

ARABLE FOCUS

THE JOURNAL FOR THE CEREALS AND OILSEEDS INDUSTRY

Integrated pest management (IPM)

What really affects the farm's bottom line?



Levy payers set to shape AHDB's direction

Register before 31 March 2022 to have your say

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If you no longer wish to receive this information, please email us on the address above.

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

View from the chair

Autumn brought decent drilling conditions, and most crops are looking well. However, I don't think any of us can look beyond winter without wondering what will come next. Has agriculture ever moved faster? Fertiliser values, even when purchased early, have been eye-watering; many will look to make nutrients stretch as far as possible. Our new fertiliser adjustment calculator (page 10) will make decisions easier, but there will be many other big choices to make.



As the new AHDB Cereals & Oilseeds sector chair, one of my first actions is to ask you to take part in 'Shape the Future' to help decide AHDB's direction (page 20). AHDB must remain in step with you, our levy payers, so we can deliver the best value. So, we need to hear your views this spring to help AHDB and your Sector Council set a robust strategy for investment over the next five years.

Shape the Future will ask whether you back the continuation of the independent research and development we provide to tackle pressing matters, such as managing the impact of the Farming Rules for Water and high fertiliser prices. It will also ask you to score the importance of our operations to your business, including the environment, integrated pest management (IPM) and varietal choice. We will look at all responses closely.

Because of the way the levy is collected (via merchants), we don't have a comprehensive list of levy payer contacts. As a result, you need to register online (before 31 March 2022) to have your say in April. It's straightforward (it took me less than five minutes). The more levy payers that take part, the better we will be able to respond to your needs.

We work closely with agronomists and other advisors, so I ask that you speak to them about how AHDB benefits your business. Our work may often reach your farm without you even knowing it. If we are doing something valuable, you need to know so that you can lend your voice to the debate on our future work. It is only you, the levy payer, who can make that known.

Find out more about Shape the Future at ahdb.org.uk/shape-the-future

Sarah Bell

AHDB Cereals & Oilseeds sector chair

Over the hedge

News from across AHDB



Shape the future of cereals and oilseeds

Levy payers are at the heart of everything we do, so it's only right that we give you a greater voice in how we spend your levy. To take part in Shape the Future, levy pavers must register online (it only takes a couple of minutes). Then, in April 2022, registered levy payers can tell us what they value most from AHDB. The results will help our Sector Councils invest levy funds in line with what levy payers want. ahdb.org.uk/shape-the-future

Grassland resources

Well-managed grassland provides the cheapest feed throughout the year, either as grazed grass or silage. Making the most of grass on your farm offers a huge opportunity to increase profits in a sustainable way. AHDB has a wealth of resources that can be used to ensure best practice grassland management. Numerous events are also planned, from grass training courses through to grazing discussion groups. ahdb.org.uk/grass

Dairy net-zero roadmap

To help famers lower their carbon emissions and impact on the environment, we've launched 'The Dairy Roadmap Climate Ambition: Supporting UK Net-Zero'. This sets out the dairy industry's support for reducing greenhouse gas emissions and limiting global warming, and indicates how we will support the Government's minimum standard for improvement across the industry. ahdb.org.uk/dairy

Baking boom is over for burnt out home cooks

During the first lockdown we saw a baking boom, with many people starting sourdough, baking biscuits and teaching their children to bake while they had time off school. However, with the return to a more normal way of life, many people have now stopped, which has affected home baking and pre-packed flour sales over the last year. Our analysts have looked at the trends and what they mean for industry. ahdb.org.uk/baking-boom

Red Tractor position

In 2008, an industry consultation backed the development of a comprehensive food quality assurance scheme - with AHDB subsequently investing annually in Red Tractor. With Red Tractor financially established and self-sustaining, the AHDB Board has decided it is no longer appropriate to provide these funds (from the current financial year). However, AHDB may continue to fund specific Red Tractor projects, providing the benefit to levy payers is clear.

ahdb.org.uk/news/red-tractor-announcement

We Eat Balanced

Our consumer marketing campaign We Eat Balanced had a major push throughout January and February. At the heart of the latest campaign iteration was a new TV advert, designed to present the facts and bust the myths around UK food and farming. Consumers saw it featured on terrestrial and digital TV, while watching video on demand, on social media and in major supermarkets. A revamped website acts as the 'hub' of the campaign. weeatbalanced.com

Claim your BASIS and NRoSO points

BASIS and NRoSO CPD points are available for readers of Arable Focus. Instructions on how to claim points for the current (1 June 2021 to 30 May 2022) CPD year are available from the dedicated page on the AHDB website. ahdb.org.uk/cpd



Students' Union: rhynchosporium resistance research



In a quest to generate durable resistance to a major barley disease

- rhynchosporium – a PhD project has delivered strong genetic leads to plant breeders.

Catherine Harries, who manages disease research at AHDB, investigates.

By the time irregular grey patches develop on the leaves of barley, ringed by dark brown margins, the opportunity to control rhynchosporium has passed. The earlier the disease is stopped in its tracks, the better.

Although several fungicides have good protectant activity against rhynchosporium, a more sustainable disease-management approach would be to let crop genetics take the strain. However, the lack of strong, durable resistance, coupled with the economic importance of this disease, mean barley breeders are hungry for new sources of resistance.

Based at James Hutton Institute, Jean-Noël Thauvin has completed a four-year (2017–21) AHDB PhD project on the topic. At the heart of his studies was a collection of 312 barley landraces that allowed him to tap into the worldwide genetic diversity for this crop.

He used a genetic technique (association mapping) to identify sections of the barley genome associated with changes to rhynchosporium levels. In total, 21 quantitative trait loci (QTL) were identified, and in this mix were the two main rhynchosporium resistance genes (*Rrs1* and *Rrs2*). But they were not alone – he also identified several other areas that may be associated with resistance. In particular, experiments confirmed the involvement of the *HvADH-1* gene – which is involved in resistance to powdery mildew.

Jean-Noël also crossed eight of the most interesting resistant landraces with a relatively susceptible elite malting spring barley cultivar. Through a series of subsequent crosses, using a process known as backcrossing, genetic recombination events were fixed in 736 recombinant inbred lines (RILs). These RILs were then assessed for disease symptoms (phenotypic data) in field trials.

The cross with a Syrian landrace resulted in the greatest distribution of disease symptoms in the subsequent population. This population was screened with molecular markers, which identified 50,000 genomic datapoints. Around one-third (15,249) of these segregated between the two parents. He used information on the presence or absence of these genetic data points, alongside the disease data, to build a 'linkage map' to highlight genetic regions linked to rhynchosporium resistance.

