

China – Opportunity or Threat to the UK Fruit Industry?

Worshipful Company of Fruiterers

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Executive Summary

This work details many of the visits and experiences which I have enjoyed over the last 24 months in the course of my Nuffield travels. Stops in China took me to fruit processing plants, research stations, fields, exhibitions and markets. It presented the opportunity to see first hand just how quickly things there are changing and how industrious the Chinese really are.

Travelling onwards to New Zealand I had the opportunity to view what was a very different approach to fruit production and marketing. While we are totally inward looking in the UK (and readily afforded this luxury with a home market of 60 million people), New Zealanders, being out on a limb at the other end of the world with a domestic market of only 4 million, have become strongly market focused and entirely outward looking. Their industry is now stronger than ever as a result.

I had expected to see more of the same in Australia and was therefore surprised to find an industry which had stagnated largely as a result of imposing trade barriers dressed up as bio-security. If ever there was an advert for free trade this was it.

Chile was again fascinating. In my ignorance I had expected to find a country which was backwards (perhaps third world even). Once there I found exactly the opposite with a well developed and innovative fruit industry, and some very sharp and focussed businesses keen to build strong external relationships and export the very highest quality fruit.

While my conclusions are not entirely clear cut, on the balance of evidence I am persuaded that China is not a significant short to medium term threat to the UK fruit industry. Longer term could be an entirely different matter. The only thing one can say with any certainty is that we ignore the Chinese at our peril, so while we can sleep comfortably for now I would advise doing so with one eye open!

1. Introduction

My interest in China and its ramifications for the UK fruit industry was sparked as a direct result of the commercial pressure which we faced at Wilkin & Sons Ltd. As processors operating in a global market we were all too acutely aware of the availability on the world markets of cheap Individually Quick Frozen (IQF) Chinese fruit and the inherent economic pressures to avail ourselves of this fruit.

Strawberries as an example serve to highlight the point well. As a business, it costs us something close to £1200 to produce a tonne of fruit to the required standard for processing. IQF Chinese fruit is available delivered to our door at £400 per tonne. The scale of the differential is striking if not alarming. Wilkin & Sons Ltd has however in its wisdom recognised that there is greater value to the business and the brand from provenance, and the ability to vertically integrate the production chain from field to plate. Ultimately there are much wider benefits to the business than purely short term financial gain. While the values of the Tiptree brand certainly help to strengthen this approach it is not a unique situation and is increasingly being adopted by others.

This dilemma none the less raised the question as to what the implications were for the wider fruit industry and how concerned we should be about the ever-present and evolving threat from Chinese producers.

Inevitably, while my primary focus was on China and its implications, as a grower one is always interested in what the wider world is up to, what works and what doesn't. On the farm we are constantly trying to improve and it is a source of ongoing fascination that some can always triumph in the face of adversity while others fail to make the most of their many opportunities and bemoan their lot. I hope you will therefore understand any apparent distractions which have crept in along the way which on the face of things bear little relation to the main thrust of this study.

Personally, I come from a family farming background in Southern Ireland, I studied Horticulture at Writtle College in the late 1980s, and have subsequently held several management positions within the fruit industry both in the UK and abroad. More recently, I have been farm manager for Wilkin & Sons Ltd since late 2001. I live in Tiptree with my wife Rachel and our young boys William and Thomas.

2. China

Much is written about China and its vast almost incomprehensible scale, a population of 1.3 billion people and growing, a land area in excess of 9 million square km (nearly 39 times that of the UK), 30 provinces and in excess of 650 cities. All of these conspire to make it virtually impossible to accurately distil any coherent and uniform thoughts on China. Rahul Jacob writing in the Financial Times in 2006 summed up the dilemma for authors as “few subjects can seem as vast or daunting for an author (as China). It is virtually impossible to tackle the whole country as a whole, and it is therefore not surprising that most take a bite-sized approach.” This of necessity echoes my approach entirely; I have visited and seen only the tiniest snapshot of China and Chinese life, while it is difficult to reach conclusions based on this approach, for the purpose of this work - needs must.

Beijing

- **Fourth China Agricultural Trade Fair**

I travelled to China in Mid October 2006, arriving supposedly just in the nick of time for the final day of the Fourth China Agricultural Trade Fair. As things transpired, being the last day of the fair, half the exhibitors were already dismantling their stands - not the auspicious start that I might have hoped for.

It did however give me the opportunity to take in some of the sights and sounds and tentatively start to get a feel for the fresh produce industry. What was immediately apparent was the vastness of the show (spread over 5 enormous halls) the huge numbers of people (a common theme throughout my trip) and the enormous range of produce available.

I was struck during the Trade Fair at the generally poor condition of much of the produce on display. While arriving on the last day as stalls were being dismantled was perhaps not the smartest move, it was nonetheless an international showcase for the country's fresh produce industry and as such an event at which one could reasonably have expected them to put their best foot forward. Perhaps more than anything it served to highlight some of the problems with a lack of cold-chain infrastructure, a theme which was to become recurrent throughout the rest of my travels.

- **Beijing Lurou Berry Juice Ltd**

My next stop in Beijing was a visit to the Beijing Lurou Berry Juice Company and some of their associated fruit production areas.

One could not fail to be impressed by their new factory: recently built for an investment believed to be in excess of €7million, it was state of the art in every way. While designed primarily as a juicing facility, it also included freeze drying facilities and IQF (individually quick freezing) capability where its focus was specifically on strawberries, raspberries, blackberries and boysenberries.

Completed in 2005 its equipment, facilities and procedures were exceptional. In common also with all the factories and packhouses I visited in China it had every conceivable form of Certification apparently covering most potential markets, and it operated to the highest food hygiene standards.

By comparison, however, their fruit supply bases were a different kettle of fish. I was taken to see one of their fields at Huairo demonstration farm about 45 minutes from Beijing. The fields were cropped with Tulameen & Autumn Bliss raspberry inter-planted with Senga Sengana and Tioga strawberry. The site was part of a research station demonstrating best practice to growers and showcasing new varieties for the industry. Substantial investment had obviously been made within the infrastructure of the site – a concrete road had been built running through the middle and they had used an expensive training system with concrete posts. Shaded temporary storage areas had been constructed for fruit holding and hand-wash and lavatory facilities were available for staff. However, this standard was not reflected in the plant material seen in the ground, plantations were patchy and plants lacking vigour. The inter-planting of material also suggested something of a lack of focus.



