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Rebecca Gibson, Agrii Pulse Product Manager

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EDITORIAL

Modelled from a giant pea?

Those with memories of 1970's children's TV shown just before the early evening news may remember Roobarb – a shakily drawn cartoon in which a hapless green hound (called Roobarb) created chaos from a garden shed, invariably observed and mocked by Custard, a mischievous, grinning cat. Memories may be inaccurate but, in my mind, Custard usually came out on top, which is right as only a weirdo would serve rhubarb on top of custard. A more popular animation was *The Magic Roundabout* in which Dougal, a long-haired dog with no legs, moved around an imaginary park like an erratic hovercraft. He had numerous companions including a spaced-out rabbit called Dillon, Brian the snail, a huge-footed girl, a strange pink cow and a magical moustachioed jack-in-a-box character named Zebedee. They argued over different ideas and outcomes, appearing and disappearing with great rapidity, and all the while Dougal tried to keep the peace. I recall insane confusion which was invariably resolved by Zebedee appearing (boing!) and announcing it was "time for bed." The roundabout revolving to grating theme music closed the programme.

Like most, I have been flummoxed by the recent comings and goings, vanishings and almost ghostly reappearances at Westminster; the policy ideas cascading like confetti mostly blown away on the political gale, with change and almost maniacal chaos not unlike that of *The Magic Roundabout* but with serious, real-life consequences and a total lack of humour – unless you join me on the very dark side.

At the time of writing, our second Prime Minister this year, Liz Truss, has stepped down and Rishi Sunak has taken her place. The shortest serving Prime Minister in history, probably the shortest lasting set of political policies and possibly, Cabinet too. The DEFRA Secretary was only in place for seven weeks.

Although it was a short period of time, it was long enough for DEFRA to announce that the ELM schemes – years in their incomplete conception – will be reviewed. Many will translate this as a kicking into the long grass, creating further uncertainty. Uncertainty that in other



sectors wrought chaos – so badly received, the reaction resulted in even faster revolutions and we all know that the faster the ride, the more the carnage.

In UK agriculture the power to sway rapid change is much less dramatic. A slower moving fractured entity it may be, but while depending upon seasons, commodity values and capital investment, attention is needed. Change will happen and, without guidance, the industry may morph in directions unintended by inadvertent politicians.



MANY WILL TRANSLATE THIS AS A KICKING INTO THE LONG GRASS, CREATING FURTHER UNCERTAINTY

PGRO is commercially independent and without political masters, was borne of farmers for farmers, with the remit to conduct and disseminate applied crop research for their benefit. Innocent of political ways, other than their uncertainty (something akin to what the Magic Roundabout is to industry), we have neither remit nor resources to lobby, but are willing to communicate sensing benefit or need. Our message is always from the perspective of the crops we research and the relentless pursuit of efficient, profitable pulse crops for UK growers. Following the surprising announcement of an intended review of the ELM schemes, it seemed right to remind the Secretary of State of the opportunities peas and beans present in pursuit of hitherto declared government objectives around sustainability, productivity and the environment. We are at least consistent and persistent – the message remains strong and is hopefully not considered so much rhubarb! Who knows if anyone will read it now, but as the political Magic Roundabout keeps turning there is one curious link; apparently Zebedee was first modelled from a giant pea.

Letter (27 September 2022) to the then-Secretary of State, Rt Hon Ranil Jayawardena MP on page 19

Roger Vickers, PGRO Chief Executive

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Our newest recruits

DATES FOR THE DIARY

24th January

YEN conference with ADAS
www.yen.adas.co.uk/events
East of England Showground, Peterborough

25th January

Pulse Roadshow in York with Syngenta

26th January

Pulse Roadshow in Peterborough with Syngenta

13-14th June

Cereals Event in Perlethorpe, Notts
www.cerealsevent.co.uk

Look out for the PGRO Field Trials Open Day in early July (date tbc)



MARKET PROSPECTS



James Maguire,
President of Pulses UK



Pulses UK is the trade association which aims to promote the production and consumption of pulses within the UK.

Pulses UK continues to be active promoting pulses to the British public with a growing social media presence as well as attendance at trade shows and school days across the country.

Despite short-term market issues, the long-term future for peas and beans is positive

DEFRA recently announced that the total bean crop size has increased to 208,000ha, far exceeding the 188,000ha predicted by the market. Although this increase has a knock on effect - increasing the exportable surplus and causing oversupply for example - it is encouraging that total production has increased beyond expectations and predictions.

Oversupply is a short-term issue and one that may not be as bad as some experts have estimated, as yields per area is down. As growers cannot trade beans for human consumption at present, the feed bean heap is effectively bigger, but demand has slowed. Existing export sales for feed are being rolled to later contract periods. However, new feed demand is no longer tied to wheat values as a premium and is standing alone.

The UK has a significant volume of beans to export (approximately 75-100 kMT). However, the Australian harvest is due soon and although it's predicted to be big in volume, the quality is still unknown. The crop is currently experiencing rain, which could prove beneficial for UK growers if the crop turns out to be poor quality.

Our advice in the meantime to those farmers who need to move pre-Christmas is to sell. If you can hold or have beans for human consumption, then wait until spring.

The outlook for peas is particularly strong.

The old crop markets are quiet, largely traded out for marrowfats with unsold open market likely to achieve a significant premium. Large blue demand is also strong and the best samples will achieve robust prices.

Demand for yellow peas is currently static but should rise with the increase of human consumption pea products such as crisps and protein formulations.

Although the New Zealand pea harvest may see marrowfats being imported to meet current demand, there is also the potential for large blues from the UK to step up.

Looking further towards the long term, export markets to Asia for snack peas are still favouring UK peas due to our robust traceability. We will always be first option for buyers, to the extent that we may not be able to meet demand. This could provide an incentive for those farmers considering adding peas to their rotation. The benefits that adding peas to your rotation can bring are numerous and demand looks only set to rise.



RESEARCH

Crop Masterclass Videos

PGRO's central focus is on how it can bring its expertise in pulse crop production to UK growers, supporting a more productive, efficient and, ultimately, profitable future for those who grow peas and beans.

Earlier this year we unveiled a new series of masterclass videos, featuring practical advice for pulse growers on cover cropping, integrated pest management and tackling pea and bean diseases.

Hosted on YouTube, the videos give growers detailed information on how to grow better pulse crops, based on PGRO's years of research and experience.

The cover cropping masterclass details work carried out by PGRO in partnership with GPC, Birds Eye, HMC and Elsoms over five years that showed vining peas can yield up to 1.5 tonnes per hectare more if they are planted after a cover crop.

The video explains how cover crops captured high levels of soil mineral nitrogen, and that researchers found a link between berseem clover and winter vetch and the reduction of foot rot risk in vining peas.

PGRO's Dr Becky Howard, Research and Development Manager, presents how to monitor and assess pest populations ahead of the season with tips on how this can aid an integrated pest management strategy.

