in land, labor and capital, and (2) generate a surplus that can be ploughed back into updating their operations. For example, to stay competitive, producers need the resources to invest in improved cultivars and advanced equipment, all of which cost money. However, strong prices become especially important for a commodity like kiwifruit that is facing threats to its solvency as the result of PSA. Among those threats are loss of current production, reduced value of infected orchards and higher costs of preventing or mitigating damage from future PSA infections. Indeed, one might argue, that kiwifruit producers will need stronger than normal price levels on a consistent basis for many of them to survive the PSA crisis.

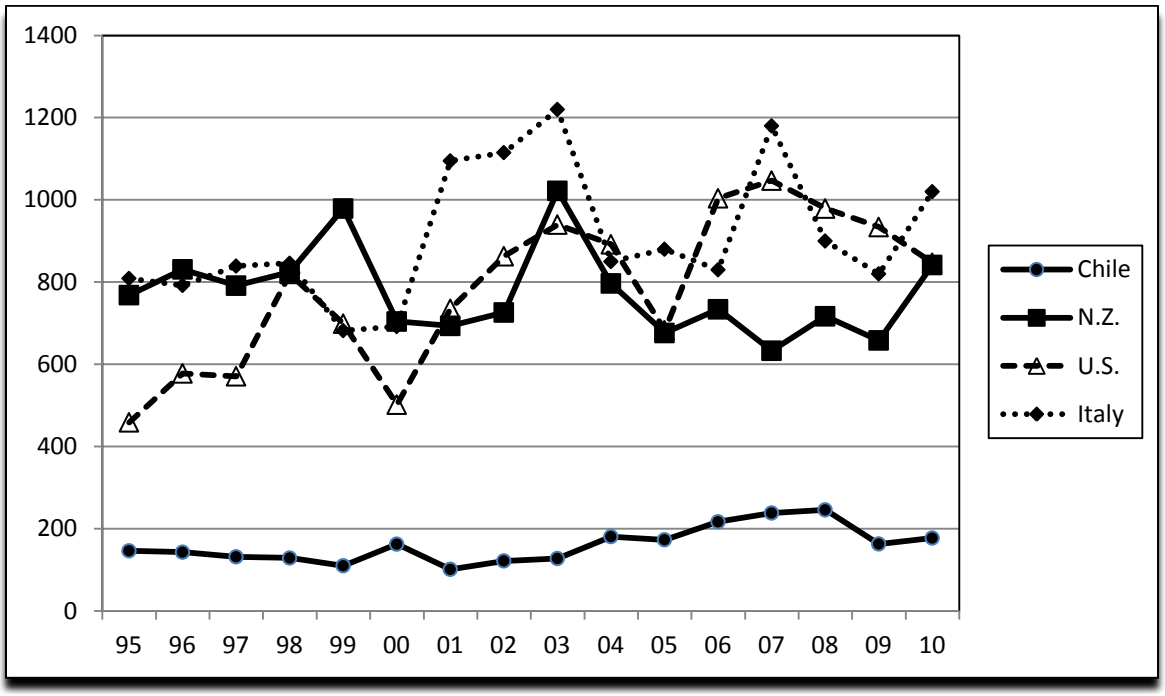
In this chapter, we review past price trends in the kiwifruit industry and, as far as possible, trace how prices have changed in response to the different conditions created by the PSA crisis. It is important to remember that while the kiwifruit industry has been struggling with PSA, other forces within the industry, like weather-related effects on production, continue to affect prices. In addition, many other forces outside the kiwifruit industry continue to affect kiwifruit price levels. Among these are widespread economic problems in many major markets. Such problems have noticeably altered the shopping and buying habits of many consumers. Another continuing influence is increased competition from the multiplicity of fruit and snack products that are now available on supermarket shelves. If kiwifruit prices move above their normal range because of reduced supplies, consumers can easily substitute other fruit products. Customers, once lost, may be difficult to win back without future price reductions.

Unfortunately, no single measure of prices adequately captures the complexities of the kiwifruit business. For that reason, prices are examined at different levels of the marketing system and for different quality characteristics. In addition, price data are not always reported in a consistent format across producing countries and markets. Of necessity, then, this chapter focuses on the price series most likely to paint an accurate picture of the level of returns in the kiwifruit industry.

International Comparisons of Producer Prices

Each year, UN,FAO publishes estimates of producer prices of kiwifruit in most major producing countries. The latest data (shown in the chart below) are available through 2010, the year before PSA became widespread in the kiwifruit industry. Thus, the chart is a good indicator of returns in different countries during a normal (pre-PSA) period.

Major Producing Countries: Producer Prices of Kiwifruit, 1995-2010
(US$ per metric ton)



The data show that producer prices for Italy, New Zealand and the United States tended to move in a price band between $600 and $1,000 per metric ton. Producer prices in Italy were most often the highest. This is not unexpected since New Zealand producers face much higher costs in getting kiwifruit to major markets than do Italian producers. Years of peak prices for the two leading exporters rarely coincided. Again, this is to be expected given the different seasonal focus of these rivals. Producer prices in Chile were consistently lower than those of its three rivals. For much of the period, costs in Chile were also believed to be much lower, allowing producers to survive at those lower prices. However, that advantage is being eroded by rapid cost increases in Chile.

Producer prices in the United States appeared to be trending upward modestly over the 1995-2010 period. However, as will be shown later, much of that increase was due to inflation of the U.S. dollar. While data in the chart above was presented in terms of U.S. dollars to permit comparisons, producers in Italy, New Zealand and Chile were paid in their domestic currency. Thus, their orchard returns were heavily influenced by trends in the exchange rates of their domestic currency against the U.S. dollar.

The chart below shows the wide swings in those exchange rates that have taken place since 1995. The exchange rate in each year was indexed against the year 2000 equal to 100. Between 1995 and 2001, producers got rising level of euros, Chilean pesos, or New Zealand dollars per U.S. dollar earned in final markets. So, Italian, Chilean and New Zealand producers all benefited from weaker currencies. The Chilean peso continued to weaken against the U.S. dollar until 2003. However, all three currencies strengthened against the U.S. dollar from 2003 to 2008, and the New Zealand dollar strengthened further through 2012. Exporters from the euro block continued to be disadvantaged compared to the year 2000.

Major Producing Countries: U.S. Dollar per Selected Currency, 1995-2012

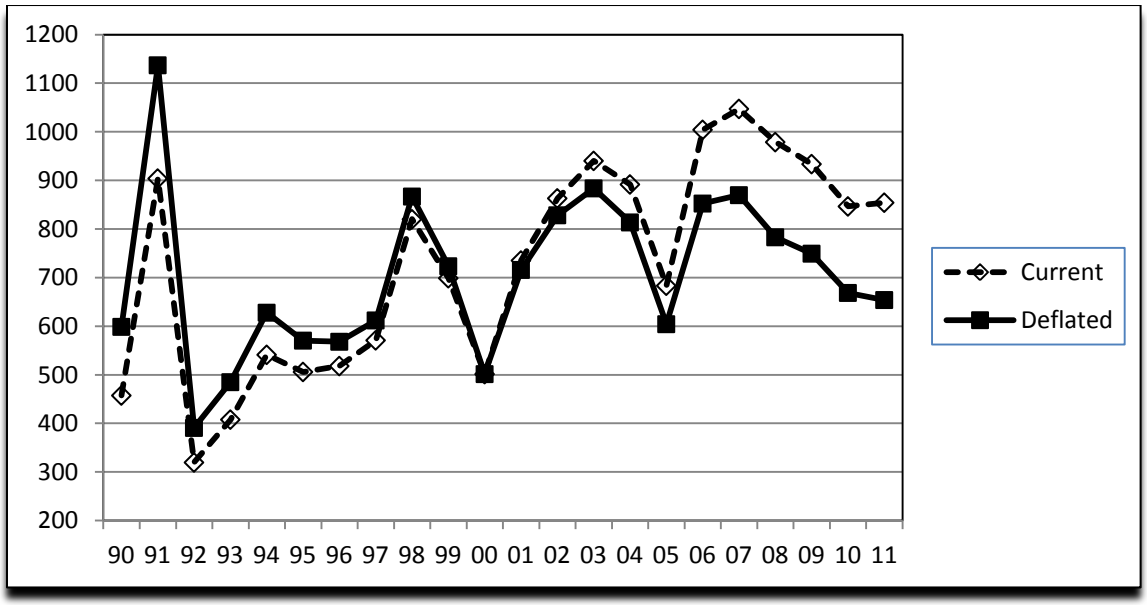
(Index, Year 2000 Rate = 100)

Effect of Inflation on U.S. Kiwifruit Grower Prices.

While exchange rate changes can distort the relationship of prices across international borders, inflation is a major factor in distorting price relationships over time. The chart below shows producer prices in the United States for the 1990-2011 period in both current dollar prices and deflated by the consumer price index to the base 2000 = 100. After peaking above $900 per metric ton in 1991, current prices were in a deep slump for the next six years. They did not exceed the 1991 peak until 2003, but then reached a new peak of $1,047 in 2007.

United States: Current and Deflated Grower Prices of Kiwifruit, 1990-2011

(US$ per metric ton)



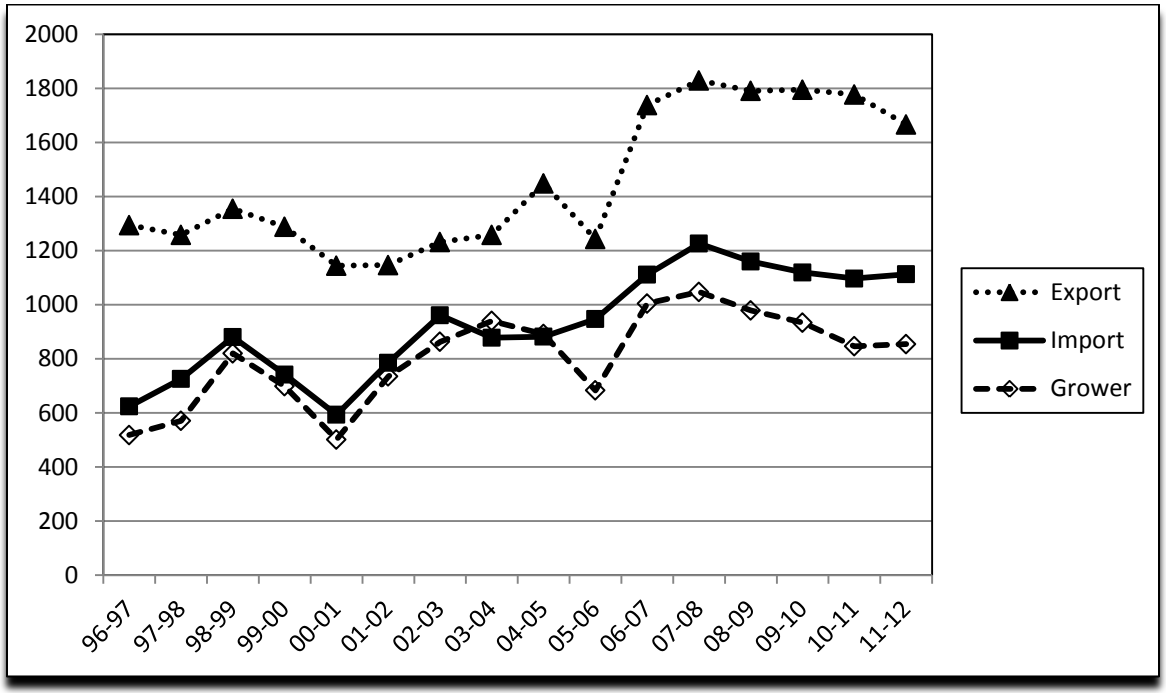
However, in deflated dollars, average grower prices still fell far below the 1991 level, even in the later years of peak prices, in 1998, 2003 and 2007. Prices have been falling in both current and deflated terms since 2007. If the same deflation factors were applied to the U.S. dollar prices for Chile, New Zealand and Italy shown previously, they too would show declining real prices. When inflation erodes the value of returns in this way, the industry must find additional ways to reduce costs and improve productivity in order to survive. PSA will add one more hurdle in applying either of those solutions to counter inflation.