Raspberries inter-planted with strawberries – Beijing, October 2006

Ultimately I don't know what the daily capacity of the factory was – it was a substantial facility and to run it effectively may have required hundreds of tonnes of fruit daily. It was late October when I visited and as such post harvest – the facility had been closed for the winter. The difficulty for me was reconciling this enormous capacity with the potential I saw in the fields. The site we looked at was in the region of 60 acres and I would have thought had a maximum potential to produce up to 120 tonnes of strawberries and 80 tonnes of raspberries – in short, enough to maintain a day's production within the factory or perhaps two at the most. My hosts mentioned half a dozen growing areas but the potential of these was unclear. It is apparent that they had made a substantial investment in a fledgling business and obviously had confidence in its potential. While it was not clear that this was readily available, one is always conscious of how quickly things can change in China when a lucrative niche has been identified.

Xian

- **Huasheng Fruit**

The second part of my trip took me from Beijing to Xian in Shaanxi Province, home of the Terracotta Army and the apple capital of China.

Huasheng Fruit is a large scale operation boasting potential storage capacity for up to 40,000 tonnes of apples. Standards within the packhouse were high (complete with a room dedicated to displaying myriad certificates of certification) with a fairly high degree of automation, though also with enormous potential for improvement. It is worth perhaps remembering that to a greater degree China's recent economic success is built on the back of very low labour costs where average rates for manual workers are somewhere in the region of £5.00/day – this does not help to engender a culture of maximum mechanical efficiency.

The predominant apple variety in the region was Fuji – a magnificent variety when eaten straight off the tree, but bland once stored for several months and subsequently shipped half way round the world. Fuji is a difficult variety to handle and to achieve the best possible skin finish and colour the fruit is double bagged prior to harvest. A couple of weeks before harvest the outer bag is removed leaving a uniform green skin finish. The second bag which is essentially red cellophane then remains on the fruit until harvest. It is the combination of the two that ultimately leaves the fruit with its characteristic pink/red blush, delicate skin and helps to realise its renowned sweetness. All this attention to detail means that Fuji comes at a price, but one on which the Chinese are ideally placed to capitalise.

Observing the fruit handling process from field through to packing was mind boggling if not occasionally frustrating. Fruit was collected and gathered into a tarpaulin spread on the ground at the end of the field. From there it is individually packed into 20kg crates and transported a short distance to a central "sleeving" area. Here the fruit in the crates is unpacked, sleeved (with a spongy polythene sock) to protect it in transit to the packhouse and the stalk is cut out to avoid puncturing other fruit while in transit. It is then repacked in the same crates for onward transportation to the central packhouse (approximately a 5 hour journey by road). On arrival at the packhouse when fruit is

unloaded from the lorry, the whole process then happens in reverse with the socks removed by hand and the fruit then placed individually into bulk bins for onward handling within the packhouse. While the inefficiencies in the system are apparent and to a degree can be justified as a result of China's ultra low labour costs, perhaps a cause for concern for us is the potential to mechanise this whole system and in due course to make greater efficiency savings.

The orchards of the Huasheng growers (of which there are many hundreds) proudly advertise their compliance with Eurep-Gap standards. Average orchard size is about 2 mu or 2/15ths of a hectare (1/3rd of an acre). Production standards by comparison with western orchards were low, at an estimate no more than 10% of the fruit seen in the orchards would have ultimately made it to a UK supermarket specification.

Establishing how traceable the fruit was from the packhouse back to the field was not clear cut. While there were robust systems in place for batch traceability (a batch being a complete lorry load), it was harder to see how the fruit was traced back to the individual orchard/grower. A single lorry may have been carrying fruit from a dozen different growers.

Qingdao

- **HengRun Foodstuff – Liayang**

My third stop-off took me to Qingdao in Shandong province. Qingdao is a coastal town, set to be the host city of sailing for the 2008 Olympic Games.

My hosts were Amy Chu and Julie Zhang of Uren Food Ingredients. Typical of a new generation of young educated Chinese, they were courteous, hospitable, open and of course spoke flawless English. Travelling by road several hours north of Qingdao, we visited the fruit processing plant of HengRun Foodstuffs based in the city of Laiyang.

I was interested again in their fruit processing capability and ultimately seeing where their fruit was sourced from and how it was handled. In common with previous processors, the standards exhibited within the factory were again exceptional, with state of the art facilities for produce handling and storage. The plant also had an impressive laboratory for quality assurance. Amongst other things they had the ability to undertake their own residue testing via an impressive (and very expensive) piece of Siemens technology.

Travelling on from the factory to the fields (a drive of some 45 minutes from the city) took us through some heavily cultivated agricultural areas. The lasting impression one develops is of the enormous disparity between the pace of change and progressiveness of the cities by comparison with a very underdeveloped rural economy. Mechanisation on farms was basic with only the very simplest of machinery in evidence.

During my travels I did not see any truly large scale areas of production. The average farm size in China is 2mu (1mu=0.06ha or 0.16acres), the size of some of the larger consolidated blocks which I saw averaged 40-50 acres, the largest I saw throughout my time was 150 acres. It appears to be an enormous logistical challenge for growers to

consolidate large enough blocks of land for meaningful volume production. It necessitates many different farmers (perhaps hundreds) agreeing to the same terms and conditions and can take years to set up in the first instance.

The farms supplying the HengRun factory were no different being small in scale and disparate. Due to the time pressures and the distances involved I only had the opportunity to visit one of their farms. As I was visiting at the end of October (late autumn) harvest was well finished with next year's crop relatively recently established. Beds were on 1.5 metre centres with 2 rows per bed. Soils were tending towards a clay loam and were prone to capping – a problem compounded by the extensive use of flood irrigation. The plants themselves were a combination of “Allstar” and Senga Sengana, while only relatively recently planted, the plant material looked very clean – and I was advised that the site was organic. Average crown size was small at around 8mm and, uniformity of planting across the field was poor with many gaps.