The resources (genetic markers/maps and lines) produced are all amenable for the rapid introduction (introgression) of new resistance loci into elite breeding lines by the plant-breeding community. Although it will take many years for varieties based on this research to hit the Recommended Lists (RL), it has brought durable rhynchosporium resistance one step closer to the market.

For further project information, search 'rhynchosporium PhD' at ahdb.org.uk/research

Variety blend tool for WINTER WHEAT

Varietal mixtures increase a field's genetic diversity and may help slow the spread of some diseases. AHDB's Bastiaan Brak explains how he's used RL data to build a tool to guide variety-blend decisions.



As a research data analyst, I am fascinated by numbers – they can reveal so much about the workings of the world. Yet, all too often, their full potential goes unexploited.

Even within the relatively narrow field of variety trials, we only scrape the surface of the data story. So, when several UK farmers mentioned (independently) that they were experimenting with winter wheat variety blends, I knew Recommended Lists (RL) data could be crunched in a way to guide their decisions on which varieties to test.

The UK is not alone: globally, there has been a spike in interest in the use of mixtures. For example, in France, it is estimated that the bread-making wheat area grown as mixtures has more than doubled – from around 5% in 2017 to around 12% in 2020 (Source: FranceAgriMer).

The primary reason people consider mixes is to add genetic diversity to a field, because this will help spread risk – with disease being top of the risk-management list. Although several scientific studies have shown that the technique has promise as a disease management tool, it is a complex area – involving numerous genetic and environmental interactions. It is therefore best to test the approach on the farm before adopting the approach more widely. And this is where the variety blend tool comes in.

RL data

When it comes to the development of a tool, it is often best to focus on the simplest option and add in the bells and whistles later. Even in the most basic form, a tool can be surprisingly complex. The variety blend tool has simple mathematics at its heart. For the selected components, the tool simply adds together the associated values and divides the total by the number of varieties in the mix – the bigger the average score, the potentially stronger the mix.

Of course, it is not that simple. Although many components are associated with 1–9 values (brown rust, yellow rust, septoria tritici and lodging) others have relatively large values (Hagberg Falling Number, specific weight and untreated yield).

For these components, the tool converts their values to a 1–9 scale – where 1 and 9 represent the minimum and maximum values, respectively (see Table 1), with other values (between these points) determined by a simple straight line. The tool also considers protein content values, as published in the RL. As a mixture of at least three varieties is considered best, the tool allows the selection of three-way or four-way mixes.

Table 1. Minimum and maximum component values for Hagberg Falling Number, specific weight and untreated yield

Component	Minimum value (1)	Maximum value (9)
Hagberg Falling Number (HFN; s)	100	350
Specific weight (kg/hl)	70	85
Untreated yield (%)	70	130

Source: AHDB

Words of caution

Since the values generated by the tool are based on the performance of single varieties in RL trials, the tool is not able to capture the complex interactions associated with varietal mixtures or predict relative performance. However, it can indicate which varieties to add to a mix for subsequent on-farm testing.

Parental diversity

The tool also assesses the potential influence of parents, grandparents, great grandparents and great-great grandparents in the mix, based on NIAB winter wheat parentage data. Once again, it is a simple calculation – this time based on the number of times a variety features in the lineage. A score of '1' indicates that varieties in the blend share no ancestors, whereas a score of '0' indicates that all varieties in the blend share the same parentage.

As with any tool, the best way to find out what it can do is to experiment with it – it is resilient and tough to break. Each year, we update the tool shortly after the RL booklet edition is launched.

If you plan to test mixtures on the farm, be sure to talk with grain buyers first to assess any potential specification issues.

The variety blend tool is just one of several data-driven tools I've helped develop – you can access them all at: ahdb.org.uk/tools

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NEAVING GD3000M Spring 2022

BROME: TALES FROM THE WEED SEEDBANK

Some bromes are becoming less sensitive to certain herbicides. Jason Pole, a communications manager at AHDB, explains what this means for management.

Your field's seedbank provides an evidence trail that, following a forensic analysis, can help shape management decisions. Central to any detective work is the assessment of the weed species present and, increasingly, herbicide-resistance status. As this isn't easy, we commissioned ADAS to conduct an evidence-based assessment of UK brome populations.

Brome identification and distribution

The research included a UK-wide survey. It revealed an increase for all five main brome species, which are now found in all UK regions. Rye brome has increased considerably in the last 30 years (although the reason for this is unclear). Distribution of bromes has also changed: spreading from the field margins/headlands further into cropped areas. Evidence suggests this rise will continue – especially as less-intensive farming approaches are adopted, such as low/no-till cropping, and more land is put down to field margin strips and other environmental areas.

The research also found that brome identification was generally inaccurate. This is problematic because the best management approach depends on the species present – and, with herbicide resistance concerns thrown into the mix, knowing which brome is in your field is becoming even more important.

From a cultural-control perspective, for barren (sterile) brome and great brome (the *Anisantha* group) it is best to cover seeds (with soil/chopped straw) shortly after harvest.

For meadow brome, rye brome and soft brome (the *Bromus* group) however, it is best to leave seeds to ripen on the soil surface for one month before cultivating.

Herbicide resistance in UK bromes

The researchers used seed samples (collected during the survey) to grow brome in containers to assess the resistance risks associated with several herbicide modes of action. This identified resistance to ALS herbicides in UK brome populations for the first time:

- Sterile brome four populations (Lincolnshire, Worcestershire, Nottinghamshire, and Berwick)
- Rye brome four populations (two in Shropshire, two in Bedfordshire)
- Meadow brome two populations (Yorkshire)
- **Great brome** one population (Shropshire)

The geographic distribution of these populations reveals that resistance is far from an isolated incident. However, on a positive note, the assessments found no clear evidence of resistance to either of the two ACCase herbicides tested (propaquizafop, cycloxydim), even in populations showing resistance to ALS herbicides.

The research indicates that, at present, good brome control is achievable, especially in non-cereal crops within the rotation. However, to sour that news, the researchers also detected reduced sensitivity to glyphosate in one sterile and one rye brome population.

Herbicide efficacy

When poor weed control is observed, it is easy to jump to conclusions and assume that resistance is the cause. However, although many people believed resistance was present in their fields, the survey didn't often find evidence to confirm this. Sub-optimal use of herbicides is the more likely reason – and tackling this is important to eliminate survivors of any treatment. As spray timing is critical (as well as dose), the researchers also investigated this aspect in sterile brome and rye brome. The main findings are summarised in Table 2. They indicate that, irrespective of the herbicide or weed, a spray targeted at growth stages (GS) 21-23 was consistently most effective.