There is also advice for growers on the symptoms of common diseases to watch out for in peas and beans before they occur, including foot rot, downy mildew, powdery mildew, chocolate spot and sclerotinia.

PGRO's Molecular Biologist Ana Lages' masterclass guides growers through what to do when sending soil and seed samples to be tested at PGRO's lab.

Collectively, the videos have been watched hundreds of times.

Chief Executive Roger Vickers said: "Our team delivers invaluable advice on how to use our services and learn from our trials to make better informed decisions in the year ahead."

Scan the QR codes to watch them now:



Molecular services



Cover cropping



IPM tools for legumes



Disease management in peas and beans



VESPA

Winter Bean

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The Winter Bean creating a real buzz!

Winter beans – the perfect fit

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Good break crop gross margin

Good opportunity to control grass weeds

Ready markets for feed and export use



SUPPLY CHAIN FOCUS



Stephen Marsh
Managing Director

Meet Granta, Pulses UK's latest member

Industry-leading Granta Processors pride themselves on processing grains, pulses and seeds to the high standards typically required by supermarkets and food producers in the UK.

Managing Director Stephen Marsh believes joining Pulses UK will help Granta demonstrate to the wider industry what it can bring to the table to support the supply chain.

"We have always found networking the most effective way of contacting potential clients as it lets us explain the extent of our services and the level of technical detail that we are able to go into," Stephen explains. "We are hopeful that we will find those opportunities with Pulses UK."

Balancing quality and waste

On a mission to deliver a flexible processing service, the business also acts as a technical partner to traders.

"We often support traders when discussing the technical aspects of a supply chain and we're able to provide reassurance for the end user," Stephen says.

"We have a vast wealth of experience in the seed and pulse processing field dating back over 100 years. We're conscious that the commercial considerations in a processing operation are often opposed to quality concerns. Our skill is finding an appropriate balance between quality and waste."

Preventing product degradation

As pulse crops are delicate after harvest, an expert hand when it comes to processing and storing is extremely important, says Stephen.

"We have gone to considerable expense to equip our plant with gentle handling systems to prevent product degradation," he explains. "Proper assessment of the incoming goods will also flag up batches that are more delicate and appropriate adjustments to the processing can be made."

"An understanding of the proposed end use of the product is also important as certain processes, such as canning, can present problems that are not obvious when the product is in its raw dry state. Moisture content is obviously critical when considering the storage capabilities of a batch. Proposed end uses such as dry packaging, for example, need a lower moisture content than what may be acceptable for other uses."



WE HAVE A VAST WEALTH OF EXPERIENCE IN THE SEED AND PULSE PROCESSING FIELD DATING BACK OVER 100 YEARS

A technical approach to handling distressed cargo, including leaks and infestation

Granta takes an impartial technical approach to all incoming goods, minimising any issues with water leaks or infestation that can lead to waste.

"Problem loads are assessed and, as far as possible, we segregate damaged from undamaged goods



Peas for processing

on arrival," Stephen says. "In the case of a water leak, it is often possible to isolate most of the load as undamaged. After segregation, each portion is then fully analysed and decisions are taken on its appropriate use and whether further remedial action, such as drying, screening, colour sorting, is necessary."

"We are equipped with fumigation chambers here and if infested goods are brought to us, we can put them immediately into isolation and fumigate them to kill pests. We can then put them through an appropriate cleaning process to remove the dead pests and ensure the product is appropriate for use."



NEWS

Pulse Roadshows set for January 2023

The popular Pulse Roadshow events held by the Processors and Growers Research Organisation (PGRO) and Syngenta are set to return for 2023.

Offering growers the option to attend an in-person event or join virtually, there are three dates being planned by the research organisation in tandem with the crop protection company.

At the time of writing details were yet to be fully confirmed but it is expected that farmers wanting to attend a physical meeting will have options in the north of England and the East Midlands.

The first meeting will take place on 25 January at The Old Parsonage in York. Alternatively a similar event will run the following day at The Kingsgate Centre, Peterborough.

Those who can't attend will be able to catch up online at a later date.

Presentations will be recorded, allowing anyone who misses the webinar to watch again at a time that suits them.

PGRO Chief Executive, Roger Vickers, said it was positive to be able to run the events 'in-person' again after the covid19 pandemic interrupted the roadshow schedule for the past two years.

"There are not a huge number of events such as these, which are tailored to pea and bean growers, offering them the opportunity to learn more about how to physically grow the crop while also hearing about the wider industry surrounding pulse production," he said.

"The schedule is still being developed but it will follow the successful format of having technical updates on the

research projects being undertaken by the team at PGRO while also seeing what is new and interesting from the world of crop protection within Syngenta."

Last year attendees heard about the launch of Elatus Era for disease control in peas and beans, and a market update from Pulses UK President, James Maguire.

PGRO provided insights on variety selection and intercropping, and an update on integrated pest management tools.

"Follow our Twitter account @PGROresearch or check our website for full details of the event, and how to book, in December," Roger added.



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VARIETY UPDATE



Chris Judge

PGRO Senior Technical Officer

PGRO unveils 2023 Pulse Descriptive Lists

The PGRO voluntary Pulse Levy funds Descriptive List (DL) trials for peas and spring and winter beans.



The Descriptive List (DL) gives growers the opportunity to compare different varieties and evaluate which will suit their situation. Promising new material from plant breeders is regularly submitted and those that suit the market and have traits of interest are likely to be supported and available for purchase in the future. With pulses playing a beneficial role in farm rotations, the development and interest in new material is promising.

The past 12 months has seen a lot of changes; a new monarch, multiple new Prime Ministers and a new temperature record set in the heatwave. At times like this it can be tempting to look for things you can rely on, that stay consistent. Fortunately, PGRO's Pulse DL is one of them. Not only have the trials run successfully, but the data produced is also reassuringly consistent.