- **Yongchang Food Group, Liayang.**

This is another processor based in Liayang several hours from Qingdao. My host on this occasion was Jin Ou-Yang of SVZ Ltd once again well educated, enthusiastic and forward looking. The Yongchang Food Group was established in 1988 as a joint venture with foreign investors. The business is currently valued in excess of £18 million with a workforce of over 3200 employees. The plant had multiple food preparation capabilities including IQF, washing, blanching, steaming, frying, seasoning and mixing across a range of close to 100 different fruits and vegetables.

As I was now coming to expect, standards within the factory were exceptionally high with what was beginning to appear as the prerequisite laboratory in place and all analysis and residue testing done in house. While the set up was impressive, one was left wondering how objective they could ever be residue testing their own fruit.

Towards the end of October 2006, literally a week before I travelled to China, the European Commission levied an import tax on Chinese IQF strawberries of over 34% largely on the back of Polish complaints of the European market being flooded with below cost Chinese fruit. During my visits this was understandably causing great concern for many of the Chinese processors, which they referred to as the EU “Anti-dumping tax”. Uniquely however, Yongchang had escaped these sanctions as a result of an EU audit process where they were able to prove that no produce had been sold to Europe below the cost of production. They were therefore in a strong position relative to the competition domestically and were understandably pleased with their situation and the unhindered run it gave them at the European market.

Collectively the factory had close to 4500mu (300ha's) of strawberries being grown for them within a 150km radius of the factory. I was advised that yields were generally low at 5 tonnes/ha (330kg/mu) and that grower's returns were in the region of £200/tonne (£1000/ha). The predominant varieties grown for the factory were “Allstar”, American 6 and American 13. Once again as I visited late in the season I could only view newly planted crops which looked clean but as before small and patchy; the ground was again suffering badly from capping as a result of flood irrigation.

- **Dragons Garden – Yifengdian**

Travelling again from Qingdao towards Jinmo City, Yifengdian village is home to the Dragons Garden Factory. Run by Kirby Wang as part of a joint venture with David Berry of Berry Ltd in Wales. The business is very different in that it is truly vertically integrated with farms and factory all directly under Kirby's control.

Kirby was a gracious host and enormously enthusiastic. His mind-set was different to all of the people who had chaperoned me previously – more western looking and particularly on farm he was keen to push the traditional boundaries, trying new crops and growing techniques.

In contrast to all the other businesses I visited, Kirby had put the horse before the cart. Having first established his crops, Kirby then set about finding a factory in which to process them. His factory in Yifengdian village was older than the others which I visited but still managed to produce IQF fruit to a high standard, as ever their HACCP, ISO and Kosher Certificates were all in place. Capability within the factory included IQF, sugar packs, slicing, dicing and puréeing.

In field what was refreshing about Dragons Gardens operation was their approach to production. They had moved away from the traditional flat-bed flood irrigated system that was prevalent elsewhere and were attempting to adopt a raised bed trickle irrigated system similar to a more western approach. While the execution of this system was perhaps not quite as it should have been one could not fail to empathise with Kirby's entrepreneurial spirit, particularly given the more typical Chinese preference for not raising their heads above the parapet.

Uniquely, Kirby had established leases on some larger tracts of land and was directly providing labour and management for this land ensuring that he had a guaranteed supply come harvest. In addition to the cultural innovations which he had initiated, he had introduced new crops to the area including raspberries, blueberries and blackberries as well as a wider range of strawberry varieties. He had also established a couple of what are now certified organic blocks. On visiting these the sceptic in me wondered how organic they really were, but (wearing as I was on that occasion a light coloured shirt) a cloud of ladybirds landing on me (quite literally in their thousands) provided pretty convincing evidence that perhaps things were as they professed to be.

- **Jiaxing Tomco Ltd – Qingdao**

As with previous factories visited, this was again a fruit processing plant of the highest order and working to the very best standards, as ever all the prerequisite bits of certification were in place and proudly displayed for all to see.

Shanghai

The low point of my travels came during my last three days in China which were spent in Shanghai. I had been advised prior to my trip that Shanghai was a “must see” and at the end of a fairly intensive trip it seemed a good place to finish.

Not being a lover of cities at the best of times, two days in Shanghai was a test of endurance, one certainly not to be repeated. The unceasing smog while I was there really drove home just how badly polluted the country was as a whole. Development there continued unabated with cranes ever-present and new high-rise buildings in construction around every corner. The sheer volume of people within the city had to be seen to be believed, the sight of 4 pedestrian attendants present at every crossroads simply for the purpose of directing human traffic (this was in addition to pedestrian traffic lights) was extraordinary. The whole experience was overpowering and having seen all the prerequisite tourist sights I couldn't get out of the city fast enough.

3. New Zealand

The contrast between China and New Zealand could not have been greater. Flying from Shanghai to Wellington, I arrived late on a blustery spring evening. The following morning I headed straight for the inter-island ferry and was on my way to Picton on the South Island. The sense of relief travelling up the Marlborough Sound towards Picton having escaped the mass of humanity and pollution in Shanghai was enormous.

I have yet to come across anyone who has a negative word to say about New Zealand. It is a magnificent country, with beautiful countryside throughout, a pure and unspoiled atmosphere and a very welcoming population.

As I hope will become apparent, I was struck with the thoroughly positive attitude which I encountered almost universally. Our mind set in the UK with regard to our production and marketing is very much inward looking, we are very good at griping about the problems which we face supplying the supermarkets which are on our doorstep. Try adding all the problems which we face to the logistics of shipping your produce 11,500 miles or nearly 19,000 kilometres around the globe and then we really would have something to worry about. With an indigenous population of only just over 4 million people, any New Zealand growers with grand ambitions have to look further afield if they want to grow their businesses.

It is typical of New Zealanders however, not to expend energy worrying about what might have been but to channel their energies on what they can do to provide the best produce they can, in the best condition, in the right place and on time. Their mind-set is entirely different, they are totally outward looking and this really galvanises their thought processes. Imagine shipping a large proportion of your harvest to the other side of the world (incurring all the associated costs to get it there) only to have it rejected – what do you do, dump it on the wholesale market for little money or ship it back again only to

dump on the domestic market back home? You do the only thing you sensibly can and get your offering right first time – this requires an extraordinary understanding of your business and the highest degree of attention to detail along all areas of the production chain to ensure your produce landed in the UK is the very best – even better than domestic offerings.

