

# KWS UK

2021 Variety Guide

SEEDING  
THE FUTURE  
SINCE 1856





KWS Cranium - pictured front cover  
KWS Tardis - pictured above

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## Introduction

The KWS Variety Guide is a catalogue of cereals, oilseeds, hybrid rye, peas, maize and sugar beet.

The guide is intended to give growers and professional advisers the information needed to guide variety choice based on market suitability, regional performance and some of the practical aspects of management that determine how a variety does on farm.

This year, we've included much more information to help guide more specific choices. This includes end-user requirements of the various market groups, how factors such as drilling date can influence performance, what makes for a good 'late driller' and how new developments in plant breeding such as how tolerance to Barley Yellow Dwarf Virus (BYDV) works and what it offers growers.

All figures in the guide are sourced from the AHDB 2021/22 Recommended List, unless otherwise indicated.



**If you have any questions, or would like any further information on our varieties, please do not hesitate to contact the KWS UK team, see page 6 for details.**

# Your commitment. Your energy. Our applause.



## Thank you

We would like to thank farmers and everyone who is involved in the food supply chain - thank you for your hard work and ensuring we continue to have food on our tables.

[www.kws-uk.com](http://www.kws-uk.com)

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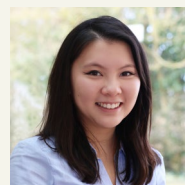
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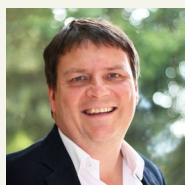
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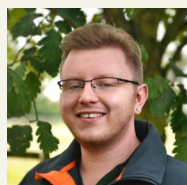
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# Cereals 360 is here!

We've missed seeing you this summer but you can still get all the information you need from our virtual crop tour. Cereals 360 makes it possible to experience all our key varieties of barley, hybrid rye, oilseed rape and wheat.

Meet the exciting experience that provides a virtual crop tour across all of our key varieties of barley, hybrid rye, oilseed rape and wheat!

Learn as you listen to KWS experts talking through our key crop portfolio covering yield, agronomy, end markets and disease resistance whilst watching the crop in the field.

Cereals 360 is accessible wherever, whenever, from the comfort of your own home across computers, or out in the field on tablets and mobile.

Enter the weblink into your device now or scan the QR code to be immersed in the KWS Virtual World; Cereals 360!

Varieties featuring the Cereals360 logo can be viewed in the Virtual World

Visit [www.cereals360.co.uk](http://www.cereals360.co.uk) or scan the QR code below:



**HANDY TIP!**

**When scanning the QR code:** Open your camera, hold your device so the QR code appears in the viewfinder and your device should recognise the QR code and show a notification. Simply tap the notification to open the Cereals 360 link. For Android long-press the Home button and click 'What's on my screen?'



my  
KWS

## myKWS: Service for your seeds

High-quality seeds are the foundation of successful farming. However, to really unleash the full potential of your seeds, area-specific crop management, and holistic decision-making are just as important.

With myKWS, we now can expand our services. The combination of high-quality seeds + regional advice + digital service enables us to provide a firm foundation for important decisions and future paths to successful farming.



More than 50,000 farmers are using myKWS already.

Join in and take advantage of these new opportunities at:  
[www.kws-uk.com/mykws](http://www.kws-uk.com/mykws) or scan the QR code to create your account now!





# SOWING4PEAK PERFORMANCE

## The future of crop production genetics, today

Sowing for Peak Performance (SPP) is KWS's fundamental breeding objective that underpins all cereal genetic development now and into the future.

It's based on the premise that 80% of your crop's potential is locked in by the seed you buy and sow. Whilst of course, you can fine-tune this with the correct Nitrogen levels, using fungicides wisely to protect it from disease, and paying attention to basic management principles but once you've made your variety choice, your production potential is largely set.

So to get the best performance on your farm it is critical that when you choose your variety, you are using a wealth of data to tailor your choice for both your farm and individual field situation.

That's important now and will become increasingly so in the future. We're entering uncharted waters when it comes to crop production in the years ahead with many of the accepted principles and practices, we have taken for granted, increasingly under scrutiny. Much of the chemistry we have come to rely on is slowly being lost to revocation and what we have left is coming under increased resistance pressure. Our use of essential nitrogen is also under pressure due to growing environmental concerns, the challenge of reducing the carbon footprint of crop production generally, and worries over loss of Nitrogen from the system in terms of leaching and release to the atmosphere. Global warming is changing our climate with more extreme weather events predicted and widening variability in growing conditions, often within the same season.

And all this is happening against the backdrop of a global population growing towards 9.0bn in the next 25 years.

## It's time for action!

The way we have produced crops in the past, is not the way we will in the future. What has got us to this point in our agricultural evolution, will not get us to where we need be without substantial changes.

At KWS, we've always been passionate about genetics and the vital role seed plays in the production equation. We're proud of what we have achieved to date and appreciate the key role our genetics can play in responding to the demands of the future.

Working with businesses across the agri-supply chain, we've identified five key needs that growers must address if they are to keep their business profitable and environmentally sustainable in the years ahead. Each of these carries a commitment from KWS to ensure our genetics address these as far as possible.

### 5 key requirements for profitable and sustainable UK crops and how SPP can help now and in the future:

#### 1 To maximise production/profitability from available resources

- Getting the most production from the resources you have available to you is the key to being sustainable.
- KWS provide a range of high yielding varieties with an assortment of specific agronomic traits. Select your variety based on your soil type, growing conditions, locality to market and maximise your yields.





## 2 To achieve effective crop management with reduced windows of opportunity

- Climate change has become a reality for many growers over the last few years with growing conditions not just varying dramatically between the years but also within the same season itself.
- KWS actively select for high resilience so that they can help on-farm, spreading workloads at critical times and buying you time. Note that varieties outside of your different market segments may be used to widen spray windows and harvest timings.

## 3 To achieve optimum crop health without a high level of agronomic interventions

- Striving to breed varieties with high levels of resistance to the most damaging diseases has been a key KWS aim for many years. Our current portfolio is strong proof of this with some of the highest scores for untreated yields, resistance to *Septoria*, Mildew, and Rusts on the RL.
- But if growing a less resistant type for a specific market requirement, adapt your management practices to boost disease resistance e.g. later drilling of wheats will increase *Septoria* resistance scores.

## 4 To reduce amount of all inputs used and associated costs

- It's not just about cutting fungicide spend; by choosing the right variety, you could save more on labour, diesel and machinery wear and tear and, ultimately, replacement.

## 5 To get greater productivity from soils long-term

- Less travel means less potential damage to soils and less time and money spent trying to correct the compaction problems associated with multiple wheelings and carrying out operations in unsuitable conditions.
- From considering how varieties can perform in direct drilled situations through to those that are stiff strawed, variety selection can be tailored to your farm.

## So how can SPP help me today?

Every farm is unique, and each farm business has different goals – which makes variety choice highly personal.

However, by using KWS's SPP ethos, growers can be assured that proactive variety choice will fix 80% of your crop performance. This will pay off, both in cost and time, at time of sowing, during the growing season, and through to harvest.

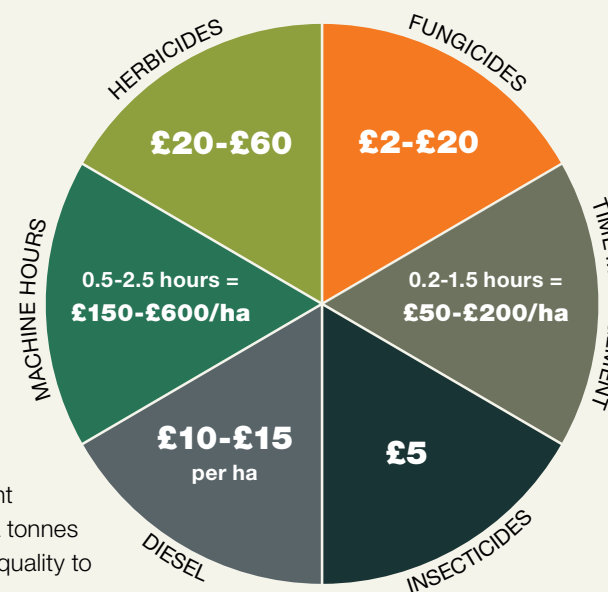


### SAVINGS IN:

- Time management
- Machine hours
- Fungicides
- Herbicides
- Insecticides
- Diesel

### BENEFITS TO YOU:

- Better plant health
- Improved soil quality
- Reduced carbon footprint
- Increased output = extra tonnes
- Higher chance of better quality to attain premiums on offer





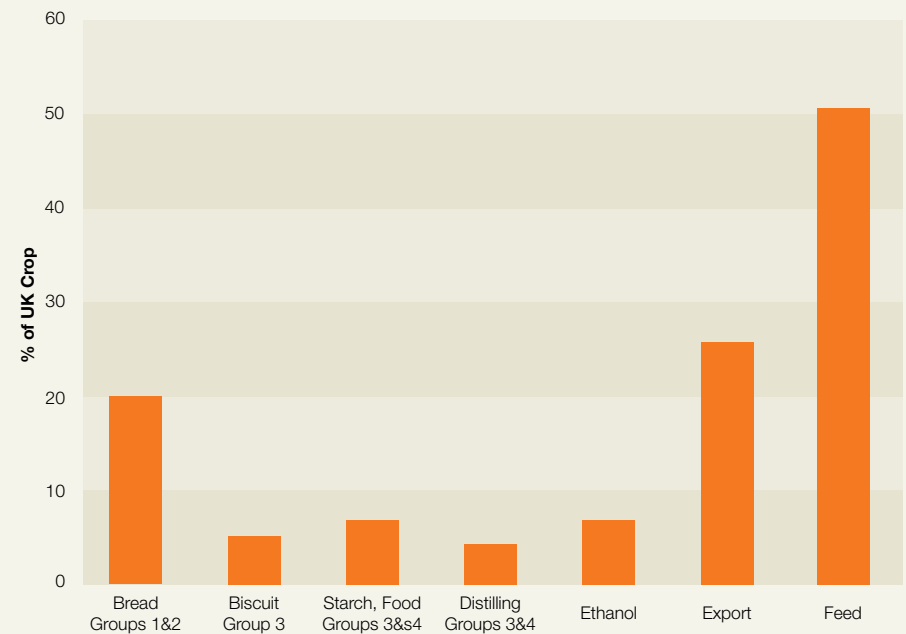
# WHEAT

## Winter Wheat

### Wheat demand

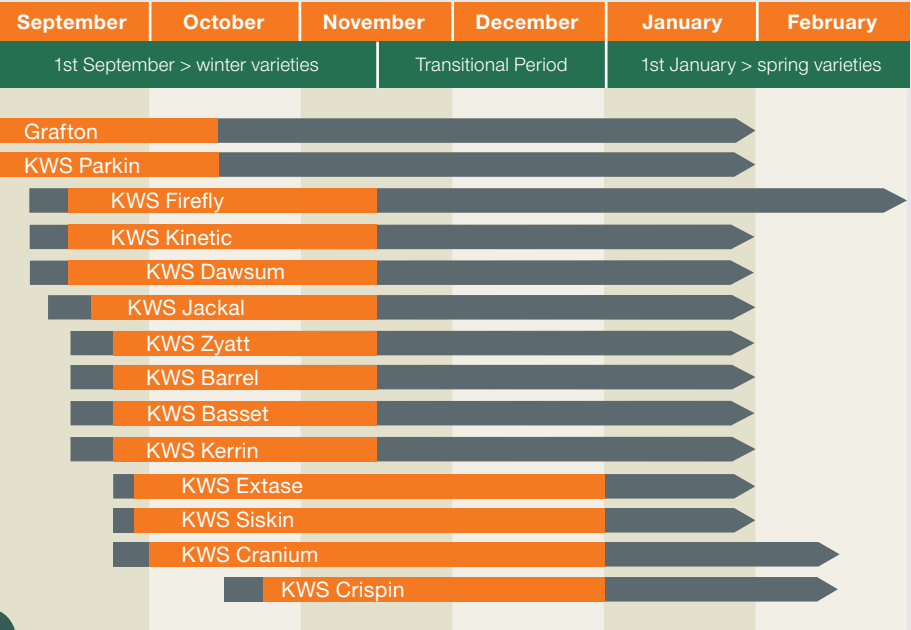
Each year in the UK, flour millers use some 5 million tonnes of wheat to produce over 4 million tonnes of flour, with approximately 60% used for bread making. Pre-packed flour, as seen on supermarket shelves constitutes approximately 4% of the market. Approximately 5.5% of production is exported annually. Other users of flour include the biscuit and cake industries, starch manufacturers, and food ingredient companies (data source: UK Flour Miller). Export and feed make up the balance of the UK wheat crop destination.

**Graph 1: Demand**



Data Source: 5 years average DEFRA Statistics

# Wheat optimum drilling times



Our varieties will perform well up until the official latest safe sowing date, but from our experience the optimum sowing windows are marked in orange and this is when you can expect them to give their peak performance.

When planning your cropping strategy, pick varieties that will give you the best performance based on your unique farm circumstances; sowing date is one key factor but to find out how to get the ultimate peak performance from your cropping strategy see page 10.

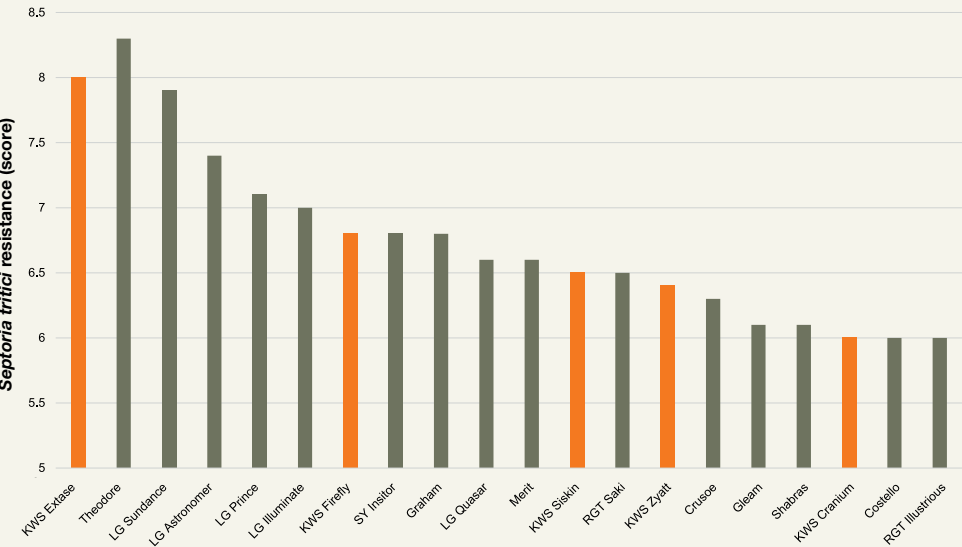
# Key wheat disease considerations

Arguably the most important yield-robbing diseases in winter wheat are *Septoria* and yellow rust. With chemistry starting to drop out of the picture, genetic resistance is becoming a key element in profitable wheat production in the UK. Here we bring you up to date on the latest thinking during this transition period as wheat genetics become considered, by some, as tank-mix partners in their season management.

## Septoria tritici

The most destructive disease in UK wheat, which in extreme cases has been shown to decrease yield by up to 50%. Current resistances are based mostly around plant breeders stacking partial resistant genes, which have cumulative small effects with increased durability as opposed to using major genes. With the loss of Cholorthalonil™ many growers are focusing more than ever on highly resistant varieties such as KWS Extase.

Graph 2: Ranking of winter wheat varieties with a score of 6 and above on UK 2021/22 RL





Varieties like Extase with resistances well above 6.0 offer opportunities to reduce fungicide costs, especially in lower risk seasons and later drillings. More importantly, they help deliver effective disease control in high pressure seasons when critical fungicide timings may slip.





If you want to learn more about how varieties can contribute to the successful control of *Septoria*, then use this QR code to link to our video which highlights the work KWS are involved in and see how chemistry and genetics can work together to best control this disease.



# Yellow rust

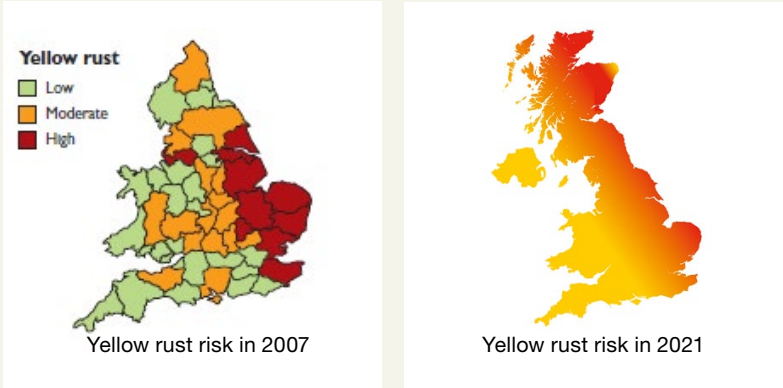
Yellow rust is most important in the East, although in recent years infection has become common across all regions of the UK.

Yield losses of 40-50% often occur in untreated, susceptible wheat varieties. In crops that are early sown there is an increased risk due to exposure to a green bridge from the previous crop and the mild winter weather followed by a humid microclimate. Late sown crops are also more at risk as the plants are smaller throughout the year. While many growers have relied on a well-timed, structured fungicide programmes to control the disease, the potential loss of epoxiconazole based chemistry from 2022 means that genetics may be required to do more of the ‘heavy-lifting’ in yellow rust control.

In the past, Yellow Rust ratings on the RL have been based on a 3-year dataset of adult plant yellow rust resistance. Yellow rust races are dynamic with pathogen race

variations causing a constant threat; the UK Cereals Pathogen Survey, defining current juvenile plant resistance and the new AHDB Yellow Rust Watch List, adds useful layers of information to the largely historic disease information contained in the RL.

KWS supports all these activities as it provides more information for farmers, helping them make the right variety choices for their individual growing situation and to plan their crop management accordingly. We are also excited that the newest addition to our wheat portfolio not only adds yellow rust resilience with OWBM resistance, it also adds high yield potential with seedling yellow rust resistance to the important hard Group 4 market sector.