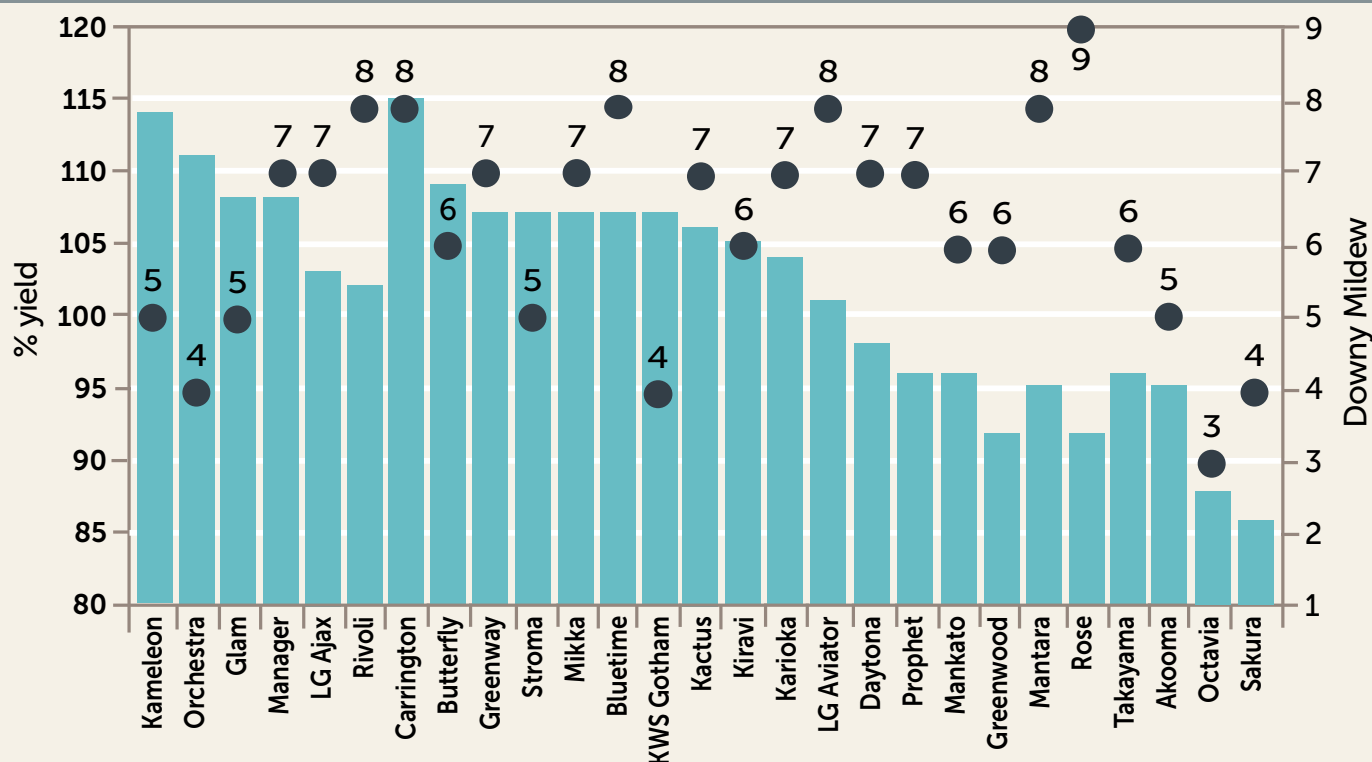
High yielding varieties on the DL have maintained their good performance. Other traits such as disease ratings also retain similar scores to before with the addition of new supporting data. Hopefully the new varieties added to the list will also be stable and reliable in the years to come.

The DL trial series uses a five-year rolling data set. The yield control uses a reliable group of varieties that have been in the trial series for four or five years and applies across all types.

Dry conditions in April impacted initial growth of the spring sown crops, but rainfall in April wasn't as low as in 2020 and 2021. The summer heatwaves led to early harvesting of most crops, with the first DL pea trial (Essex/Cambridgeshire border) being harvested on 18 July. This was 17 days earlier than the first DL

trial harvested in 2021 (Marholm). On average spring bean DL trials were harvested 23 days earlier than in 2021. The last trial to be harvested was one of the North Yorkshire spring bean trials on 2 September.

Five-year control yields for both peas (3.88 t/ha) and spring beans (4.24 t/ha) were lower than in the previous DL. The five-year yield for winter beans barely changed. Looking at the five years currently used in the datasets, yields were slightly down in 2022 compared to 2021 for all three pulse groups, and 2020 stands out for being a poor yielding year for both peas and winter beans. Seasonal differences will have an impact on the results but having five years in the data set minimises atypical influences from any one season.



Peas

High temperatures and dry conditions helped to reduce levels of powdery mildew. Five combining pea trials from 2022 were added to DL dataset. Average yields for the season were 3.63 t/ha. The highest yielding trial was based in Kent (4.49t/ha).

Yellow

Kameleon (114%) and Orchestra (111%) remain the top-yielding yellow peas. Both have yielded consistently well since being added to the DL in 2020. Glam (Senova) and LG Ajax (Limagrain) are new additions to the list. Glam has a yield of 108% and has the latest maturity of the yellow peas. LG Ajax has a yield of 103% and has good resistance to powdery mildew.

Green

Three new varieties – Butterfly (LS Plant Breeding), KWS Gotham (KWS) and Kiravi (Senova) – have been added to the DL. Carrington (LS Plant Breeding) remains the top-yielding green pea at 115%. Butterfly also performed well with 109%. It has earlier maturity and larger seed size

than Carrington. KWS Gotham and Kiravi are both later maturing varieties with competitive yields of 107% and 105% respectively. Within the green category, LG Aviator and Greenwood have resistance to powdery mildew, an increasingly important trait. Carrington, Bluetime and LG Aviator have the highest downy mildew rating (8).

Maple

Mantara and Rose remain the only two maple peas on the DL. Both have good resistance to downy mildew.

Marrowfat

New variety Takayama (LS Plant Breeding) becomes the top yielding marrowfat with a yield of 96%, 10% more than Sakura. It has a thousand seed weight of 350g, a smaller seed size than Sakura. It also has a better downy mildew rating (6) than all the other marrowfats on the DL. Akooma and Octavia remain on the DL.



DRY CONDITIONS IN APRIL IMPACTED INITIAL GROWTH OF THE SPRING SOWN CROPS, BUT RAINFALL IN APRIL WASN'T AS LOW AS IN 2020 AND 2021.





THE DL TRIAL SERIES USES A FIVE-YEAR ROLLING DATA SET. THE YIELD CONTROL USES A RELIABLE GROUP OF VARIETIES THAT HAVE BEEN IN THE TRIAL SERIES FOR FOUR OR FIVE YEARS AND APPLIES ACROSS ALL TYPES.