Trade Links to Domestic Producer Prices

As shown in previous sections, the kiwifruit industry is particularly open to trade links. Even the largest producing and exporting countries are also prominent importers of fresh kiwifruit, especially for off-season supplies. The result is that producers in any country are affected by the level of production and of trade in all partner countries. The United States provides a good example of how trade affects internal producer prices for kiwifruit.

United States: Export, Import and Grower Prices of Fresh Kiwifruit, 1996-2012

(US$ per metric ton)



The chart above shows average export and import prices of fresh kiwifruit, and average grower prices for all kiwifruit in the United States for the seasons from 1996-97 to 2011-12. It shows that all three price series were highly correlated. Export prices have averaged 57 percent higher than import prices for the entire period, and about 55 percent higher for the last five years. Grower prices have averaged 86 percent of import prices for the entire period and 82 percent for the last five years. Clearly, domestic grower prices have been heavily influenced by the prices of traded fresh kiwifruit.

Role of Export Competition

The level of supplies available from exporting countries, and the competitive pricing strategies followed by each, also affect levels of prices in each country from year to year. For example, in Western Europe, the three major export competitors, Italy, France and Greece, have varied in volume of supplies, quality standards and pricing strategies, but all use the euro currency. Italy has long been the dominant supplier. This means that it must sell a wide mix of kiwifruit in many markets. In response, France, a relatively smaller producer, has tried to avoid head-to-head competition with Italy by aiming its exports at premium-price markets. Greece has tended to focus on lower-priced markets either within the euro zone or elsewhere. The table below shows how average export prices for the three competitors have moved over the last two decades. Data are presented both for five-year averages since the 1991-92 season, and for annual averages since the 2001-02 season.

Italy, France and Greece: Export Prices of Fresh Kiwifruit, 1991-92 to 2011-12

(euros per kilogram)

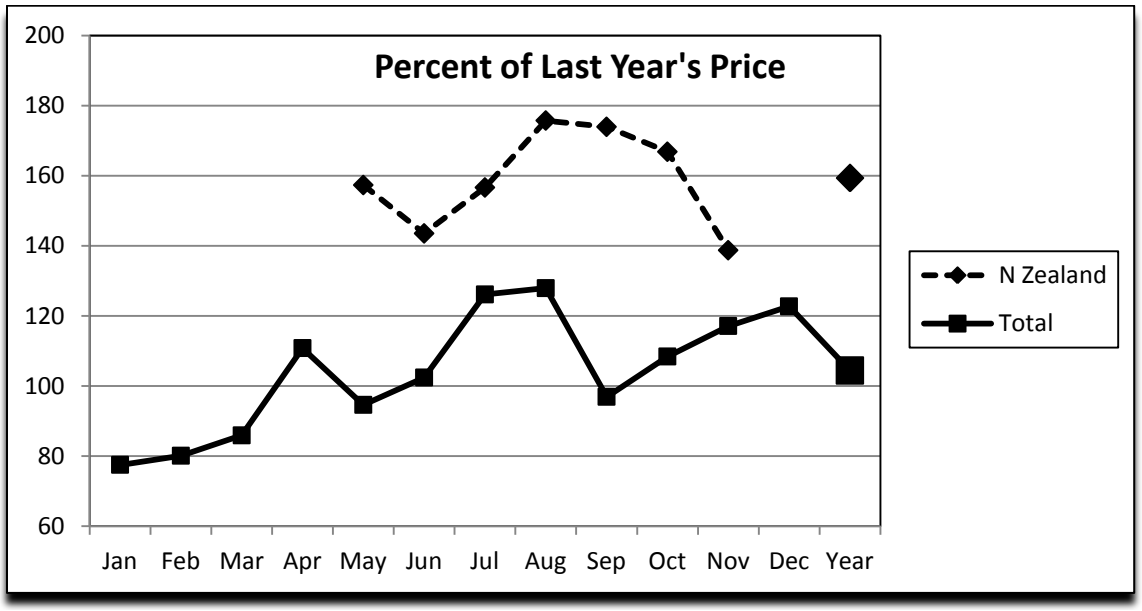
Season	Italy	France	Greece	3 Countries
1991-96 Average	0.70	0.90	0.69	0.72
1996-01 Average	0.80	1.18	0.58	0.83
2001-06 Average	0.93	1.46	0.68	0.98
2006-11 Average	0.95	1.42	0.70	0.96
2001-02	1.09	1.46	0.77	1.12
2002-03	1.01	1.55	0.72	1.06
2003-04	1.00	1.57	0.74	1.08
2004-05	0.72	1.28	0.53	0.77
2005-06	0.86	1.38	0.63	0.90
2006-07	0.81	1.29	0.63	0.84
2007-08	1.15	1.62	0.80	1.17
2008-09	0.93	1.46	0.74	0.96
2009-10	0.82	1.26	0.59	0.82
2010-11	1.02	1.49	0.76	1.00
2011-12	0.83	1.23	0.72	0.85

While all the price series showed wide swings from one year to the next, the swings for each country tended to be in the same direction. Between 1991-92 and 2010-11, French export prices averaged 46.7 percent above the Italian average, while Greek prices averaged 78.4 percent of the Italian average. For the most recent five-year period, from 2007-08 to 2011-12, French prices were 48.6 percent above the Italian average and Greek prices were 76 percent of the Italian average. Clearly, the relationship between export prices of these three competitors has been stable over a long period.

Influence of PSA on Prices

None of the price series presented so far would have been heavily impacted by the PSA outbreak. However, more recent seasonal data are not yet available. The most recent data available relate to monthly export prices during 2012, when the influence of PSA on exports was more significant, especially in New Zealand. That influence should be starting to show up in export market prices. The chart below shows for the United States how monthly import prices from all sources and from New Zealand changed in each month of 2012 from the same month in 2011.

United States: Year over Year Changes in Monthly Import Prices, Total and New Zealand, 2012 versus 2011
(percent)

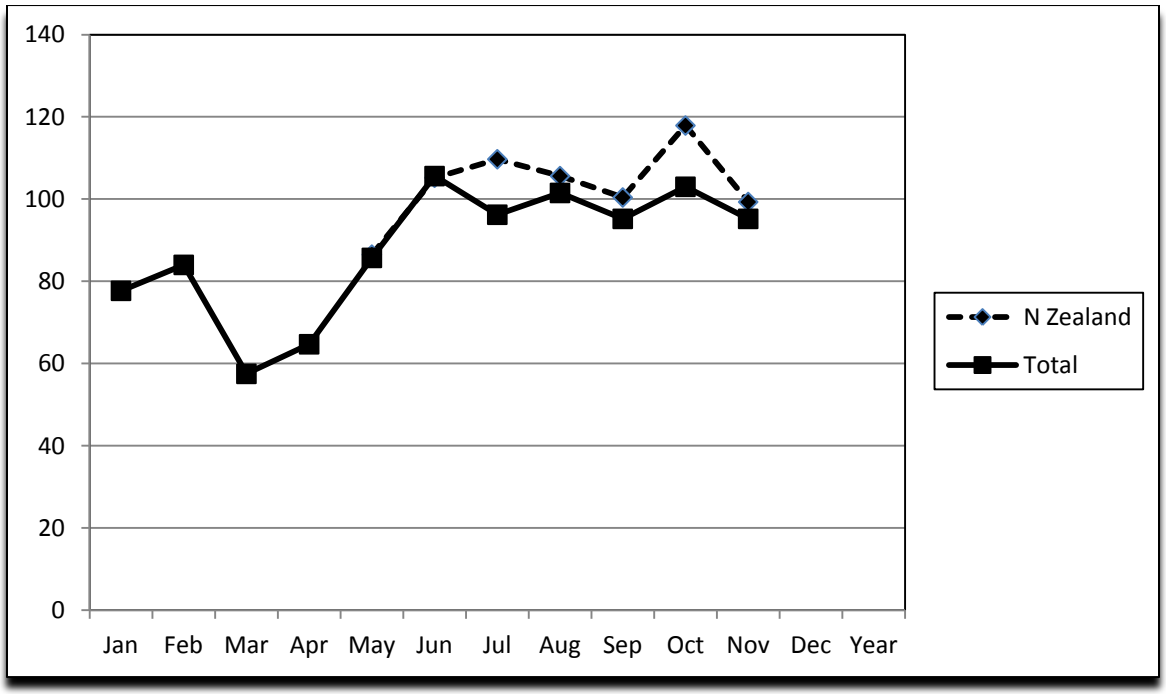


Import prices from all sources averaged below those of 2011 through June 2012, then briefly surged by over 20 percent in July and August 2012. However, for the entire year, they were only 4.4 percent higher. In contrast, prices of imports from New Zealand were more than 40 percent higher in most months of 2012, and averaged 59 percent higher for all of 2012. It would be logical to assume that the PSA crisis affected New Zealand prices, which, in turn, lifted all import prices.

However, a similar chart for the EU-27 does not support that conclusion. Prices of imports from all sources averaged well below 2011 levels through May 2012. Between June and November, they averaged close to 2011 levels. Average prices of New Zealand imports were higher in each month of 2012 than in 2011, but the increases were minor compared to those reported for the United States. These differences could also be due partly to strategic allocation decisions made by Zespri. While imports of New Zealand fresh kiwifruit in the United States were about 46 percent lower in 2012 than in 2011, they were only 6 percent lower in the EU-27.

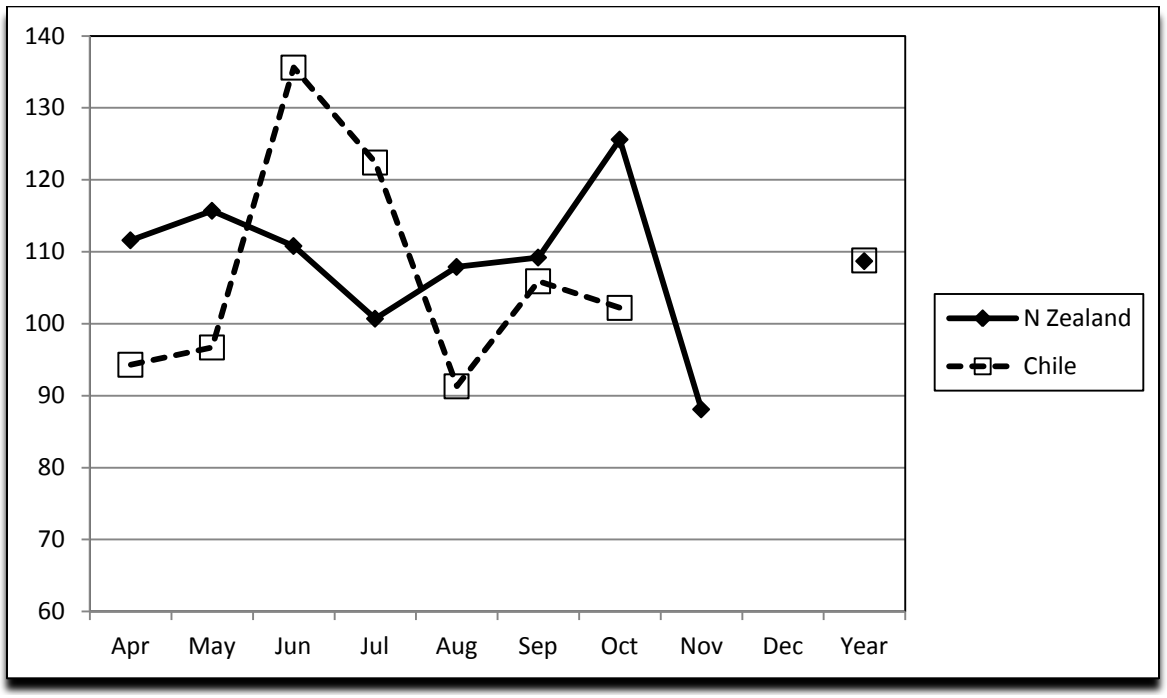
EU-27: Year over Year Changes in Monthly Import Prices, Total and New Zealand, 2012 versus 2011

(percent)



Japan: Year over Year Changes in Monthly Import Prices, Chile and New Zealand, 2012 versus 2011

(percent)



In Japan, New Zealand alone supplied 93.5 percent of all imported kiwifruit in 2012. The only major competitor was Chile with 4.4 percent. Thus, changes in New Zealand prices dominated changes in prices from all sources. For that reason, year to year comparisons by month were shown only for New Zealand and Chile. While both averaged an 8.8 percent increase in price for the year, the changes by month were quite erratic. Chilean prices in 2012 were more than 20 percent higher than in 2011 in June and July, but lower in April, May and August. In contrast, New Zealand prices were higher in every month between April and October, had their largest gain of 25.6 percent in October, then plunged below the 2011 level in November. Some of these price changes may have been due to changes in total supplies or to reallocation of supplies from one month to the next. For example, total annual imports from Chile increased by 676 metric tons (31.7 percent), while total imports from New Zealand decreased by 1,925 metric tons (2.9 percent). However, it is not possible to establish how much of that reallocation might have been due to the effects of PSA on supplies, especially of Zespri™ Gold. For all three major markets, the United States, EU-27 and Japan, there was evidence of changed volumes and prices of imports.