Note: the link between spray survivors and resistance risk is not as marked as in some other weed species, most probably due to the self-pollinating nature of bromes.

For information about basic biology, identification and management of brome visit: ahdb.org.uk/brome

For further information, contact: Jason Pole AHDB Marcomms Manager (Cereals & Oilseeds) jason.pole@ahdb.org.uk

Table 2. Optimum timing for herbicide use in sterile and rye brome

Herbicides tested	Brome species	Start of the seedling stage (GS 12-13)	Start of tillering (GS 21-23)	From mid- tillering (GS 25+)
MON79379 (glyphosate) HRAC Group 9* (EPSP synthase)	Sterile brome		+++	
	Rye brome		+++	
Laser (cycloxydim) HRAC Group 1* (ACCase)	Sterile brome	++	+++	+
	Rye brome	+++	+++	+
Broadway Star (pyroxsulam + florasulam) HRAC Group 2* (ALS)	Sterile brome	+++	+++	++
	Rye brome	++	+++	+

*Herbicide groups based on the Herbicide Resistance Action Committee (HRAC) Mode of Action Classification Map (2021). Group 1 = Inhibition of Acetyl CoA Carboxylase (ACCase). Group 2 = Inhibition of Acetolactate Synthase (ALS). Group 9 = Inhibition of Enolpyruvyl Shikimate Phosphate Synthase (EPSP synthase). Source: AHDB project report 636



LATEST RB209 UPDATE 'ON TRACK'

With fertiliser prices skyrocketing, Alice Sin, who helps manage the AHDB Nutrient management guide (RB209), highlights the latest research results set to keep arable crops sufficiently nourished.



It's been almost five years since we issued the first update of the AHDB Nutrient management guide (RB209). Previously managed by Defra, the baton was passed to us to deliver robust guidance on the use of fertiliser, manure and slurry applications to cropped land.

We invest in cycles of nutrient management research to inform the regular updates to RB209. Several projects that concluded in 2021 will inform the 2022 update. One such project (nitrogen and sulphur recommendations in barley) featured in the autumn 2021 edition of Arable Focus. This article outlines other recently completed projects.

HS2 treasure trove

Before work on HS2 started, a detailed assessment of the rail route occurred. It unearthed prehistoric remnants and Roman battlefields – but it also yielded an agricultural treasure trove. The collection of over 1,400 topsoil and upper-subsoil (<50 cm) samples along the track's route provided a unique analysis opportunity. AHDB funded an analysis of these samples by Reading Agricultural Consultants, which focused on the relationship between nutrients/pH in the topsoil and the more mysterious subsoil.

Liming review

Changes to support mechanisms, lime products and farming systems, mean a review of liming guidance was overdue – not only in relation to lime's influence on soil pH, but also its role in delivering calcium, an essential nutrient, to crops. During the production of RB209 we work with partners across industry – and the Agricultural Lime Association (ALA) was best placed to conduct the initial review (at no cost to AHDB).

Nitrogen price spikes

High fertiliser prices make it essential to understand the point at which the value of extra grain produced is not worth the cost of the extra nitrogen applied.

To account for this 'economic optimum', AHDB commissioned ADAS to conduct a rapid review and extend RB209 price tables.

Published last autumn, these tables now rise to the equivalent to £863/t of ammonium nitrate. The tables have also been extended to £350/t for cereals and £700/t for rapeseed, to help account for stronger prices. For example, for a grain price of £200/t, a rise in the ammonium nitrate fertiliser price from £345 to £863/t would necessitate a per-hectare reduction of 70 kg nitrogen (associated with a yield decrease of 0.6 t/ha). The review also considered the impact on quality specifications and the value of nitrogen from non-fertiliser sources.

FERTILISER ADJUSTMENT CALCULATOR

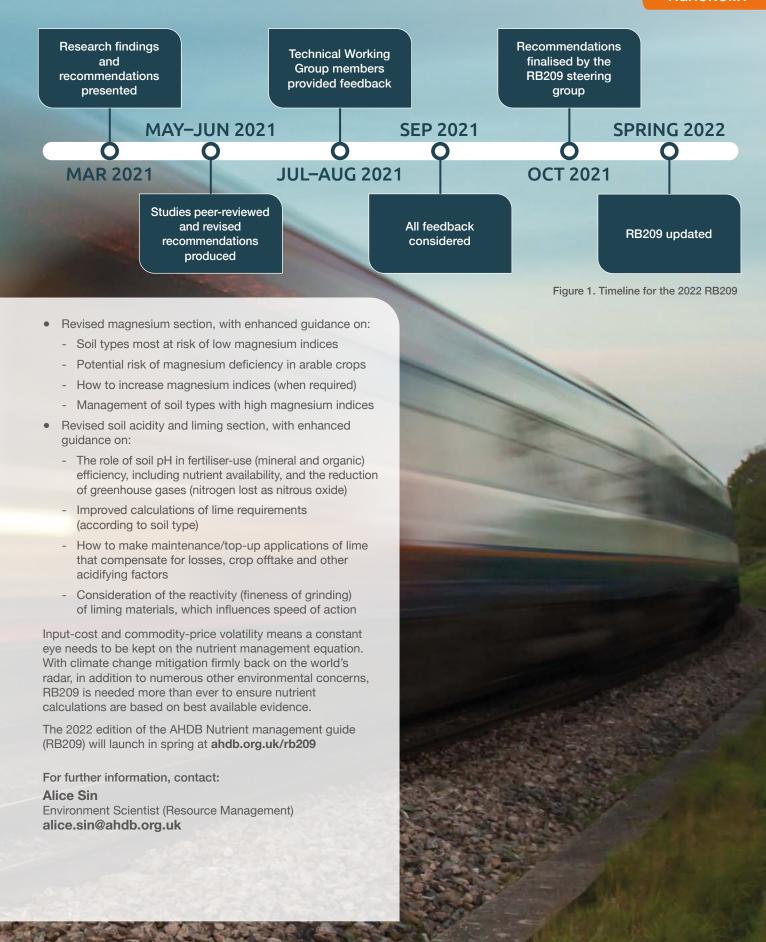
Use our new tool to establish the economic optimum amount of nitrogen to apply to crops: ahdb.org.uk/nitrogen-calculator

Revising RB209

RB209 research results undergo peer review, then the recommendations are considered by the Arable Technical Working Group (TWG), which includes farmers, manufacturers and agronomists, before being signed off by the RB209 steering group (Figure 1 shows the timeline for 2022).