Spring beans

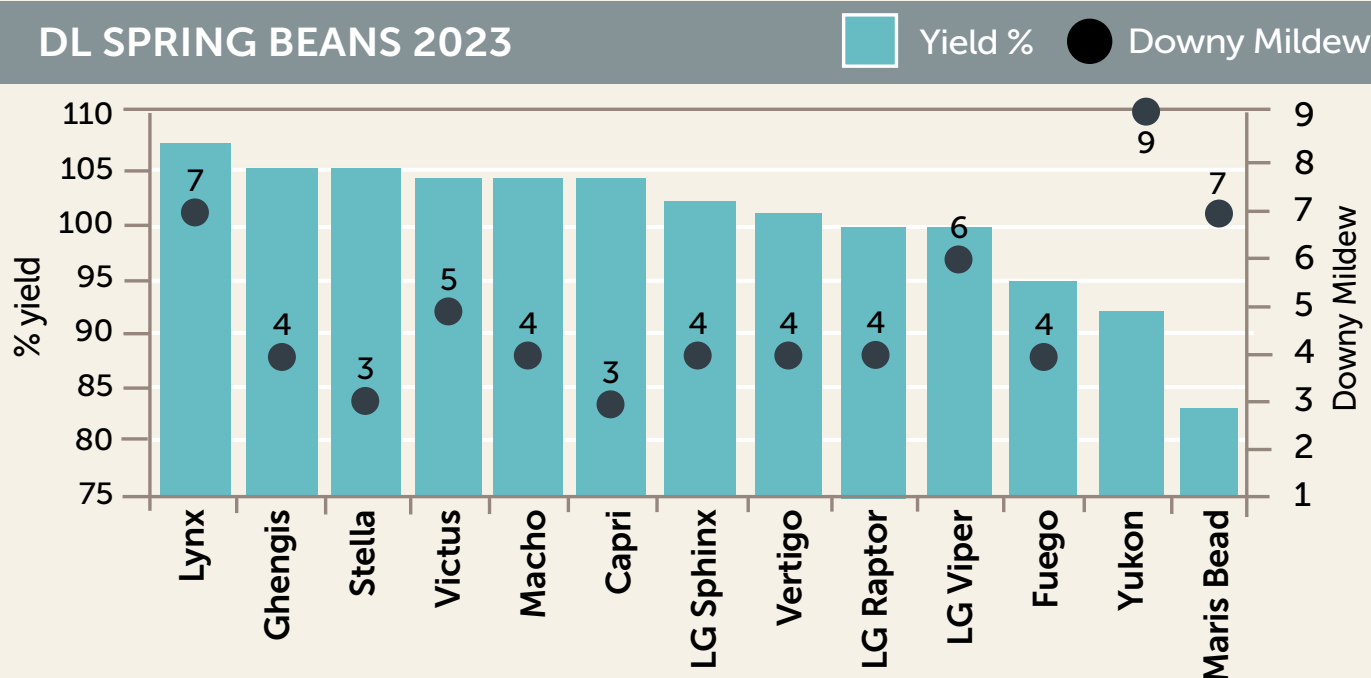
Spring bean trials suffered in the prolonged hot and dry period in the summer, leading to lower yields than 2021. Eight trials from 2022 were added to the DL matrix. The overall average yield for 2022 was 3.70 t/ha and the highest yielding site was Northumberland which achieved 5.16 t/ha.

Lynx remains the top yielding variety (107%). It has a good downy mildew rating (7) and has been one of the highest rated varieties since its addition to the list. Despite having a low yield (92%), Yukon has the best downy mildew rating (9)

and is the earliest maturing variety on the list. Maris Bead, the only bean on the list with a black hilum, has the same downy mildew rating as Lynx (7).

Four new high-yielding spring bean varieties have performed well but at the time of writing have not yet received UK National List status. They will be included on the electronic version of the DL once NL listing is confirmed. The varieties are Genius, Futura (Both LS Plant Breeding), LG Stego (Limagrain) and Focus (Saaten Union).

DL SPRING BEANS 2023



Key to Source Of Varieties

Agent Code
On DL

UK Agent

Agrii

Agrii

Dalt

Dalton Seeds

IARA

IAR Agri

KWS

KWS UK Ltd

LSPB

LS Plant Breeding

LUK

Limagrain UK Ltd

SU

Saaten Union (UK) Ltd

Sen

Senova Ltd

WAC

WA Church (Bures) Ltd

Winter beans

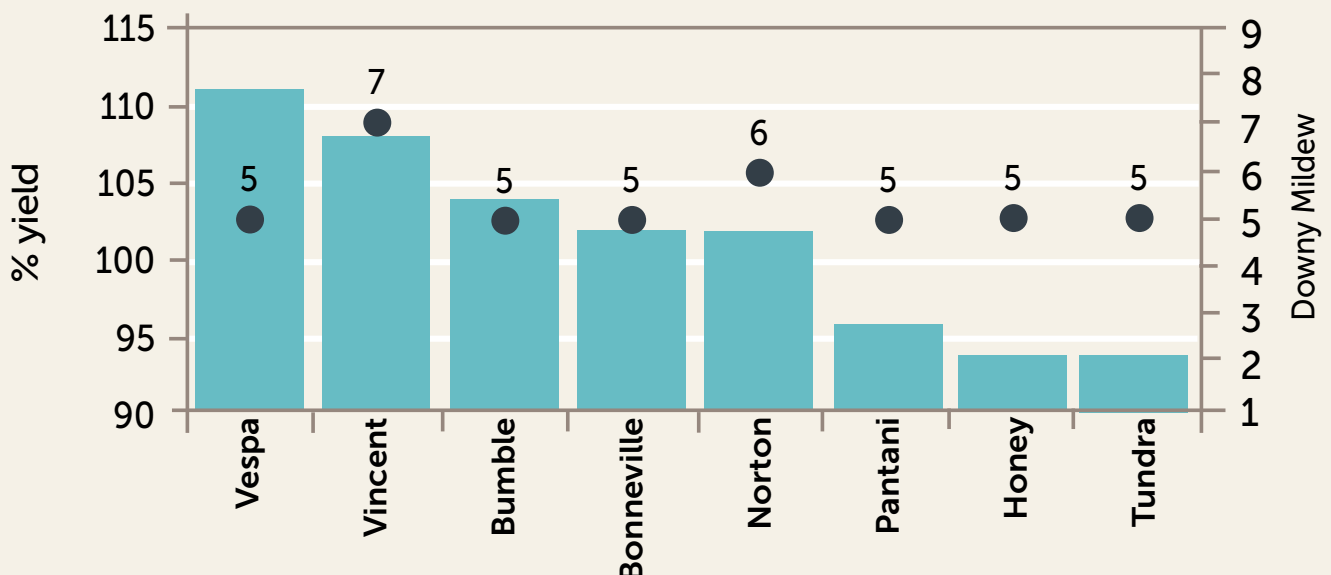
Most trials established well with better conditions for winter drilling than the past few years. Four trials from 2022 were added to the DL matrix. The average yield for 2022 was 4.78 t/ha and the top yielding site was Hereford which averaged 6.76t/ha.

Bonneville (Senova) is the only new addition to the 2023 list. Its yield is above average at 102% and it has the second highest protein content on the list. Vespa continues to have the top yield, achieving 111% of control, with Vincent performing second best at 108%.

Ratings for downy mildew in winter beans have been added to the DL. Winter bean downy mildew tends to occur at low levels in isolated patches. The ratings were generated based on eight winter bean trials and assessed relative to disease levels in winter beans. Winter bean downy mildew ratings should not be compared directly to spring bean downy mildew ratings. Most varieties have scored a 5 for downy mildew, with Vincent (7) and Norton (6) having higher ratings. Rust on winter beans has also been added to the DL.

