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Farming Scholarships

Fresh Produce Excellence: Growing Our Share of the Value Chain

Written by:

John Gray NSch

December 2024

A NUFFIELD FARMING SCHOLARSHIPS REPORT

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EXECUTIVE SUMMARY

The UK berry sector is facing extremely challenges times. After many successful years over the past four years costs of production have increased by approx. 40% whilst at the same time output returns have increased by approx. 20% resulting in a significant margin gap. Consequently, we are starting to see some growers leave the sector. This is all the more frustrating given that berries, being a fantastically healthy product, are in demand.

My studies took me to the UK, the Netherlands, Norway, the US and Canada, Australia and New Zealand and South East Asia where I met breeders, growers and marketers with the aim of understanding 'how we as growers can increase our share of the value chain'. While the UK is often seen as one of the more advanced berry producers globally, with a sophisticated market, there are several lessons to be learnt from different approaches in other countries.

New techniques in breeding, namely molecular marker assisted breeding and gene editing are speeding up the development of new berry varieties. This is likely to bring benefits to growers in terms of higher yields and improved disease resistance which should allow for lower costs of production.

In the UK most berries are produced in polytunnels, a so called 'mid tech' system. In the Netherlands in particular the majority of berries are produced in more intensive glasshouse systems. These systems, whilst initially a lot more expensive, allow for large yields per hectare and should a cheaper source of energy be available, then these systems represent an opportunity to increase efficiencies and to extend the season of availability of UK berries. Arguably in the UK we have 'overengineered' our berry supply chain with too many check points in the process and there is an opportunity to go back to basics to get it right first time, thereby allowing for a reduction in cost without compromising the final product quality.

There are exciting and growing markets in other parts of the world such as the Middle East and South East Asia and, in the future, India. These countries have rapidly expanding middle classes who are prepared to pay the same or more than European consumers for berries and, due to their tropical climates, will import berries for many years to come. These markets represent an opportunity for UK growers to spread their risk and ultimately add more value to their businesses.

A recurring theme throughout my travels was the profound impact of investing in people. In New Zealand, the Māori saying, "What is the most important thing in the world? It is the people, it is the people, it is the people," resonated deeply. World-class individuals, when nurtured and empowered, drive businesses forward, fostering innovation and sustainable growth.

In summary, through my travels I have seen that there is potential for change and for growers to improve their share of the value chain and therefore I am optimistic for the future of UK berry production.



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All photos are the author's own unless otherwise stated.

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CHAPTER 1: PERSONAL INTRODUCTION



Figure 1: The author, John Gray.

I grew up on the family farm in Angus on the fertile east coast of Scotland. After studying agriculture at Edinburgh University, I spent five years living and working in Poland on a large-scale arable operation, mainly focussed on potatoes. It was in Poland that I started selling, in those days washed potatoes, to supermarkets, supplying the first Tesco store which opened in Wroclaw in 1998.

Having spent all my summers working on the family fruit farm and having a passion for being involved at all stages in the production and selling of berries, in 2003 I came back home and joined Angus Soft Fruits Limited, of which I am now the Managing Director where I lead a fantastic team of 80 berry specialists.

The business is involved throughout the berry supply chain, breeding new varieties, producing berries in the UK, Morocco and Chile, sourcing from

growers around the world and selling to retailers in the UK, Europe, South East Asia and the Middle East.

Additionally, I'm the vice Chairman of Ringlink, the UK's largest machinery ring, a cooperative which provides a range of services to its 3000 members.

I'm a lifelong learner and love travelling and visiting other businesses and hearing people's stories. I'm delighted to have been given this opportunity by Nuffield.

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CHAPTER 2: BACKGROUND TO MY STUDY SUBJECT

In 2019 berry growers were seeing their production costs increase significantly driven primarily by increasing labour costs which make up approx. 50% of these costs. At the same time market returns were fairly static and so margins were coming under pressure.

The graph below, reproduced from a slide presented by Henry Dimbleby at the 2019 Oxford Farming conference, shows that primary producers achieve by far the smallest ROCE (return on capital employed) when compared with other parts of the UK food chain, dropping to close to zero when the impact of subsidies is removed.

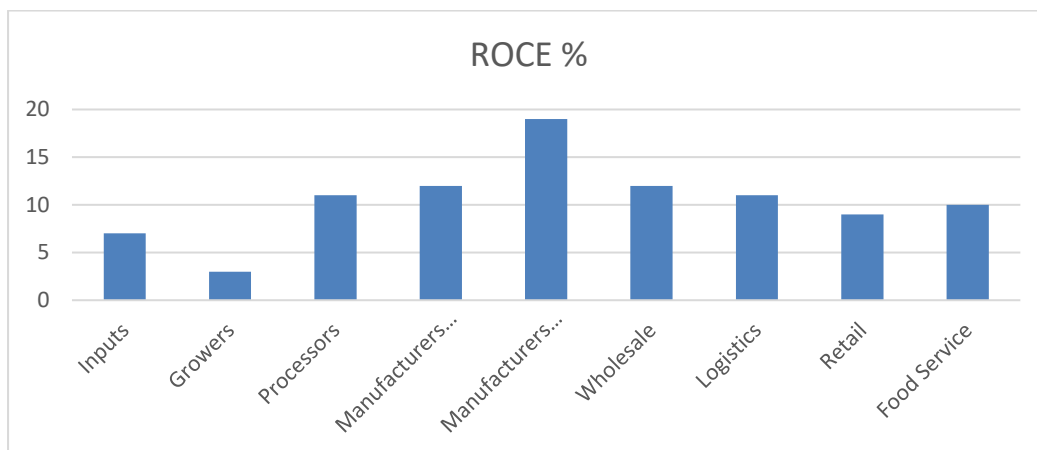


Figure 2: Adapted from slide presented by Henry Dimbleby at 2019 Oxford Farming Conference