The 2022 edition has extensive revisions, with section 1 – Principles of nutrient management and fertiliser use

- having the most significant updates:
- New subsoil recommendations, to improve estimates of soil nutrient supply and lime requirements
- New clay classification (in relation to potash release and applications)





INTEGRATED PEST MANAGEMENT (IPM)

With IPM moving up the farming and political agendas, the AHDB Agronomists' Conference 2021 explored its usage and ways to encourage further adoption.

From 2022, a national action plan to promote the sustainable use of pesticides will feature integrated pest management (IPM) at its core. With national average scores of IPM usage hitting around 70/100*, the industry is off to a strong start. However, increasing uptake requires further investment in knowledge and advice, as well as targeted financial support. And it's all about the management of risk.

Mapping out IPM

To understand the risks, the first step was to map out the IPM components. The new AHDB-funded report: 'Enabling the uptake of integrated pest management (IPM) in UK arable rotations (a review of the evidence)' detailed over 500 papers and articles on IPM usage. Led by ADAS, the work is a definitive reference point for IPM and its adoption.

For the UK, the work considered 40 IPM strategies and 80 key crop pests: 642 IPM situations in total. These were scored for effectiveness of control, the economic importance of the pest target, and aspects related to practicality and implementation.

Published as a series of tables, the report includes at-a-glance information on the most effective non-chemical control measures and how they compare to chemical control. In cereals for example, varietal choice, sowing date and rotation were cited as particularly effective. For pest control in oilseeds, decision support, including thresholds, and the use of in-field non-crop areas were notable interventions.

Neil Paveley, Head of Crop Protection at ADAS (pictured), said: "The scores also guide research priorities. Where literature provides good evidence that an IPM intervention ought to be effective, but the strength of evidence in practice for the UK is not quite there yet, then that becomes a priority for research".

Multiple layers of complexity

AHDB uses a 'prevent, detect and control' mantra as a foundation for IPM discussions. However, these simple words mask incredible complexity especially at the crop/target-pest level.

Chloe Morgan, Senior Research Scientist at ADAS, savs that IPM starts with varietal choice. The AHDB Recommended Lists (RL) allows comparisons of treated and untreated yields, indicating the potential varietal yield responses to fungicides. For varieties with a lower risk of yield loss from disease, less-intensive spray programmes can potentially be followed.

However, there are multiple layers of complexity. For example, RL disease resistance ratings are influenced by crop-management decisions. Reflecting on recently completed AHDB-funded research (see Autumn 2021 edition of Arable Focus), Chloe said: "If a winter wheat variety is sown relatively early, its effective septoria resistance rating will drop - compared to the disease resistance rating on the RL. Conversely, if sown relatively late it will increase the rating. However, the opposite is true for yellow rust: later-sown crops result in younger, more susceptible, plants at the time when yellow rust pressures are typically higher."

Economic incentives

Neil Paveley said: "There are many cost and risk concerns, which could be lessened with economic incentives. These could be delivered, for example, as part of Environmental Land Management (ELM) schemes and the Sustainable Farming Incentive (SFI)."

As part of a Defra-funded ELM test-and-trial project – instigated by the NFU and delivered by ADAS and SRUC – a land management plan tool was created to guide IPM decisions. It was well received by farmers, and indicated potential to be used alongside SFI standards to trigger payments. Neil said: "The test-and-trial report is with Defra. Ultimately, they will decide the next steps for such a scheme."

IPM is a knowledge-intensive process, which extends beyond productivity and economics. For example, the greenhouse gas (GHG) implications of management also need to be considered. With net-zero ambitions in mind, it is essential that nitrogen inputs deliver the planned return on investment. Neil said: "It is not good to invest in a crop canopy only to have it destroyed or competed with."

Digital solutions

The potential to use digital technologies to get information to farmers' fingertips faster was discussed at the conference. This included delivery of targeted information during the cropping/planning cycle, and further investment in decisionsupport tools – including integration within farm management software.

Find out more

While this article provides a flavour of the IPM debate, more information is available on our IPM web page, including conference videos and an IPM podcast: ahdb.org.uk/ipm

*Source: NFU and the Voluntary Initiative (VI), IPM assessment plan responses

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UK feed wheat prices soared in the first half of the 2021/22 marketing year, reaching highs of £234.60 per tonne at the end of November 2021 (Figure 2). Global and domestic tightness in the wheat market have supported these levels.

Milling wheat supply woes

The global supply woes, particularly for milling wheats, have been particularly felt in Canada and Europe. To help curb rising food inflation, Russia has implemented a series of export taxes on the commodity. This has further exacerbated supply concerns. As the Russian export price typically sets the floor for wheat prices in the EU, this move has particularly supported European wheat prices. The world was banking on a record Australian crop to help ease the situation. However, untimely rains affected the quality of Australian wheat this season. So, while overall production is pegged at a record 34.4Mt, weather has hampered the availability of milling wheat.

Domestically, the UK is experiencing another tight season. While production rebounded this year – to 14Mt, following the previous season's sub-10Mt supply – opening stocks for the 2021/22 marketing year were the lowest this century (1.4Mt). Additionally, strong freight costs and logistical challenges have hindered imports.

High input costs

While the price of wheat has been on the up, so have the input costs for the 2022 harvest. Fertiliser prices have soared over recent months (Figure 3), with shortages in natural gas (the feedstock for fertiliser) causing fertiliser plants to scale back, even cease, production.



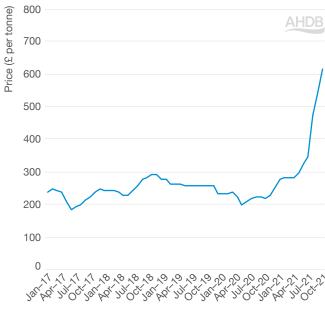


Figure 2. Nearby UK feed wheat prices

Figure 3. UK-produced fertiliser (ammonium nitrate) prices

While some growers forward-purchased fertiliser when price lists were released in summer 2021, others bought nearer to the time it was needed. Those buying later experienced higher prices, with some unable to source sufficient quantities. There are anecdotal reports of growers scaling back their nitrogen use on this year's crop, to gain maximum cost efficiencies. Although this has the potential to impact this year's yields, many other factors are pivotal in yield formation and there is still plenty of growing time left this season.

