A Nuffield Farming Scholarships Trust Report

Award sponsored by

Worshipful Company of Fruiterers and The Food Chain

Realising the potential of UK apples and pears

James Smith

July 2017
NUFFIELD FARMING SCHOLARSHIPS TRUST (UK)

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A Nuffield (UK) Farming Scholarships Trust Report

Date of report: July 2017

Title Realising the potential of UK apples and pears

Scholar James Smith

Sponsor Worshipful Company of Fruiterers and The Food Chain

Objectives of Study Tour To understand the constraints to profitability in the UK for apple and pear growers by looking at markets, supply chains, production methods overseas. To develop a set of criteria for success for the UK grower. To determine how a medium size grower (without sufficient scale to integrate fully, or small enough to be nimble) can prosper in the UK market place.

Countries Visited France, Holland, UK, Australia, Tasmania, New Zealand

Messages
- Invest in continuous improvement in good and bad years
- Strive to access new markets
- Be at the forefront of genetic varietal development to meet changing market demands
- Understand your market and develop strong relationships to own the supply chain
- Seek reward for investment in reducing volatility for retailers
- Look after soils and produce the healthiest food possible
EXECUTIVE SUMMARY

The UK fresh produce market place is stagnant and burdened by regulation. Moreover, increasing retail space per capita and the subsequent deflation in food prices is putting increasing pressure on UK producers who face rising costs as well as increased risks of climate change, political instability, litigation and bureaucracy.

This study has been undertaken to see how producers elsewhere in the world are rising to these challenges and to see how they view the UK market as historic suppliers to it. From this will come some indication as to how growers in the UK can adapt and meet these challenges. There is no question that there are profitable companies in the UK but it is the smaller growers, who cannot run packhouses or transport companies, that need to adapt in order to prosper.

Typically growers in the UK have enjoyed something of a growers’ charter where they grow what THEY think is best and deliver it to the market to get it sold for a profitable return. This no longer the case and a higher degree of market focus is needed. Many farming companies realise this and drive efficiencies through vertical integration, using scale, and focus on the market through retailer partnerships. Meanwhile a large number of smaller growers are not in a position to do this themselves. Some are small enough to be nimble, close to their consumers and can make it work this way but many fall between the two: too big to be nimble and too small to benefit from scale in order to invest in the supply chain and to face retailers through direct supply models. How do these businesses re-create themselves to adapt to the 21st century UK produce sector?

The success of many other producing countries is driven by multiple markets and the ability to sell the whole crop. In the UK the industry struggles to export any meaningful volumes and thus relies entirely on the domestic market. The UK retailers are world leaders in understanding their consumers and have identified what drives sales of apples and pears. Neat, convenient packs of fruit at a set price appear to sell best as the consumer knows what they are getting; waste levels are low and it is easy to manage promotional activity. The problem for the grower is that apples are not always the same shape, size or colour so getting a one-size-fits-all pack right is very challenging. There’s no question that consumers thrive on convenience and like to know what they’re getting but, for the producer, selling by pack has its challenges as pack weight can vary resulting in varying price per kg back to the farm. Understanding this is vital to the supply chain when negotiating prices.

The grower is the first link of the supply chain, NOT the supplier into it, therefore efficiencies have to start on the farm. The competitive nature of the UK retail sector means that price pressure will not go away and in order to profit from fruit growing, those doing it must understand their cost of production to the last penny. They must commit to forward thinking, dynamic supply chains by being the foundations on which the latter are built. While the climate in the UK is marginal for apple and pear production and yields are limited, lessons can be learned from all around the world as to how one can make the best of what the UK has.
# Contents

EXECUTIVE SUMMARY .................................................................................................................................

1. Introduction ........................................................................................................................................... 1

2. Background to my study ....................................................................................................................... 2

3. Where did I go and why? ....................................................................................................................... 3

4. Climate change and fruit production around the world ........................................................................... 5

5. The power of the brand ........................................................................................................................ 7

6. Perception of the UK market ............................................................................................................... 8

7. Yield. What’s possible? .......................................................................................................................... 10

8. Labour supply ...................................................................................................................................... 14

9. Discussion ............................................................................................................................................ 15
   9.1 Summarising ................................................................................................................................... 16

10. Conclusions ......................................................................................................................................... 18

11. Recommendations ............................................................................................................................. 19

12. What’s next? ....................................................................................................................................... 20

Acknowledgements and thanks .................................................................................................................. 23
DISCLAIMER

The opinions expressed in this report are my own and not necessarily those of the Nuffield Farming Scholarships Trust, or of my sponsor, or of any other sponsoring body.

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Nuffield Farming Scholars are available to speak to NFU Branches, Agricultural Discussion Groups and similar organisations
1. Introduction

As a fifth generation fruit grower in West Kent I have been working on the family farm since 2002. Prior to that I worked as a technical manager for a fruit importer mainly working on avocados from around the world. This involved working with UK retailers as well as packers, exporters and growers in countries such as South Africa, Kenya and Mexico in addition to those closer to home in Spain and Israel. It was an interesting time in my career and gave me invaluable experience to bring back to the family farming business. After staying in touch with my father over recent years, in 2002 we had a conversation around his thoughts for the business as he reached 65 and if I would like to be involved. It meant leaving my job with all the perks of international travel and meeting interesting people all over the world to help him run the farms and develop new ways of doing things. After some consideration I agreed to join him and started work part time for a year as I trained a replacement at my previous job.