As Baroness Boycott put it “Farmers get £9.2bn of the £113bn per year value of the agri food sector. Where does the other £100bn go? Packaging, marketing, processing... This is one of the great disconnections of our time.”

Primary producers who take by far most of the risk in our food chain are the least rewarded.

Fast forward four years and as many of us know costs of production have increased to another level. In the UK we estimate that the costs of berry production have increased by approx. 40% over the past four years whilst our output returns have increased by approx. 20% and therefore a significant gap exceeding any profit has arisen.

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The cost inflation figures shown in the graphic overleaf are taken from a recent report by the Global Coalition of Fresh Produce which is made up of fresh produce associations from across the world.

Their report concluded that less than half of fresh produce being sold globally is being sold at a profit, a frightening statistic.

SURVEY INTO GLOBAL PRODUCTION AND OPERATING COSTS AND PRICES FOR FRUITS AND VEGETABLES

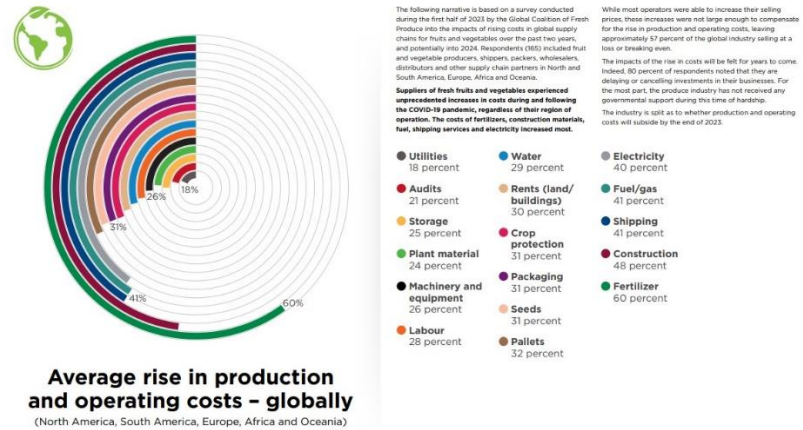


Figure 3: Global coalition of fresh Produce, Producer Costs & Prices – Survey report (Sep 2023)

Coupled with extreme weather impacting production volumes this is creating unprecedented supply chain strain and has rightly called into question the UK’s position on food security.

UK berry production has been hit by the majority of these factors. Whilst many such as electricity and shipping are showing signs of easing, most are not and the main driver of cost inflation in soft fruit - labour - will not reduce.

It is against this challenging background that I embarked upon my Nuffield adventure to study “how we as growers can increase our share of the value chain”.

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CHAPTER 3 – MY STUDY TOUR

The UK	Various points 2022-2024 (one week total)	Growers and berry breeders
Norway	May 2022 (one week)	Growers (berries, potatoes and lettuce) and retailers
Singapore & Thailand	September and November 2022 (two weeks)	Understanding how fresh produce is marketed internationally whilst attending trade shows
Australia & New Zealand	January 2023 (two weeks)	How growers and marketers operate from an export perspective – visited berry, kiwifruit and top fruit growers and breeders
The US & Canada	March 2023 (three weeks)	North American Strawberry Growers Association congress. Visited berry growers and breeders
The Netherlands	September 2023 (one week)	Visited Wageningen, tomato and berry growers and breeders

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CHAPTER 4 – THE ROLE OF BREEDING

4.1 The berry breeding industry

Globally, soft fruit is a fairly niche crop. Until the early 90s the majority of breeding programmes were undertaken by public bodies such as East Malling in Kent, the James Hutton Institute in Scotland and UC Davis and UC Florida in the US. Through the 2000s we have seen private programmes develop which are often aligned to routes to market, examples being Berryworld and Driscolls in the UK.

More recently we have started to see some 'corporatisation' of soft fruit breeding, examples being businesses such as the Spanish Planasa and more recently major players such as Bayer, who recently purchased the NIAB East Malling strawberry breeding programme and Rijks Zwaan. Such changes could be viewed as an opportunity, as more investment is likely to be made, however, at the same time, they could result in more of the benefits of breeding being retained at that stage of the chain.

Breeders target a range of traits including flavour, shelf life, yield and disease resistance.

The majority of current soft fruit varieties have been produced by experienced breeders, with a wealth of knowledge and an eye for detail, using traditional breeding techniques. This entails making crosses, producing large numbers of unique seedlings and then screening those seedlings laboriously over many years. It typically takes 10 years to develop a new soft fruit variety using traditional techniques.