Influence of Cultivar on Prices

Because of its single-desk marketing system, New Zealand has produced the longest series of data on returns from the two major cultivars, Hayward and Hort 16A. Hort 16A has been marketed as Zespri™ Gold. The Zespri organization's annual reports also distinguish between the prices for conventionally-produced Hayward, marketed as Zespri™ Green, and organic Hayward, marketed as Zespri™ Green Organic. Data in the table below are presented for individual seasons, and as averages for two five-year periods, 2001-2006 and 2006-2011.

New Zealand: Orchard Gate Return, by Product, 2001-2012

(NZ$ per tray)

Season	Zespri™ Green (Hayward)	Zespri™ Green Organic (Hayward)	Zespri™ Gold (Hort 16A)
2001-02	4.51	5.51	4.96
2002-03	5.65	7.58	6.59
2003-04	6.35	8.68	7.26
2004-05	4.32	6.05	5.50
2005-06	3.47	5.34	5.48
Average 2001-06	*4.24*	*6.63*	*5.96*
2006-07	4.09	6.54	5.18
2007-08	3.11	5.32	4.45
2008-09	3.68	6.26	5.41
2009-10	3.70	5.67	7.73
2010-11	4.21	6.07	8.89
Average 2006-11	3.76	5.97	6.33
2011-12	3.80	5.53	7.66
2012-13f	4.33	6.30	10.06

The average orchard gate return per tray for Zespri™ Gold rose modestly between 2001-06 and 2006-11, while that of Zespri™ Green and Zespri™ Green Organic fell by 10 percent or more. All returns were lower in 2011-12, the last relatively normal season. Preliminary estimates suggest that returns for the 2012-13 season were up 30 percent for Gold and 14 percent for Hayward products.

Influence of Other Quality Factors on Kiwifruit Prices

The Zespri organization has also been able to use its single point of entry into world export markets to differentiate within cultivars on the basis of quality attributes and market acceptability. Zespri provides growers with a wide range of incentives to encourage them to qualify their products for the most lucrative pools. The actual grower payments per tray, including incentives, for recent seasons are shown in the table below. The figures for 2012-13 are forecasts based on the season to date results.

New Zealand: Returns from Kiwifruit Exports, 2001-12

(volume, million trays, and Grower Payments[1], NZ$ per tray)

Product	Unit	2001-03	2004-06	2007-09	2009-10	2010-11	2011-12	2012-13p
		Average	Average	Average	Season	Season	Season	Season
Zespri™ Green	Trays (m)	50.7	61.4	73.3	75.0	72.9	77.2	70.6
	NZ$/tray	8.04	7.04	6.91	7.15	7.56	7.35	7.92
Zespri™ Green Organic	Trays (m)	2.4	2.6	3.1	3.4	3.3	3.5	3.1
	NZ$/tray	09.75	8.73	8.94	9.11	9.33	9.07	9.25
Zespri™ Gold	Trays (m)	7.3	15.6	22.5	22.2	21.4	29.9	22.3
	NZ$/tray	10.38	9.50	10.40	12.28	12.90	12.16	14.77
Kiwi Green	Trays (m)	1.9	1.5	1.0	0.7	1.8	1.9	n.a.
	NZ$/tray	5.51	5.01	4.31	5.02	4.44	4.11	n.a.
Kiwi Green Organic	Trays (m)	0.1	0.1	0.1	0.0	0.0	0.0	n.a.
	NZ$/tray	6.74	6.14	5.45	n.a.	n.a.	4.37	n.a.
Kiwi Gold	Trays (m)	0.7	0.2	0.2	0.2	0.5	0.6	n.a.
	NZ$/tray	4.19	4.99	5.54	6.72	6.77	5.91	n.a.
Non-standard	Trays (m)	1.4	1.0	0.5	0.5	1.8	0.8	n.a.
	NZ$/tray	4.45	4.60	5.27	8.21	7.46	7.82	n.a.
Total All Pools	Trays (m)	64.5	82.4	100.0	102.0	101.7	113.9	n.a.
	NZ$/tray	8.19	7.48	7.69	8.32	8.68	8.61	n.a.

[1] Total fruit and service payments, including loyalty payments.

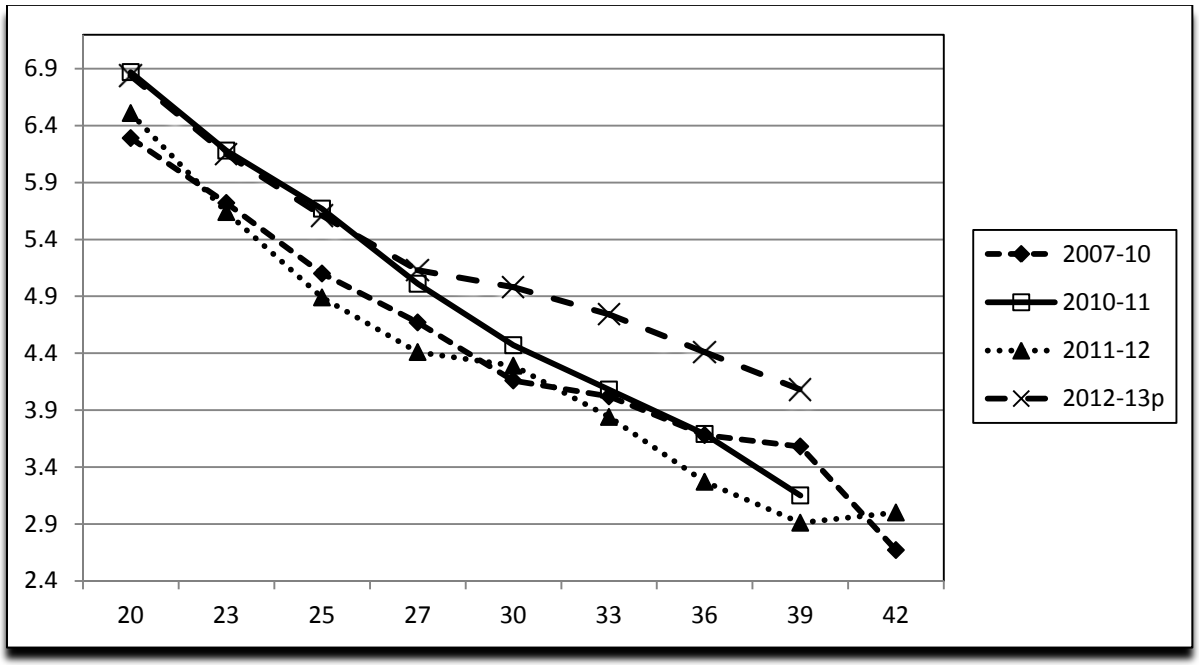
Payments for Zespri™ Green and Zespri™ Green Organic were consistently higher than for lower quality Kiwi Green and Kiwi Green Organic. Payments for Zespri™ Gold were generally about double those for Kiwi Gold. In the last complete season, 2011-12, prices of products bearing the Zespri™ brand exceeded those for the Kiwi brand by $3.24 for green, $4.70 for green organic and $6.25 for gold kiwifruit. Payments for miscellaneous, non-standard products averaged close to those for Zespri™ Green. These relationships are likely to change as the New Zealand industry moves to a different mix of cultivars and products.

Influence of Size on Prices

In previous issues of the World Kiwifruit Review, we have illustrated the impact of fruit size on the prices of fresh kiwifruit by using orchard gate returns data. However, the real driver of the size effect actually occurs first at the retail level and is passed back relatively uniformly to the grower level. The chart below shows the average retail prices of fresh kiwifruit by size in France for the average of the three seasons, 2007-2010, and for the individual seasons beginning 2010-11.

France: Retail Prices for Kiwifruit, by Fruit Size, Selected Years

(euros per kilogram)



In most seasons, the relationship between size and price was strongly linear. Sizes are measured in number of pieces per 3 kilogram tray, varying from the largest shown here (20 per tray) to the smallest (42 per tray). The shifts from year to year tended to be relatively uniform across sizes. The smaller the size, the lower the average retail price. Preliminary data for the 2012-13 season suggest that prices for kiwifruit between size 30 and size 39 were higher than in previous seasons. Thus, the retail market responds both to differences in the total volume of the kiwifruit supply and to changes in the relative availability of different sizes.

Wholesale Market Prices in 2012

Wholesale markets remain an important barometer of trends in market prices as more and more transactions involve program trading between private parties such as large exporters and large retailers. Wholesale markets have remained relevant, both as supplementary sources of supply for large retailers and by increasingly catering for food service operators and local food suppliers. They have also received help in remaining viable from metropolitan governments that see them as a valuable social and economic asset.

Monthly data for the year 2012 are presented on the three following pages for five important wholesale markets in Europe and North America, New York, Rotterdam, Paris, Montreal and Toronto. All five markets handle fresh kiwifruit from both Northern and Southern Hemisphere suppliers. The prices reported here are the "mostly" or average prices for the Hayward variety by origin, pack type and fruit size. The absence of prices for some months or other cultivars does not mean that no fresh kiwifruit packs were available. In general, market reporters only provide prices for an item when there is sufficient volume of normal quality to estimate a representative price.

Only the pack types that were most consistently reported are included in these tables. These are generally the pack types that are sold in the greatest volume in any particular market. As a result, prices for the same items are not reported for every market. The most popular pack types in any market are influenced by tradition and the preferences of the wholesalers and their clientele. However, a few major pack types recur every year, making year to year comparisons possible.

In general, prices in calendar year 2012 were quite similar to those in 2011. However, there was a notable surge in prices in the last three months of 2012 as it became apparent that there would be smaller crops in Italy and France. This benefited later season arrivals from New Zealand and early season arrivals from Europe. As in previous years, the most extensive price quotes were available for the New York and Rotterdam wholesale markets. In New York, limited quotes were available for one-layer flats, but the predominance of quotes was for loose containers containing 9 kilograms (approximately 20 lbs). There was more overlap between Northern and Southern Hemisphere kiwifruit in the spring of 2012 than in the previous year.