My education had been at local schools then on to Reading University where I studied Crop Science Bsc leaving with a 2:1. Looking back now at how I regarded subjects such as entomology and soil science I wished I had the foresight to realise how crucial they would be in my future career. Needless to say I didn’t, and it’s only with the benefit of hindsight that I see the error of my ways. Now, as a grower, there is nothing more important than your soil, and the pests that we have to deal with need understanding as pesticides are fewer and further between.

I live on the farm with my wife Helena and son Theo who was born right in the middle of the Contemporary Scholar’s Conference in Cavan, Ireland. His arrival cut short my conference as I headed home, only to miss his arrival by 8 minutes! As I write this he is now nearly 18 months old and changing by the day. Whether he decides to be a farmer or not we shall see but things will be very different for his generation compared to mine. Now in my 40s my outlook is certainly different and this study has been a real eye opener putting my life and work into perspective.
2. Background to my study

I have considered applying for a Nuffield Farming Scholarship for many years because of the global perspective and contacts it would bring to my business, but have always struggled to come up with the precise subject that I felt really strongly about. I needed to feel strongly enough that it would enable me to answer questions about my farm, my career and what the future might look like: one that was important enough for me to dedicate plenty of time to it and which would be meaningful for me and my business.

When I first gave it some thought I decided to look at the role of the grower in the supply chain (I hear groans as the word sustainable is just around the corner). I have been involved with producer organisations since 2006 and have invested a lot of time and energy trying to get growers together to collaborate and benefit from joint efforts, with varying success. More recently I have been part of a venture to bring three businesses together to form a single part grower-owned marketing company to supply a major UK retailer. This is now in its third year of supply and working well.

Alongside these industry-focussed efforts we have invested a significant amount of money in new orchards, controlled atmosphere cold stores, renewable energy, an irrigation reservoir and new varieties. Despite all my efforts, since poor weather and low yields in 2013 and the Russian embargo in 2014, the farm has been losing money. Young orchards have failed due to canker, prices have collapsed, a number of new varieties are not succeeding and it has become difficult to see how to improve the situation. What is clear is that the rest of the supply chain is irrelevant in the absence of profitable farms.

The title is ambiguous for good reason. I wanted to have the freedom to investigate all areas of fruit growing, supply and retail. This is risky as you can be too vague but as my work involves all areas I wanted to leave no stone unturned. As a result this is a broad study rather than an in-depth technical one, but one that I hope will help growers make decisions about their future.

I have embarked on this study to find ways of making money out of the apples I grow and to attempt to validate my efforts in getting growers together and rationalising the supply chain to UK retailers. At the outset, I assumed that growers would be on top of production techniques and that I would focus on supply chain models: this was naïve. If I quote myself that the grower is the foundation of the chain and not a supplier to it then production techniques are fundamental to success. For UK growers to profit with commodity prices then they have to optimise production of fruit that the market wants. In danger of ending my report before it has started the following chapters will address these issues.
3. Where did I go and why?

I travelled to Western Australia, Victoria Australia, Tasmania and New Zealand on my main tour. I also visited businesses in France, Holland and the UK to look at issues around my topic.

Australia is the home of Pink Lady, the strongest apple brand in the world. Western Australia is largely self-sufficient in fresh produce and views “imports” as anything from outside WA let alone other countries. Victoria is a large producer of apples and pears and is where a fellow 2016 Scholar lives and works. Mitch Mcnab is similar to me in that he is working with his father and trying to modernise their fruit growing operation. I met Mitch at the Contemporary Scholar’s Conference and visiting this area made sense. Not only do they produce a lot of apples and pears in Australia they also have to contend with climatic extremes of heat and very high water demands.

When travelling around Australia I was told a number of times of a couple of very influential growers in Tasmania. Tim Reid, fifth generation apple grower now growing cherries for export and Howard Hansen an entrepreneurial apple and cherry grower who were worth meeting up with. Having a relatively relaxed itinerary can be challenging when you are on the other side of the world but it also allows you to be flexible so at the last minute I managed to line up meetings with these people and booked some flights to Hobart. To see how someone has identified a necessary change in his business and seen it through was well worth the visit to Tasmania.

New Zealand has always been held up as the place to see first class apple production and, despite being in the country no less than 3 times before, I had never stopped to look at apples and pears. I had always been on holiday on previous occasions and the last thing on my mind had been work. This time it was all about apples and I visited both islands looking at how they are driving yield and quality and what is making the industry such a global success in 2017.
My trip was designed around visiting Western Australia, a country which, like the UK, exports very little and supplies everything into the domestic market and is seeing increasing import pressure. Not only that, but the retail environment is changing with the arrival of Aldi and one or two other discounters now on the high street.