4.2 Molecular breeding

In recent years we've seen an acceleration of so-called molecular breeding where DNA markers can be used to screen material before they become seedlings thus speeding up the selection process. A novel example is white pearl strawberries, bred by the University of Florida. While attending the NASGA (North American Strawberry Growers Association) conference, the breeder Vance Whitaker explained that they have identified a single gene controlling white colour. If they are targeting white strawberries, they can therefore screen seedlings at a very early stage and any not possessing the gene marker can be eliminated, thus speeding up the selection process.

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Figure 4: www.grocer.co.uk M&S launches White Pearl strawberries in first for UK high street on 18 January, 2023.

4.3 Berries from seed

Berry plants are almost exclusively propagated vegetatively. The majority of growers in the UK will import their plants from the Netherlands where there is a specialised propagation sector. Inconsistent quality of plant material is one of the most significant factors in variable yields in soft fruit. The concept of seed breeding and the resulting plants being grown from seed rather than vegetatively is not new. The concept is that traits can be fixed in a series of mother lines and when these are crossed the resulting seed is true to type, a so-called F1 hybrid. This is the norm for a lot of vegetable production. By removing much of the vegetative propagation process, plant consistency should be improved and it should remove significant cost from the process.

With established vegetable seed companies such as Rijk Zwaan and Bayer entering the sector, berry plants propagated from seed may be within reach in the years to come.

4.4 Gene editing

Gene editing allows plant breeders to make very precise changes to DNA. This typically looks to improve a beneficial trait or to deactivate an undesirable trait within a plant. This is fundamentally different to Genetically Modified in that no DNA from other species is introduced and therefore the change or edit as it is known could have happened naturally.

When in California I met a plant breeder from Pairwise, one of the first companies to utilise gene editing in plants, a process they term 'the seismic tweak'. They are able to improve flavour and yield, reshape plant architecture, adjust plant composition, create natural resistance and adapt plants for climate change. He

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explained that whereas traditional breeding starts with thousands of possibilities, in gene editing they start with one cell.

Gene edited produce is now a reality. Mustard greens have double the nutritional value of Romain lettuce however they have a bitter flavour. Pairwise have applied their 'seismic tweak' to edit out the bitterness. The resulting product will soon be marketed in the US under the brand name Conscious Greens.

Pairwise is already working on berries with the aim of gene editing out the seeds from blackberries. Another individual whom I met from a tomato business questioned the need for a calyx, which highlighted how gene editing has the potential to think right outside the box!

With the passing of the Genetic Technology (Precision Breeding) Act 2023, which allows the development and marketing of gene edited crops in England, we are well placed to be leading players in Europe using this exciting new technique.

A successful variety is the foundation. In the next chapter we will consider production systems.

4.5 Chapter summary

- Berry breeding is attracting the attention of corporates which may result in more value being retained by breeders
- More advanced breeding techniques, including molecular marker-assisted breeding and gene editing, will allow breeders to be more targeted which should result in more and faster gains in flavour, disease resistance and yield
- Propagation of berries by seed rather than vegetatively could improve plant quality and reduce costs



CHAPTER 5 – HOW WE PRODUCE BERRIES

5.1 Technology level

Technology level	Characteristics	Examples
Low	Unprotected soil systems	Scandinavia/ Germany/ US
Mid	Protected substrate systems	UK
High	Heated glasshouse systems	Netherlands
Ultra	Controlled Environment & Vertical systems	Middle East

In Scandinavia and a lot of Europe, for example Germany, and further east 'low tech' production still accounts for the majority of berry production. These systems still grow predominantly in the soil and are often unprotected. This is also the case in the US where almost all Californian soft fruit production is still in the soil and heavily reliant on soil fumigants. Pressure to reduce their usage may push the US to consider substrate and table top production, however most producers whom I visited were resistant to the idea even though horrendous spring rains in March 2023 had just washed out a significant percentage of soil crops.

5.2 Vertical farming

In recent years there has been much noise about vertical farming. Initially these businesses were focussed on leafy greens however several have started to look at berry production. I visited one business in the Netherlands which was growing coffee indoors!

As the graph overleaf shows, vertical farms have the potential to produce very high yields per ground area and to utilise resources such as water more efficiently than even glasshouse systems. However, the increase in energy costs has hit these businesses hard. Many are reliant on a significant premium for their products, the market for which is small. One systems expert commented that vertical will always be more expensive than ground-based systems so, unless you have extremely expensive land, or a very high value market, or an inhospitable climate, then I expect that these systems will remain niche and we may see more casualties.