New York: Wholesale Prices of Fresh Kiwifruit, 2012
(mid-month prices, US$, selected packs)

Origin & Pack	Size	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1 layer flats													
Italy	25			9.00	8.00								
	27	9.00	9.00	9.00	8.50	9.00						9.50	9.50
	33		7.00										
	36			8.00	8.00	8.00						9.00	9.00
	39			8.00									
Chile	27						7.50	7.50	7.25	8.00	9.00		
	33							8.00	8.00				
	36						7.50	7.00	7.00				
	39								7.00				
New Zealand	27									10.00			
	33									9.00			
	36									9.00			
9kg Cont Loose													
California	25											20.00	21.00
	27		20.00									22.50	22.00
	30		20.00								22.00	21.00	21.00
	33		18.00									20.00	19.00
	36											24.00	19.00
	39												19.00
Italy	23	17.00	19.00	17.50	19.00								
	25	17.00	19.00	17.50	19.00								24.00
	27	15.50	19.00	18.00	19.00								23.00
	30	15.00	19.00	16.00	19.00								21.00
	33	14.00	17.00	14.00	15.00								21.00
	36	12.50	15.00	13.50	13.50								20.00
	39	12.50	15.50	13.50	13.50								19.00
	42	11.00	15.50										
Chile	23					19.00	19.00	16.00	15.50				
	25				18.00	19.00	17.00	15.50	15.50	18.00			
	27				18.00	19.00	17.50	15.50	15.50	18.00			
	30				17.00	18.00	17.00	14.50	14.50	17.00		22.00	
	33				16.00	18.00	15.50	14.50	14.50	16.00	22.00		
	36				14.00	17.00	15.50	15.00	14.50	15.50		22.00	20.00
	39					15.50	15.50	13.50	13.50	17.00			
New Zealand	27									23.00		24.00	
	30						24.00	22.50	23.00	23.00			
	33						24.00	21.00	23.00	22.50	26.00		
	36									22.00	24.00		

In Rotterdam, there were more quotes for smaller packs than in New York. However, by far the most common pack type included was the 10 kilogram loose container.

Rotterdam: Wholesale Prices of Fresh Kiwifruit, 2012

(mid-month prices, US$, selected packs)

Origin & Pack	Size	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
3 kg Cont													
France	25	7.05	7.23	5.24									
	27	6.73	6.57										7.19
Italy	25	6.34	4.93	5.89	5.23							5.11	4.54
	27	4.10	5.23	4.19	4.18	4.09						5.11	4.54
	30	3.97	4.27	4.06								4.79	4.21
	33	3.84	3.96									4.47	4.21
	36	4.16										4.15	3.89
	39											3.83	3.89
Greece	23											4.69	
	27											4.47	
	30											4.25	4.12
	33											3.99	3.92
	36											3.74	3.73
Chile	30									5.52			
	33									5.52			
	36									5.52			
10 kg Cont Loose													
France	25		18.40	16.36	16.35								
	27	17.94	17.09	15.71	15.69								18.96
	30	16.66	15.77	14.40		11.50							17.65
	33	15.38	14.46	13.09	13.08	10.22							16.35
	36	14.10	13.14	11.78		8.95							15.04
	39			10.47	10.46	7.67							
Greece	23	13.45		14.40	13.08							14.70	14.38
	25	12.17	13.14		12.43	12.78						14.38	13.73
	27	11.53	12.49	13.74	11.12	12.14						13.74	13.08
	30	10.25	10.52	12.43	12.42	11.50						12.46	
	33	9.61		11.12	11.12	11.12						11.98	11.45
	36	8.97		10.47		10.80						11.50	10.96
	39	8.33				9.59							
	42	8.33											9.81
Italy	25	12.49		12.43	12.42							15.02	15.50
	27	14.90	12.15	12.11	12.23							15.15	13.99
	30	13.46	11.17	11.58	11.25							14.38	13.21
	33	11.34	11.18	10.93	10.46							14.35	12.72
	36	10.22	10.19	9.82	10.10							13.07	12.75
	39	9.61	9.20	8.84	9.48		18.00					11.50	12.42
	42	8.97		8.51	8.50							12.11	12.10
Chile	23				19.62	16.62	17.06	15.05	17.00	15.69	14.05		
	25				19.62	16.62	17.06	15.66	16.47	15.69			
	27				19.62	15.66	16.42	15.66	15.45	15.04			
	30				18.96	15.02	15.48	14.12	15.14	14.29			
	33				18.96	14.38	15.16	13.51	14.52	13.64			
	36				18.96	14.06	14.53	12.59	13.91	12.02			
	39					12.46	14.53	12.68	12.36				
	42					9.59	14.21	11.05	12.36	11.79	9.80		

Paris: Wholesale Prices of Fresh Kiwifruit, 2012
(mid-month prices, US$, selected packs)

Origin & Pack	Size	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
10 Kg cont Loose													
France	27	16.50	17.10	16.90	17.10	16.70	16.30					21.60	21.60
	30	15.20											
	33	11.40	15.80	15.60	15.80	15.40							
Greece	30	11.40	12.50									16.00	
Chile	30												
	33							16.60	16.60	17.60			
								16.60	16.60	17.60			
New Zealand	33					27.60		24.60	24.70	26.10	25.90	25.50	
	36						25.20	22.70	22.80	24.10	24.00		
5.6 kg Cont													
New Zealand								15.34	15.42	16.31	16.19		
								15.34	15.42	16.31	16.19		

Toronto/Montreal: Wholesale Prices of Fresh Kiwifruit, 2012
(mid-month prices, US$, selected packs)

Origin & Pack	Size	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Toronto, 10 kg													
Italy	25				20.74	20.74	21.04	21.23	21.72	21.96	21.98	21.55	22.28
	27				20.74	20.74	21.04	21.23	21.72	21.96	21.98	21.55	22.28
New Zealand	33				29.81	29.89							
Montreal, 9kg													
New Zealand	27	14.49	18.76	25.19	22.27	21.18	22.94	26.11	26.70	30.55	31.15	30.56	28.26
	30			25.19	22.27	21.18	22.94	26.11	26.70	30.55	31.15	30.56	28.26

Chile and New Zealand were prominent suppliers in most wholesale markets, as was Italy. It was the only European supplier consistently represented on the New York wholesale market. France and Greece were more strongly represented on the major European markets.

For the larger packs of 9 or 10 kilograms, price quotes were consistently available for eight or more different sizes. The correlation between larger sizes and higher prices followed normal expectations, with some minor exceptions where nearby sizes were quoted at a single price point.

As in previous years, there was a pecking order among countries in the general level of prices. New Zealand product consistently earned a substantial premium over that from other countries. Among European suppliers, product from France tended to receive a premium over that from Italy, which, in turn received a premium over that from Greece. This is consistent with the average export prices reported earlier in this chapter.

Judging from the range of items reported on wholesale markets in 2012, the kiwifruit industry appears to have paused in experimenting with newer packaging options. With supplies reduced by PSA and unfavorable weather, there has been less urgency about finding ways to placate retailers or woo new consumers. However, that experimentation in packs and packaging continues in competing fruits and is likely to again become important to the kiwifruit industry if and when supplies resume their long-term growth trajectory.

V. Analyzing Demand for Fresh Kiwifruit

Whither Kiwifruit Demand?

The world kiwifruit industry has been subject to a rare combination of setbacks that have raised new questions about how much demand for fresh kiwifruit has changed in recent years, or is likely to change in the near future. The first batch of setbacks resulted from the recessions of various depths, lengths and continuity that have assaulted so many of the world's economies. The second relates to the disruptions to supply, and the increasing uncertainty about future supplies, caused by the PSA outbreak, which has also varied in depth and length in different producing countries. However, it is important to attempt to measure how demand has changed, or is changing, in order to develop appropriate strategies for future marketing and promotion.

Measuring the strength of demand for a minor fruit like fresh kiwifruit is not easy at the best of times because of the difficulty in accessing accurate and timely data on related changes in prices and quantities. In previous sections, data were presented separately for volumes consumed and prices paid for fresh kiwifruit at different levels of the marketing system. However, measuring demand requires examining the relationship between price and quantity at the same point in the marketing chain. Such simultaneous data series are rarely available. As a result, it is necessary to use what data series are available and interpret what they infer about changes in demand for all fresh kiwifruit.

While there were some signs that the global economy was slowing in 2007, the most severe downturn began after the financial crisis in the summer of 2008. That financial crisis led to a loss of confidence in the international banking system. As a result, international trade plummeted as exporters worried about getting paid. While the global exchange system was shored up by early 2009, and more normal trading conditions resumed, most world regions remained in recession for much of 2009. The recovery was most rapid in the BRICs countries of Brazil, Russia, India and China, but by 2010, most of the richer countries of North America, Western Europe and East Asia were also beginning to recover.

However, in 2010, the severity of the debt crisis in Greece first received widespread attention. When the European Monetary Authority, the European Union and the International Monetary Fund struggled to bail out the Greek economy, it brought new focus on similar debt problems in Spain, Portugal and Italy. There was widespread concern that if these, much larger, countries, required a bailout, the existing institutions could not cope, and that the euro currency union could collapse if it did not make major changes in its rules and membership. Since then, many conferences have been hastily convened, and many patchwork measures have been put in place, to temporarily shore up the European Monetary system and the European Union. However, much of Europe slipped back into recession in 2012.

Since the first onset of the global recession in 2007-2008, governments, and international agencies, have divided into two distinct camps in the policies they have used to aid recovery. On the one hand, some countries, like the United States and China, have dramatically increased government spending to attempt to stimulate their economies out of recession. In general, such policies were designed to increase overall demand for consumption goods, both food and nonfood, as increased government spending compensated for decreased private spending. Such measures are usually referred to as "Keynesian", in honor of the famed British economist, John Maynard Keynes, who first propounded them as an antidote to the Great Recession of the 1930s. In general, major financial authorities, including the U.S. Federal Reserve Board, the European Monetary Authority and the Bank of England supported Keynesian policies by increasing the money supply and keeping interest rates low to encourage private and business borrowing.

On the other hand, many other governments blamed their national or regional problems on past over-spending. They adopted austerity policies that involved cuts in many categories of government expenditures. The theory was that cuts in government expenditures would reduce tax and regulatory burdens on private businesses and induce them to create jobs and hasten recovery. However, in many cases, governments cut jobs and direct payments to citizens, that led to reduced consumer expenditures, with limited response by private businesses. Austerity policies were espoused by the coalition government in the United Kingdom, among others. While the long-term benefits of austerity programs are still not clear, the short-term effects have been lingering recessions.

In many other countries, governments have vacillated between stimulus policies and austerity policies, and have often employed both simultaneously. In the United States, President Obama and his Democratic Party, that generally favors stimulus, in 2012-2013 became locked in a contentious debate with the Republican Party, that generally favors austerity. Since the Democratic Party then controlled the Senate, and the Republican Party controlled the House of Representatives, any action will require compromises. As long as the uncertainty continues, both major corporations and small businesses are reluctant to commit to expand hiring, the biggest single stimulus that the U.S. economy needs. In Japan, a new Prime Minister, Shinzo Abe, has strongly endorsed a stimulus policy, and has pressured the Bank of Japan to ease monetary policy so as to stimulate inflation, and promote consumer spending.

While it is still uncertain what effect these different policy options will have on the recovery of individual economies or of the global economy, the evidence available suggests that consumer expenditures on fruits and vegetables have suffered in countries that have favored austerity policies while they have held up relatively well in countries that favored stimulus. For example, in the United States, real incomes of all households fell 1.5 percent between 2004 and 2011, and average household expenditures fell by 3.8 percent. However, average expenditures on all fresh fruit rose by 13.7 percent, while those on fresh vegetables fell by less than one percent. The Fresh Facts on Retail report published by United Fresh showed that both the volume and value of sales of fresh fruit fell modestly in 2008 and 2009, but grew by 3 to 4 percent annually since. Sales of organic products, and of berries, have grown by 12 to 14 percent per year. This suggests that recovery in expenditure has been particularly robust among higher income consumers.

