



FARMING
FOR THE
FUTURE

M&S
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Farming for the Future
Annual Report – April 2015

Farming for the Future



Background

As one of the UK's leading retailers, Marks & Spencer sells stylish, high quality, great value clothing and home products, as well as outstanding quality food, responsibly sourced from suppliers across the globe. We are transforming M&S from a traditional British retailer into an international multi-channel retailer. Our heritage of innovation helps us lead the way with first-to-market products across food, fashion and homeware, and our food business is renowned for its focus on quality, freshness, convenience and speciality.

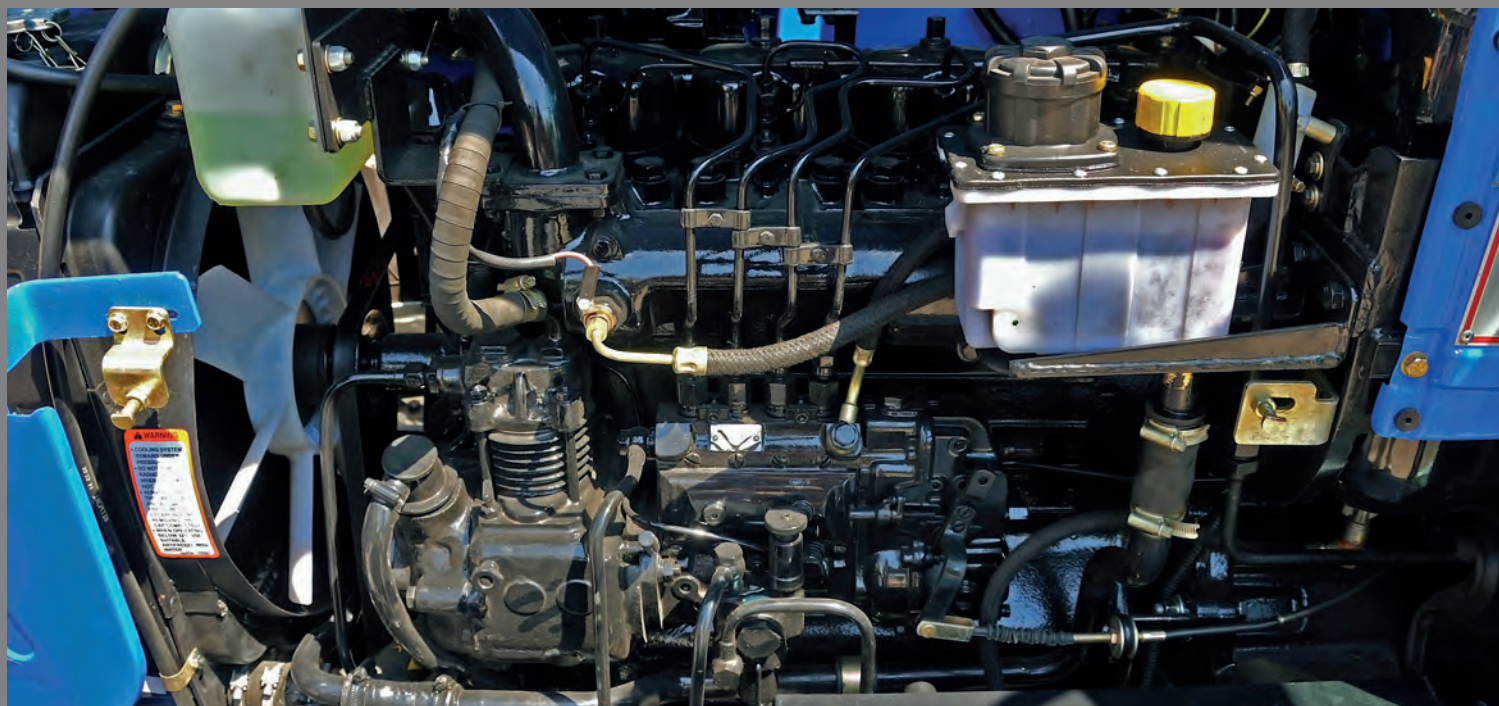
Our eco and ethical plan - Plan A - is our strategy for becoming the world's most sustainable retailer. Re-launched in 2014 as Plan A 2020, this sees us set out 100 new sustainability commitments for the next five years. An important part of this activity is our 'Farming for the Future' programme, which we originally launched back in 2010. Since then we've made significant investment into sustainability initiatives in the farming sector through this programme and we are committed to continuing these initiatives in the years ahead.

What is Farming for the Future?

Farming for the Future is about us helping the farmers in our supply base - here and across the world - address the challenges ahead by finding opportunities to improve efficiency, environmental performance and ethical practice. This will make their businesses more resilient and profitable, ensuring that they can continue to deliver quality and innovation for the long term whilst reducing their impact on the world around them.

Our core approach is focused on the 4Es:

- Efficiency - because farmers, growers and aquaculture partners that operate at a high level of technical efficiency will be more profitable, use fewer inputs for the same or higher levels of output, and will be more carbon efficient;
- Environment - because farmers, growers and aquaculture partners need to minimise their impact on the environment in terms of their use of soil, water, pesticides and energy and work to enhance biodiversity through appropriate environmental management;
- Ethical practice - because farmers, growers and aquaculture partners need to act ethically in the way that they run their businesses, treat their employees and neighbours and look after any animals in their care, ensuring high standards of welfare at all times;
- Education - because there are not enough young people coming into the agriculture industry and so we need to play our part in encouraging more people to consider it as a career option and to help develop those already in the industry so that they can become the leaders of the future.



Guimera Select Fruits
M&S stone fruit supplier
Maella nr Zaragoza, Spain

Background

M&S indicator farm, Guimera Select Fruits is committed to doing the right thing and has an ongoing sustainability programme to continually improve its business. With fuel consumption and prices increasing year on year, the business recently implemented some simple but effective measures to reduce fuel use across the business.