Most people are well aware of the impact which the loss of all agricultural support had on the wider agricultural industry in New Zealand in the 1980s. At the time it was considered a disaster – one from which the industry might never recover. Looking back at this stage it could be seen as the making of an industry. While it undoubtedly drove some inefficient farmers out of business, it was ultimately the making of many more. There has been much consolidation and up-scaling of business and it has resulted in much more efficient and focussed entities.

The question of how China is viewed within New Zealand is an interesting one. I had chosen to visit both New Zealand and Australia because I believed that, due to their closer proximity to China, they were further advanced in their trading relationship with China than those of us in the UK. This indeed proved to be the case and while the general opinion of those I visited was that China for them was an enormous opportunity, various parts of the fresh produce industry have seen directly the consequences of China flexing its economic muscle. In particular the domestic broccoli and garlic industries in New Zealand had been virtually wiped out in the mid 1990's by the availability of bottom dollar Chinese produce. However, more recently there has been the beginnings of a revival in domestic garlic and broccoli production. There was also a suggestion that as general affluence was increasing back in China producers there were beginning to focus again on the opportunities within their domestic markets.

Nelson

- **Julian Raine – Wai-West Horticulture Ltd**

Wai-West manage over 700 acres of apples, berry-fruit, grapes, kiwi and hops. Employing 20 permanent staff and up to 300 seasonal staff they are based in the Waimea plains, just south of Nelson city (towards the north of the South Island). Nelson and its environs are famed for their mild Mediterranean type climate and enjoy in excess of 2,500 sunshine hours (the most of anywhere in New Zealand) each year. This coupled with its mild winters represents one of its key advantages for pip fruit production.

First impressions are everything and while it may be an oversimplification, generally when you walk into a farm and it looks right – it is right. Wai-West was no exception. One knew with confidence that things were done well throughout its operations and that this was a successful business.

Their cropping included Boysenberries; although originally discovered in California, over half the world's production is now grown in and around Nelson. Wai-West's production is sold for processing either block frozen, IQF or as a concentrate. Their kiwi fruit production, of which Nelson is the most southerly growing area in New Zealand, is all sold to export markets. Apples are predominantly sold for export with smaller quantities going to the domestic market and for processing.

While operational standards were exceptionally high throughout the business it was in their apple production that the greatest innovation was apparent. All new orchards were established on M9 rootstocks and with a focus on new club varieties such as Jazz™ and Tentation®. There was a move with these varieties towards maintaining smaller trees, closely spaced and thoroughly supported. The predominant tree spacing was 3.5m x 1m on a post and wire system with the first wire at 1 meter off the ground supporting a sprinkler line, the second wire was at 1.5m and subsequently there were up to 5 more wires at 50 cm spacing's. Any branches that were not tied on to support wires were tied down below 45° to suppress growth and facilitate excellent light penetration. Heavy crop thinning was undertaken particularly in early years to help quick and thorough establishment of the orchard.

Wai-West Horticulture was an exceptional business and one which served to bring home to me how a large part of the recipe for success is by simply having a thoroughly positive outlook and paying the greatest possible attention to detail at every level.



Julian Raine, Wai-West Ltd – Nelson, November 2006

Moving further afield within the Nelson area I spent a little time with Richard Palmer – General Manager of Saxton Fruit and Freshco Nelson. Saxton Fruit was the grower owned packhouse operation while Freshco Nelson is predominantly an Apple and Pear marketing and supply company, owned by growers and their export partner Freshco Ltd whose head office is based in Auckland. Working in close partnership with its growers, Freshco select, pack and store fruit to meet market demand. New Zealand's export marketing opportunities were liberalised following the break up of ENZAS' monopoly. Freshco Ltd was one of the first to capitalise on this opportunity and appeared to be thriving as a result.

- **Dr John Palmer – HortResearch, Nelson.**

Travelling north east from Nelson brought me to Motueka, home of HortResearch Nelson. There I met Dr John Palmer, formerly of East Malling in Kent. Dr John quickly brought me up to speed on the many climatic advantages which the area enjoyed – 2,500 sunshine hours, 1,350mm annual rainfall, peak summer temperatures which seldom exceed 28°C and a relative lack of frost during flowering. One constant challenge for growers however was hail, a phenomenon the results of which I managed to see while in the region. Much work appears to have been done in the area to address the challenge through the use of netting, the bulk I saw being of a garish red colour. I was advised that not only did the netting protect the fruit from hail but had an added benefit of increasing the temperature underneath by up to 3°C as well as providing a stable environment in the process. Much of the netting prevalent in the area would seem to have been constructed on old hop-training posts and wires. As with the use of Spanish tunnels in this country the benefits from the use of hail-netting were significant, the most striking example which I was given being on Comice Pears where it had the potential to increase C1 packout from 50t/ha to 90t/ha.

Dr John went on to talk about the healthy state of the research industry within New Zealand and mentioned Feijoas, a crop heretofore unknown to me as an up and coming fruit crop. Feijoas (also known as Pineapple Guava or Guavasteen) are ellipsoid in shape, about the size of a chicken's egg with a sweet aromatic flavour. Apparently they have already been grown in the UK as far north as Western Scotland.



Feijoas – whole and cut
Source: Wikipedia.org

Hawkes Bay – Auckland

- **Dr Stuart Tustin, HortResearch, Havelock North**

From Nelson I travelled back to the North Island. Heading as I was for Auckland, a brief stop off in Hawkes Bay presented the opportunity to catch up with Dr Stuart Tustin, the science leader in fruit crop physiology.

HortResearch is a Government owned research institution. It is expected to successfully commercialise its research outputs through to formation of collaborations with industry. HortResearch is interesting in that it integrates traditional horticultural science with new genomic approaches for the sustainable delivery of fruit and fruit derived products. They

have always been at the forefront of an industry which had developed from an export value £30 million in 1980 to over £600 million in 2003. (HortResearch. 2007). Further discussion with Dr Tustin clarified that while up to 50% of the organisations funding comes directly from Government, a further 15% comes from commercialisation of research findings with the remaining 35% coming directly from industry.