DL WINTER BEANS 2023


Yield % ● Downy Mildew



COMBINING PEAS - PGRO Descriptive List 2023

The control for yield is the mean of 4 and 5 year varieties (3.88 t/ha). Yield differences of less than 13.2% are not statistically different.



			Agronomic characters			Resistance to			Seed characters			
	UK Agent see appendix	Yield as % of control	Earliness of maturity (1-9)	Straw length (cm)	Standing ability at harvest (1-9)	Pea wilt (Race1)	Downy mildew (1-9)	Powdery mildew *	Thousand seed weight (g) (@15%mc)	Protein content (% dry)	No. Years in matrix	Year first listed
Yellow												
Kameleon	Sen	114	6	76	7	R	5	[S]	301	21.8	5	20
Orchestra	LSPB	111	6	80	7	R	4	[S]	315	22.1	5	20
Glam	Sen	108	3	88	7	R	5	[S]	248	21.8	3	23
Manager	KWS	108	6	83	7	R	7	[MR]	282	22.8	5	18
LG Ajax	LUK	103	6	76	7	R	7	[HR]	265	22.1	3	23
Rivoli	Sen	102	5	80	7	[S]	8	[S]	281	22.1	4	22
Green												
Carrington	LSPB	115	5	86	7	R	8	[S]	244	21.4	4	22
Butterfly	LSPB	109	7	83	7	R	6	[S]	293	21.1	3	23
Greenway	IARA	107	5	88	7	R	7	[S]	301	22.1	5	21
Stroma	LSPB	107	6	81	7	R	5	[S]	319	21.6	5	21
Mikka	IARA	107	5	87	7	R	7	[S]	294	22.7	5	21
Bluetime	LSPB	107	3	90	6	R	8	[S]	284	21.8	5	18
KWS Gotham	KWS	107	3	86	6	-	4	-	289	22.1	3	23
Kactus	Sen	106	5	78	7	R	7	[S]	290	21.7	5	20
Kiravi	Sen	105	4	83	7	R	6	[S]	278	21.7	4	23
Karioka	Sen	104	5	86	7	R	7	[S]	255	22.7	5	18
LG Aviator	LUK	101	4	77	7	R	8	[HR]	284	21.8	4	20
Daytona	Agrii	98	6	78	7	R	7	[S]	271	22.1	5	10
Prophet	LUK	96	4	77	6	R	7	[S]	300	22.0	4	07
Mankato	KWS	96	4	82	7	R	6	[S]	255	22.4	5	19
Greenwood	IARA	92	8	70	6	R	6	[HR]	226	21.6	4	17
Maple												
Mantara	LUK	95	6	64	7	R	8	[S]	232	23.4	3	10
Rose	Dalt	92	8	78	6	S	9	[S]	257	24.9	3	03
Marrowfat												
Takayama	LSPB	96	4	87	6	R	6	[S]	350	21.5	3	23
Akooma	LSPB	95	4	81	5	R	5	[S]	406	22.8	5	21
Octavia	IARA	88	3	79	7	R	3	[S]	399	23.0	5	20
Sakura	Dalt	86	5	80	6	R	4	[S]	382	23.3	5	08


(1-9) A high rating indicates that the variety shows the character to a high degree. All varieties are semi-leafless. Downy mildew: Varietal resistance may vary in different regions as race structure of the disease changes. Pea wilt (*Fusarium oxysporum* f. sp. *pisii*) (race 1)

R = Resistant; S = Susceptible. *Powdery mildew Trials & Breeders information - HR = High resistance, MR = Moderate resistance, S = Susceptible. [] = Breeders information. © PGRO 2022 23.11.2022

SPRING BEANS - PGRO Descriptive List 2023

The control for yield is the mean of 4 and 5 year varieties (4.24 t/ha). Yield differences of less than 7.3% are not significantly different.




			Agronomic characters				Resistance to		Seed characters				
	UK Agent see appendix	Yield as % of control	Flower colour	Earliness of maturity (1-9)	Straw length (cm)	Standing ability at harvest (1-9)	Downy mildew (1-9)	Rust* (1-9)	Thousand seed weight (g) (@15%mc)	Protein content (% dry)	No. Years in matrix	Year first listed	
	Pale Hilum												
	Lynx	LSPB	107	C	6	108	8	7	4	518	28.1	5	16
	Ghengis	LSPB	105	C	7	113	8	4	5	558	28.1	5	20
	Stella	SU	105	C	7	110	8	3	5	537	27.8	5	21
	Victus ^{LVC}	LSPB	104	C	7	104	8	5	4	547	27.8	5	19
	Macho	LSPB	104	C	5	109	8	4	6	650	26.8	5	20
	Capri	SU	104	C	7	109	8	3	4	512	28.3	5	21
	LG Sphinx	LUK	102	C	6	108	8	4	4	499	28.4	5	21
	Vertigo	LSPB	101	C	7	108	8	4	4	572	27.8	5	13
	LG Raptor	LUK	100	C	7	109	8	4	5	534	28.0	5	20
	LG Viper	LUK	100	C	5	99	9	6	7	582	28.4	5	21
Fuego	LUK	95	C	7	104	8	4	4	562	28.3	4	05	
Yukon	LSPB	92	C	8	101	8	9	5	622	27.5	5	20	
Black Hilum, Tic													
Maris Bead	WAC	83	C	6	115	7	7	-	399	29.7	3	64	

(1-9) A high rating indicates that the variety shows the character to a high degree. The scales of characters of spring beans do not necessarily correspond with those for winter beans. The export market for human consumption usually requires pale hilum types. LVC = Low Vicine & Low Convicine. *Rust data influenced mostly by 4 trials in 2020, the lsd is approx 1 rating point. © PGRO 2022 23.11.2022

WINTER BEANS - PGRO Descriptive List 2023

The control for yield is the mean of 4 & 5 year varieties (4.50t/ha). Yield differences of less than 8.0% are not statistically different.



			Agronomic characters				Resistance to		Seed characters				
	UK Agent see appendix	Yield as % of control	Flower colour	Earliness of maturity (1-9)	Straw length (cm)	Standing ability at harvest (1-9)	Downy mildew (1-9)	Rust* (1-9)	Thousand seed weight (g) (at 15%mc)	Protein content (% dry)	No. Years in matrix	Year first listed	
	Pale Hilum												
	Vespa	Sen	111	C	5	115	8	5	5	667	25.7	5	18
	Vincent	Sen	108	C	5	117	8	7	4	768	26.9	5	21
	Bumble	Sen	104	C	5	121	8	5	5	665	25.3	5	16
	Bonneville	Sen	102	C	6	115	8	5	4	692	26.5	3	23
	Norton	Sen	102	C	7	112	8	6	5	659	25.8	5	21
	Pantani	LSPB	96	C	8	90	8	5	5	610	23.3	4	22
	Honey	Sen	94	C	7	105	9	5	4	673	25.9	5	12
Tundra	LUK	94	C	6	105	8	5	5	607	25.7	5	14	

(1-9) A high rating indicates that the variety shows the character to a high degree. The scales of characters of winter beans do not necessarily correspond with those for spring beans. © PGRO 2022 23.11.2022



INTERVIEW



Sam Brooke
CEO of the British Society
of Plant Breeders

Breeding pulses fit for the future

With the 'most significant policy development for plant breeding in 20 years' on the horizon, the future of pulse crop breeding is bright.

