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OPINION

Most farmers and growers love a farm walk. There's nothing like being able to get a good look over the hedge at what your neighbours are doing, or learn how others have tackled similar (or even different) challenges in their farm business. If you are lucky there's also the chance to network over a beer or a burger.

When Nuffield Scholars are involved, the chances of seeing something truly innovative add to the attraction. It's therefore not surprising that the Field Tours following this year's Nuffield Triennial Conference proved so popular with attendees.

What may be more surprising however is the fact that the Sustainable & Organic Field Tour included two of the UK's largest vegetable producers who grow crops in the heart of the Cambridgeshire Fens.

When compared to other farm types, intensive vegetable production may not be seen as the most sustainable of enterprises - thanks its need for intensive cultivations and the demand for high quality produce. At the same time the challenges of farming in the fens, such as having to contend with soil erosion and peat oxidation, are well known and have, in the past, drawn criticism from environmental NGOs.

In fact, these challenges make it even more important to produce products sustainably, whether or not they are organic. Changes to rotations, the use of cover crops and minimal cultivations, alternative crop protection techniques and improved water application all play a part in these businesses.

Far from being a 'muck and magic' return to simple farming, these businesses are utilising the very latest science and techniques to improve the sustainability of their farming operations and improve the environment. As Andrew Burgess of Produce World commented; "these are all things that can be applied to conventional production as well."

At the end of the day best practice is best practice, but these businesses also demonstrate that what is good for one location or soil type can be disastrous in another. The message that there are no 'one size fits all' solutions needs to be taken to government, environmental campaigners and the general public. All too often there can be antagonism between organic and conventional growers, or those who farm intensive or low-input systems. Perhaps it's time for a few more farm walks?

Lettuce growers get Luna Sensation EAMU

CRD has issued an EAMU for the use of Bayer fungicide Luna Sensation (fluopyram + trifloxystrobin) to control Botrytis and Sclerotinia on outdoor and indoor lettuce.

BLSA technical director David Norman submitted the industry support document for this EAMU. In it he says: "The outdoor lettuce crop in the UK is produced on around 6,000 hectares with a total output value of around £130 million and the protected lettuce crop adds a further £17 million. Losses due to bottom rots from Botrytis and Sclerotinia are highly significant at 10-15% per annum, worth £13-20 million to the industry.

"The lettuce industry needs additional fungicides for the control of these diseases. The addition of Luna Sensation will bring a new active and combination of actives which will help to improve control and increase product choice for lettuce growers. This will also help to reduce residues and the initiation and spread of fungicide resistance. For these reasons the BLSA strongly supported the EAMU for Luna Sensation in lettuce."

The authorisation permits a maximum of one treatment per crop, a maximum individual dose of 0.8 L/ha and a pre-harvest interval of 7 days.

Bayer's campaign manager horticulture Tim Lacey says: "Luna Sensation is a co-formulation of new generation SDHI active fluopyram and strobilurin fungicide trifloxystrobin. It's a very flexible product for integrated disease control programmes, has built-in resistance management and a short pre-harvest interval."

For more information on this EAMU refer to the CRD pesticides database; *https://secure.pesticides.gov.uk/offlabels/search.asp*

Botrytis on lettuce.

Combating weeds with lasers

Researchers from the University of Bonn in Germany are working on a system which would automatically identify weeds and then destroy them using a short laser pulse.

Dr. Julio Pastrana and Tim Wigbels from the Institute of Geodesy and Geoinformation at the University of Bonn, are currently developing the novel system which uses cameras on an all-terrain robot vehicle, or which could be mounted on a tractor add-on. They say that unwanted weed species should be automatically identified in a variety of crops and treated in a targeted way.

"The robot shoots the leaves of the unwanted plants with short laser pulses, which causes a weakening in their vitality," reports Dr. Pastrana.

"We predict that we will no longer need to use herbicides on our fields and the environment will be protected," adds Wigbels. "It is now a case of finding investors and further developing the business plan for the start-up."

The researchers are developing a new start-up company 'Escarda Technologies' for one year at the University of Bonn with an EXIST grant from the Federal Ministry for Economic Affairs and Energy, and the researchers are also using the funding to buy the parts needed to construct a prototype.

Tim Wigbels and Dr. Julio Pastrana with their weed recognition software which detects a plant and then shoots a laser to damage the foliage. (Courtesy Volker Lannert/Uni Bonn).

Four year GM potato trial for Sainsbury Laboratory

The Sainsbury Laboratory (TSL) in Norwich has received approval from DEFRA farming minister, George Eustice, for a trial of genetically-modified potatoes between 2017 and 2021. The trial site at the John Innes Centre has to meet restrictions, notably a 20 metre wide strip around the GM plants with the plot not over 1,000 sq metres.

These field trials are part of TSL's "Potato Partnership Project" to develop a Maris Piper that is blight and nematode resistant, bruises less and produces less acrylamide when cooked at high temperatures. The project is majority funded by the Biotechnology and Biological Sciences Research Council (BBSRC) with additional funding from industry partners BioPotatoes (UK) and Simplot (US).

George Eustice wrote that he has "taken advice from the advisory committee on Releases to the Environment and Natural England" and agreed the terms, limitations and conditions of consent with the Food Standards Agency in terms of health and safety to humans.

Study reveals lack of knowledge about biopesticides

A lack of knowledge about biopesticides is leading to inefficient application by growers and reducing the success rates of integrated pest and disease management programmes (IPDM), according to researchers.

This is the conclusion of trials conducted as part of AMBER, a five-year project funded by AHDB with the aim of identifying management practices that growers could use to improve the performance of biopesticide products within IPDM.

David Chandler, principal research fellow at University of Warwick said: 'It was clear from our observation trials that there was a lack of understanding about how biopesticide efficacy is affected by factors such as population sizes of pests and diseases, environmental factors such as exposure to UVA and B and water volumes.

"More information needs to be given to growers on how to apply biopesticides in practical situations. This could be done through modifications to improve labeling"

Joe Martin, crop protection senior scientist at AHDB said; "In a survey we conducted as part of AMBER, we found that growers perceived biopesticides to be unreliable, however we believe this could be in part as a result of incorrect applications. We need to make sure growers are provided with as much knowledge as possible about the optimum conditions required for good performance of each biopesticide in order to identify potential improvements in application."

Gracie Emeny, knowledge exchange manager at AHDB said; "A key part of AMBER will be sharing knowledge and experience from the trials with growers and the industry to improve best practice guidelines." AMBER trials will now focus on developing practices that optimise biopesticide performance and will be tested on commercial nurseries.

A new website has just been launched to keep growers updated with the AMBER project news. It also contains useful information for anyone looking to find out more about biopesticides. Visit; *bit.ly/AMBERproject*.

Agrovista offer new commercial drone service

Some of the most significant advances in agronomy available to UK farmers were on display at Agrovista's stand at Cereals 2017 last month. Among these was a recently launched commercial drone service, developed by Plantsystems, Agrovista's precision services arm.

This service offers flight packages carried out by the company's fully-approved unmanned aerial vehicle (UAV) operators, or a processing service for farmers who have their own drones.

"The development of drone technology is providing real potential for using relatively simple hobby tools for more complex agronomy tasks," says Lewis McKerrow, Agrovista's head of precision technology.

Research by the company has shown that higher-specification hobby drones costing around £1200-1800 fitted with a good-quality standard visual camera can do most of the tasks carried out by professional drones costing several times as much.

"Good hobby drones are fine for identifying most parameters of field performance," says Mr McKerrow. "You need something with a reasonable flight time of 15 minutes or more, even when it's a bit windy. The drone should also carry a camera that can provide 3.5cm resolution at 120m flying height, allowing you to create maps showing establishment, biomass, weeds and disease and to carry out plant counts."

Agrovista uses its MapIT Pro software to process data captured by the drone from several passes during the season to create field maps. These can be used for variable rate drilling and nitrogen application, and even patch spraying weeds with high resolution accuracy.

Flight and data processing charges vary according to location and job size, typically costing £3-4/ha. Drone operators who only require the data processing service will pay around 50p/ha per zone map and £1/ha for a zone and rate map.

Agrovista is now offering a commercial drone service.

BCGA variety trials

The 2017 BCGA Carrot Variety Demonstration will take place on Thursday 5th October 2017, at Trotters Field, Alderton Road, Shottisham, Woodbridge, Suffolk, IP12 3RH, courtesy of Tompsett Growers Ltd.

The varieties were drilled by Shaun Coleman of NIAB on 28th April 2017, and include 53 carrot varieties, from 7 seed companies, a mixture of types and plant densities.

This AHDB Horticulture sponsored event runs from 9.00 am to 3.30 pm and is registered for BASIS and NRoSO points. Entry is free of charge and light refreshments will be provided.

Syngenta celebrates 150 years since creation of S&G

Syngenta is celebrating 150 years as leading pioneers of vegetable seed breeding, with the commemoration of the creation of Sluis & Groot (S&G) by two Dutch farmers from Andijk in the Netherlands, in July 1867.

From those origins as cabbage seed exporters, and through several transformations, the business has grown into a premier European and Global innovator in vegetable seed varieties, including brassica, leafy vegetables, peas, tomatoes and peppers.

Renowned for the development of varieties with novel consumer attributes and strong agronomic characteristics, the business is now fulfilled by a dedicated Syngenta European seed breeding team and comprehensive UK field trials, technical and sales support team (pictured below).

More recently, the creation of a new dedicated vegetable seeds business for northern Europe, within the global Syngenta umbrella, has primed additional investment to support growing worldwide demand for the company's vegetable seeds.

At the centre of the latest phased multi-year business development programme, is a €21 million investment in a ground-breaking R&D Technology Centre for vegetable seeds, at Einkhuizen in North Holland. With state of the art plant breeding technologies and production facilities, it will help to further strengthen the company's reputation for high quality varieties and seed.

James Gray, Syngenta Vegetable Seeds Commercial Manager for UK, Eire and the Nordics, said:

"We have now secured the commitment and investment to forge a bright future for the business and our grower customers, and build on the exceptional 150-year history and legacy of the original S&G pioneers.