New-crop prices

Despite wheat prices at near-historic highs, with input costs at record levels, margin is once again king to maximise return. So, what do prices look like for the new crop? At the end of 2021, the November 2022 UK wheat contract sat at £196.50, softening slightly from its November 2021 peak of £211.50.

As we move through the first few months of 2022, markets will keep a keen eye on the impact of weather on crops in key global exporter countries. The USA remains a watch point, particularly the impact of windstorm damage on crops during autumn 2021. As we move into the spring, the Black Sea region will have a greater handle on how their wheat crops have wintered and the effect of any winterkill on forecast volumes. If fertiliser prices remain elevated, EU wheat yields could potentially be hampered if deliveries are received late and miss first application dates.

Source: AHDB

In the near future, the outlook (at the time of writing in January 2022) for wheat markets remains supported. With both global and domestic wheat markets looking tight, anything that adds to a downwards supply revision will further support prices.

Conversely, with the world still in the grip of the coronavirus pandemic there remains the possibility of further local lockdowns, with the resulting slowdown likely to negatively affect demand.

Therefore, in a season of high input costs and even higher prices, margin remains of the highest importance. It is crucial to consider marketing strategies, for both the old and new crop, to provide the best return possible.

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EU remains the major market for UK barley exports

Who are the key players in the global barley market, and where do UK exports fit in? Dorit Cohen, AHDB **Exports Marketing Manager, answers the key questions.**

Compared to last year, the UK has seen a 10-15% decrease in barley output this season (down to 7.1 million tonnes). Despite this, export availability is only down slightly on last year (at 1.34 million tonnes). This season's larger wheat crop has dampened the demand for domestic feed barley, so the UK still needs export opportunities.

EU market

For the rest of this season, barley exports will be the largest source of grain out of the UK, mainly destined for EU markets. On average (for the last five seasons), 88% of UK barley exports have been to EU markets. HMRC data (until the end of October) shows barley shipments into the EU at just over a quarter of a million tonnes, with Spain and Portugal taking the lion's share.

Global market

The UK has been a long-term supplier of feed barley to the Middle Eastern and North African (MENA) region, with Morocco the largest non-EU recipient of UK barley. The country has taken 68,000 tonnes (all for its animal-feed sector), which is an impressive 90% of the circa 75,000 tonnes of barley exported to non-EU markets (until the end of October 2021).

However, changes to global trade flows and large barley crops in Russia and Australia mean competition is fierce. Russia's exports have been competitively priced and moved rapidly in the first half of the 2020/21 marketing year. This helped limit competitor share in the Middle Eastern markets during the July-to-December period.

Russia exported 2.8 million tonnes of feed barley to Saudi Arabia and 0.5 million tonnes to North Africa in 2020. However, Australia is also a keen competitor in the Saudi Arabian barley market, exporting around 0.5 million tonnes to the country in the same period. A healthy exportable surplus - of over eight million tonnes in the 2020/21 marketing year - has helped make Australian barley more competitive. Additionally, efforts to develop new markets for Australian barley have been successful. This followed the loss of barley exports to China, which was Australia's biggest barley export market (an anti-dumping investigation saw Beijing impose a punitive import duty on barley that effectively prohibited it from the market). Australian barley has been strongly represented in Saudi barley tenders, with demand likely to remain stable against Russia (if it remains competitive).

Given the strong competition among barley suppliers to the MENA region, such as Australia, Russia, and Ukraine, the UK is unlikely to operate on a cost-attractiveness basis this season.

For more information visit: ahdb.org.uk/exports



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Under the bonnet: HOW TO REPLACE LOST BPS INCOME

A Wiltshire farmer reveals how a free half-day consultation has helped him add value to his business.

AHDB's Farm Business Review service aims to soften the move away from Basic Payment Scheme (BPS) funds. The Defra-funded* service was set up to help arable, beef, lamb and dairy farmers across England prepare for change and get to grips with new environmental and public-good-based schemes.

Mixed farmer Paul Aldridge of Pythouse Farm in Salisbury worked with AHDB knowledge exchange manager Sarah Hurford to take a deep dive into his business. The BPS has been vital, and the farm is in its penultimate year of a Higher-Level Stewardship agreement. Paul said: "The business performs very well, but when BPS is removed it is clear that profit will be minimal."

Sarah and Paul assessed the options and schemes that could add value. The consultation found the operation could recoup up to 30% of losses incurred due to BPS cuts: the business could regain around £23,000 under the Sustainable Farming Incentive (SFI), via the grassland and arable soil standards.

The farm will now incorporate regenerative techniques to make it eligible for the soil options, with minimal changes to the farm's approach. Taking a closer look at the business's production costs, in line with the move towards a regenerative systems approach, Sarah and Paul were able to delve into and refine the enterprise's 10-year 'regenerative plan'.

Paul proposes to increase the use of direct drilling and over-winter cover crops. He hopes this will help to reduce production costs too, especially fertiliser and spray costs. With the BPS contributing, on average, around 60% of UK farm net income, taking a hard look at ways to shave input costs is increasingly vital.

The potential to diversify income streams over the next five years was also explored. The farm grows cereals for malting and milling.

The discussions revealed scope to access more diverse outlets for the farm's crops. The pair also explored marketing options, such as forward selling and growing on contract.

Paul said: "I highly recommend AHDB's Farm Business Review service to anyone wanting to unpack the finer details of their operation. We all need to be more innovative to survive this agricultural transition. This service has helped me identify a clearer path to add value to our operation."

Find out more at: ahdb.org.uk/farm-business-review

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66 This service has helped me identify a clearer path to add value to our operation 99

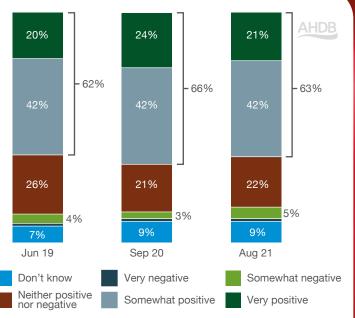
BOOSTING POSITIVE PERCEPTIONS OF AGRICULTURE



Steve Evans, from AHDB's Retail and Consumer Insight team, reflects on a relatively unpredictable year, especially the effect on consumer trust and perceptions about agriculture.

Since 2019, AHDB has tracked consumer attitudes. The good news is that consumer impressions of British agriculture are generally positive (Figure 4). In fact, around two-thirds of respondents had 'very' or 'somewhat' positive impressions of British agriculture. The trend has been similar for the last three years, with a slightly more positive response in 2020 – potentially in response to the coronavirus pandemic.