Source AHDB

	Treated Yield (% controls)	Adult RL YR rating	Adult UKCVPS (% disease)	Seedling resistance
KWS Cranium	104	8	1	Resistant
SY Insitor	104	5	6	Susceptible
KWS Kinetic	103	4	21	Susceptible
Gleam	103	5	9	Susceptible
RGT Gravity	103	7	6	Susceptible
KWS Kerrin	102	4	10	Susceptible
Graham	102	8	1	Susceptible
Costello	99	9	0	Resistant
Theodore	99	9	0	Resistant

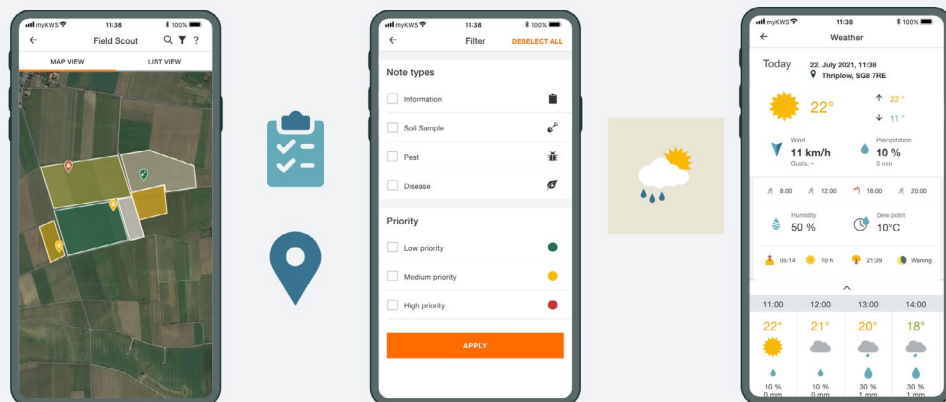
Data source: AHDB Winter Wheat RL, UKCVPS 20/21

## Seed + Service: Increase your yield with the help of myKWS

Get even more with the myKWS app! The use of myKWS and the corresponding app is free of charge. You have free access to all basic functions such as the seasonal expert information, the calculators, and field management. If you would like to use the satellite-based digital services for your KWS varieties, all you need to do is take a photo of your delivery note and register quickly at the beginning of the season.

Create important notes about your site-specific observations on the fields. For example, the detection of pest or disease infestation can be recorded at the exact location with the myKWS app. Use the Field Scout to manage important information and have a better overview of your fields and crops.

myKWS also offers damage symptoms finders, accurate weather data and much more!



### Download now!

Visit [www.kws-uk.com/mykwsapp](http://www.kws-uk.com/mykwsapp) for more information or download directly by scanning the QR codes!

Google Play:



Apple App Store:



## Group 1

Wheat varieties within this sector are those that are used by millers for breadmaking and give year-on-year consistent milling and baking performance. They will achieve a premium if they meet specified quality requirements of 13% protein, 250s Hagberg Falling Number and 76kg/hl specific weight. Premiums for lower specification Group 1s (so called low protein low HFN contracts) may be available – it's always best to check with your local market on their precise requirements.

SPECIFICATION		UK FLOUR MILLERS
	Group 1 Sepcs	UKP Specs
<b>Protein</b>	13%	11.0% - 13.0%
<b>HFN</b>	250	250
<b>Specific weight (kg/hl)</b>	76.0	76.0
<b>Max. moisture content (%)</b>	15%	14%
<b>Max. admix</b>	2%	2%
<b>W</b>	-	Min. 170
<b>P/L</b>	-	Max. 0.9

## Group 1 varieties

### KWS ZYATT



#### Details

Group	Year Listed	UK treated yield	Parentage
1	2017	98%	Hereford x KWS Quartz

#### Comments

KWS Zyatt is the highest yielding Group 1 on the Recommended List. Commercial experience in the mill and bakery has shown the variety delivers excellent protein functionality, making it suitable for use in a wide range of bread applications. A specific weight of 77.8 kg/hl, a HFN of 267 seconds and a milling specification protein of 13.1%, combined with its group-leading yield across all regions and soil types and its UKP export-approved status, make it the leading Group 1 wheat.

KWS Zyatt has one of the highest untreated yields of all Group 1 varieties, at 79% of the treated controls. Its combination of good all-round disease resistances, including a score of 6.4 for *Septoria tritici*, 5 for yellow rust and 6 for brown rust make it a compelling variety proposition. KWS Zyatt now has a strong on-farm following for its second wheat performance, and when combined with its disease resistance, stiff straw, and mid-maturity it is the stand-out variety for both first and second wheat positions.



# KWS Zyatt – use your loaf

In today's challenging times, finding the best local market and the right variety to fulfil it will be crucial for growers looking to maximise their farm's potential. To achieve this, those close to a flour mill or port should have KWS Zyatt earmarked as one of their top varieties to consider growing this autumn.

Since being added to the AHDB Recommended List in 2017, it has earned a reputation as a consistent performer in the Group 1 sector. Moreover, KWS Zyatt's excellent physical grain package is supported by its tried and tested results from the UK baking industry, where it has been shown to deliver a wide range of good quality end-use products.

Yields are 1% ahead of the next best Group 1 milling wheat and in the AHDB East and West where over 80% of Group 1 plantings can be found, it delivers consistently high yields.

But there's more to KWS Zyatt than just milling performance. For those looking for a wheat that performs well in the second wheat slot or one with a good, balanced disease package then Zyatt will be a good option.

KWS Zyatt is stiff strawed and has solid eyespot resistance, appearing to be one of those varieties that is a naturally good second cereal. Its grain quality is strong, therefore its seed rates can be pushed without compromising grain quality. As well as topping its group for treated and untreated yields, and an impressive 6.4 for *Septoria tritici*, its scores put it amongst the most disease-resistant varieties on the Recommended list.

*"KWS Zyatt has impressed us with its consistently good baking performance and versatility across a range of applications."*

**Shaun Taylor**  
Technical Director of  
Hovis Bakeries

Varieties featuring the  
Cereals360 logo  
can be viewed on the  
KWS Virtual World  
[www.cereals360.co.uk](http://www.cereals360.co.uk)

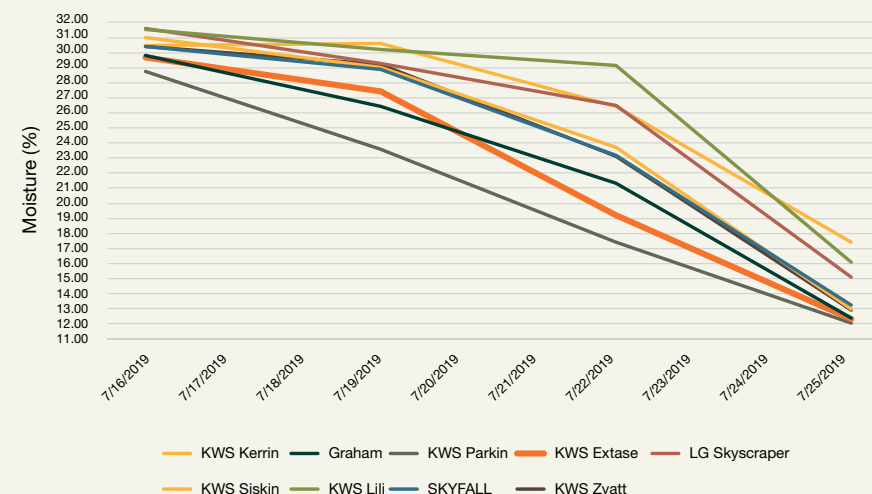


## Group 2

Varieties in Group 2 are routinely used in the bakery for breadmaking, but also may have other bakery applications too. As a result, they may have specific end-use characteristics which are not suited to all grists. Consequently, these varieties are likely to attract varying market prices. Lower protein Group 2 wheats are also widely used by millers, but will attract variable premiums - it's always best to check with your local market on their precise requirements.

SPECIFICATION			UK FLOUR MILLERS
	Group 2 Specs	UKP Specs	
Protein	12.5%	11.0% - 13.0%	
HFN	250	250	
Specific weight (kg/hl)	76.0	76.0	
Max. moisture content (%)	15%	14%	
Max. admix	2%	2%	
W	-	Min. 170	
P/L	-	Max. 0.9	

Graph 2: Drydown of Milling Wheats (Group 1 & 2) in KWS trials, Harvest 2019



Data Source: KWS Trials, Harvest 2019



## Group 2 varieties

KWS EXTASE		AHDB RECOMMENDED		360	
Details					
Group	Year Listed	UK treated yield	Parentage		
2	2019	100%	Boisseau x Solheio		
Comments					
<p>Arguably the most exciting variety to come on to the Recommended List since the turn of the millennium, KWS Extase is the best example of the new generation of wheats that combine market value, high yield and outstanding disease resistance.</p> <p>A specific weight of 78.4 kg/hl, a HFN of 299 seconds – the highest score for both characteristics of any Recommended breadmaking wheat– and a milling specification protein of 12.7% make it the outstanding choice in this market group. It is also the only Group 2 variety to be supported by a buy-back contract for full milling specification through to lower protein flours by a national miller.</p> <p>Its exceptional untreated yield of 95% of treated controls is 5% ahead of the next best-performing variety and owes much to its unprecedented resistance to <i>Septoria tritici</i>. For which it has a score of 8.0 and was the first UK variety to be awarded a score over an 8.0. KWS Extase also boasts an 8 for yellow rust and a 7 for brown rust.</p> <p>KWS Extase is a French-bred, quality wheat that is performing well across northern Europe. It brings new genetics to the UK, but just as with Skyfall, it fits well with the conditions we have. With stiff, strong straw and as one of the earliest maturing varieties on the RL (see graph 2 on page 23) it will appeal strongly to those in the East and those looking for complementary varieties to spread the harvest workload. This maturity and good wet-weather disease resistance will also support its appeal to those in the West and North.</p> <p>Its speed of movement through stem extension is faster than average and closer to that of varieties such as Gallant, so growers will want to prioritise it ahead of others when planning spring fertiliser schedules.</p> <p>Care must be taken in planning sowing to make the biggest advantage of earliness. Sowing later maturity crops before earlier ones can nullify an advantage. We would suggest sowing KWS Extase before KWS Siskin. Early maturity is a key characteristic for any milling type, ensuring that grain quality is preserved, especially in a catchy harvest.</p> <p>Since the 20th May 2020 you can no longer apply chlorothalonil, which puts a hole in <i>Septoria</i> control for many growers. Increasingly good genetics are being realised on farm as a key part of the solution, with KWS Extase being the variety of choice for many. KWS recommend a spray programme tailored to the situation and season with at least two modes of action in each tank-mix at the two main timings. Growers are urged to protect the genetics, so preserving KWS Extase as a key variety on-farm today and in the future.</p>					

Thanks to KWS Extase's early maturity, it will be one of the first varieties to be ready and its good grain quality package will benefit growers at harvest. Experience in KWS trials at Thriplow in 2019 and 2020, again showed KWS Extase being earlier to mature than current Group 1 wheats Skyfall and KWS Zyatt.

Fast movement has been recorded time after time in KWS trials – crops should be carefully monitored and expectations of calendar growth stages avoided. The pictures below illustrate KWS Extase's competitive ear emergence compared to other Group 2 varieties.



KWS Extase



Cordiale



KWS Lili





## The growers experience

“On paper, KWS Extase looked like an exciting new addition to the 2019/20 RL, and having drilled it in autumn 2018, its performance did not disappoint. This harvest yielded well, ranging from 11.9 - 12.6 t/ha with an excellent sample of great looking wheat. What's more, we sold loads into our local miller at full Group 2 specification. With the disease pressures ahead, KWS Extase is certainly a key variety we will be drilling this season and beyond.

“It was spotlessly clean - the cleanest variety I've seen - although you still get a decent return from what you invest in it. I could tell it was a different variety when it emerged - we'd put it in a heavy bit of dirt and expected large losses. But, oh my God, in the spring it flew out of the blocks. It's a very vigorous variety, and drilled at the end of Sept, early Oct, I'd say no more than 350 seeds/m<sup>2</sup>

is about right - around 25 seeds/m<sup>2</sup> less than you'd want for KWS Siskin.”

**Andrew Robinson**  
Toddington Farms,  
Bedfordshire

## The millers experience

“Since issuing the buy-back contracts in 2019, we've been pleased with the response from growers who have made commitments going forward. We've seen some good results in the mill and are pleased to be able to offer growers ample opportunities to make a quality premium, even at a low protein. Our contracts are for either full spec 13% with fallbacks down to 12% or min 11.5% protein with fallbacks to 11%.”

**George Mason**  
Senior Grain Buyer  
at Heygates Milling

KWS SISKIN

AHDB

RECOMMENDED

360

Details

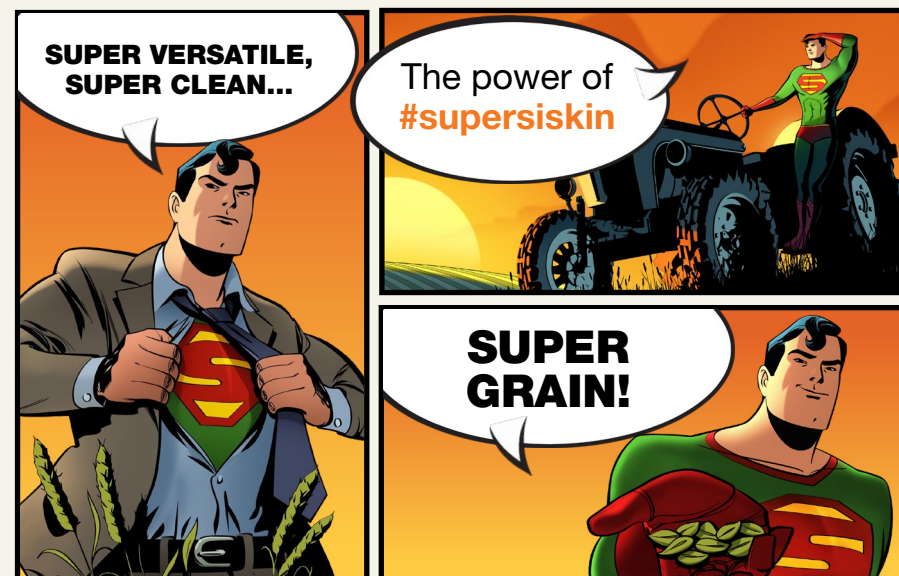
Group	Year Listed	UK treated yield	Parentage
2	2016	100%	KWS Sterling x Timaru

Comments

KWS Siskin is one of the most adapted varieties for use in modern farming. With an ultra-wide sowing window, it is the ideal variety for enabling competitive winter cropping and countering black-grass. An impressively strong disease profile and a grain that is widely accepted by end-users at all protein levels, KWS Siskin is a versatile variety that fits a range of situations and fills many requirements.

A strong yielder across all regions and consistent performer across the seasons, it is popular as a quality wheat and as a feed. A specific weight of 76.9 kg/hl, a HFN of 289 seconds and a milling specification protein of 12.7% make it an attractive variety for domestic and export markets where the UKP brand is recognised.

Another variety with a strong disease resistance profile, it has an untreated yield of 80% of treated controls due in large part to strong *Septoria tritici* and yellow rust resistance for which it scores a 6.5 and a 9 respectively. Importantly, KWS Siskin is one of the few varieties on the current RL to have juvenile plant resistance to yellow rust. Its vigorous growth habit makes it well-suited to later drilling, while still offering medium maturity.





## Group 3

This Group contains soft varieties for biscuit, cake and other flours where the main requirement is for soft milling characteristics. Group 3 wheats are unique to the UK, they have inherently lower protein with good extraction rates and good extensibility but not too elastic gluten. At the right specification, UK Group 3s ensure that the nations biscuits are not too chewy, stay the right shape during baking and that the right number of biscuits are produced for each packet. These varieties are uniquely grown in the UK environment and are desired by continental millers for use in biscuit and flatbread production; hence many Group 3 wheats have the UKS brand for export.

SPECIFICATION		UK FLOUR MILLERS
	Group 3 Sepcs	UKS Specs
Protein	11.5%	10.5% - 11.5%
HFN	220	220
Specific weight (kg/hl)	74.0	75.0
Max. moisture content (%)	15%	14%
Max. admix	2%	2%
W	-	70 - 120
P/L	-	Max. 0.55

In addition, thanks to the lower protein, higher starch ratio of these softer milling types, many Group 3s also have opportunities in the wheat distilling sector.



## Group 3 varieties

KWS BARREL		AHDB RECOMMENDED	Comments
Details			
Group	3		A high yielding Group 3 variety on the Recommended List and joint highest yielding soft wheat variety in the North where it has become firmly established on farm, KWS Barrel is UKS approved and orange wheat blossom midge (OWBM) resistant. A specific weight of 77.2 kg/hl, a HFN of 234 seconds and protein of 11.4%. KWS Barrel has a reasonable disease package, except to <i>Septoria tritici</i> which will need watching. It has delivered its best performances on light land and also performs well as a second cereal where it yields above the average of controls.
Year Listed	2016		
Treated Yield	100%		
Parentage	Bantam x Viscount		

KWS BASSET			Comments
Details			
Group	3		A solid and reliable variety across all regions, sites and years, KWS Basset is a UKS export approved variety with orange wheat blossom midge (OWBM) resistance. The highest specific weight of any Group 3 variety at 77.5 kg/hl, a high HFN of 235 seconds and a protein of 11.6% support its reputation for excellent grain quality. KWS Basset has good straw strength and is of average height at 85cm. Its disease resistance is average except for <i>Septoria tritici</i> and brown rust, both of which will need watching.
Year Listed	2016		
Treated Yield	98%		
Parentage	Cassius x Scout		

No longer Recommended, data source: AHDB Winter Wheat Recommended List 2020/21







## KWS Firefly – flexibility with a touch of magic!

### Looking for a variety to help schedule your workload on-farm this year?

Then look no further than KWS Firefly - a high tillering, very stiff type with early maturity, it will work well for those who are drilling in September, whilst offering those on heavy land the excellent stem stiffness needed to deliver secure high yields in later drilled first or second wheat slots.

