

Sweeping the board: the secrets to genetic success



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NICK BIRD

With a record-breaking eight new wheat varieties added to the most recent AHDB Recommended List, *CPM* sits down with breeder KWS to find out how the company is driving genetic innovation.

By Charlotte Cunningham

Wheat breeding in the UK has come a long way from the days of simply picking the best-looking crops in the field. What was once a slow, trial-and-error-based process has since evolved into a high-tech science where genetic markers, drones, and data-driven selection are shaping the future of farming.

Today, breeders aren't just looking for high yields, they're on a mission to breed crops that can withstand unpredictable weather, resist the toughest diseases, and still deliver top-quality grain. As such, the innovation happening behind the scenes

is revolutionising the ability to grow crops.

At the heart of this transformation is a blend of cutting-edge technology and good old-fashioned agricultural know-how. Scientists can now scan millions of genetic data points in a flash, pinpointing the best traits with precision – something which would have been unimaginable a few decades ago.

With more than 25 years of experience under his belt, research scientist Nick Bird has had a front-row seat in watching this evolution unfold. Working as the UK winter wheat research lead at KWS, the past 10 years of his career have



Better breeding

KWS research scientist Nick Bird says developments to the firm's breeding programme enable them to characterise material better for a more in-depth insight into what's inside. ►



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Next gen innovation

What KWS is bringing to market now has the potential to revolutionise crop production and drive forward a whole new generation of innovation, believes the firm's Olivia Bacon.

► been focused on the development of hybrid wheat and other key wheat requirements such as quality, yield and disease and fungal pathogen resistance, explains Nick. “Twenty-five years ago, when I first started generating data from genetic markers, you might have had 100 data points a day, whereas now you can generate millions in a morning.”

In terms of the benefit this has brought to KWS' breeding programme, Nick explains this development has enabled the firm to characterise its material better and get a more in depth insight into what's inside – which parts are beneficial, or not – which has helped drive forward breeding innovation. “It's all about gathering as many of those beneficial genes as we can while discarding those which aren't appropriate for our breeding programme.”

In terms of other technologies such as phenotyping and the use of drones, Nick says while progress has been made, there remain limitations and difficulties which they're working through at present. “At this moment in time we still rely heavily on breeders

walking fields, phenotyping with their eyes and scoring accordingly, although we're looking for digital solutions.

“We can use genomic selection which uses phenotype and genotype data from multiple varieties to predict the performance of unseen varieties solely on their genotype.

“While we've made some small improvements to the speed in which we can bring this progression to market, the biggest benefit has been we're better at identifying the positive and negative material than ever before.”

The result of this progress is seen in KWS's ability to develop varieties which boast genetic traits which can help growers maximise productivity – with their latest launches proving this, says KWS UK head of product management, Kate Cobbold.

With eight new wheats added to the latest AHDB Recommended List and top placings in all the key Groups – as well as in both conventional and hybrid barley as well as OSR – Kate believes yield is once again king for growers in the current challenging conditions.

“While yield has always been a focal point for us as it's important to growers and the principal way varieties are ranked in the UK, in recent years our attention has been on adding enhanced functionality to crop options.”

This has been typified by KWS' Sowing for Peak Performance (SPP) initiative during the past ten years which has placed emphasis on qualities such as overall resilience, disease resistance, field performance and consistency of production, she explains.

“Behind this rationale were factors such as the increasingly variable growing conditions now experienced as a result of climate change, the reduced number of agronomic

options available, and the move to more sustainable methods of crop production.

“As a result, varieties like Group 2 KWS Extase, with its RL-leading untreated yield and septoria resistance, plus the high yielding Group 4 all-rounder KWS Dawsum, with an untreated yield not too far behind Extase and proven production reliability, have established themselves as the UK’s most widely grown wheats in recent times.

“There are other examples of this thinking in action, such as KWS Tardis, with all of these varieties continuing to be highly effective choices in rotations.”

Of course, nothing in agriculture stands still and a new set of criteria are starting to influence UK production demands, notes Kate. “Sustainability remains a top priority for growers and the wider food supply chain alike, as does resilience, whether it’s defined as a crop’s capacity to thrive in difficult conditions or a market’s ability to reliably supply what consumers want.

“Food security is an increasingly concerning topic and SFI puts a growing emphasis on every hectare of land being more productive



New initiative

KWS’ Kate Cobbold says the firm has launched a new initiative which builds on its previous Sowing for Peak Performance campaign.

than ever as more areas are taken out of conventional agricultural production.”

All of these factors are underpinned in a new initiative launched by KWS – Productivity2 (Productivity Squared).

“Productivity2 builds on SPP to put a variety’s ability to deliver the best results at a gross margin level centre stage of the decision-making progress,” she explains. “Everything SPP brought to people’s thinking is still as important as ever but we’re now adding to this with new levels of yield potential, largely the result of some important breeding developments made in recent years.

“In the past, when characteristics such as septoria or yellow rust resistance were added to a variety, there was usually a yield penalty to pay. So, a variety that was the strongest agronomically, wasn’t usually the highest yielder.”