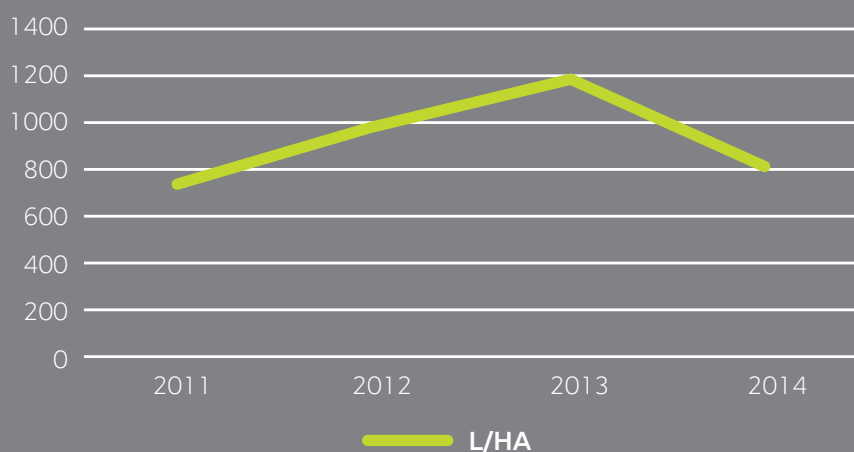
Approach

Guimera installed a fuel dispenser linked up with an informatics software system to monitor the fuel usage of individual machines. They also purchased a larger bulk tank in order to stock up on fuel when market prices are lower.

Objectives

- To buy the best quality fuel to increase the life of filters used in machinery.
- To reduce greenhouse emissions by reducing consumption and using quality fuels.
- To control workers who are using the fuel station to refuel and avoid misuse (the system demands a code to start refuelling)

CONSUMPTION OF GASOIL PER HECTARE 2011 - 2014



- To know the consumption of each item of machinery (every item is recorded in the software)
- To detect problems that increase the fuel consumption of machines, such as issues with diesel engine fuel injectors.

The farm has been steadily expanding meaning that consumption / hectare is the best measure rather than overall fuel use.

Next steps

This initiative is just one of a much wider set of objectives to improve sustainability. The farm has also invested in a programme to replace older tractors with new, lower emission models to significantly reduce the farm's greenhouse gas emissions and to further increase fuel efficiency.

Results

Since the implementation of the system in 2013, fuel per hectare has significantly reduced as shown in the graph above. Further major improvements in the coming years are expected.

Costs/benefits

The cost of the project was €35,000. The fuel station was easy to set up and has received positive feedback from staff.

The practical way that we deliver our programme of activity is through the following:

Inspiration

- We deliver products that excite and inspire our customers, exceeding their expectations and never compromise on quality, integrity or food safety.
- We build relationships with our farmers and growers to inspire them to drive change in their businesses to address the sustainability challenges they face

In touch

- Our ways of working support a long term partnership approach with farmers, growers and fishermen

Innovation

- We utilise the latest science and innovation on both products and process to ensure we improve things for the better

Integrity

- Our standards are developed with farmers, growers and fishermen in mind. They are challenging yet achievable, now and in the future

Why is this important?

During the next fifteen to twenty years global population is expected to reach 9bn. Climate change will put increasing pressure on global food production. Reduced oil supplies will increase costs and potentially limit the use of some agricultural inputs.

At the same time, farming faces a social challenge due to the lack of young people engaged in the industry. And consumers continue to take a growing interest in the way that food is produced.

This combination of factors presents a huge challenge to the farming industry and to food retailers. Farmers, growers and aquaculture partners must become more technically efficient, increasing output whilst achieving higher quality standards and controlling costs and environmental impact. The food chain must also engage with consumers to develop mutual understanding.

Marks & Spencer leads the way in providing consumers with the best quality food. We firmly believe that the best raw materials make the tastiest, freshest, most wholesome food and we have a number of well established initiatives in place to ensure that is what we provide through our stores, such as our Select Farm and Field to Fork programmes, which ensure that we buy from farmers and growers that we know and trust and who follow our unique codes of practice.

But we must react to the changing global situation. We must continue to differentiate our offer and must ensure that the provision of the best tasting food for our customers is consistent with the best choices for our planet. We must work with farmers to help them adapt and to make our supply chain resilient, ensuring we have security of supply for the future.

Our Plan A commitment

As outlined above, Plan A was reviewed in 2014 and this saw 100 new commitments being made under the banner of Plan A 2020. Part of this saw an existing commitment to sustainable farming, Farming for the Future, revised and distilled into a new pledge that will take us forward over the coming years.

Sheeplands Farm, part of the Hall Hunter Partnership M&S berry supplier Berkshire, United Kingdom

Background

Established in 2002, Sheeplands Farm comprises 99 hectares of land in Twyford, growing a range of raspberries, strawberries and blueberries under polytunnels for M&S. In 2013 the site produced more than 1,400 tonnes of soft fruit.

Prior to 2014 the farm employed a trickle irrigation system, with river and borehole abstraction servicing their water requirements.

However, the calcium bicarbonate levels in both of these sources were in excess of 250ppm, which required the application of substantial amounts of nitric acid to balance pH levels to ensure optimal growing conditions.

Not only was the farm keen to reduce its reliance on the River Loddon and secure its long term water supply (with the South East and East experiencing increasingly frequent droughts), but it also wanted to reduce the substantial cost associated with nitric acid application, which stood at £15,000 a year.

With Sheeplands also endeavouring to minimise its environmental impact, the farm decided to launch a new water management system in 2014 that would help secure future water supplies, reduce nitric acid use and incorporate a source of green energy production.

Approach:

In order to reduce the farm's reliance on river and borehole extraction as water resources, an extensive rainwater capture and storage system was implemented in 2014.

This system comprises of a range of specially constructed drainage ditches that divert rainwater run off from the farm's poly tunnels into a small settling pond. The well-established, natural reed bed in the pond slows the flow of water; filtering it before it is pumped into a large winter water storage reservoir. The water storage reservoir is 65,000m³ in size and equipped with two 45m³ per hectare pumps.

The farm has also introduced a



'fertigation' system to reduce water and fertiliser wastage.

Water is pumped from the winter storage reservoir, into water irrigation tanks, where it is then mixed with fertiliser before being trickle fed to crops. This enables feed to be applied regularly, accurately and as efficiently as possible.

To meet the desire for a source of on-site renewable energy, a floating solar panel unit was established on the farm's new reservoir and became operational in November 2014. The unit consists of 800 panels, is 1 acre in size and has a 200kW capacity.

Objectives:

- To minimise use of mains water and its associated financial cost
- To reduce annual nitric acid usage by 30%
- To decrease the reliance on the River Loddon as a source of irrigation water
- To generate a source of renewable and sustainable energy on the farm site
- To increase the efficiency and accuracy of water and fertiliser application

Results:

The business is now confident that it has successfully secured its water resources in the face of future droughts and restricted river and borehole abstraction. Its reservoir currently holds a two month supply of water.

By utilising greater quantities of harvested rainwater, which has a low pH level, the business has also been able to reduce the amount of nitric acid that it uses by 30%.

