

ARABLE FOCUS

THE JOURNAL FOR THE CEREALS AND OILSEEDS INDUSTRY

**Levy payers shape
AHDB's future**

**Black-grass and
its underground
tricks**

Breeding wheat to
BEAT YELLOW RUST

How plant breeders deliver disease resistance

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AHDB is a statutory levy board, funded by farmers, growers and others in the supply chain. We equip the industry with easy to use, practical know-how which they can apply straight away to make better decisions and improve their performance. For further information, please visit ahdb.org.uk

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Welcome

Just one week after the publication of the Spring 2022 edition of Arable Focus, Russia invaded Ukraine. The world changed in the blink of an eye, with a huge impact on politics, markets and input prices. The conflict delivers unprecedented global challenges, especially for farmers in Ukraine.



For UK growers, it is a mixed picture. In general, crop condition is good with potential for a strong harvest. Naturally, this depends on conditions remaining favourable – including sufficient rainfall (following a relatively dry start to the year). With commodity prices high, harvest 2022 may be positive for many growers, especially for those who bought fertiliser early.

At the time of writing, with on-farm early season ammonium nitrate (34.5% N) prices around £705/t and November 2023 wheat around £274.70/t, there is potential for positive margins in 2023. However, with higher cashflow requirements, complex forward-selling decisions and unpredictable weather thrown into the mix – risks feel higher than ever.

The political agenda continues to change too. Ukraine has refocused attention on food price inflation and food security. New technology is back on the agenda – with a bill in England to allow gene editing. On wider industry matters, AHDB continues to work with stakeholders to help ensure Red Tractor evolves to meet the changing needs and challenges. We hope to say more about this in due course.

Finally, AHDB is changing. I thank those who expressed views in the recent Shape the Future votes. In general, levy payer feedback on priorities was positive and membership of the AHDB Cereals & Oilseeds sector council has now been agreed (see pages 4–5).

Inflation in our costs and a change to AHDB's VAT status mean I will support your new council over the next few months to help them make prioritisation decisions for investment, as well as identifying where we need to make changes to how we operate. Shaped in response to your feedback, look out for your new sector strategy this autumn.

Ken Boyns

AHDB Divisional Director – Services

UKRAINE MARKET IMPACT HUB

Written by our team of analysts, visit the hub for:

- The latest data on market movements
- A clear and impartial view of what this means for industry
- Links to tools and resources to help you mitigate business impacts

ahdb.org.uk/market-impact-of-ukraine-conflict

Shape the future of farming

STF Update

Cereals and Oilseeds results

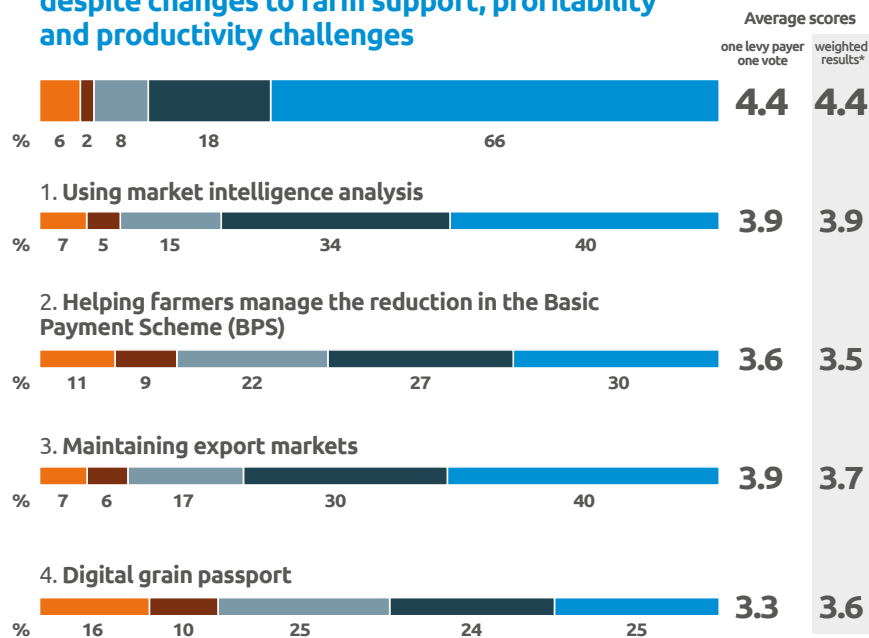
Levy payers were asked if they agreed with the proposed priorities for the cereals and oilseeds sector by ranking them in terms of importance from 1 to 5, where 1 is low and 5 is high. They were then asked to rank the work that AHDB should do to support those areas.

Giving levy payers a greater say in how AHDB is run and what we deliver for their businesses is the only way we can stay relevant to the industry. Receiving feedback directly from those using our services will make sure we're providing the right support needed to face the big challenges ahead.

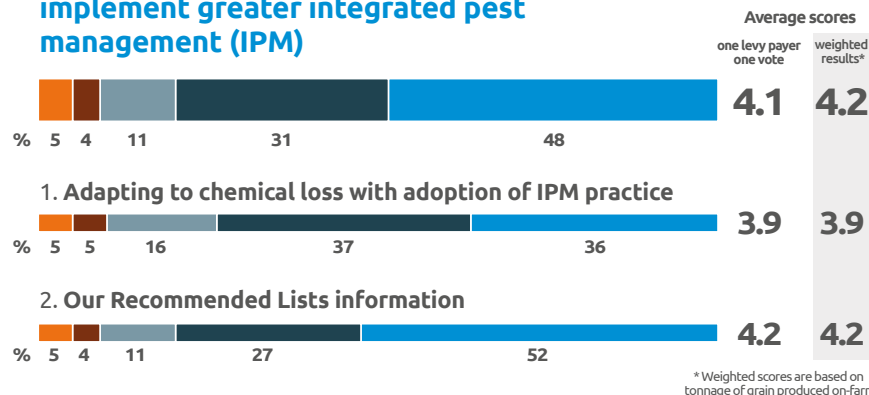
We made a public commitment to build a modern, fresh governance structure that puts levy payers right at the heart of everything we do, and one way we're delivering on this promise is through the formation of our new sector councils.

Results and feedback from the Shape the Future vote will now be used by your sector council to inform funding decisions on the work AHDB will deliver – so, they really couldn't have a more important role in how AHDB is run.