That's according to Sam Brooke, CEO of the British Society of Plant Breeders (BSPB).

She is optimistic about the future of pulse variety research and believes that, despite the challenges over the past few years, the sector is on the verge of a turning point.

Historically, there's no denying that research into pulse varieties has been more limited than that awarded to more mainstream crops such as wheat. It's a chicken and egg conundrum; growers could grow more and better pulses if the sector attracted more investment, but that investment won't be forthcoming until the acreage given over to pulses increases.

However, the forthcoming Precision Breeding Bill, which is currently working its way through the Parliamentary approval

process, could prove the catalyst for finally breaking down this impasse, as it will enable breeders to develop varieties more suited for UK growing conditions and remove some of the obstacles that have put farmers off in the past.

Removing red tape

By allowing breeders to use techniques currently banned under EU law such as gene editing, the Precision Breeding Bill will make access to such cutting-edge technology more readily available and more affordable.

Sam believes this isn't a moment too soon for a process which is notoriously costly and protracted.

"Getting a new pulse variety to market currently takes seven to ten years," she explains.

"It requires a great deal of horizon scanning in order to predict what UK farmers might need a long way down the line; we have to consider what diseases may be a problem and any other challenges farmers may have and that's very difficult."

Reducing breeding cycles would be hugely beneficial. However, this requires a great deal of investment. The breeding cycle for wheat has been reduced to around five years, but that reflects its dominance in UK arable production with approximately two million hectares of wheat grown and, consequently, the significant investment in the crop.

However, all is not lost. There is hope the technology permitted under the Bill will dramatically shorten pulse breeding cycles and that increased demand for homegrown protein will boost investment in the sector.

"The capabilities we could have in the future thanks to the Bill will enable breeders to develop varieties more suited for UK growing conditions," Sam says.

"This will result in higher yields and will mean they fit better into current rotations.

"We're hearing more at a government level about the desire for homegrown pulses and the need to reduce our reliance on imported soya. That's making a big difference and it will start to filter down. There are already an increased number of public-private research and development projects going on, which is exciting."

A grower's wish list

"Creating new varieties isn't difficult – what's hard is producing varieties that are a significant step forward," Sam says.

"The challenge is discovering the next step forward, whether that's a yield increase or producing varieties that mature earlier so there is less pressure on those farmers worrying about planting the next crop,

because historically pulse varieties have been quite late maturing and are often the last to be harvested.

"That fear of not being able to prepare the land for the next crop has probably put farmers off using pulses in a big way in their rotation."

In the past, increasing yield has typically been a pulse variety breeder's primary focus, but this is slowly shifting.

"Farmers still want to be more productive per hectare than they were 10 years ago," Sam says. "But the focus has shifted towards ensuring new varieties can mature earlier without having a negative impact on yield, as well as certain disease resistances, downy mildew in particular."



BREXIT UNDOUBTEDLY THREW SEVERAL LARGE SPANNERS IN THE WORKS.

The ultimate challenge is getting every base covered in just one variety.

"There are varieties out there with good downy mildew resistance and there are some that are early maturing, but they currently come with a bit of a yield lag," Sam says. "Getting everything in one variety is the challenge."

Ensuring quality and improved digestibility, particularly for monogastric livestock, has also become more important.

"Before, pulses wouldn't have been viewed as a key part of the ration, but as livestock farmers are trying to incorporate more homegrown protein into the diets that is changing."

Coping with extreme weather events is also a concern, but the selection process for new varieties tends to deliver the most reliable and steadfast as a matter of course.

"The great thing about the selection process taking up to a decade and being so thorough is that it does naturally select the very best varieties," she says.

"It's survival of the fittest – you may start with 500-1,000 options, but only one of those will probably end up on the market."

However, even though the process naturally selects those varieties most adaptable, there is no room for complacency. "We think that some of the precision breeding techniques we're hopefully about to get access to could

have an even greater impact on the varieties' response to extreme climate," Sam says.

The Bill being passed and ushering in a new age of high-tech breeding techniques is welcome news after a challenging few years for the industry.

Brexit undoubtedly threw several large spanners in the works.

"Post-EU there was also the need for us to have specific UK national listings, which has doubled the cost of getting a variety registered for sale," Sam says. "Combined with import and export issues, costs have increased significantly and that has been a real challenge."

Sam believes BSPB is succeeding in its mission to build a strong regulatory framework for new varieties in the UK, but she knows that investment will be a key challenge.

One of its key roles is to collect royalties from growers using certified and farm saved seed, which is then given back to breeders.

"However, we don't think we're collecting as many royalties from farm saved seed for pulses as we are for other crops," Sam says.

"This means we're not returning that money to the breeders and investment in the sector really is crucial."

Often, farmer and growers don't realise that they need to pay for their use of farm-saved seed.

"We still have some way to go on communication with pulse growers," she says. "The link we have with farmers is often through those people who go on farm and process their seed for them or treat it with a relevant seed treatment."

"Pulses aren't often cleaned and there are no seed treatment options now in the UK, so we don't have that link to growers. Over the coming months that's something we want to improve."

Sam's message to pulse growers would be to get in touch with pulse breeders in the UK.

"They're very visible and open and want to talk about what farmers need from new varieties," she says.

"And please get in touch with us if you think you should be declaring farm saved seed for pulses – it's a streamlined, easy process and it really is critical that we collect that income and give it back to the breeders."





KNOWLEDGE



PROVIDING INSIGHT FOR GROWERS FROM SOURCES THEY CAN RESPECT AND INFORMATION UPON WHICH THEY CAN ACT FOR CROP PRODUCTION IMPROVEMENT.

Knowledge is power



Earlier this year we published a piece called “Messages from citizen science” outlining how ‘citizen science’ is about the accumulation of large sets of data that under normal circumstances the scientific researcher would find too costly or even impossible to obtain.

The Pea and the Bean Yield Enhancement Network (YEN) was established in an attempt to gather a significant data set from which collectively growers and industry can learn. Gathered over a long period and from a wide geographical area, the volume of data built over time should reveal patterns and trends that can be considered by individual holdings and

used to inform cropping decisions and agronomy choices to improve crop production and profitability over time.

The data comes from real farms and real crops in real time. It is not a scientifically designed trial in controlled circumstances, but it is so much more than a simple on-farm observational study. Replication comes from the nature of the data captured on multiple crops and sites rather than in replicated plots on single sites. Its strength comes from the sheer number of crops that are entered. The science comes in the methodology of data collection, the resulting analysis and interpretation.