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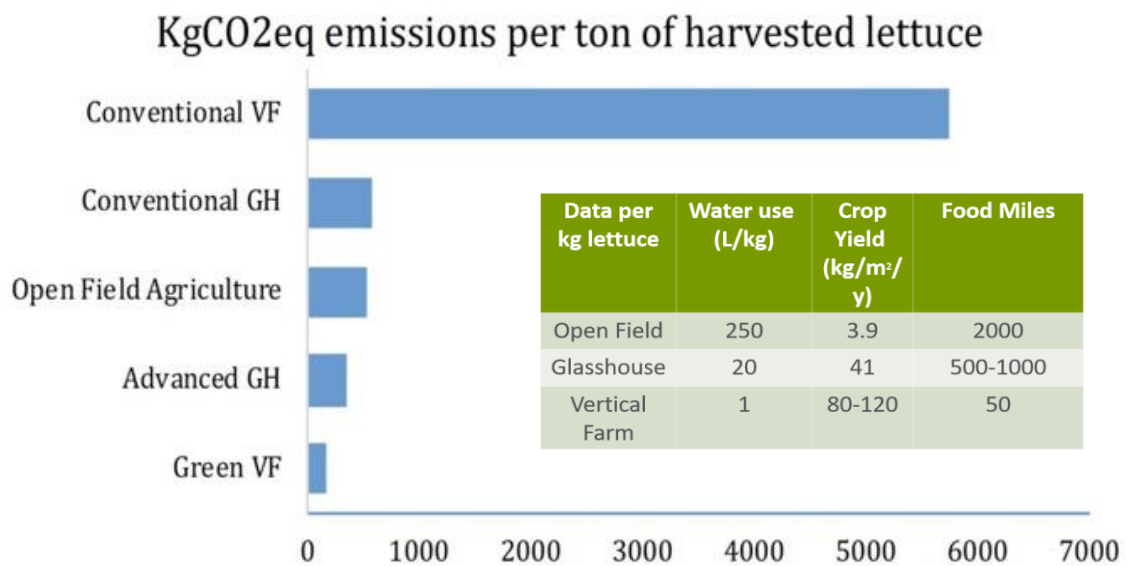


Figure 5: taken from presentation delivered by Derek Stewart, James Hutton Institute at Angus Soft Fruits Annual Conference , November 2022

5.3 Glasshouse production

Therefore, of more interest is the Netherlands where 60% of strawberries are produced under glass. Glasshouse production is a step-up in terms of levels of temperature and humidity control vs mid tech tunnelled systems which are common in the UK.

One person whom I met in the Netherlands posed the question ‘is the tomato grower of today the strawberry grower of tomorrow?’ His view was that strawberry production would intensify as was the case with tomato production.

Glasshouse systems allow significantly more control over the growing environment and increasingly we are seeing more sensors deployed to allow more data to be collected as outlined in the graphic below. I visited Let’s Grow BV who have developed a data visualisation platform. This allows tomato and strawberry growers to view lots of data through dashboards. It then allows scenario planning for future seasons. For example, you could model different growing strategies based on different market prices at different points in the season and differing costs of inputs such as energy production. Such scenario planning can allow the grower to maximise net return from their system.

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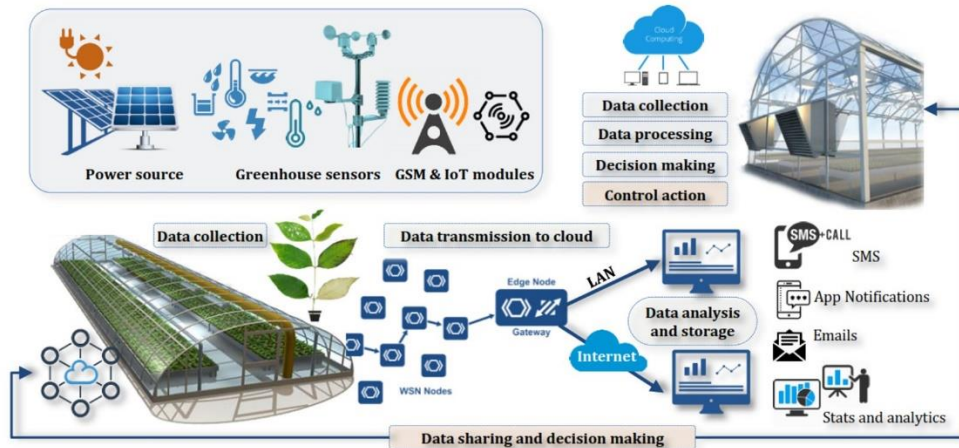


Figure 6: taken from presentation delivered by Derek Stewart, James Hutton Institute at Angus Soft Fruits Annual Conference , November 2022

5.4 Reimagining tomato production – combining breeding and production system

In the Netherlands I visited Certhon who design and build controlled environment systems all over the world. They have reimagined tomato production. Currently most tomatoes are grown over a 10-month period in labour intensive high wire systems shown on below. Working in collaboration with breeders, Certhon have developed a dwarf tomato variety where all the fruit ripens at the same time after 15 weeks. They envisage a system illustrated at the bottom of the page whereby sequential plantings allow consistent production. Rather than pickers moving through the crop, the crop moves as it develops to a single harvest point where it is envisaged that harvesting will be automated and therefore most of the production will be undertaken without the use of human labour.