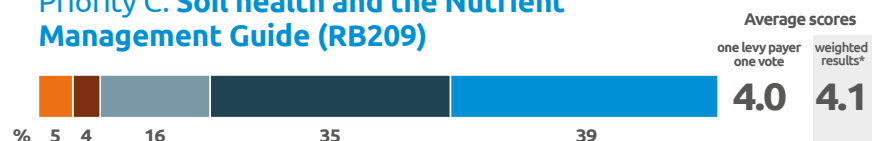
Priority A. Supporting farmers to remain viable despite changes to farm support, profitability and productivity challenges



Priority B. Tackling pest, weed and disease pressures with less chemistry available, and implement greater integrated pest management (IPM)



Priority C. Soil health and the Nutrient Management Guide (RB209)



1. Management of soil health and our Nutrient Management Guide (RB209)



* Weighted scores are based on tonnage of grain produced on-farm

Priority D. Meeting 'Net Zero' ambitions for the environment across supply chains, including biodiversity, while maintaining profit margins



1. Supporting our industry to deliver sustainable change



* Weighted scores are based on tonnage of grain produced on-farm

Priority E. Maintaining our reputation among customers and consumers, and attract skilled staff



1. Protecting and enhancing the reputation of the industry



2. Educating consumers of the future



3. People working in agriculture and labour supply



* Weighted scores are based on tonnage of grain produced on-farm

ahdb.org.uk/shape-the-future

Sector council appointments

The following people received more than 50% of the votes and have been ratified as sector council members:

Tony Bell

Tom Clarke

Polly Davies

Russ McKenzie

Sarah Nightingale

Cecilia Pryce

ahdb.org.uk/cereals-council

Over the hedge

News from across AHDB

Sustainable Farming Incentive

AHDB's latest Horizon report examines the pros and cons of the Sustainable Farming Incentive (SFI). At current payment rates, the analysis shows that most SFI standards will only provide a small financial benefit to many farmers when the costs of relevant SFI actions are included. Farmers who are already undertaking some of the actions and don't have to take land out of production will benefit the most.

ahdb.org.uk/trade-and-policy

Scottish Arable Farm of the Year

There are only a few more days left to get in nominations for the 2022 Scottish Arable Farm of the Year Award competition (submission deadline is 20 June). The call – jointly issued by AgriScot, AHDB and SoilEssentials – will see shortlisted farms visited by assessors this summer, and the winner announced at AgriScot on 16 November 2022. For information on the nomination process, email info@agriscot.co.uk

Arable Scotland

Arable Scotland brings together the key players in Scottish food production – from farmers to distillers and exporters – to discuss industry issues. Themed on Net Zero, the 2022 event takes place on 5 July at the James Hutton Institute's Balruddery Research Farm in Invergowrie.

ahdb.org.uk/events/arable-scotland-2022

We Eat Balanced

We Eat Balanced featured on TV, social media and in print during January and February. The 2022 campaign saw the Pork, Beef & Lamb and Dairy sectors join forces to deliver messages around health, sustainability, and Britain's world-class food and farming standards. The £3.5 million campaign reached almost 24 million UK households.

weeatbalanced.com

Upcoming events

From open days at Monitor Farms and Strategic Cereal Farms to variety trial sites, summer 2022 is bursting with event activity. To locate your local events, visit ahdb.org.uk/events

Students' Union

PhD investigates the 'hare' (wheat) and the 'tortoise' (black-grass)

An AHDB PhD student is exposing black-grass' hidden tricks to help cereals compete with this major arable weed.



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Based at the University of Leeds, student Jed Clark has designed experiments to examine what gives some crops the power to fight back against black-grass.

In this battlefield, roots are in charge – something that is difficult to assess in commercial field crops. Jed has devised an experimental system that allows him to use containers to pit crop against weed.

The approach also allows the environment to be controlled and, via the use of permeable and non-permeable barriers in the containers, permits the assessment of physical and chemical interactions.

In addition to clear physical interactions, Jed's work shows that chemicals play an important role. He found that chemicals released from roots (exudates) – whether from wheat or black-grass – can travel to other plants and affect their growth. In the case of wheat, these chemicals tend to slow down growth. In the case of black-grass, however, chemicals have a neutral or a positive effect on growth. Jed believes that this may help explain the high black-grass densities often observed on arable land.

In another experiment, Jed simulated field conditions and observed a 'hare-and-tortoise' response. Over the simulated winter black-grass grew slowly, yet consistently. However, wheat appeared to race away – above the ground, at least.

Hydroponic systems were used to reveal root-growth differences (Figures 1 and 2). Black-grass achieved much higher root densities, with wheat investing more in shoot biomass. In fact, final black-grass root biomass was almost double that for wheat. Black-grass roots also represented a much larger proportion of total plant biomass – 40% compared with 17% for wheat.

The dense root system of black-grass gives it a competitive advantage over winter wheat in the spring, when demand for nutrients and water increases. These results also help explain why spring-sown wheat competes better against black-grass. Weed control prior to drilling spring crops kills any black-grass, levelling the playing field. The results may also explain why winter barley – known for its vigorous root growth – is not affected as much by black-grass.

Over the remaining two years of his PhD, Jed plans to screen winter wheat varieties for differences in their ability to compete with black-grass. He also wants to improve in-field assessment approaches, by adopting a 'shovelomics' approach – which involves digging up and washing roots prior to their examination. Finally, Jed wants to further investigate the root chemicals behind the growth responses observed in his earlier experiments.



Figure 1. The root system of black-grass



Figure 2. The root system of wheat

For further information, search 'black-grass PhD' at ahdb.org.uk/research

ADVANCES IN BYDV MANAGEMENT

Do claims of varietal resistance to BYDV translate to measurable differences in cereal yields or is it just a gimmick? Paul Gosling, who leads the RL at AHDB, investigates.

The use of specialist categories and described types in the RL allows us to provide specific recommendations for varieties that have novel traits. Resistance/tolerance to *Barley yellow dwarf virus* (BYDV) in cereals is a specialist trait we recently added to the RL.

The previous edition of the RL (2021/22) included the winter wheat variety RGT Wolverine for the first time, and it was the first variety listed that featured a trait to resist BYDV. In the latest edition of the RL (2022/23), the winter barley variety KWS Feeris, with BYDV tolerance, was added.

Control of BYDV through genetics is becoming more appealing, following the loss of seed treatment options for autumn aphid control. The use of such specialist options is particularly valued by those concerned about resistance in aphids to pyrethroid sprays in BYDV high-risk situations.

BYDV in RL trials: the Dorset experience

Some traits are difficult to test for, so we ask breeders to provide evidence to support their claims. It is important to state that we do not verify their claims in RL trials. BYDV resistance/tolerance is one such trait. While RL trial operators do record BYDV symptoms in trials, it is difficult to set up a fair test of resistance/tolerance due to the sporadic nature of the disease – across trials, plots and even within plots.

Sometimes, however, trials deliver their own unplanned verdict on crop genetics. This was illustrated perfectly by two winter barley RL trials in 2021. Located in Dorset, the trials took place just 1.5 km away from each other and were drilled just 10 days apart. The same variety set was grown at each trial site, including two varieties with BYDV tolerance.

Trial 1

Drilled: 15 September 2020

Pyrethroid (lambda-cyhalothrin) application: 11 November

BYDV symptoms: None

Trial 2

Drilled 25 September 2020

Pyrethroid application: None

BYDV symptoms: Developed in the spring

In trial 2, the one with BYDV symptoms, it was clear that the two BYDV tolerant varieties were performing far better than varieties with no tolerance, in terms of visual symptoms.

Yield impacts

Of course, tolerance only counts when it makes a difference to yield. When we looked at how varieties yielded, compared to the trial mean (set at 100%), the BYDV-tolerant varieties stood out (Figure 1):

- In the trial with no BYDV symptoms, the two BYDV-tolerant varieties scored 108% and 103% of the trial mean
- In the trial with BYDV symptoms, the two BYDV-tolerant varieties scored 131% and 124% of the trial mean

In conclusion, in situations where BYDV infection is a serious threat, BYDV tolerance is a useful trait, with measurable yield benefits.

