



Managing uncertainty

From grassweed suppression to improved NUE to early entry for oilseed rape to flexible end use, hybrid barley has cemented its value to growers over the past two decades. CPM discovers how the crop offers both resilience and yield stability.

By Lucy de la Pasture

By its very nature, farming is uncertain; it's at the mercy of the weather, agronomic challenges and the markets. But when it comes to controlling what can be controlled, variety choice is one of the most important decisions on the farm.

Introduced 20 years ago, Colossus was the first hybrid barley to reach the market in the UK. It promised hardier crops and 10% better yields than conventional types. It's fair to say that not only have hybrid varieties improved significantly since that pioneer variety, the agronomic benefits they offer are now also much better understood and this is reflected in their popularity on farm, with 33% of certified barley seed sales now hybrid varieties.

Asked why hybrids have become such a favourite, Ben Urquhart, Syngenta seeds

The value of vigour

technical expert, simply answers 'heterosis'. That's the technical term for hybrid vigour — where the progeny of cross-pollinated varieties exhibit greater biomass, speed of development, and yield than both parents.

Consistent performance

While yield advantage is undoubtedly a big plus point for Hyvido hybrid barley varieties, Ben believes it's far from the only reason hybrids are proving popular with farmers. "SY Kingsbarn is the most popular, with a yield 106% of controls, but it's consistent with it. Both Bazooka and Belfry were added to the AHDB Recommended List (RL) in 2016 and have retained their place with yields of 104%. They are high yielding varieties that have maintained their performance over time."

Another major driver of hybrid barley popularity is its competitiveness with grassweeds, adds Ben. "In trials we've seen a clear difference in grassweed suppression between species — for example, winter wheat and winter barley — and between barley varieties, with hybrid six-row varieties being more competitive than conventionally bred six-row and two-row varieties the least competitive of all."

Following these early trials on blackgrass, more recent work has shown hybrid barley to be more competitive against ryegrass and brome species — both increasing problems, partly as a consequence of the trend in tillage reduction.

"We know hybrids are particularly beneficial in a blackgrass situation, reducing

“The hybrid root traits give resilience across regions, across soil types, and across different seasons.”

numbers by 20 heads/m². With ryegrass and brome the same competitiveness applies; suppressing grassweed growth, which leads to fewer tillers, smaller ears and reduced seed return in all of these species."

Ben notes that hybrid barley will suppress grassweeds irrespective of their herbicide resistance status. "Reduced weed seed return to the soil from surviving grassweeds is a key part of sustainable grassweed reduction. However, there are also shorter-term benefits, and the latest calculations reveal the yield benefit alone from suppressing blackgrass with hybrid barley could be worth more than £50/ha (0.165t/ha)."

But it's not just above ground that hybrid barley has an ability to suppress grassweeds, trials show the architecture of its vigorous roots also compete with blackgrass for nutrients and water.

"This bigger root system has the ability to get to depth and scavenge for nutrients and

water. The hybrid root traits give resilience across regions, across soil types, and across different seasons,” says Ben.

It’s been calculated that increasing average root length by just 1.0cm would give access to an extra 130t of soil per ha for extra water and nutrient uptake, based on average soil density, so it helps explain the competitive advantage of hybrid varieties over conventional.

And knowing that the rooting system of hybrid types is inherently larger than in conventionally bred varieties, it seems likely that plants were able to make better use of nitrogen. So ADAS were charged with exploring nitrogen use efficiency in trials to establish whether this was the case.

“We started off from a sustainability angle to try and understand whether it was possible to reduce bagged nitrogen inputs. We’re now in the third year of trials with ADAS and are finding hybrid NUE is significantly different to that in conventionals,” explains Ben.

ADAS’ Dr Sarah Kendall is leading the trials measuring nitrogen uptake efficiency and nitrogen utilisation efficiency, which together translate into overall nitrogen use efficiency. The research is comparing two hybrid barley varieties — SY Kingsbarn and Bazooka — with two conventional two-row winter feed barley varieties at six different N doses, which range from 0-360kg/ha.