While Dr Tustin took me through a wide ranging discussion on the state of the fruit industry generally within New Zealand, he also introduced me to the concepts of nutrigenomics and nutraceuticals or, in short, functional foods for health – both of these require Nuffield studies in their own right (indeed Geraint Hughes from Wales has done just that this year) so I don't propose to go into further detail here. What it did serve to highlight, however, was the scope of the work they were doing at HortResearch and the much longer term view which they appeared to be taking with much of it.

- **Greig Taylor – Freshco, Auckland**

Based in Auckland but with collaborative partnerships throughout the country, Freshco was founded in 1989 by John Mangan and Greig Taylor with the express aim of “providing fresh New Zealand produce to world markets and building sustainable, ongoing, long term relationships with key customers”. Freshco's growth has been stimulated particularly in recent years by the disbanding of ENZA which was considered top heavy and resulted in a lack of competition. They have also attempted to maintain a strong focus on organic and have been instrumental in establishing organic focus blocks to encourage and secure organic research for the future.

In much the same vein Freshco have also been pioneers in the development of Greengro™ “a proprietary, multi-level, agronomy and food safety programme”. In addition to maintaining the base standards of EUREPGAP as well as customer specific standards, essentially Greengro™ is about incorporating sustainable growing with reduced chemical inputs and a nil detectable residue target. The idea of nil detectable residues is now gaining rapid momentum in the UK; interestingly, the whole concept and much of its development has been born out of Julian Raines Nuffield Study in 1996.

Greig ran me through the current position of the various export markets and how they were viewed within New Zealand. Broadly, due to bio-security concerns Australia was currently a closed market to New Zealand fruit but one which they saw as having enormous potential. More recently there have been ongoing legal wranglings between the Australians and New Zealanders on trade liberalisation with the Australians continuing to use bio-security as a trade barrier. Elsewhere, the North American market is a challenge due to the ready availability of cheap competition from South America. Continental Europe was difficult due to the many different language barriers but the UK was a substantial market with a strong retail focus and premium prices for a quality offering – the UK currently represented up to 30% of their sales. Japan was the other significant market, geographically easy to access and with a strong quality focus but price pressure in part due to cheaper Chinese competition. Given the increasing affluence of consumers in China, Freshco viewed it as a substantial opportunity and were unconcerned about a threat from Chinese fruit to their domestic market.

- **Francie Perry - Perry's Berries, Auckland**

Perry's Berries are the largest Strawberry growers in New Zealand. Based close to Auckland in Onehunga they grow a mix of Pajaro and Camarosa for both the domestic and export markets. They remained unconcerned about imported Chinese strawberries reaching the domestic markets, predominantly due to their lack of cool chain infrastructure and their consequent inability to land fruit into New Zealand in a fit state for the demands of the domestic market. Conversely they saw China as large potential export opportunity.

4. Australia

Travelling on to Australia, I was expecting to hear much the same optimism and enthusiasm as I had come across in New Zealand and was very surprised by contrast to find (particularly in the case of top fruit) a demoralised and inward looking industry, all the more so for what we characteristically regard as the Australian's brash, "never say die" attitude. I am mindful though that as I make this generalisation, there were also several notable exceptions.

Australia's problems seem to lie squarely at the door of their bio-security laws which have bred an enormous degree of complacency and inefficiency into their industry. It appeared to me that the lack of competition on their markets had stifled innovation and that many businesses had stagnated as a result. While I had been forcefully struck in New Zealand at how outward and forward looking growers were, I was similarly taken aback at how inward looking Australian growers were.

Western Australia

- **Various Growers – Nr Donnybrook**

Driving several hours south of Perth, I spent a couple of days in and around Donnybrook. Seventy percent of the apple production in the area is based around Pink Lady and Red Delicious grown on an open Tatura training system. Because of its closer proximity to the Asian markets relative to the rest of Australia, it should have a strong competitive advantage. The growers I met were disillusioned at the current position of the industry and none was replanting, choosing instead to focus their energies elsewhere.

While bearing no direct relationship to my study, one of the defining moments on my travels was an afternoon and evening spent with Peter Rose. Peter was a Nuffield scholar from 1965 and was farming potatoes, lucerne, beef and sheep. Having lost his wife in the mid 1990s he had redoubled his efforts on farm and had in the space of 10 years doubled the size of his operation (in the process adding many thousands of additional acres to his holding), he was rightfully delighted that he would have cleared all debts relating to this expansion by the end of 2006. He really brought home to me the

old cliché that it really is never too late to get on and do something if your mind-set is right and you are prepared to work hard and more importantly work smart.

- **Terry Hill – Horticultural Director, WA Dept of Agriculture and Food**

My conversation with Terry Hill focussed specifically on China which he viewed as a short to medium term threat but much more of a long term opportunity. He pointed to recent problems which the Japanese have had with Chinese fruit and veg exceeding mrl's (minimum acceptable residue levels). He also believed that while fresh produce is a relatively new departure for the Chinese, they were for many crops currently in a "honeymoon period" regarding pest and disease pressures, this being a position that could and would only deteriorate. He acknowledged the damage which imports of carrots, cauliflowers and garlic in particular had done to the Australian markets in recent years with Chinese produce often being as low as a third of the cost of domestic produce! However, he also explained that this had created a backlash within Australia with various growers' organisations developing successful "buy Western Australian first" advertising campaigns.

- **Alan Hill – Western Australian Fruit Growers Association.**

Alan took me through the Western Australian market and reinforced the message that no apples and pears are imported to the state due to stringent bio-security laws. The position is more relaxed with stone fruit, imports being permitted from the Eastern States and New Zealand. He identified a lack of Government funding for research and development, a general lack of vision within the wider industry and distortions which had been created within the market through the advent of large poorly run corporate investment projects (specifically in apples) which had swamped markets with large quantities of poor quality fruit and depressed prices for all as a consequence.

Due to its relative geographical isolation, the soft-fruit industry in Western Australia was small and tended to be centred close to Perth, home to the larger part of the population.