Aphid-spray decision support

An active AHDB project aims to strengthen support for aphid-spray decisions. From aphid monitoring approaches to the production of decision support tools, the ADAS-led project covers a lot of ground.

Key messages are already emerging from the three-year project:

- Physically inspecting plants is time-consuming and can miss areas of aphid infestation
- Trap data – whether from national suction traps (managed by Rothamsted Research) or in-field traps – provide a good indication of regional and local aphid pressures, respectively
- In-field yellow water traps (pictured) caught 2–3 times more aphids than yellow sticky traps
- A prototype spray decision support tool – called ACroBAT – shows potential to reduce the number of autumn aphid sprays

The ADAS Crop BYDV Assessment Tool (ACroBAT) considers many more parameters than the AHDB BYDV (T-Sum) tool. Five BYDV-inoculated barley trials, in the current (2021/22) season, resulted in three and eleven autumn spray recommendations with ACroBAT and T-Sum tools respectively, by early December.

Although the initial results are promising, a full analysis (including consideration of harvest 2022 yield data) is required to determine the tool's full potential. The full story will be published in the project's final report, which is due later this year.

Further information on the project – Management of aphid and BYDV risk in winter cereals – is available via: ahdb.org.uk/research

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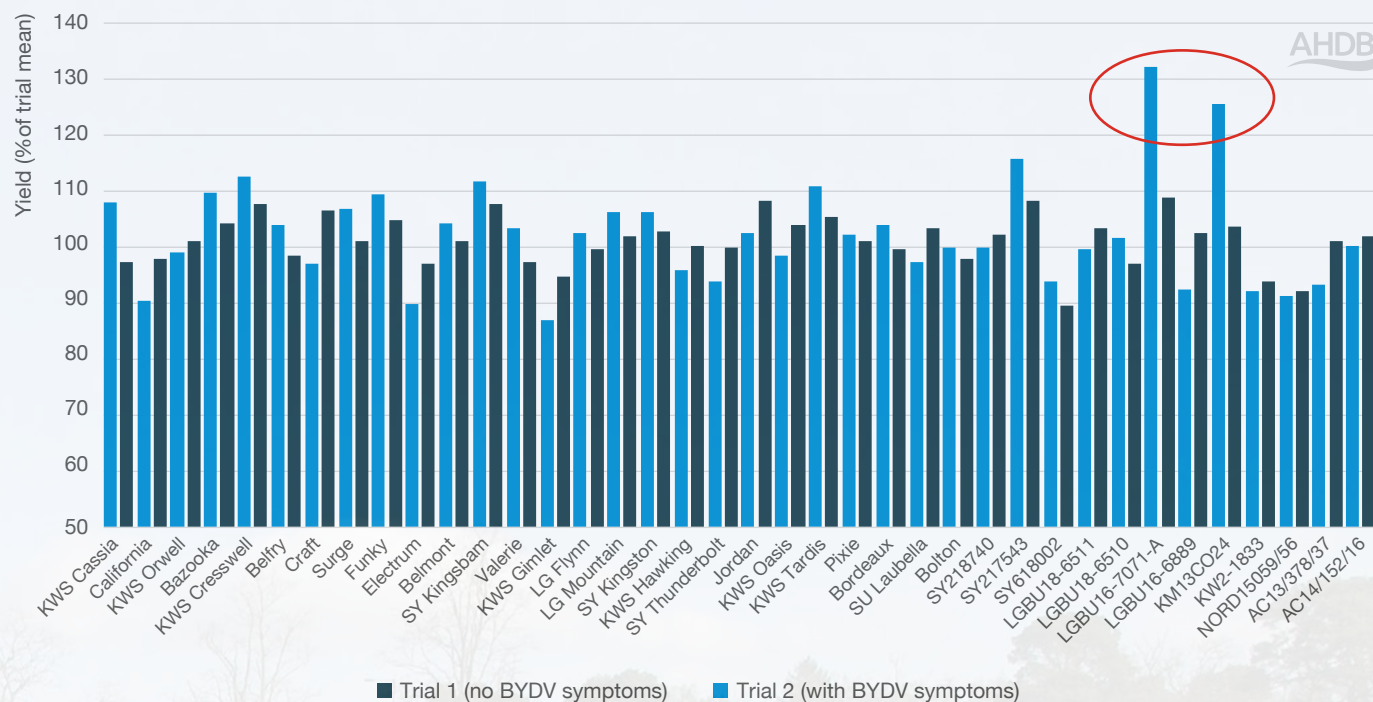


Figure 1. Winter barley RL yield results (harvest 2021, Dorset) clearly show the better performance of the two coded BYDV tolerant varieties (red circle) when BYDV was clearly present at the trial site (Trial 2).



BREEDING WHEAT TO BEAT YELLOW RUST



Plant breeders work hard to ensure that winter wheat offers good levels of resistance to yellow rust. Jason Pole, who leads on AHDB's crop disease communications, looks at a recent UKCPVS presentation on the topic.

The AHDB-funded UK Cereal Pathogen Virulence Survey (UKCPVS) is vital to plant breeders, according to Rachel Goddard of plant breeding company Limagrain. Presenting at this year's UKCPVS event, she highlighted how the collaborative project helps to ensure that winter wheat variety developments match the pace set by adaptable yellow rust populations.

Yellow rust evolution

Over the last 50 years, major breakdowns in yellow rust resistance have occurred relatively frequently (Figure 1) – in cycles of around 5 to 10 years.

When new pathogen variants arrive, they can spread rapidly (in just a few seasons). In 2011, the presence of the Warrior yellow rust race in the UK was confirmed. Compared to previous changes, Warrior was highly unusual for several reasons, including:

- It was derived from a sexual recombination (outside of Europe)
- It was first identified in many countries in the same year
- It caused yellow rust on many wheat varieties
- It was complex and varied
- Compared to the previous population, it was highly adaptable. It:
 - Tolerated a greater range of temperatures
 - Had a shorter time from infection to sporulation
 - Produced a greater number of spores
 - Developed black telia relatively late in the season
 - Broke many resistance genes and gene combinations

In fact, Rachel said that post-Warrior “yellow rust was like a new disease”.

A major reason why Warrior affected so many varieties was because it unpicked a single, major adult plant resistance gene – YRClare – which had been extensively used in plant breeding since 1997.

The post-Warrior explosion in the diversity of the yellow rust population was so large it demanded a change to the way new variants were named. Today, new races are

assigned to a genetic colour group and given a sequential number – unique to the varieties on which they cause disease (pathotype).

Since the incursion of Warrior, the red group of isolates has dominated the population – with it featuring over 50 pathotypes. Frequencies of these pathotypes vary over time and space: even across a short distance in a field, the pathotypes present can vary substantially. The three most dominant pathotypes represent around a third of the population, according to the most recent UKCPVS results.