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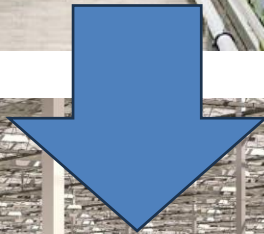


Figure 7: [Gronos for Tomatoes - Indoor Farming - Certhon](#)

We should also consider the opportunity to expand our self-sufficiency in UK produce. When you look at the top 10 importers of fruit and vegetables into the UK, you can see that the majority of produce by value comes from countries such as Spain, South Africa and the US where there are significant climate risks particularly in the case of water. In 2024, the Spanish authorities rationed the availability of water to berry growers in Huelva which produces by far the majority of Spanish berries, a large proportion of which are exported to the UK. This highlights the threat which climate volatility poses to the UK.

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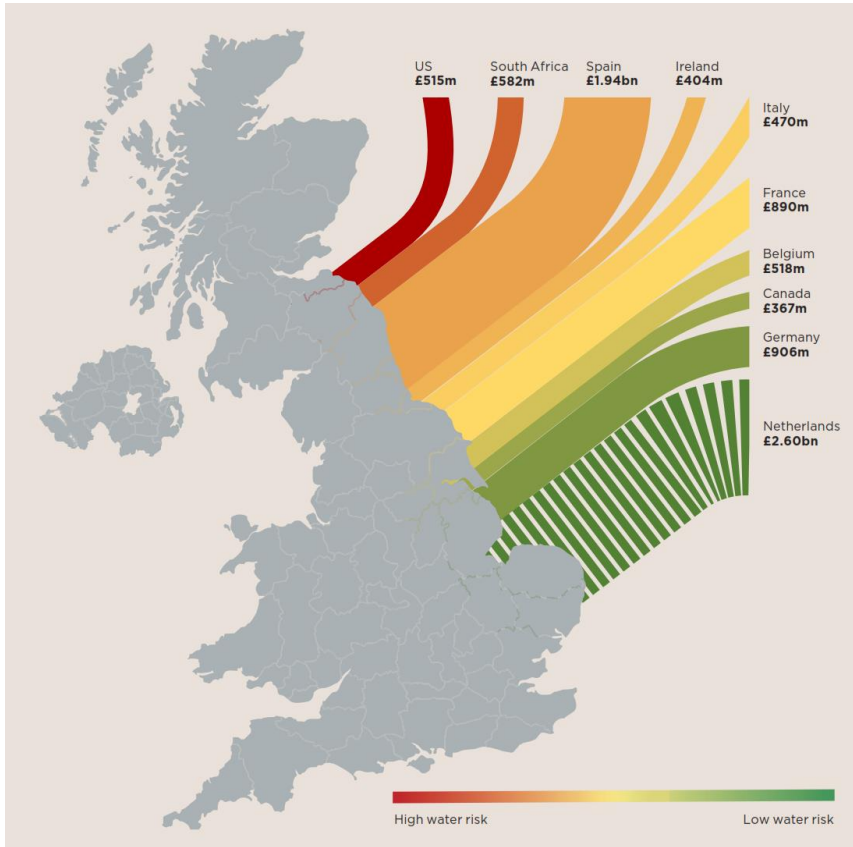


Figure 8: Savills research, 2019

This therefore represents a significant opportunity for us in the UK to adopt higher technology, data driven systems to increase our production of UK soft fruit thus displacing imports from climate sensitive regions such as Spain and South Africa.

The major limiting factor to utilising glasshouse and controlled environment systems using LED lighting is the cost of energy. We should therefore be exploring how we can support growers to utilise efficient forms of energy such as geothermal to extend UK self-sufficiency in soft fruit.

5.5 Supply chain simplification

Amidst looking at different growing systems, I reflected on our harvesting and packing processes in the UK. Our process starts with crop assessment by a field manager. Pickers then harvest the crop, checking the quality at the same time. After picking the fruit is quality checked prior to leaving the field. Fruit is then transported to the packhouse where it is QC checked on intake before being packed where fruit is QC checked before an on-line QC check is carried out prior

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to a positive release QC check before finally being despatched to depot. Commonly seven pairs of eyes have checked the fruit along this part of the chain!

This contrasts with the US and Australia. There, the crop is similarly assessed. Then pickers harvest, checking quality into the final pre labelled punnet and outer box. All that now happens is that the fruit is cooled and shipped. When I asked the grower why they didn't QC check the fruit in the cooler before despatch he commented that they did this as they picked it!

Whilst quality standards in the UK are extreme it did strike me that we've moved away somewhat from "getting it right first time" and there may be an opportunity to simplify our processes thus removing cost without compromising quality or food safety.

5.6 Are the robots coming?

Looking to the future of harvesting, this could involve some form of image-based assessment, followed by harvest by robot. When visiting Louise Sutherland at Burlington Berries in Tasmania, I saw the UK designed and built Dogtooth picking robots in action, picking berries from table tops. In Oxnard I also saw Advanced Farm's robots which operate on soil-based systems.

There's no doubt that picking robots are advancing, however it does look like it will take several years before they are operating fast enough to become relevant. Whilst robotic pickers will dramatically reduce the labour requirement in soft fruit production, given the current financial state of the industry it is difficult to see how there will be an appetite for the considerable capital expenditure that would be required to purchase large numbers of robots.

It is likely that more efficiencies can be gained in the shorter term through using sensor technology to optimise nutrition and yields.