"With continued investment in the exceptional vegetable lines in development and coming to fruition now, it's an exciting time for Syngenta and for growers."

Syngenta's UK Vegetable Seeds team.

PotatoSize™ app to assess potato size pre-harvest

Test digs to assess tuber size are taken for granted as a tried-and-tested part of the crop season. However, technology is about to give growers an option to streamline the process thanks to the launch of a new PotatoSize™ app.

PotatoSize™, the result of a joint project between James Hutton Institute, James Hutton Limited and Agrovista, aims to replace laborious riddling and counting to estimate tuber sizes with automated analysis of an image of tubers obtained from the test dig.

"This type of analysis is a vital component to allow growers to manage burn down/haulm destruction strategies to ensure market requirements are achieved," says Lewis McKerrow, Agrovista's head of precision technology.

The mobile app allows quick and easy assessment of crop statistics, including crop weight in 5mm size bands (t/unit), current estimated crop weight per area (e.g. t/ha) and an easy-to-read bar graph of size bands.

"This level of detail provides growers with the information they need to achieve accurate, consistent across crops and sites," he adds.

"Growers can now forget about using cumbersome riddles and size grids and for larger organisations, the app will enable them to obtain consistent results from different staff across multiple locations, as well as the ability to export results back to a central point."

Using PotatoSize™, growers can assess crops in just a few minutes. Commenting on ease of use, Mr McKerrow says that it is important users follow the guidelines in the app.

"Image analysis is a complex piece of software, when you add in different soil colours, tuber colours, and ambient light conditions, it has certainly proved challenging to develop. We have spent the last year refining the algorithms and as long as users follow the detailed instructions then good, consistent results are achieved."

PotatoSize™ is available for iOS and Android devices and can be downloaded from the App Store and Google Play store. Once downloaded and registered, users will get 5 free image processes to try the app, thereafter it is priced at £1 per image process (discounts for volume credit purchases). Existing users of Agrovista's Axis system can download the app and use their existing login to use the app.

Lewis McKerrow, Agrovista's head of precision technology.

New website for Herbert spares

Hub4Parts Limited, who supply spare parts for Herbert vegetable handling equipment, has launched its new website *www.hub4parts.co.uk* giving growers, packers and processors a key reference point when looking for components to keep their system fully operational.

Since launching this support business at the start of 2017 after buying the spares business and exclusivity for the plastic screen manufacturing operation, Andy Hubble, Herbert's ex-Commercial Manager, has delivered both manufactured and sourced parts all around the world.

Andy was joined in the business in early March by his wife Max, who also has over 14 years of experience working at Herberts, which means collectively 46 years of knowledge is available to help source the right parts.

With access to parts manuals, bills of materials, and component drawings, Hub4Parts are able to source and supply spares for machines from the early eighties right up to the current day.

They can also provide plastic grading screens in any width or length.

New era for biocontrols

Biocontrol of insect pests stands on the cusp of a new era, with the development of exciting technology offering the potential for highly-selective species specific targeted treatments, using an entirely naturally occurring mechanism. Speaking at the recent Farmers Weekly Future Farming lecture, Max Newbert, Syngenta insecticide specialist, highlighted future opportunities created by the company's development of RNA-based biocontrols.

He said that utilising selected fragments of RNA with an identical sequence to an insect pest's own RNA sprayed onto the crop, will, once ingested by the target pest, prevent protein synthesis within the insect's cells and effectively kill it before the crop is unduly damaged. For instance, trials with Colorado Beetle in potatoes had offered complete control and protection of the crop, while untreated plants were decimated in hours.

"As RNA is naturally occurring everywhere, it is not introducing anything new to the environment," said Max. "Furthermore, since all RNA is unique to individual species, it has no effect on any non-target organisms."

He also pointed out that RNA products can overcome some of the issues with existing biocontrols, including having an immediate effect without having to wait for the predator numbers to build up, for example. Also, while most existing biocontrols only offer a suppression of pest populations, RNA products could offer higher levels of control, at or above existing chemical options. They can also be easily applied with existing application techniques.

"Finding new chemical actives is increasingly difficult and highly expensive," said Max. "We are losing existing products to regulatory hurdles at a rate of four removed to every one new ai registered. Biocontrols can offer real and viable alternatives to fill some of the space being lost from conventional chemistry.

"We do need to develop the regulatory process and the practical implication and utilisation at a farm level for successful introduction and use of the technology," he said. Max pointed out that there was no timescale for introduction in the UK, with products currently in development primarily aimed at crop pests of the US and South America.

ScanStone appoint new Area Sales Manager for East Anglia

ScanStone have appointed Ashley Sismey as their new Area Sales Manager for East Anglia. Ashley who is based near Lakenheath, Suffolk, will cover the whole of East Anglia, including Norfolk, Suffolk, Cambridgeshire, Essex and Peterborough.

He will be dealing with the parts, sales and service distribution in the above areas as well as conducting demonstrations of ScanStone's product range. Ashley has a breadth of knowledge in the vegetable industry including a lot of experience as a mechanic repairing potato machinery.

Ashley Sismey.

PRODUCE WORLD AND G'S DEMONSTRATE SUSTAINABILITY

by Richard Crowhurst

As part of the AHDB-sponsored Nuffield International Triennial Conference last month, a group of delegates on the Sustainability & Organic Field Tour visited two of the UK's leading vegetable growers to see profitable and sustainable crop production in action.

The first stop of the day was Produce World's organic packhouse at Yaxley near Peterborough. Here Director Andrew Burgess provided an overview of the Produce World business and his own journey from a "dyed-in-the-wool intensive grower" to the organic proponent within the Produce World Group and a member of not only the board of LEAF, but also the NFU Organic and Horticulture boards.

"The OP (organophosphate) scare of 1995 made me think," he explained. Having converted one farm to organic production in 1997, the business has developed from the point where it required around 50 different growers to supply 5-10 tonnes of product a week, to the point that 90 per cent of today's UK production comes from just four growers, including the business's own farm.

Growing 3,000 acres of organic carrots and parsnips a year, the firm is currently seeing sales growth of around 6 per cent a year, which creates challenges in terms of securing enough land. In a good week the packhouse will produce 500 tonnes of finished carrots.

Crops are grown in East Anglia, Shropshire, the East of Scotland and Northern Scotland to provide seasonal continuity, with imports coming from long-term sources in Italy, Spain and Israel.

"It is a very competitive market and our aim is to be more efficient and better," Andrew explained. "We run grower events and trials and share knowledge as some people are particularly good at certain things." The result of this is that the organic crops now have pack-outs and quality that outperform the conventional part of the business. Particular areas of focus in terms of agronomy include soil health, the use of black plastic to improve crop germination and encouraging predators for the control of willow-carrot aphid.

He pointed out that, "these are all things that can be applied to conventional production as well. In organic production we have to manage more factors; it's a far more complex way of farming."

Andrew also admitted that being part of a business which

The reed bed water treatment facility at Produce World Yaxley.

Viewing automated celery harvesting at G's.

relies on conventional production for 80 per cent of its turnover can sometimes create potential conflicts in terms of marketing. "However, we don't want the market to overheat," he stressed. "I'd like to maintain 6-7 per cent growth a year and currently other channels are growing faster than retailers, so we would like to become less reliant on the multiples."

One example of this is that the company now supplies schools in seven London boroughs; a market which he says has been helped by the development of the Food for Life Catering Mark by the Soil Association.

Unlike most conventional growers, cavity spot is not an issue, which Andrew believes is due to the lack of fungicide use which he feels can knock out beneficial and antagonistic fungi in the soils. "We have also taken up more alternative varieties to Nairobi; we're looking for fast maturing varieties with less top. We are also adding woody material to our composts, but will still have very intensive cultivations."

It's not just in the field that Produce World is innovating carrot production. The Yaxley site now has its own reed bed natural water treatment system. "We used to use water from the river, but we were spending £50,000 a year on treatment chemicals," explained Factory Manager Jamie Tointon. "Now 89 per cent of the water we use is from our own closed loop recycling system." After passing through a series of S-bends which allow solids to fall out of the water, it is passed through a series of lagoons containing reeds and pea gravel to filter it.

"We use about 178 cu m of water a day for unloading, washing and floating product through the line, together with 13 cu m of potable mains water for hydro-cooling and spray bars, etc, he explained. "We have 3-4 acres of land tied up here, so you couldn't do this on an industrial estate. The area is like a miniature nature reserve: we've planted trees and sown wild flowers and we let weeds grow."

Sustainable production in the Fens

After lunch the group moved on to G's production site at Barway near Ely where Charles Shropshire is the third generation of his family working at G's Fresh, with overall responsibility for the company's Cambridgeshire farming operations. After giving an overview of the company's history and current structure (which includes operations in the UK, Spain, Poland, Czech Republic, Senegal and the United States), he explained how organics is a key area for the company.

"Organics is growing. We are putting another 100 acres into conversion this year," said Charles. "Overall we are seeing around 10 per cent growth in organics across our business, in areas like beetroot, celery, lettuce and onions. In particular we can't produce enough organic onions and we are seeing a 5 per cent year on year increase in demand for organic Little Gem lettuce, but we need to be careful that this doesn't eat into our Iceberg sales."

Charles Shropshire and G's Innovation Director Charlie Kisby both stressed that organic sales are also enjoying growth in Northern Europe. "We have to evaluate things on a crop-by-crop basis. We refer to ourselves as a marketing-led farming business. We are seeing a lot of organic growth in Northern Germany, while it is a very fragmented market in the United States," added Mr Kisby.

As well as the company's own farms, the G's Growers Producer Organisation includes 24 like-minded growers, which the company describes as being akin to a marriage. With the unique challenges of farming in the Fens, such as peat oxidation and susceptibility to wind erosion, soil has always been seen as a valuable resource by the company. In fact Charles's grandfather Guy Shropshire developed a straw planter to tackle the issue of 'Fen blows' in the 1970s.