Post-Warrior, the yellow rust population has changed so much that its ability to unlock resistance in some old varieties (from the 1990s) may have, in essence, been forgotten. This includes Brigadier (Figure 1), which features genes known to counter the Warrior population of races. Therefore, historic genetics may offer solutions for the varieties of tomorrow.

Plant breeding challenges

Traditional wheat breeding cycle takes around 10 years. Despite early promise, in pre-breeding and National Lists trials, varieties may no longer be resistant (or may be less resistant) by the time they reach RL trials.

However, UKCPVS pathotype information (presence and frequency) guides plant breeding efforts. The provision of representative pathotypes to breeders – for artificial infection (inoculation) of varieties in disease nurseries – also helps breeders back winners.

Disease nurseries are also used to evaluate resistance (R) gene combinations. There are at least eight R genes across the current set of RL winter wheat varieties. Wheat breeders look to incorporate (stack) as many effective R genes as possible to deliver durable disease resistance – providing any major yield penalties can be avoided.

Most current RL winter wheat varieties have two or three R genes for yellow rust, and three have four. However, several only contain one R gene – not only increasing the vulnerability in these varieties, but to others too. Plant breeding companies, such as Limagrain, now aim to avoid using single R genes in commercial varieties.

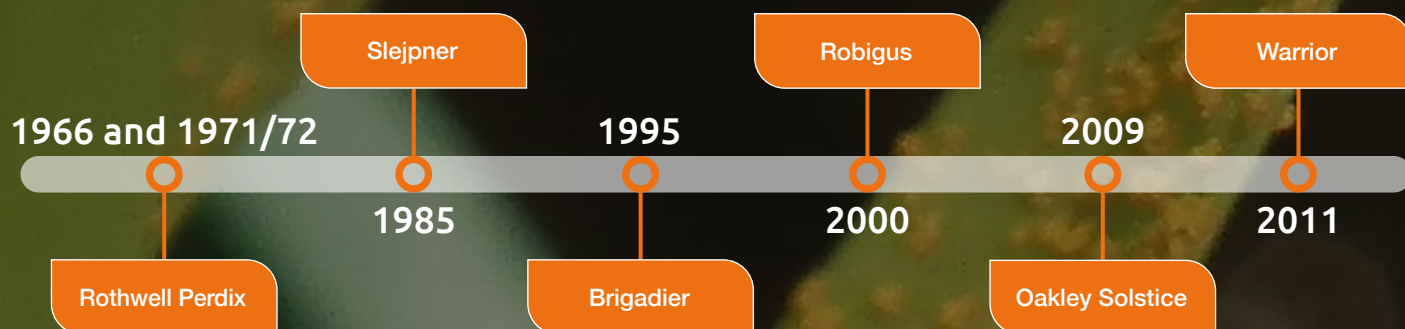


Figure 1. Timeline indicating key years for wheat yellow rust population change

There is a continual hunger to introduce new sources of resistance, as the elite wheat gene pool is narrow. Breeders turn to wheat's wild relatives, direct ancestors, and landraces to help expand it. However, this route takes as much as three times longer than elite crosses due to the need to flush out undesirable traits. However, genetic technologies, such as marker-assisted selection, are helping to speed up the plant breeding process.

Despite the changes to the yellow rust population, many RL varieties have strong resistance to the disease at the adult-plant and young-plant stages. The fact that farmers have strong options at their disposal is due to the relentless investment and skill of plant breeders.

For further information on the UKCPVS project, visit: ahdb.org.uk/ukcpvs



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NET-ZERO RESEARCH partnership

Amanda Bennett, Senior Environment Manager at AHDB, provides an overview of a set of rapid-fire research projects that aims to move UK agriculture along the path to Net Zero.



When it comes to climate change, agriculture has an instrumental role to play. It has never been more important to invest in sustainable agricultural systems, to ensure that they are both profitable and deliver environmental public goods.

Research funder BBSRC has similar goals to AHDB. Last year, an opportunity arose to partner with them to invest in science to help UK farms reach Net Zero by 2040. In this partnership, BBSRC contributed the funding (nearly £0.5m) and AHDB provided near-market research management expertise.

The funding has supported ten short (c. three month) projects that address farmer-identified challenges. Conducted mainly over the winter and spring of 2021/22, the diverse research sees many of the country's leading agriculture and bioscience experts collaborate. Included in the mix are an impressive eight

projects of relevance to the production of cereals and oilseeds crops.

Available soil phosphate test kit field trials

Rothamsted Research has developed a rapid, low-cost, in-field prototype test kit for available soil phosphate. By working with farmers, the researchers will test the kit in commercial settings and identify potential improvements. The team will also seek organisations to help manufacture and/or distribute the final product.

Automatic monitoring of nocturnal crop pest activity

Numerous crop pests are active at night, including cabbage stem flea beetle in oilseed rape and vine weevil in horticultural crops. As it is challenging to monitor for nocturnal pest activity,

researchers at Harper Adams University will develop an automated monitoring tool for vine weevil. With proof of concept established, this technology has potential to be adapted for use to detect other pest species.

Best-practice for tank-mixing biopesticides

Led by Stirling University, this project aims to deliver clear recommendations for biopesticide application for simultaneous control of multiple pest species. Although focused on protected horticultural crops, the research will also provide general recommendations on tank-mixing biopesticides for use in open-field cropping systems.

Regenerative agriculture in challenging environments

The north of England is characterised by cold, wet winters and summers with lower temperatures than other regions of England. In many areas, soils are heavy and poorly drained. Such conditions can inhibit the uptake of regenerative agricultural practices. Researchers at Newcastle University will develop a farmer network in the region to identify the challenges and successes associated with regenerative agriculture.

Optimised inputs for oilseed rape

Led by the University of Reading, this research will develop a computer model to explore ways to reduce fertiliser (and potentially pesticide) inputs while maintaining economic return in oilseed rape. Management adaptations will be identified via established grower networks and stakeholder workshops.

Reducing crop disease risk through residue management

Anecic (deep burrowing) earthworms are known to influence some crop diseases – both directly, by modifying host defence metabolism, and indirectly, via preferential consumption of pathogen-infected residues. Researchers at the University of Nottingham and SRUC will investigate the latter biocontrol action, including in reduced-tillage systems, to improve disease management guidance.

Chitinous biowaste streams as soil health amendments

Some biowaste streams – including shellfish waste, mushroom waste (spent compost and mushrooms) and black soldier fly waste (frass) – have similar characteristics. Such biowaste contains biopolymers, such as chitin, as well as major crop nutrients, organic matter and calcium carbonate (lime). Researchers at Harper Adams University will explore the potential to transform chitin-containing biowaste into a high-value soil health amendment.

Improving crop immunity to foliar diseases

Led by the University of Edinburgh, this project will examine crop immune responses to cereal diseases. In particular, the researchers will study the ubiquitin-dependent immune activation in 24 spring barley cultivars infected with the brown rust pathogen in field conditions. The work will build on knowledge acquired in model plants, such as arabidopsis, to better understand pathogen perception and defence responses in crops.