In contrast, in the United Kingdom, the value of sales of many produce items continued to decline as consumers reduced the quality or volume of items that they bought, or their frequency of purchase. In addition, the U.K. organic produce sector has been in the doldrums since 2009. In response, retailers have continued heavy discounting of produce with special offers and advertised specials, while discount retailers have increased their share of the total food market. While the austerity programs introduced in 2010 cannot be blamed for all these declines, they have undoubtedly helped to make the declines more severe. Any recovery in spending by the more affluent has been masked by the general decline.

World Demand for Fresh Kiwifruit Imports

Since so much of world kiwifruit production is sold fresh in international trade, a good place to begin examining changes in demand for fresh kiwifruit is at the global import level. In previous issues of the World Kiwifruit Review, we examined trends in imports of fresh kiwifruit by the rich developed countries that have, in the past, tended to dominate world imports. These countries tended to be members of the Organization for Economic Cooperation and Development (OECD), the so-called "Rich Man's Club." Data for OECD imports were available from the FAOSTAT database.

In the 2012 edition of the World Kiwifruit Review, we discussed an analysis of OECD demand for fresh kiwifruit imports for the years from 1984 to 2009. The results were as follows:

OECD per capita quantity imported = 220.0764 - 0.3102 Deflated import price
(2.889)* (5.344)*

+ 4.0540 OECD Income per capita R^2 = 0.95
(4.196)*

Both price and income were measured in U.S. dollars, adjusted for inflation. The regression explained a very high proportion (95 percent) of the variation in per capita quantity of imports of fresh kiwifruit. On average, a 10 percent reduction in average import price was associated with a 6 percent increase in per capita quantity imported. A 10 percent increase in OECD income per capita was associated with an almost 18 percent increase in per capita quantity imported. Since per capita income in OECD countries increased by 54 percent between 1984 and 2009, that alone would have led to an approximate doubling of per capita imports. In addition, the OECD population increased by almost 24 percent in the period, further increasing the actual volume of fresh kiwifruit imports. Analysis of data for 2009, the first full year of the global recession, suggested that the recession had contributed significantly to a decline in the average import price for fresh kiwifruit. Unfortunately, data for OECD imports have not been available since 2009. In addition, exporters have been making strenuous efforts to expand sales in developing countries outside the OECD. For that reason, in the 2013 issue of the World Kiwifruit Review, we looked at import demand for the entire world.

We looked at similar relationships for world per capita quantity of fresh kiwifruit imported as we had for the OECD analysis, for the years from 1993 to 2010. The results were as follows:

World per capita quantity imported = -155.8339 - 0.0127 Deflated import price
(3.473)* (0.690)

+ 0.0464 World GDP per capita R^2 = 0.87
(9.699)*

The equation again explained a high proportion (87 percent) of the variation in world per capita quantity of fresh kiwifruit imports. The income variable, world GDP per capita, was strongly significant. However, the effect of deflated price was negative as expected, but was not statistically significant.

The results indicate that on average a 10 percent increase in price was associated with a reduction in per capita imports of only 1.3 percent, whereas a 10 percent increase in the income variable (per capita GDP) was associated with a 23 percent increase in per capita imports. This suggests that the average level of price has not been as powerful a factor in influencing fresh kiwifruit imports as has been the growth in world affluence. Indeed, the average deflated price in 2010 was 9 percent below the average price in 1993. In contrast, world population was 25.6 percent and world per capita GDP 28.7 percent higher. This would help to explain most of the doubling of fresh kiwifruit imports in the period.

World per capita GDP in real terms increased in every year between 1993 and 2008. It fell by 3.2 percent in 2009, and was still 1.8 percent below the 2008 level in 2010. While per capita imports were higher in both 2009 and 2010 than in 2008, the economic slowdown had an effect on prices. Average import prices were 17.6 percent lower in 2009 than in 2008 and 15.4 percent lower in 2010. Thus, it would appear that the global recession had an impact on the prices received by fresh kiwifruit exporters.

A recent Belrose, Inc. publication, "Asian Import Demand for Apples, Pears, Sweet Cherries and Kiwifruit. Potential to 2020," attempted to quantify demand for fresh kiwifruit in a number of Asian countries where adequate historical data were available. It found that fresh kiwifruit imports responded strongly to rising

per capita incomes. The response was particularly strong in China, Taiwan, South Korea and Thailand. In general, countries needed to have relatively high per capita incomes before they became major importers of fresh kiwifruit. Some Asian countries imported smaller quantities of fresh kiwifruit at relatively low prices which would not have provided major exporters with sustainable returns.

There appear to be excellent prospects for increased imports of fresh kiwifruit in the more affluent Asian countries in the next decade. Many of these countries were not hit as hard by the global recession as were countries in other continents. However, the rapidity of the growth in fresh kiwifruit imports is also heavily dependent on the ability of these countries to sustain high rates of economic growth.

Clearly, further recession or slower growth in all or parts of the world economy between 2010 and 2012 could have had a slowing effect on fresh kiwifruit imports. Data to test that hypothesis in the major Asian markets were not available as we went to press. However, more recent data were available from more traditional markets. These are examined in the next section.

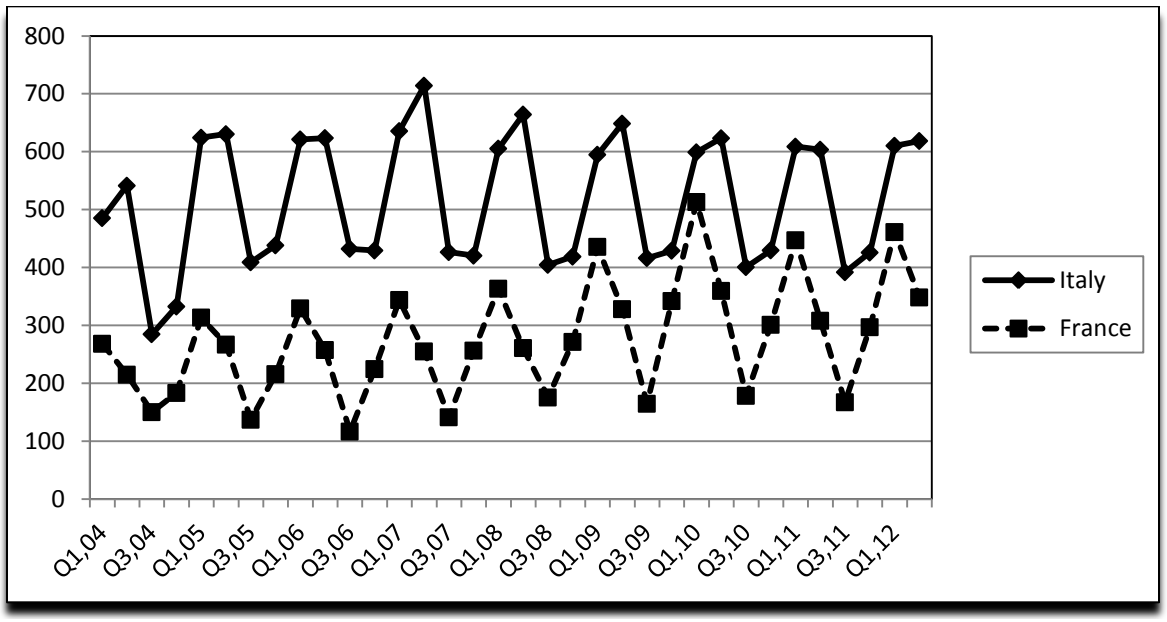
Retail Demand in Western Europe

The countries of Western Europe have consistently been the leaders in consumption of fresh kiwifruit. However, recent retail data were available only for a few countries. The most complete series were for France and Italy, countries that are important producers, exporters and importers of fresh kiwifruit.

The chart below shows the reported per capita quarterly sales in large retail stores of fresh kiwifruit in France and Italy from the first quarter of 2004 to the second quarter of 2012. These are believed to represent about 70 percent of all retail sales, so they are a useful guide to long-term trends. While the variation between seasons was quite wide in both countries, per capita sales in Italy appeared to be on an upward trend through 2007, and to then move slowly downwards. In contrast, the trend was positive in France until 2010, before it moved gradually downwards. The gap in per capita consumption between France and Italy narrowed until 2010, then widened again.

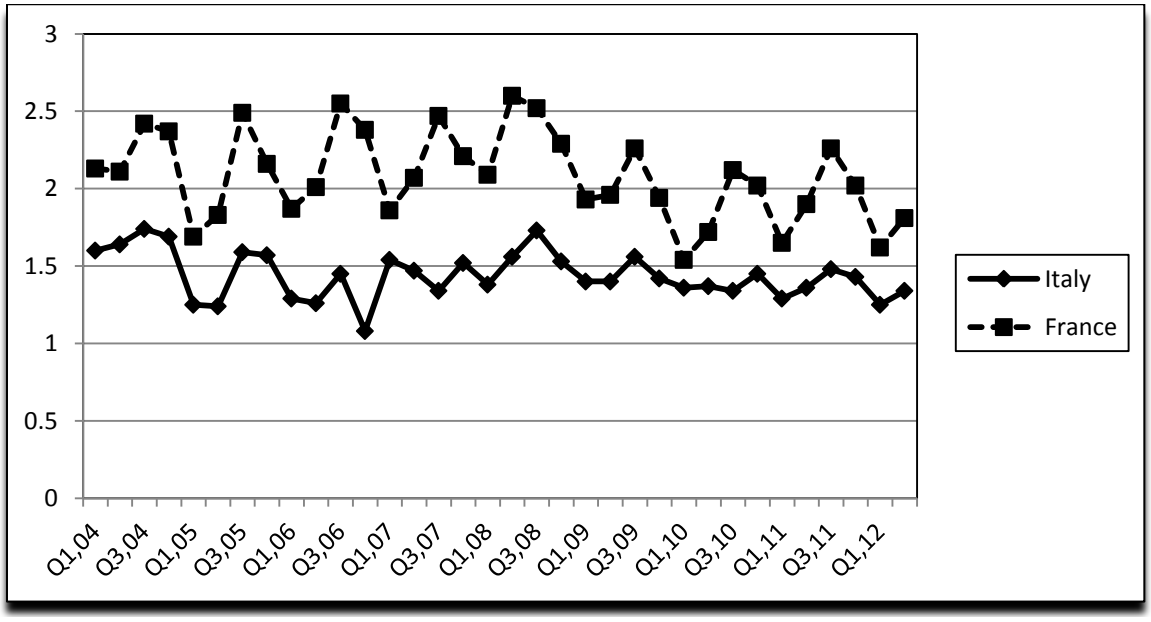
France and Italy: Quarterly Sales per Capita of Fresh Kiwifruit in Large Retail Stores, 2004-2012

(grams per capita)



France and Italy: Estimated Quarterly Retail Prices of Fresh Kiwifruit in Large Retail Stores, 2004-2012

(grams per capita)



In the case of average deflated retail prices, those for France were consistently higher than those for Italy throughout the 34 quarters shown. However, the variation between seasons was much smaller in Italy than in France, and became even smaller in Italy after 2009. In the case of France, prices appeared to move in a lower band after 2009 than before.

To investigate shifts in per capita sales and prices in recent seasons, we compared average quarterly data for Italy and France for the four calendar years before the Great Recession, 2004-2007, and after, 2008-2011. In the case of France, per capita retail sales were higher in each quarter, and averaged one third higher annually in 2008-2011 than in 2004-2007. However, deflated prices averaged 5.7 percent lower, and were lower in every quarter except the second quarter. In the case of Italy, average retail sales per capita were 4.5 percent lower, with decreases in the first and second quarters more than offsetting increases in the third and fourth quarters. Prices averaged more than 10 percent higher, rising strongly in quarters 1 and 2, and falling slightly in quarters 3 and 4.