Fully approved by nabim as soft Group 3, KWS Firefly delivers a strong grain package with the correct balance of resistance and extensibility required and is widely accepted by the UK's biscuit houses. It's biscuit credentials have also found favour with the continental millers and KWS Firefly is approved for export as UKS. Add this to excellent yield performance in the East, where over 70% of the UK's biscuit wheats are grown. In KWS Firefly, you get a first-choice variety for growers looking to capture several premium markets in this region.

5 reasons why you should grow KWS Firefly for harvest 2022:

- Very wide sowing window, from September right through to the end of February
- Excellent resistance to *Septoria tritici* (6.8)
- One of the stiffest varieties on the market - today (twin 8s for standing)
- Resistant to OWBM
- Added market opportunities for biscuit or export

### KWS FIREFLY



#### Details

Group	Year Listed	UK treated yield	Parentage
3	2019	101%	Cougar x KWS Rowan

#### Comments

KWS Firefly is a biscuit wheat that in the last year has transformed the Group 3 sector for both farmers and end users alike. Roughly 75% of biscuit wheat is grown in the East of England, but KWS Firefly's high yields across Great Britain combined with its strong disease resistance and stiff straw will support its appeal in the West and North of England.

It has a specific weight of 75.6 kg/hl and a protein of 12.0%. KWS Firefly has stiffer straw (with or without a PGR) than any other Group 3 variety and at 83cm is one of the shortest Group 3s on the market today. KWS Firefly is resistant to orange wheat blossom midge (OWBM).

Its all-round disease resistance is outstanding with a 6.8 for *Septoria tritici*, a 7 for yellow rust and a 5 for brown rust which support an untreated yield of 80% of treated controls. It has maturity similar to that of KWS Barrel.

At 243 seconds KWS Firefly is one of the best Group 3s for HFN and has consistently delivered high HFN across several years of official trials. It has performed strongly in both first and second cereal situations with slightly stronger performances on heavier land. It is suitable for early drilling although its best performances have followed October sowings.

## Growers experience

"The first thing we look for in a variety is OWBM resistance, which KWS Firefly has. It also had good scores against *Septoria*, good straw stiffness and it offered good performance across a range of soils, which is also important to us. Last year we grew it as a first, second and third wheat and it did well in every situation. We never looked back from drilling. And when it came to harvest it out-yielded all Group 4 hard wheats on the farm."

**Henry Ruffle**  
Moat Farm, Ipswich



# Winter Wheat Recommended List 2021/22, Groups 1, 2 & 3

## Page 1

	KWS Zyatt	Skyfall	Crusoe	RGT Illustrious	KWS Extase	KWS Skakin	LG Detroit	LG Prince	LG Illuminate	LG Quasar	KWS Firefly	Merit	LG Astronomer	KWS Barrel	Elicit
End-use group	UKFM Group 1				UKFM Group 2			UKFM Group 3							
Scope of recommendation	UK	UK	UK	UK	UK	UK	E&W	UK	UK	UK	UK	E	UK	UK	UK
	C				C			*	NEW	NEW	NEW		NEW	NEW	C
Fungicide-treated grain yield (% treated control)															
United Kingdom (10.8 t/ha)	98	97	96	96	100	100	99	103	102	102	101	101	101	100	99
East region (10.7 t/ha)	98	97	96	95	100	99	99	104	102	102	102	103	102	100	99
West region (10.9 t/ha)	99	97	97	97	101	100	99	102	101	101	101	99	100	100	99
North region (11.0 t/ha)	97	96	93	94	98	98	93	[100]	[102]	[101]	98	[100]	[98]	103	100
Main market options (The specific attributes of varieties are different, so, whenever possible, varieties should not be mixed in store)															
UK bread-making	Y	Y	Y	Y	Y	Y	Y	-	-	-	-	-	-	-	-
UK biscuit, cake-making	-	-	-	-	-	-	-	Y	Y	Y	Y	Y	Y	Y	Y
UK distilling	-	-	-	-	-	-	-	[Y]	[Y]	[Y]	-	[Y]	[Y]	-	Y
ukp bread wheat for export	Y	-	Y	-	Y	Y	Y	-	-	-	-	-	-	-	-
uks soft wheat for export	-	-	-	-	-	-	-	-	[Y]	[Y]	Y	[Y]	-	Y	Y
Grain quality															
Endosperm texture	Hard	Hard	Hard	Hard	Hard	Hard	Hard	Soft	Soft	Soft	Soft	Soft	Soft	Soft	Soft
Protein content (%)	12.4	12.5	13.0	12.4	12.1	12.0	12.5	11.3	12.0	11.6	12.0	11.7	11.9	11.4	11.8
Protein content (%) - Milling spec	13.1	13.2	13.6	13.0	12.7	12.7	13.1	[11.3]	[12.4]	[12.0]	12.5	[12.1]	[12.4]	12.0	12.4
Hagberg Falling Number	267	279	274	277	299	289	283	250	251	212	243	255	238	234	213
Specific weight (kg/hl)	77.8	78.4	77.9	77.2	78.4	76.9	77.6	74.8	76.6	75.4	75.6	76.5	77.8	77.2	76.8
Chopin Alveograph W	177	-	220	-	191	162	218	[74]	84	87	91	87	[134]	101	90
Chopin Alveograph P/L	0.7	-	0.6	-	0.6	0.5	0.7	[0.3]	0.3	0.3	0.3	0.2	[0.4]	0.4	0.3
Untreated grain yield (% treated control)															
United Kingdom (10.8 t/ha)	79	74	69	80	93	80	75	83	85	82	80	80	86	71	78
Agronomic features															
Resistance to lodging without PGR (1-9)	7	8	7	7	7	6	8	[7]	[7]	[7]	8	[7]	[7]	7	7
Resistance to lodging with PGR (1-9)	8	8	8	8	8	7	8	8	8	8	8	7	8	8	8
Height without PGR (cm)	84	83	81	89	90	84	86	83	82	89	83	88	88	84	85
Ripening (days +/- Skyfall, -ve = earlier)	0	+0	+0	+1	-1	+0	+1	+2	+1	+2	+1	+1	+1	+1	+0
Resistance to sprouting (1-9)	5	5	6	6	[7]	5	[6]	[6]	[7]	[6]	[6]	[6]	[6]	6	[5]
Disease resistance															
Mildew (1-9)	7	6	6	7	7	7	6	4	5	6	5	3	4	6	6
Yellow rust (1-9)	5	3	9	8	8	9	8	8	7	6	7	8	9	7	8
Brown rust (1-9)	6	8	3	6	7	5	5	8	8	8	5	8	9	5	6

# Winter Wheat Recommended List 2021/22, Groups 1, 2 & 3

## Page 2

	KWS Zyatt	Skyfall	Crusoe	RGT Illustrious	KWS Extase	KWS Sixkin	LG Detroit		LG Prince	LG Illuminate	LG Quasar	KWS Firefly	Merit	LG Astronomer	KWS Barrel	Elicit
End-use group	UKFM Group 1				UKFM Group 2			UKFM Group 3								
Disease resistance (continued)																
Septoria tritici (1-9)	6.4	5.8	6.3	6.0	8.0	6.5	5.4		7.1	7.0	6.6	6.8	6.6	7.4	4.2	5.1
Eyespot (1-9)	7@	6@	5	6@	[4]	5	[5]		[5]	[5]	[4]	[4]	[4]	[5]	4	4
Fusarium ear blight (1-9)	6	7	6	6	6	5	7		6	5	6	5	6	6	6	6
Orange wheat blossom midge	-	R	-	-	-	-	R		R	R	R	R	R	R	R	R
Breeder/UK contact																
Breeder	KWS	RAGT	Lim	R2n	Mom	KWS	LimEur		LimEur	LimEur	LimEur	KWS	ElsW	LimEur	KWS	ElsW
UK contact	KWS	RAGT	Lim	RAGT	KWS	KWS	Lim		Lim	Lim	Lim	KWS	Els	Lim	KWS	Els
Annual treated yield (% control)																
2016 (11.0 t/ha)	98	96	95	92	99	99	99		-	-	-	100	-	-	101	102
2017 (11.1 t/ha)	101	98	96	97	99	99	99		-	-	-	102	-	-	101	98
2018 (10.5 t/ha)	98	98	96	97	101	101	98		102	102	101	101	102	101	99	98
2019 (11.5 t/ha)	96	96	99	95	101	100	101		103	102	101	102	101	102	101	99
2020 (10.0 t/ha)	97	96	94	97	99	97	96		103	102	103	100	101	100	102	98
Rotational position																
First cereal (11.1 t/ha)	98	97	96	95	100	100	98		102	102	102	101	101	101	101	99
Second and more (9.5 t/ha)	99	97	95	95	101	98	99		104	102	100	101	102	100	100	100
Sowing date (most trials were sown in October)																
Early sown (before 25 Sept) (11.0 t/ha)	[102]	97	95	98	-	101	-		[106]	[109]	-	103	-	[105]	99	100
Late sown (after 1 Nov) (9.5 t/ha)	97	97	95	95	101	99	98		[106]	[103]	[103]	101	[105]	[101]	101	97
Soil type (about 50% of trials are on medium soils)																
Light soils (10.8 t/ha)	97	97	94	93	101	98	97		[103]	[102]	[101]	101	[101]	[99]	101	99
Heavy soils (10.9 t/ha)	99	97	97	96	100	100	101		103	103	102	103	103	103	100	99
Agronomic features																
Lodging % without PGR	4	2	3	4	4	21	2		4	3	7	2	11	3	3	6
Lodging % with PGR	1	2	2	1	1	7	3		4	4	3	1	4	1	2	3
Latest safe-sowing date #	End Jan	End Feb	End Jan	Mid Feb	End Jan	End Jan	End Jan		[[End Jan]]	[[Mid Feb]]	[[End Feb]]	End Feb	[[Mid Feb]]	[[Mid Feb]]	End Jan	Mid Feb
Speed of development to growth stage 31 (days +/- average)																
Early sown (Sept)	-2	-2	+1	+0	-3	-7	+6		-	-	-	-2	-	-	+5	-2
Med sown (Oct)	-4	-3	+0	+2	-6	-5	+2		-	-	-	-3	-	-	-2	+2
Late sown (Nov)	-2	-2	+0	+0	-3	-2	+1		-	-	-	+0	-	-	+2	+2
Status in RL system																
Year first listed	17	14	12	16	19	16	19		21	21	21	19	21	21	16	18
RL status	-	-	-	-	-	-	*		P1	P1	P1	-	P1	P1	-	-





## Soft Group 4

These are feed varieties that may or may not have additional end-use opportunities – some have tested positive for distilling whilst others may be suitable for soft milling applications on the continental market. It is always worth checking with your local merchant to fully understand the specification your end user customer requires.



## Soft Group 4 Varieties

KWS JACKAL		AHDB RECOMMENDED	Comments
Details			
Group	4 Soft		KWS Jackal is the soft wheat of choice for those who favour early drilling. It performs impressively wherever sown, but it excels in the North and East regions where it will be closest to end-user demand and its SWRI approval supports its appeal to those supplying distilling contacts. For whom it is also a good partner variety to KWS Barrel. It performs strongly as both a first and second cereal and also on light and heavy soils. Its disease resistance is average with an exceptional score for yellow rust of 9, but low scores for <i>Septoria tritici</i> of 4.8 which will need watching. KWS Jackal carries orange wheat blossom midge (OWBM) resistance.
Year Listed	2018		
Treated Yield	100%		
Parentage	KWS Santiago x KWS W177		



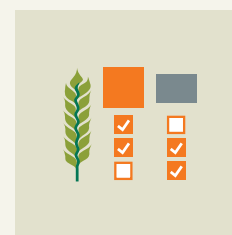
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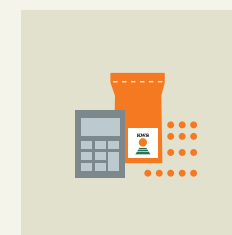
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	LG Skyscraper	RGT Saki	LG Spotlight	Elation	Swallow	KWS Jackal	LG Sundance
End-use group	Soft Group 4						
Scope of recommendation	UK	UK	UK	N	N	N	UK
				C	NEW		*
Fungicide-treated grain yield (% treated control)							
United Kingdom (10.8 t/ha)	105	104	103	101	100	100	100
East region (10.7 t/ha)	105	104	102	101	100	100	99
West region (10.9 t/ha)	104	104	104	101	100	100	100
North region (11.0 t/ha)	103	102	101	101	[102]	101	99
Main market options (The specific attributes of varieties are different, so, whenever possible, varieties should not be mixed in store)							
UK bread-making	-	-	-	-	-	-	-
UK biscuit, cake-making	-	-	-	-	-	-	-
UK distilling	[Y]	-	[Y]	Y	Y	[Y]	[Y]
ukp bread wheat for export	-	-	-	-	-	-	-
uks soft wheat for export	-	-	-	Y	-	-	-
Grain quality							
Endosperm texture	Soft	Soft	Soft	Soft	Soft	Soft	Soft
Protein content (%)	11.6	11.6	11.5	11.8	11.3	11.3	11.5
Protein content (%) - Milling spec	12.2	12.0	12.1	12.4	[11.9]	12.0	12.1
Hagberg Falling Number	214	227	288	210	245	185	178
Specific weight (kg/hl)	76.8	75.9	78.0	77.2	76.3	75.5	73.8
Chopin Alveograph W	-	-	[73]	95	-	[76]	[101]
Chopin Alveograph P/L	-	-	[0.4]	0.3	-	[0.3]	[0.3]
Untreated grain yield (% treated control)							
United Kingdom (10.8 t/ha)	81	85	78	75	79	73	83
Agronomic features							
Resistance to lodging without PGR (1-9)	7	7	7	7	[8]	7	6
Resistance to lodging with PGR (1-9)	7	7	8	8	9	7	7
Height without PGR (cm)	92	88	93	82	79	87	87
Ripening (days +/- Skyfall, -ve = earlier)	+0	+3	+1	+1	+0	+1	+2
Resistance to sprouting (1-9)	[5]	[6]	[7]	[6]	[5]	[5]	4
Disease resistance							
Mildew (1-9)	7	5	6	7	5	7	7
Yellow rust (1-9)	8	8	6	8	6	9	9

	LG Skyscraper	RGT Saki	LG Spotlight	Elation	Swallow	KWS Jackal	LG Sundance
End-use group	Soft Group 4						
Disease resistance (continued)							
Septoria tritici (1-9)	5.1	6.5	5.2	4.1	5.7	4.8	7.9
Eyespot (1-9)	[4]	[5]	[5]	4	[3]	4	3
Fusarium ear blight (1-9)	7	6	6	6	5	6	6
Orange wheat blossom midge	R	R	R	R	R	R	R
Breeder/UK contact							
Breeder	LimEur	RAGT	LimEur	ElsW	BA	KWS	LimEur
UK contact	Lim	RAGT	Lim	Els	Sen	KWS	Lim
Annual treated yield (% control)							
2016 (11.0 t/ha)	108	-	104	101	-	102	102
2017 (11.1 t/ha)	105	104	104	101	-	101	98
2018 (10.5 t/ha)	102	102	99	100	100	100	101
2019 (11.5 t/ha)	104	104	102	100	100	100	99
2020 (10.0 t/ha)	103	105	103	102	102	101	99
Rotational position							
First cereal (11.1 t/ha)	104	104	103	100	101	101	100
Second and more (9.5 t/ha)	104	104	101	102	100	101	100
Sowing date (most trials were sown in October)							
Early sown (before 25 Sept) (11.0 t/ha)	[[103]]	[108]	101	101	[105]	102	97
Late sown (after 1 Nov) (9.5 t/ha)	103	[105]	101	101	[100]	101	98
Soil type (about 50% of trials are on medium soils)							
Light soils (10.8 t/ha)	104	103	102	102	[101]	100	99
Heavy soils (10.9 t/ha)	105	103	103	100	100	101	100
Agronomic features							
Lodging % without PGR	9	11	5	5	0	6	13
Lodging % with PGR	10	4	2	2	0	9	12
Latest safe-sowing date #	End Jan	[End Jan]	End Feb	Mid Feb	[[End Feb]]	End Jan	End Jan
Speed of development to growth stage 31 (days +/- average)							
Early sown (Sept)	-5	[+8]	-4	+0	-	+5	+9
Med sown (Oct)	+0	[+1]	-3	-1	-	+3	+3
Late sown (Nov)	-4	[0]	-1	-1	-	+1	+3
Status in RL system							
Year first listed	19	20	19	18	21	18	17
RL status	-	P2	-	-	P1	-	*





## Hard Group 4

Grown mainly as feed wheats but some may be used by millers in general purpose grists if they achieve contractual standards. Hence it's always a good idea to choose varieties with a robust grain package for protein, HFN and specific weight. It is also worth checking with your local merchant to fully understand the specification your end user customer requires. Growers should take care and avoid mixing hard and soft types in store.