Further information

The AHDB and BBSRC Net-Zero partnership lays the foundation for the development of novel solutions for a more sustainable agriculture. It is anticipated that these projects will act as a catalyst for longer-term collaboration and a gateway to secure further funding. Each project will produce a final report, which will be published on our website later this year.

For further information on the Net-Zero partnership, visit: ahdb.org.uk/net-zero-partnership

ABOUT BBSRC

Part of UK Research and Innovation (UKRI), the Biotechnology and Biological Sciences Research Council (BBSRC) invests in world-class bioscience research and training.

bbsrc.ukri.org



**Biotechnology and
Biological Sciences
Research Council**

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THE AHDB PLANTING AND VARIETY SURVEY IS IT HELPFUL?

Senior Market Specialist Manager (Arable) Vikki Campbell analyses five years of annual data to gauge the accuracy of the AHDB Planting and Variety Survey.



In July, AHDB will release the 2022 AHDB Planting and Variety Survey results, providing the first detailed look at what might be available in the upcoming harvest – issued a month before Defra's provisional area data.

The results develop the story from the Early Bird Survey, which provides the earliest indication of national cropping intentions. First and foremost, the Planting and Variety Survey delivers strong GB harvest area estimates. However, it also features more granular

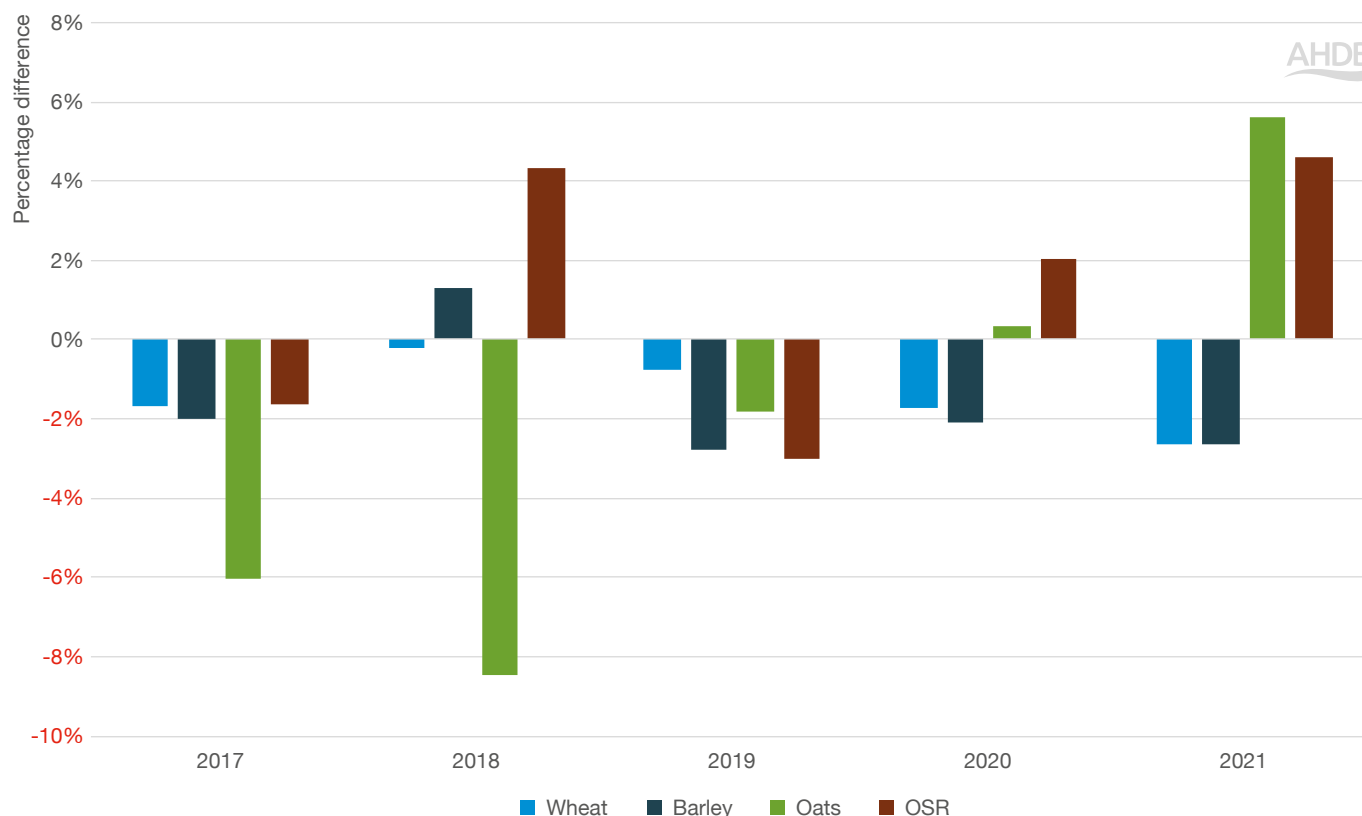
data – with results broken down by crop, end-use group (e.g. UK Flour Miller groups and malting-approved barley varieties) and region.

Survey accuracy

To be truly informative, surveys need to provide a strong indication of the situation on the ground. So, how accurate is the Planting and Variety Survey compared with the later-released official Defra figures? An analysis of the

survey data from the last five years (2017–21) can provide answers to this important question (Figure 1).

For wheat, the AHDB survey has been no more than 3% different to the final official Defra figures. Generally, AHDB estimates fall on the more conservative side. This has been observed in the past five seasons, with an average difference of -1%. For barley, the pattern is similar. Our estimates for total GB barley area were never more than -3% different to the final Defra figures.



Source: AHDB, Defra

Figure 1. Differences between AHDB Planting Variety Survey and Defra area figures

As might be expected, crops with smaller areas are associated with larger margins of error. The differences between the two data sets were as much as -6% and +6% for oats, while the range for oilseed rape (OSR) moved between -3% and +5%.

Survey benefits

The survey provides an early insight into the direction of the domestic market and can help inform crop marketing strategies. Planning how to market the crop is especially important this season, given market volatility and high input prices. And this is all set in the context of a changing subsidy situation.

We already know that the UK will enter the next marketing year with tight opening stocks for wheat and barley. Any additional supply tightness, domestically and globally, for the 2022/23 marketing year will only serve to support prices further.

The UK demand outlook also remains supported (at the time of writing). Yes, animal feed demand may soften, due to herd reductions (primarily in the pig sector). However, the second bioethanol plant, due to come fully up to speed during 2022/23, will create demand – particularly in the north of the country.

Not only do the survey results assist in decisions for the current marketing year, but having an early, clear picture of domestic supply can help frame a picture for the season(s) beyond. Crops drilled in winter 2022 are likely to be associated with even higher input costs. Many growers secured a large portion of their fertiliser requirements for 2021/22 prior to the price increases. Many will not be so fortunate for the crop drilled this autumn. The upshot is that costs are likely to bite into margins more for the 2022/23 crop than crops set for harvest later this year. Planning cropping and marketing strategies is essential to adapt to margin pressures.

This article highlights some of the ways the survey delivers value to the industry. Each year, industry is encouraged to complete the survey. Although this is on a voluntary basis, the higher the number of participants, the more robust the survey results will be.