I also saw several significant investments in post-harvest grading equipment designed to improved efficiencies. In New Zealand, Gourmet Blueberries have an automatic depalletiser for destacking field trays of blueberries and automatically feeding their grading line. Advanced Farm have designed a packhouse system that grades strawberries in bulk similar to potatoes. Hansen's Cherries in Tasmania run an advanced optical grading line to ensure that their cherries are in optimal condition for the high-value Asian market. Their grading operator moves between Tasmania, the US and Canada to utilise his expertise in optimising similar grading lines.

Now that we have discussed the breeding and production of berries, in the next chapter we will look at how berries are marketed.

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5.7 Chapter summary

Higher tech production systems, including the use of sensor and robotic technology have the potential to produce larger quantities of berries with less input use.

There is the potential to think outside the box, combining breeding and production systems to step change grower economics

Arguably we have over engineered our supply chain in the UK and there is potential to remove cost without compromising on end product quality



CHAPTER 6: BERRY MARKETING

6.1 The UK market

In the UK the majority of fresh produce is sold by multiple retailers examples being Tesco, Sainsburys and Aldi, who operate very efficient models. Almost all produce is sold as 'private label' with a tiering of product with entry point 'value', 'core' and 'premium' stock keeping units (SKUs).

The UK is one of the most competitive markets for fresh produce in the world. The graphic below illustrates that UK prices tend to be at the lower end within Europe, in this case for lettuces. You can also see that the UK has been less responsive in terms of paying more as costs of production have increased and supplies come under pressure. This lack of responsiveness of supply and demand forces is driven by a move to longer-term pricing whereby growers fix prices for the season.

In other markets prices are agreed weekly and, in some cases, daily. In the US I encountered the concept of 'unselling', that of unwinding a pre-agreed deal to one that is more reflective of the reality of the current market conditions.

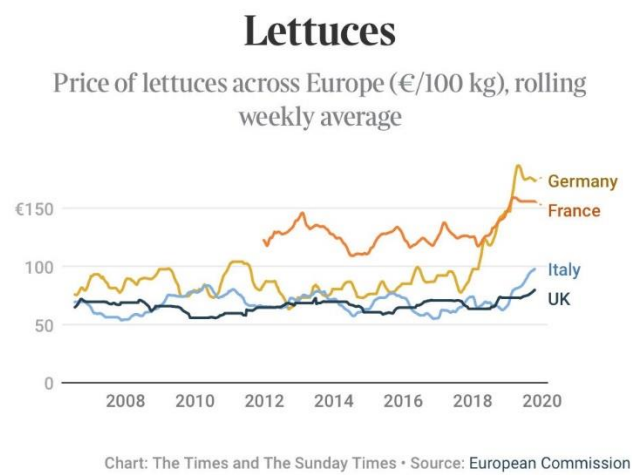


Figure 9: source: the Times & the Sunday Times + European commission

6.2 Differentiation in other markets

Contrast clinically efficient UK supermarkets with the fun and colour of retailers in the US and Canada. There, shopping the fresh produce area is a much more disruptive experience with a lot more focus on loose as you can see overleaf with apples in Vancouver, Canada. Prices are also much higher and have increased

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significantly over the past few years; again, supply and demand forces are operating as they should.

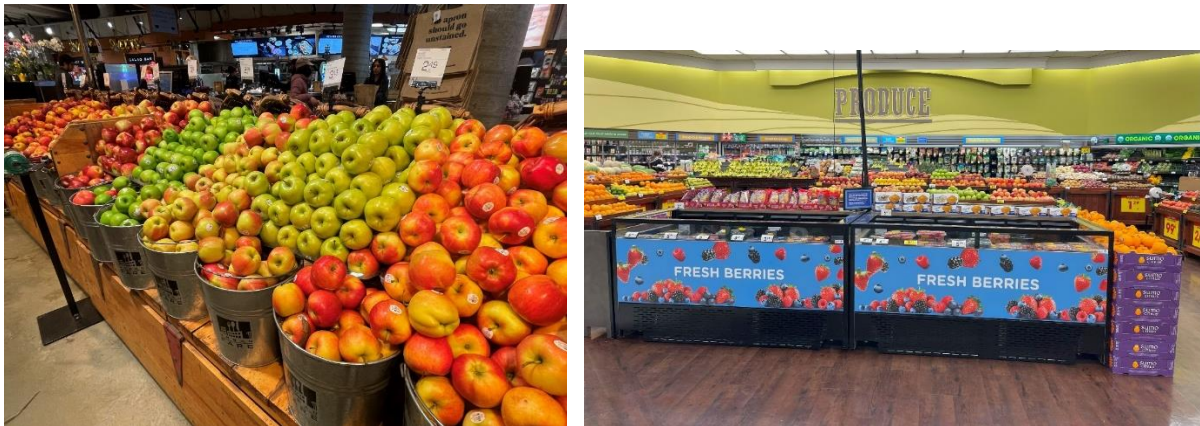


Figure 10: US & Canadian retailers, photos: author's own

In South East Asia, for example in Thailand, Singapore and Hong Kong, this is taken to a different level. Here grocery shopping is often an evening experience with stores within downtown shopping malls. There is a lot more focus on sampling, displays and branding. There is a culture of gifting of fruit in presentation boxes as you can see here. There is also a much wider variation in products and pricing. These Naganopurple sweet muscat grapes are £27 for around 750g! And the cherries, which are British, are £34 per kg which is several multiples of what they would be sold for in even the most expensive of UK supermarkets.