The floating solar panels have been

	Unit	2014	2013
Irrigation Pump	kWh	117,949	140,968
Top Field Pumps / Priva	kWh	207,692	176,139
Borehole	kWh	23,438	36,354
River pump	kWh	84,390	30,921
Reservoir	kWh	8,070	0
SOLAR PV Reservoir	kWh	-180,000	0
Total energy consumption		441,539	384,382
Total Grid		261,539	384,382
Total CO₂e (cool farm tool)	kgCO ₂ e	130,012	172,297
Annual net CO₂e saving	kgCO ₂ e	42,285	

a success and Sheeplands expects to generate 180,000 kWh per year, some of which will be used to provide energy for the pump and irrigation mechanisms that form part of the new water management system.

Cost/benefits:

The cost of constructing the winter reservoir was a considerable expense, coming in at around £250,000, accompanied by a £40,000 filtration and pump system.

However, if the farm was to experience a drought and they had not secured their water resources, they would expect to experience a 100% crop failure rate within two weeks. This would obviously have serious financial repercussions.

The farm used to spend around £15,000 a year on nitric acid but since its new water management system, this has been reduced by £4,500 annually.

Overall cost of the floating solar panel system was £250,000, but the business expects to recoup £20,500 every year, for the next twenty years through subsidies. It is also estimated

that an average saving of £24,000 will also be made each year by not having to purchase electricity from the National Grid.

Next step:

Although Sheeplands has only recently implemented their new water management and renewable energy systems, they are pleased with the way things have progressed and are very optimistic about the future.

Commenting on the project, Martin Skarp from Hall Hunter, said:

"The developments that we have carried out could result in a net saving of 42 tonnes of carbon dioxide equivalent annually and make the farm more resilient to a change in climate, changing regulations and changing market requirements.

"We are proud to be part of the M&S Indicator Farm programme and their involvement has inspired us to look harder at our production methods and to tread as lightly as possible in the environment".

Farming for the Future is now Plan A commitment 53, which states:

“Through the M&S Farming for the Future programme we will define key sustainability hotspots by sector and develop plans to manage hotspots in each sector through producer and industry engagement. We will publish an annual report to report on progress and share our learning more widely.”

We are pleased to report that we are very much on plan with this commitment.

What has been our focus in the last year?

Agriculture is a diverse industry and the issues faced by one sector are often very different to those faced by another. Consequently, there is no ‘one size fits all’ solution to the sustainability challenges we face.

As a result, we have been working closely with suppliers, farmers and growers, as well as a range of independent industry advisers and specialist consultants, to identify the key sustainability issues by sector so that we can engage with the producers involved and develop prioritised and targeted plans to address them.

The year to March 31, 2015 has been our first year of working under this new commitment, and our focus has been on identifying the key sustainability hotspots and putting in place the right mechanisms to ensure we work across different sectors to help suppliers address these issues moving forward.

Identifying hot spots by sector

Our main priority this year was to build on the work undertaken in previous years to agree a definitive list of sustainability hotspots by sector so that we know exactly where our focus should be moving forward.

Working with Nora Conry, a Bord Bia Origin Green Ambassador, as well as a number of other industry advisers, we undertook a comprehensive review of the findings from our Indicator Farm activity to date, using data generated by our Indicator Farms and through dialogue with farmers and growers. This has resulted in the following hotspots being identified:

Key hotspots by sector:

Produce	Farmed fish	Beef and sheep	Dairy	Poultry	Pigs
<ul style="list-style-type: none"> • Water use • Energy consumption • Pesticide and fertiliser use • Soil management • Training / people 	<ul style="list-style-type: none"> • Feed • Fish health & welfare • Energy - hatcheries • Community 	<ul style="list-style-type: none"> • Nutrition • Grassland management • Fertility and health • Soils and nutrients • Water and environment • Supply chain structure and producer engagement 	<ul style="list-style-type: none"> • Feed • Animal welfare • Environment • Ethical labour • Carbon 	<ul style="list-style-type: none"> • Feed • Animal welfare • Energy consumption • Litter quality • Heating / ventilation 	<ul style="list-style-type: none"> • Animal health • Water quality • Outcome scores (tail docking, bruising) • Slurry disposal • Feed

This has helped to shape a refocused approach to our Farming for the Future activity, recognising that different sectors have different levels of sustainability ‘maturity’ and different challenges. This exercise has also given clarity to the areas where M&S is able to influence behaviour and practice and the areas where that is much harder.

Our activity...

Indicator Farms

A key part of our Farming for the Future activity is our Indicator Farms programme. This sees us working closely with a small number of farmers and growers across a broad range of sectors. We are working with these farmers to understand the specific challenges that they face and to identify new approaches that are practical and will help mitigate sustainability challenges in their sector. We are then sharing learnings through knowledge transfer activity.



In recent years we have used our Indicator Farms to establish baseline data and this has informed our hotspot analysis in the last twelve months. As a result, we have refocused our Indicator Farms activity by sector to ensure that it is more closely aligned to the specific needs and challenges of that sector. A summary of our new approach to Indicator Farms is detailed below, by sector:

- Produce – Our Indicator Farms are continuing to monitor key sustainability indicators and specific projects have been agreed to address key challenges. An example of this would be pollinator plans, where trials are being undertaken with a small number of growers to look at innovative ways of attracting pollinators, with the findings being shared across the wider supply base. To help foster the exchange of best practice across our diverse range of Indicator Farms in this sector, we are holding grower meetings each year, to provide technical input on key issues and to showcase best practice. One of these meetings took place in April at the Elvedon Estate in Norfolk and focused on renewable energy, farm energy generation, potato storage and irrigation, biomass heating for glasshouses and awards.
- Dairy – All of the farmers in our dedicated fresh liquid milk pool are considered part of the Indicator Farms programme. These farms undertake benchmarking for health and welfare, farm standards, carbon emissions and sustainability, with the support of a specialist veterinary surgeon, a nutritionist and the suppliers. A number of continuous improvement workshops are then held through the year to tackle hotspot issues and provide advice and examples of best practice.
- Beef and sheep – We have 45 Indicator Farms across our beef and sheep supply base in the UK and Ireland. Our beef and sheep indicator farms are now collecting data through a self-assessment (being supported by our suppliers), with this data then being benchmarked externally by SRUC. We are also hosting farmer-led meetings, focused on hotspots and looking at farm examples of best practice via farm walks, as well as providing external input via Scotland's Rural College (SRUC), as required.
- Poultry – We have four Indicator Farms in the poultry sector. Our poultry indicator farms collect data and benchmark this to provide guidance for areas for improvement. They are also undertaking specific trial activity to establish best practice, which we can then share across the supply base. We are also hosting a series of informal producer engagement sessions on an ongoing basis, to help to highlight best practice and sharing learnings.
- Pigs – We have four Indicator Farms across our pork supply base. These farms will monitor data and benchmark performance as well as undertaking specific trial work with M&S and our suppliers to address key sustainability hotspots. The results from these trials will be shared across our supply base. Our pig producers are now meeting in an informal way with support from M&S and suppliers, to share best practice. We have deliberately adopted an informal approach to help to break down barriers between different supply chain partners and between farmers themselves and to support the development of strong relationships where information can be freely shared without prejudice. This approach has been developed with the participants and will continue to evolve.

