

# A glimpse of gold

## Insider's View: Wheat

As the challenges of modern crop production push farmers towards cutting inputs while achieving the same results, could new bread-making variety, RGT Goldfinch, be a breakthrough as the first commercial insecticide-free wheat on the market? CPM digs into the details.

By Melanie Jenkins

**The goldfinch of farm hedgerows is both brightly coloured and adept at pecking seeds from thistle heads, and is even mentioned in the unfinished 'The Cook's Tale' by Chaucer, but new quality bread-making wheat, RGT Goldfinch, has only just begun to tell its story.**

As the first quality wheat with bread-making potential that's resistant to both barley yellow dwarf virus and orange wheat blossom midge, alongside having a strong agronomic package, could it offer growers after a premium the peace of mind they've been looking for?

RAGT's Lee Bennett certainly thinks so, highlighting it's a wheat that appeals to growers looking to embrace the Sustainable Farming Incentive, utilise integrated pest management and go insecticide free.

Goldfinch has been dubbed the 'insecticide-free wheat', but as Lee points out, this is technically something growers can do with any wheat variety. "The difference with Goldfinch is you can go insecticide free without any risk," he states. "There are

a lot of farmers who don't use insecticides and there are a lot more that don't want to use them, and alongside the SFI payments, the direction of travel is to move away from using them on farm.

"In a situation where there's background BYDV and the insecticide regime is either absent or poorly timed, we're seeing RAGT's Genserus (BYDV resistant) varieties, such as Goldfinch, come to the top and out-perform other varieties.

"Although Goldfinch might not be the highest yielding, it's a safety net which provides yield consistency when adversity would otherwise negatively affect the crop – I think it's a step forward for plant breeding and UK farmers."

RGT Goldfinch is currently in the AHDB Recommended List trial system as a candidate being considered for recommendation this autumn. While trial conditions are undertaken with strict management protocols in place, Lee highlights the variety has the ability to show its true performance when BYDV is present, even at sub-clinical levels, when more susceptible varieties can still leak yield.

"In an insecticide free scenario, its performance will shine through every single time but we just don't see these conditions in official trial situations. In our own trial plots last harvest, which were inoculated with BYDV-carrying aphids, and which received no insecticide treatment, Goldfinch yielded 106%, Skyfall 95% and Extase 92%, in line with the performance of BYDV-resistant varieties in similar trials carried out over the past few years."

RAGT's BYDV-resistant material pipeline utilises Bdv2 genetics which greatly reduce the levels of symptoms the plants express from the virus, explains RAGT's plant breeder, David Schafer. "Goldfinch has come out of a long-term breeding effort which involved incorporating Bdv2,

*“ Trying to compare the likes of Goldfinch with Skyfall is like trying to compare chalk and cheese.”*

*Lee Bennett highlights that Goldfinch is a wheat which appeals to growers looking to embrace the Sustainable Farming Incentive, utilise integrated pest management and go insecticide free.*

originating from a wild wheat progenitor into UK adapted germplasm that'll provide the traits required by UK growers."

It was at the point in the breeding programme that Goldfinch demonstrated bread-making characteristics when its potential as a commercial variety really came through, says David. "We had various material that was showing BYDV resistance, but with Goldfinch's combined bread-making quality and disease characteristics, it had a lot of potential."

So why is BYDV resistance so important? BYDV is an aphid transmitted disease which can result in severe yield losses of up to 60% in susceptible varieties of wheat, according to AHDB figures.

And it's a problem that's getting worse due to climate change, says entomologist, Alan Dewar. "Because of climate change, there's a higher risk of aphids being able to



*Stuart Attridge has been impressed with Goldfinch so far, and says it's a variety that could garner attention for its green characteristics.*

## Scoring high against disease

Andrew Pitts first became aware of Goldfinch shortly after Harvest 2022 and saw it as a great opportunity to further the move towards regenerative farming at The Grange, Mears Ashby in Northampton. "I've had a relationship with RAGT for more than 20 years, growing pre-basic seed, so to be with them at the forefront of plant genetics is really interesting."