The 2022 survey closed on 16 June. If you would like to assist with future surveys, please get in touch with AHDB.

Access the survey and results at ahdb.org.uk/cereals-oilseeds-markets

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WHAT DOES WAR MEAN FOR CEREAL EXPORTS?



Dorit Cohen, AHDB Exports Marketing Manager, examines if the UK can increase supply to customers that usually rely on imports from the Black Sea region.

Russia and Ukraine are major cereal exporters – they supply over a quarter of the world's wheat and are major suppliers of barley and corn. However, the closure of Ukrainian ports and military activity have disrupted trade flows. Furthermore, the unprecedented difficulty with sowing and harvesting, particularly in Ukraine, is likely to lead to a dramatic decline in yields in 2022.

An interruption to 2022–23 grain supplies in Ukraine would be hard to miss. Relatively little is held in stores, with most exported. In a typical year, it is estimated that Ukraine exports more than two-thirds of its annual wheat harvest and 80 per cent of its corn. However, times are far from typical, with uncertainty the only certainty.

MENA market demands

Many countries in the Middle East and North Africa (MENA) region are particularly dependent on wheat from Ukraine and Russia. A disruption to grain imports could fuel food shortages, higher food prices and social unrest.

Given that the MENA markets are unable to source wheat, barley and corn internally to meet their requirements, they may need to look beyond the Black Sea region to source grain. So, can the UK step in and fill gaps created from lost Ukrainian and Russian supplies?

Over recent seasons, fierce competition in the MENA feed barley markets from Russia and Ukraine has limited the UK's market share in the region. Despite this, the UK has been a long-term supplier of cereals to these markets – a foot in the door that could prove useful, providing opportunities for feed barley and milling wheat.

For example, there is scope to target UK milling wheat exports to North Africa. In particular, **uks** biscuit-grade wheat is popular with Moroccan millers. In recent years, the emergence of Russian and Ukrainian milling wheat to this market has made competition tough. In fact, no **uks** wheat has been imported into Morocco in the past few seasons. With shifting market dynamics, this recent trend could be bucked.

UK supply constraints

According to the Early Bird Survey of planting intentions, the UK wheat area is forecast up 1% (15 Kha) year-on-year (at 1,805 Kha), with the winter barley area also estimated to have risen for harvest 2022. However, these increases are relatively modest. Additionally, 2021/22 has been one of the tightest supply-and-demand marketing seasons on record for both crops. Although there may be increased opportunities for the UK to export to the MENA region, there may not be the surplus available to do this.

In this global marketplace, other key players are also eyeing the same opportunities. Ultimately, the opportunities will depend on grain production in other export origins, including Australia, Argentina, USA and France. Even accounting for reduced outputs from Ukraine and Russia, export competition is likely to remain fierce.

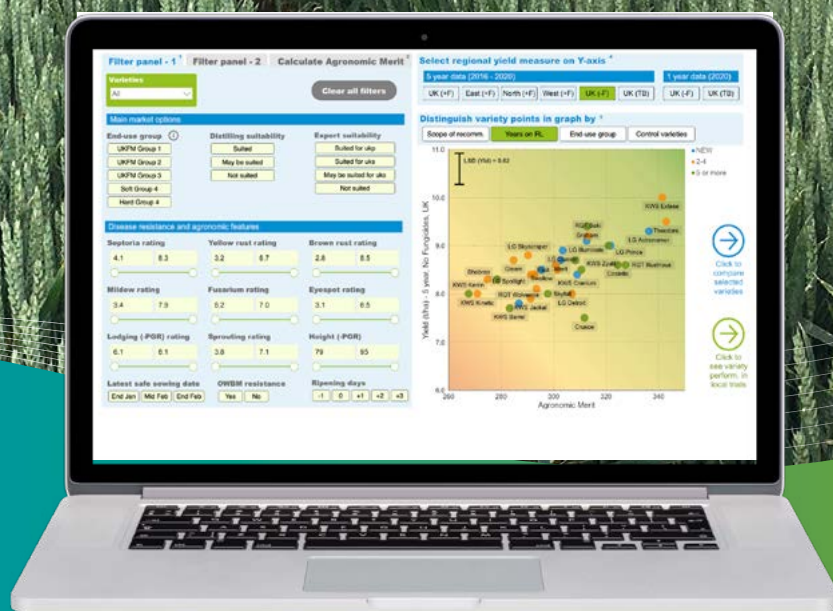
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Does it pay to cut nitrogen fertiliser?



Mark Topliff, AHDB Lead Analyst – Farm Economics, demonstrates how it can pay to cut inorganic nitrogen fertiliser usage.

In the last 12 months, imported ammonium nitrate (AN) fertiliser prices have more than doubled – including a 191% spike at the end of 2021. Even fertiliser products such as diammonium phosphate (DAP) experienced a 111% lift in prices compared to the previous 12 months.

Production cost pressures

Naturally, elevated prices impact production costs (Figure 1). For example, if you apply autumn 2021 inorganic fertiliser prices to application rates used for harvest 2021 crops, then costs would be up to £200/ha higher. Even if purchased for a lower price in summer 2021, the cost increase would still be around £70–£80/ha.

Nitrogen and yield

Farmbench results indicate a weak association between the amount of inorganic nitrogen applied and wheat yields (Figure 2). At a typical application rate of 220 kg N/ha, yield differences of around 6 t/ha were reported. Understanding this variation could help people use nitrogen more effectively.

Farmbench figures from first winter feed wheat reveal differences between the top and bottom 25% groups of farmers (Table 1). The top 25% achieved higher yields with less inorganic nitrogen used per tonne of grain generated. They also spent less on fertilisers, with a higher use of organic fertilisers – which may have contributed to the success of this group.

Nitrogen: how low can you go?

The nitrogen recommendations in the AHDB Nutrient Management Guide (RB209) are based on the economic optimum, which can be calculated using the break-even ratio (BER) – the amount of kilograms of yield needed to pay for one kilogram of nitrogen fertiliser.

Based on current grain and fertiliser prices, the typical BER for cereals is around 9.7:1 (9.7 kg of grain needed to pay for 1 kg of nitrogen fertiliser). For oilseeds, the typical BER is around 3.6:1. However, as bought fertiliser prices and grain or oilseed prices (expected or received) vary considerably, it is important to estimate the BER for each unique situation.