Case study - biological pest control

Marshgate Farm
M&S pear supplier
North Kent, United Kingdom

Background

David Long grows 55 acres of pears on Marshgate Farm, which he supplies to M&S. Whilst the warm, sheltered climate of North Kent provides the perfect conditions for growing the fruit, the farm has suffered extensively from pest damage caused by pear suckers.

“The problem seemed to be incurable”, says David, “We were using more and more insecticide to control the pest and resistance issues meant that the sucker was starting to beat us.”

The problem reached its height in 2011, when the most severely affected orchards yielded just 10 t/ha with a 40% grade out due to misshapen and blackened fruit caused by sucker damage.

In 2012 East Malling Research approached David and got the farm involved with a series of trials to try and combat the pest problem. Whilst there is no direct answer to controlling the pear sucker, the farm implemented several of the recommended methods during 2013/2014, with fantastic results.

Approach:

Three indicator orchards were identified at Marshgate and farm staff started monitoring the number of pear sucker eggs, nymphs, adults and natural pear sucker predators found in each orchard. This provided the information to support and assess the success of anti-pest activities.

Anthocorid bugs were deployed in ‘hot spots’ around the orchards, where natural predator numbers were low. As these pear sucker predator bugs do not overwinter in pear orchards, they were purchased from an outside source.

The farm also improved the orchard habitat to encourage increased numbers of natural predator insects. This included planting specific types of new vegetation (such as willow, wild flowers and stinging nettles) as well as stopping the mowing of orchard alleyways.

A new overhead irrigation system was also implemented to increase the chances of pear suckers being washed off pear tree leaves.



Objectives:

- To monitor levels of pear sucker and predator bugs in indicator orchards
- To artificially increase the number of anthocorid bugs within the farms orchards
- To provide a suitable orchard environment to encourage the growth of natural pear sucker predator insect populations
- To implement new crop maintenance systems which will make life as challenging for the pear sucker as possible

Results:

Since implementing the new pest control strategy, there has been a significant reduction in the amount of damage caused by pear sucker and Marshgate Farm is now achieving 28t/ha yield on average with just a 15% grade out.

By implementing the new bio control measures the farm's mature, most productive orchards are now set to achieve 30-40 t/ha, with more than 85% class 1 pears.

Cost/benefits:

Overall, Marshgate Farm is now achieving annual financial returns per hectare of orchard that are significantly above the figures achieved before it implemented its biological pear sucker control strategies. This is primarily due to the higher yields and increased percentage of fruit now grading out at Class 1, but also through reduced mowing costs

The farm has also seen several other additional benefits from implementing the new control measures.

“We have witnessed better levels of pollination in orchards due to our development of wild flower strips” states David “and because we aren't going out spraying or mowing as much, we have a reduced fuel bill and far less wear and tear is occurring to farm machinery.”

Next step:

By working with East Malling Research and launching a sophisticated biological, integrated pest management control system Marshgate Farm has been able to reap significant rewards.

The system has proved so effective, that David is not only looking to expand his farm in the future, but also the pest management plan.

“We are currently planting new pear orchards over the next six years” states David “and the plan is for all of our orchards to be planted with wild flowers rather than grass. It will be left rough and hopefully provide further vegetation needed for predators of the pear sucker.

“With decreased use of broad-spectrum pesticides, pests other than the pear sucker (such as the rhynchites weevil) can occasionally become a problem in orchards, but by careful monitoring, hot spots are quickly identified and spot treated.

“Keeping on top of the pear sucker will continue to be a priority and we still have a lot of fine tuning to do on our biodiversity work. If we can continue to keep the pear sucker under control using natural methods I think we will have made a real breakthrough.”

Education

Our education activity continues to gain momentum. We have supported young farmers in Scotland via our sponsorship of a new class within the Fatstock Show, which gave them the opportunity to walk the M&S beef supply chain and improve their understanding of the industry from field to fork. The winners of the class were hosted on an educational trip to the Eurotier exhibition in Germany.

We have also supported students at Greenmount College in Northern Ireland, who undertook a project set by M&S and Linden Foods as part of their degree studies, having undertaken a walk the supply chain day. Students presented their project to a panel from M&S and Linden, with the winning team visiting M&S at Waterside to spend a day with buyers, agricultural managers, product developers and technologists to improve their knowledge of the issues and challenges around food production and retail. The second year of this programme has recently taken place.

In a new development this year, we are supporting a degree student at Harper Adams University College, with a scholarship in partnership with Rabobank. This will see the student spend their year out work placement with M&S working on projects as part of the agriculture or agronomy teams.

We are also supporting two aquaculture apprenticeships in collaboration with the University of the Highlands and Islands and Scottish Sea Farms. These apprenticeships give participants access to the retail supply chain as well as the core aquaculture skills that they need, improving their awareness of customer requirements and consumer trends.

Finally, our Agricultural Leadership Programme, run at Cranfield University School of Management, continues to gain momentum, with further programmes taking place in May 2014 and February 2015. So far, 55 delegates have taken part in the programme which has been held on four separate occasions during 2013 -2015.

The cohorts to date have been made up of a diverse range of delegates from a variety of sectors, with each course intake including producers, processors, suppliers and M&S staff. There have also been delegates from overseas.

Feedback forms ask each delegate to score aspects of the course out of 5 where 1 = poor and 5 = excellent. Cumulative results show the following:

Overall programme including its content, structure and design 4.7
 The extent to which the programme encouraged and promoted new ways of thinking: 4.6
 Rate to what extent would you recommend the programme to colleagues: 4.7

Engagement activity

Agricultural and trade shows

We attended a number of major regional agricultural shows over the summer months of 2014 to spread our messages about sustainable farming to our customers and suppliers and to meet and engage with our producers. Shows we attended include:

- Balmoral Show, Belfast, Northern Ireland
- Royal Highland Show, Edinburgh, Scotland
- Great Yorkshire Show, Harrogate, England
- Royal Welsh Agricultural Show, Builth Wells, Wales
- Fruitlogistica, Berlin, Germany
- Livestock Event, Birmingham

This programme will be replicated in 2015.