"One of our key objectives is to return soils in better health to the next generation," explained G's head agronomist Emma Garfield. "For example we are now using spent mushroom compost to help protect the soil from wind erosion. In terms of soil health and biology there is not a single solution, we have to look at the whole picture." In other areas of the country water erosion can be an issue, and to tackle this, the company has taken headlands and other areas out of production, putting in 'grass waterways' to capture runoff and soil.

G's has also initiated a PhD looking at the effects of cover crops in collaboration with Cranfield University. "As with anything else that we grow, these cover crops need careful management," explained Emma. "We are also doing some work on remote sensing

Tour co-organiser Stephen Briggs welcoming the group to his farm.

and where it can add value on the farm. We are constantly innovating and looking at integrating different parts of the group."

Such an approach is, in part, made possible by the scale and diversity of the G's business. For example mushrooms are grown using heat from the company's AD plant. This is fed with maize which is now an important part of the rotation and which adds another cropping option.

Digestate from the AD plant and spent mushroom compost are both used across the farms, bringing a number of benefits in terms of soil health and nutrition. For example, digestate use has significantly reduced the need for potassium fertiliser on many crops.

There was then time to tour the company's organic farm at Barway and see some of these techniques in practice: organic celery crops are grown under nets to prevent capsid damage, which has become an issue over the last 6-7 years. However, this then increased the humidity around the plants leading to an increase in septoria. To overcome this, the company now establishes the crop using overhead boom irrigation, before switching to trickle irrigation.

Meanwhile, a visit to one of the G's many conventional celery fields gave those on the tour a chance to see both mechanical and hand harvesting in operation, as well as the opportunity to see one of the company's 16 harvesting rigs in action. These are all designed and maintained in-house by a dedicated team of engineers and are capable of harvesting, washing and packing up to 120 packs per minute.

Is Agroforestry the Future?

The final visit of the day was to the farm of one of the tour organisers; organic farmer and former Nuffield Scholar Stephen Briggs. He has converted a proportion of his 101 ha tenanted farm near Peterborough to agroforestry. This consists of rows of apple trees, surrounded by a 3 metre wide pollination strip, at 24 metre wide intervals, allowing arable cropping to be carried out on a 6 metre controlled traffic system between the tree rows.

"Up to 50 per cent less nitrogen is lost under agroforestry systems than arable land," explained Stephen. "Studies have shown that overall the systems can be 40 per cent more productive - so why isn't everyone doing it?"

In his case, a range of modern and heritage apple trees on MM106 semi-dwarfing rootstocks were planted as feathered maidens in 2009. They are now producing a crop which is harvested following the cereals and is currently used for producing premium apple juice. In the past Stephen has grown a range of vegetable crops, but found he lacked the scale necessary to make it a feasible long-term enterprise. "We either had to get bigger, or do something else," he explained.

As a result he and his wife are currently in the process of building a farm shop. On the outskirts of Peterborough, and with around 7,500 cars passing the farm every day, he hopes to tap into what is currently an under-served market in the area. As well as selling fruit from the farm, he has earmarked a new area for vegetable production on site which will be managed externally. The shop will also feature locally produced bread, a high-welfare butchery and a coffee shop.

APHIDS & LIGHT LEAF SPOT – PREDOMINANT CONCERNS FOR 2017

*A year ago we were facing a biblical influx of diamondback moths that threatened to devastate brassica crops. This year they've hardly made an appearance yet and Allium & Brassica Centre agronomist **Andy Richardson** is far more concerned about aphids. Here he explains why, and how to deal with them, and previews a new decision support initiative for the range of brassica leaf spots.*

This time last year you couldn't walk through a brassica crop without stirring a cloud of diamondback moth. 2016 was the worst year since 1996, compounded by pyrethroid resistance and desperately few spray days in June.

While there has been some migration into the UK late this May and into early June, numbers caught have, so far, been a fraction of last year's and to date we have seen very few caterpillars

Those that appear will largely be dealt with by the drenches used this season. The majority of broccoli, cauliflower, cabbage and sprout crops are being grown from plants drenched with Verimark (cyanotraniliprole) and Tracer (spinosad) has been used on many kale crops. These drenches should keep crops free of caterpillars for around eight weeks from planting. This should also help prevent numbers from ramping up later on. We're in a much better position than we were last year.

Although there is a wide range of pyrethroids approved on brassicas, we are not advising their use. Diamondback moth last season was found to be resistant to pyrethroids and we believe that their use early on exacerbated the situation. Therefore, until advised otherwise by the Rothamsted testers, we will not be recommending them. Steward (indoxacarb) and Tracer (spinosad) are two other foliar options.

My predominant pest concern this year is aphids. Having lost Dursban (chlorpyrifos) last year and with Aphox (pirimicarb) going at the end of July, we're now down to just four foliar insecticides for aphid control and two of these neonicotinoids – see table below. This is going to put pressure on risk and resistance management.

While the challenge of aphid control with this reduced armoury varies significantly by crop, it is not difficult to envisage a scenario where we could run out of treatments, particularly on those crops where we are not permitted to use Cruiser (thiamethoxam) phytodrip at sowing.

The 9th June AHDB Aphid News reported peach–potato aphid caught at all sites with numbers increasing at nine of them. The top three by accumulated numbers were; Broom's Barn 988; Wellesbourne 627; and Kirton 214. These are well above average with Kirton's catch to date being ten times the ten-year mean. Tests have shown that 60-70% of these migrants are carrying turnip yellows virus.

Foliar Insecticides for Aphid Control on Brassicas 2017

Product	Full Approval	EAMU	Maximum Individual Dose	Maximum Number of Applications	Harvest Interval
Biscaya (thiacloprid)	Broccoli Cauliflower Cabbage B.sprouts	Kale Collards (2249/14)	0.4 L/ha	2*	7 days (21 days Kale and Collards)
Insyst (acetamiprid)		B.sprouts (2866/07)	250 g/ha	1*	21 days
Movento (spirotetramat)	Broccoli Cauliflower Cabbage B.sprouts Kale Collards		0.5 L/ha	2	3 days
Plenum WG (pymetrozine)	Broccoli Cauliflower Cabbage B.sprouts	Kale Collards (2246/08)	0.4 kg/ha	3 (2 Kale & Collards)	14 days (7 days Kale & Collards)

* Only two foliar applications of a neonicotinoid are permitted per crop.

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Allium & Brassica Centre agronomist Andy Richardson.

sowing should easily get through to harvest with just one or two foliar aphicide sprays.

By contrast most long season crops – sprouts, storage cabbage, late autumn and winter cauliflower – will be grown from Cruiser treated plants. This should see them through the first wave of aphid infestation in June/July and dealing with the second wave in August/September should just about be manageable with the insecticides we've got.

Kale and collards are however going to be very challenging to grow from an aphid control viewpoint, with no approval for Cruiser, and only six permitted foliar aphicide applications. Getting insecticides to where they are needed is also a challenge in a fully-grown kale plant. Movento's (spirotetramat) two-way systemicity is very good for this, but with other insecticides choice of water rates, nozzles and timing will be critical.

It's likely we'll need to use three sprays against the first wave of aphids leaving us only three to deal with the second. A hot, dry August and early autumn could then see numbers building up again fast and us running out of options some months short of harvest.

With the European Commission proposing to extend the ban of neonicotinoid seed treatments to all non-flowering crops we don't know how long we'll continue to have Cruiser available. And the outlook for aphid control in kale this season illustrates how difficult the situation could become for all vegetable brassicas. The long and short of it is that we desperately need to keep Cruiser in the armoury and

Kale (pictured above and right) is going to be very challenging to grow from an aphid control viewpoint this year.

This bulletin also reported the first catch of six cabbage aphids at Kirton and accumulated numbers at most traps more in line with the ten-year mean. Aphox in particular was very useful for cabbage aphid and we used to mix it with other actives to combat resistant peach–potato aphid.

Short season, summer/early autumn crops of broccoli and cauliflower not being treated with Cruiser (thiamethoxam) at

gain a couple of new approvals too. We just can't work with the alternative of praying for cool, wet weather.

Brassica diseases

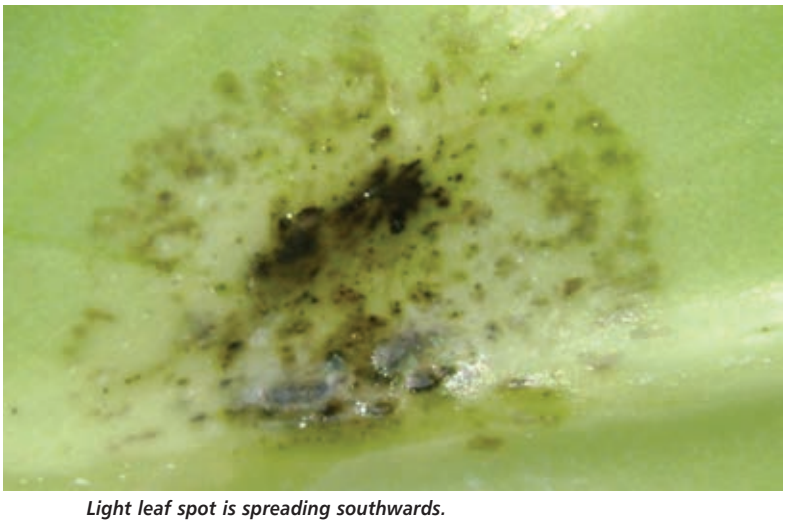
Turning to diseases, we've been very ringspot focused in Southern England and now have to address the southwards spread of light leaf spot. Seven or eight years ago it was very rare to see the disease here in Lincolnshire, but over the last three to four years we've seen more and more.

We've been lucky so far but need to be prepared because we're not doing prophylactic spraying as they are in Northern England and Scotland and are still growing some susceptible varieties. Given a wet autumn it could bite us hard.