Victoria

- **Pickworth Orchards Pty – Stuart Pickworth, Tatura**

Stopping as I did only fleetingly in Victoria I was fortunate to grab a couple of hours with Stuart Pickworth, Managing Director of Pickworth Orchards Pty, a long established family business. With a business based mainly around apples and cherries, the mood was decidedly more upbeat here than I had come across in Western Australia even if many of the same challenges prevailed.

Pickworth Orchards was a long established business which had its roots in processing, operating as it did in and around SPC Ardmona (a subsidiary of Coca-Cola Amatil) one of the largest deciduous fruit processors in the southern hemisphere. In its earlier years Pickworth Orchards produced over 85% of its fruit for processing and only 15% for fresh; today the balance is 8% for processing and 92% for fresh. They were farming over 210ha's of tree fruit.

The industry generally within the area has seen a fair degree of consolidation within both growing and packing with much of the historical processing now being outsourced to Thailand. Stuart made reference again to the lack of funding for R&D from the Government, which is a gap now in part beginning to be bridged through grower funding. To this end, Stuart was a past Chairman of AFFCO – The Australian Fresh Fruit Company, founded in the late 1990s it is a comprehensive network of nurserymen, growers, packers, storage units, distributors, industry associations and interested groups who gather for the sharing of information and advancement of the industry. In 2000 its members were estimated to have a combined turnover of close to AU\$3 billion.

While in Tatura – home of the Tatura Trellis system (“V” trellis or Australian “V”), which appears omnipresent in Australia (across a broad range of tree fruits) a brief word on it is perhaps appropriate.

Developed at the Tatura irrigation research institute in 1973 it was specifically developed to produce early and high yields without the use of dwarf rootstocks and to facilitate greater ease of mechanisation. Rows are orientated North-South and are typically 2 meters between the tops of the trellises in adjoining rows (4.5-6 meters centre to centre). They are maintained at a height of 3 meters with the “V” typically started at 45cm. Spacing between plants in the row is 1-2 meters depending on scion/rootstock vigour and soil type. The system has been used successfully with peaches, nectarines, apples, pears, plums, apricots, cherries, grapes and kiwi fruit. The very nature of the system means that it is geared towards older production systems with more vigorous rootstocks and in many respects its prevalence still in Australia points to the lack of innovation from which the industry there has now suffered for a number of years.



Tatura training system in Apples - Western Australia, November 2006.

South Australia

- **The Smart Group – Brendon & Damien Smart, Victor Harbour and Keith**

Led by Brendon and his sons Damien and Ryan, the Smart Group is a diversified family business which includes broad acre arable, livestock, irrigated pasture, wine grapes and production. They are geographically spread throughout South Australia with the grape and wine production centred in the Hindmarsh Valley (near Victor Harbour), to the South of McLaren Vale. The remainder of the business is based near Keith, a quiet rural town about 3.5 hours south east of Victor Harbour.

Brendon has been very much a pioneer within the agricultural industry in creating a corporate structure for his business, a move which he describes as a revelation. Frustrated by continual and high staff turnover, he describes his epiphany as the realisation that this was not everyone else's fault but his! To address the issues he had identified he set about establishing a formal board structure for his business which included several paid non-executive members. This was the start and his philosophy now revolves around empowering those within his business to take on as much responsibility as they feel they can either handle or want – he will in turn give them every support they need. The effect on his businesses has been dramatic with staff turnover virtually eliminated and individual units performing more strongly than ever before.

Brendon was an impressive character in every sense, and I find writing about him now that it is impossible to do him the justice he deserves. He will be well known within Nuffield circles following his time as Chairman of Nuffield Australia, this is however only one of his many interests and public positions. Brendon is a formidable personality, one who has left a lasting impression on me.

Damien, Brendon's oldest son and a 2007 Australian scholar was an equally formidable character. With responsibility for the business' Keith operations, he was an innovator in irrigation and spent several hours taking me around Akeringa station where I saw extensive networks of flood irrigation, innovation in centre-pivot irrigation including ongoing trials with different nozzle technologies. Most interesting, however, was the installation of a 40ha block of state of the art sub surface drip irrigation for Lucerne production. Drip lines were installed throughout the block at a depth of 30cm and at 60cm intervals. The cost of installing the system was about AU\$6,000/ha. There have been many benefits to the system including increased yields of up to 20% and a saving of up to 200 labour hours over conventional flood irrigation in the course of a season. However the greatest benefit was the saving of total water used per hectare, this reduced from 11.4mgl with flood to 3.6mgl with the trickle system, a saving of close to 70%. In the current climate within Australia this represented an enormous leap forward for the industry.

- **Kym Green – Ellimatta Orchards, Lenswood**

Perhaps the most surreal and thought provoking trip of all my travels, I visited Kym Green on a strong recommendation from Brendon Smart and wasn't disappointed.

Ellimatta Orchards is a family run business of which Kym is second generation. Unconventional and pioneering perhaps sum him and his approach to farming up best. As the originator of the **KGB** (Kym Green Bush) system for cherry production he has since written and lectured extensively around the world on its effective application.

The KGB system is essentially a modified "Spanish Bush". Because of the general prevalence of poorer soils in Australia, vigorous root-stocks such as mazzard or colt are most common. The problem with the Spanish bush system was that it was too complicated (and by extension expensive) to manage. The KGB system is essentially therefore a simplification of this. Tree spacings tend to be at 4-4.5m between rows with 2-2.5m in row giving a plant density of between 900-1250 trees/ha. Mature tree height is limited to 3.5m allowing the bulk of the picking to be done from the ground. The system is developed by cutting the main trunk back and subsequently cutting back each scaffold limb four times over the first two years with the intention of developing a bush type tree with 25-30 limbs. Once mature, annual pruning consists of removing 2-4 of the largest limbs within the tree leaving a stump from which new replacement limbs develop. The process of limb removal continually cycles the fruiting wood within the tree. (ISHS. 2007).



Kym Green – Lenswood, December 2006

While the KGB was one of Kym's earlier innovations, more recently he eschewed much of conventional production's wisdom and embarked on an alternative route. While not certified as an organic producer (indeed he was still using a small number of key chemicals) he is heading much more in the direction of a bio-dynamic system.