Farming for the Future awards

To support the show programme we also run an awards scheme for M&S producers and suppliers. This encourages farmers and growers within the supply chain to share best practice and highlights the benefits of sustainability. In 2014, the awards attracted high quality entries from across the globe and culminated in six regional winners and an overall overseas winner. Videos were made of all finalists and these were shown at the Agricultural Shows as well as being published on Producer Exchange (<http://producerexchange.marksandspencer.com/farming-awards>). These awards attract significant attention at and around the shows, generating press coverage and celebrating best practice in our supply base.

We launched the 2015 awards to our supply base in January, with the shortlisting process having been completed in early March. This year we have three categories – Young farmer, Outstanding producer and Innovation and we have selected six finalists in each region (two per category). These farmers will be visited between late March and late April, with the winners being announced at the 2015 regional agricultural shows.

Influencer/ NGO briefings

During the last twelve months our programme of influencer briefings has continued. Our agriculture and agronomy team have regular meetings with many of the key influencers in their sectors, and we actively engage with government (including devolved governments) on sustainability and industry issues.

Newsletters

This year we have continued to produce a Farming for the Future newsletter, which is sent to farmers and growers in our supply base as well as to a range of industry stakeholders.

Moving forward, it is our intention to publish sector specific newsletters twice per year alongside our annual report. This will enable us to deliver more targeted information to farmers and growers.

Producer Exchange

Our online farming information portal, Producer Exchange, continues to evolve and new content is posted regularly. We are currently scoping out more significant improvements to the site to improve navigation and make it easier and simpler to find relevant content. The site can be found at <http://producerexchange.marksandspencer.com>

Producer meetings

Producer meetings continue to be a key part of our day-to-day implementation of Farming for the Future. As well as discussing operational and technical matters, these meetings provide an opportunity to discuss sustainability and the activity going on within the Farming for the Future programme. They also enable face-to-face discussion and knowledge transfer between M&S and producers and between individual producers. Colleagues within the Agriculture & Fisheries and Agronomy teams are tasked with undertaking regular farm visits to ensure that they are aware of current issues on farms in the sectors that they are responsible for.

Industry engagement

We continue to engage with the wider industry, through direct contact and via support of industry initiatives. We routinely attend major industry events such as the Farmers Weekly Awards, The Grower of the Year Awards, The Oxford Farming Conference, FruitLogistica, the NFU Conference, etc. M&S team members have also spoken at a number of key industry conferences and events. We have also held face to face meetings with the farming unions, levy boards, red tractor assurance, CIWF, WWF, Prince's Countryside Fund, Institute of Agricultural Management, Defra, Scottish Government, Welsh Assembly Government, Harper Adams University, Greenmount College, Scottish Rural University College, Food Standards Authority and RSPCA.

Sponsorship activity

To raise the profile of M&S Farming for the Future activity, the business continues to make use of strategic sponsorship opportunities. In the last twelve months these have included the LEAF Open Farm Sunday and involvement in the Prince's Countryside Fund. We also sponsor major livestock classes at the agricultural shows we attend. We also sponsored the Oxford Farming Conference in January 2015 and the NFU Conference in February 2015 and are working on a joint initiative on game with the RSPB on sustainable sourcing.

Stevenson Brothers M&S potato supplier Essex, United Kingdom

Background

Stevenson's have been producing potatoes for M&S for more than twenty years; harvesting up to 7,000 tonnes annually for the UK market. The crop is raised predominantly over 140 hectares of clay loam soil in Essex and lifted towards the end of summer. Potatoes are then placed in refrigerated box storage for up to ten months.

Continual irrigation of the crop using rain guns during the growing season and the sustained time frame of storage represent significant costs for the producer in terms of electricity, water and fuel consumption.

Approach:

An audit was launched in 2012 to establish potential energy efficiency improvements that could be achieved in the areas of refrigerated storage and field water irrigation. Once the relevant areas for improvement were identified, a specific action plan to remedy these issues was implemented between 2013 and 2014 as part of the M&S Indicator Farms programme.

Within their oldest refrigerated storage unit, CO₂ sensors were installed, two 86 kWh solar arrays established to feed electricity directly to the unit and a new inverter driven compressor was purchased to replace the oldest, open drive compressor cooling system. The stacking height of boxes was also reduced and curtains were installed to improve airflow.

In terms of changes to their irrigation system, a new inverter drive irrigation pump was installed, the diesel usage of various irrigation pumps was monitored and a wider bore irrigation hose reel - which would enable wider lane spraying - was tested.

Objectives:

Storage:

- To measure and regulate CO₂ levels in storage facilities
- To harness solar energy to reduce consumption of electricity provided by the National Grid
- To reduce the energy consumption from compressors required during the pull down and crop storage phases
- To improve the air flow amongst storage boxes within storage unit



Irrigation:

- To improve the efficiency of irrigation pumps, thereby reducing diesel consumption
- To identify the most efficient irrigation pumps to which the most challenging and energy consuming irrigation tasks could be assigned
- To improve irrigation techniques to reduce overall energy requirements required per hectare of field irrigation

Results:

Since implementing new systems in 2013 and 2014, grid electricity, diesel fuel and levels of water consumption have all been reduced.

The number of staff hours required to maintain irrigation and cold storage systems has also declined, freeing up valuable time to be spent elsewhere within the business.

Cost/benefits:

The initial audits of the irrigation and storage units cost £500 each.

The cost of store efficiency improvements came to approximately £40,000 (£20,000 of this total cost would have naturally occurred in order to keep in line with technological advances) and the solar panel installation cost £120,000.

In terms of improvements to the irrigation system (including a new pump and irrigator) total spending came to £47,000.

Energy & Water				
	Unit	2012	2013	2014
Whole farm water footprint	M ³	68,618	127,376	100,653
Water source		75% Surface 25% ground	Winter-filler reservoir	Winter-filler reservoir
Solar	kWh	0	50,000	70,594
Gas oil (Red Diesel)	L	0	75,000 attributable to potatoes	65,000 attributable to potatoes
Grid electricity	kWh	Unknown	31,207 for 48,874 cubic metres water	27,684 for 41,237 cubic metres water

These initial costs have, however, reaped significant rewards, with the solar panel installation alone saving more than £12,000 on electricity costs and approximately 26 t/CO₂e annually.

