



Innovation Insight

Grand slam

Achieving the highest yielding variety of the year is a bit like topping the music charts of the plant breeding world, but what does it take to do this across four different crops? CPM takes a closer look at this year's headline varieties.

By Melanie Jenkins

With the release of the 2024/25 AHDB Recommended List, Limagrain has taken its second clean sweep in a row with the top yielding varieties across wheat, barley and oilseed rape.

Additionally, with the publication of the British Society of Plant Breeders 2024 Forage Maize Descriptive List in September, the company has the highest yielding early maturing maize variety, but how has the breeder achieved this feat?

According to Limagrain's Martin Titley, the starting point is significant investment. "We normally invest about 14-15% of our turnover into our plant breeding programmes across the UK and Europe

and this gives us the resource to develop effective breeding programmes."

Further to this, the company has UK based breeding programmes for wheat, barley and OSR. "This ensures that the breeding work done in the UK means the programme produces varieties that are suited to the conditions farmers have to deal with here," he explains.

Genetic markers

"Our UK wheat varieties are bred at Woolpit, Bury St Edmunds in Suffolk, while barley and OSR are bred at Rothwell in Lincolnshire, and we feel that we might not have had the success we've had if these varieties hadn't been bred here."

Another element is the use of genetic markers in plant breeding, which is not limited to Limagrain, explains Martin. "It's not just yield markers that have been identified, but others such as the yellow rust gene which provides strong resistance to the disease, plus orange wheat blossom midge (OWBM). And through genomic selection other traits such as lodging resistance, and varieties with higher specific weights, have also been identified.

"In OSR we've identified turnip yellows virus (TuYV) and pod shatter resistant genes, both of which have been fundamental to helping improve yield, but especially the latter because it

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LG Caravelle

For the second year running, LG Caravelle has topped the winter barley RL, yielding 105.6% coming in 0.1% ahead of its sister variety, LG Capitol. "Caravelle is still the highest yielding two-row feed barley, demonstrating good all round disease resistance, with a very high specific weight," explains Limagrain's Ron Granger.

The variety scores 7 for both mildew and brown rust, while it's rated 6 against net blotch and rhynchosporium. "Caravelle has good grain quality, with a high specific weight of 71.4kg/hl and low screenings at 1.7% through a <2.25mm sieve."

It also has good straw strength combined with good brackling resistance with an earlier maturity (0) "It's a variety that delivers the range of agronomic characteristics thought desirable by growers on farm," he says.

According to Ron, the winter barley feed market is a competitive space, so it was

essential to produce a variety that could perform across all regions and seasons, while continuing to deliver its agronomic package. "Historically, if we look back at varieties like LG Mountain, added to the list in 2019, there's been a huge improvement in terms of agronomics, both in two-rows and hybrid varieties. We're seeing better disease resistance, improved grain quality, better straw attributes with significant increased yield and the older varieties just do not compete with what's available now."

Additionally, Caravelle has been shown to work well in blackgrass situations, he points out. "Although it's usually hybrids that are associated with this, Caravelle is higher tillering and based on external trials, we've seen it compete with blackgrass well.

"It's always hybrids which have been perceived as having the highest yield potential, but we're now seeing two-rows up to this level,



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with better all-round agronomics and with more genetics in the pipeline, its exciting times," he concludes.

means the pods stay intact and retain seed longer.

Moving forward, genetic solutions will be a vital solution for helping farmers in

the long term as the regulation of the current chemical use becomes more restrictive, highlights Martin. "What breeders can achieve through genetics

and breeding is only going to become more vital and we'll have to produce varieties that continue to bring improved resistance and higher yields to the table." ■

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LG Armada

Taking the top spot on the OSR RL, LG Armada has sailed passed the competition with a gross output of 106.5%. The variety is one of a new generation of varieties from Limagrain, which also includes Academic (106.4%) and Adeline (106.3%).



Armada is one of Limagrain's seventh generation of hybrids which bring new maintainer and restorer lines to the table.

"These are our seventh generation of hybrids and for the first time in a while, they bring new maintainer and restorer lines to the table which have allowed us to produce a stacked portfolio of stem health attributes," explains the firm's Liam Wilkinson.

Stem health is a key part of Limagrain's drive to secure yield on farm, he says. "Having strong stem health has allowed Armada to produce consistent performances across the UK. While having pod shatter and cylindrosporum — stem based light leaf spot — resistance provides on-farm security in all situations and across regions. And as stem health has improved, we're seeing bigger stems and better rooting which results in higher oil content - Armada and the other varieties in the seventh generation have all demonstrated increased oils compared with our past portfolio."

Although it was bred in the UK, Armada has been tested in Europe and because of its performance has been highlighted for use in some continental countries, says Liam. "It's performed and been consistent across versatile settings, so



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we knew at the pre-National List stage that it would be a good fit across the board.

