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AHDB

*from theory
to field*

RB209: Going beyond gold

RB209 has long been the cornerstone of crop nutrition guidance and an upcoming review intends to ensure it stays that way. While celebrating its golden anniversary, CPM investigates what the future might hold.

By Janine Adamson

Similar to a successful marriage, RB209 has involved strong foundations, a willingness to adapt to changes in the wider environment and working together with others to achieve specific goals.

This year marked its golden anniversary — a time to reflect on the past 50 years and to look ahead to understand its place in crop production. As a result, AHDB is embarking on a review to ensure the Nutrient Management Guide (RB209) remains relevant for today’s farming systems.

“It’s quite an achievement for RB209 to be celebrating its 50th year, but neither farming nor nutrient management stand still so we’ve instigated a strategic review,” says AHDB’s Dr Amanda Bennett. “This involves gathering views from across all sectors on the technical content and guidance provided,

which will also be used to help direct research and knowledge-exchange and support nutrient management decisions.”

The pledge to continue to improve RB209 was made in the AHDB Cereals & Oilseeds sector plan (2022–2027). Chairing the RB209 review is AHDB Cereals & Oilseeds sector council member, David Bell. A mixed farmer from East Fife, David is also on the Recommended Lists (RL) review steering committee.

Essential to our success

He says RB209 provides many farmers with the cornerstone of their crop nutrient planning. “We all strive to ensure we’re managing our farms in the most sustainable way we can, ensuring the guidance takes account of the latest science and understanding is essential to our success,” says David.

But where did RB209’s story begin? Although nutrient management research had been conducted for well over a century, officially speaking it was back in 1973 — this was when the Ministry of Agriculture, Fisheries and Food (MAFF) published the first comprehensive set of fertiliser recommendations for major crops in the UK, RB209 (Reference Bulletin 209).

Perhaps reflective of the time, the first few editions of RB209 in the 1970s emphasised artificial sources of nutrients and information on organic manures were relegated to a few

lines of text and one table.

During the MAFF and subsequent Defra eras, the environment was increasingly at the heart of the recommendations. Keen to reduce diffuse and point sources of pollution, the guidance emphasised the precise use of nitrogen and the final government-led (8th) edition was published in 2010.

Then, AHDB picked up the reins in 2015, working in partnership with government departments and other organisations to manage revisions to RB209. A review of the technical content was undertaken and AHDB launched its inaugural edition of the Nutrient Management Guide (RB209) in 2017.

“Revisions have been issued each year



Amanda Bennett says because neither farming nor nutrient management stand still, AHDB has instigated a strategic review of RB209.

Timeline developments

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| 2015: AHDB leads RB209 |
| 2017: First AHDB edition includes yield adjustments for nitrogen (for wheat and barley) |
| 2019: First major update to sulphur recommendations since the mid-1990s |
| 2020: The most significant revisions to phosphorus guidance since the 1980s |
| 2021: Revised 'economic optima' (break-even-ratios) for nitrogen in response to high prices |
| 2022: Overhauled recommendations for spring barley |
| 2023: Golden-anniversary edition released |
| 2024: RB209 reviewed |

since. It might seem the same but there have been regular updates to ensure it remains relevant," explains Amanda.

Headlining the changes under AHDB's tenure were yield adjustments for nitrogen in wheat and barley, which enabled growers to tailor their inputs to match potential yields. In response to decreasing sulphur depositions, the 2019 edition updated the mid-1990s recommendations for the nutrient so applications would meet the requirements of modern, higher-yielding varieties.

But, research found major adjustments to the figures weren't required across the board. For example, in winter oilseed rape only a modest increase in sulphur was required, and it was also discovered that crops used sulphur from organic sources more efficiently than previously thought.

The most significant revisions to phosphorus management guidance since the 1980s occurred in the 2020 revision, with improvements to soil analyses, target indices and grain offtake values.

In 2021, RB209 entered uncharted territory and was updated with a facility for growers to calculate optimum nitrogen rates in response to soaring fertiliser prices. These 'economic optima' (break-even-ratios) pinpointed when the value of extra grain produced wasn't worth the cost of the extra nitrogen applied.

Subsequently, in the 2021-22 season, AHDB issued updated guidance and released the nitrogen fertiliser adjustment calculator for cereals and oilseeds.

Distinct sections

And the changes continued — spring barley found itself in the spotlight last year, when recommendations were revised following an analysis of 15 years of trial data. It led to a boost to the crop's expected yield benchmark (from 5.5t/ha to 7t/ha) and new yield-adjustment guidance.

In its current guise, RB209 is split into seven distinct sections so users can identify relevant information and nutrient guidance



The review presents an opportunity to give RB209 a make-over, not dissimilar to the recent Recommended List exercise that has been taking place, says David Bell.

for individual crops, while updates that reflect the latest research can be easily incorporated in the publications. The guide is divided into principles of nutrient management and fertiliser use (1), organic materials (2), grass and forage crops (3), arable crops (4), potatoes (5), vegetables and bulbs (6), and fruits, vines and hops (7).

The golden anniversary edition was published earlier this year and featured a range of improvements, including changes to the recommendations for cereals.

Amanda says among these were notable adjustments to the recommendations for oats and key considerations for nitrogen management for milling wheat, an example being that nitrogen rates for oats are now based on expected yield.

"We work closely with many external parties and farmers who participate in the UK partnership for crop nutrient management group, with three sector technical working groups focused on the detailed science. Collectively, these groups inform, coordinate, and collate the data. Critically, they ensure that updates are evidence-based and independently reviewed." ►



RB209 is celebrating its golden anniversary, having provided 50 years of nutrient management guidance.