Red diesel costs associated with producing potatoes have also been reduced significantly by 10,000 litres a year, equating to roughly £5,000 worth of direct savings.

By reducing water consumption by 21% the new irrigation systems have also helped the organisation secure its water supplies by reducing the level of pressure on its three winter reservoirs. Whilst it is difficult to assess the financial impact of such an improvement, Stevenson's appreciate its importance, stating, "Without a secure supply of water, the production of quality potatoes would not be possible on our land type. For this reason, security of supply is absolutely vital to our potato production activities"

Next step:

The initial audits and the consequential work undertaken to improve Stevenson's potato production business have been beneficial and have influenced how the company will approach efficiency drives in the future.

Tom Stevenson says: "The primary benefits of the changes undertaken have probably not been in monetary terms in their own right, but more so from a critical approach to looking at energy and resource use across all of the production process in the business.

"Whilst we were not unaware of this in the past, a sharp focus on a couple of areas has opened our mind to further potential changes. The use of an 'if you can't measure it, you can't manage it' approach to a number of aspects of the potato production process has greatly helped our drive for further efficiencies. "



External relationships

Our Farming for the Future activity relies on relationships with a large number of external stakeholders, both in the delivery of activity and the shaping of our focus. We were fortunate to secure the services of Nora Conry, an Origin Green Ambassador from Ireland's Bord Bia sustainability programme, to work with us for a number of months last summer in identifying the sustainability hotspots in our supply chains and the action needed to address them. We also work closely with FAI on animal welfare issues, with ADAS and SRUC to provide independent consultancy to our Indicator Farms programme, with RSPB on sustainable game sourcing and upland moor management and with a number of other NGOs and government organisations. We work closely with Cranfield University and Greenmount College on the delivery of our education programme, and have partnered with Rabobank and Harper Adams University College on a scholarship. The UK livestock levy boards (QMS, EBLEX, HCC, BEPEX), along with the Farming Unions in Scotland, England & Wales and Northern Ireland are also consulted regularly through our wider industry engagement activity.

Our suppliers are also an integral and essential part of our Farming for the Future journey and their input and support in delivering change is vital to future success. The challenges we face are not unique to M&S and our supply chain and we are committed to working closely with others in the industry to identify a clear way forward and to help deliver change.

What are our plans for the year ahead?

We now have clearly defined sector plans for the year ahead to enable us to fulfil our Plan A objectives. Our outline activity will look like this:

Produce

We will maintain the existing Indicator Farms for the year ahead. We will hold two producer meetings during the year for these Indicator Farm participants, where we will get them together to share knowledge and gain some expert insight from external specialist advisers. We will also publish three sector specific newsletters during the year – targeted at the fruit, veg & salad and horticulture sectors respectively – with each newsletter having two issues.

We will focus case studies on Indicator Farm activity and provide technical information either through videos or technical bulletins, which we will make available on our website.

M&S is partner for University Scholarship



M&S is the industry partner for the 2014 Rabobank Agri-food Scholarship at Harper Adams University. The award, sponsored by Rabobank, funds the tuition fees for an undergraduate in each of their three years at university and also provides guaranteed employment with a partner agri-food company during the sandwich year of their degree course.

Will Taylor, from Thirsk in North Yorkshire was recently awarded this year's scholarship and will undertake a 12-month placement with M&S before completing his final year studies at Harper Adams.

Innovation fund supports grass project



Ireland is renowned for its plentiful supply of grass, and M&S beef farmer Larry Nugent is working hard to make sure he uses this precious feed source as resourcefully as possible. To do this, Larry is working with Linden Foods and M&S on a three-year project to investigate ways of improving output from grass in order to maximise farm efficiency. The three-year initiative is being supported by the M&S innovation fund and is comparing the performance of 60 Aberdeen Angus steers, split between unimproved grassland and intensively managed, improved swards.

The 60 Aberdeen Angus were purchased as 100 kilo calves from Linden Livestock in the spring and went immediately to pasture. One group of 30 have been set stocked while the remaining 30 have been rotationally grazed using paddocks. The stock have been weighed four times since turn out and initial results indicate similar animal performance for both groups, but the rotationally grazed animals have used considerably less land.

Working with Greenmount College beef adviser Senan White, the Nugents have hosted regular farm walks this year, all of which have been well attended by other beef farmers. Areas covered so far include soil analysis, drainage, grass identification and fertilisers, with the most recent meeting looking at reseeding methods. Here Larry has trialled both traditional cultivations and minimum cultivation techniques, with grass breeding experts also joining the group to discuss seed selection.

In year 2 and 3 of the project a direct comparison will be made between the performance of batches of Aberdeen Angus steers on the various newly established swards compared to the unimproved areas.

Larry Nugent is an M&S Indicator Farmer for the beef sector, working with other M&S producers to share best practice and address sustainability issues in his sector.

Case studies - education

Developing students



As part of our commitment to education through Farming for the Future, we recently supported a project at the College of Agriculture, Food and Rural Enterprise (CAFRE Greenmount campus) in Northern Ireland, in association with Linden Foods.

This saw BSc Agricultural Technology students participating in an innovative supply chain project, visiting both Linden Foods in Dungannon and the Sprucefield Food Hall of Marks & Spencer. During both visits the students toured the respective facilities and were given presentations on various aspects of the supply chain.

Following these visits the students were tasked in teams with a project to develop a supply chain for a new food product targeting the M&S customer. The programme culminated with a visit to Greenmount Campus by Linden and M&S staff, who observed the student presentations on their project.

The winners of this were Kiera Stewart, Robert Smyth, Philip Truesdale and George Williamson (pictured with M&S Head of Agriculture and Fisheries, Steve McLean). The team was presented with their certificates at an awards ceremony on the M&S stand at the Balmoral Show before visiting M&S HQ, London in June. They spent time with key individuals including buyers, technical managers, agricultural managers and NPD developers, to get a better understanding of how a retailer works and what informs retailers' sourcing decisions. The team was taken out to dinner by M&S before having some free time in London the following day.

A similar programme is currently underway for 2015.

Walk the chain



As part of our ongoing commitment to encourage and support young people working in agriculture, M&S sponsored a new category at last year's Scottish National Premier Meat Exhibition. The Young Producer competition was a joint initiative coordinated by the Scottish National Fatstock Club together with processor Scotbeef. As part of the event, organisers offered all 36 entrants a chance to follow a carcass right through from producer to retailer. The young people from Scotland were invited to tour the Scotbeef Bridge of Allan abattoir as well as their processing site at Queenslie in Glasgow, followed by a visit to the M&S food hall at Braehead.