I went from there to the other extreme: the export-focussed professionalism of New Zealand, long time suppliers to the UK and now enjoying a period of success with huge efforts made into opening up markets in Asia. Their focus is moving away from traditional markets in northwest Europe to the growing economies in Asia, closer to home and prepared to pay well for good fruit.

*See table below which gives a summary of my travels.*

<table>
<thead>
<tr>
<th>Country</th>
<th>Month/year</th>
<th>Reason for choosing this country</th>
</tr>
</thead>
<tbody>
<tr>
<td>Holland</td>
<td>August 2016</td>
<td>Visit to research station to look at trials on apple and pear production</td>
</tr>
<tr>
<td>Australia</td>
<td></td>
<td><strong>Western Australia</strong> for similarities to the UK and climate change impact.</td>
</tr>
<tr>
<td>Tasmania</td>
<td></td>
<td><strong>Victoria</strong> for apple and pear production, focussing on export to WA and abroad, and moving away from traditional processing markets.</td>
</tr>
<tr>
<td>New Zealand</td>
<td>All visited during February and March 2017</td>
<td><strong>Tasmania</strong> for apple production and export cherry as a move away from apples.</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>New Zealand</strong> as world leaders in apple and pear production</td>
</tr>
</tbody>
</table>
4. Climate change and fruit production around the world

Among fruit growers and farmers of most descriptions, the biggest topic of conversation is the weather. It’s hardly surprising as few industries are so reliant on the sun, rain and temperature to ensure a successful year. In the UK, weather patterns have been changing, winters are getting wetter and milder, spring temperatures less consistent, summer rain events more severe and periods of cold weather arrive when the sun is needed. This affects plants in a number of ways, some immediately obvious, while others manifest themselves in subsequent years. This represents increased risks for growers as yield and quality are all affected when the weather goes wrong.

The UK is not alone. In Western Australia the traditional growing areas for Pink Lady are moving south as average temperatures rise and fruit fails to colour up to the variety standard. Very little Pink Lady is grown in Donnybrook now and production is moving south of the Manjimup. Even there, growers are looking to alternative products such as avocados as apple production becomes increasingly problematic. Warm nights and even hotter days mean that clones of Gala and Pink Lady no longer perform as they did, and the market is only after high colour apples. (See figure 5, left). This fruit was expensive as it was early Gala but it doesn’t eat well and will affect later sales of fruit as consumers have poor eating experiences. Not only are temperatures changing the nature of the fruit produced, the extreme heat during the day also causes problems of sun scorch. Many new orchards in the area now have shade netting which also helps to keep out parrots and parakeets, which have a penchant for eating the fruit. The reflective film shown in the picture (figure 6 on next page) is a common way for growers to try and improve colour but it’s really temperatures that are the problem rather than light. As these conditions make apple production harder, avocados are now a major area of growth in WA. With prices in the region of AUD 5 (GBP 2.95 at today’s exchange rate) per kg avocado growing looks good. Compare this to AUD 0.65 (GBP 0.38) per kg for apples then it is no surprise that growers are investing in other crops away from apples.

With dry conditions the water demand for apples and pears is very high across the country with various schemes in place - from private investment in winter-filled reservoirs to government-owned irrigation schemes such as the one in the Goulburn Valley in Victoria north of Melbourne. Here land

Figure 5: Gala apples in Perth central market. Poor colour caused by warm nights

Realising the potential of UK apples and pears by James Smith
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owners and water users can buy water, and trade allocations on the open market. Water is used for irrigating crops as well as for cooling during periods of hot weather so high volumes are used at certain times. Despite the cost of the water there are periods when a huge amount is lost through excessive use, poor infrastructure and relatively little soil moisture measurement. In hot dry years the cost of water can be prohibitively expensive.

In New Zealand the effects of climate change are similar to the UK. They are not as far south as the UK is north and so enjoy more hours of sunlight by comparison (2400-3000h per year in NZ compared to 1600-2000 in the UK). Weather has always been a challenge in New Zealand with violent storms often hitting fruit growing parts of the country. A huge storm hit Hawkes Bay in 1994 that is still talked about, and again violent storms hit in March 2017 although this time most of the harvest was over. Variable climate, warm winters and generally rising temperatures are the theme wherever you go. Many growers are adapting, some are holding on and trying to exit the industry as returns slowly fall and others are being forced to change as banks back away from failing businesses.

Climate change is affecting the entire planet and, as growers, it is essential that means of adapting are found. This means either accepting that what used to work no longer does and change tactic such as the apple growers changing to avocados; or grow new, less temperature-sensitive varieties which colour and set fruit bud regardless of chill units or temperature differentials prior to harvest. It is not always easy to make the transition from one crop to another especially where perennial crops are concerned as they are long term investments and often start to fail mid way through their design life: which is why new crops, clones, and varieties must be considered well in advance of planting new orchards.
5. The power of the brand

Branding is hugely important in most aspects of business, and while the author of this report is no expert on this subject, it is interesting to see what has been done with the Pink Lady brand first developed in Western Australia in the 1970s by John Cripps. Cripps Pink (sold as Pink Lady if it meets high quality standards) is a cross between Golden Delicious and Lady Williams. The same breeding programme produced Cripps Red now sold as Sundowner. Interestingly the latter seems to be losing favour in Australia despite being a very good storing apple with great eating qualities. It is worth giving a closer look as to how one is a global brand achieving sustained high prices, and the other is falling from grace by comparison.