One initiative, in conjunction with AHDB Horticulture and Professor Roy Kennedy, that will help is the addition of light leaf spot forecasting to Brassica Alert for 2017. Risk will be determined by spore capture and weather data and displayed as low (green) or high (red) as is currently done for ringspot. We hope to have the light leaf spot forecast running at, at least one site in 2017, with the ringspot forecast running from four sites in Lincolnshire, as previously.

It will enable the targeting of fungicide sprays to peak risk times, which will both improve control and crop quality. In trials over many years, use of the forecasts has significantly improved both marketable yield and quality compared with the somewhat 'old fashioned' standard three-weekly sprays.

For disease control this season we foresee programmes commencing in August on longer season crops; sprouts and storage cabbage. Given the need to target light leaf spot as effectively as ringspot our programmes will be based on at least two sprays of Rudis (prothioconazole), in our opinion, the most effective triazole.



Light leaf spot is spreading southwards.

ROOT CROP HARVESTERS

by Mike Williams

Self-propelled machines are at the forefront in the recent batch of new and updated harvesters for potatoes and other root crops, and the list of design improvements includes increased power, more user-friendly controls, improved separation and measures to reduce soil compaction.

Last year's new arrival in the Grimme self-propelled harvester range was the Varitron 270 Platinum model offering a number of features including a power boost from 326 to 354hp, making it the most powerful two-row potato harvester available.

The power unit is a six-cylinder Mercedes engine with a 1500rpm operating speed while digging, reducing to a fuel-saving 1300rpm for road travel.

It is available on wheels or on rubber tracks, and the features include the ErgoDrive control system built into the driver's seat armrest and capable of programming up to 77 different functions. Two control terminals with video monitors provide an overview, and there are up to eight cameras linked to Visual Protect, a control system that automatically switches on the relevant camera if a problem is developing. The bunker capacity is 7 tonnes and it has a 45 sec unloading time.

Other recent developments in the Grimme range include this year's launch of the Varitron 220 Platinum model which shares the 270 model's 354hp engine and ErgoDrive controls, but has a 2 tonne capacity buffer bunker. Also new for this year's harvest is the addition of Speedtronic automatic web speed control for the single-row SE75-55 trailed bunker harvester. Operating on the intake web and the first and second main webs, the control system automatically adjusts the speed of each web independently to maintain optimum output. The latest version of the single-row harvester also shares the Visual Protect camera control featured on the Varitron Platinum 270.

The established trend in the harvester market is for more growers to switch from trailed to self-propelled, and this is likely to continue, says Adam Johnson of Grimme UK. Key benefits helping to encourage growth in self-propelled harvesting include reduced ground compaction as well as increased separation capacity and throughput, he says.

The newest addition to the Dewulf range of potato harvesters is the Xtreme version of the Kwatro four-row self-propelled model, with production at the Dewulf factory in Belgium starting last year. One machine has already been sold to a UK grower for

The Varitron Platinum two-row harvester features Grimme's recently introduced ErgoDrive control system.

the 2017 harvest. The Xtreme model is designed to harvest potatoes grown in rows with 90cm spacing or in 1800mm beds, and the layout includes a front mounted lifting unit working ahead of 900mm wide rubber tracks, with extra wide rear wheels available as an option to provide a further reduction in ground pressure.

The equipment includes ADC automatic depth control based on a pair of skids, while row following is automatic and the digger and sieving webs have a uniform 1760mm width to minimise damage risks. Bunker capacity is 17.5 cu m and the power unit is a 500hp Scania engine.

Dewulf's biggest selling self-propelled potato harvester in the UK is the two-row R3060 model. The first version of the R3060 was built in 2006 and the current model is the fifth generation, introducing a number of specification improvements including a change of power unit from Deutz to a Scania engine. The power output is increased to 350hp with improved fuel economy including a reduced engine speed for road travel, and the transmission is hydrostatic.

The R3060 is available with the familiar lifting system of two diabolos with shares, but the options list includes the ADC system without diabolos featured on the Kwatro. There is a digger web plus two sieving webs, and the Claas cab has a colour monitor and links to four cameras.

As well as harvesters for potatoes, Dewulf also offers a range of special machines for lifting other root crops including carrots, onions, red beet and parsnips. The Miedema range of potato planting, grading and handling equipment is also made by Dewulf, which distributes machinery in the UK through Niagri Engineering and Netherton Tractors in Scotland.

For UK growers the most popular models from the AVR range are the self-propelled Puma four-row harvester and the 9200 trailed two-row model. The Puma is a long established model which has benefitted from a number of specification updates, and the current version is the Puma 3 which is available with the recently introduced All Condition Control or ACC option. ACC has been developed to improve harvesting on heavy clay soils, enabling the operator to raise the diabolos hydraulically above the ridges, with depth control managed by sensors that monitor skid movements.

Dewulf's Kwatro Xtreme potato harvester lifts four rows at 90cm spacing.

Optional equipment for the Puma includes the AVR Varioweb cleaning module using a pintle belt plus axial rollers with continuous adjustment to vary the cleaning action, and the potato digging unit can be replaced by special attachments for harvesting carrots or lifting onions.

AVR introduced the Spirit 9200 two-row trailed bunker harvester four years ago. A special feature is the additional cross roller set available as an option and designed to increase separation efficiency while improving crop distribution on the pintle belt to boost capacity. The specification includes a picking-off table for up to four operators, bunker capacity is 8 tonnes and the drive is hydrostatic with a tractor power recommendation at about 140hp.

Cameras are on the options list and there is also a special harvesting unit for lifting onions, a carrot harvesting attachment complete with torpedos, and the 9200 can also be supplied in a VW version with a Varioweb cleaning module.

Supplying bespoke machines for customers is an expanding business at Standen Engineering. Recent examples include engineering separator options for use with onions, carrots, parsnips, sweet potatoes and red beet said sales director, David Wilson, and he thinks the demand from growers who have special machinery requirements will continue to increase.

The Puma 3 from AVR can be equipped with attachments for harvesting potatoes, onions or carrots.

Another growth area for

The Simon Toplifter carrot harvester distributed by Standen Reflex features a new in-cab touch-screen control box.

Standen Engineering is the demand for the windrowing attachment for the T2, their best selling potato harvester. Sales are continuing to increase because when used with the T2 harvester's RoTo axle, it eliminates the need for a trailer when opening up a field, and this reduces the damage caused by trailer wheels running on the rows, Mr Wilson explained.

The RoTo axle allows the right hand wheel to rotate through 180 degrees so that it can be set out for general field work, but it can be moved inwards to follow the tractor wheel for opening-up and also to bring the total machine width within the legal limit for road transport.

There is also a new development on the Simon Toplifter carrot harvester imported by Standen Engineering through their Standen Reflex imported machinery division. The Toplifter is a popular machine in the range, and the manufacturer has recently added a new in-cab touch-screen control box. The design is user-friendly, and the reports from the operators who have already used the new screen have been very positive.

The Patriot trailed harvester built in Scotland by ScanStone Potato Systems has had a successful first year. The two-row trailed harvester was demonstrated for the first time in 1916, but the Patriots available for this year's harvest are already sold, explained ScanStone's William Skea, and they have kept just one harvester which will be used for demonstrations and show stand appearances.

ScanStone designed the Patriot with what they describe as an entry level specification to provide a high output at a competitive price. The harvester is land wheel powered and uses belt drives. Haulm extraction is followed by a four-roller Evolution cleaning system designed specifically for the Patriot, and there is a high capacity cart elevator for unloading. Customers can choose either diabolos or wheels for depth control, and a picking-off table is on the options list.

A special feature of the trailed harvester from Jones Engineering is that it was designed for lifting vegetable root crops rather than being a potato harvester that can be adapted for other crops. It is a share lifting harvester used for a wide range of crops including carrots, parsnips and onions, and it is available with a choice of vibrating shares, flat shares, bar shares or squeeze type lifting shares. All the webs are hydraulically driven and the specification includes powered wheels, a 1.2m wide cart elevator and touch-screen controls.

The Yorkshire based company offers the harvester with a design and build service that can adapt specifications to suit growers' individual requirements, and they also build special purpose one-off harvesters in both trailed and self-propelled versions.

MH POSKITT - CUSTOMER FOCUS ENSURES SUCCESS IN CHALLENGING MARKET

by Richard Crowhurst

In recent years Yorkshire grower Guy Poskitt has been most visible to other growers as the chair of the NFU's National Horticulture and Potatoes Board. He is now vice-chairman, having stepped down due to time constraints, but he and the union continue to lobby government hard on the issues facing British horticulture.

Guy Poskitt's business has won a number of awards, including Grower of the Year and Farmer of the Year (courtesy MH Poskitt).

"We lobby very hard on various issues, of which pesticides is one," Guy explains. "The biggest issue we have at the moment as an industry is labour and Brexit. It is very simple; if we have no migrant workers we have no business. That's our biggest concern over Brexit at the moment although there are many others, such as bureaucracy and free trade."

When asked if government is listening to the message, he responds: "I have a very simple message for Theresa May: take my workers away and close my business down, but before you do that think about how you can run the health service and care homes without migrant workers as well. The whole of the food chain is full of migrant workers. Even a small livestock farmer who has no migrant workers on his farm will have his livestock processed through a processing plant by migrant workers and the products will be handled through a distribution centre by migrant workers."

In 2010 MH Poskitt Ltd won the overall Grower of the Year award, while in 2012 Guy was named the Farmers Weekly Arable Farmer of the Year, as well as the overall Farmer of the Year. "It's a great advert for your business," he says. "It's a great accolade for my employees and my customers." He puts this success down to the business's customer focus and the role of his 208 employees: "We have a great team of people. I'm very passionate about getting the right people and looking after them because this business isn't about me; it's about my people. They are the ones who deliver day to day."

The farm comprises over 6,000 acres on owned and contracted farmland and grows combinable crops, potatoes and sugar beet, but it is for its specialist vegetable crops, and carrots in particular, that the business is best known, with vegetable crops representing 80 per cent of the total value.