Scotbeef Livestock Liaison Manager, Laura Barwick said: "We believe that this event is the first of its kind. By seeing this process for themselves, producers can appreciate why retailers ask for the specifications they do. It was a pleasure to show the groups around and is something we hope to make an annual event."

M&S Agricultural Manager, Anna Playfair-Hannay is keen

to get young people involved in the initiative: "60,000 entrants are needed in the agricultural industry in the next ten years. Events like these are extremely important to help and encourage young producers into the industry. The event helps the next generation gain a better understanding into the different mechanisms of a supply chain, the requirements of processor and retailer and ultimately understanding what the end consumer requires. It is key that all stages of the supply chain work closer together in the future."

Erica Mathers who travelled from Orkney for the event said: "I was really pleased to be invited to come along today and found it very interesting. It's a good way of getting our generation thinking about the bigger picture of what is involved in getting the meat we produce out onto shop shelves".

Overall winners, Isla Begg and Craig Bell, won a trip to EuroTier, an agricultural trade fair held in Germany this November.

Agricultural Leadership Programme



Steven Jack took part in the M&S Agricultural Leadership Programme (ALP) in 2014. This is a bespoke education programme that we've developed with Cranfield University to broaden understanding about sustainability and management practice.

Steven grows carrots and potatoes for M&S in Morayshire & Inverness-shire and has undertaken a lot of work looking at season extension and varietal selection.

"I think it's a fair bet that psychometric profiling wouldn't appear on too many farmers' to-do list. Nor mine, either, that is until I won the national M&S Farming for the Future award last year. The prize was a place on the M&S Agricultural Leadership

Programme... a far cry from the day job in the fields of Scotland.

On the course I was joined by other farmers as well as suppliers and M&S staff. The first half of the week was spent learning more about how the global supply chain works and how we as individuals fit into that cycle. The second part of the week concentrated on personal development. The daunting prospect of psychometric profiling formed a big part of this and provided us with a detailed breakdown of our personality preferences, and the impact these can have on the people we work with.

Now, back in the office, I am finding ways to push through change or make progress in areas where we

were struggling before. If we have an issue that just isn't moving forward, I go back to the drawing board and think about how I can tailor my approach to better suit the team members working on that particular problem.

Having a week away from the business, but not being 'on holiday', was valuable in itself. Spending time with people from other parts of the food chain was really inspiring; and learning how to deal with challenging situations in the workplace certainly opened up my mind to new ideas."

Some specific areas of focus include:

- Promote Cravo growing approach in strawberries – results so far are excellent with increased yield and significant reduction in inputs;
- Focus on insects in fruit – change in behaviours on some farms has delivered significantly fewer insects
- Use information generated by new M&S Select Grower Field to Fork audit approach to highlight work being done in the supply base and share knowledge
- Promote trial work being undertaken by growers on water use reduction, pollinators, etc.

Beef & Sheep

We plan to continue to have 15 Indicator Farms per supplying processor (45 in total). Due to the geographical spread of producers, each processor is working with M&S on a bespoke plan to deliver farmer meetings for all supplying farms as well as interaction between Indicator Farms through farm visits. We are also planning to roll out additional 'walk the supply chain' events to supplying farms as these help share knowledge and improve supply chain efficiency.

We will publish sector specific newsletters twice per year that highlight best practice, provide an overview of the findings from our Indicator Farms and share information about events. We will also produce case studies on Indicator Farms and technical bulletins on subjects that impact hotspots.

Specific areas of focus will include:

- Producer events to share knowledge
- Three trial farms in Northern Ireland with specific hotspot focus plans, from which we'll share knowledge across whole supply base
- Plan to have one of our Scottish Indicator Farms as a trial farm for 'Precision Farming in Ruminant Production' as part of a PACE project

Dairy

All of the dairy farms in our milk pool are Indicator Farms and we will continue to monitor health and welfare, production information, carbon footprints, biodiversity information and ethical labour provision on these farms. This information will be used to inform the approach of continuous improvement workshops throughout the year. We will publish a newsletter specifically for members of the dairy pool highlighting best practice and summarising the continuous improvement workshops.

Specific areas of focus:

- Animal Welfare
- Cost of production (and therefore farm efficiency)
- Carbon footprinting

Pigs

In the pig sector we will have four Indicator Farms, with the primary focus being on animal health and welfare in the year ahead as this has been identified as the priority hotspot.

We will hold 'walk the supply chain' events in the summer of 2015 (one per supplier) and will also issue sector specific newsletters twice per year to share information and raise awareness of best practice. We will also produce technical advisory documents and case studies, which will be shared on Producer Exchange.

Specific areas of focus in the year ahead include:

- Acid treated water trial
- Selenium trial
- Free farrowing crates trial
- Ammonia reduction trial

Poultry

In the poultry sector we will have four Indicator Farms, with the primary focus being on animal health and welfare in the year ahead as this is the priority hotspot in this sector.

We will hold 'walk the supply chain' events in the summer of 2015 (one per supplier) and will also issue sector specific newsletters twice per year to share information and raise awareness of best practice. We will also produce technical advisory documents and case studies, which will be shared on Producer Exchange.

Specific areas of focus in the year ahead include:

- Sustainable intensification – what does it look like in poultry?
- Campylobacter control/mitigation
- Enrichment trials



Summary

As we make progress on our Farming for the Future journey we are reminded that the challenges we face are complex and varied. We are making good progress with our engagement activity but there remains much to do.

There is growing recognition among our producers that sustainability is something that they need to incorporate into every day business. What remains key is that we understand the challenges our farmers face and continue to ensure that our messages are relevant and engaging to spark interest, drive enthusiasm and deliver change. It is also clear that we cannot deliver our objectives overnight – which is why our long term commitment to delivering change that will benefit our farmers and growers, and will deliver security of supply for us as a business, remains critical to our overall food group strategy.

We are pleased with our progress to date and remain confident that the core themes of our Farming for the Future programme are in line with, and will help us address, the major challenges we face.

Our approach moving forward will, therefore, be to continue to focus on these key areas – efficiency, the environment, ethical practice and education.

The agricultural industry continues to move at pace and our sustainable farming commitment will continue to develop to ensure that we deliver secure and sustainable supply chains for the future that will ensure that all involved prosper.



Barfoot Farms
M&S sweetcorn supplier
West Sussex, United Kingdom

Background

Established in the 1970s by Peter Barfoot, Barfoot Farms has had a long association as a vegetable supplier to M&S. Its farming operations currently incorporate 5,000 acres of land spread across Hampshire, West Sussex, Kent and the Isle of Wight.