“We’re seeing that the overall higher NUE

in hybrids is being driven by improvements in nitrogen utilisation efficiency, indicating that for the same amount of N taken up by the crop, the hybrids produce more yield,” explains Ben. “It all comes back to hybrid vigour — they’re just inherently better at growing.”

Further trials with ADAS are investigating the water use efficiency of hybrids, which may further explain the resilience and yield stability characteristics hybrids have become associated with.

Enhanced rooting

The multiple rooting benefits which are inherent in hybrid varieties can be further enhanced by using seed treatment Vibrance Duo (fludioxinil+ sedaxane), adds Ben. “If you’re looking to establish hybrid barley, particularly when for grassweed competition or when drilling late in the year, then sedaxane will help the crop up and away and to become well-rooted quickly.”

While the advantages of hybrid varieties are now well known, breeding programmes have looked to plug some of the weaknesses that were associated with some of the early varieties, including specific weight and resistance to lodging.

“Yield is always something we’ll be aiming to improve as it’s a necessity for inclusion on the National List and the RL, but we’re looking for the complete package — yield, grain quality, comprehensive disease



Although yield is always something breeding programmes aim to improve, Ben Urquhart says they’re looking for the complete package – yield, grain quality, comprehensive disease resistance and varieties with stiff straw that are resistant to lodging and brackling.

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Recently added to the RL, varieties SY Nephin (2023) and SY Canyon (2022) are a case in point, highlights Ben. “Volume and Boost are hybrid varieties that have been superseded but specific weight was a weakness for them. Now we have both Nephin (71.4) and Canyon (71.7) which have higher specific weights than most two-row feed varieties, second only to KWS Cassia (72.4) and LG Caravelle (71.8).

The untreated yield figures for Canyon and Nephin evidence the importance of ▶

An agronomist’s perspective

It’s hybrid barley’s ability to outmuscle grassweeds that has made ProCam agronomist Paul Gruber a big fan — in fact 80% of the barley he advises on in Oxfordshire/Buckinghamshire is hybrid.

Standing in a crop of hybrid barley, Paul says the tramlines are just stacked with blackgrass which emphasises the good job the crop has done in suppressing blackgrass below the canopy.

“Last year the blackgrass didn’t flush in the autumn and the drill had to get going. But the crop’s doing what hybrid barley does,” he says. “Hybrids also give a bit of a buffer when the weather goes against you with pre-emergence herbicides.”

But grassweed competition isn’t the whole story, it’s the rotational fit of hybrid barley that also appeals to Paul. “Because hybrid barleys are early maturing, it’s a help to our oilseed rape strategy. The sooner the crop is off, there’s less moisture being drawn out of the ground which helps with OSR establishment.”

Paul also has a theory that the bigger root mass of hybrid barley helps structure the soil,

making it easier for OSR to channel its roots downwards.

The agronomy provides few additional challenges to conventional crops and Paul advises not to be afraid of using low seed rates. “Around 200-250 seeds/m² is all you need and hybrids offer flexibility on drilling date — you can go early or you can be confident when drilling late into October, with the caveat that you get early spring nitrogen on.

“It’s an extraordinary crop, the way it grows in the spring. It’s all about maintaining tiller numbers so early nitrogen is key, but you do need to keep the brakes on with PGRs,” he adds.

Because of this spring biomass and height, a ‘timely and robust’ PGR programme is justified, believes Paul. “I’d probably advise applying three PGRs in a thick, growthy crop — at GS25-30, at T1 and a late PGR to reduce the risk of brackling. The ‘bounce back’ effect after early PGR application can be significant because of their fast, vigorous growth.”

Two robust fungicide sprays is all that’s



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warranted, says Paul. “SY Canyon has good disease resistance but brown rust late on is a weakness.”

For Paul, hybrid barley stacks up in the short term but also with a longer-term view. “Where I have conventional barley, there’s a steady build-up in the brome population and I think this could become an increasing issue as tillage is reduced, especially as there are no sensible chemical options for bromes in barley.”



The combination of consistent performance and high yield has made SY Kingsbarn the favourite hybrid barley variety in the UK.