## Hard Group 4 Varieties

GRAFTON		
Details		Comments
Group	4 Hard	A popular and established variety that reliably does better on farm than its performance in official trials suggested. It does well in the North where its suitability to early drilling and heavy land has earned it a strong following. It does well as a second wheat and is early to mature, making it a suitable entry crop for oilseed rape. Reasonable all-round disease resistance and short straw. Not suited to late autumn drilling. Exercise caution with PGRs.
Year Listed	2009	
Treated Yield	No longer on RL	
Parentage	Cordiale x W97	

KWS CRISPIN		
Details		Comments
Group	4 Hard	The ideal late driller for those wanting a high yielding variety for sowing after root crops or seeking to delay drilling deep into the autumn. Like its parent Conqueror, it has a vigorous growth habit which sees it establish itself quickly after sowing. A specific weight of 77.0 kg/hl is among the best of the hard feeds while its HFN is equally respectable at 273 seconds. A short and stiff strawed variety, KWS Crispin has excellent resistance to yellow rust but a <i>Septoria tritici</i> score of 5.9 means it should be among those prioritised come spring fungicides. KWS Crispin is resistant to orange wheat blossom midge (OWBM) and has excellent physical grain quality.
Year Listed	2016	
Treated Yield	No longer on RL	
Parentage	Conqueror x Timaru	

Data sources: AHDB Recommended List, Winter Wheat 2018/19 and 2020/21

KWS KERRIN		
Details		Comments
Group	4 Hard	A solid and reliable variety across the East and North regions, both heavy and light land sites and across contrasting years, KWS Kerrin was the stand-out performer in harvest 2018 being one of only two varieties to yield in line with its long-term average. A specific weight of 76.2 kg/hl, a HFN of 148 seconds and a protein of 10.9%. It is a KWS Santiago cross and, like its parent, is resistant to orange wheat blossom midge (OWBM) and performs consistently over sites and seasons.
Year Listed	2017	
Treated Yield	102%	
Parentage	KWS Santiago x KWS W177	

KWS KINETIC		
Details		Comments
Group	4 Hard	KWS Kinetic is an impressive hard feed with a high yield, very stiff straw, mid maturity and OWBM resistance. It has good physical grain quality with a specific weight to rival the best of the Recommended List at 78.5kg/hl. This is complemented by a high HFN of 267 seconds and a protein of 11.5%.
Year Listed	2020	
Treated Yield	103%	KWS Kinetic is a high input, high output variety for those who value short stiff wheats. The <i>Septoria</i> score is 5.3 and a yellow rust score of a 4.3 does not reflect what has been seen in high yellow rust prone areas. Good mildew and brown rust scores of 6.0.
Parentage	Reflection x KWS Silverstone	

## KWS PARKIN



### Details

Group	Year Listed	UK treated yield	Parentage
4 Hard	Not added to RL	102%	Reflection x Costello

### Comments

Falling just short of making it onto the 2020/2021 Recommended List, our latest wheat addition could be overlooked by some – but this small and mighty variety could offer growers something truly unique this autumn.

With the wet weather in both autumn 2019 and 2020 still at the front of many minds, a variety suited to early drilling could be top on many UK farmers wish lists; and for those looking to get quick off the mark then KWS Parkin is the ideal choice. It can be drilled across a range of soil types although its best yield performances may come from heavier soils. And from our own trials we've seen that it is highly suitable for both first and second wheat positions.

To get the best out of KWS Parkin, growers should consider drilling this variety before the 25th September. In AHDB and KWS trials, it was in this relatively early slot that the true yield potential of KW Parkin was realised and the variety significantly out-performed well-known barn fillers.

Parkin's other stand out feature is its height, at 78.6cm, it's an impressive 15cm shorter than the tallest variety on the RL and super stiff too. Since the demise of Grafton and Cordiale, over the last 5-10 years or so we've really seen a gap in the market for this type of variety. Today farmers are looking for agronomic tools like KWS Parkin that are short and stiff enabling PGR applications to be simplified and introducing flexibility into spray windows, allowing them to be safely widened to when workloads or weather conditions permit. It's the obvious choice for growers in the East and Yorkshire on more fertile soils and those that use manures and digestate.

In official AHDB trials KWS Parkin's score for ripening came in at -1 compared with Skyfall at 0. Taking a look at the latest Recommended List, you will see that growers options for early maturity are limited; unlike 10 years ago, no variety offers anything earlier than a zero for maturity.

KWS Parkin is unique: On a larger farms, or in certain locations, having a variety that is earlier to mature is incredibly valuable as it allows you to get the harvest going.

KWS Parkin is a great choice for growers that are looking for something different – and this season, if you are looking to get quickly out of the blocks then it should be the first wheat you put in your drill.

Data source: WW trials harvest 2020, AHDB



"I've always been a Skyfall man, but I think I may have found our new main crop. I was instantly attracted to the early maturity. Harvest is so much later up here which means we have a very narrow turn-around period for getting OSR in the ground or drilling autumn crops."

**Robert Childerhouse**

Musgrove Estates, North  
Yorkshire (ex CPM March 2020)



## Winter Wheat Recommended List 2021/22, Hard Group 4

Page 1

	SY Isolator	KWS Cranium	KWS Kinetic	Gleam	RGT Gravity	KWS Kerrin	Graham	RGT Wolverine	Shabraz	Costello	Theodore
End-use group	Hard Group 4										
Scope of recommendation	UK	UK	UK	UK	UK	E&W	UK	Sp	UK	UK	W
		NEW		C				NEW	*		
Fungicide-treated grain yield (% treated control)											
United Kingdom (10.8 t/ha)	104	104	103	103	103	102	102	102	101	99	99
East region (10.7 t/ha)	104	104	103	103	103	102	101	101	101	99	99
West region (10.9 t/ha)	104	104	105	103	103	102	105	102	101	100	102
North region (11.0 t/ha)	105	[102]	100	102	101	102	101	[103]	102	99	[[90]]
Main market options (The specific attributes of varieties are different, so, whenever possible, varieties should not be mixed in store)											
UK bread-making	-	-	-	-	-	-	-	-	-	-	-
UK biscuit, cake-making	-	-	-	-	-	-	-	-	-	-	-
UK distilling	-	-	-	-	-	-	-	-	-	-	-
ukp bread wheat for export	-	-	-	-	-	-	-	-	-	-	-
uks soft wheat for export	-	-	-	-	-	-	-	-	-	-	-
Grain quality											
Endosperm texture	Hard	Hard	Hard	Hard	Hard	Hard	Hard	Hard	Hard	Hard	Hard
Protein content (%)	11.0	11.3	11.5	11.5	11.5	10.9	11.5	11.2	11.5	12.1	12.2
Protein content (%) - Milling spec	11.4	[11.4]	12.1	12.0	12.0	11.4	11.9	[11.8]	12.1	12.7	12.8
Hagberg Falling Number	273	277	267	217	199	148	279	274	211	326	313
Specific weight (kg/hl)	78.4	75.4	78.5	76.3	75.9	76.2	76.8	75.9	76.0	80.8	74.3
Chopin Alveograph W	-	-	-	-	-	-	-	[143]	-	-	-
Chopin Alveograph P/L	-	-	-	-	-	-	-	[0.7]	-	-	-
Untreated grain yield (% treated control)											
United Kingdom (10.8 t/ha)	78	78	74	81	77	74	87	72	77	80	88
Agronomic features											
Resistance to lodging without PGR (1-9)	6	[8]	7	7	7	7	7	[7]	7	7	7
Resistance to lodging with PGR (1-9)	7	8	8	7	7	7	8	8	7	8	8
Height without PGR (cm)	95	88	84	87	88	86	88	86	86	82	83
Ripening (days +/- Skyfall, -ve = earlier)	+1	+2	-0	-0	+1	+1	-1	+2	-0	+2	-0
Resistance to sprouting (1-9)	[5]	[6]	[6]	[5]	[4]	6	6	[6]	4	7	[7]
Disease resistance											
Mildew (1-9)	6	5	5	6	4	7	7	5	6	8	[7]

## Winter Wheat Recommended List 2021/22, Hard Group 4

Page 2

	SY Isolator	KWS Cranium	KWS Kinetic	Gleam	RGT Gravity	KWS Kerrin	Graham	RGT Wolverine	Shabraz	Costello	Theodore
End-use group	Hard Group 4										
Disease resistance (continued)											
Septoria tritici (1-9)	6.8	6.0	5.3	6.1	4.9	4.8	6.8	5.3	6.1	6.0	8.3
Eyespot (1-9)	[5]	[5]	[5]	4	4	5	3	[5]	4	5	[5]
Fusarium ear blight (1-9)	7	6	6	6	6	6	7	6	6	7	6
Orange wheat blossom midge	R	R	R	R	R	R	-	-	-	-	-
Breeder/UK contact											
Breeder	SyP	KWS	KWS	SyP	R2n	KWS	SyP	R2n	SyP	KWS	DSV
UK contact	Syn	KWS	KWS	Syn	RAGT	KWS	Syn	RAGT	Syn	Sen	DSV
Annual treated yield (% control)											
2016 (11.0 t/ha)	-	-	-	103	106	102	102	-	102	96	-
2017 (11.1 t/ha)	104	-	105	102	103	101	101	-	100	101	99
2018 (10.5 t/ha)	103	104	102	103	100	103	100	101	101	100	99
2019 (11.5 t/ha)	106	102	104	103	102	103	103	102	102	99	101
2020 (10.0 t/ha)	103	105	101	103	103	102	102	102	101	100	[97]
Rotational position											
First cereal (11.1 t/ha)	104	104	103	103	102	102	102	102	101	100	99
Second and more (9.5 t/ha)	103	103	102	103	104	103	101	101	102	98	[99]
Sowing date (most trials were sown in October)											
Early sown (before 25 Sept) (11.0 t/ha)	-	-	99	103	100	[[102]]	100	-	[104]	98	97
Late sown (after 1 Nov) (9.5 t/ha)	[104]	[108]	[103]	103	104	103	99	[101]	98	100	[[99]]
Soil type (about 50% of trials are on medium soils)											
Light soils (10.8 t/ha)	107	[105]	104	102	103	103	102	[99]	101	98	[[99]]
Heavy soils (10.9 t/ha)	104	103	105	103	102	101	102	102	101	99	101
Agronomic features											
Lodging % without PGR	14	1	5	5	6	8	7	4	10	3	8
Lodging % with PGR	4	3	3	4	7	9	2	3	11	1	2
Latest safe-sowing date	[End Jan]	[[Mid Feb]]	[End Jan]	Mid Feb	End Jan	End Jan	End Jan	[[End Jan]]	Mid Feb	End Jan	End Jan
Speed of development to growth stage 31 (days +/- average)											
Early sown (Sept)	[0]	-	[-2]	+7	+5	+0	+3	-	+2	-2	[-1]
Med sown (Oct)	[+1]	-	[+5]	+2	+2	+2	+0	-	+0	-1	[-3]
Late sown (Nov)	[+2]	-	[-2]	+3	-2	+0	-3	-	+0	-2	[-1]
Status in RL system											
Year first listed	20	21	20	18	18	17	16	21	17	15	20
RL status	P2	P1	P2	-	-	-	-	P1	*	-	P2



# New For Drilling 2021

## KWS CRANIUM

AHDB

RECOMMENDED

NEW

360

### Details

Group	Year Listed	UK treated yield	Parentage
4 Hard	2021	104%	KWS Crispin x KWS Kielder

### Comments

KWS Cranium, the thinking farmer's wheat!

New to the 2021/22 RL, KWS Cranium is a unique wheat which is set to earn itself the reputation as the go-to risk management tool for UK growers. It offers the best combination of yellow rust resistance (9), OWBM resistance, and stem stiffness available in the feed sector today. It's because of this that Cranium will earn itself a place on most farms this autumn.

A mainstream sower, KWS Cranium sits at the top of the hard feed pack in terms of yield performance. It retains its yield potential as a second wheat and, thanks to its vigorous growth habit, really shines in later drillings ([108%]). KWS Cranium is a variety that wants to maximise its yield, it has the vigour and stiffness that keep it going right through to harvest. What's more, it is a consistent performer no matter the site nor the season.

It has a strong disease package, especially against the more important disease of *Septoria* (6.0) and yellow rust (9). A solid 6 for *Septoria* significantly reduces the risk of the disease and can add flexibility into fungicide planning. KWS Cranium's value in the fight against yellow rust is clear: it adds seedling resistance to the high yielding hard Group 4 sector and retains this high level of resistance through to the adult plant stage. With mildew and brown rust both scoring 5, this needs watching but should be well controlled with standard farm programs.

KWS Cranium is the stiffest feed on the market today, hence reducing the potential for lodging and yield loss.



Graph 3: KWS Cranium adds superior stem stiffness to the feed sector



## KWS Dawsum

KWS DAWSUM (KWS W383)			
<div> <div>AHDB</div> <div>CANDIDATE</div> <div>360</div> </div>			
Details			
Group	Year Listed	UK treated yield	Parentage
4 Hard	Candidate	105%	KWS Kerrin x Costello
Comments			
<ul style="list-style-type: none"> <li>■ Awesome yield (105% UK and East, 107% West and 106% North, untrt 88% of trt)</li> <li>■ Awesome grain (80.1kg/hl spec weight)</li> <li>■ Awesome disease resistance (Sept 6.3, mildew 8, yellow rust 9, brown rust 7)</li> <li>■ Awesome flexibility (great early 106%, mainstream, 105% and late 114%* KWS trials harvest 2020)</li> </ul> <p>Awesome Dawsum! The bankable barn filler – a hard feed type that offers great yields with exceptional specific weight (80.1kg/hl). It's a really clean, nice plant type with one of the widest sowing windows available.</p> <p>This is a variety that will be in demand. We have a small seed pre-release in autumn 2021 so that growers can take advantage of good future prices and plant a real barn-buster this autumn.</p> <p>During its years of development, KWS Dawsum has delivered great yields in both the early and late sown slots. This makes it a really flexible all-round variety, the like of which we have seen in the past from wheats like KWS Santiago. In short, it will deliver whether you plan to drill but have the flexibility to deliver if the weather changes your plans.</p> <p>KWS Dawsum has a great disease package for such a high yielding barn filler with excellent untreated yields and good scores against all the main yield-robbing diseases; this will be key to allowing growers some flexibility over spray timings when workloads are at their peak in the spring.</p> <p>A short to mid length strawed variety, KWS Dawsum is very stiff offering security of maintaining yield through to harvest where it will produce big heaps of highly marketable grain, thanks to the strong specific weight, good HFN, and protein.</p>			

Data source: AHDB Winter wheat trials harvest 2021 - Candidate varieties


## Awesome Dawsum in a nutshell


	Treated Yield (% controls)	Protein (all trials %)	HFN	Specific weight (kg/hl)
<b>KWS Dawsum</b>	105	11.2	285	80.2
SY Insitor	104	11.0	273	78.4
Gleam	103	11.5	218	76.3
Graham	102	11.5	279	76.8
Costello	99	12.1	326	80.8
LG Skyscraper	105	11.6	214	76.8
Champion	105	11.3	222	75.0
LG Farrier	105	10.9	261	78.9


"I think farmers are going to love it – bushel weight is a massive plus. In Frontier trials Dawsum produced 106% yield - higher than any other candidate or current RL variety. It has a similar growth habit to Costello, so suits early drilling in the West and North. It also performs well in late sown trials and is higher tillering than KWS Kerrin. As well as this, it is extremely stiff and has a strong disease package. Definitely a variety that should capture the attention of UK farmers wanting to fill up the barn."


**Jim Knight**  
Frontier Seed Development Manager

## Upcoming Winter Wheats

KWS PALLADIUM (W388)		AHDB CANDIDATE	
Details		Comments	
Group	Potential Group 2	Introducing the really clean breadmaking wheat with harvest security built in. KWS Palladium is a potential Group 2 milling wheat with good grain quality, good gluten strength, good loaf volume and has the potential for export as UKP. It has excellent untreated yields thanks to very strong scores for <i>Septoria</i> (7.3), mildew (8) and yellow rust (9). It is a consistent yielder across the regions and has performed well across contrasting seasons. A short and stiff strawed variety, KWS Palladium offers growers the security of an early harvest, an essential characteristic for a top-quality milling wheat.	
Year Listed	Candidate		
Treated Yield	101%		
Parentage	KWS Zyatt x KWS Trinity		

KWS GUIUM (W376)		<div> CANDIDATE</div>	
Details			Comments
Group	Potential Group 3		<p>A potential Group 3, KWS Guium delivers good gluten extensibility along with a good biscuit wheat protein (11.1%), HFN (266) and specific weight (78.2kg/ hl). It also has the benefit of distilling potential as an additional market sector. KWS Guium is a high input-high output variety and responds well to a structured fungicide programme. It performs well across the main biscuit producing regions of the East (103%), where its good yellow rust (9) and OWBM resistance will be key. A short-medium strawed variety, KWS Guium is later maturing (+2 compared to Skyfall at 0) but has the benefit of excellent sprouting resistance (less than 2% compared with KWS Barrel at 20%).</p>
Year Listed	Candidate		
Treated Yield	103%		
Parentage	KWS Rowan x Tempo		

KWS BRIUM (W380)		 CANDIDATE
Details		Comments
Group	Potential Group 3	<p>A great variety for the North thanks to its distilling potential and yields in this region ([103%]). Like its parent KWS Basset, KWS Brium has solid Group 3 biscuit potential and as such would ideally suit the soft milling and biscuit houses in this region. Good scores for mildew (7) and yellow rust (9) are useful; a well-structured fungicide programme will help deliver high yields. A medium height variety (92cm) KWS Brium has stiff straw and at a +1, its maturity will make it ideally suited to northern regions.</p>
Year Listed	Candidate	
Treated Yield	102%	
Parentage	KWS Solo x KWS Basset	

KWS HENUM (W389)		 CANDIDATE
Details		Comments
Group	Potential Group 4	In a recent farmers weekly survey* 98% of respondents said that top <i>Septoria</i> resistance was important or very important when they chose a wheat variety to drill. For many, varieties with a rating of 6.0 or above offer options in fungicide savings in both low pressure seasons and later drillings; helping growers maximise their investment in chemistry. For these growers, KWS Henum will be one to look at. It has the best <i>Septoria</i> resistance in National List Trials (7.3), excellent untreated yields (81), and good resistance to mildew (8) and yellow rust (9). It is a variety that is also grown in Denmark where it out-performed KWS Extase against <i>S.tritici</i> in 2020. Good performance in the West (104%) will certainly add to KWS Henum's appeal.
Year Listed	Candidate	
Treated Yield	102%	
Parentage	KWS Kerrin x KWS Hardwick	
		* KWS and FW Planting Intentions Survey for drilling 2020/21

All varieties: AHDB Winter wheat trials harvest 2021 - Candidate varieties



# Spring Wheat

## Group 2



UK FLOUR  
MILLERS

KWS COCHISE		AHDB RECOMMENDED	Comments
Details			
Group	2		KWS Cochise is the highest-yielding spring breadmaking wheat on the 2021/22 Recommended List. It is 12% higher yielding than Mulika and yields as well as the current spring feed types. Its specific weight of 79.0 kg/hl is outstanding, while its HFN of 239 seconds and protein of 13.2% make it a good Group 2 option. Its high untreated yield of [84%] of the treated controls reflects its good all-round disease resistance. KWS Cochise is orange wheat blossom midge (OWBM) resistant. At 81cm, it is of average height.
Year Listed	2017		
Treated Yield	106%		
Parentage	Ashby x Lapis		