"We grow carrots, parsnips, swedes and pumpkins," explains Guy. "Our carrots are grown in Yorkshire, Nottinghamshire, Lincolnshire, Lancashire and Scotland, and then we have joint-ventures with other growers to further extend the season. We grow in excess of 1,000 acres of carrots."

Like most fresh produce businesses, imports are used to supplement UK production when necessary, including parsnips from Spain and carrots from Israel, France and Spain. "We try and minimise our imports," he adds. "There is a big demand for British produce and imports are more expensive, but sometimes nature doesn't deal us the right cards in the right order, so we have to import to maintain availability. Provenance is something that customers want, but in reality quality has to be the priority and there are times when the UK quality is not as good."

The business has grown significantly from the late 1990s through the first decade of the 21st Century, and today MH Poskitt is a direct supplier to Asda and Aldi, as well as providing products for food manufactures and food service clients. As well as washing and packing vegetables, the company has its own prepared business. It faces the same issues in terms of profitability and low prices as the rest of the industry and while heavy promotions can boost sales, the large temporary uplifts in volume create a number of production challenges. Both retail and food service markets are strong, but Guy describes wholesale sales as "weak and inconsistent."

Five years ago solar panels were installed on the site, while a 250 kW anaerobic digestion plant was commissioned in May 2015. "They both run really well and we were able to get a favourable feed-in tariff," he explains. There are no other

The company produces fresh carrots for Aldi and Asda, as well as a number of food service clients (courtesy MH Poskitt).

parties involved in the AD plant, with the company growing the feedstock, operating the plant and using the both the resulting electricity, heat on site and the digestate on the farm.

"It's quite unique not to export electricity," comments Guy "The maize works very well in the rotation as we have late availability of land in the spring with a limited cropping profile to follow it. The plant is quite small but we are in total control of it."

The season typically begins with lifting UK carrots in the middle of June from joint-venture growers in Suffolk and Norfolk. Then carrots from the central counties begin around the second week of July and supply the packhouse until the beginning of May the following year. Scottish grown crops are then use to finish the season through to the first week of June. Unlike carrots, parsnips are not grown in Scotland, so there is a longer import window, but Guy points out that demand for what is typically seen as a winter vegetable is also very low in June.

All the carrots and parsnips are washed and processed ex-field. While some swede is cold stored, this technique does not suit carrots for the UK market. "We've done a few trials and the skin finish is not as bright, so from a retail perspective it isn't what customers want," explains Guy. "We've also found that carrots from our sandy soils don't store very well."

Guy Poskitt stresses that his staff are his business's greatest asset (courtesy MH Poskitt).

However, using straw to keep crops in the field creates a number of challenges: "Some landlords don't like the mess that straw leaves, despite the fact that rent compensates for this. Strawing is also very expensive and increasingly blackgrass is a big worry. We try our best to get clean straw and we encourage the farmer whose land we are renting to sell us his straw to put on his field."

Guy adds that the types of soils used to grow most vegetable crops are also those where blackgrass control is easiest thanks to the rotation, so that an infestation of blackgrass on a sandy field is less serious than some other situations.

The company also grows around 100 acres of swede, predominantly for use in its mixed veg packs. Pumpkins were added to the cropping mix five years ago as a result of customer

As well as washed fresh produce, MH Poskitt also has a prepared factory (courtesy MH Poskitt).

demand. "It's good for the farm as it is another different crop," points out Guy. "It is planted late which is ideal as a lot of our land is not cleared until May, but it is a challenge to get them mature at the right time.

Farm Manager James Bramley looks after the carrot crops with help from two agronomists: Howard Hinds of Root Crop Consultancy and Ashley Cooley of Agrovista. "We have immense challenges in terms of agronomy," comments Guy. "We have less and less crop protection products available, so we are increasingly looking at mechanical hoeing, weed wiping and inter-row spraying using Garford machinery." Another challenge is the proposed total ban on neonicotinoid insecticides; something which Guy says is "totally unjustified on a crop that doesn't flower."

Cavity spot remains an issue, with good rotations being the primary control. "We don't drill too early which has an effect on yield, but definitely reduces cavity spot," says Guy. "We also try to encourage our customers to get their consumers to understand that minor cavities are not overly detrimental. Together with the NFU we are seeing some success with this and the issue of food waste is also making retailers assess specifications more sympathetically to use more of the crop." This is an area that Guy is heavily involved in personally, both in his role with the NFU and having appeared on television as part of Hugh Fearnley Whittingstall's War on Waste programme.

The new Tong grading system uses seven Visar optical graders which are capable of splitting the crop six-ways. They have increased crop utilisation while achieving a significant reduction in labour costs.

In terms of the varieties grown, he points out that; "Nairobi is still the market leader 25 years on. As nobody wants to pay any more for carrots, the variety which gives you the biggest yield is the winner. However, there are several good new varieties which we use such as Norfolk and Newcastle.

"We like growing Eskimo from Hazera as it has good frost resistance because the crowns don't grow out of the floor, although yields can be significantly less than Nairobi."

Nearly all the crop is now share-lifted as the technology has improved, with Asa-Lift harvesters from Grimme being used. Tractor and trailer units are used to bring local carrots back to the packhouse, while for distances over ten miles bulk lorries are used. On arrival the carrots are de-stoned, washed and hydro-cooled before grading and packing.

Last year the company invested £2.3 million on a new grading line utilising Visar camera graders from Tong Engineering. It grades carrots by size and quality and can split the crop into six different categories at once. "We're very happy with it. It's given us increased crop utilisation and a significant reduction in labour costs," says Guy. "We are investing in more packing equipment this year as last Christmas we were very tight in terms of our capacity." The seven Visar graders have reduced the number of staff required for grading from 20 to two – with the others being redeployed elsewhere in the business so there have been no redundancies.

As well as rising labour costs due to the Living Wage, the price of many inputs such as seed has risen with the fall in the pound after the Brexit referendum. Seed prices have risen as a result, while the demand for smaller carrots and pre-packs is also increasing demand and the number of seeds sown. "I am really concerned about the race to the bottom in the industry," he says. "There has to be a common sense approach as we can't continue with increased costs and reduced prices. There is nowhere left to go, and there will be industry casualties: we are not talking about huge prices, just one or two pence to make sure the supply chain remains viable."

As a result of Brexit consumers seem to have become more aware of the potential for food costs to rise, and Guy points out that as an industry we should not feel embarrassed to charge a fair price for what we produce. It's a message that his fellow growers will hope he and his colleagues on the NFU Horticulture and Potatoes Board can get through to retailers and consumers alike.

MSG URGES FARMERS TO PULL TOGETHER TO PRESERVE METALDEHYDE

by Sue Jupe

While water stewardship remains vital to maximise protection of the environment and in particular birds and small mammals, the Metaldehyde Stewardship Group (MSG) has launched an enhanced campaign for 2017.

According to MSG spokesman Simon McMunn; "It's more important than ever for the industry to pull together and follow stewardship advice, to help preserve the future of the active ingredient, which remains a key tool in slug control.

"Water stewardship remains vital and is still very much at the heart of the campaign," he said, speaking at the recent MSG 2017 campaign launch event. "However, metaldehyde products are undergoing re-registration and the regulatory risk assessment, forming part of this process, has revealed a requirement for increased protection of birds and small mammals. Stewardship is now a CRD-agreed condition of metaldehyde product availability and regulators will be monitoring the campaign closely."

MSG spokesman Simon McMunn.

Assuming completion of Annex III re-registration by the end of 2017, new labels in 2018 are likely to have restrictions and other changes aimed at reducing metaldehyde in surface water, combined with further CRD-agreed enhanced stewardship.

The latest guidelines consist of four steps, with a new 10m buffer zone and IPM being critical for 2017.

"Firstly, no pellets should be allowed to fall within a minimum of 10 metres of any field boundary or watercourse," explained Simon McMunn. "The buffer was previously six metres and only applied to watercourses. Increasing it to 10 metres of all field boundaries will help protect birds and small mammals, and provide additional protection to water.

"Secondly, with the view of helping to minimise slug infestations and reduce the need for treatment, metaldehyde slug pellets must only be used as part of a wider Integrated Pest Management (IPM) programme.

"Factors such as soil and stubble management, planting methods, weather, trapping and monitoring should all be considered as part of slug control programmes. And, if treatment is necessary, it's imperative to refer to the full set of MSG guidelines."

Farmers, agronomists and operators are encouraged to 'Think field factors' before treating with metaldehyde. "A field's soil type, topography and proximity to a water course are key to whether metaldehyde applications could be a risk that will subsequently impact drinking water quality, and should always be considered.

"And, last but not least, we want people to stop and think 'B.I.R.D' before applying. This stands for Buffer, I'm legal, Records and Dose.

"These steps are all easy to implement but will have significant impacts on the future of metaldehyde availability. I'd really encourage everyone one to get involved and apply pellets responsibly."

Speaking at the launch event, agronomist Dr David Ellerton of Hutchinsons endorsed the role of stewardship. "I firmly believe that stewardship is one of the core reasons that metaldehyde is still available to farmers and it's a credit to the work of the MSG and the agricultural industry over the past nine years. In common with all the agronomy organisations, Hutchinsons is fully behind the enhanced campaign.

Agronomist Dr David Ellerton of Hutchinsons.

"We need to keep this momentum going forwards and I'd therefore encourage the agricultural industry to engage with the enhanced stewardship and implement the necessary steps required to protect metaldehyde."

While labels on packs of slug pellets remain unchanged for 2017, the MSG is clear that the highlighted steps should be implemented with immediate effect.

Water companies' view

Speaking on behalf of Water UK, Dr Lu Gilfoyle said; "Water UK does not currently view that there is justification for a

complete nationwide ban of metaldehyde, recognising the significant issue slugs pose to agriculture and the importance of retaining several actives for food security and supply chain resilience."

However, she went on to say; "There is an absolute duty on water companies to provide affordable, wholesome drinking water which has the trust of the consumer. The most cost-effective way of ensuring non-metaldehyde slug control techniques are used in high-risk areas is via the use of a combination of voluntary and more targeted regulatory mechanisms.