Pink Lady is grown under license in over 15 countries and managed closely by Apple and Pear Australia. It is not grown in the UK as it is deemed that the climate will not allow the variety to perform satisfactorily therefore a licence is not granted. Only countries with suitable climate are permitted to grow the apple, to ensure that strict quality parameters are met. There are few brands in fresh produce that get through to the shelves of UK retailers, who prefer “own branding” of fruit and veg. Pink Lady can’t be sold unless under its brand. The quantity of trees is controlled to prevent over-supply situations occurring so prices are kept high by matching supply to demand. Many new varieties have struggled to match this and as a result have struggled to gain market share; not because they are poor varieties but they have not been managed in a way that enables them to create demand and compete with other apple varieties as well as other fruit and vegetables. Kanzi and Jazz are good examples of strong brands and, although behind Pink Lady in terms of age, they are building a following and are closely managed.

Consumers will reward quality with loyalty and growers will pay for good brand management but somewhere in the middle some enlightened business acumen is required.

Gala is one of the most popular varieties around the world now and when it is good it takes some beating. Consumers will reward quality with loyalty and growers will pay for good brand management but somewhere in the middle some enlightened business acumen is required. Surely the industry in the UK needs a good variety for all, not a few disparate ones owned by marketing companies in an attempt to gain market share.
6. Perception of the UK market

For producers in the UK there is significant pressure from imported produce, not only apples and pears but every other line of fruit from grapes to citrus. This, combined with total reliance on selling into the domestic market, makes things challenging. Conversely it can be said that UJK producers are in a strong position, being located in their market with minimal transport costs and without immediate neighbours selling in to it.

Historically the UK had less retailers competing for consumers than Germany or Holland but, with the advent of the discounters who have moved over from northern Europe, the situation has changed. Price pressure is high and demands for quality more so. The UK was the main market when Pink Lady came about and exports from Western Australia were grown on the back of the UK market. The same could be said for the reliance of New Zealand on the UK with Gala and Braeburn exports building their industry.

In the 21st century however things look different. The demands for quality are higher than ever and standards in terms of food safety and ethical trade make supplying this market very difficult. Many people in Australia and New Zealand alike remember when the Commonwealth was a trading community and when the UK entered the European Union in 1973 it all but turned its back on its Commonwealth partners in terms of trade. It is surprising that this is still a consideration and now, in light of the UK moving to leave the EU, will the Commonwealth become important again?

It is unlikely, as other members such as New Zealand and Australia have long since looked elsewhere for strong trade relationships. Asia is providing this as they take more and more produce. Indeed Asia’s demands are high but then so are the prices they are willing to pay. In Asia, as people become more affluent, they up-trade in their food purchasing and continue to spend over 30% of their income on it. In western Europe it is widely reported that as affluence increases the percentage spend on food falls, with 10% a common figure.

There is a culture of cheap food in the UK which is putting exporters off as the costs of supply are not matched by healthy returns. Supplying Asia is by no means easy but the rewards are significant if standards are met. in the UK high standards are pre-requisite and returns are constantly low in comparison to other markets. It is no surprise then that the significance of the UK for fruit growers in the southern hemisphere is dwindling. Some packers and exporters still focus on it with dedicated routes of supply to major retailers but in general much less fruit is sailing to northern Europe.

When discussing the apple market with growers in Western Australia it is clear that the UK has a very sophisticated and competitive retail sector which is driving a number of changes that are only just beginning there. Discounter chains and high levels of consumer analysis is putting increasing pressure on producers as pack types and quality specifications get ever tighter to maximise sales. This is not such a problem for supply chains with multiple markets but those without are facing tighter and tighter...
margins and very little value in fruit that does not hit the right parameters. High levels of prepacked fruit and very few loose sales are supposed to be driving sales or enabling apples to compete for shelf space. Growers who are growing by weight but whose fruit is sold by count or pack need a different approach as retailers are rarely able to be flexible in their sales strategies. Consumers in the UK appear to demand single prices for packs so they know what they are getting and for how much. This means the grower has to focus from the outset on how their fruit is sold and aim to hit these criteria. It is by no means simple and when the UK situation was described to an Australian grower and packer they were horrified and expressed concern as to how a UK grower can make a living.

This represents an opportunity for UK growers to continue to replace imported fruit with well stored, home grown fruit, but is only possible if supply chains work together to ensure that prices are adequate for the investment needed. Long term storage of produce manipulates prices and tends to distort the market so very clear plans need to be agreed to make it work. Apples and pears are relatively low value and due to the extended marketing window it is easy for prices to be below the true cost of production leaving no money for re-investment.

The question is: can the UK grower adapt to prosper in this environment or will they simply look for other products to grow due to the issues discussed?
7. Yield. What’s possible?

Discussions around yield happen wherever crops are grown and it is no different in the UK. When growing commodities it’s all about tonnes per hectare and the same can be said for apples. The difference for fresh produce is the quality that is produced and picked. With wheat, the basic parameters are disease, protein levels and moisture content. The latter can be dealt with through drying but the others are what determine the quality and associated price bracket for that wheat. Keep the crop clean, hit the right protein parameters and the rest is yield.