KWS GIRAFFE		AHDB RECOMMENDED	Comments
Details			
Group	2		Introduced in spring 2020, is a high yielding nabim Group 2 wheat. KWS Giraffe is a truly dynamic wheat that yields well in both spring and autumn sow slots; often delivering yields on a par with market leader KWS Cochise. It also boasts the highest protein level (13.6%) and best specific weight (79.8 kg/hl) of any spring wheat on the RL, offering growers truly marketable grain at harvest. KWS Giraffe also offers growers security at harvest with short and stiff straw, good grain quality and early maturity, completing its attractive package.
Year Listed	2020		
Treated Yield	103%		
Parentage	KWS Recoletta x KWS Kilburn		

KWS CHILHAM		AHDB RECOMMENDED	Comments
Details			
Group	2		KWS Chilham is a Group 2 with excellent grain quality. It performs strongly when sown in both the late autumn (101%) and spring sowing (100%) windows. KWS Chilham has excellent all-round disease resistance, especially to <i>Septoria tritici</i> (7) and yellow rust (7) which supports one of the highest untreated yields of any spring wheat on the Recommended List ([87%] of treated controls). Its high specific weight of 78.4 kg/hl, impressive HFN of 329 seconds and protein of 13.0% make it an outstanding Group 2 quality wheat. It is orange wheat blossom midge (OWBM) resistant. At 77 cm, it is slightly shorter than the average of varieties on the RL.
Year Listed	2017		
Treated Yield	100%		
Parentage	Sparrow x Azurite		

## Group 4 Hard

KWS TALISKER		AHDB RECOMMENDED	Comments
Details			
Group	4 Hard		KWS Talisker is a high-yielding spring feed with a hard endosperm texture that has performed consistently well since entering trials in 2016. It has excellent disease resistance with scores of 8 for mildew, 9 for yellow rust and 6 for <i>Spetoria tritici</i> . Brown rust will need monitoring. Sown in either the spring or late-autumn, KWS Talisker performs strongly and will appeal to those looking for a spring feed to add to the winter feed heap.
Year Listed	2019		
Treated Yieldw	105%		
Parentage	KWS West field x KWS Pepito		

## Spring Wheat Recommended List 2021/22

	Mulka	KWS Cochise	KWS Giraffe	KWS Chilham	WPB Escape	KWS Talisker	Hexham	KWS Kilburn
End-use group	UKFM Group 1	UKFM Group 2			Hard Group 4			
Scope of recommendation	UK	UK	UK	UK	UK	UK	UK	UK
	C	C			NEW			
<b>UK yield as % control</b> (spring sowing)								
Fungicide-treated (6.8 t/ha)	94	106	103	100	107	105	105	103
Untreated (% treated control) (6.8 t/ha)	[82]	[84]	-	[87]	-	[92]	[96]	[82]
<b>UK yield as % control</b> (autumn sowing)								
Fungicide-treated (9.1 t/ha)	96	103	[104]	101	[104]	102	106	-
<b>Grain quality</b> (spring sowing)								
Endosperm texture	Hard	Hard	Hard	Hard	Hard	Hard	Hard	Hard
Protein content (%)	13.6	13.2	13.6	13.0	12.5	12.5	12.7	13.2
Hagberg Falling Number	321	239	296	329	264	278	275	270
Specific weight (kg/hl)	77.4	79.0	79.8	78.4	77.0	79.2	77.8	76.1
<b>Agronomic features</b> (spring sowing)								
Resistance to lodging with PGR ∞	-	-	-	-	-	-	-	-
Straw height without PGR (cm)	80	81	78	77	77	83	81	82
Ripening (+/- Mulika, -ve = earlier)	0	1	+1	+0	+2	+1	+2	+3
Resistance to sprouting ∞	-	-	-	-	-	-	-	-
<b>Disease resistance</b>								
Mildew (1-9)	7	8	[8]	[7]	[8]	[8]	[6]	[7]
Yellow rust (1-9)	7	4	6	7	8	9	9	5
Brown rust (1-9) ∞	-	-	-	-	-	-	-	-
Septoria tritici (1-9)	6	6	5	7	[6]	6	7	6
Orange wheat blossom midge	R	R	-	R	-	-	-	-
<b>Annual treated yield</b> (% control, spring sowing)								
2016 (8.5 t/ha)	[93]	[102]	-	[99]	-	[104]	[106]	[103]
2017 (7.3 t/ha)	93	107	[103]	102	-	[105]	[103]	102
2018 (5.5 t/ha)	[95]	[107]	[107]	[99]	[113]	[105]	[100]	[100]
2019 (6.9 t/ha)	94	107	102	98	106	105	105	100
2020 (6.2 t/ha)	[98]	[105]	[101]	[103]	[107]	[106]	[109]	[107]
<b>Breeder/UK contact</b>								
Breeder	BA	KWS	KWS	KWS	WPB	KWS	KWS	KWS
UK contact	Sen	KWS	KWS	KWS	LSPB	KWS	Sen	KWS
<b>Status in RL system</b>								
Year first listed	11	17	20	17	21	19	19	14
RL status	-	-	P2	-	P1	-	-	-

# BARLEY

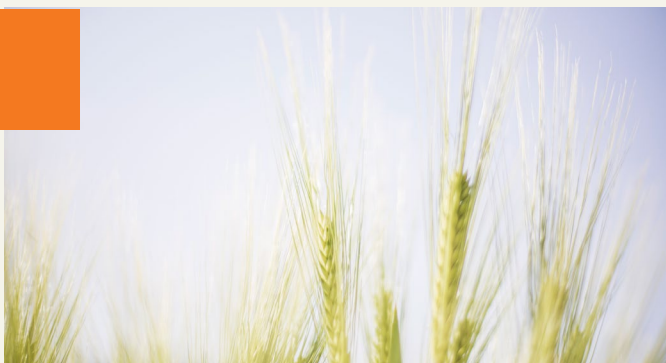
# Winter Barley

## Winter barley warrants greater consideration

With wet weather at drilling this season, a reduction of OSR in many rotations and a large surplus of UK feed barley, the winter barley area is predicted to be down >5% for harvest 2021 at just 394,000ha. But winter barley still remains an important part of UK grower's rotations. Many see the benefits of using winter barley to increase crop diversity, while others argue that it can be a more profitable option than second wheat. This is due to its higher yield potential and lower input requirements. What's more, our new product, KWS Feeris also offers growers the traditional benefits of winter barley but with added peace-of-mind in this post neonicotinoid era, thanks to its built-in BYDV tolerance (page 62).

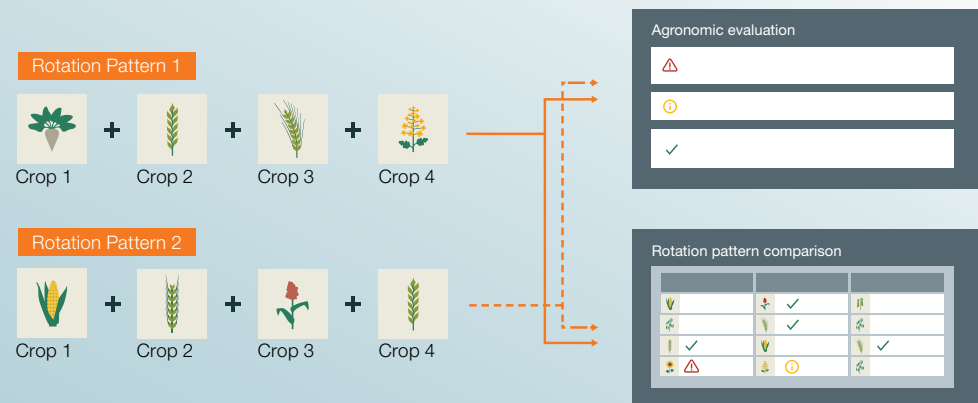
### Reasons to grow winter barley

- It is often the first crop to be harvested, helping to spread the summer workload and make way for cultivations: for many there is no better entry for oilseed rape.
- Given the same fertiliser regime as wheat (170-220 kg N/ha), it delivers similar yields and often does better in the second cereal situation;
- Variable costs are roughly 75% of wheat;
- Fungicide timings are typically a week earlier than wheat, helping to spread the sprayer workload and reduce the pressure on wheat application timings;
- Barley straw has a higher sale value than wheat. At about £65/t baled ex-field, this is roughly equivalent to an extra £180/ha.
- Investment in breeding is bringing better disease and virus resistance: in 2018 KWS introduced Amistar, a BYDV tolerant six-row variety.
- Investment in breeding is also delivering varieties with better yield potential: the leading two-row varieties offer yields comparable with that achieved by the best six-rows.



## Optimise your crop rotation!

The myKWS Crop Manager tool makes it possible to experiment digitally with different crop rotations. The economic and agronomic evaluations support you in planning suitable crop rotations for your fields.



1. Helpful when making relevant decisions in a variety of situations
2. Easy and direct comparison of crop rotations
3. Agronomic evaluation of crops and rotation patterns to minimise risks









## Two Row Feed

KWS CASSIA		AHDB RECOMMENDED	
Details			Comments
Group	Two Row Feed		KWS Cassia has been the benchmark variety for winter barley growers since its introduction in 2010 and is widely considered to be greater than the sum of its parts.
Year Listed	2010		
Treated Yield	98%		
Parentage	(Eden x Carat) x Saffron		It has a good average yield – a reliable 98% of controls in all regions of the United Kingdom – with a bold grain and the highest specific weight of any winter barley on the AHDB Recommended List at 71.4 kg/hl. It also has low screenings, good straw strength, and an untreated yield that is better than its average disease scores suggest.
			At 91 cm, it is of average height while its average maturity will appeal to those wanting to prepare ground in good time for oilseed rape.

KWS GIMLET		AHDB RECOMMENDED	
Details			Comments
Group	Two Row Feed		KWS Gimlet is high-yielding two-row feed that will appeal strongly to those in the east, where it has delivered its best performances at 105% of controls. It is the ideal variety for arable farmers wanting a high-yielding barley variety to fit the rotation. It has good resistance to both Rhynchosporium and net blotch, where it scores 6 for each. It is also resistant to Barley Yellow Mosaic Virus (BYMV).
Year Listed	2019		
Treated Yield	103%		
Parentage	(California x Matros) x KWS Glacier		At about 95cm (with PGR), Gimlet is taller than its parents. While being earlier to mature than KWS Glacier, it's also higher yielding than KWS Orwell. Straw strength is good, though experience suggests the use of a PGR is advised.

KWS ORWELL		AHDB RECOMMENDED	
Details			Comments
Group	Two Row Feed		An extremely stiff strawed variety of average maturity that delivers consistently high yields across all regions of the UK. Orwell has gained favour on-farm and has become the nation's favourite winter barley. Apart from mildew, which will need watching carefully, Orwell has respectable disease resistance. Its medium height, low screenings, and stiff straw make it appealing to those with mixed farms or with more fertile soils.
Year Listed	2016		
Treated Yield	102%		
Parentage	KWS Tower x KWS Salsa		

KWS TARDIS		AHDB RECOMMENDED	NEW
Details			Comments
Group	Two Row Feed		KWS Tardis heralds a new dawn in two-row winter barley breeding at KWS. As the highest yielding 2-row feed on the Recommended List, it out-performs the UK's leading 2 and 6-row conventional feed types as well as producing similar yields to the best hybrids. It performs best in the East (107%) where it produces good grain (69.1 kg/hl) with good screenings (2.2% through 2.25mm sieves). A medium height variety, KWS Tardis has good resistance to lodging (8), a key requisite for its top performance on heavier soils ([110%]). A great all-round disease package including 7 for Rhynchosporium and 5 for net blotch will appeal to many.
Year Listed	2021		
Treated Yield	106%		
Parentage	11-12 x KWS Orwell		KWS Tardis, 2-row yields from another dimension!

KWS HAWKING			
Details		RECOMMENDED	
			Comments
Group	Two Row Feed		KWS Hawking is a high yielding two-row feed barley on the market with a high specific weight of 68.7 kg/hl, stiff straw and good all-round disease resistance. It has performed consistently well across all regions, though its best performances have come in the East and West. KWS Hawking has performed well in the last two years of trials including the drought year of 2018. Hawking has maturity equal to Orwell.
Year Listed	2020		
Treated Yield	103%		
Parentage	(11-12 x California) x KWS Tower		KWS Hawking will be in high demand for drilling in autumn 2021 and will be set to become a significant variety in the market.

With nearly 20 years' service under the belt of KWS Cassia, feed barley growers are now looking to new addition KWS Hawking to deliver reliable yields on-farm. It's a low-risk variety, with strong straw and no agronomic weaknesses that takes 2-row feed yields up a notch.

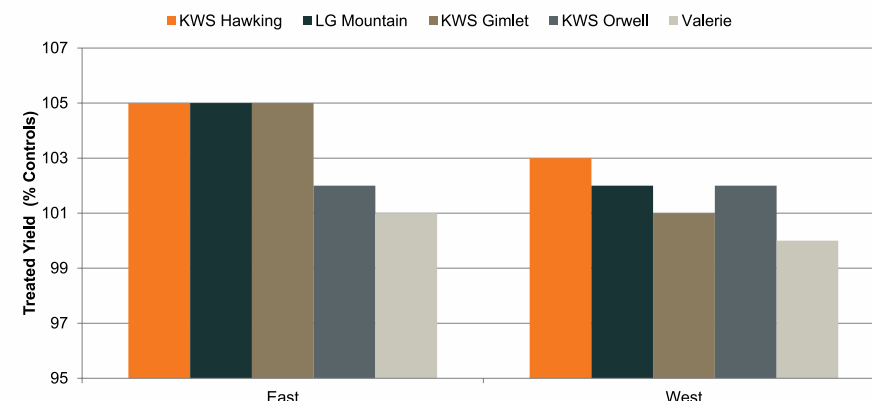
A three-way cross, KWS Hawking takes the positives of grain quality from 11-12 (an internal KWS line) and couples them with the yield potential from Tower along with the height and earliness of California.

At 103% of controls, KWS Hawking is recommended for the whole of the UK, but experience has shown that it comes into its element in the East (105% controls) – in KWS trials.

But with a raft of high yielding 2-row feeds on the RL, does KWS Hawking really offer growers something different? The new addition offers high yields with improvements on straw strength over KWS Gimlet, better lodging resistance than LG Mountain and Jordan, and at a score of 5, better mildew than KWS Orwell.

An added benefit is that KWS Hawking is an earlier maturing type. In our own KWS UK trials for the past 2 seasons, the variety is significantly ahead of its stablemates in reaching ear emergence in May. This suggests that KWS Hawking will be earlier to harvest than AHDB data implies, spreading the workload at harvest and providing a good entry for following OSR crops.

Graph 6: Barley Yields



“Growers who like varieties like KWS Orwell and Cassia are likely to find comfort in KWS Hawking. It's a low risk variety, with no real weaknesses.

So for those looking for something new, this seems like a natural progression. I can see a lot of Orwell growers moving over to Hawking but there will also be those from other varieties as it doesn't require the same attention to detail around PGR use as others and that's a big bonus for many.”