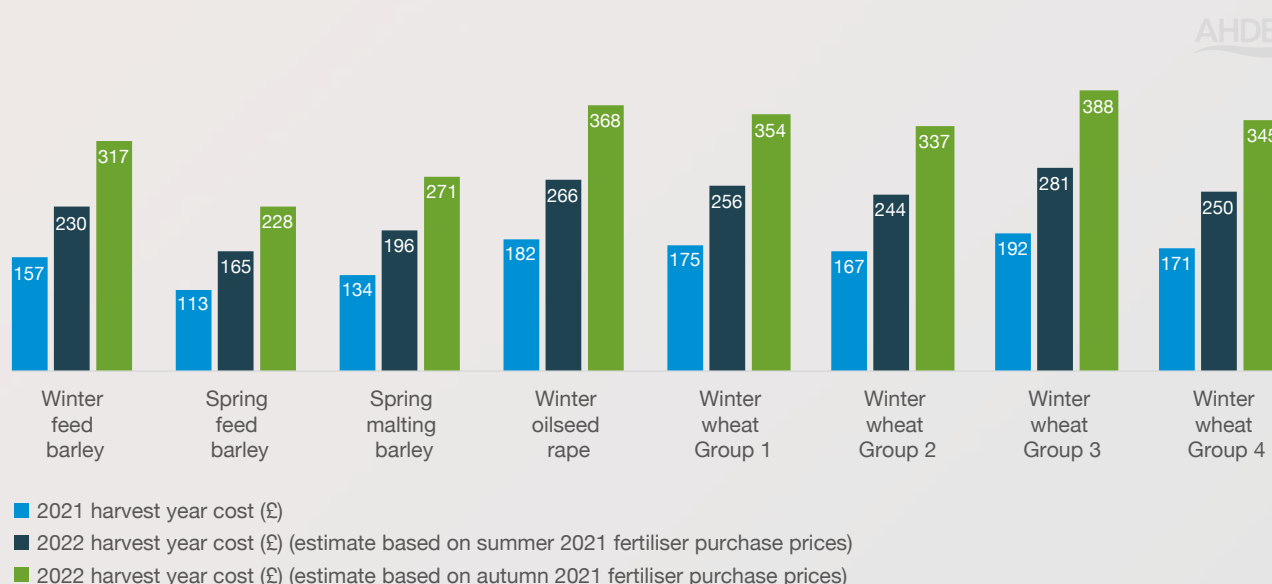


Figure 1. How high fertiliser prices could affect production costs. 2021 costs based on AHDB Farmbench results. 2022 estimates based on Defra agricultural indices and AHDB fertiliser survey findings, applied to Farmbench 2021 results (assumes no change to application rates)

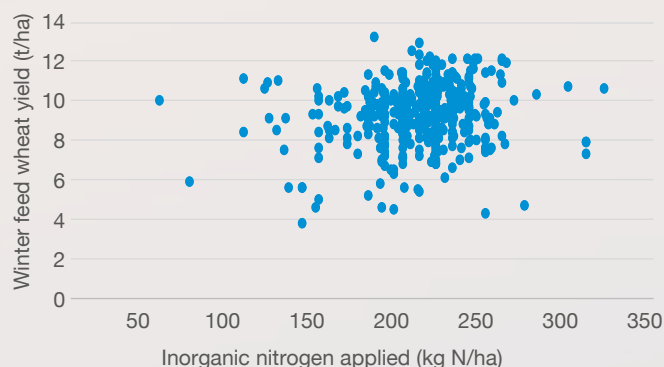


Figure 2. The weak relationship between wheat yield and total inorganic nitrogen applied. Based on 405 Farnbench results (2018–21) for conventional first winter feed wheat on clay loam soils

Table 1. Fertiliser and yield figures for the top and bottom 25% groups of farmers (ranked on net margin performance). Based on 405 Farnbench results (2018–21) for conventional first winter feed wheat on clay loam soils

Fertiliser or yield measure	Top 25%	Bottom 25%	Difference Top to bottom
Yield (t/ha)	10.2	8.5	+1.7
Inorganic N applied (kg N/ha)	214	201	+13
Inorganic N:yield ratio (kg N/ha:t/ha)	21	24	-3
Total fertiliser cost* (£/ha)	188	198	-10
Inorganic fertiliser (% of cost)	92	93	-1
Organic fertiliser (% of cost)	4	2	+2
Trace elements (% of cost)	4	5	-1

*Total fertiliser cost includes the cost of inorganic, organic fertilisers, and trace elements

BER EXAMPLE

Fertiliser price (AN): £785/tonne

Expected winter wheat price: £275/tonne

BER: 6.9:1

- Using this BER, the recommended reduction in nitrogen would be 35 kg/ha (saving £80/ha)
- The estimated yield reduction would be 0.23 t/ha (losing £63/ha)
- The difference between cost saved and income lost is a gain of £17/ha

In this scenario, it could pay to cut inorganic nitrogen fertiliser rates.

Nitrogen fertiliser adjustment calculator

AHDB has published a calculator to help determine the BER and suggest an adjustment to the RB209 recommended nitrogen fertiliser rate. Simply enter the fertiliser price and the nitrogen content, as well as the grain or oilseed price. Additionally, enter your typical application rate and crop area for more results on the nitrogen requirements for your situation.

ahdb.org.uk/nitrogen-calculator

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THE SOFTER SIDE OF MONITOR FARMS



Colin Chappell is hanging up his monitor farmer boots. Judith Stafford asks him about his experiences and the tips he'd give to anyone thinking about taking on the mantle.

Farming is an emotive subject and draws strong opinions. And many farmers keep their cards close to their chests. Despite these daunting facts, monitor farmers sign up to open their doors, their accounts and their minds to others.

A local cohort of farmers can provide great support and, at the same time, strong criticism. Nowhere has that been truer than at Gander Farm near Brigg in Lincolnshire, where fourth-generation farmer Colin Chappell stuck his head above the parapet and became an AHDB Cereals & Oilseeds monitor farmer in 2017.



About Brigg Monitor Farm

Gander Farm is a traditional mixed Lincolnshire farm. Of the 645 hectares, only 40 hectares are permanent pasture. The lowland farm is controlled by the River Ancholme. Dominated by high clay content (62%) soil, the farm often experiences flooding and waterlogging, but rarely drought.

The first meeting

At his first meeting, Colin spoke to a room full of stern faces and crossed arms. Nominated by somebody else to host the monitor farm, he must have wondered what he'd let himself in for. He shook like a leaf.

Being a monitor farmer isn't about age, experience or farm size. It's an attitude – a willingness to listen, to accept criticism and to learn. It can take a while to warm to the role. Before long, however, the group became tightly knit, explored many subjects, learnt hard lessons, and shared highs and lows. To sum up: they opened their hearts and their minds.

Sharing problems

Colin said: "Being a monitor farmer has transformed the way I farm and think. Farmers are not always the best at talking to each other – and, initially, I found this hard. When you open up and talk, however, you learn that we're not too different and we face similar issues – such as the loss of funds through the Basic Payment Scheme (BPS). Now I say that speaking with farmers was the part I enjoyed most. We need to support each other and find solutions to the challenges we face."

Colin's most memorable meeting session covered the topic of stress: "Towards the end of my time as a monitor farmer, one of the most powerful things happened. I spoke about some specific issues I had with the Rural Payments Agency (RPA), as well as the general weight of bureaucracy on our shoulders. My story encouraged somebody else (now a very close friend) to tell his story – which was far more problematic than my own situation.

"Acknowledging struggles is the first step in finding a way out of them. Discovering others who face the same challenges is a comfort. Through sharing, relationships deepen, trust is built and support networks develop – it is very special to be part of this."

Measuring performance

Over the past four years as a Monitor Farm, there has been a spotlight on the practical, technical, and business aspects of Colin's farm – with measurement, through benchmarking and monitoring, used extensively.