Farmers are, by far, the most trusted group in the supply chain, with 70% of consumers trusting them. This compares to 53% for retailers (the next most trusted group). Consumers particularly value farmers for their expertise and attitudes to the environment and animal welfare. However, others are making progress in these areas: retailers in particular are narrowing the gap.



Source: AHDB/Blue Marble 2021

Figure 4. Consumers were asked to indicate their overall impression of British agriculture today.

Note: results were more positive for older ages (80% of over-65s were 'very' or 'somewhat' positive), those who felt well-informed (70%) and those who lived in a rural area (70%).



Farmers care about the planet

The key motivators for many consumers' meal choices are taste and enjoyment. However, consumers are complex - with multiple factors, often below the surface, influencing purchase decisions.

Climate change and the environmental impact of food production are areas of growing consumer interest, fuelled by recent media exposure. Rightly or wrongly, farming and food production practices have been referenced as contributing to the climate emergency - with COP26 shining a significant spotlight on agriculture in the second half of 2021.

Although there are on-farm initiatives that aim to tackle climate change and benefit the environment, the positive stories don't always reach consumers in a digestible way. This is because it's hard to communicate the technical, and often complex, changes that are taking place. To cut through, the key is to focus messages and amplify them across the industry.

Many consumers (65%) believe that farmers care about the planet (Figure 5). When the coronavirus pandemic began, more people bought locally. Farmers and independent retailers have a great opportunity to capitalise on this. Although many consumers desire to buy in an environmentally friendly way, this desire is often tempered by price premiums. Layered on top of this are signs of an economic ripple effect squeezing household budgets further in 2022. As a result, consumer pockets are likely to be even more price-sensitive.

Figure 5. (See below) Consumers were asked to consider the food system and express how they felt about a series of statements – expressed on a scale of 1 (strongly disagree) to 5 (strongly agree).

Most people want to live healthier

Consumers also want to adopt healthier lifestyles. This trend grew steadily between 2013 and 2018. It has eased back a little recently, but seven out of ten consumers still claim they try to lead a healthier lifestyle (Kantar, 52 w/e 21 March 2021).

Health motivations frequently link strongly with consumer confidence. For example, when consumer confidence is reduced, the amount of food and drink consumed for health reasons declines. Since the start of the pandemic, consumers are less likely to cite health as the reason behind meal decisions with enjoyment and convenience becoming more important. However, when restrictions were eased (during the second half of 2021) health started to creep back up consumers' priority lists.

The reputational landscape

The consumer decision-making process is often complex. The reputational space interlinks many factors, such as trust, transparency and the environment. It's also often products that hit multiple needs that prove most attractive – with consumers constantly evaluating things like quality, taste, health and enjoyment.

We want to encourage the industry to build a positive sustainability story for agriculture. We need to reassure consumers of the UK's high standards and offer transparency. We need to consider health and environmental messages, and link them to how products are produced. We need to demonstrate the good work in the supply chain and show our shared values to consumers.

It is critical to maintain and boost consumer trust – and AHDB is here to help. For further information on this topic, including access to our recent consumer reputational landscape webinar, visit ahdb.org.uk/retail-and-consumer-insight

For further information, contact:

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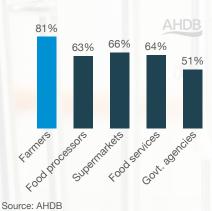


Figure 5a. Experts at what they are doing

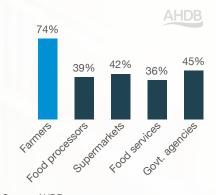


Figure 5b. Care about animals

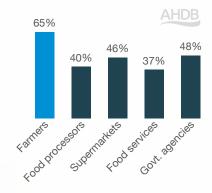


Figure 5c. Care about the planet

The future of farming IS IN YOUR HANDS

Change comes as standard in farming. Martin Grantley-Smith, AHDB Cereals & Oilseeds director, reflects on changes at AHDB since it was formed and how levy payers can have a stronger say in our operations.

I joined HGCA in 2009 at a time of great change. The newly formed AHDB had its first board and chairman. It also brought a new location (from London to Stoneleigh) and new staff. It provided a great opportunity for a fresh start and different ways of thinking.

One of the earliest priorities was to increase our presence among levy payers. Although working from a single HQ has strengths, it limited our ability to keep our fingers on the UK's regional farming pulses. We therefore built a case for and secured a field-based Knowledge Exchange Team. This presence has been invaluable in helping us work with you at a regional level.

Farmer-to-farmer learning

However, we knew that was not enough. Largely inspired by Dairy New Zealand, we discovered the best way to promote better on-farm practice was not through conversations with us – but between you. Farmers frequently learn from other farmers. So, our next step was to establish the Monitor Farm network - with the host farms acting as beacons for likeminded farmers. Driven by its passionate participants, the network has an unparalleled ability to share farm performance information and better practice ideas.

Although our research reports are a critical part of the evidence base, they need translation to fit the numerous UK farming situations. In response, we worked closer with the agronomist community. But we needed to do more. The establishment of our Strategic Cereal Farms has helped us put cutting-edge research and innovation into practice on commercial farms around the UK. More importantly, these farms spark debate and help direct our investment in research.

Over the last decade, these new knowledge exchange activities marked a shift in the balance of our investment. It was a deliberate strategy by AHDB's board, which was concerned that too much research information was not getting out to industry. However, it may now be time to swing the pendulum back slightly to help fund the delivery of technical innovations over the medium-to-long term.

Shape the future

Change is a staple part of our business. We constantly review what we do and listen to our levy pavers all over the UK. However, we need to listen harder. Recent coronavirus lockdowns showed how we can reach many levy payers using digital means - and we want to exploit this to give you a stronger voice on how to invest AHDB time and effort. 'Shape the Future' opens to all levy-paying businesses in April 2022.

To take part you need to register in advance. Even if you are content with what you get from AHDB, we need to hear your views. Ultimately, the results will help us prioritise the products, tools and services we deliver (over the next five years).