"Water UK supports the view of the Drinking Water Inspectorate that simply continuing current programmes of work will not be sufficient to secure drinking water compliance as we still haven't solved the water quality issue." She warned that metaldehyde could become a potential barrier to water trading, hampering efforts to improve resilience across the industry.

With a simple molecular structure, metaldehyde requires huge amounts of energy to break the bonds. Wide-scale investment in additional treatment processes is not a sustainable answer as there is an unacceptable cost to customers and the environment.

Wearing her Anglian Water hat, Dr Gilfoyle explained that the necessary water treatment works - with advanced oxidation treatment facilities to remove metaldehyde from the region's drinking water - would require capital costs of £595million and operating costs of £17.4m per year. This would result in an unacceptable 21% increase in Anglian Water customers' bills.

An alternative approach is Anglian Water's 'Slug it out' initiative - working with farmers to reduce the level of metaldehyde in the regions water before it reaches the treatment works. Centred on six key reservoirs: Alton Water in Suffolk; Ardleigh Reservoir near Colchester; Hollowell Reservoir, Ravensthorpe Reservoir, Pitsford Water in Northamptonshire and Grafham Water in Cambridgeshire - farmers are incentivised to stop using metaldehyde.

Encouragingly, Dr Gilfoyle said 100% of farmers approached had got on board and there had been significant reduction in metaldehyde levels in the water – due to reduced use of metaldehyde pellets and changes in pumping patterns from rivers. She reported that 89% of farmers had rated ferric phosphate as performing better or no different to metaldehyde, although pointing out it was more expensive.

She explained that while not all land is high risk, abstraction management is not always possible and participation is voluntary making it difficult to get 100% compliance 100% of the time – with the unpredictable weather adding to the complexity.

"Water companies cannot resolve the issue alone," said Dr Gilfoyle. "We need a sustainable solution for agriculture as well as water customers." While Anglian Water remains committed to continuing to work with agriculture, landowners and the MSG, she said there were lessons to learn – "it is not right for agriculture to be dependent on products causing issues with drinking water."

More information on enhanced stewardship can be found at *www.getpelletwise.co.uk.*

Ferric phosphate

Since the loss of methiocarb, ferric phosphate chemistry has played an increasing role. According to Alan Horgan, technical specialist at Certis UK, when ferric phosphate was first introduced to the market it was met with some scepticism - with reluctance from farmers to use it due to lack of familiarity and independent trials data.

"The profile of ferric phosphate has now risen and the efficacy of its performance is widely accepted within the marketplace," he said. "Sluxx HP was introduced to the market two years ago with new, additional key benefits of a more vibrant colour for greater visibility in the field and improved pellet durability. There has been good grower experience and feedback, and a number of independent trials proving efficacy."

Mr Horgan said that the main advantage of Sluxx HP was its increased number of baiting points - 66 per m2 - which was especially useful within high value crops. It was proven to have the same efficacy as other products on the market but offered an improved environmental profile.

Water UK believe that the most cost-effective way of ensuring non-metaldehyde slug control techniques are used in high-risk areas is via the use of a combination of voluntary and more targeted regulatory mechanisms.

"Growers of high value salad crops are particularly cautious when it comes to slug control, as quality is extremely important. Just one incidence of slug damage on a single lettuce can cause the entire crop to be downgraded. Within arable crops it's acceptable to incur a certain degree of damage without having an appreciable effect upon yield," he said.

Alan Horgan recommended that high value crop producers should start thinking about an IPM approach to slug control the season prior to planting. "Rotation and pressures in the previous year should both be taken into account in order to forecast the pressure for the upcoming season, and ultimately, to make a decision on which crops to plant in which fields," he said. "Potato growers look to apply Sluxx HP at between 50 to 60 per cent canopy cover to target the slugs while they're feeding on the surface.

"In light of the new MSG guidelines, growers may consider using Sluxx HP in place of metaldehyde products in high risk fields, and in the field boundary 10m buffer zone. It's inevitable that the ever-increasing restrictions on metaldehyde use are likely to focus a grower's attention upon ferric phosphate products."

Commenting on slug pressure for this season, Mr Horgan said; "We've experienced another mild winter followed by very cold and dry conditions in the spring. While it has held back egg hatching, it has been good for overall survival. There is potential for this season to be another high-pressure year, but this will depend on field history - particularly in areas where slug populations were high last year, and the summer weather conditions. Growers need to consider previous crop, crop residues and previous slug history in order to establish a real understanding of the risk."

Alan Horgan, Certis UK's technical specialist.

Summing up he said sensible use of any slug pellet should be paramount. "Following the guidance on the label, ensuring even distribution and establishing an accurate rate of use are all important factors in effective usage. In general, attention to detail on application equipment is key to good pellet distribution. In addition to the label guidance, it's important growers follow the latest stewardship advice."

MORE OPTIONS IMPROVING THE UPTAKE OF BIOLOGICALS

by Richard Crowhurst

As the availability of biologically-derived crop protection products and biorationals has increased, so too has their commercial uptake by growers. However, with such a wide range of different products falling into the broad label of 'biological', and with certain key differences in how such products work compared to chemical compounds, it is important that vegetable growers understand how to get the best from them.

"Growers have gradually started using biorationals, and have found them to be successful when used as part of an Integrated Crop Management (ICM) approach," says Selchuk Kurtev, IPM manager at Certis.

"However, there is still more that can be gained from the performance of biorational products in a wider sense. Biorationals are generally very specific products, which target certain pests and lifecycle stages and therefore need to be used in precise ways. Optimum performance is dependent on a number of variables such as timing, environmental conditions and application techniques."

Recent changes to product approvals mean that a number of conventional products are no longer available, or have had further restrictions on their use imposed on them. Selchuk points out that this is where biorationals can support ICM programmes, delivering the flexibility in application timings from the start of crop production through to just before harvest which is no longer possible with many conventional products.

He cites Spruzit as an example of a successfully introduced biorational product: "It includes natural pyrethrins and oils, and has proven to be very effective for pest control in vegetable crops. At a more general level, improving the performance of these products can be achieved by the industry proactively working with growers to discuss successes and failures, and educate each other on developing and optimising the use of biorationals in different situations."

"Vegetable growers are becoming more familiar with many biological products," agrees Tim Lacey of Bayer. "For example, the use of Serenade ASO and Contans WG from Bayer is becoming more common-place in both conventional and organic systems."

Serenade is used in a number of situations under various EAMUs allowing both foliar and soil applications across a range of crops. "Serenade's main use is still for Botrytis control in soft fruit, with some useful secondary activity on powdery mildew as well," he explains.

"In open-field crops, many carrot growers see the value in adopting Serenade to help manage cavity spot with some useful additional benefits on crop health and also helping with Sclerotinia management following many successful trials by Bayer. It is applied either pre-drilling and incorporated in the soil or applied at the metalaxyl-M timing and washed into the soil."

Serenade can help to manage Cavity Spot on carrots [Bayer].

Severe Sclerotinia damage to lettuce [Bayer].

Potato growers are also adopting Serenade, usually applied in-furrow or with on-planter fertiliser, and Tim says they are seeing commercially valuable results in terms of tuber yield and quality. "Leafy salads growers are also embracing Serenade to help with managing a range of diseases including Botrytis in their crops," he adds.

"Contans WG is now a standard component for rotational control of Sclerotinia in the lettuce and leafy salad industry, commonly being used where rotations are tight or include several of the many crop species that are susceptible to Sclerotinia. Growers of other susceptible crops, such as carrots, celeriac, brassicas, pulses and potatoes are also now including Contans WG in their rotations where Sclerotinia issues have built up over previous seasons."

As existing products become more well known, manufacturers continue to develop new ones. "The latest product from Certis, called Agree 50 WG, is due to be available on the market in July and is based on soil dwelling bacterium. It currently has approval for use in swede, beetroot, radish and ornamental crops," says Selchuk.

"Agree 50 WG contains Bacillus thuringiensis subs. aizawai strain GC-91 and specifically targets caterpillars, with very good activity against Diamond Back Moth. This product is an ideal fit for ICM strategies as it is host specific and it has no effect on non-target organisms in the crop. It's the first aizawai strain within the UK, with a unique activity profile."

It joins the company's existing portfolio which includes NEMguard, a botanical product derived from garlic which is available for the control of Free Living Nematodes (FLN) in carrots and parsnips. One benefit of NEMguard is that it has no MRL, together with multi-site activity which lowers the risk of the development of resistance by target species.

"Biologicals can be used alongside conventional products as part of a whole plant production strategy," points out Selchuk.

"However, it's imperative to understand their compatibility with conventional chemistry and traditional plant protection techniques, how they interact and work together. Growers need to have an understanding of the impact of conventional products to the biorational agents, while trying to safeguard the natural predators of the pests.

"Understanding the pest history on farm and regular monitoring are both important in terms of planning pest control, and ensuring growers are targeting the right pest at the right time."

For example, Andrew Gough, Technical Manager of Lallemand Plant Care points out that microbes can be used as biocontrol agents as they can prevent the proliferation of plant pathogens and other pests.

"The incidence and severity of

Andrew Gough, Technical manager of Lallemand Plant Care.

such challenges can be reduced through direct effects such as parasitism or the disruption of crucial systemic functions," he says. "In addition, microbes with antifungal activities compete against pathogens by rapidly colonizing aerial plant parts and roots, using most of the available nutrients, and in this way they make it difficult for pathogens to grow.

"Prestop® is one such innovative biofungicide which is now well established in the UK and Irish horticulture growing sectors. The product is made up of a minimum of 200 million spores per gram of Gliocladium catenulatum strain J1446. This is a naturally occurring soil fungus, which is capable of providing a number of very useful disease control benefits on vegetables and salads with no harmful residues and therefore a zero harvest interval."

Of particular interest to field growers is the product's control on damping-off and root or base-rot disease caused by Pythium, Rhizoctonia, Phytophthora and Fusarium spp. on vegetables, salads and aromatic plants. "Once the crop plants are better protected, which Prestop® meaningfully supports, they will be considerably healthier and productive to the benefit of yield and quality at harvest," Andrew adds.