The nutrient guide

With a passion for crop nutrition baseline, Oxfordshire arable farmer James Price says he's never without a copy of RB209. A member of the AHDB Cereals & Oilseeds board in 2015, which was when AHDB took ownership of the 'nutrient guide', James felt the move to bring the guidance 'in-house' was an opportunity to give farmers more influence.

According to James, nutrient management is the fundamental grounding to his farm business. Both he and his core team are FACTS qualified, which James believes helps them in their quest to build back

organic matter levels and tailor nutrients to crop requirements.

RB209 proved particularly valuable recently when they decided to add oats to the rotation. With little experience of the crop as a team (including the farm's agronomist), the updated information within RB209 gave them a baseline to work with and they didn't have to start from scratch to optimise their input strategy.

James says he'll continue to use RB209 and refine the approach to oats as his personal experience builds, flexing plans to meet the requirements of the site.





Collaboration between growers and advisors is key, which includes following up on the sign-posts to further reading that are within RB209, says Alli Arden.

► But what about the future? According to Amanda, section one — principles of nutrient management and fertiliser use — will remain the bedrock of RB209.

“Soil health plays an intrinsic role in nutrient management and it’s so important to understand how the two are connected. Section one, which includes the fundamentals of soil properties and nutrient supply, is the foundation of the guide,” she explains.

“It’s then how you stack on top of those fundamentals — the next layer being organic materials, and finally synthetic inputs. Soil health should always underpin it all.”

Amanda says current farming systems look very different to those of the 1970s, and although some pressures remain, growers have wider aspects to consider such as their contribution to net zero.

“Everyone is under pressure to reduce their synthetic input use, whether that’s to make efficiencies, or to improve their sustainability credentials. There’s a greater focus on understanding the carbon footprint of production systems — something which has come under scrutiny of late,” she says.

“But then for arable farmers pursuing a regenerative approach, what’s the impact of integrating livestock into the rotation or cover

cropping? How does this affect nutrient management and a following crop’s requirements? Or what happens for biomass or energy crops?

“This is why we’re assessing the scope of RB209, what it means for today’s farmers, and how to support these emerging strands which are being embraced by businesses.”

Agronomist Alli Arden chairs the AHDB’s arable technical working group for RB209. She agrees that as well as being challenging, times have indeed moved on.

Use all tools

“There are so many goals to achieve as an industry, we have to use all of the tools that are available to us. At the same time, product innovation is developing at a rapid pace, from biostimulants to urease inhibitors.

“It’s important that RB209 echoes that pace of change and reflects the mechanisms being used within practical farming scenarios,” she says.

Amanda anticipates the review will ensure that industry guidance on nutrient management remains relevant to current and future farming systems. Critical to this, she says, is having buy-in at an individual farm level.

“On-farm interpretation is integral to good nutrient management. There’s no one-size-fits-all, RB209 has to work alongside each individual farm and people who know the site inside-out. You can’t replace that knowledge,” says Amanda.

This is a sentiment echoed by Alli. “Much evidence goes into the guidance, it’s a starting point to work from and acts as a reference document. However, because it’s a distilled tool, it doesn’t have all of the answers for every crop.

“Collaboration between growers and advisors is key — this includes following up on the sign-posts to further reading that are within the guide, rather than simply executing a figure from a table,” she says.

David says the review presents a great opportunity to give the guidance a

make-over, not dissimilar to the recent RL exercise that has been taking place. “It’s important that RB209 is updated to represent the most current research and understanding, to empower growers with the knowledge they require to grow crops in challenging environments.

“There remains a lot that we don’t know about soils and the interactions that happen below ground, including those between nutrients and plants. But what we have learnt of late should be integrated into the guidance to reflect modern understanding,” says David.

He believes more levy payer input into this specific aspect of AHDB’s work will deliver even more value for farmers. “Appropriate governance is critical in ensuring money is invested wisely and we should be listening to levy payers to deliver what they truly require,” stresses David.

“We’re learning a lot from the RL review which can hopefully be applied to influence the process for RB209 to ensure it runs as smoothly as possible.”

According to Alli, AHDB is ideally positioned to maintain ownership of the guidance. “What AHDB offers is a controlled framework to deliver both the review activity and future iterations of RB209. Since it took over, the guide has become a ‘living document’ and a collaborative effort.”

Scoping beyond this, as well as the actual guide, the data from RB209 is used across a number of commercial digital products and APIs (Application Programming Interfaces). David would like greater recognition of this contribution.

“You could say that as farmers, we don’t always realise we’re using RB209 information because it’s fed into a product behind the scenes. I’d like this input to be highlighted so that levy payers aren’t paying twice for the same data, essentially improve the regulation around RB209’s commercial use moving forward,” he says. “It belongs to the AHDB and therefore belongs to levy payers,” he concludes. ■

Be involved

Agronomist and chair of the AHDB’s arable technical working group for RB209, Alli Arden, says it’s ‘incredible’ that RB209 has survived for 50 years, which is why the review will play an integral role in futureproofing its existence.

“Some may criticise the recommendations in RB209 because they don’t offer all of the answers, but there’s little point voicing such critique if it’s not shared as feedback. This is the number one opportunity for farmers to be

involved and help to steer positive change,” stresses Alli.

Levy payers wishing to contribute initial ideas and suggestions for the development of RB209 can email: nutrient.management@ahdb.org.uk with ‘RB209 Strategic Review’ in the subject header.

Contributions received before 1 January 2024 will be considered as part of the initial phase of the review process.

Research roundup

From Theory to Field is part of AHDB’s delivery of knowledge exchange on grower-funded research projects. *CPM* would like to thank AHDB for its support and in providing privileged access to staff and others involved in helping put these articles together.

For more detail about the project, visit ahdb.org.uk/rb209