**Simon Minns**  
Managing Director at  
James Mortimer  
CPM April 2020

## Winter Barley Recommended List 2021/22, Two Row Feed

Page 1

	KWS Tardis	Bolton	Bordeaux	LG Mountain	KWS Hawking	KWS Gimlet	Jordan	LG Flynn	KWS Orwell	Surge	Valerie	KWS Creswell	KWS Tower	California	KWS Cassia
End-use group	Two-row feed														
Scope of recommendation	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	N	UK	W	UK
	NEW	NEW	NEW						C				*		
Fungicide-treated grain yield (% treated control)															
United Kingdom (9.7 t/ha)	106	106	106	104	103	103	103	102	102	101	101	100	100	99	98
East region (9.5 t/ha)	107	107	107	105	105	105	105	104	102	103	101	100	99	100	98
West region (9.8 t/ha)	[105]	[104]	[104]	102	103	101	103	101	102	101	100	100	100	99	98
North region (9.8 t/ha)	105	105	104	105	101	101	99	101	101	99	100	101	100	[98]	98
Untreated grain yield (% treated control)															
United Kingdom (9.7 t/ha)	83	83	81	83	81	82	86	81	80	86	83	73	72	79	81
Main market options															
MBC malting approval for brewing use	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Grain quality															
Specific weight (kg/hl)	69.1	68.6	69.9	69.4	68.7	68.5	68.9	70.3	68.1	69.3	70.0	68.4	67.6	68.2	71.4
Screenings (% through 2.5 mm)	2.2	1.9	1.7	2.2	2.3	2.4	1.9	1.7	2.1	1.9	0.9	2.1	2.2	2.0	1.7
Screenings (% through 2.5 mm)	7.2	6.8	5.5	7.5	7.3	7.5	6.1	5.4	6.3	6.0	3.1	7.4	7.3	6.5	5.1
Nitrogen content (%)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Status in RL system															
Year first listed	21	21	21	19	20	19	20	19	16	16	19	17	14	13	10
Untreated grain yield (% treated control)															
United Kingdom (9.7 t/ha)	83	83	81	83	81	82	86	81	80	86	83	73	72	79	81
Agronomic features															
Resistance to lodging (1-9)	8	8	7	7	8	7	7	7	8	7	8	7	8	8	7
Straw height without PGR (cm)	[92]	[88]	[88]	87	[92]	100	[87]	96	89	89	92	90	93	95	94
Straw height with PGR (cm)	86	84	86	86	87	95	84	92	86	86	87	88	88	92	91
Ripening (+/-KWS Orwell, -ve = earlier)	0	1	0	0	1	2	1	1	0	0	0	0	1	0	1
Winter hardiness	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Disease resistance															
Mildew (1-9)	5	6	6	5	5	6	5	4	3	5	6	4	5	6	5
Brown rust (1-9)	6	5	5	7	6	6	8	7	7	7	6	6	7	5	7

## Winter Barley Recommended List 2021/22, Two Row Feed

Page 2

	KWS Tardis	Bolton	Bordeaux	LG Mountain	KWS Hawking	KWS Gimlet	Jordan	LG Flynn	KWS Orwell	Surge	Valerie	KWS Creswell	KWS Tower	California	KWS Cassia
End-use group	Two-row feed														
Scope of recommendation	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	N	UK	W	UK
	NEW	NEW	NEW						C				*		
Disease resistant (continued)															
Rhynchosporium (1-9)	7	5	4	5	6	6	7	6	6	7	6	6	5	6	5
Net blotch (1-9)	[5]	[5]	[4]	5	6	6	5	6	5	6	[6]	5	4	5	5
BaYMV	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
Breeder/UK contact															
Breeder	KWS	Ack	NS	LimEur	KWS	KWS	Ack	LimEur	KWS	SyP	Bre	KWS	KWS	Lim	KWS
UK contact	KWS	ElsAck	Sen	Lim	KWS	KWS	ElsAck	Lim	KWS	Syn	Sen	KWS	KWS	Lim	KWS
Annual treated yield (% control)															
2016 (9.4 t/ha)	-	-	-	104	-	102	-	102	102	101	101	100	100	99	98
2017 (9.9 t/ha)	-	-	-	103	103	104	103	101	102	100	101	99	98	100	98
2018 (10.2 t/ha)	106	105	106	104	104	102	102	102	102	100	101	101	102	99	98
2019 (10.2 t/ha)	107	106	106	105	103	104	103	102	102	103	-	100	99	99	98
2020 (8.9 t/ha)	104	105	103	105	101	101	100	101	102	100	99	101	100	97	98
Soil type (about 50% of trials are medium soils)															
Light soils (9.3 t/ha)	104	105	104	104	101	101	101	102	101	100	100	101	101	97	98
Heavy soils (9.6 t/ha)	[110]	[106]	[107]	107	107	104	104	105	103	103	[101]	99	100	[102]	98
Agronomic characteristics															
Lodging without PGR (%)	1	2	7	12	5	14	17	7	2	4	4	7	3	3	5
Lodging with PGR (%)	2	1	3	6	2	6	6	4	2	3	1	4	3	2	3
Brackling (%)	10	11	11	28	8	11	9	7	10	11	7	17	10	9	12
Malting quality															
Hot water extract (l deg/kg)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Status in RL system															
Year first listed	21	21	21	19	20	19	20	19	16	16	19	17	14	13	10
RL status	P1	P1	P1	-	P2	-	P2	-	-	-	-	-	*	-	-



# BYDV

**Barley yellow dwarf virus (BYDV) is distributed worldwide and infects most cereals and grasses. It is transmitted persistently by more than 20 aphid species. Symptoms were first observed in 1951 on barley in California and were later characterized in oat and wheat. It has since been identified worldwide.**

Barley Yellow Dwarf symptoms include stunting and leaf discolouration, though it is often mis-diagnosed because they resemble plant nutrient deficiencies. The stunted plants often appear in circular patches or as randomly scattered plants within a field. Leaf discoloration varies from shades of yellow, to red or purple. High light intensity and cool temperatures (15 to 18°C) have been found to favour expression of BYDV symptoms.



Symptom expression is generally dependent on the time of infection. Seedling infection may be lethal or cause a distinct yellowing of older leaves. Plots with post-seedling infections have a yellowed or reddened flag leaf. Disease symptoms usually appear in late spring at stem extension as a result of autumn infection and yield losses of up to 63% have been observed. Spring infections have delayed symptoms which are usually less severe, though yield losses of up to 41% have been recorded.

The most important aphid vectors in the UK are the bird-cherry oat aphid (*Rhopalosiphum padi*) and the grain aphid (*Sitobion avenae*). Aphids acquire BYDV by feeding on infected plants and transmit the virus in subsequent feedings. The virus survives in perennial grasses and is spread by aphids to and within crops. The virus is persistent, meaning once infected, aphids remain infected for the rest of their life.

## The scale of the problem in UK Agriculture today

Traditional high risk BYDV regions of the UK are coastal areas of the South, South East and South West. However, when autumn-early winters are mild, almost any part of the UK can suffer damaging infections.

2019 was the first season where barley was drilled without seed treatments to control BYDV. Rain during key drilling timings will have delayed or inhibited planting, so reducing the risk of BYDV that growing season. We may see high-pressure seasons in the future, if growers push to drill as early as possible.

## What can plant breeding offer?

Genetic tolerance or resistance to BYDV will offer growers a risk reduction tool for aphid prone areas, opportunities for growers to continue traditional sowing timings, and will be an essential element of an effective IPM strategy.

### Tolerance

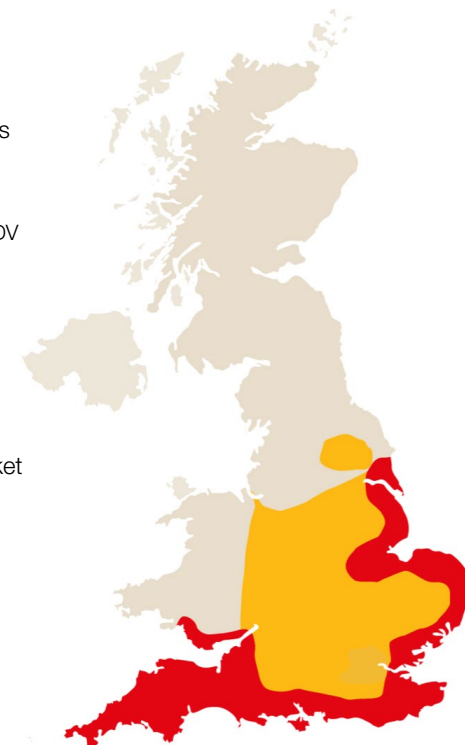
- Best characterized gene in barley is ryd2
- Infected plants show little or no symptoms
- No yield loss in crop in low-mid infection
- Virus still present in crop
- KWS Feeris offers genetic tolerance to BYDV

### Resistance

- A resistant crop can not be infected
  - there is no yield loss
- Resistance can be against the aphid vector or the virus
- No commercialised barley in the UK market has full resistance to date

### Map showing high and medium risk areas for BYDV


- High
- Medium



# Six Row

AMISTAR			
Details			
Group	Year Listed	UK treated yield	Parentage
Six Row Feed BYDV Tolerance	EU Common Catalogue	103%*	Confidential
Comments			
Amistar is a Barley Yellow Dwarf Virus (BYDV) tolerant variety that has performed strongly in KWS and distribution trials in the past two years. It is early to move in the spring and is early maturing.			
In trials without BYDV pressure, Amistar yielded close to that of KWS Cassia and KWS Tower (i.e. at the average of control varieties in official trials) and had a specific weight akin to that of KWS Cassia.			
In situations with high BYDV pressure, Amistar demonstrated the value of tolerance in protecting yield potential. In 2017 and 2018 trials in Cambridgeshire where virus pressure was high, Amistar suffered yield losses of between 0.4 and 0.5% whereas the losses from non-tolerant varieties ranged from 6 to 19%.			
The variety can be used to reduce the risk to other varieties by sowing in aphid-prone areas such as headlands, beside margins or around areas difficult to spray, such as close to water courses. Alternatively, the variety can be sown across the entire field area if desired, but it will be for the grower and their advisers to consider how to make best use of the yield protection afforded by Amistar.			
It is flexible across a wide sowing window so can be sown early as per standard practice or drilled later where there is a desire to reduce the risk of infection to other varieties.			

Data source: KWS trials


FUNKY		 RECOMMENDED	Comments
Details			
Group	Six Row Feed	Funky is the only six-row conventional barley on the 21/22RL. It performs consistently across all regions in the UK (105% in the West ) and has a high untreated yield (88%) due in part to it excellent all-round disease resistance. At -1 maturity, it is the earliest to mature of any of the conventional winter barley feeds currently on the RL, and at 96 cm height without PGR, Funky is the shortest 6-row type with the stiffest straw on the market today.	
Year Listed	2017		
Treated Yield	104%		
Parentage	Gigga x KWS Meridian		

	Belmont \$	SY Kingston \$	SY Kingsbarn \$	SY Thunderbolt \$	SY Baracoda \$	Belfry \$	Bazooka \$	Funky	Libra \$
End-use group	Six-row feed								
Scope of recommendation	UK	UK	UK	UK	UK	UK	UK	UK	UK
	NEW			NEW	*		C	C	*
Fungicide-treated grain yield (% treated control)									
United Kingdom (9.7 t/ha)	107	107	107	107	107	106	106	104	103
East region (9.5 t/ha)	108	106	107	107	107	106	106	103	103
West region (9.8 t/ha)	107	109	107	[107]	107	107	105	105	104
North region (9.8 t/ha)	107	108	107	107	107	105	105	104	102
Untreated grain yield (% treated control)									
United Kingdom (9.7 t/ha)	76	88	85	88	85	89	85	88	81
Main market options									
MBC malting approval for brewing use	-	-	-	-	-	-	-	-	-
Grain quality									
Specific weight (kg/hl)	68.7	69.7	69.7	69.6	68.7	68.6	69.2	69.0	70.8
Screenings (% through 2.25 mm)	2.8	2.6	1.8	2.3	2.1	2.4	2.5	4.4	2.3
Screenings (% through 2.5 mm)	9.6	8.9	7.0	7.9	7.4	9.4	8.7	16.1	8.4
Nitrogen content (%)	-	-	-	-	-	-	-	-	-
Status in RL system									
Year first listed	18	21	19	21	19	16	16	17	18
Untreated grain yield (% treated control)									
United Kingdom (9.7 t/ha)	76	88	85	88	85	89	85	88	81
Agronomic features									
Resistance to lodging (1-9)	7	7	7	6	7	8	7	8	7
Straw height without PGR (cm)	112	[120]	113	[114]	121	111	117	96	110
Straw height with PGR (cm)	105	107	103	106	110	103	110	92	104
Ripening (+/-KWS Orwell, -ve = earlier)	0	-1	0	-1	0	0	0	-1	0
Winter hardiness	-	-	-	-	-	-	-	-	-
Disease resistance									
Mildew (1-9)	5	7	7	8	7	5	5	5	4
Brown rust (1-9)	4	6	5	7	5	6	5	7	6
Rhynchosporium (1-9)	7	6	6	6	6	7	6	7	6
Net blotch (1-9)	5	6	5	[6]	5	5	6	5	6
BaYMV	R	R	R	R	R	R	R	R	R
Breeder/UK contact									
Breeder	SyP	SyP	SyP	SyP	SyP	SyP	SyP	KWSMR	SyP
UK contact	Syn	Syn	Syn	Syn	Syn	Syn	Syn	KWS	Syn

	Belmont \$	SY Kingston \$	SY Kingsbarn \$	SY Thunderbolt \$	SY Baracooda \$	Belfry \$	Bazooka \$	Funky	Libra \$
End-use group	Six-row feed								
Scope of recommendation	UK	UK	UK	UK	UK	UK	UK	UK	UK
		NEW		NEW	*		C	C	*
Annual treated yield (% control)									
2016 (9.4 t/ha)	109	-	107	-	108	107	107	104	103
2017 (9.9 t/ha)	107	107	107	-	106	106	106	106	104
2018 (10.2 t/ha)	107	107	107	107	107	105	103	103	102
2019 (10.2 t/ha)	107	108	108	109	108	107	106	105	104
2020 (8.9 t/ha)	106	108	105	106	105	106	105	104	101
Soil type (about 50% of trials are medium soils)									
Light soils (9.3 t/ha)	106	106	105	103	105	104	105	104	101
Heavy soils (9.6 t/ha)	107	107	108	[111]	106	110	107	104	105
Agronomic characteristics									
Lodging without PGR (%)	13	15	13	37	10	5	7	2	11
Lodging with PGR (%)	9	10	2	14	6	2	4	2	4
Brackling (%)	17	13	16	14	12	8	11	13	23
Malting quality									
Hot water extract (l deg/kg)	-	-	-	-	-	-	-	-	-
Status in RL system									
Year first listed	18	21	19	21	19	16	16	17	18
RL status	-	P1	-	P1	*	-	-	-	*



## Upcoming Winter Barley

KWS FEERIS		AHDB CANDIDATE			
Details					
Group		Year Listed		Parentage	
Six Row Feed BYDV Tolerance		Candidate		Amistar x KWS Kosmos	
Comments					
<p>KWS Feeris is a conventional 6-row winter barley that brings BYDV tolerance to the market in a realistic barley package suited to all regions of the UK. Like other 6-row barley's KWS Feeris has excellent yield potential (104%), but really stands out in the West where it achieves its best yields (109%).</p> <p>It has a good all-round disease package including 7 for Rhynchosporium and 8 for net blotch coupled BaYMV resistance and BYDV tolerance. KWS Feeris is reasonably tall-strawed (at 94cm) but a good 5-10cm shorter than commercial hybrid 6-rows. It's stiff strawed too which will be of benefit to many growers, especially those in prevalent blackgrass situations. KWS Feeris has similar maturity to KWS Orwell and at harvest will deliver good quality grain with a specific weight of 68.7kg/hl.</p> <p>In short, KWS Feeris is a good variety in its own right – but coupled with the added benefit of BYDV tolerance, it delivers an excellent risk management tool for barley growers in high pressure hotspots and those looking to push drilling as early as possible.</p> <p>KWS Feeris is currently under evaluation by the MBC to determine malting potential for use in brewing.</p>					

Data source: AHDB Winter barley trials harvest 2021 - Candidate varieties



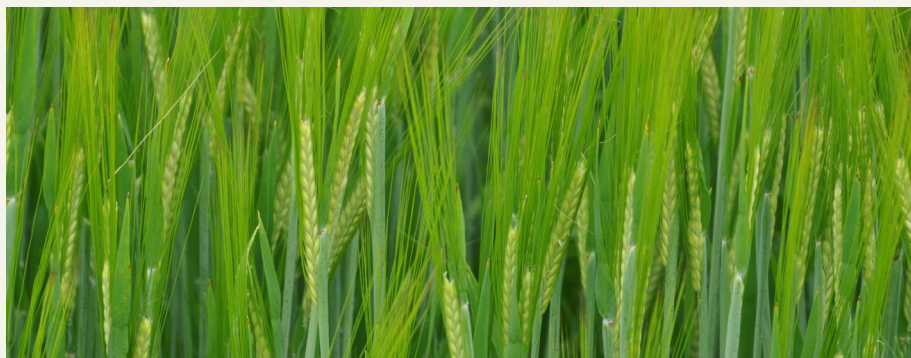
# Spring Barley

## Two Row Malting

KWS IRINA		
Details	Comments	
Group	Two Row	KWS Irina is a high-yielding spring malting variety. It is high tillering and has very stiff straw and the best brackling score on the RL. KWS Irina combines low screenings, excellent agronomy, yield, and end-use potential. Agronomically it ticks all the boxes.
Year Listed	No longer on RL	
Treated Yield	102%	
Parentage	Conchita x Quench	

Data source: AHDB Recommended List Spring Barley 2019/20

KWS SASSY		MBC Malting Barley Committee
Details	Comments	
Group	Two Row Distilling	KWS Sassy is a high-yielding, non-GN-producing spring malting variety with good yields in the North (99% controls) – the traditional home of the distilling industry. KWS Sassy has excellent spirit yield and grain quality. It also has the loWest screenings of any distilling type and is one of the earlier distilling types to mature – similar to Concerto. It has full MBC approval for malt distilling use.
Year Listed	2016	
Treated Yield	98%	
Parentage	Concerto x Publican	



	Skyway	SY Splendor	SY Tungsten	Firefox	Cosmopolitan	LG Diablo	Laureate	RGT Planet	Iconic	Sienna	KWS Sassy	Propino	Fairing
End-use group	Malting varieties												
Scope of recommendation	UK	UK	UK	UK	UK	UK	UK	UK	W	UK	UK	UK	Sp
	NEW				C	C	C	C		*		*C	
Fungicide-treated grain yield (% treated control)													
United Kingdom (7.5 t/ha)	106	103	103	103	102	102	101	100	99	98	98	95	93
East region (7.5 t/ha)	106	103	101	102	102	103	102	99	98	96	96	94	92
West region (7.1 t/ha)	[108]	103	102	102	102	100	102	100	101	98	98	96	95
North region (7.7 t/ha)	103	103	103	103	102	103	100	99	99	99	99	95	92
Main market options													
MBC malting approval for brewing use	T	P	P	-	P	F	F	F	P	-	N	O	-
MBC malting approval for malt distilling use	-	-	P	P	-	F	F	N	-	O	F	N	-
MBC malting approval for grain distilling use	-	-	-	-	-	-	-	N	-	N	-	N	F
Grain quality													
Specific weight (kg/hl)	68.7	67.9	67.4	66.4	66.2	66.9	66.3	67.8	67.1	70.2	68.4	68.1	68.2
Screenings (% through 2.25 mm)	1.3	1.7	1.9	1.7	1.6	1.6	1.6	1.4	1.8	1.8	1.2	1.0	1.1
Screenings (% through 2.5 mm)	3.3	4.5	5.0	4.2	3.7	3.9	3.8	3.8	4.6	4.2	2.9	2.2	2.8
Nitrogen content (%)	1.52	1.51	1.46	1.50	1.48	1.48	1.51	1.51	1.51	-	[1.51]	1.60	-
Status in RL system													
Year first listed	21	20	20	20	19	18	16	15	20	15	16	10	16
Untreated grain yield (% treated control)													
United Kingdom (7.5 t/ha)	96	91	91	92	93	94	93	91	93	90	91	82	84
Agronomic features													
Resistance to lodging (no PGR) (1–9)	7	7	7	7	7	7	7	7	7	7	6	7	7
Straw height (cm)	75	73	73	71	70	72	70	73	76	77	78	75	72
Ripening (+/-Concerto, -ve = earlier)	+1	+2	+1	+1	+1	+2	+1	+0	+0	+1	+1	+0	-1
Resistance to brackling (1–9)	8	8	8	8	7	8	8	8	8	7	6	8	8
Disease resistance													
Mildew (1–9)	9	9	9	9	9	9	9	9	9	9	9	6	8
Brown rust (1–9)	-	3	4	4	4	5	5	5	5	5	5	5	4
Rhynchosporium (1–9)	-	[4]	[4]	[5]	6	5	6	5	[6]	5	6	5	6