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Figure 11: Grapes & cherries in Hong Kong retailer. Photo: Author's own

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6.3 Branding

In contrast to the UK, the majority of fruit and vegetables in these markets are branded. Below are examples of two very popular fresh produce brands, both of which I then had the opportunity to visit in New Zealand – Rokit apples and Zespri kiwifruit.

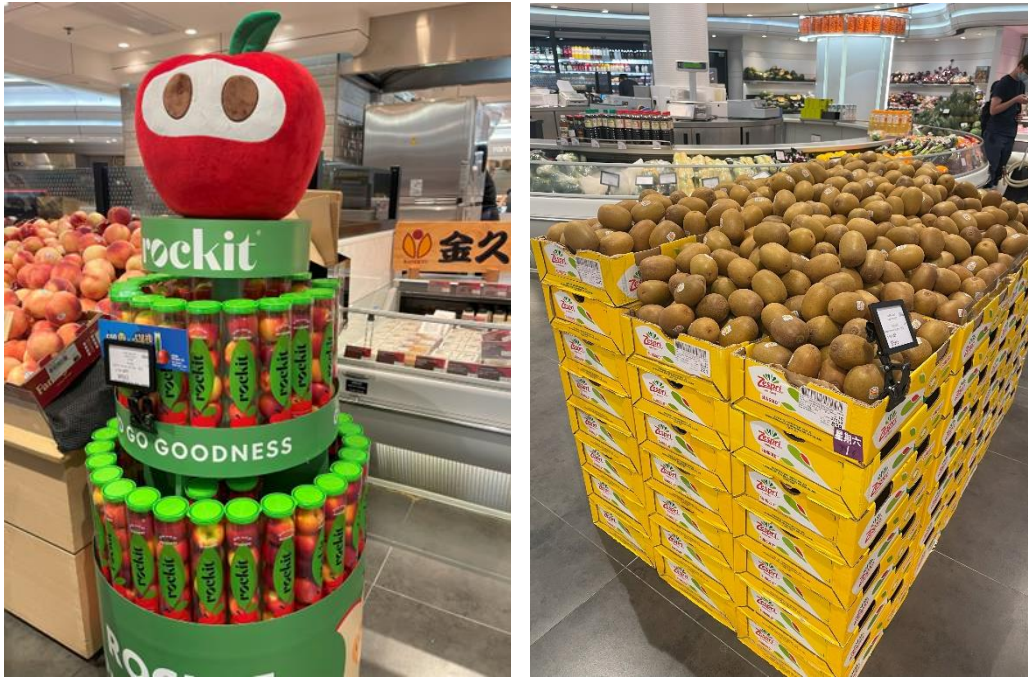


Figure 12: Rokit apples & Zespri Sungold kiwifruit in Hong Kong. Photos: Author's own

Rokit apples is an amazing story. New Zealand government-owned Plant and Food research, which I also visited, bred these small apples which are sweet and have little core. Given their small size the breeder was told to get rid of them. However, one entrepreneurial grower had an idea, inspired by a tube of tennis balls. Rokit apples are sold as a snacking apple positioned to compete with chocolate bars and crisps.

Rokit have recently announced a new marketing campaign where they have partnered with the Dreamworks animated film 'Kung Fu Panda'. The campaign will involve Kung Fu Panda-themed packaging and a range of promotions. Their main market is Asia and, as you can see, they have displays which we would associate with brands such as Coca Cola and Walkers crisps in the UK.

John Loughlin, the chairman of Rokit Apples, told me their story. He has managed and chaired several significant New Zealand agricultural businesses in meat, wine, kiwifruit and apples. He explained that with expensive land, freight

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and capital, New Zealand's agriculture focussed on a small number of products such as lamb, milk, apples and kiwifruit and got exceptionally good at it.

When discussing cropping performance he also told me a humorous anecdote to illustrate the dangers of talking about averages. "I'm going to give you two buckets, one full of ice and the other of boiling water and I want you to put one foot in each bucket and tell me if 'on average' you feel OK." His point was that whilst important to work on averages, you always need to know the potential and then work out how to move towards it!

I also visited Zespri, who have a monopoly on the sale of New Zealand kiwifruit with the exception of the Australian market. Whilst monopoly marketing boards in most countries have disappeared, Zespri seems to have bucked the trend and continues to be very successful.

In partnership with Plant and Food Research (the same breeder as Rockit apples) they developed the golden kiwi fruit. It is a massive step change in terms of sweetness and is very popular in Asia. Unusually it is also a higher yielder than the traditional green Hayward kiwifruit hence the big smile on this grower, and past Nuffield Scholar, Julian Raine's face. I commented in my notes that if I had a choice to be reincarnated it would be as a New Zealand kiwifruit grower!