With apples for fresh produce it is very different as it’s all about eating quality so the parameters are visual, physical, and chemical. The apple (depending on variety) must have the right level of colour, the right level of soluble solids (BRIX), adequate firmness, minimal chemical residues, no pest damage, no bruising and good eating qualities - often determined by just a few people.

The challenge is how can all of these parameters be met when the value of the product is relatively low? The answer is yield of class 1 product per hectare, yield of anything else is a loss. Prices are unlikely to increase, rewards for quality do not exist in the general market place as the bar has been raised so that the norm is now higher than ever before. There is less and less value in second class fruit due to a situation of over supply.

In 2004 New Zealand produced its largest crop ever with 13500 ha of apple production hitting an average of 41t/ha. 84% of the crop went to the EU and the US and Braeburn averaged NZD 9 a carton.

In 2017 the area in production has dropped to 9500 ha but the average yield has increased to 61t/ha. Now only 50% of the production goes to the EU and US and 50% is focussed on Asia. So 2004 produced 594,500 tonnes of fruit from 13500 ha and in the 2017 the industry has produced 579,500 tonnes from 9500 ha.

See chart on next page.
The numbers are significant:

- there are fewer growers as those who were failing stopped growing fruit due to unsustainable losses
- land has been lost to other crops such as grapes and stone fruit
- those that have remained have increased yield per ha by 50%
- Access into new markets has seen prices rise from NZD 9 to as high as NZD 54 for new varieties such as Envy
- The industry has consolidated, improved and become more professional

New Zealand has been at the forefront of apple growing for many years and has been through good and bad times. It is encouraging to see real prosperity from fruit growing and the level of re-investment to push things forward for the next 10 years. For an industry to increase productivity by over 50% and open up new markets alongside the advent of very good new varieties is remarkable and the UK can learn a lot from it. It is asked why the southern hemisphere is relevant to the UK growers and the answer is only too obvious. Regardless of what is produced, the basics are the same: inputs, process, outputs and the market. To think that only one geographical area is relevant would be folly. New Zealand enjoys more sunlight at 41° south than the UK where we sit at 52° north and the soils are very fertile so the UK might not be able to match the numbers but the principle can be applied and huge improvements made.

Despite the incredible performance over the past 13 years the industry is not standing still as profits are invested in new systems of growing and new varieties that are aimed at meeting the needs of the Asian market. Apples such as Envy, Pacific Rose, Pacific Queen, Jazz, Kanzi and Pacific Beauty are all capable of high yields and are market-focussed. Production methods are being trialled to see what the next benchmark in yield is. The target is to move to 100t+ per hectare and there’s no reason why they
shouldn’t achieve it if the early indications are right. Continuous improvement is at the forefront of what they do and the results speak for themselves.

It is true that high yields can be achieved from traditional orchards with large trees and less capital investment but that only works for processing quality fruit now, which is very low value. Unless the whole process is mechanised and quality is not an issue then looking back to extensive plantations is not an option. Yield of class 1 starts with knowledge of the market, that drives decision making on variety selection, which in turn influences orchard designs, rootstock selection, site and soil type - before a tree is even planted. Relying on old orchards producing 50% of what the market wants will not work but is still going on in the UK today.

A single orchard in the Motueka region near Nelson growing Envy has produced 100 tonnes per hectare with an 80% pack out for export at NZD 48 per 18kg case. This equates to NZD 100,000 (GBP 56,559 at NZD 1.76 to the British pound) per hectare back to the farm. This might be exceptional but more and more growers using the right systems on the right soils with hail nets to protect the crop are achieving these numbers. The UK has good soils and yields of 70 tonnes per hectare are possible but much greater attention to detail is needed to make this consistent.

Where New Zealand enjoys an average of 2200 hours of sunlight a year compared to 1600 hours (Met Office Statistics) in Southern England it could be considered that the UK is only capable of 72% of the yields achieved down there. This means that as NZ aims for 100+ tonnes per hectare the UK should be aiming for an average of 70 tonnes per hectare. In 1990, 2237 hours of sunshine were recorded in Bognor Regis so it is possible and, with climate change, will the UK begin to get more sunlight? These are incredibly crude calculations with infinite variables involved when coming up with any kind of model, but crop production is simply harvesting sunlight so a crude use of this principle is a start.
With the concept of marketable yield in mind the grower is tasked with gaining a greater understanding of their market, their soils and their own ability to get the most out of a hectare of orchard. The market is unlikely to change out of sympathy for apple farmers so they need to adapt. It might mean that orchards grown in a particular area for the last 100 years are no longer viable as that soil and set of circumstances has hit a ceiling in terms of marketable yield. Perhaps new varieties won’t prosper there so the chances of success are extremely limited in the retail market. That said, if the grower has their own market for what they grow through a farm shop or local sales then small scale production could work.