*Andrew Pitts saw Goldfinch as a way to support his regenerative farming journey.*

Goldfinch stood out to Andrew due to its Genserus BYDV-resistant genetics alongside its resistance to OWBM, and its capacity as a milling variety. "Its disease characteristics are brilliant – there's just nothing else out there like it."

Andrew's 4.5t of seed was direct drilled into ground which had been two years off wheat, in late September 2023 following a pea crop. "We applied our normal pre-emergence programme based on the level of blackgrass we expect, applied no insecticides and fed the crop 160kgN/ha for yield and another 40kgN/ha for protein."

Because Andrew has grown the crop for pre-basic seed, he applied a far more comprehensive fungicide programme than if he'd been growing it commercially. "If this were a commercial crop it would only have had a T2 at flag leaf and a T3 when the ears emerged. But because this crop was grown to maximise both quality and yield, it's been grown to a different protocol," he explains. "As a commercial crop it would have £30-£40/ha less spent on fungicide inputs."

"It currently looks terrific, having tillered well and has been clean as a whistle all through the season. Protein levels are predicted to be at 13.5% where the crop's been fed appropriately, so I'm expecting it to perform. I'm excited to get the combine into it and compare it with other varieties on farm. I think it's a real step forward and I'm sure there'll be premiums for it commercially, so I'll definitely be growing more next year."

Andrew isn't fazed that Goldfinch isn't the highest yielding milling variety in a treated situation, seeing the potential to save on insecticides, the possibility to reduce fungicide sprays and gain SFI payments as more than outweighing this.

"You couldn't get a better variety agronomically, and the industry has been desperate for a decent low risk milling wheat. The lower cost of production, alongside premiums, will outweigh the lower yield – it's all about gross margin per hectare rather than out-and-out yield."

overwinter as live insects rather than eggs, and their evolved asexual lifecycles are more of an issue than they were previously."

The main species that transmits BYDV is the bird cherry-oat aphid, which is a host alternating aphid, meaning it originally moved between woody primary and graminaceous secondary host plants between winter and summer. "If we were still seeing this happen at 100% across the species, then we wouldn't have the issues

with BYDV that we do now because the adults wouldn't be wintering on cereal crops.

"But it's now more of a problem because it's evolved an asexual lifecycle in temperate areas, so the warmer it is in winter, the more the asexual forms of the species are selected. It's the evolution of this asexual lifecycle that's made BYDV such a problem."

With the past winter having been very mild, Alan points out the proportion of asexual



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# Insider's View: Wheat

► forms of the aphids in the UK are likely higher than they were the previous year. "The lethal temperature is  $-7^{\circ}\text{C}$ , so if there are ground frosts or the air temperature is below this, then the aphids will be killed off. But in mild autumns they're still able to cause the virus to spread before frosts occur."

Alan points out that in barley, BYDV will present as yellow colouring, but in wheat it's reddish to maroon. "It's most prevalent in earlier sown crops rather than later ones, and is more likely to be seen in areas where the aphids have a higher survival rate such as in the South West. In certain areas, a lot of a crop can be lost by sowing early and not controlling the spread of the virus promptly," he says.

"There are also issues surrounding the continued use of chemicals to control aphids such as pyrethroids, whereby

insecticide resistance occurs or non-target organisms are impacted, which is why genetic resistance is so valuable and I believe is the way forward."

However, Alan worries that so long as pyrethroids are so cheap, this could inhibit the uptake of resistant varieties especially where there's a yield lag. "We have to change our mindsets, because if we continue to use chemistry as we have done resistance to insecticides could develop, undermining their benefits."

Alongside its BYDV and OWBM resistance, Goldfinch scores an 8 for mildew, 9 for yellow rust, 9 for brown rust and a 7 for septoria, says Lee. "It's the only variety throughout the whole registration process that showed both juvenile and adult resistance to all the prevalent strains of brown rust."