"Even at the early stages of its path to commercial launch, Armada was getting a lot of interest from the trade and has garnered the attention of farmers," says Liam. "It's been one of our biggest launches of a pre-recommended variety for a long time and we had seed commercially available for sowing this year."

LG Beowulf

The highest yielding wheat variety on the latest RL, LG Beowulf clocks in at 106.2%. Although there are three other varieties on the RL sitting in the 106% window, Beowulf has a yield advantage of 0.5%, giving it top spot, explains Limagrain's Ron Granger.

"The variety is a hard feed wheat and although Limagrain has dabbled with hard feed wheats in the past, historically the majority of our programme was based around soft wheat. Limagrain is now exploring a different territory with the hard feed sector, so this is a new adventure for us," he says.

In addition to the variety's headline yield, Beowulf brings with it many of the desirable agronomic characteristics thought of as high importance by growers, according to Ron. "The variety has stiff straw, rated 8 for standing, both with and without a PGR, and has a good specific weight at 78.3 kg/hl, as well as OWBM resistance. It's great to have OWBM resistance because although it's not talked about a lot, it can impact yield in some seasons, especially in the South East. Beowulf also has a secure disease resistance profile with scores of 9 for yellow rust resistance and 6.7 against septoria."

A major element in producing wheat varieties such as Beowulf came down to not just looking at yield during the breeding process but trying to create varieties with resilience that cope well

across different seasons, he explains. "The past few seasons have been very different, but we've seen consistent results in the trials during this time which gives growers confidence in a variety.

"Beowulf has also shown good consistency across all regions as well, including Scotland where it has performed well. The variety can be grown as a first and a second wheat, on light or heavy land and in early to late drilling slots," says Ron. "It's shown high yield potential across the early and through to the late drilling window, allowing for drilling date flexibility on farm while maintaining high yield performance. We've also seen the variety perform very well with commercial rates of fungicide in both internal and independent agronomy trials."

So where has Beowulf inherited its performance from? "One of its parents is Gleam, which has been a very successful variety on farm bringing with it a security of performance around yield and a good agronomic package with a high specific weight. Gleam may not be the highest yielder now, but it's a robust variety that has consistently performed in wet and dry seasons. Beowulf's other parent, Costello, although perceived lower yielding and known as a safe variety, contributes stiff straw, good disease resistance and a respectable specific weight," he explains.

"Going back 15-20 years, varieties would



The industry requires high yields and grain security, and robust varieties are Limagrain's aim going forward, explains Ron Granger.

perform one year and not the next and this is something breeders have all worked hard to overcome," says Ron. "Although Limagrain isn't known for its hard feed wheats, we wanted to produce a variety that ticked all the boxes in terms of agronomics, disease resistance, grain quality and yield to help growers manage the current challenges they face. Whether that's the changing agricultural environment, the increasing use of integrated pest management on farm, or reducing costs, the key to all of these elements will be producing suitable varieties. The industry requires high yields and grain security, and robust varieties are the aim going forward."

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Saxon

Limagrain's maize variety, Saxon, was added to the BSPB 2023 Forage Maize Descriptive List, but has again topped the list for early varieties in 2024 with dry matter yields of 19.1t/ha, says the firm's Tim Richmond. "On the Descriptive List, Saxon yields 105.2% of the controls, which is very high for an early variety with an FAO of 180.

"We've been working to develop a high yielding variety with a good feed value that is suited to an early harvest, and Saxon fits these criteria," he explains. "Of all varieties on the list, no other varieties are both as high yielding and as earlier to mature than Saxon, meaning farmers can have the reassurance of a safe and early harvest alongside yield expectation."

Another element the breeding team worked to bring to the variety was good digestibility, according to Tim. "Half of the dry matter yield of every plant is from the cob and starch which is 100% digestible, but the other half is made up of leaves and the stem, and the digestibility of these latter parts can range from 50-60%. In Saxon, the leaves and



Based on two years of private and a further two years of National List trials, followed by testing with BSPB and NIAB, Saxon came through very strongly as a UK variety, explains Tim Richmond.

stem are 59% digestible, which means that for every kg of silage produced, it has a higher ME content that also contributes to the total ME yield/ha grown. Saxon has the highest ME yield of all varieties available at 224,682MJ/ha at harvest."

So how did Saxon make its way to a UK commercial situation? "All maize varieties are bred on the continent initially, and a few years ago the team discovered a new cross that looked promising through the primary phase of parent inbred lines," explains Tim. "Once we developed this into a new hybrid line, we could test it in the UK and we really saw the potential of Saxon.

"Based on two years of independent and a further two years of National List trials, followed by testing with BSPB and NIAB, Saxon came through very strongly as a UK variety," explains Tim. "The variety is now in its second commercial year and agronomically has stood up well, while being a good all round performer."



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