France and Italy: Changes in Retail Sales per Capita and in Deflated Prices for Fresh Kiwifruit, 2004-2007 and 2008-2011

Country	Period	Units	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Annual
France	2004-07	Grams	313.8	248.6	136.1	220.1	229.6
		€/kg	1.88	2.00	2.48	2.27	2.10
	2008-11	Grams	439.9	314.2	171.3	302.9	307.0
		€/kg	1.78	2.01	2.29	2.06	1.98
	Change %	Grams	+ 40.2	+ 26.4	+ 25.9	+ 37.6	+ 33.7
		€/kg	- 5.3	+ 0.5	- 7.7	- 9.3	- 5.7
Italy	2004-07	Grams	571.5	611.7	351.4	387.4	480.1
		€/kg	1.43	1.43	1.56	1.53	1.48
	2008-11	Grams	480.2	506.4	403.3	425.8	458.3
		€/kg	1.68	1.75	1.53	1.46	1.63
	Change %	Grams	- 16.0	- 17.2	+ 14.8	+ 9.9	- 4.5
		€/kg	+ 17.5	+ 22.4	- 1.9	- 4.6	+ 10.1
Italy-France	2004-07	Grams	257.7	363.1	215.3	167.3	250.5
	2008-11	Grams	40.3	192.2	232.0	122.9	151.3
	2004-07	€/kg	- 0.45	- 0.57	- 0.92	- 0.74	- 0.62
	2008-11	€/kg	- 0.10	- 0.26	-0.76	- 0.60	- 0.35

Between 2004-2007 and 2008-2011, the gap between Italian and French per capita retail sales narrowed substantially in every quarter due both to consistent increases in France, and decreases in Italy in the first and second quarters. In contrast, the gap between average deflated retail prices in France and Italy shrank in each quarter and annually as prices in France slipped in three quarters, while those in Italy rose in the first and second quarters.

In order to make quantitative estimates of how much retail demand for fresh kiwifruit might have changed in Italy and France, we updated previous analyses of quarterly data through the fourth quarter of 2011 for France and the second quarter of 2012 for Italy. As before, the separate effects of the Great Recession were tested by use of a dummy variable with the value of one for each quarter beginning with the fourth quarter of 2008. The results are shown below:

France: Retail sales per capita = 224.341 - 179.341 Deflated retail price
(2.695)* (11.016)*
+64.557 GDP per capita + 38.046 D Winter + 36.115 D Recession R^2 = 0.82
(4.391)* (3.613)* (2.485)*

Italy: Retail sales per capita = 82.488 - 441.532 Deflated retail price
(0.344) (7.796)*
+ 251.724 GDP per capita + 22.568 D Recession R^2 = 0.57
(4.397)* (0.737)

In general, the results were quite similar to those presented in the 2012 edition of the World Kiwifruit Review. The equation for France explained more of the variation in retail sales than did the equation for Italy. Most coefficients were significant at the 95 percent level, except for the Recession dummy variable, which was significant in France, but not in Italy. However, in both cases, the results were counterintuitive. Demand was higher after the recession began. From previous studies, it was known that demand in winter was significantly different from demand in summer in France, but not in Italy. All things being equal, per capita sales in France in winter were about 38 grams higher than in summer.

We also attempted to measure how sensitive per capita retail sales were to changes in average prices and incomes, the so called price elasticities and income elasticities. We measured these effects for the period beginning in the first quarter of 2004, to get a more up-to-date measure. The average quarterly retail price elasticity was -1.41 in France, and -1.23 in Italy. This suggests that a 10 percent decrease in retail price was associated with a more than 10 percent increase in per capita retail sales. Conversely, increases in real prices of 10 percent were associated with a greater than 10 percent decrease in per capita retail sales.

The average income elasticity was + 1.44 in France, and +2.04 in Italy. Again, both of these are very favorable results, indicating that per capita retail sales of fresh kiwifruit have responded positively to increases in per capita incomes in these two countries. However, the converse also holds. Static or declining per capita incomes, that have been experienced recently in France and Italy, have provided a less favorable environment for increased sales of fresh kiwifruit without the reductions in average prices that have occurred.

Data for Spain are available for four quarters in 2002 and 2011, but not for the intervening years. They show that per capita retail sales of fresh kiwifruit in Spain rose by over 20 percent in the decade, but average prices fell in real terms by 12 percent. The biggest gain in retail sales was in the first quarter, but there were double digit gains in all four quarters. Real prices were lower in every quarter, with the biggest decline occurring in the fourth quarter.

Spain: Comparison of Retail Sales per Capita and Deflated Prices for Fresh Kiwifruit, 2002 and 2011

Period	Units	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Annual
2002	Grams	701.9	623.9	488.2	686.5	625.1
	€/kg	1.88	2.08	2.18	2.21	2.08
2011	Grams	959.7	737.0	563.3	800.9	764.2
	€/kg	1.69	1.90	2.00	1.89	1.83
Change %	Grams	+ 36.7	+ 18.1	+ 15.4	+ 16.7	+ 22.3
	€/kg	- 10.1	- 8.7	- 8.3	- 14.5	- 12.0

Spain's economy has been in serious trouble for several years, with an exceptionally high rate of unemployment. As we went to press, the Spanish government was still unwilling to seek a bailout similar to the package provided to Greece. It has sought to turn its economy around with drastic domestic austerity measures. Until this issue is resolved, demand in Spain for many commodities, including fresh kiwifruit, is likely to remain under pressure.

Farm Level Demand in the United States

Retail data comparable to that for European countries is not publicly available for the United States. Thus, in the past, we have relied on analyses at the grower level to assess the key factors influencing demand for fresh kiwifruit in the United States. Each year, the USDA,ERS provides information on supplies of kiwifruit available from domestic and import sources and on per capita consumption of fresh kiwifruit. The most recent data relate to the 2011 marketing year. These data were used to estimate the following demand equation for the period from 1988 to 2011. The results were as follows:

UNITED STATES: Deflated Farm Price = 1261.988 - 1863.71 Consumption per capita
(4.769)* (5.105)*
+ 0.0115 Deflated income per capita R^2 = 0.56
(1.202)

As in similar equations reported in previous issues of the World Kiwifruit Review, the per capita quantity of fresh kiwifruit consumed in the United States was negatively and significantly related to deflated farm price. The average farm price flexibility with respect to quantity consumed per capita was -1.339, slightly lower than in the two previous years. This indicates that a 10 percent increase in per capita consumption would be associated with a 13 percent decrease in deflated farm price, and about a 5 percent decrease in grower revenue. While the income coefficient was positively related to farm price, it was not statistically significant, unlike the situation at the retail level in France and Italy. With respect to the effect of the Great Recession, in 2010, per capita consumption was the same as in 2009, but deflated price was over 10 percent lower. However, in 2011, per capita consumption jumped by 22 percent, while deflated price fell by only 2.2percent. This conforms with the broader recovery of expenditures on fresh fruits in the United States noted previously.

An important influence on prices and consumption of fresh kiwifruit in the United States is the fact that over 60 percent of supplies normally come from imports, some of which compete directly with domestic supplies. We again investigated the differential effect on deflated grower prices of domestic shipments and of net imports (that is, imports less exports). This resulted in the following updated equation:

UNITED STATES: Deflated Farm Price = 1463.969 - 9.293 Domestic shipments
(8.583)* (4.803)*
- 3.586 Net Imports R^2 = 0.54
(3.145)*

This equation explained about as much of the variation in deflated farm price as the previous equation. Both domestic shipments and net imports had a significant negative effect on deflated farm price. However, each additional ton of domestic shipments placed on the market had twice as large a depressing effect on farm price as a ton of net imports.

In relative terms, a 10 percent increase in domestic shipments was associated with an 8.4 percent decrease in deflated farm price, whereas a 10 percent increase in net imports was associated with only a 4 percent decrease in deflated farm price. However, unlike previous analyses, it appears that domestic shipments can now increase without reducing growers' total revenues. Demand conditions may finally be becoming more favorable to domestic producers of kiwifruit.

Influence of New Cultivars on Fresh Kiwifruit Demand

Prior to the advent of PSA, any discussion about the influence of new cultivars on fresh kiwifruit demand was dominated by the success of Hort 16A, marketed as Zespri™ Gold. Analyses showed that Hort 16A was complementary to, rather than competitive with, the Hayward cultivar. By gradually expanding supplies of Hort 16A in key markets, the Zespri organization succeeded in extending total demand for fresh kiwifruit without reducing demand for Hayward. Hort 16A helped win new customers for fresh kiwifruit, and induced large increases in average retail prices paid in many markets, equally large increases in returns to growers at the

orchard level, and major boosts in the value of kiwifruit orchard investments. Most of those contributions are about to unravel as Hort 16A appears destined to be rapidly withdrawn from production.

A number of other cultivars have been commercialized around the world in the last decade. While the departure from the scene of Hort 16A may offer increased market opportunities, particularly for yellow-fleshed cultivars, none of the existing cultivars appear to have the breadth of appeal once held by Hort 16A.

Thus, the burden of restoring the revenue potential of the kiwifruit industry will fall heavily on the standard Hayward cultivar, on the new green G14 cultivar and on the two new yellow-flesh cultivars, G3 and G9. New cultivars are also being developed in red-flesh and bite-size niches. For the Hayward variety, the key to elevating returns will be widespread efforts to improve the appearance, taste and consistency of the product placed on world markets. That may have been neglected to some extent as developers pursued winning new cultivars. Zespri's replacements for Hort16A will undoubtedly have to go through various growing pains as they seek to win the loyalty of retailers and consumers. Unsatisfactory experiences now could cause major setbacks later.

In the normal course of events, the new red-fleshed cultivars and bite-size cultivars would be gradually introduced to potential markets so that the inevitable growing pains could be ironed out before production was scaled up. There may be a temptation to rush such cultivars to market to fill some of the void left by Hort 16A. However, it will be several years before these cultivars become major revenue generators for the global kiwifruit industry.

Demand Summary

While there was some evidence that demand for fresh kiwifruit had been hurt by the Great Recession, demand continues to be quite responsive to rising per capita incomes in both developed and developing countries. The loss of Hort 16A will have to be overcome if the global industry is to get back on a growth trajectory. However, if and when the world economy returns to a robust rate of growth, the kiwifruit industry is in a favorable position to resume its own rapid growth.

6. Marketing Initiatives

Difficult Trading Environment

The kiwifruit industry is being forced to recalibrate its marketing initiatives in the light of the actual and projected product damage resulting from PSA. However, any recalibration has to take into account the very difficult trading conditions that prevail in many major markets.

The biggest challenge is the weaknesses that have been exposed in many developed economies as a result of the global financial crisis and the Great Recession that followed. As they normally would in the case of a minor recession, many governments increased public expenditures to try to compensate temporarily for the slowdown in private expenditures. However, the gap proved to be much larger than expected, and as public expenditures ballooned, the credit worthiness of many countries came into question. A long list of countries, beginning with relative minnows like Cyprus, Iceland, Ireland and Greece, and gradually expanding to Portugal, Spain, Italy, the United Kingdom, France and the United States, saw their debt either suffer, or be threatened with, downgrades in global markets. This focused new attention on the gap between the long-term commitments many governments had made to their citizens on unemployment, health care and pensions, and their ability to fund those commitments from a slow-growing economy. Needless to say, when the solvency of a country's sovereign government comes into question, it creates enormous uncertainty across that country's entire economy.

That uncertainty has been not been eased by the gambles that the monetary and fiscal authorities have taken to get economic growth back on track. The leading monetary authorities, including the U.S. Federal Reserve Board, the euro zone's European Monetary Authority, the Bank of England, and most recently, the Bank of Japan, have pumped trillions of dollars into their systems and driven interest rates to historically low levels in an effort to hasten economic recovery. The debate continues about whether or not that monetary easing helped or hindered economic recovery.