This report however, is focussed on a national level and the future of the UK apple sector as a whole. The UK has relied on its own knowledge as well as that shared with other countries but research and development has been cut over the years so production levels are not increasing at a level shown by the New Zealanders. There is a limited amount of research going into new varieties and production methods but it tends to be disparate and not industry-wide and certainly not high on the government’s agenda. Some of the larger apple growing businesses are investing in their own projects to push forward but, on an industry level, the drive for continuous development is slow and unfocussed.

To change this needs political support which in the current climate might be difficult but, as the UK moves out of Europe, is the food production sector going to become more important rather than government relying on imported food?

The market is where the answers lie and it’s only by having a joined up industry that focusses on delivering what is required that an increase in marketable yield can be achieved.
8. Labour supply

Horticulture is typically dependent on labour for harvesting, packing and grading. Some of these operations can be mechanised to a certain extent but the need for people is not going to go away any time soon. Technology is a long way off commercial reality for key tasks. In the UK the industry used to rely on the Seasonal Agricultural Workers Scheme until it was decided that free movement of labour within the EU made it redundant. Now, as the UK looks to move out of the EU in an attempt to gain control of its borders, how will businesses harvest their crops and staff the packhouses?

The UK model tends to use labour from countries such as Romania and Bulgaria and farms offer on-site accommodation to keep a reliable source of labour on farm. Such accommodation is heavily regulated and the best farms that want to retain staff will offer high standards of accommodation, regular work and good pay.

In Australia and New Zealand the industry has been largely served by backpackers who are incentivised to work on farms in order to qualify for a visa extension for up to two years. Farms will provide campsites in some instances, or people come out each day from back-packer hostels to work on the farms. This is a very transient work force with people coming and going from day to day including supervisors who can also come and go as they please. Many of them are Europeans looking to earn some money to fund further travels and move from place to place. This would be unworkable in the UK and is becoming increasingly problematic in the Antipodean countries, and the pressure to meet increasing quality standards pushes back to the farms which need to harvest on time and with care to maintain quality. Schemes such as the Seasonal Worker Program are being set up to bring in workers from the Pacific Islands and Timor Leste to help provide employers with reliable labour where Australian labour is not available.

This is starting to work for some farms such as McNabs in Shepperton, VA, where a core team of Vanuatu workers has been working alongside backpackers to bring some stability to the work force. It is similar to the UK in 2003 where farms were using Eastern European workers as local labour became less reliable. Now farms in the UK are almost entirely reliant of migrant labour for horticultural work. It will be interesting to see if things move the same way elsewhere in the world.

With the changes afoot in the UK, labour is and will continue to be a major threat to the industry and regulated schemes will be needed to safeguard businesses.
9. Discussion

At the outset of this study the aim was to look into the role of the grower in the supply chain, in order to understand how they could influence or control a greater proportion of it through various activities. It assumed that production techniques and growing systems were a given as most growers still in business are at the top of their game. This was a mistake as what is clear is that the grower, as the first link of the supply chain, is entirely responsible for production of the right product which enables the whole system to function and there are many growers who are nowhere near the top of the game, perhaps their own, but not THE game. The questions raised over the past 18 months are numerous and should be given some consideration.

- Where is the right place to grow apples and pears?
- Is there a realistic chance of UK growers thriving in the current and future climate?
- How does the UK stop selling the belief that food is cheap?
- Does climate change spell the end of cheap food (and a lot of other things)?
- How do farmers restructure and move forward in the absence of capital?

The situation is difficult to put into a coherent set of words as there are so many variables at play. Is climate change, with the predicted warm winters, wet summers and cold springs, going to make apple growing impossible in the next 5 years? If so where do the apples come from, how are they produced and who’s going to do it? The availability of workers to get everything done is uncertain, as is the range of plant protection products that have been needed thus far to ensure consistent levels of production.

One has to assume that, on balance, apple production can be viable on the right soils and in the right parts of the UK and in the hands of the right people. A history of growing is not enough: skilled professionals are needed, and a recognition that the climate is changing must be acknowledged. Measures need to be taken to counter this through growing methods and only then will the industry still be here in 10 years. Does this mean that most growers should stop now? Should they look for alternatives as increasing risks outweigh the mediocre returns for apples and pears?

So what’s the incentive? The risks and threats are clear so what is the rationale for carrying on? If the average grower can get yields from 35 tonnes per hectare to 45 tonnes per hectare (30% increase) with an 80% class 1 sale volume and achieve GBP 450 per tonne back to the farm, then that equates to GBP 16,200 per hectare output. Take off growing costs including harvest, and gross margins of GBP 10,000 per hectare are achievable. Is this enough is the question and how does the grower make the transition from 35 to 45 tonnes? Inflation in food prices is happening in 2017 for the first time since...
2013, and retailers are starting to realise that they need good growers who can run profitable farms in order for them to have long term availability of good fruit.

The challenge for the UK grower is to form a plan around the next 10 years and try to iron out the ups and downs of farming in a volatile climate.

9.1 Summarising

There is no question that apple and pear production in the UK faces significant challenges and that growers are the only ones who can make the decisions necessary to deal with them.