Golden Kiwifruit is a game changer in terms of sweetness. It is interesting to reflect that whilst it has been around for several years, we are only just starting to see in the UK in some retailers' premium ranges. This highlighted to me the relevance of the Asian market where they are prepared to pay a premium and the resulting lack of focus by Zespri on the UK market.



Figure 13: Julian Raine, Nelson, New Zealand.

Fresh produce excellence: growing our share of the value chain by John Gray NSch

A Nuffield Farming Scholarships Trust report generously sponsored by The Worshipful Company of Fruiterers & The Royal Highland Agricultural Society of Scotland



Asmund Bjertnaes grows baby potatoes and lettuce in Norway, all of which are branded. He works closely with his retail customer Meny, part of the Nordsgruppen retail group which controls 60% of grocery sales in Norway. As a result of this imperfect market Norwegian producers have some exemptions to competition law effectively allowing them to set the price. Whilst this results in much higher prices in the case of berries production systems, in many cases they were less efficient than where competition has driven efficiencies.

6.4 Local sales win

In Germany, 25% of growers' strawberries are sold at the farm gate. Norwegian grower Per was probably the happiest strawberry grower I met. He grows 250t of an old variety, Korona, in a traditional soil system with no fertigation, making it a very low input. He sells the majority of his production at the roadside from a small shop.



Figure 14: Per & Frederick Saxebol. Photo: Author's own

Korona has a very limited shelf-life of only a day or two. When I suggested he grow a longer shelf-life variety, he explained that his customers bought from him today and then they ate them that day and then came back for more the next day and the last thing he wanted was a longer shelf life! This was a valuable lesson in knowing your customer and market as the requirements are not always the same!

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6.5 Chapter summary

- There is a diverse and exciting market beyond the UK and Europe
- Countries and businesses have specialised in exports
- Fresh produce brands can play in the space traditionally dominated by larger corporates such as Coca Cola
- Local markets can pay off



CHAPTER 7: CONCLUSIONS

- Berry production in the UK is close to being financially unsustainable. This has arisen through costs of production increasing way beyond the returns being generated and we are starting to see growers exiting the sector. This is all the more frustrating given that berries are such a fantastically healthy produce which consumers want more of.
- Advances in breeding techniques utilising tools such as molecular marker assisted techniques and gene editing will speed up the development of new varieties and have the potential to produce the equivalent game changer of the golden kiwifruit. This would mean higher yields and disease resistance for growers and a sweeter, long shelf-life berry for the consumer.
- The UK berry sector is predominantly 'mid tech' meaning that we use polytunnels with fertigation systems with some but limited control over the environment. Vertical farming is likely to be a step too far, however higher intensity glasshouse production systems could be the answer which would also allow us to extend our season and to reduce reliance on imports from climate susceptible countries such as Spain.
- There is significant potential to export berries beyond our traditional markets in the UK however this requires focus and specialism as these markets have different requirements.
- People are key to the fresh produce businesses. Investment in people in both training and particularly development, and improved conditions results in better productivity and ultimately higher margins.



CHAPTER 8: RECOMMENDATIONS

- With the demise of the Agriculture and Horticulture Development Board (AHDB) funding, public breeding programmes are under threat and growers should consider whether they can help to fund programmes such as those at East Malling and the James Hutton Institute or risk all berry breeding being privatised.
- Growers, supported by grower associations, should explore new markets collaborating on pre-competitive elements such as market access and standards.
- Policy makers should support the development of advanced breeding tools such as gene editing to allow UK breeders to improve varieties for growers and their customers.
- Policy makers should support the adoption of higher technology glasshouse developments through loans and grant funding so that we can develop more self-sufficiency in berries for a longer season in the UK, thus taking pressure off countries where climate pressures are higher e.g. water.
- UK produce businesses should invest more in people, both management and workers, as they are key drivers of success.



CHAPTER 9: AFTER MY STUDY TOUR



My Nuffield journey has shown me that whilst the UK berry industry is among the most advanced in the world, and that the UK supermarket sector is one of the biggest and most efficient, we can learn a lot from other countries and other sectors.

I couldn't have done this without undertaking a Nuffield Scholarship as it allowed me time to step back and think away from our busy business. I will be encouraging others to do the same as it is an unforgettable experience.

In practical terms our business is already benefitting from some of my findings and I will be digging deeper into how we can utilise advances in breeding, intensify our production and develop new markets whilst always keeping our people front and centre.

Figure 15: Author, John Gray.



CHAPTER 10: ACKNOWLEDGEMENTS AND THANKS

In New Zealand, the Māori saying: "What is the most important thing in the world? It is the people, it is the people, it is the people," resonated deeply. There are too many to mention individually and therefore I would like to say a huge thank you to everyone whom I met on my travels, some of whom are pictured below. I would especially like to thank:

- Everyone at Nuffield for their support particularly during the challenging times during Covid
- My sponsors, The Worshipful Company of Fruiterers and the Royal Highland Agricultural Society of Scotland
- The 2021, 2022 and 2023 year groups whom I had the good fortune of being connected to and with whom I have made many friendships
- My team at Angus Soft Fruits

Finally, my amazing wife Fiona, and our three children Fraser, Cameron and Finlay for putting up with me being away so much!



Figure 16: A selection of the growers I visited.

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