Goldfinch is of medium height, producing



*As the first variety from RAGT's BYDV-resistant material pipeline, Goldfinch has BDV-2 genetics which reduce the levels of symptoms the plants express from the virus, explains David Schafer.*

plenty of biomass, with good stiff straw and will respond well to PGRs, he adds.

A medium maturing variety, it's most suited to well-bodied land and can be drilled from early September through to the end of November, says Lee. In terms of seed rates, he believes Goldfinch benefits from an increase of 5-10%, or around 25-50 seeds/m<sup>2</sup> more than standard. "This'll allow the crop to produce more ears which will bring the yield with it. Like varieties such as Solstice and RGT Illustrious, Goldfinch tends to produce a measured amount of strong tillers and fewer secondary tillers."

According to Lee, this is why the variety achieves strong grain quality and good proteins. "There's no dilution from secondary tillering and the associated small green grains or their demand for nitrogen. Goldfinch has no issues achieving protein content and isn't hungry for nitrogen. It's regularly achieved a Hagberg in excess of 350 in trials and has provisional Group 2 standing and I'm confident that it's already well liked by millers," he adds.

Stuart Attridge of Harlow Agricultural Merchants has certainly been impressed with Goldfinch so far, noting it's a variety that could garner attention for its green characteristics. "A number of years ago we had a similar instance with KWS Extase where there were a few end consumers that were happy to pay a premium for its greener credentials because it required fewer inputs.

"Both supermarkets and flour users wanted it for its environmental characteristics and we're now seeing an increased demand filtering down for farmers to use fewer inputs."

Although Goldfinch ticks these boxes it also has to achieve the quality required by millers, and from what Stuart has seen so far, he's confident in its potential. "I heard about the variety about eight months ago and it's possibly as good as anything we have.

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"There's a shortfall of milling wheat compared with demand at the moment and we're seeing the premium reflect this, and based on the baking results of Goldfinch we've had, it looks to be very promising for this market," he explains.

Stuart says the issue with new varieties is there's always a lack of volume, so at present there's more demand for Goldfinch than can be supplied. "But after the coming harvest, we'll be able to supply more to millers and get a better picture of how it performs and if it yields on farm. However, based on the information we have so far, it looks very promising especially as the market will likely be moving to support more disease resistant varieties."

Chairman of Marriage's flour millers, George Marriage, also looks favourably on Goldfinch, indicating it could have a place in the grist. "Our focus is on producing consistently performing flour for our customers, so we're interested in quality future bread making wheats.

"Test samples milled from Goldfinch have been assessed in our test bakery

over three years and since 2021, it's performed positively – flour milled from this wheat has produced a good strong dough which was easy to handle, with the finished breads having good shape, oven spring and close texture."

There's a lot of material coming through RAGT's Genserus pipeline for growers to look out for, with feed wheat varieties currently at National List 1 stage and varieties suited to other Groups also coming through experimental breeding programmes in the UK.

According to David, there's a continual drive for improvement in breeding programmes and BYDV resistance is just one branch that's being explored. "We're also looking to combat the stability of production and so our objective is to tackle any and all traits that lead to instability." ■



George and James Marriage note that Goldfinch samples have been assessed in Marriage's test bakery over three years and it's performed positively, with flour milled producing a good strong dough.

## Goldfinch at a glance

Yield (% treated controls)	
UK treated	-
UK untreated	-
East region treated	-
West region treated	-
North region treated	-
Grain quality	
Specific weight (kg/hl)	78.2
Protein content	11.6
Hagberg Falling Number	285
Agronomics	
Lodging without PGR	-
Lodging with PGR (%)	1
Straw length without PGR (cm)	87.8
Ripening (days +/- Skyfall)	+1
Disease resistance	
Mildew	8
Yellow rust	9
Yellow rust (young plant)	R
Brown rust	9
Septoria	7
Eyespot	5
Barley yellow dwarf virus	R
Orange wheat blossom midge	R

Source: RAGT

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