Kym introduced me to “Radionics” a system heretofore unknown to me. The Radionics association describe Radionics as “a method of sending precisely defined healing energy to people, animals or plants, no matter where they are in the world. The name reflects the view of early practitioners that they were ‘broadcasting’ healing, but we now believe that radionic treatment occurs at a level of reality where there is no distance between us. This is a challenging concept, but it is entirely compatible with modern physics and also with the ancient mystic teaching that at some level we are all one, and that at this level exchanges of healing energy can occur”. It’s a far out concept to try and get one’s head around particularly so having seen it in “practice”. Twelve months down the line from my visit I am still taken aback by what I saw and unsure whether it is a plausible system. If it is, it turns much of what we know and practice as an industry on its head. As I have already said on another occasion in this report, delving deeper is a Nuffield study in its own right. Ultimately the crops I saw in Kym’s fields were of the highest quality and yields were as good as he had ever achieved conventionally but with much lower input costs. As is so often the case the economics speak for themselves and it is hard to argue against the numbers!

- **Hillside Farm – Brenton Sherry, McLaren Flat**

The last of my visits within Australia took me to Brenton Sherry’s strawberry farm near McLaren Vale. It was a well run tidy operation using single row raised beds at 75cm centres with plants close in the row at 27cm giving an overall planting density of 50,000/ha. At an average yield of 1.5kg/plant this equated to a yield of class 1 fruit per hectare of over 75 tonnes, or over 600 tonnes per season from his 8 hectare block.

By comparison with the UK returns were excellent with prices averaging around AU\$9/kg over the course of the season. All production was based on Camarosa. What struck me on this farm was not in production but in the packing of fruit. In the field fruit was picked into large (500gr) returnable field punnets which, once rapid chilled in the packhouse, were turned out loose onto a belt where they were individually sorted, size graded and packed into a final punnet for sale. We are often hard on ourselves in the UK and think that others do things better or are more efficient, but in this instance I could not get (and still can’t) my head around how inefficient the whole packing system appeared. I was only left to conclude that they were making too much money not to have to worry!

5. Chile

Having covered China, New Zealand and Australia on the first leg of my trip, I travelled to Chile as a second independent leg in early 2007, arriving in late February essentially just at the end of their blueberry harvest and early into their apple harvest.

Geographically Chile is an extraordinary country being 24 times longer at 4270km than it is wide at an average of 177km. This presents logistical nightmares for those administering the country but climatically presents many opportunities spanning as it does three distinct climatic zones from the Atacama Desert in the north to a Mediterranean climate in the middle and moist temperate in the south.

From a fruit farming perspective Chile has several advantages including low labour costs at £1.00/hr inclusive of all taxes and health insurance, opposing seasonality with the northern hemisphere, high sunshine hours, a generally dry climate in the main temperate fruit production areas but with plentiful access to water for irrigation. While the availability of labour has historically never been a problem, this has started to become more problematic in recent years and the unions are now agitating for higher wages.

- **Vital Berry Marketing S.A. (VBM), Santiago.**

This was established in 1989 by six raspberry growers with the intention of growing, packing and shipping the highest quality raspberries to their customers. Following its initial success with raspberries it quickly added the full range of berry fruits to its portfolio. Today about 25% of all its requirements still come from its own shareholders. Because of Chile's great length VBM has growers spread over 1500kms, they are in a position to offer a broad range of fruits over an extended harvest season. The geography of the country is such that with the protection of the Andes to the east and the coastal range and Pacific ocean to the west that it has remained relatively free of many pest and disease issues. VBM also enjoys substantial interests in Argentina with the company now having about a 24% share of the Argentinean blueberry market. They currently export all their fruit to markets in Europe, Asia and North America. Unconcerned by the prospects of imports from China due to their lack of cold chain infrastructure, they saw them longer term as much more of an opportunity. Enrique Acevedo, VBM's Research and Development manager was kind enough to arrange some interesting farm visits.

- **Cristian Vicencio – El Colorado**

El Colorado was a small town several hours' drive to the south of Santiago. The farming operations were substantial with close to 380ha of intensive fruit production. The split on farm was 30ha of blueberries, cherries and wine grapes respectively with the remaining 290ha split between apples and pears. The apple production was centred on Fuji, Royal Gala, Pink Lady, Braeburn and Red Chief – a variety grown specifically for the Middle Eastern market because of its visual appeal and vivid colouring.

Seeing Fuji in production once again was interesting, the tree health was certainly much higher than those I had seen in China but the detail required in production was of a similar magnitude. Once again all the fruit had been bagged to ensure uniform and thorough colouration and interestingly I saw first hand the use of silver foil under the trees to help maintain the highest possible light levels. Both of these can be seen in the photo below although in this case the silver foil has been pulled back under the trees as harvest was imminent. All fruit grown on farm was destined for export.



“Bagged” Fuji –El Colorado, March 2007

- **Gaston Meynet – Los Angeles**

This was a 150ha unit of blueberries and cherries both for fresh export and raspberries for IQF. Production standards in the raspberries were poor and reflected their targeted processing market. Both the blueberries and the cherries were grown to a high standard. In recent years there has been an enormous expansion in the area of blueberries grown in Chile (mirroring trends and demand elsewhere). While soils are very often not immediately suitable for blueberry production with lower pH's, the use of deep man made beds with soil and sawdust mixes finished with sawdust on top seems to be mainstream. Application rates for saw-dust of 500m³ a hectare were not unusual.

- **Ramon Jorquera (VBM) – San Jose Farms**

Established in 1990, producing blueberries, raspberries, blackberries and redcurrants, San Jose Farms is one of the oldest blueberry producers in Chile with a total fruit production area of some 90ha. It was an impressive operation, immaculately run and producing fruit to the very highest standards and, as with previous farms visited, all geared towards the export market.

- **San Clemente – Felipe Hughes, Santiago.**

The final stop on my trip took me to the head office of San Clemente a fresh fruit export business operating out of Santiago. Felipe took me through a broad ranging discussion on the current state of play within the industry and their views on China.

Founded in 1983 with an initial 100ha of orchards growing apples, table grapes, Clementine's and cherries and a turnover of just US\$800k, today the business's turnover exceeds US\$35million – impressive growth by any measure. The company currently exports to more than 40 countries and has a supply base of some 1500ha. Its largest export markets included the UK, Europe, US, Canada, Latin America and Asia including China.