This study was embarked upon to try and define the role of the grower in realising the potential for apple and pear production on home soil. Visiting growers, packers and exporters around the world, it is clear that the UK market is one of the most challenging as it is expensive to supply and the consumers do not value food highly. Every retailer is trying to find the best way to drive sales and give the shopper best value but this is increasing costs down the chain despite continuous attempts to cut direct costs. Reducing transport costs, reducing packing and grading costs, reducing packaging costs will drive sales.

These are all the targets set by retailers and those in the supply chain and the problem is that little consideration is given to the ability of the humble tree to produce exactly what the consumer wants. The tighter and tighter the specifications get and the more generic the product, the less engaged the consumer will be. It can already be seen that fewer and fewer varieties are grown as so many existing ones don’t hit the parameters being imposed by the retailers.

In order to succeed growers must produce apples that are 63-73mm in size, highly coloured, high in soluble solids, store well, yield well and taste nice. This is a big ask for a country where there is enormous variation in soil types, weather and skill.

So does the industry work towards a monochrome approach to apples in order to survive in a low price market which demands the best at the lowest possible price? The answer is no to that. The answer is to supply the market with high quality fruit and work closely with retailers and consumers so people are aware of what they are eating. The links between nutrition and human health are so strong that billions of pounds within the NHS could be saved by people eating more healthily; the government has to recognise that healthy food and a healthy population is the only way it will balance the books.

Realising the potential of UK apples and pears by James Smith
A Nuffield Farming Scholarships Trust report generously sponsored by The Worshipful Company of Fruiterers and The Food Chain
Take it one step further. Healthy food comes from healthy soil, healthy soil needs looking after and is the only way that carbon can be removed from the atmosphere and put back into the ground where it won’t contribute to global warming. We have a catastrophic imbalance of carbon between gaseous and tissue-based carbon. Organic matter has been lost from soils at an alarming rate and and previously stored carbon in fossil fuels is being burned, adding more carbon to the atmosphere.

This might seem like heading off on a tangent towards the end of this report but the author makes no apology. There is no potential for apples and pears or anything else if the world doesn’t wake up to the ticking clock that will stop when human life ceases on earth because humanity didn’t realise it was behaving like a plague species and using up all the resources around it before moving on. Humanity has nowhere to go and action has to start now on a global level.

Travelling around to see where is best to grow apples and to find out what can be learnt has shown that climate change is dramatic and real. February 2017 was the coldest and wettest in Perth WA but it also had some of the hottest weather in the same month. Pink Lady apples don’t go pink in Western Australia any more. Wildfires and searing temperatures in Victoria, hail storms and wet summers in New Zealand make those regions as problematic as the UK.

The ability of growers and farmers to feed the world goes hand in hand with improving soil health and sequesting carbon as fast as they can. They should be rewarded for good farming and soil health ahead of top quality produce and this has to be implemented around the world. Reward improving the planet and everything else will follow. Healthy planet, healthy soil, healthy food, healthy people: and after that look at packaging costs. It is easy to focus on the small efficiencies that make a few pounds difference and allow the retailer to sell for a few pence less but the big and urgent project is getting the planet back on an even keel.

The role of the grower is to work tirelessly to improve their soil and produce the healthiest food possible. The supply chains and markets will respond and better farm performance will follow. There needs to be no sacrifice in this. Farms will do better on the back of better food and and yields will increase. If one wants to increase yield look at your soil. Get that as strong as possible, then work out what rootstock works best, what apple tastes and looks the best and work with everybody involved to manage costs and deliver profit back to the farm. Reward best practice and it will come.

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10. Conclusions

1. Apple and pear production in the UK faces significant challenges. Growers are the only ones who can make the decisions necessary to deal with them.
2. For a grower there is nothing more important than the soil. To increase yields look at your soil.
3. Horticultural pests need fully understanding because pesticides to deal with them are fewer and further between.
4. The rest of the supply chain is irrelevant in the absence of profitable fruit farms.
5. Climate change is affecting the entire planet and means of adapting must be found.
6. Branding is very important and many growers are not prepared to pay for the marketing required.
7. The significance of the UK market for fruit growers in the southern hemisphere is dwindling.
8. The UK consumer increasingly wants to buy apples in pre-packs at a fixed price.
9. Yield of anything less than a Class I product generally makes a loss.
10. Labour availability is and will continue to be a major threat to the industry.
11. With regard to resources in general, humanity is rapidly using them up and not replacing them.
11. Recommendations

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<td>1.</td>
<td>Growers must focus from the outset on how their fruit will be sold: loose or in pre-packs</td>
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<td>2.</td>
<td>Supply chains must work together to ensure that prices are adequate for the investment needed in storage and packaging.</td>
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<td>3.</td>
<td>Growers must produce a higher percentage of Class I fruit. This starts with knowledge of the market, which drives variety selection, which influences orchard design, rootstock selection, site and soil type.</td>
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<td>4.</td>
<td>Industry bodies in the UK must continue to lobby government to ensure growers have the labour to harvest their crops in good time to meet market demands.</td>
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<td>5.</td>
<td>Growers, as the first link in the supply chain, must take responsibility for production of the right product which then enables the whole system to function.</td>
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<td>6.</td>
<td>Growers must supply the market with high quality fruit and work closely with retailers and consumers to make people aware of what they are eating.</td>
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<td>7.</td>
<td>Farmers must be rewarded for good soil health above all else.</td>
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12. What’s next?