Discussions with industry indicate that our future focus should be on three areas:

- Finding ways to remain profitable, particularly as production support subsidies wind down and new schemes become available
- Protecting crops and maintaining yields with fewer chemicals and adopting more integrated pest management (IPM) approaches
- Coping with a growing demand for climate change and environmental performance information - including on the topics of carbon, nitrogen and water

We will be asking how important the following areas are to levy payers:

- The Recommended Lists for cereals and oilseeds (RL)
- The Nutrient Management Guide (RB209)
- Market intelligence
- Monitoring of key pests, diseases and crop contaminants
- Control of key pests and diseases (e.g. fungicide performance)
- The Monitor Farm and Strategic Farm programmes
- Delivery of and participation in key arable events and shows
- Production of practical guidance, via publications and the AHDB website



Register before 31 March 2022 to have your say

What really affects a farm's bottom line?

Mark Topliff, AHDB Lead Analyst – Farm Economics, uses farm-performance data to get to the bottom of what makes the biggest difference to farm profitability.



Payment and policy changes, along with input and output price volatility, mean it's easy to get lost in the day-to-day running of a farm. So, we've used farm performance data to look at what really affects profitability - at the crop and operational levels.

The analysis uses Farmbench data, from three conventional crop harvests (2018, 2019 and 2020), to help compare the performance of the top 25% with the bottom 25% performing enterprises.

It's not all about income

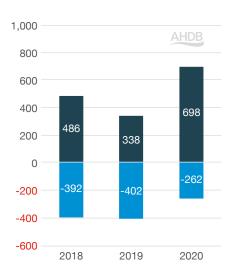
Depending on the crop and year, our analysis (Figure 6) shows that income often plays a bigger part in the performance difference, but costs were sometimes the more important component. However, higher incomes and lower costs always contributed to the success of the higher-performing group.

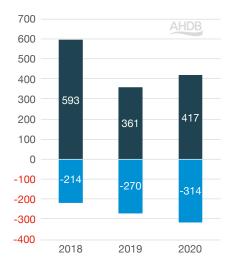
Our analysis also shows that income is far more tightly linked to yield, than prices received. Oilseed rape is an extreme example of this (Figure 7), but the statement holds true for most crops.

Labour and machinery costs

When we dissect cost differences between the best and worst performers, labour and machinery costs stand out. Typically, variable costs change relatively little between the top and the bottom 25% averages. However, the top group tends to make more efficient use of its labour (Table 3). A higher labour cost should mean a lower contracting cost, and vice versa.

Often people reduce overhead costs by spreading them over more hectares. However, if the farming operation is generating a loss, the cost of purchasing or renting extra land is likely to exacerbate the situation.





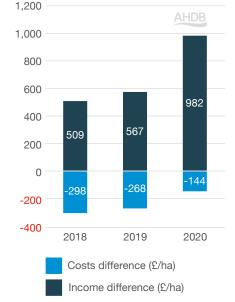


Figure 6. Income and cost of production difference between top and bottom 25% (performance by year and crop. Left: winter feed wheat. Middle: spring malting barley. Right: winter oilseed rape)*

*Benchmarks ranked by full economic net margin performance. Costs are total variable and overheads, including depreciation, rental value of owned land and unpaid labour

Table 3. Spring malting barley labour and contracting costs average (2018-20)

Costings (£/ha)	3-year average of top 25%	3-year average of bottom 25%	Difference top 25% to bottom 25%
Total labour*	118	158	40
Total contracting costs**	55	84	29
Total	173	242	69

^{*}Includes paid labour and a value for the unpaid labour

For most UK farm sizes, there appears to be a weak association between a larger farmed area and higher margins (Figure 8). If looking to expand, ensure the farm business is operating as efficiently as possible first.

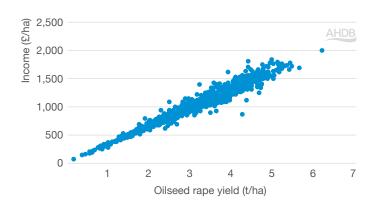


Figure 7. Winter oilseed rape yield and prices versus income (2018-20)

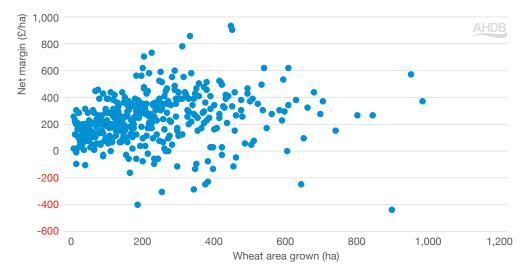


Figure 8. The weak association between wheat area grown and net margin (2018–20)

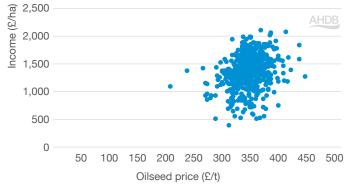
What are the secrets of success?

Optimising yields and controlling costs tend to go hand in hand. However, mindset is also key. Research identifies eight characteristics associated with top-performing farms:

- 1. Minimise overheads
- Set goals and budgets
- Gather information (including comparisons with other farms)
- Understand the market
- 5. Focus on the details
- 6. A mindset for change and innovation
- 7. Improve people management
- Specialise

So, what really affects the bottom line?

At a recent arable discussion group, a group compared 2021 wheat net margin figures – with one farm's profit from wheat standing above the rest. When asked to reveal the secrets of their success, the farmer simply replied: 'attention to detail'. Although mentioned in the above list, it underpins everything else. ahdb.org.uk/farmbench



^{**}Includes enterprise-specific contracting and a share of general farm contracting charges

Can insecticide use be reduced with in-field flower strips?

To help reduce insecticide requirements, Strategic Cereal Farm East grows flowering strips in and around their fields. Farm co-host, Patrick Barker, explains the benefits.

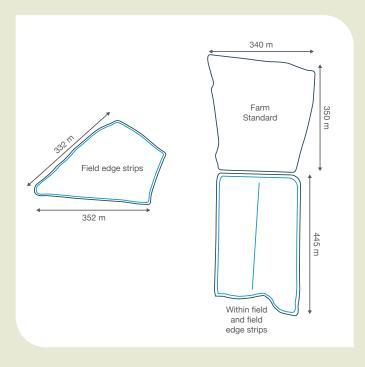
We want to deliver as much as possible for the natural environment. We are not growing flower strips just because they look nice. While we want to encourage biodiversity, that's not the whole story. It is also about discovering how we reduce our inputs.

We grow flower strips because it is good for the farm, the environment and, hopefully, the bank balance. Critically, it is also good for the image of farming.

Enhancing insect predators and parasitoids (numbers and activity) is a key component of integrated pest management (IPM).

The flower strip trial is in three fields in the same rotation across the farm. Two have six-metre margins – one with a margin all around the edge, the other has a margin round the edge and down through the centre. The third, a farm standard, has no margin.