Colin said: "One year you can be at the top, the next at the bottom – the important thing to understand is why this happens. It will give you more confidence to make decisions.

"By happenstance, we hired a combine for one harvest. A close eye on my accounts made me question why I needed to own a combine, when it is only used six weeks each year. Why spend all our hard-earned profit? To stop the government getting its hands on some of it through tax?"

Technical challenges

During the Monitor Farm period, the farm has transitioned from ploughing to direct drilling, which was a challenge on the clay soils. As part of these system changes, Colin has also used more spring crops and cover crops.

Colin said: "I think of soil as a living, breathing organism, treating it with kid gloves. The less I do to the soil, the healthier it is."

His approach has delivered improvements in soil structure, widening work windows, and reduced the black-grass seed burden. He also spends less on fuel (per hectare) and fertiliser.

Asked what advice he'd give to somebody thinking about becoming a monitor farmer, Colin said: "Don't hesitate. Go for it. It is a challenge, but it only challenges what's happening inside your head. It will transform you and the way you farm."

Follow the Brigg Monitor Farm journey at ahdb.org.uk/farm-excellence/brigg

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NEW MONITOR FARMS

navigate business volatility

Graham Bannister, AHDB's Interim Head of Knowledge Exchange, unveils the six new Monitor Farms that will help the arable sector adapt in a period of unprecedented change.



The 2022 intake of monitor farmers is unique. They join our Farm Excellence platform at a time when business volatility is at levels not seen for decades, with the nature of change not seen before. Over the next three years, our new Monitor Farm hosts will share their journeys as they look to adapt their businesses to major shifts in the policy and trade environment.

The hosts, selected by AHDB board members and staff, were chosen because they are open-minded and receptive to exploring new approaches and technology. Demonstrating potential to tackle the industry's challenges head-on, all hosts felt collaboration, resilience, and productivity were critical to success. These three areas already form common points for discussion across the on-farm network.

Each host will see their business put in the spotlight, with every aspect of the business scrutinised and no stone left unturned. Whether looking at soil management or machinery policy, the cost implications to the farm business will always take centre stage. Critically, the farms will provide a regional focus for discussions on subsidy changes and how to capitalise on emerging environment schemes.

The new Monitor Farms, which include ones located in Wales and Northern Ireland, add strength to a network that now extends to 20 farms. Each farm is supported by a steering group of local farmers and agronomists – to ensure activity is regionally targeted – and hosts 4–6 meetings annually, with the first events taking place this summer.

Cheltenham in focus

Key developments at each Monitor Farm will be outlined in future editions of Arable Focus. Here, we introduce the host of the Cheltenham Monitor Farm – Andrew Walters.

Andrew is the farm and estates manager at the 500-hectare Boddington Estates, a role he has held for over eight years. Located on the outskirts of Cheltenham, the farm includes 450 hectares of arable

crops – mainly milling wheat, winter barley, winter beans and winter oilseed rape. The rotation is flexible and exploits spring crops – such as barley, linseed and canary seed – when conditions prevent the drilling of winter crops.

Across the farm, a more regenerative approach is being adopted, with min-till establishment widely used. However, the farm is situated on land dominated by heavy Evesham clay soil with areas of high black-grass pressure. Consequently, Andrew adopts a flexible approach to cultivation that responds to each field's needs. This includes the use of occasional ploughing, rotational leys and fallow periods. All machinery is owned and replaced to a five-year plan, to minimise the risk of costly repairs.

Areas of grass leys and permanent pasture also feature on the estate – for the farm's 140 head herd. Most straw from the arable crops is baled for the cattle enterprise. The business also has a muck-for-straw deal in place with a neighbouring farmer, who also purchases any surplus straw.

Andrew always looks for opportunities to move the business forward. This includes farm expansion, and the reduction of operations and inputs. However, changes are only made when it makes clear business sense. As part of efforts to manage inputs, Andrew regularly (weekly) walks the farm's crops with his agronomist and adjusts inputs in response to crop condition.

Trials are also conducted on the farm to test new ways of working. Recent activities include incorporating sheep within the rotation and making better use of cover crops.

The farm has 37 hectares of woodland and numerous environmental areas, though none is currently in stewardship schemes. A major area of activity over the next three years is to reduce the farm's dependence on Basic Payment Scheme income, which includes the exploitation of new environmental schemes.

THE NEW MONITOR FARMS

Buckinghamshire and Bedfordshire

Host: Will MacLennan, Dollars Grove Farm

First meeting: 30 June 2022

Cambridge

Host: Matt Redman, Oldfield Farm

First meeting: 6 July 2022

Cheltenham

Host: Andrew Walters, Boddington House Farm

First meeting: 21 June 2022

Limavady

Host: Alistair Craig, Carsehall Farm

First meeting: 28 June 2022

Thame

Host: Garth Weston, Sydenham Grange Farm

First meeting: 6 July 2022

Vale of Glamorgan

Host: Dan Moore, R&L Anthony Ltd

First meeting: 16 June 2022

Follow the Monitor Farm story and access event details at:
ahdb.org.uk/monitor-farms

For further information, contact:

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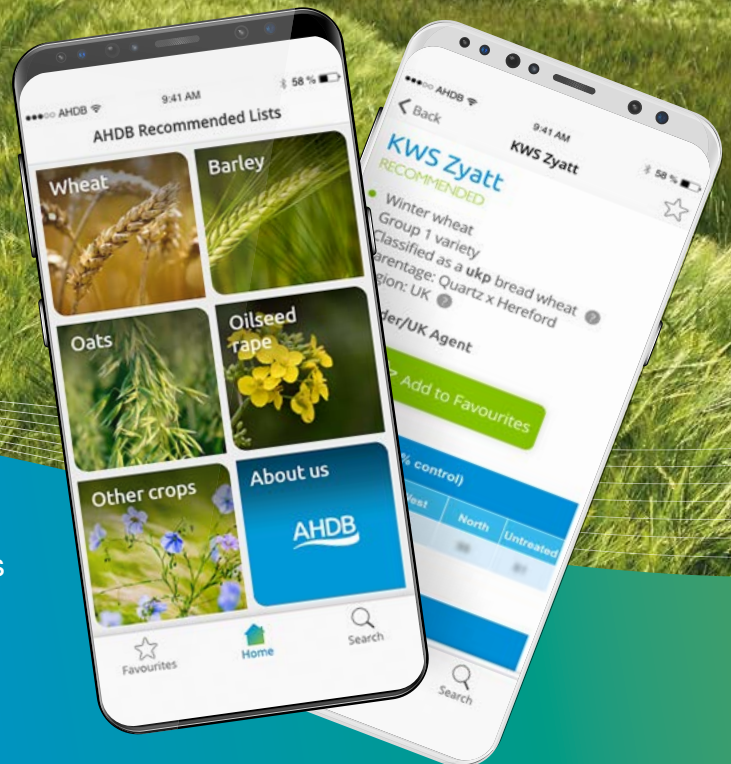


Figure 1. Five of the new Monitor Farm hosts visited AHDB in April. Left to right: Dan Moore, Alistair Craig, Andrew Walters, Matt Redman, and Will MacLennan.

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