Tim Lacey also stresses the importance of understanding how biological and conventional products interact. "It's generally quite easy to use biologicals alongside conventional chemistry – one just needs to consider what the target is, what the threshold you want to achieve is, what tools you have to do it with and what limitations these tools may have in regard to their deployment," he says.

"Typically one might choose to use a biological to target a pest or disease when populations are low, such as early in the epidemic life-cycle or after stronger chemical options have reduced the pressure. When pest or disease populations are escalating, then conventional chemistry options are generally best, returning to biologicals once the populations are more easily managed again.

Such an approach requires a good level of understanding by both growers and their agronomists. "Every vegetable grower should understand the pest lifecycle as a bare minimum, and consider which biorational options will fit at what stage, targeting the pest when it's most susceptible," says Selchuk.

"It's also important to understand the performance of their product choices and whether they're slow acting, preventative or curative. Biorationals tend to perform best when used as part of a proactive and preventative approach, before pest pressures get too high."

Tim adds: "It is definitely the case that use of biologicals is not as straightforward as conventional chemistry has been. However, with the right approach, and with the appropriate consideration of the various factors which may influence efficacy – particularly coverage – good results can be achieved."

In fact, such challenges also

Potato growers are just one group who are starting to use more biological products for crop protection [Bayer].

apply to the development of biorational products. "Awareness of biologicals in all crop areas has improved significantly over the last 5 years, particularly since the large R&D manufacturer companies such as Bayer have been involved, points out Tim.

"Biologicals based on bacteria and their naturally produced active compounds seem in our experience to be easier to commercialise than those based on fungi. This is mainly related to the greater robustness of the bacterial resting spores compared to fungal spores, which tend to have more limited storage periods, often requiring refrigeration.

"There are also greater considerations with fungal based biologicals with regard to tank-mixes and previous or following fungicidal chemistry. These are less relevant for bacterial based products. The fact that products based on fungi are a little more involved in their storage and use to get the best effect from them compared to bacterial based products (which tend to be more robust and similar to conventional chemistry) means that it is a greater challenge to commercial uptake with these products."

These challenges are not stopping the development of new products, despite the fact that, with the possible exception of some residue data, the regulatory process for all types of biological agents is the same, and is very similar to that for conventional chemistry. Bayer has two biological products currently in the pipeline. "One is a biological fungicide based on a different Bacillus species to Serenade which is more specialist on mildews (mainly powdery); and the second is an insecticide for sucking pests based on plant extracts," explains Tim. "Both products will be targeted at protected crops (fruit, veg and ornamental) first – maybe late 2018 or into 2019, with the intention of moving out into relevant open-field crops after this."

When it comes to open field crops, Selchuk Kurtev feels that vegetable growers in the UK can take lessons from growers overseas. "In South Africa for example, growers approach pest and disease management as a consortium, where groups of farmers in one region come together to tackle pest issues," he says.

"Looking at the bigger picture, and considering large scale ICM strategies, such as large scale introductions of macro-biologicals, across multiple fields and farms, could provide improved efficacy and value from the use of biorational products in the UK."

Looking forward, Tim feels that the move towards even greater use of biorationals will continue, but will not always be straightforward. "The level of acceptance for biologicals still has a gradient from the very intensive, high value sectors such as protected fruit and vegetables where biologicals are an established standard part of production, down through high value open-field vegetable crops such as lettuce and leafy salads where some biologicals are used as standard practice," he says.

"On crops like carrots, brassicas and potatoes some growers are now using biologicals such as Serenade and Contans regularly alongside conventional chemistry.

FARMDROP - ENABLING CONSUMERS TO BUY VEGETABLES DIRECT FROM GROWERS

by Bill Sherer

Farmdrop is an app which allows consumers to order produce direct from farmers and growers. Currently app users can choose from about 1500 locally sourced products which include a wide range of freshly grown vegetables.

The company which sells a whole range of food and groceries, has recently raised a further £7 million for continuing development and expansion, making a total of £11 million which has now been raised since its launch in 2014.

Farmdrop is the brainchild of City businessman Ben Pugh, the firm's founder and Chief Executive. Farmdrop figures to date are impressive with sales having increased by about 600% over the last year. The company reached annualised revenues of £3 million earlier this year.

Ben Pugh, Farmdrop's founder and Chief Executive.

New hub developments

Whilst Farmdrop is currently based only in London with a hub in Bermondsey, plans are already afoot for another opening in Bristol, which is scheduled to come on stream in September. "We have already researched and identified at least a further 20 new, potential Farmdrop locations which could be up and running over the next four years" says Phil Ives, Farmdrop's Director of Supply Chain. Edinburgh is another city which would fit the Farmdrop new hub mould. The overall strategy includes plans for a hub in every major UK city.

Demand for vegetables

These initiatives in different parts of the UK might well mean that there is a

A typical Farmdrop delivery.

requirement for new & additional vegetable growers resulting in sales opportunities to supply Farmdrop.

"We are not merely trying to source simply organic vegetables" says Phil Ives. "Quite a few of our best growers produce excellent non-certified vegetables and there is a good consumer demand for this category as well," he says.

Whilst the company is interested in all vegetables, there is a particular retail demand for quality herbs and top class tomatoes and peppers. The business does not agree to take a specific, guaranteed amount of vegetables each week or month. Farmers and growers fulfill orders as and when they are received by the firm. "Our growers receive about a 75% share of the retail price which is just about double that from a typical supermarket," says Ben Pugh.

Purton House Organics

Purton House Organics is an award winning organic farm, based at Church End, Purton, near Swindon, Wiltshire. In addition to a Gold Medal achieved at The Soil Association Organic Food Awards 2013, the farm also won the Wiltshire Wild Life Trust Award in 2013. About 10 out of the farm's 70 hectares are used to grow various vegetables for Farmdrop whilst at the same time also supplying the Purton House Farm Shop and a successful box scheme. "Our land is loamy and as well as tomatoes, broad beans, brassicas, potatoes and onions, we also grow aubergines. During the winter, the emphasis is on oriental salads," says Mrs Rowie Meers who manages the business.

The farm has 10 different sized polytunnels and a main packing shed with two cold rooms, which are used to ensure both vegetables grown and meat reared can be stored in peak condition. Great importance is attached to good irrigation and this is reflected in a large lake which is strategically situated in the middle of the farm to supply most of its water requirements.

Purton House Organics supply Farmdrop with vegetables.

"Farmdrop have taken the heat off me," says Rowie Meers. The company handles both the marketing and sales for the farm's vegetables. This allows her to concentrate on growing which is ideal for the development of the overall business. "I like the fact that in negotiations with Farmdrop, when I nominate my preferred price for our organic vegetables, then invariably the firm will say, yes, that's fine by us," she explains. The prices paid to Purton House Organics by Farmdrop are better than those offered by the wholesale market for Rowie Meers vegetables.

Purton House Organics relationship with Farmdrop is continuing to develop in a positive way. For example, last October staff from the Bermondsey hub took part in one of Purton House Organics' regular farm walks. "It allowed both parties, including our own full time staff of six, to better understand how our vegetables are grown successfully which is then communicated back to the consumer by Farmdrop colleagues and that has to be good for on-going business success and feedback for everybody," commented Rowie Meers.

These visits have been reciprocated with Farmdrop invitations to key Purton Farm Organics staff to join the firm for evening meals in London focused on not just an enjoyable social occasion, but also informal and valuable business discussions in a relaxed, social environment. All these activities mean that Purton House Organics is growing, with a current annual turnover of £275,000 which continues to increase year on year.

Trust and transparency

Since it launched, Farmdrop has assembled a diverse team of in-house technology developers, professional buyers, hub pickers and delivery drivers. The company's commitment to sustainability is reflected in the fact that all of its customer delivery vehicles are electrically driven.

"We have grown and evolved with our farmer base through a mutual trust and transparency which has been the cornerstone of our

Some of Farmdrop's colourful delivery vans.

success to date in such a comparatively short time," explains Phil Eves. It is very much an open and strong, mutual relationship.

However, as Farmdrop continues to grow, he acknowledges that in time there might well have to be some form of legally binding document drawn up between the company and its suppliers to cover all likely scenarios. At the same time there is a recognition and understanding that the important founding trust and transparency will always remain as an integral and key ethos within the business.

The Farmdrop Producer team at Bermondsey consists of six staff. "Their experiences cover a wide spectrum of working knowledge, know-how and expertise. Above all they have to be consummate communicators in all facets of their day-to-day work with our growers" explains Phil Ives. Coming from many different business backgrounds, some of the producer team have previously been growers in their own right whilst, for example, others have been responsible for sourcing food on behalf of restaurants.

The London hub obtains its vegetables from up to 50 growers who are located within reasonable travelling distance of the capital which is of great logistical help to the Farmdrop team.

Customer Experience

Farmdrop has already invested heavily in ensuring that its model works effectively. The plan is that a significant proportion of the £7 million recently raised will be used to make the customer experience even more successful than it is currently. This is particularly important as the business scales up.

Currently only 52% of food eaten in the UK comes from local sources and only 23% of all the fruit and vegetables we consume in Great Britain is grown in The United Kingdom. These figures provide a great opportunity for a business such as Farmdrop.

The firm's next-day-delivery service enables customers who shop by mid-day with their app to receive delivery of their vegetables by the afternoon of the next day. This means that the freshness and quality of the vegetables they deliver surpasses what many retail outlets can offer.

Ben Pugh says that supermarkets have become irrelevant in his life not least because he is at the forefront of next generation solutions. "It is clear that during the next 20 years change will only become quicker," he says. All this is taking place against a background of better informed consumers who are passionate about food provenance and how their food, including vegetables, is grown and marketed.

Summary

In a short time Farmdrop has successfully used state-of-the-art technology to meet consumer demands for food which is both sustainable and locally produced. It is expanding successfully and whilst working with vegetable growers, will continue to develop even further to meet the needs of the ever-important British consumer.