66 So, from a business point of view, if we can achieve aphid control through IPM, then every time the sprayer doesn't go out there is a bit more money in the back pocket

Strip establishment

We established the margins in spring 2020 and the central plot in autumn 2020. They have all performed well. Summer monitoring, by NIAB, gave data to support that: they found 16 grass and flowering species in a one metre quadrat.

I think that the success was down to sowing the right species for our soil type. The best way to narrow down the species choice is to look at what already grows naturally on the farm. Like our cash crops, soil conditions have to be right for establishment of the flowering strips. They require a good, fine seedbed. However, it is also important not to sow them too deeply and to get them into a warm soil, with a bit of rain forecast to get them away.

The strips provide flowers in spring and summer, and overwintering habitat in the autumn and winter. NIAB found that no two fields were alike in their composition of invertebrate pests and beneficials.

Generally, there were numerous natural enemies across the trial. However, it was difficult to draw conclusions because the number of aphids was low – with numbers well below treatment thresholds (in all parts of the trial).

There were few aphid predators (lacewing, hoverfly and ladybird larvae) in the pitfall and water traps across the trial too. This isn't surprising: while these species are highly effective predators, aphids and soft-bodied insects are their predominant prey. As a result, their absence could be a consequence of the fact that there were no aphids there for them to eat.

Planting flower strips is not just about biodiversity; it is also about discovering how we reduce our inputs. Insecticides can be expensive and potentially damaging. So, from a business point of view, if we can achieve aphid control through IPM, then every time the sprayer doesn't go out there is a bit more money in the back pocket.

This year, we didn't find clear answers. However, in-field flowering strips contribute to the whole-farm ecosystem. I want every field of cropped land and every measure that we put in place to complement each other - so the whole farm works in harmony.

STRATEGIC CEREAL FARM WEEK

This article is part of a series produced following Strategic Cereal Farm Week (winter 2021/22). Our Strategic Cereal Farms put cutting-edge research and innovation into practice on commercial farms around the UK. The week of online events featured the latest results, delivered by our farm hosts, industry experts and researchers.

Read more about Strategic Cereal Farm Results Week at: ahdb.org.uk/sfweek2021

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Dealing with high nitrogen costs

Crop nutrition and the use of organic materials have been at the heart of on-farm discussions across the UK. AHDB Knowledge Exchange Manager Michelle Nuttall explores the common themes.



Rising fertiliser prices make nutrient losses through run-off, volatisation and nitrate leaching not just harmful to the environment, but increasingly damaging to the bottom line.

Richard Orr, Monitor Farmer in Northern Ireland, neatly illustrated the financial impact of this at a meeting in Downpatrick. This year, his fertiliser costs could rise from £29,660 to £64,000. With the situation similar at farms across the UK, we responded to calls to discuss ways to optimise crop nutrition as part of our programme of webinars and events over the winter period.

Despite having different themes – achieving net zero, optimising nitrogen use and making the most of muck, for example – common threads ran through these discussions. Understanding the current nutrient status of soils – and, if organic materials are being used, their nutrient values – as well as application timing, are all central to optimising crop nutrition and avoiding unnecessary loses.

Optimum nitrogen use

According to James Holmes, AHDB Environment Senior Scientist, how much nitrogen is going to be used should be one of the last things to consider.

He believes that the first step in the efficient and effective use of fertiliser is to ensure soil is in the best possible shape. A healthy soil structure will help prevent leaching and nurture soil biology, which, in turn, will help to promote nitrogen and carbon cycles.

James advised farmers to: "Dig holes, evaluate soil structure and improve it where possible. Test and manage your soil's pH – it is critical to efficient fertiliser use. Optimise potassium and phosphorous by making sure soils are at the target indices. If they are above a target, save your money – this may also help improve soil health.



Think about your rotation and consider introducing peas or beans to fix nitrogen. Only once you've considered such elements should you consider the nitrogen applications."

When it comes to calculating how to only apply what crops need, it is relatively straightforward with synthetic fertiliser. The AHDB Nutrient management guide (RB209), along with the tailored SRUC technical notes for Scotland, provide robust, independent sources of information (see page 10).

Nutrients from organic materials

Although RB209 also covers the use of organic materials, the situation is relatively complex. The published figures are averages, based on many samples. The following are just some of the factors that impact nutrient content of manures and slurries:

- Livestock species
- Livestock diet
- Bedding type and quantity
- Water use

Material storage

As a result, averages need to be used cautiously. Speaking at a 'make the most of your muck' webinar, Lizzie Sagoo, ADAS, said: "RB209 gives average figures. While there are lots of data points behind these numbers, laboratory testing is the only way to get an accurate assessment of the nutrient value of the material you're applying."

Lizzie also stressed the importance of testing representative samples, based on several mixed sub-samples. In the case of slurry this means stirring, because the dry matter content settles during storage. It is important to remember this at application too – later loads (from the bottom of stores) often contain higher levels of dry matter and nutrients.

Organic material applications

When it comes to applications, timing and technique are key to reducing losses. Nitrate leaching is higher when applications are made during the autumn and the early winter period. This is because of the greater rainfall between application and the end of soil drainage in the spring, compared to later winter/early spring applications. This is the main reason for 'rule one'

in Defra's Farming Rules for Water, which demand a shift away (in some situations) from the autumn spreading of organic materials.

Up to a third of readily available nitrogen can be lost through volatilisation. Applying slurries using precision application kit – such as a trailing hose, a trailing shoe or shallow injection – will reduce ammonia loss from slurry applications. Incorporating material will lower losses from solid manures.

As with integrated pest management (IPM), there are many tools in the toolkit – including variable rate applications of synthetic fertilisers and the use of urease inhibitors. Like IPM, understanding what is available and how to use it requires investment in knowledge. However, with current prices and mounting pressure to reduce run-off and emissions, we need everything that's in the box – and we will continue to explore the options at our on-farm events.

This article is based on a webinar and an extended article that can be accessed via:

ahdb.org.uk/news/getting-themost-out-of-muck-applied-tocereals-and-oilseeds

For further information, contact:



Shape the future of cereals and oilseeds

Levy payers are at the heart of everything we do, so it's only right that we give you a greater voice in how we spend your levy. In April 2022, we'll be asking all eligible levy payers to shape our work and priorities. Your views will help guide what we deliver over the next five years. Have your say on the support we offer your business and the industry.

Register before 31 March 2022 at ahdb.org.uk/shape-the-future