With minority crops, the building of large data sets takes time. The combined crop area for peas and beans in 2022 was reported by DEFRA at 0.26 million ha in England, which is small compared to over 2.6million ha for cereal crops and 0.32 million ha for oilseed rape.

Crop areas on agricultural holdings on June 1

Arable Crops (hectres)	2018	2019	2020	2021	2022	% change 2022/2021
Total arable crops	3,853,352	3,890,466	3,665,963	3,745,607	3,740,145	-0.1%
Wheat	1,618,871	1,676,833	1,265,111	1,654,867	1,667,962	0.8%
Barley	806,735	831,851	1,044,989	816,149	782,081	-4.2%
Oats	132,229	142,850	169,362	158,983	139,924	-12.0%
Rye	24,410	24,037	23,902	37,091	39,621	6.8%
Triticale	9,235	12,460	13,726	14,738	10,158	-31.0%
Oilseed Rape	545,068	492,077	344,913	268,410	322,786	20.0%
Field Beans	152,063	134,690	178,808	184,810	208,154	13.0%
Peas for harvesting dry	37,475	40,338	51,115	60,390	56,586	-6.3%

As a result, comparable representation is always an issue, and this was exemplified in the AHDB's Farmbench project. Recently reported findings compared almost 11,900 crops, surveyed between 2017 and 2021. While almost 3,500 were for winter wheat, over 2,000 for spring barley and over 1,700 for oilseed rape, fewer than 900 were for faba beans (winter and spring combined) and only 89 were for peas. A larger sample size ensures that the meaning of the output will be much more transparent and the comparisons between upper and lower quartiles more realistic.

With the pea and the bean YENS we are starting with a much smaller potential number of crops and a smaller pool of growers with which to work. Therefore reaching a critical mass of data will take time.

To date, 99 crops have been collated for peas since inception and 122 for beans.

It has previously been estimated that a meaningful data set needs a minimum of 100 crops to be established with a complete data set for each. Consequently, it is important that more growers are encouraged to participate and that those who embark upon this journey with us commit to complete the data capture required. Ideally, we would like to reach this level annually.

Year on year we are working with ADAS to refine the quantity of data needed and the specific nature of that data. At the start of the process, it was not clear what would be critical and what would be simply nice to know. It is now becoming more apparent what we can do without and how it can be made easier to capture, obtaining the critical data with the least amount of effort from growers.

The aim is as always to provide insight for growers from sources they can respect and information upon which they can act for crop production improvement.

Our report in the Spring edition of this magazine outlined the type of data being collected and the format in which it would be reported. You can find the detail here: www.pgro.org/downloads/PULSE-SPRING-2022-flip.pdf on page 7 along with an explanation of the meaning of box and whisker type charts.

The results from the 2022 YEN programmes will be distributed to the participating growers in December. Each grower will receive a report relating to the crops(s) that they entered into the programme and it will be accompanied by a guide to interpretation and the meaning within.

It is the 10th anniversary of the ADAS YEN concept into which the pea and bean YENs have become family members. In recognition of this anniversary, ADAS has taken the opportunity to put together a full day anniversary conference, which will take place on 24 January at the East of England Showground. It will be an event open to all, regardless of whether they are current YEN participants or not.

At the event, pea and bean YEN participants will have the opportunity to interact with others to compare notes. PGRO will be present alongside ADAS to answer any queries growers may have about their pulse crops, discuss interpretations and lessons derived from the 2022 results and the longer term trends observed.

The conference itself will celebrate the "measure to manage" approach and introduce general topics on what has been learned over the past 10 years of the wider YEN programme. Content will be focused around helping the industry understand how data through the YEN approach can improve decision making on-farm. An interactive programme is intended and planned sessions will include: drivers of "farm factor," key metrics in measuring crop performance and broader issues surrounding opportunities, costs, sustainability, quality and crop nutrition.

YEN conference booking contacts are Dhaval. Patel@adas.co.uk and Laurie.Abel@adas.co.uk

The opportunity to participate in the YEN programme for peas and/or beans in 2023 is already open. There are first come, first served opportunities for sponsored participation, which means there is no financial cost to the grower. For details of sponsorship opportunities enquire with the YEN sponsoring partners, or the organisers PGRO or ADAS.

You can register your intention here: www.yen.adas.co.uk/join-bean-yen and www.yen.adas.co.uk/join-pea-yen.

Participation will help you become so much more acquainted with your crops – there is nothing to lose!



“
THE DATA COMES FROM REAL FARMS AND REAL CROPS IN REAL TIME





RESEARCH



Dr Becky Howard
PGRO R&D Manager

Pest monitoring developments in peas and beans



METOS® UK

PGRO, with PheroSyn and Koppert UK, has been evaluating systems to monitor pea and bean weevils, and PGRO, Koppert and Metos UK have also been investigating novel trapping technology for pea moth.

Pea and bean weevil

Weevils may cause damage if large numbers appear when plants are small, particularly in cloddy seedbeds and conditions of slow growth. The main damage occurs as larvae feed on the root nodules but if leaf damage is anticipated, early treatment of the crop is necessary to interrupt the egg laying period and reduce root damage.



Figure 1: Leaf damage to beans caused by pea and bean weevils.

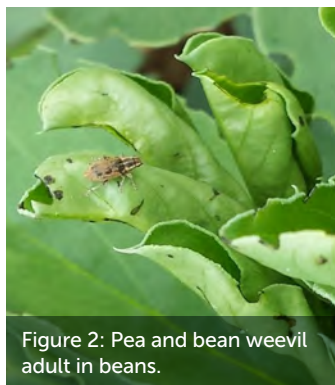


Figure 2: Pea and bean weevil adult in beans.

PGRO, PheroSyn and Koppert UK's system detects adults when they begin migrating in the early spring and comprises five cone traps containing a pheromone lure.

Traps are sited on a single grassy verge or headland of a field which had been cropped with peas or beans the previous year (Figure 3). They should be sited by mid-February and weevils counted three times each week.

A threshold occurs when the average number of weevils per trap exceeds 30 on a single occasion. Monitoring should continue until the number of adults in traps starts to decline, or until the latest sown crops have emerged (whichever is the sooner).

If previous experience is that weevil damage occurs regularly, an insecticide can be applied as soon as first signs of notching are observed. During periods of slow growth, a second spray should be applied 10-14 days later.

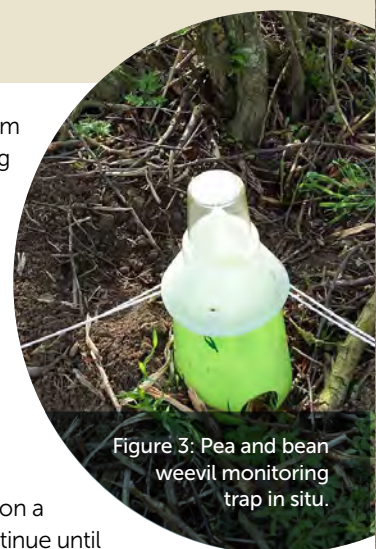


Figure 3: Pea and bean weevil monitoring trap in situ.