	Skyway	SY Splendor	SY Tungsten	Firefox	Cosmopolitan	LG Diablo	Laureate	RGT Planet	Iconic	Sienna	KWS Sassy	Propino	Fairing
End-use group	Malting varieties												
Scope of recommendation	UK	UK	UK	UK	UK	UK	UK	UK	W	UK	UK	UK	Sp
	NEW				C	C	C	C		*		*C	
Breeder/UK contact													
Breeder	NS	SyP	SyP	Ack	Sej	LimEur	SyP	RAGT	Sec	LimEur	KWS	SyP	SyP
UK contact	Agr	Syn	Syn	ElsAck	Sen	Lim	Syn	RAGT	Agr	Lim	KWS	Syn	Syn
Annual treated yield (% control)													
2016 (7.8 t/ha)	-	-	-	-	102	102	100	101	-	98	98	96	94
2017 (7.4 t/ha)	-	103	102	103	103	103	100	100	100	98	97	95	92
2018 (6.8 t/ha)	106	103	103	103	103	102	102	98	100	97	97	95	94
2019 (7.8 t/ha)	106	104	102	103	102	102	102	100	98	98	98	94	93
2020 (7.4 t/ha)	105	103	103	102	102	102	102	99	99	98	97	95	92
Malting quality													
Hot water extract (l deg/kg)	314.5	314.0	314.7	313.8	313.2	314.1	314.2	313.9	315.5	-	314.8	311.1	[308.2]
Status in RL system													
Year first listed	21	20	20	20	19	18	16	15	20	15	16	10	16
RL Status	P1	P2	P2	P2	-	-	-	-	P2	*	-	*	-



# OILSEED RAPE



# Winter Oilseed Rape

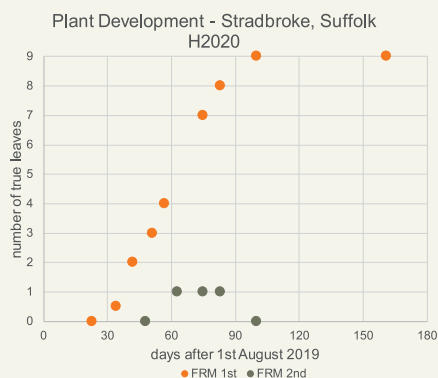
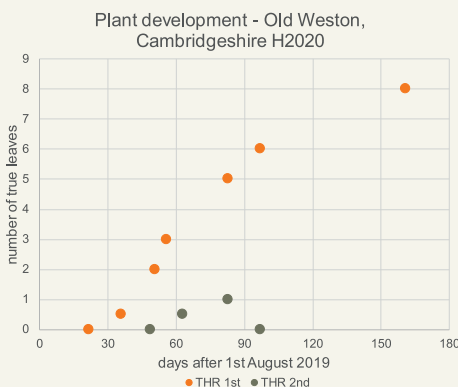
Winter Oilseed Rape is well recognised as a great break crop, but over recent years the area has declined significantly as it has become such a difficult crop to get to harvest. However, where it can be grown successfully it is still one of the most profitable crops on the farm.

At KWS we have been involved with the oilseed rape crop since it was first introduced into the UK and have learned a lot about the crop over the years. The key criteria of our breeding programmes aimed specifically for the UK, other than gross output, are; autumn vigour, disease resistance, and standing ability.

Since the loss of the neonicotinoids, the main concern is around establishment and this has increased our focus on autumn vigour further. We have looked closely at what factors successfully established crops have in common. Some of the areas we looked at were:

- Time of drilling
- Variety characteristics
  - Speed of development, disease profile, straw strength
- Methods to reduce the financial risk

Time of drilling has proved to be key over the last couple of years as can be seen from the graphs of drill timings at two of our trial sites. In both instances the later drillings were lost.



## Establishment

Having established that early drilling is key, we next considered what attributes a variety needs to be suitable for early drilling:

- Good disease resistance
  - Light leaf spot, stem canker, verticillium stem stripe
- Stiff straw
- Speed of growth both in autumn and spring

The crop will be in the ground for a longer period, so needs to have good disease resistance and straw quality. At KWS we select varieties for good disease resistance including verticillium stem stripe – for further information regarding disease assessment please visit our website.

Rapid autumn growth is important as the crop needs to grow away from the pressure of cabbage stem flea beetle. However, autumn vigour on its own is not enough. Well established oilseed rape crops in the autumn are not immune to CSFB larval attack. Plants need to have a robust growth habit and good spring vigour as well to survive these attacks. We have seen some differences in the ability of varieties to cope with this pressure, as the photos below show. These are two different varieties in neighbouring fields planted on the same day. The variety on the right has grown away from the attack with much more vigour than the variety on the left.





There are some anecdotal reports that suggest stubble height and companion cropping can have an influence on the establishment of oilseed rape:

- Tall stubble seems to deter the CSFB in the first instance and can be a deterrent to pigeons
- The use of companion crops has increased, with clovers and buckwheat being the most popular.

Risk reduction is also important that's why at KWS we have introduced the KWS oilseed establishment partnership. For more information please see page 84 and 85.

So how do the varieties from our current portfolio fit into the criteria that we have identified for early drilling?

Characteristic	Barbados	Campus	Blazen	Flamingo
Autumn vigour	5	8	7	8
Spring vigour	7	9	8	8
Pod fill period	6	5	5	6
Verticillium stem stripe	8	8	7	8

Data source: KWS breeder assessment

Characteristic	Barbados	Campus	Blazen	Flamingo
Light leaf spot	7	6	6	7
Stem canker	7	6	7	4
Stem stiffness	8	8	9	8
Flowering time	6	6	6	6
Maturity	4	5	5	5

Data source: AHDB Recommended List trials 2021/22

## OSR Optimum Drilling Times



Good establishment of your oilseed rape crop is key and varieties differ in their suitability for early or late drilling.


One of the important factors is to get good seed to soil contact and sufficient moisture levels.

This optimum drilling chart is designed to help you select your variety to get the best performance from our oilseed rape portfolio.

Varieties featuring the  
Cereals360 logo  
can be viewed on the  
KWS Virtual World  
[www.cereals360.co.uk](http://www.cereals360.co.uk)




## Recommended For The UK

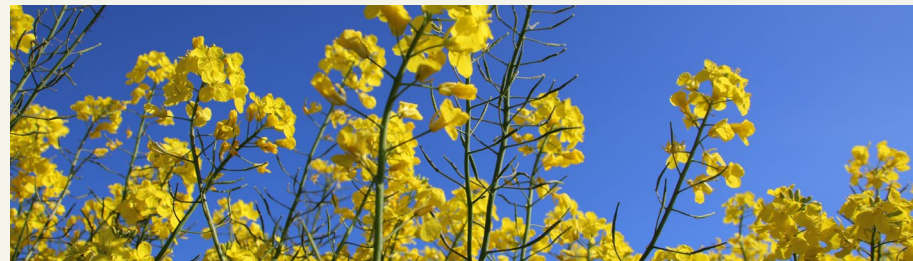
BALLAD		 RECOMMENDED	Comments
Details			
Recommendation	UK		
Year Listed	2019		
Treated GO	100%		

Ballad is a high gross output variety with a consistent performance. It has good resistance to lodging and is rated 6 for LLS and 5 for stem canker.

Ballad is a high gross output variety with a consistent performance. It has good resistance to lodging and is rated 6 for LLS and 5 for stem canker.

CAMPUS			
Details			Comments
Recommendation	Control variety		Extremely consistent variety both on farm and in trials. One of the most widely grown varieties in the UK for all of the last 6 years – reflecting both its strong vigour and consistency in its on farm performance. Good tolerance to verticillium stem stripe and twin 6s for LLS and stem canker
Year Listed	No longer listed		
Treated GO	102%		

Extremely consistent variety both on farm and in trials. One of the most widely grown varieties in the UK for all of the last 6 years – reflecting both its strong vigour and consistency in its on farm performance. Good tolerance to verticillium stem stripe and twin 6s for LLS and stem canker



Winter Oilseed Rape Recommended List 2021/22, UK												
	Ambassador	LG Aviron	Aurelia	Acadia	Artemis	Aspire	Aardvark	Templation	DK Expansion	Ballad	V 316 OL <sup>2</sup>	DK Imprint CL &
Variety type	Hybrid	Hybrid	Hybrid	Conv	Hybrid	Conv	Conv	Hybrid	Hybrid	Conv	Hybrid	Hybrid
Scope of recommendation	UK	UK	UK	UK	UK	UK	UK	(Sp)	UK	UK	Sp	Sp
		NEW						*	*C	*		NEW
Gross output, yield adjusted for oil content (% treated control)												
United Kingdom (5.3 t/ha)	108	108	107	107	106	104	104	103	102	100	98	95
East/West region (5.2 t/ha)	109	109	107	107	107	104	104	103	102	100	99	95
North region (5.9 t/ha)	102	105	106	104	102	103	103	98	102	102	96	91
Seed yield (% treated control)												
United Kingdom (4.9 t/ha)	108	110	107	106	106	103	103	102	102	100	98	97
East/West region (4.8 t/ha)	109	110	107	107	106	103	104	102	102	100	99	97
North region (5.4 t/ha)	103	107	107	104	102	102	102	97	102	101	96	93
Untreated gross output, yield adjusted for oil content (% untreated control)												
United Kingdom (5.4 t/ha)	110	-	109	105	105	103	103	103	101	98	98	-
Untreated seed yield (% untreated control)												
United Kingdom (5.0 t/ha)	110	-	109	105	105	103	102	102	101	98	98	-
Agronomic features												
Resistance to lodging (1–9)	[8]	[7]	8	8	[8]	8	8	8	8	8	8	[8]
Stem stiffness (1–9)	8	6	8	9	8	9	8	7	8	8	8	6
Shortness of stem (1–9)	6	6	6	7	5	7	6	6	5	7	6	6
Plant height (cm)	159	161	155	150	164	146	153	154	165	150	157	163
Earliness of flowering (1–9)	7	8	7	6	6	7	8	6	6	7	6	5
Earliness of maturity (1–9)	6	6	5	5	6	4	5	5	5	5	5	5
Pod shatter	R	R	R	-	R	-	-	-	R	-	-	R
Disease resistance												
Light leaf spot (1–9)	7	7	7	6	6	7	7	6	6	6	6	6
Stem canker (1–9)	7	7	7	5	6	5	6	5	7	5	5	8
TuYV	R	R	R	-	R	R	-	R	-	-	-	-
Breeder/UK contact												
Breeder	LimEur	LimEur	LimEur	LimEur	LimEur	LimEur	LimEur	DSV	MonTec	KWSMR	MonTec	MonTec
UK contact	Lim	Lim	Lim	Lim	Lim	Lim	Lim	DSV	Bay	KWS	Bay	Bay
Annual treated gross output, yield adjusted for oil content (% control) - UK												
2017 (5.7 t/ha)	105	-	107	107	104	105	105	99	101	102	96	-
2018 (5.6 t/ha)	104	105	105	106	103	104	104	101	100	101	97	92
2019 (5.5 t/ha)	106	106	107	107	106	104	103	101	103	102	96	91
2020 (5.6 t/ha)	107	109	107	103	104	100	102	100	103	99	99	95
Seed quality (at 9% moisture)												
Oil content, fungicide-treated (%)	45.2	44.5	45.3	45.7	45.6	45.7	45.7	46.1	45.5	45.6	45.3	43.8
Glucosinolate (µmoles/g)	10.9	11.2	10.2	8.1	12.3	9.9	10.0	12.0	10.1	10.8	12.3	14.3
Status in RL system												
Year first listed	20	21	20	20	20	19	20	19	19	19	15	21
RL status	P2	P1	P2	P2	P2	-	P2	*	*	*	-	P1



## Recommended For The North

BARBADOS		AHDB RECOMMENDED	Comments
Details			
Recommendation	North		Well established and reliable variety with excellent disease resistance – twin 7s for LLS and stem canker, as well as good tolerance to verticillium stem stripe. Recommended for the North but widely grown across the UK. Suited to early drilling. Its relatively late maturity score is a reflection of good disease resistance.
Year Listed	2016		
Treated GO	101%		

BLAZEN		AHDB RECOMMENDED	Comments
Details			
Recommendation	North		Blazen is a high-yielding variety recommended for the North with excellent standing ability. It is marketed under the <b>KWS OEP scheme*</b> . It has a 6 rating for LLS and a 6 for stem canker and good tolerance to verticillium stem stripe.
Year Listed	2020		
Treated GO	102%		

\*To find out more on the KWS Oilseed Establishment Partnership (OEP), see page 84

## Winter Oilseed Rape Recommended List 2021/22, North


	Blazen	Barbados	DK Exsteel
Variety type	Conv	Conv	Hybrid
Scope of recommendation	N	N	N
<b>Gross output, yield adjusted for oil content (% treated control)</b>			
United Kingdom (5.3 t/ha)	101	97	101
East/West region (5.2 t/ha)	101	96	101
North region (5.9 t/ha)	<b>102</b>	<b>101</b>	<b>100</b>
<b>Seed yield (% treated control)</b>			
United Kingdom (4.9 t/ha)	102	97	101
East/West region (4.8 t/ha)	102	97	101
North region (5.4 t/ha)	<b>104</b>	<b>101</b>	<b>100</b>
<b>Untreated gross output, yield adjusted for oil content (% untreated control)</b>			
United Kingdom (5.4 t/ha)	98	97	104
<b>Untreated seed yield (% untreated control)</b>			
United Kingdom (5.0 t/ha)	99	97	104
<b>Agronomic features</b>			
Resistance to lodging (1–9)	[8]	8	8
Stem stiffness (1–9)	9	8	8
Shortness of stem (1–9)	6	6	5
Plant height (cm)	152	155	166
Earliness of flowering (1–9)	6	6	6
Earliness of maturity (1–9)	5	4	5
Pod shatter	-	-	R
<b>Disease resistance</b>			
Light leaf spot (1–9)	6	7	7
Stem canker (1–9)	6	7	8
TuYV	-	-	-
<b>Breeder/UK contact</b>			
Breeder	KWSMR	KWSMR	MonTec
UK contact	KWS	KWS	Bay
<b>Annual treated gross output, yield adjusted for oil content (% control) - UK</b>			
2017 (5.7 t/ha)	104	100	101
2018 (5.6 t/ha)	102	98	100
2019 (5.5 t/ha)	101	99	101
2020 (5.6 t/ha)	100	97	101
<b>Seed quality (at 9% moisture)</b>			
Oil content, fungicide-treated (%)	44.7	45.0	45.5
Glucosinolate (μmoles/g)	10.7	11.1	11.9
<b>Status in RL system</b>			
Year first listed	20	16	19
RL status	P2	*	*



Varieties featuring the  
Cereals360 logo  
can be viewed on the  
KWS Virtual World  
[www.cereals360.co.uk](http://www.cereals360.co.uk)






## Recommended For The East/West

FLAMINGO			
Details		Comments	
Recommendation	No longer listed	Flamingo is a high gross output variety with good autumn vigour. It has very good resistance to LLS with a 7 rating. Stem canker needs attention with a rating of 4. It has good spring vigour and gold standard tolerance to verticillium stem stripe.	
Year Listed	2017		
Treated GO	102%		

Data source: AHDB Recommended List Trials, Winter Oilseed Rape, East/West 2020/21

## Oilseed Rape Candidates

HAYA		 CANDIDATE		
Details				Comments
Recommendation	East / West			High gross output candidate variety with good standing and early maturity. Excellent resistance to stem canker and medium resistance to LLS. Under test for verticillium stem stripe.
Year Listed	RL Candidate			

HELIOTT			
Details			Comments
CANDIDATE			
Recommendation	North		
Year Listed	RL Candidate		

\*Candidate varieties not yet national listed – this does not constitute an offer for sale



## Winter Oilseed Rape Recommended List 2021/22, East/West

	LG Antigua	DK Expectation	Respect	Darling	George	Dazzler	PT275	PT279CL &	Nizza CL &
Variety type	Hybrid	Hybrid	Hybrid	Hybrid	Hybrid	Hybrid	Hybrid	Hybrid	Hybrid
Scope of recommendation	E/W	E/W	E/W	E/W	E/W	E/W	E/W	Sp	Sp
	NEW	NEW	NEW		*		*		
Gross output, yield adjusted for oil content (% treated control)									
United Kingdom (5.3 t/ha)	108	106	106	103	103	102	102	96	93
East/West region (5.2 t/ha)	109	107	106	103	103	102	102	96	94
North region (5.9 t/ha)	102	96	101	100	100	98	97	91	88
Seed yield (% treated control)									
United Kingdom (4.9 t/ha)	108	106	106	102	103	101	102	96	94
East/West region (4.8 t/ha)	108	107	107	103	103	101	102	97	94
North region (5.4 t/ha)	102	96	102	99	100	97	97	92	89
Untreated gross output, yield adjusted for oil content (% untreated control)									
United Kingdom (5.4 t/ha)	-	-	-	102	99	102	101	94	87
Untreated seed yield (% untreated control)									
United Kingdom (5.0 t/ha)	-	-	-	101	98	101	101	95	88
Agronomic features									
Resistance to lodging (1–9)	[8]	[8]	[8]	[8]	8	[8]	8	8	[8]
Stem stiffness (1–9)	8	7	8	8	7	9	8	8	8
Shortness of stem (1–9)	6	6	6	6	7	6	6	6	6
Plant height (cm)	162	156	162	159	151	153	156	156	152
Earliness of flowering (1–9)	7	8	7	7	7	8	5	6	7
Earliness of maturity (1–9)	6	6	5	5	5	6	5	6	5
Pod shatter	R	R	-	R	-	R	R	-	-
Disease resistance									
Light leaf spot (1–9)	6	7	6	6	6	6	6	5	5
Stem canker (1–9)	7	8	8	8	9	8	5	5	6
TuYV	R	R	-	R	-	R	-	-	-
Breeder/UK contact									
Breeder	LimEur	MonTec	NPZ	DSV	SyP	DSV	PionOS	PionOS	R2n
UK contact	Lim	Bay	LSPB	DSV	Els	DSV	Cor	Cor	RAGT
Annual treated gross output, yield adjusted for oil content (% control) - UK									
2017 (5.7 t/ha)	-	-	-	102	102	100	100	93	91
2018 (5.6 t/ha)	105	101	103	100	101	99	101	94	91
2019 (5.5 t/ha)	105	102	103	103	101	103	98	93	93
2020 (5.6 t/ha)	105	101	103	102	102	99	99	94	87
Seed quality (at 9% moisture)									
Oil content, fungicide-treated (%)	45.6	45.4	45.0	46.1	45.5	46.2	45.4	45.0	44.8
Glucosinolate (µmoles/g)	11.5	12.2	11.8	12.2	9.6	11.1	8.4	10.9	14.9
Status in RL system									
Year first listed	21	21	21	20	19	20	19	19	20
RL status	P1	P1	P1	P2	*	P2	*	-	P2