For further information about how to become a potential Farmdrop supplier, e-mail; *farmily@farmdrop.com*

WORTH FARMS - A FOURTH GENERATION FAMILY BUSINESS

by Richard Shepherd-Barron

Around 1900, Arthur Hovenden Worth started ploughing grassland near Holbeach in Lincolnshire which had been used for sheep and the wool trade for many generations.

Within five years he was planting potatoes, which today are a mainstay of the vegetable cropping on the 2,300 hectare farm.

The A H Worth group of companies includes Worth Farms, QV Foods (fresh processed and prepared vegetables), Manor Fresh (fresh produce packing and distribution - a joint venture with Fresca) and also Hovenden Park Golf Club.

It also provides the base for Holbeach Marsh Co-operative - HMC (a 30 grower member group producing vining peas for freezing across Lincolnshire and Norfolk, which was formed in 1968). Duncan Worth joined the family business in 1995 and is today CEO of the group with Simon Day joining the company in 2010 to manage the farming operations.

Worth Farms joined LEAF in 1995 and became a LEAF demonstration farm in 1996 with LEAF Marque accreditation being received in 2008. Duncan Worth said: "We had over 1,000 visitors to the farm in the first five years of being part of LEAF, and today host many school visits each year. We took part in Open Farm Sunday two years ago and this was a huge success with more than 1,000 people coming to see us in one day."

AH Worth was also involved in the formation of Management Development Services (MDS) in 1986 and played a leading role in the group of farmers who wanted a training organisation to provide management experience for graduates wishing to work in the agricultural, horticultural, food processing and food technology industries.

The farmed area has been expanded in recent years by

Simon Day, Worth Farms' manager.

land acquired from various Farm Business Tenancy (FBT) agreements and contract farming arrangements. Part of this acreage is rented out annually to a salad, celeriac and brassica growing specialists, complementing the eight year crop rotation system.

The land is mainly grade 1 alluvial silt and currently there are 260 hectares of potatoes which produces around 15,000 tonnes per year. The rest of the farm grows wheat, sugar beet, vining peas, spring barley, mustard, and with maize and rye for the Group's anaerobic digester plant.

Worth Farms' eight year rotation plan is distinct from the more usual six years. Farm Manager Simon Day said: "We reduced the potato area around 2010 from 365 hectares to today's 260 to concentrate on

Worth Farms' Challenger and AVR planting operation.

the very best soils and crops. This increased rotation with reduced cultivation and ploughing, helps protect our precious soils.

PCN is our biggest issue but biofumigants are becoming a key part of our integrated control. We're using cover crops very successfully and our large harvesting machinery is on tracks with trailers on low-profile tyres. We also use RTK guidance to help with over-trafficking."

Simon explained that they have also moved to Challenger tracked tractors for their cultivation usage, and now have three of these machines. Their two Grimme harvesters were changed at this time and now they have one with a small bunker hopper which has increased output by 10-15 per cent. They plant with a six metre AVR cultivator and a second 4 metre cultivator with a four row planter attached to it. This is now a two man operation whereas previously it required a six man team.

Harvesting potatoes in 2016 with a Grimme harvester.

They are operating a long term trial with Hummingbird Imaging using unmanned aerial vehicles (UAV) to monitor the potato and pea crops. The aim is to take costs out of the operation and to perhaps increase yields.

The bulk of the potato crops go to QV Foods and Manor Fresh for customers like Marks and Spencer and Aldi. Simon said: "We're concentrating currently on Maris Piper with careful irrigation aimed at reducing scab and improving the skin quality. We also trial other varieties on a continuing basis."

There is a core team of ten permanent employees and fifteen students and seasonal workers join in for the harvesting periods. Mostly Polish, many have been coming to Holbeach Hurn for many years with some of them leaving their own farms to earn extra money in the UK and providing the benefit of their own skills.

Worth Farms employs these people directly as many are returners year on year or through Concordia, ensuring that all regulations and laws are complied with, as well as giving the seasonal workers an excellent working and social environment. Simon said: "We have a very happy team - the average age is 38".

As mentioned earlier, there is an anaerobic digestion plant nearby. A joint venture with Holbeach Biogas and built by Tamar Energy, this 1.5Mwh plant was opened in May 2014. It uses 30,000 tonnes of feedstock per year. This includes 12,000 tonnes of grown crops such as maize and rye; 8,000 tonnes of potato peel which comes from QV Foods; plus 10,000 tonnes of local vegetable waste. The electricity produced is used by the packhouse operations with any surplus being exported to the national grid. The digestate produced at the end of the process is used both in solid and liquid form as a consistent organic fertiliser on the farm and there is a large reservoir to store the liquid.

With the potato, salad and brassica crops there is a large need for irrigation although the farm's soil is very water retentive compared to the lighter soils in other areas. Over recent years reservoirs to store 25 million gallons of water have been constructed.

The water is captured from the roofs and yards with the packhouse water being cleaned and UV treated. The farm is alongside the Wash and very low, so the local water is saline but this abstraction is mixed with the fresh to make it usable.

Over the years, Worth Farms have been very involved in ensuring that the environment is protected along with its inhabitants and they feel that the LEAF audit guides this very well. They have been in the ELS and HLS schemes from an early date, ensuring that non-farmed areas are set aside for wildlife with hedge and ditch management carried out on a strict rotational programme and with six metre buffer zones helping these operations as well as the wildlife.

They are proud that they have a good number of barn owls and marsh harriers on the farm with other smaller wildlife flourishing.

Barn owl chicks.

Worth Farms' efforts were recognised in 2015 at the Farm Business Food & Farming Industry Awards when they won the prestigious Farm Business of the Year Award. The judges said; "Worth Farms scale of success is phenomenal and in achieving this scale, developing a highly sophisticated diverse sustainable business is one to emulate". Duncan Worth responded by saying: "We strongly believe that our commitment to innovation, the environment, collaboration and people is at the leading edge within the agricultural industry."

When I visited the farm in April it was obvious the farming operations here are as Duncan described. The farm was very tidy with well-maintained buildings and machinery, a superb internal roadway infrastructure, large water storage and wildlife areas and very healthy looking crops for this season. It was very impressive.

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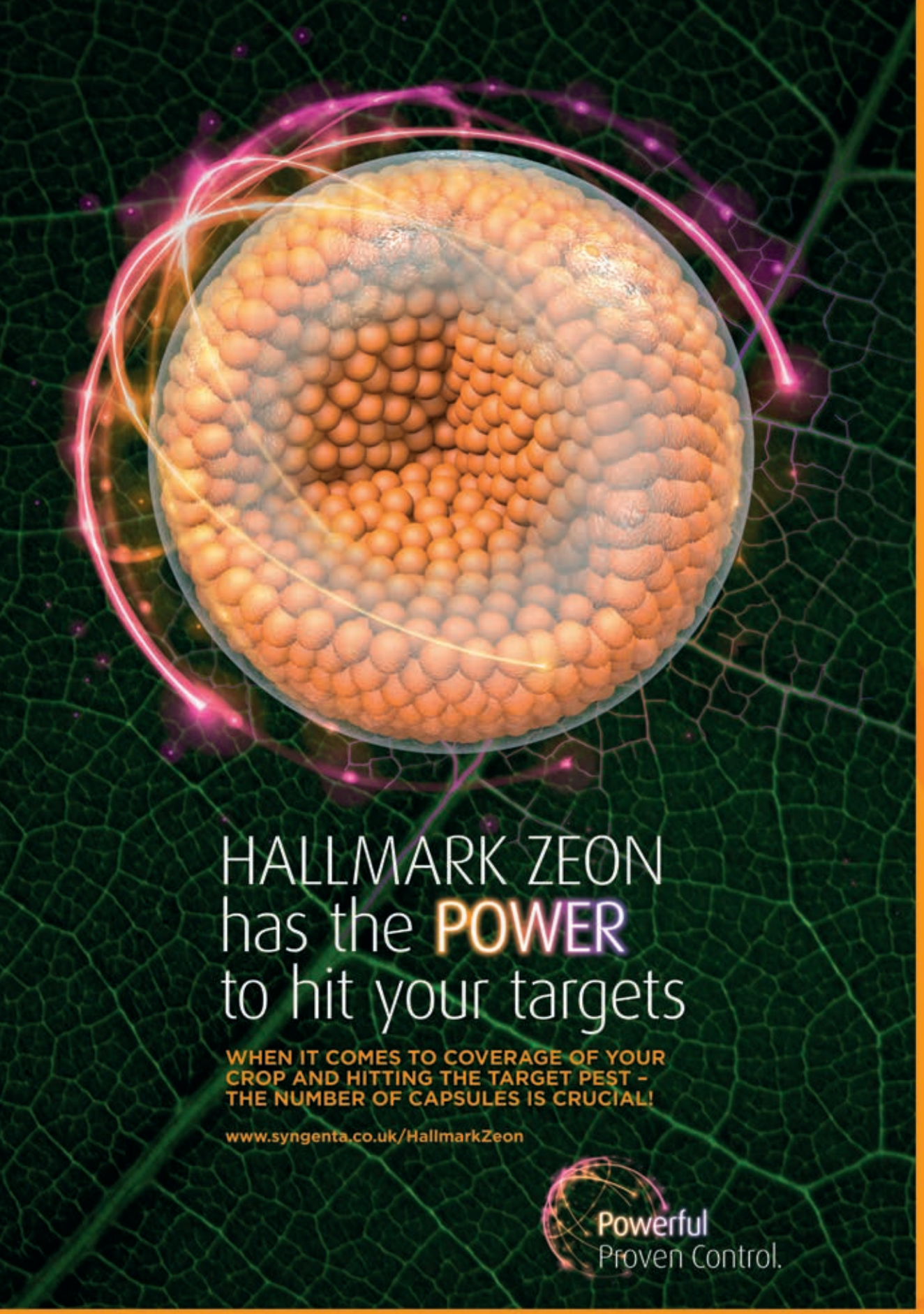

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