The farm, which is an M&S Sustainable Indicator Farm, has been voted as 'British Vegetable Grower of the Year', 'Most Environmentally Friendly Farm in Hampshire' and, in July 2013, won the M&S 'Plan A People Award'.

At Barfoots, previous soil management processes revolved around a traditional plough based and rotational crop system. This meant that for long periods, a proportion of land was being rested without cropping and with no benefit to soil health. In fact, there were concerns that during such periods, organic matter and nutrients within relevant soils were depleting.

Healthy soils help sustain higher yields and play a crucial role in preventing soil erosion. As such, in 2013, Barfoots set about implementing policies to improve the structure, biodiversity and nutrient holding capacity of their farm's soil. By doing so, the business hoped to create healthier, higher yielding crops with fewer inputs.

Approach:

In order to improve the quality and productivity of their soil, Barfoots implemented a new soil management plan, with an initial focus on sweetcorn production.

This included the integration of cover cropping with mustard as part of their crop rotation pattern and utilising a strip till cultivator to reduce the area of land disturbed during seed bed preparation.

The businesses also introduced a Trimble based GPS, controlled traffic system to reduce compaction issues caused by farm machinery; helping to maintain the structure of soil beds and reduce fuel consumption required per hectare of cultivated land.

A concerted effort was made to reduce overall chemical fertiliser use and better utilise the digestate that was

- productivity of crops
- To reduce use of conventional chemical fertilisers and their associated financial cost
- To maximise the use of digestate as an alternative soil fertiliser
- To reduce overall fuel consumption per hectare of cropping area
- To minimise the damage that machinery has on the farms soil structure

Results:

Overall, the farm is pleased to report that sweetcorn crop yield per hectare has improved since the implementation of their new soil management strategy:

For 1 ha main season sweetcorn crop			
Costs before new soil management approaches		Costs with new soil management approaches	
Cost bag fertiliser for a standard crop on index 2 soils before increased use of cover crops and digestate	£262	Cost of cover cropping (seed, additional soil cultivations, management)	£48
Average costs of fuel for cultivations before controlled traffic	£8.12	Cost of GPS controlled traffic system technology	£7
Average margin of yield	£VARIES	Cost of bag fertilisers under new regime	£140
		Average margin of yield	£VARIES

produced as a by-product from the farms bio-digester plant, which has been operating since 2010.

Objectives:

- To increase soil biodiversity and improve soil structure, thereby increasing health and

The business believes that having implemented their new management strategy, the farm's soil now has higher levels of organic matter and better soil structure; though it admits that this is difficult to quantify.

The farm's soil biodata tests (which consist of counting the number of earthworms in a single spade split) report double the number of worms found within soil samples compared to those before the new soil management system was launched, suggesting significant improvements in soil biodiversity.

The use of digestate has increased on farm, with a 30% decline in purchases of nitrogen fertilisers across the business. Farm staff have stated that they believe this by-product is of much greater benefit to plant growth and crop quality than its chemical counterparts.

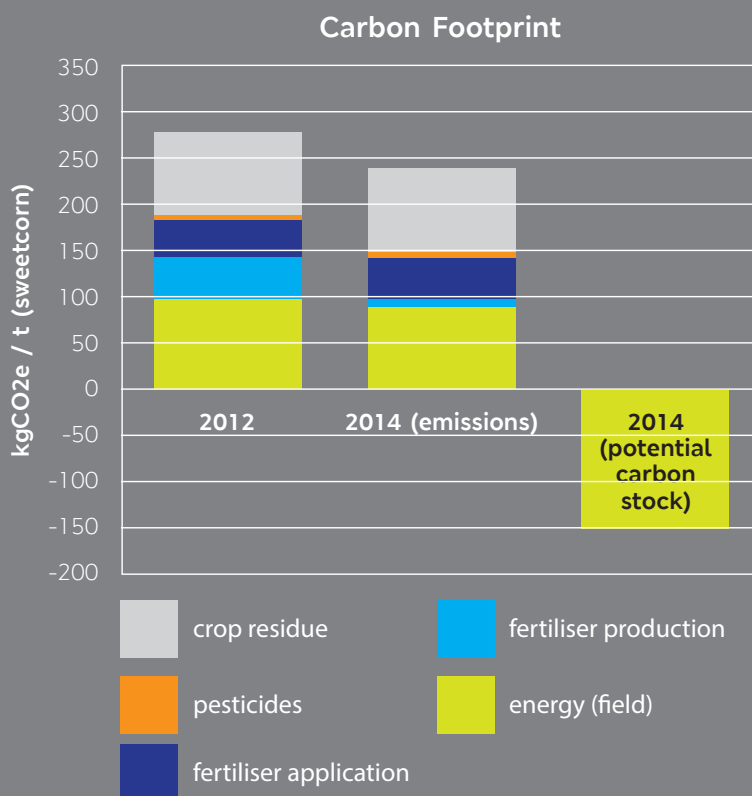
Cost/benefits:

Barfoot's have faced substantial initial and ongoing costs in order to implement their new soil management strategies, but they have achieved significant savings in certain areas, such as fertiliser costs:

The farm has reduced its bagged fertiliser costs by more than 46% and once the cost of the cover crop seed and reduced fuel use are taken into consideration, a 27.8% reduction in overall input costs per hectare has been achieved so far.

This obviously equates to an increase in the margin of each yield per hectare and the business hopes that its soil management techniques will have a long-term benefit and further improve this margin in the future.

Carbon



The graph shows a reduction in carbon footprint as a result of the actions taken by Barfoots to improve their soils. It has dropped 14% (from 279 to 239 kg CO₂e per tonne of sweetcorn). This reduction was mainly due to an 82% reduction in fertiliser production emissions by substituting artificial fertilisers with digestate (AD by-product).

It is believed that the presence of a cover crop and the shift from conventional to reduced till should have a positive impact on the carbon stock of the farms topsoil too, as these practices are known to have a beneficial impact on soil carbon.

Next step:

Barfoots is pleased with the results that have been achieved through the implementation of their new soil management plan and are hoping to extend the scope of the project, beyond sweetcorn.

“We are now looking at how the lessons that we have learned can be applied to other crops, especially the perennial crops that we grow such as asparagus and rhubarb,” said Nathan Dellicott, Director, Barfoots.

“What has become all too clear is that a farmer’s soul is his soil. We already knew this, but this project really focused our minds. No matter what the pressure of the market, whatever the demands of the business, whether it rains or shines, we will be a second rate producer if we have second-rate soil management”.

Plan **A** *2020*

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