San Clemente did not see China as a threat either domestically or in most of their export markets. Quite the contrary in fact, as they were actively establishing supply bases in both Hong Kong and Shanghai with an eye to further cementing their activities within China. They identified a lack of detailed knowledge and infrastructure for fruit storage as one of the biggest issues facing the Chinese, thus providing San Clemente with a supply opportunity.

This and other export opportunities, coupled with the ability to grow high yielding crops of the best quality and at relatively low cost have seen Chilean export markets grow dramatically in recent years. There has however also been a lot of consolidation and rationalisation domestically among exporters. In the mid 1990s there were 60 export companies, today there are 15. A lack of investment in research and development was identified as the single biggest challenge for the future of the fruit industry – a common theme in so many of the countries I had visited.

6. Conclusions

As I have already alluded to throughout this report, China is a big subject to take on. Perhaps if I knew then what I know now I might not have been so brave or foolhardy in the first instance. Nonetheless the damage is done and I must now try to clarify my various thoughts.

Looking to China as a threat one can only conclude that they have virtually unlimited potential to distort and upset any market they choose to enter – this is clearly evidenced with what happened in various areas of the vegetable industry in both Australia and New Zealand. Furthermore the pace at which they can move is staggering; as an example over three hundred regional airports have been built in the last 10 years. Enter any Chinese city and the speed and scale of change is all too apparent. Labour is both exceptionally cheap and plentiful, an enormous fillip for a fruit industry in any country. Many of the fruit processing businesses I visited were world class and may point the way of things to come from the wider industry.

However, if one starts to look at the other side of the equation the waters begin to muddy. China is currently undergoing mass transmigration from the countryside to the cities. Where once people had a subsistence existence and could feed themselves, they now need their food produced for them. Add to this the generally improving affluence of the people and their ever increasing aspirations for previously unaffordable food commodities based on animal protein, dairy and a wider range of fresh fruit and vegetables. While the urban economy is growing at a staggering rate, the rural economy is not. A lack of general infrastructure (roads, power, water) compounded specifically with a lack of cold-chain infrastructure and the long distances to packhouses and ports will continue to make it difficult for the fresh fruit industry to provide goods to the UK in an acceptable condition. Distance from our market is another concern though not insurmountable. My belief is that we are often distrustful of the Chinese in the western world and that as our confidence continues to be undermined through unfolding stories about antibiotics in Chinese honey, lead paint on children's toys, counterfeit drugs etc, these can only continue to fuel our fears further. Another issue which may serve to undermine producer confidence within China (while protecting European markets) is the levying of import tariffs. Neither must we lose sight of the general antipathy towards China's record on human rights and environmental destruction and pollution.

Looking at the opportunities, these also come on two levels. Firstly there is an obvious opportunity to supply knowledge, technology and expertise. The danger being that having improved standards therein they will come back and use this as a stick with which to beat us. Language however will always present a significant barrier when dealing with the Chinese, though never insurmountable. There are probably opportunities for western companies to invest in farming businesses in China and to take a lead in developing the industry, while I saw one small scale fruit farming joint venture; I did not see any large scale operations. I did anecdotally hear of several within the vegetable industry who had tried but were finding the business environment extremely challenging.

The second opportunity on which I would pin a greater degree of emphasis relates to the current changes within our consumers and markets. Moves towards locally sourced, low

carbon, fresh/healthy and generally ethically produced, traceable food all serve our purpose well and are an opportunity on which our industry is capitalising now and must continue to do so.

If pushed to summarise my thoughts into a single paragraph, I would suggest that short to medium term (5-10years) we can be relaxed about China and its impact on our fruit industry – indeed I see many opportunities ahead and am optimistic in the light of current trends. Longer term, however, I think we ignore China at our peril. We can see all too readily how if they turn their attentions to an issue or problem they can be single minded in their determination to succeed. Also I think our current perceptions will change; 30 years ago the phrase “Jap crap” was common place, today their goods are highly regarded and they are revered as the gurus of manufacturing.

7. Reflections

As I conclude my report, the would-be 2008 scholars are currently undergoing their interviews and it is therefore 24 months since I was lucky enough to embark on my study.

While the last two years have inevitably gone by all too quickly, they have also been the most exciting, jam packed and rewarding of my life. When I was awarded my scholarship the timing was not ideal (it never is though), I still had six months left to go on an MBA I was completing and a 20,000 word dissertation looming. My wife was 3 months pregnant with our second child (our first son William being only 12 months old) and work was extremely busy. Coincidental with being awarded my bursary I was appointed as a Director of Thursday Cottage Ltd (a subsidiary of Wilkin & Sons Ltd).

I am still unsure how we muddled through but some how we did and it has all been the greatest fun. Thomas our second son was born in May 2006, I graduated with my MBA in September 2006. I started my travels in October 2006, finished them in 2007, and somehow made it through my presentation at the annual conference in November 2007. Finally, to cap it all off I have just learned that in June of this year (2008) I am to be appointed to the main board of Wilkin & Sons Ltd.

It has been busy but it has been enormous fun. I cannot stress strongly enough to anyone who may be even vaguely contemplating applying for Nuffield (or knows of someone who should) what a magnificent opportunity it is to meet some of the most inspirational people you may ever come across, to see places you may otherwise never make it to, and generally to achieve things you never imagined possible. I now look forward to the many challenges ahead at work with a renewed confidence, enthusiasm and desire to succeed. I hope also to have every opportunity to put back into our industry some of the faith which has been shown in me by the Worshipful Company of Fruiterers.

I hope that more generally from an industry perspective that there will be something of interest in here for everyone, if my conclusions on China are not as clear cut as some

may have liked, I hope that the different elements of the equation will at least provide some pause for thought and discussion.

My Nuffield study and travels being ended I now look forward with enthusiasm to the start of a life-long Nuffield journey.

Christopher Newenham, January 2008.

8. Acknowledgements

This work has been facilitated on so many different levels by many people. I have attempted to summarise below who has helped where but needless to say this list is not definitive.

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UK

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Cristian Vicencio – El Colorado
Gaston Meynet – Los Angeles
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