Consequently, some of the varieties with the highest yield potential were also some of the most vulnerable and susceptible to diseases or abiotic stresses, but things are very different now, she points out. “KWS Extase rewrote the rules on this by combining the highest untreated yield, a good marker for a variety’s overall agronomic strength, with a fungicide-treated yield that rivalled some of the highest performers when it joined the RL in 2019.

“On top of this, it combines the potential to reach Group 1 milling specification and that high outright yield gives producers the opportunity to grow it as a barn-busting feed wheat if that was their choice.

From Nick’s perspective, he says targeting disease resistance is his main priority at the moment. “Obviously, we always have yield in mind. But to provide the ability for a farmer to grow those crops to their



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In terms of specific diseases, Nick says yellow rust and septoria are particularly important. “We’re also looking at pathogens which aren’t there all the time. Brown rust, for example, varies in its incidence across years whereas looking further ahead, stem rust and fusarium head blight aren’t significant issues at this moment in time, but could become so.”

Kate adds that KWS Dawsum offers similar opportunities with good grain quality and specific weight adding to its marketability, underpinned by reliable performance in the field and consistent high yields. “The refining of this genetic ability to reliably combine a full agronomic profile without it affecting the outright yield potential is the basis of Productivity2. It’s a way of thinking we’re now taking across all of our crops including wheat, barley, maize, sugar beet, rye, oilseed rape, peas and oats.”

The manifestation of this is particularly visible in KWS’ performance in the 2025/26 AHDB RL, she points out, with yield, resilience and marketability the key elements of productivity in action. “Don’t forget, while output is a fundamental part of the productivity equation, so too is the cost of production. So while yield dictates the top line in terms of revenue earned, cost of inputs plays a key role in determining the final gross margin/ha.

“A variety that’s more robust and requires less agronomic intervention can contribute more to the bottom line than one that’s needy and requires significant expenditure to deliver its full potential.”

That’s where disease resistance and resilience come in, but marketability is important too, she adds. “Being able to achieve premiums for your production adds markedly to the top line of the productivity equation.”

KWS wheat product manager Olivia Bacon agrees and highlights how the new KWS winter wheat varieties add value to the new Recommended List. “In Group 1, new KWS Vibe brings the highest overall protein production to help growers maximise their margins together with a comprehensive agronomic package. Vibe brings genuinely improved performance to a sector that’s seen



An impressive package

New variety KWS Vibe brings the highest overall protein production to help growers maximise their margins together with a comprehensive agronomic package.

few new additions in recent years. We believe it’s the new ‘protein banker’ for the UK with the best combination of yield and protein of all varieties, but with a much better plant package for growers than previous varieties.”

Its yield of 98% of controls combined with a milling specification protein content of [13.2%] sets it apart from its competitors, as does its most comprehensive agronomic package of all the key Group 1 players, she adds. “This includes an 8 for yellow rust, 6 for brown rust and 6.6 for Septoria tritici resistance combined with a Hagberg falling number of 283 and specific weight of 79.1 kg/hl. It really has everything you’d wish to see in a Group 1.”

In Group 2, KWS Arnie, KWS Equipe and KWS Newbie take the three top spots and build on Extase’s legacy of high yields, milling potential and strong disease resistance, says Olivia. “These varieties also have the potential to give growers the opportunity to use them as strategic agronomic ‘tools’ depending on production requirements.

“Arnie, for example, is the new Group 2 leader with a yield some 4% points ahead of Extase at 106% of control – making it comparable to the very best Group 4s. This is together with the additional benefits of 7s for both yellow rust and septoria resistance.

“Equipe takes second spot in Group 2 at 103% of treated controls plus it has the highest untreated yield of all varieties on the new RL at

92%, underlining the strength of its agronomics and real-world resilience

Newbie completes the trio of new Group 2s with excellent first and second wheat yields, particularly in the North where it yields [107%] of controls, plus its 9 for yellow rust and 6.2 for septoria resistance will stand it in good stead across the country, says Olivia.

Group 3 additions KWS Solitaire, the group’s new highest yielder, and KWS Flute are definite ‘disrupters’ with the potential to serve all market opportunities be they distilling, export, feed or biscuits, she notes. “Like Group 2, Group 3 is also evolving with these new genetics providing a range of opportunities for growers that wouldn’t have been possible just a few years ago.”

In Group 4, where Dawsum’s reliability and all-round strength have made it the UK’s most popular wheat by area grown in recent years, KWS Scope tops the group and the new RL overall with a yield of 108% of control for the UK as a whole.

“That rises to 111% in the West region so it’s a true yield monster with the type of agronomic foundation that allows this performance to be delivered across the country, plus, it has a specific weight significantly higher than the next highest yielder on the list.

“With a 7 for yellow rust, 6 for brown rust and 6.5 for septoria resistance, Scope boasts a similar agronomics to Dawsum – with its specific weight of 78.9 kg/hl right up there too.”

Olivia concludes: “It’s a really exciting time for genetics and varieties across the board. What we’re bringing to market now really does have the potential to revolutionise crop production and drive forward a whole new generation of innovation.” ●

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