Having seen some of the best apple production in the world and taken time out of my own business I have gained perspective as to how to take things forward with our own family farm, as well as how the UK apple and pear industry should do the same. There are many things that I have learnt along the way, from simple initiatives that I am implementing to longer term strategies that have fundamentally changed my approach to farming in the UK.

Grafting over of apple trees is not new but the techniques I saw in New Zealand, matched with the resolve to make swift concise decisions about varieties, were a lesson. I have a number of orchards which for one reason or another are the “wrong variety” and are not working. The decision has been made and in one case the orchard has already been grafted and the grafts are growing well. The spacing of the tree rows is not optimal but using a Tatura trellis design seen in Australia I can increase the cropping volume of the orchard to achieve higher yields than before. What was previously an under-performing processing orchard will be a profitable Gala orchard in two years. With the heavy soil on this farm establishment of new trees is a challenge but in this case the roots are already in place and by grafting I have utilised the engine room of the orchard and simply changed the variety grown. The costs are in the region of GBP 5,000 per hectare as opposed to GBP 25,000 to grub and replant. Not only do the sums add up in this case but I know the trees in the ground are healthy and the graft wood is clean so the risk of losing the orchard due to poor nursery stock is mitigated.

The Jonagold interstem will offer a degree of tolerance to canker and there is no need to grub up everything and start again. I have always been an advocate of grubbing and replanting but, where the trees are young but the variety is not profitable, grafting over is a very effective way of improving the situation. Each tree will now be trained in a V system with two cropping leaders per original tree and these will be trained along wires to maximise cropping.
volume. Clearly the UK does not enjoy the same levels of sunlight as Australia or New Zealand so the
V will be relatively open to maximise sunlight interception; 96% of the grafts have survived so it looks
promising.

A major part of my experience over the past two years as a Nuffield Farming Scholar has been that my
strategy for changing the business has been validated. I have learnt a lot of new things but it has been
rewarding to see that I was already heading in the right direction. I have a renewed focus on improving
yield of class 1 fruit from the existing orchards and changing any parts that aren’t working.

Time spent with Alex Turnbull in the Golbourne Valley was invaluable as he had been through my
situation in previous years and had restructured the business to produce more cherries and stone fruit
rather than relentlessly growing tonnes of apples that weren’t worth enough money. He is now
completely focussed on quality and innovative ways of increasing yields as well as growing other crops
to make the farm more resilient. His level of focus was impressive and the results spoke for
themselves. From this my focus is greater than ever before: if it’s not working, stop it. If it is working,
find out how to do it better and never stop looking for the next thing to achieve better performance.

It is clear that the industry in the UK has many
challenges from the climate to a culture of under-
valued food. The title of this report is “Realising
the potential of UK apples and pears” and I believe
I have made progress in understanding how this
can be achieved. Not only must growers work
closey with retailers and with each other to build
stronger supply chains but they need to
concentrate on getting everything right and not
rely on their own experience to date.

I am working closely with TESCO on their
sustainable farming group for top fruit as well as
attending TESCO supplier network events looking
at soil health. Looking after our soils has moved
right up to the top of my agenda as well as
continuing to diversify the business. I have a strong
recognition of my love of farming and if I can’t
make apples and pears work then I need to grow
something that does.

I have been growing apricots for a few years now
and they look likely to become a larger part of the business as well as cherries and asparagus. It seems
that I have been a reasonably large scale apple grower but have become caught in the middle ground
of insufficient scale to fully integrate, but too large to be nimble. I am looking to balance the business
with products that are harvested and sold during the year to become nimble in some areas while
ensuring the apple and pear part of the business is profitable. This is still the heart of the farm and will
continue to be but will become 60% of it rather than 95%. Supplying the UK consumer via strong,
transparent supply chains is the answer for apples and pears as well as stone fruit and work on this
will be ongoing. Alongside this the industry needs to continue to access new markets or find new ways of selling the whole crop for a profit. The risks are not going to go away and weather patterns will continue to threaten yields so at some point prices will rise to reflect the availability of crops. Volatility is going to increase and growers who can take steps to mitigate this and offer retailers consistent volumes of good quality will do well. Those who want to trade and take chances will find it increasingly difficult.

My impromptu visit to Tasmania was also a real eye opener. Tim Reid was very generous with his time and his story gave me a great deal to think about. A complete re-structure from apples to cherries for export is not likely for me but the drivers behind his decisions are the same. We can grow very good cherries in the UK and consumers love them. They crop in June and July so fit in well to my portfolio of crops. They have to be protected from the rain and spotted wing drosophila as well as badgers but, when they are, it is less stressful than watching storm clouds approach unprotected crops. With a diverse range of crops that need labour from April until November I plan to use this to attract labour to the farm as they will be able to have long periods of work with good conditions and regular pay, thus mitigating the risk of lack of labour.

As a result of this study I have a clearer view of the future for my business and how the industry needs to look in order to make the most of what it has. It has been very enlightening and I feel that my journey has only really just begun.

James Smith

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