However, the biggest unknown revolves around what might happen when the monetary authorities begin to draw liquidity from the system and allow interest rates to rise again. Can they time such actions in a way that avoids precipitating another recession or rapid inflation? Many businesses, in making their investment decisions, are attempting to second-guess the effects of potential reversals in monetary policies. In particular, large banks are seeking to avoid risk by parking their money in safe securities rather than lending it to commercial businesses.

The fiscal authorities, those that make decisions on government taxing and spending, also find themselves trapped as a result of their past profligate ways. They can no longer afford many of their current programs. However, if they cut expenditures, it will mean immediate losses of government jobs, which will add to already high levels of unemployment. If they raise taxes to maintain those government jobs and programs, it will discourage job-creating investment in the private sector. Since governments now account for 40 to 50 percent of most advanced economies, such government decisions have very large consequences for their overall economies. The problem is compounded in two ways. First, it is difficult to measure the precise effects of any government action, whether it is to raise taxes or cut expenditures. Second, most governments have opted for a bewildering mixture of spending cuts and tax increases, so that it is even more difficult to determine the net effect on their economies.

Many developed countries are also facing two more fundamental drags on growth. One is demographic, the other economic. The populations of these countries are aging, with the number of retirees growing more rapidly than the workforce. Thus, the dependency ratio of the non-working population (children plus retirees) to the working population is becoming more burdensome. One way to reduce that ratio would be to have older people stay longer in the work force. Some countries have succeeded in raising the official retirement age, but efforts to do so in many countries and many occupations have met with fierce resistance. The second major drag relates to the level of productivity. In general, the rate of growth in productivity in developed countries has been weak in recent decades. The level of productivity of the labor and other inputs involved in economic activity determines business revenues and national incomes. Without more rapid increases in productivity, it will be difficult for many developed countries to expand national incomes or to afford improved life styles. Productivity increases become particularly important if the labor force is shrinking.

These general economic problems have a very real effect on the behavior of consumers, retailers and the suppliers who serve them. The Great Recession and its aftermath cost many consumers their jobs, homes and pensions, or reduced their incomes and assets. In response, many consumers, particularly in the lower half of the income distribution, reduced their overall expenditures, and altered their living and spending patterns. The number of adult children returning to the parental home increased. Many families curtailed eating out in restaurants. In shopping, they changed the type and quality of products that they bought, the retail outlets that they patronized, the timing and frequency of their shopping trips, and their use of coupons and special offers.

However, one of the surprises of the Great Recession is how rapidly people in the upper half of the income distribution have returned to their normal spending patterns. This effect has not been uniform across countries, partly because the pace of economic recovery has not been uniform across countries. Products that tend to be favored by upper income consumers are more likely to have seen demand recover than those that sell to the mass market. As previous sections have shown, in many countries, demand for fresh kiwifruit was initially affected by the recession, but has since recovered well.

The Great Recession has also brought many changes in the retail food system. It brought home to many retail organizations that they had expanded retail floor space too rapidly during the previous affluent decade, and that some of the weaker organizations would not survive intact. Indeed, such setbacks have forced major readjustments on both large and small organizations. The largest ones, such as Walmart, Carrefour and Tesco, have had the resources to reorient their operations, but many smaller retail operators have closed key divisions, or been merged into other entities.

At the same time that there was overcapacity in the traditional supermarket business, it faced further competition from above and below. Discounters, such as Aldi and Lidl, rapidly expanded the number of their limited assortment outlets to cater to more thrifty consumers. In addition, drug stores, general merchandise stores and dollar stores increased their selection of food items, again aimed at consumers that were under the greatest financial stress. Price competition, which was always keen in the supermarket business, became absolutely cut-throat.

Also in the same period, chains that catered to up-market customers, such as Waitrose, Whole Foods or Costco, had suffered least during the Great Recession, and resumed expansion rapidly thereafter. While Costco continues to operate out of a typical warehouse environment, many up-market chains have invested heavily in upgrading their physical facilities. These chains employ different sets of competitive strategies that put additional pressure on mainstream retailers. They often carry exclusive, or premium products. At the same time, they support the causes of more socially conscious consumers by stocking organic, fair trade, health-centered or environmentally-friendly products, and by requiring their suppliers to meet stricter standards in their use of labor, energy and the environment. They continue to espouse new causes and impose new standards on suppliers.

As a result, in many markets, individual retailers face a wide spectrum of competitors that can nibble away at their traditional grocery customers. Many are losing ground because they lack the resources to engage in price-cutting campaigns against their better-financed competitors, or to upgrade their retail premises to attract more affluent shoppers. They also risk alienating their major customer base if they move too rapidly into social initiatives. However, they have a strong incentive to pressure suppliers to help them meet these different kinds of competition.

One area where major retail chains appear to have found a common cause is in increasing the proportion of products that they buy locally. To many consumers, it appears logical that local products would have a smaller carbon footprint, and would tend to be fresher, than goods hauled from a long distance. Domestic producers eager to block foreign competition, and governments keen to promote local development, repeat these claims, so that in the mass media, they are often assumed as definitive. In fact, the claims are correct only in limited circumstances for a few products. In the case of fresh kiwifruit, the threat is less from kiwifruit produced locally than from retailers and consumers switching their allegiance to competing fruits that can be produced locally.

The retail food environment has continued to change in response to changes in world and national economies, new stresses faced by consumers, new sources of competition, and new social movements. It is against this backdrop that the kiwifruit industry will seek to recover from the damage of PSA.

New Zealand Leans on Innovation

The New Zealand kiwifruit industry appears to be basing its plans for recovery on the same strategy that made it so successful before the advent of PSA. The three main pillars are (1) breeding unique cultivars that will have strong appeal for consumers, (2) making these gradually available to markets by strict management of plantings, and (3) using branded promotions to distinguish the resulting products in world markets. However, implementing this strategy will be much more difficult in the next few years, especially if the Zespri organization seeks to return to past peak volumes by 2016.

In the past, the New Zealand industry took great care in selecting cultivars, resolving problems in growing, harvesting, storing and shipping, and gradually building up the volume available on selected markets. In the present crisis, there is considerable pressure to speed up the process of commercialization of the currently best available cultivars, such as G3, G9 and G14, in order to fill the gap left by the demise of Zespri™ Gold. However, the New Zealand industry appears to be divided over the adequacy of these cultivars as worthy partners to Zespri™ Green. If these new cultivars have quality weaknesses, the problem could be compounded by rushing them to market in large volumes too quickly. The producers that plant large acreages could find their investments going sour. And, if they are promoted heavily in major markets, but do not perform well, there is a risk that the entire Zespri brand could be hurt.

Zespri and the New Zealand government have announced a joint investment of NZ$35 million to research new cultivars, but it could take many years for such research to produce potential winners. This means that the New Zealand kiwifruit industry might have to deal with a much longer period of reduced supplies than that currently envisaged by the Zespri organization. In that eventuality, Zespri may be forced to reevaluate the current size of the organization and the global reach of its promotional programs. One way to maintain its promotional programs with a smaller volume base would be to increase offshore marketing charges per tray handled. That would require persuading producers that such higher charges are necessary for the long-term welfare of the industry. Such higher charges are likely to be more acceptable if per tray returns remain higher with shortened crops. In any case, the New Zealand industry will need to remain open to modifying past strategies as it works its way out of the PSA era.

Chile Still Battling Quality

The PSA problem has been emerging more slowly in Chile than in New Zealand. So far, it appears less pervasive, but its emergence is being closely monitored. In the meantime, the Chilean kiwifruit industry continues to believe that its biggest handicap in international markets is occasional lapses in the appearance and internal quality of Chilean kiwifruit. However, because Chile's exporting efforts are dispersed among numerous organizations that are diverse in size, structure and experience, and its products are sold in such a wide array of export markets, it is impossible to control quality in the way it is controlled in New Zealand under Zespri's single point of entry system.

Chile's answer has been to set up a Chilean Kiwifruit Committee with four main aims, (1) improving the quality and condition of products, (2) improving product consistency and homogeneity, (3) improving the perception of Chilean kiwifruit and generating a product identity, and (4) ensuring the consumer a great eating experience. While the Committee is backed by the organizations of fruit growers (Fedefruta) and fruit exporters (ASOEX), membership is still voluntary. As of 2012, it represented 680 growers, 48 exporters and 81 percent of the kiwifruit exported. However, the composition of the 19 percent of kiwifruit not represented may be crucial to the success of the Committee. If that 19 percent is mostly free riders that support the Committee's goals, but prefer not to join a cooperative organization, it may not be an obstacle to the Committee's goals. However, if that 19 percent includes many firms that are unwilling to meet the Committee's quality standards, it could undermine the goals in many markets.

One option for the Committee would be to develop a "Mark of Excellence" that could be granted to member firms that participated in its quality assurance programs for production, harvesting, packing and storage, and to encourage foreign buyers to look for that mark of excellence. If exporters could earn a premium price as a result of the mark of excellence, it might persuade more non-member firms to join. Working against that is the willingness of many retailers in major markets to "buy cheap" in order to gain a temporary price advantage, especially in markets where consumers remain very price sensitive. In the meantime, the Chilean Kiwifruit Committee must hope that by substantially meeting its goals among members it can lift the reputation of the entire Chilean kiwifruit industry.

Special Concerns in Europe

PSA has caused selective damage among European kiwifruit producing districts. Hardest hit have been the two leading Italian producing regions, Lazio and Piedmont. Most of the yellow-fleshed kiwifruit in Lazio have been removed. However, Italy also continues to struggle with economic distress in many of its major markets, wide swings in total supplies from year to year, and the dispersed nature of its marketing efforts. Economic distress appears set to continue in Europe for some time. PSA may only add to fluctuations in supply. However, efforts to consolidate packing and marketing continue with new consortia being formed for fresh kiwifruit and other fresh fruits. The Centro Servizi Ortofrutticoli (CSO) is a service company representing 65 fruit and vegetable companies that cover about 12 percent of Italy's fruit and vegetable turnover. CSO provides multiple fruits, including kiwifruit, with market statistics, communication and promotion, lobbying and certification services.

In France, marketing is dominated by a few large, regionally-based grower cooperatives. Their export marketing efforts are complemented by national promotional body, Interfel. Most industry research, promotion and service functions are performed by an organization dedicated to kiwifruit, the Bureau Interprofessionel du Kiwi (BIK). This has allowed the French industry to focus heavily on premium markets. The Greek kiwifruit industry has grown very rapidly in recent years. Because of the depressed domestic economy, the Greek industry has been forced to scramble for wider access to foreign markets. Most of that effort has been conducted by a few, large firms.

While production of kiwifruit has been expanding in both Spain and Portugal, most of the needs of the large Spanish market continue to be met from imports. Most major Spanish domestic marketers are also importers, and some are also exporters. This means that most of their marketing efforts tend to be opportunistic, depending on supplies available from Italy, France and the Southern Hemisphere. In contrast, increasing production has meant that Portugal has become less import dependent over time. Exports remain small, but growing.

The European kiwifruit industry continues to make extensive use of various marks of excellence, some based on national or EU-wide schemes limited to specific geographic areas. The benefits of these schemes have tended to be undermined

to some extent by the discount fervor in the European food retail system. Potential premiums may also be affected if shorter kiwifruit supplies raise the general levels of kiwifruit prices. European producers also continue to expand the use of newer cultivars. Some of these may benefit from the reduced supplies of New Zealand gold kiwifruit. European producers could also benefit if overall supplies from the Southern Hemisphere are curtailed due to PSA, especially at the beginning and end of the European marketing season. It will be important for them to remain flexible as the world kiwifruit industry works through the various uncertainties it now faces.