► disease resistance in the Syngenta breeding programme. Canyon leads all the varieties on the RL with an untreated yield of 91% of the treated control, with Nephin just one point behind at 90% which equals the best of the rest.

“These results are driven by good resistance across barley diseases, with Nephin achieving a resistance rating of 8 for rhynchosporium,” points out Ben.

Although hybrid varieties are naturally tall, straw stiffness has been a breeding priority, says Ben. “Even older varieties like Belfry have stiff straw and that’s one of the reasons it’s the number one variety in Ireland. Kingsbarn is the most popular hybrid in the UK and has a rating of

Managing uncertainty

There’s always uncertainty in farming but UK growers are heading into uncharted waters as a number of global factors — including the effects of climate change, the COVID pandemic and the war in Ukraine — combine to cause market price volatility and input inflation.

Then there are more local variables to manage — including weather-related risks, disease sensitivity shifts and weed pressures. With all of these factors combined, the stakes have risen even higher.

To help navigate these mounting risks and uncertainty for cereal growers, CPM has teamed with Syngenta to draw on its experience from varieties through to crop protection. Looking at the whole picture, this series of articles aims to help manage uncertainty for those growing cereal crops.

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7 for resistance to lodging.”

But Ben’s keen to point out that hybrids still require an appropriate PGR programme because of their height and high yields.

Tolerance to BYDV is also a breeding target and candidate varieties SY Buzzard and SY Harrier both have this trait, with further varieties in the pipeline. As often seen with the introduction of new traits, the yield lags slightly behind the top scoring varieties, explains Ben.

“Although there’s a small yield lag in these early BYDV tolerant varieties, they’re similar to Bazooka and KWS Feeris in terms of yield

and specific weight. Buzzard scores a 7 for rhynchosporium resistance so will be a well-rounded variety for wet weather disease resistance,” says Ben.

Their hybrid vigour also gives flexibility when it comes to drilling dates, he adds. “Hybrids can be drilled into October, later than conventionals, which is ideal in grassweed and higher-risk BYDV situations as part of an integrated management strategy. Where drilling can’t be delayed, varieties with BYDV tolerance can help manage the risk with less reliance on insecticide applications.” ■

Versatility where there’s blackgrass

The barley acreage has reduced in recent years at Geo E Gittus and Sons’ Symonds Farm, near Bury St Edmunds in Suffolk, but farm manager Steven Brummitt says it’s the lack of herbicide options in barley that’s driving the change. Hybrid varieties are, however, providing him with grassweed suppression and alternative uses if blackgrass gets the upper hand.

Farming 1700ha of mainly Hanslope clay soils and some medium loams, hybrids have been a staple in the rotation for 7-8 years. Steven started with Bazooka on small areas and this gradually increased until hybrid barley practically replaced conventional winter barley about four years ago, though KWS Feeris has also found a place on the farm due to its BYDV resistance trait.

Currently it’s hybrid varieties SY Thunderbolt and SY Kingsbarn that are helping to stave off the blackgrass. Typically yielding around

8-9t/ha, Steven says hybrid barley enables the farm to keep barley in the rotation without blackgrass populations increasing as it suppresses growth of the weed in spring.

“Hybrids can be drilled slightly later than conventional barley to give more time for effective stale seedbeds. While conventional barley will go in around 20 September, we can plant hybrid barley in the first week of October with very little impact on yield, and it has been drilled here as late as the third week of October,” he says.

But as well as the obvious benefits from its competitiveness and an early entry for OSR (when it’s included in the rotation), Steven finds the flexibility in end use that hybrids offer an advantage. The farm has an anaerobic digester, with maize and winter forage rye grown specifically as feedstocks.

“Hybrid barley can be harvested as wholecrop at around 32-34% dry matter for use alongside



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maize in the AD plant if maize and rye silage stocks are low,” says Steven. “If blackgrass got away from us then we’d also have the option of using the hybrid barley as a feedstock, though gas yields won’t be so high since we’ve grown it as a grain crop, limiting potential biomass through using PGRs.”

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