Pea moth

Pea moth is one of the most damaging pea pests in this country and in Europe. The caterpillars feed on peas within the pod and there is a risk of crop rejection because of contamination of the produce by damaged peas which cannot be removed mechanically or reduction of crop value.

Spraying is related to the development of the insect rather than to the growth stage of the crop and insecticides should be applied while the larvae are exposed, from the time of hatching to the time of entering the pods. Application timing is therefore critical for best control. A system of accurately timing the application of insecticides is commercially available in the form of pheromone traps which attract male moths.



Figure 4: iMetos® trap in peas

In combining peas, the threshold for treatment is ten or more moths caught in a trap on two consecutive occasions. Timing of sprays is related to egg development, and this is affected by temperature. A spray date can be obtained from www.pgro.org based on a computer prediction, 3 - 4 days after reaching a threshold.

On the predicted spray date, crops which are at the first pod set stage, or which have flowered should be sprayed, but later crops should only be sprayed when they reach first pod set. A second application should be applied 10-14 days later.

More recently there have been developments in automatic trap technology that can record the number and identity of different pest species. Metos UK (with Pessi Instruments) supply such a trap which is integrated into their iMetos® weather station technology, and this has been effectively tested for pea moth monitoring (Figure 4).

iMetos traps can take multiple images per day and ours was programmed to take one image each day for pea moth.

The trap was baited with the pheromone lure, and the software was trained to recognise and count pea moths on a sticky card placed inside the trap. This allowed us to reduce the number of field visits from every two days to once every two weeks to change the sticky card. The images can be viewed on a phone app, or from a computer (Figure 5). The technology has also been tested successfully for other pests such as bean seed fly and pea midge.

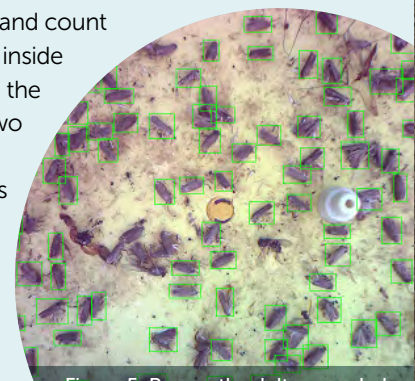


Figure 5: Pea moth adults recorded using iMetos® image technology.



PGRO calls on government to recognise pulse potential

Liz Truss' Cabinet weren't given much time to get to grips with their respective roles, but it was long enough for Defra Secretary Ranil Jayawardena to announce a review of ELMs.

The scheme, which at that point hadn't been implemented fully, now looks set to suffer further delays and the agricultural industry faces more uncertainty

However, rather than focusing on the negatives, PGRO took the opportunity to remind the then-Defra Secretary of the positive role pulses can play in UK agricultural output and why the time is right to release their previously untapped potential.

Mr Jayawardena has since been replaced by Thérèse Coffey, although the Minister for Food, Mark Spencer, remains in post.

Here is the letter, sent on 27 September 2022, in full:

Dear Mr Jayawardena,

I write to you in my capacity as Chief Executive of the Processors and Growers Research Organisation. A charity which for over 50 years has supported the UK pulse and vegetable legume industry in improving the agronomic practices of production through high quality applied research.

Having engaged with DEFRA on a regular basis in recent years we are encouraged to realise that the valuable role that increased pulse and vegetable legume cropping have to play in UK agriculture has newly gained some significant recognition. Requiring no artificial nitrogen fertiliser and having numerous other benefits for the environment and soil health, with wider increases in subsequent crop productivity, and with enormous opportunities for the substitution of imported soya, they are significantly underutilised in agricultural rotations and yet are a profitable crop with enormous potential for greenhouse gas reduction and industrial growth with export potential.

Under exploited in the past with agriculture focused on starch and oilseeds rather than protein production, pulse crops have been under invested and unsupported by the supply chain and the old farm subsidy regimes. The ELM schemes with the emphasis on public money for public good presents possibly the first real chance that pulses have ever had in modern agriculture to play their full part in UK agricultural output. They are protein crops with a low environmental footprint that grow well in the UK and grown well can be profitable for growers. With established food export markets in North Africa and with growing export demand in Europe and further afield they can also have big role as a soya substitute for the animal feed industry.

Peas and beans are also the preferred source of vegetable protein in the emerging protein extraction industry for use in the food chain as consumers demand alternatives to meat. This much promoted industry worldwide is currently at the establishment phase in the UK and many European countries, presenting significant inward investment opportunities for both domestic and export growth. If the UK is to succeed in this sector the industry will need a reliable local supply of pulses as the protein source, a resource that is currently under produced.

To date crop production appears to have been left behind in ELMs, a neglected element yet vital to food security considerations. If any review of the ELM schemes is to take place with regards to crop production, I urge you to seriously consider encouraging pulse production to realise the real benefits that are there to be had for the environment, for profitable sustainable UK agricultural practices, and for UK export growth.

Yours sincerely

Roger Vickers



NEWS

Meet Dina and Will

PGRO has welcomed two new members to its team, Dina Gomez and Will Evans.

Dina is one of three technical officers working on PGRO's trials work, which analyses different agrochemicals and biostimulants to monitor how effectively they treat pests, diseases and weeds on peas, beans and lentils.

She holds a master's degree in plant sciences from the University of Pretoria and embarked upon a career working within pharmaceuticals, carrying out chemical analysis and quality control of products, after moving to the UK.

She has a background in plant pathology and has worked in plantations in both South America and South Africa.

"I also previously worked for Floralive, a division of Smithers-Oasis, and travelled to Holland to learn how the company was carrying out post-harvest testing of flowers before setting up a lab in the UK." Dina says.

Will Evans joined PGRO in February as a Technical Officer.

He says: "After studying science at university and three years working in pharmaceuticals, I decided that agriculture was where I wanted to be and set out to gain as much experience as possible.

"I spent time working at a vertical farm in Birmingham, but when that business closed during the pandemic I realised I wanted to be working in arable agriculture. I went soil sampling for another year and half before joining PGRO."

Will says he has already learnt a great deal in just six months.

"Our team has a huge variety of projects," he says."

"We're looking forward to sharing the results and also preparing for next year's trials out in the field."



Dina Gomez



Will Evans

PGRO Agronomy App tool

The PGRO Pea & Bean App, an agronomy assistant in your pocket. Providing up to date technical backup as well as the DL variety guides and an interactive pest and disease reporting tool via your smartphone or tablet.



Download
the App from
Apple and
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Pea and Bean
Guide