China Makeover of an Industry

For the next few years, the kiwifruit industry in China will continue the process of transforming itself into one that is more globally competitive. The huge domestic demand means that there is less incentive for many producers and packers to improve their standards. However, government and industry leaders recognize that in the longer term, as Chinese consumers and retailers become more discerning, the industry will have to compare more favorably with the best suppliers from the Southern Hemisphere and Europe. Large investments have been made in research to exploit China's huge repository of kiwifruit germ plasm, in breeding improved cultivars, in efforts to improve domestic production, packing, storage and distribution systems, and in partnerships with foreign researchers and commercial firms to develop new products for the global marketplace.

One of the handicaps faced across the board within the Chinese system is that there has been low rewards for innovation. There has not been the willingness, found in the capitalist system, to challenge the status quo. There is little tradition of private sector research funding that is not beholden to government funds and government agendas. Until that culture is changed, China will be handicapped in tapping the full benefits of its kiwifruit investments.

7. Strategic Issues

Productivity a Greater Priority

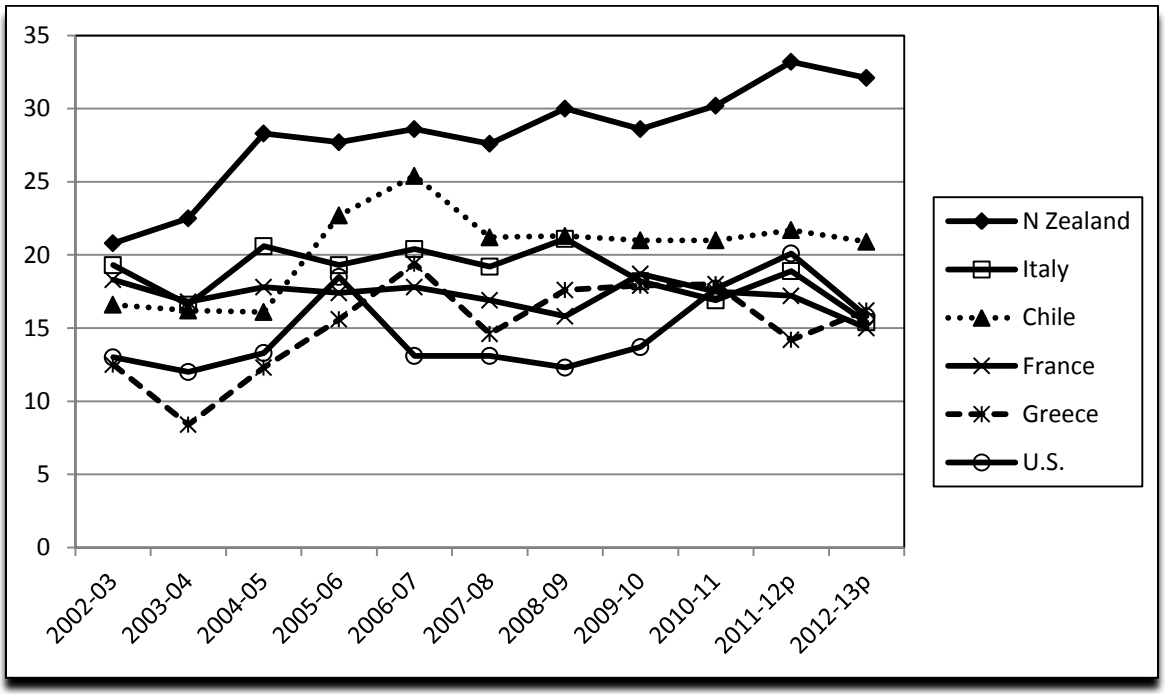
In the normal course of events, agricultural industries must compete for labor, capital and other inputs against all other industries in the broader economy. Thus, their costs of production, packing, storage, transportation, etc., tend to rise steadily while the prices they receive vary erratically and get eroded by inflation. In order to stay in business, they must continually increase the productivity of their operations, that is, they must generate increased value of output from any combination of inputs. However, productivity increases have become more important than ever in the kiwifruit industry because of the ravages of PSA.

At the orchard level, PSA has caused most losses in golden kiwifruit, the most profitable and highest yielding cultivar. Even in the case of green kiwifruit, some damage to bearing surfaces has occurred. At the same time, blocks that remain in production now have to be treated with expensive chemicals to reduce further losses from PSA. Thus, there have been added costs per hectare at the same time that average yields per hectare have fallen. The only way to counteract these developments will be by intensifying efforts to increase productivity, particularly on the dominant Hayward cultivar.

Loss of production will also affect economies of scale at each level of the supply chain. For example, reductions in the throughput of a packing line will mean that average fixed costs per tray will automatically rise. Some pack houses may be able to maintain the volumes of kiwifruit handled by "stealing" product away from competing pack houses. However, for the pack house sector in total, average costs are destined to rise. The same principle will affect every other part of the supply chain. Once again, the only way to offset these increased costs will be by increases in productivity across the supply chain. That can be achieved either by further consolidation of facilities to attain additional economies of scale, or by the introduction of new technologies that reduce unit costs, increase efficiencies, or both. However, new technologies will require additional infusions of capital into the industry at a time when many firms have had to write down the value of existing assets and of goodwill because of PSA.

Information on productivity of the kiwifruit industry in different countries is available only at the orchard level. The chart below shows average yields of kiwifruit per hectare for six of the major kiwifruit producing countries in the last decade. New Zealand has consistently had the highest average yields and a steady upward trend in average yields. However, the peak level of yields reached in the 2011-12 season may not be regained for several years ahead without major efforts by the industry and its support services.

Selected Countries: Average Yields per Hectare, 2002-03 to 2012-13
(metric tons)



For the other five major producing countries, most of the gains in average yields had occurred by 2006-07, and there have been little gains since. At least three possible factors could have contributed to this slowdown in average yields, a higher proportion of immature plantings not yet at full bearing, unpredictable seasonal weather patterns, or the impact of PSA. It is not possible to determine how much each of these factors contributed to the slowdown in growth of average yields. However, the chart does suggest that all the major producing countries face challenges in increasing orchard productivity. It will be critical to increase the value of output per hectare, for example by increasing average fruit size or fruit storage life, and not just the volume shown in the chart above.

More Consolidation Ahead

In the rest of the supply chain beyond the orchard gate, individual firms and industry organizations will have to make major adjustments if the total volume of kiwifruit available is reduced appreciably over the next few years, or if supply in their areas of operation are reduced. This will apply both to those that handle kiwifruit, such as pack houses, cool stores, inland transportation and export shipping, and to the many operations that provide inputs and services to producers and all the rest of the supply chain. For those firms or organizations that are most severely affected, especially those with a high proportion of gold kiwifruit, there is likely to be further rationalization in staffing and office space, and in the number of pack houses, cool stores, etc., that they operate. In many cases, firms may have to close down branch operations that are no longer viable. Discounting of charges has already become common as firms competed for scarcer supplies. That has provided a further incentive for rationalizing the number and size of units in the industry.

Changes due to adjustments to PSA will only add to the restructuring that was already going on in the kiwifruit industry, and in the broader fresh fruit industry. The merger between New Zealand's Satara Limited and Eastpack Limited, two major post-harvest cooperatives that also own and lease orchards, was finally approved by shareholders in mid-March 2013. The combined unit is expected to handle 27-30 percent of New Zealand's kiwifruit volume. However, one major goal of the merger was to eliminate duplicate facilities and more fully utilize the remaining facilities. That goal will also be relevant in dealing with further losses due to PSA. The larger unit also expects to have greater bargaining power in negotiating for necessary supplies and services. Another proposed merger between Satara Limited and a private company, Seeka Limited, was sidelined when PSA first hit, but has not been permanently shelved. Seeka Limited handled almost 22 million packed trays in calendar year 2012. Together, these three organizations now account for close to half of the New Zealand kiwifruit industry.

The changes in the New Zealand fruit industry have not involved only domestic firms. In 2011, German-based multinational, Baywa Limited, took control of long-established New Zealand conglomerate, Turners & Growers, including T&G's major fruit subsidiary, Enza Limited. Enza Limited had been building up its own stable of proprietary kiwifruit cultivars, attempting to diversify from a shrinking

pipfruit industry into the fast-growing kiwifruit industry. Enza Limited had been in a prolonged legal dispute with the Zespri organization over its single point of entry (monoply) of New Zealand fresh kiwifruit exports to countries other than Australia. Before the full implications of PSA were known, New Zealand kiwifruit producers voted overwhelmingly in support of the Zespri monopoly, the New Zealand government re-affirmed its support, Zespri and Enza Limited reached a temporary working agreement, and Baywa Limited indicated that it was no longer pursuing the Enza Limited challenge to the Zespri model.

However, as fewer, larger entities emerge in the New Zealand kiwifruit industry, they are likely to want to expand both domestic and international operations. Concerns about domestic supplies due to PSA could hasten efforts at greater geographical diversification. This could lead to future conflicts with long-standing Zespri policies. New Zealand may need to find new formulas for cooperation between Zespri and major onshore operators like Satara, Seeka and Baywa.

The pressures for greater consolidation also exist in other major kiwifruit producing countries. However, they are not as advanced as in New Zealand because production areas tend to be more widely separated geographically and because preferences for independent actions tend to be stronger. In addition, the ravages of PSA have been less concentrated than in New Zealand. However, there are many fruit-based multinational firms that are also trying to carve out a secure role for themselves in the dynamic fruit system. Many further changes may be in store in the next few years.

GMO and Kiwifruit

The kiwifruit industry in New Zealand has pursued two main avenues to combat PSA, conventional breeding of new cultivars that are PSA-resistant, and finding more effective control treatments with the use of chemicals. However, it has found it difficult to openly discuss the "elephant in the room," the potential role genetic engineering techniques could play in solving the PSA problem.

Zespri, and its predecessor organizations in the New Zealand kiwifruit industry, played a leading role in the anti-GMO debate in New Zealand. They had considerable influence in steering the anti-GMO policies of successive New

Zealand governments. To protect the "clean, green" image of New Zealand agriculture, they made common cause with anti-GMO activists in Europe by forswearing any use of genetic engineering in kiwifruit breeding. This stance was driven by marketing considerations rather than by science. Indeed, like agricultural scientists around the world, New Zealand scientists continued to use advances in genetic science to unravel the genetic makeup of various plants and to use the new knowledge in plant improvements. However, they made sure to avoid openly using the technique most condemned by activists, "transgenics", that is, the transfer of useful genes from one unrelated species to another.

However, faced with virulent PSA that could destroy their livelihood, kiwifruit producers in New Zealand have indicated that they would be willing to support such genetic engineering techniques if they would solve the problem of PSA. Scientists also recognize that the complexity of the PSA bacteria may require that genetic engineering techniques be employed in its solution. However, the leaders of the New Zealand industry have been reluctant to devote large resources to a possible genetic engineering solution because of their past opposition to the technology, and because of the reformulation it would require of New Zealand's traditional marketing message.

One thing is clear, the kiwifruit industry in New Zealand, and elsewhere, cannot wait too long to make a decision about intensive exploration of the potential of genetic engineering in resolving the PSA problem. Finding a resistant gene, or genes, that could be transferred from other plants or organisms to kiwifruit without compromising the current attributes of kiwifruit cultivars will be neither speedy nor assured. However, every day's delay in launching such an effort means millions of dollars in asset values and revenues lost to the industry and related entities, and delays the return of the industry to past levels of prosperity. While opponents of genetically-altered plants remain active, especially in Europe, their credibility has been strained by the failure of their dire warnings to occur after many years of protest, and by the wider recognition among governments that genetic engineering has a vital role to play in securing food supplies for a growing world population. It would seem that the industry's first priority should be to use any legal means to find resistant cultivars, that provide consumers with the customary appearance, taste and texture. If that can be achieved, smart marketing campaigns can then be used to overcome any image problems.

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