# Other Oilseed Rape Varieties

CODEX		
Details		Comments
Recommendation	NL variety	Codex is a variety with a very reliable output and good standing ability. It is rated a 6 for LLS and has an outstanding 9 rating for resistance to stem canker. Codex is marketed under the <b>KWS OEP scheme*</b> .
Treated GO	101%	

\*To find out more on the KWS Oilseed Establishment Partnership see page 84

KWS CRISTIANO		
Details		Comments
Recommendation	Common Catalogue Variety	KWS Cristiano is a high gross output hybrid variety from the KWS continental breeding programme. It exhibits good early vigour and has a solid disease resistance package.
Treated GO	High potential	



FELICIANO KWS		
Details		Comments
Recommendation	Common Catalogue Variety	KWS Feliciano is a high-yielding hybrid from the KWS continental breeding programme – it has excellent autumn and spring vigour. It is a very popular variety in France where it's new resistance to stem canker is proving valuable. The resistance comes from RLM 9 and a unique new resistance RLMS.  In addition, Feliciano KWS has good tolerance to verticillium stem stripe. LLS is not as strong, making it less suitable for high risk areas. Although it is quite a tall variety, it has very stiff straw.
Treated GO	High potential	

ERNESTO KWS		
Details		Comments
Recommendation	UK	KWS Ernesto is a very vigorous hybrid from the KWS continental breeding programme. Its spring vigour is exceptional. It carries the new RLMS resistance to phoma. It has good standing and a high yield potential.
Year Listed	Common Catalogue Variety	
Treated GO	High potential	





# The KWS Oilseed Establishment Partnership

## Going 50:50 with oilseed rape establishment

**The KWS Oilseed Establishment Partnership (OEP) is a new scheme to help growers with the risk of growing oilseed rape.**

The KWS Oilseed Establishment Partnership (OEP) launched in 2019 is designed to give producers the confidence to continue growing the crop.

Nobody is negating the very real problems many growers face in parts of the country but equally, we know there is a significant number of growers out there that recognise oilseed rape is still the best break crop option they have.

KWS wants to give growers as much support as we can, working with the distributor trade to give them access to the most cost-effective genetics and latest knowledge on crop establishment.

Essentially, growers will pay 50% of their oilseed rape seed costs up front and the second half of the payment once the crop is established. The partnership will be available nationwide through a network of 12 merchants and seed suppliers with different variety options.

We estimate that around 10% of the 2018 oilseed rape crop was lost nationally and the OEP is a way of reducing some of the risks that growers face. It shares the risk of oilseed rape establishment between the grower, the merchant, and the breeder.

### Here's how OEP works:

- The grower pays a lower price for the seed that is sown and then once the crop is drilled pays the balance, based on the area established, in November. This allows the grower to adjust seed rates at a lower cost and improves cash flow.
- The scheme is available to all growers via a simple online sign up and is managed by the British Intellectual Property Office (BIPO).
- Another feature of the OEP is a 'best practice' information sharing platform for growing the variety each season.

To find out more about the partnership, please scan the QR code







# HYBRID RYE

## Hybrid Rye: the cereal with much to offer!

KWS Group is the leading breeder of hybrid rye, with a long term hybrid breeding programme established since the mid 1980's. Offering varieties for wholecrop (as silage, or AD / biogas feedstock) or grain production (for feed grain, flour, and distilling).

Today Hybrid Rye is grown on over 5 million hectares worldwide in Europe, Russia, Canada and the United States.

For the UK and Ireland, KWS believes this highly productive cereal offers new perspectives for farmers and end users alike!

### Join the Ryevolution!

Top reasons to consider growing hybrid rye in 2021:

- Hybrid rye delivers consistent grain yields in the 2nd cereal slot
- Low nitrogen input – saving around 100 kg/ha N compared to 2nd wheat
- Low disease risk – rye typically only requires 1-2 fungicides to control brown rust
- High straw yields – ideal for livestock or renewables
- Growing demand from pig finishing units, distillers and millers
- Fit for the future; under the UK's agricultural bill, rye delivers nitrogen and agrochemical savings without compromising yields



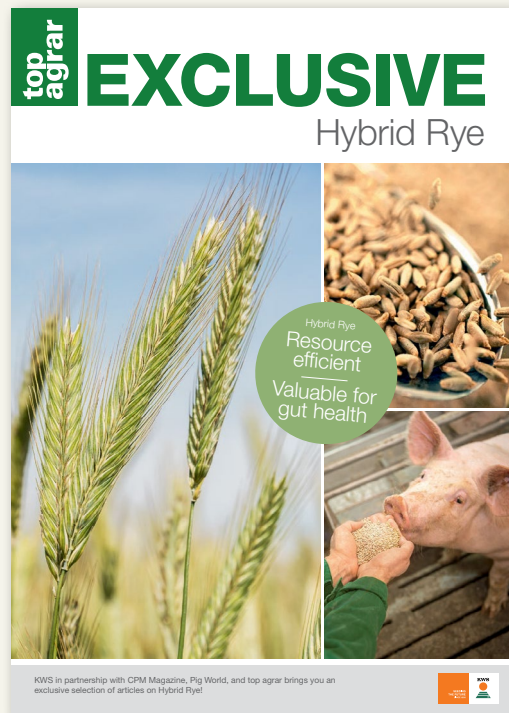


# Hybrid Rye - a high quality feed!

In Denmark, Germany, Russia, Poland, and Spain, rye is already rapidly becoming an established component of pig rations. KWS, in partnership with farmers and feed experts, are now extending hybrid rye uptake in the USA and Canada with strong interest in what rye can offer.

## Rye can boost gut health:

- Reduce feed costs: Rye is a low input, high yielding cereal – diet inclusions (of up to 70%) give maximum return on feed costs
- Behaviour: Rye raises satiety levels and leads to less tail biting & fighting over feed
- (SCFA)s\*: from rye boost gut microflora, reducing salmonella gut wall attachment
- Less gut ulceration: Rye demands more active chewing & saliva uptake – this reduces feed acidity upon stomach entry



**top agrar** **EXCLUSIVE**  
Hybrid Rye

Hybrid Rye  
Resource efficient  
Valuable for gut health

KWS in partnership with CPM Magazine, Pig World, and top agrar brings you an exclusive selection of articles on Hybrid Rye!

\*Short Chain Fatty Acids

Sources:

DCA - Danish Centre for Food and Agriculture - Aarhus University 2013.

Impact of physical form of animal diets - Kamphues 2018. Grone et al 2020.

## Download your copy!

KWS in partnership with CPM Magazine, Pig World, and top agrar brings you an exclusive selection of articles on Hybrid Rye!



## PollenPlus® KWS files for 'ergot' patent in hybrid rye

Pollen

PLUS



"Ergot is the curse of rye, but since moving to a fully hybrid variety this has become less of a concern.

We moved to KWS Bono a few years ago partly for the higher yield potential, but also because the higher quantities of pollen these PollenPlus® varieties produce.

With milling wheat on the farm too we need to be proactive and PollenPlus® varieties have helped greatly".

**David Lord**

Earls Hall Farm, Clacton on Sea.

## JSR looking to rye to benefit the pig and arable sides of the business



"With industry results having shown a potential for improved gut health, which in turn leads to improved health, behaviour and performance.

We were keen to test the cereal for ourselves and were pleased with the results.

"Rye now features as a permanent addition to our rotation and we're excited to see how pigs at other stages of the production cycle perform on it."

**Stephen Waite**

JSR's Managing Director of pigs & genetics

Varieties featuring the Cereals360 logo can be viewed on the KWS Virtual World [www.cereals360.co.uk](http://www.cereals360.co.uk)



## Hybrid Rye Varieties

### KWS SERAFINO



Details		Comments
Fire up your rye yields and grain quality!		
Breeder	KWS	KWS Serafino offers maximum yield performance for wholecrop or grain, with a leading harvest index (grains/ear).  KWS' own trials data highlights excellent hagberg (HFN) and grain sample quality when grown in UK conditions.
Year Launched	2019	
Wholecrop Yield	35-45 t/ha	
Grain Yield	11-13 t/ha	
End Use	Dual purpose hybrid (AD or Grain; Feed, Flour & Distilling)	New AHDB entry from KWS

### KWS TAYO



Details	Comments	
Join the ryevolution!		
Breeder	KWS	KWS Tayo is a brand new addition to KWS' hybrid rye lineup for 2020/21 and is currently in UK AHDB grain trials.
Year Launched	2020	
Wholecrop Yield	35-45 t/ha	KWS Tayo is an excellent option for pig finishing or sow rations. With high grain and straw yields plus low growing costs.
Grain Yield	11-13 t/ha	
End Use	Dual purpose hybrid (AD or Grain; Feed, Flour & Distilling)	KWS Tayo offers robust stem stiffness compared to older hybrids.

Data source: KWS Agroservice Trials



## Join the #ryevolution!

- KWS Tayo – the brand new addition to the AHDB Descriptive List
- New generation PollenPlus® hybrid with excellent stem stiffness
- Multipurpose hybrid (AD or grain; feed, flour and distilling)

No.1  
harvest  
index!



# OATS

## Spring Oats

Spurred on by reports that oats are the 'healthy cereal' that is a natural way to reduce cholesterol and a good source of manganese and vitamin B12, consumer demand for oats and oat-based foods is steadily increasing. There is considerable opportunity for more growth.

Helped by increasing demand, the area of oats grown in England has been steadily increasing: since 2016 the sown area has grown by more than 30% and the forecasted demand is set to increase year on year, making this crop an attractive option for a partial take-all break in the rotation.

## Husked

WPB ISABEL		AHDB RECOMMENDED	Comments
Details			
Type	Husked		
Year Listed	2020		
Treated Yield	105%		
Parentage	Husky Cross		WPB Isabel is the latest addition to the spring Oat Recommended List 2020/21. From the stable that has already delivered WPB Elyann to the market, this Wiersum line will appeal to growers looking for a high-yielding spring oat with excellent grain quality.

WPB ELYANN		AHDB RECOMMENDED	Comments
Details			
Type	Husked		
Year Listed	2017		
Treated Yield	98%		
Parentage	(Ivory x LW 00W035-01) x LW 97W020-01		WPB Elyann is an exciting spring oat! It offers high yields and the best kernel content of any recommended varieties (77.0%). Not only that, it will be one of the first varieties to mature ripening ahead of all other listed varieties.  As well as good agronomics, it has wide market appeal. WPB Elyann is already generating strong interest from the millers, as it has the right attributes for the milling market.



# Spring Oats Recommended List 2021, Husked Varieties

	Delfin	WPB Isabel	Elison	Yukon	Canyon	Aspen	WPB Elyann	Conway	Firth
Variety type	Husked varieties								
Scope of recommendation	UK	UK	UK	UK	UK	UK	UK	UK	UK
					C	C	C		*
UK yield (% treated control)									
Fungicide-treated (6.9 t/ha)	106	105	105	104	102	100	98	98	94
Untreated (% of treated control)	101	88	97	99	96	86	88	88	79
Grain quality									
Kernel content (%)	73.0	75.9	72.5	73.2	73.2	73.8	77.0	74.4	74.3
Specific weight (kg/hl)	50.9	54.5	51.0	50.3	51.7	51.7	50.9	50.5	49.3
Screenings (% through 2.0 mm)	2.8	2.0	2.7	2.8	2.4	2.1	2.5	2.5	2.9
Agronomic features									
Resistance to lodging (1–9)	8	[9]	8	8	7	7	7	9	7
Straw length (cm)	111	[109]	110	106	110	98	100	105	98
Ripening (days +/- Firth, -ve = earlier)	+0	+0	+0	+0	+0	+0	-1	-1	+0
Disease resistance									
Mildew (1–9) - see note below	8	5	8	7	8	4	4	5	4
Crown rust (1–9)	4	5	3	5	4	5	5	4	5
Annual treated yield (% control)									
2016 (8.3 t/ha)	[104]	[103]	[104]	[102]	[101]	[100]	[99]	[97]	[95]
2017 (7.2 t/ha)	[112]	[111]	[102]	[106]	[103]	[101]	[96]	[98]	[101]
2018 (6.0 t/ha)	[106]	[101]	[103]	[100]	[96]	[102]	[102]	[96]	[95]
2019 (7.1 t/ha)	[104]	[106]	[110]	[106]	[105]	[100]	[95]	[98]	[86]
2020 (6.1 t/ha)	[106]	[103]	[104]	[105]	[104]	[96]	[100]	[102]	[90]
Breeder/ UK contact									
Breeder	Nord	Wier	SE	Nord	Nord	Bau	Wier	IBERS	KWS
UK contact	SU	KWS	Sen	SU	SU	Sen	KWS	Sen	KWS
Status in RL system									
Year first listed	18	20	19	17	11	15	17	14	00
RL status	-	P2	-	-	-	-	-	-	*





# Peas

Most growers will be aware of the obvious benefit of growing peas; they are leguminous and therefore require no nitrogen, which makes them a cheap crop to grow. Include in the mix, the increase in insect biodiversity and increase in soil microbial activities - both of which have been proven to aid future crops - and they really start to look attractive.

Not forgetting that the political focus is firmly on the environment and reducing carbon within agriculture, the new agricultural bill clearly suggests this will be the case ensuring peas will have a big part to play.

Finally the UK demand for large blue peas and white peas is increasing year on year due to strong export demand to Asia and new vegan batters and coating made from peas. In spring 2020 / 2021 the gross margin on peas was the best of all spring crops proving they are very much an overlooked crop to most farmers and a real opportunity to improve the soil, decrease UK Agriculture's CO2 and provide a healthy margin also.



## Large Blue Pea

MANKATO		AHDB RECOMMENDED	Comments
Details			
Year Listed	2019		Mankato is a high-yielding large blue pea with medium height and exceptional standing to ensure a safe harvest. It is liked by end users for its good colour retention which helps growers attract a high premium for reducing bleaching when being sold. It offers a high protein of 22% dried and has a good all-round disease package including resistance to pea wilt.
Treated Yield	106%		

Data source: PGRO Recommended List 2020/21

## White Pea

MANAGER		AHDB RECOMMENDED	Comments
Details			
Year Listed	2018		Manager is a very high-yielding yellow pea that performs nationally over a range of soil types. It offers class leading downy mildew resistance and is resistant to pea wilt. It has very short stiff straw allowing for a safe harvest. Its large seed size is favoured by end users for splitting and protein extrusion also.
Treated Yield	109%		

Data source: PGRO Recommended List 2020/21



# MAIZE



## Maize 360 Virtual Tour



**Many of our customers will have already been to our demonstration site at Lydney in Gloucestershire; we usually host grower visits throughout September. Sadly, the 2020 tours had to be cancelled but instead we put together a 'Virtual 360 tour,' which can be watched from the comfort of home or even from the tractor cab while you are taking a break.**

Clever technology allows the viewer to manipulate the screen to focus on points of interest and feedback from the video has been very positive. Nevertheless, we understand that it cannot replace the 'real thing' and we look forward to welcoming visitors back to the demonstration site in September 2021.

**You can find the whole 360 tour at [www.maize360.com](http://www.maize360.com)**





# myKWS

## Digital consulting for farmers

Sign up to myKWS to gain access to tools to help with the cultivation of your KWS maize varieties, as well as all your other crops from KWS.



[www.kws-uk.com/mykws](http://www.kws-uk.com/mykws)



### Maize Seed Service

Protect yourself in the event of frost or bird damage and receive a 50% discount off seed purchase costs for re-sowing.



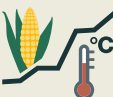
### Seed Requirement Calculator

Easily find your seed rate and unit needs, for either 75cm or 50cm row spacing.



### Soil Temperature Tool

Check your soil temperature for your area before sowing.



### Heat Unit Tool

Check your predicted harvest date based on the FAO of your selected hybrids, and the average heat units.

## KWS Maize Hybrids



**KWS specialise in the production of maize hybrids to suit all growing situations for both livestock and AD.**

Our UK focus is to select maize hybrids capable of consistently achieving top on-farm performance.

The guides below and myKWS are intended to help farmers and advisers to get the most out of their maize crop.

We are happy to provide expert advice on varietal choice for specific farm situations; please do not hesitate to contact us if you require assistance.

## Our KWS Maize publications...



### myKWS MAIZE

Quarterly  
newsletter



### Maize Best Practice

Growing and  
Agronomy Guide



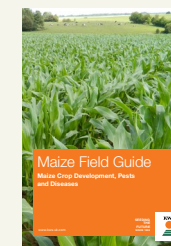
### Maize Best Practice

Ensiling, Feeding  
and Nutrition



### Cropping for Biogas

A Practical Guide



### Maize Field Guide

Maize Crop  
Development,  
Pests & Diseases



Visit [www.kws.com/gb/en/products/maize/guides-and-references](http://www.kws.com/gb/en/products/maize/guides-and-references)  
or scan the QR code to find out more



# SUGAR BEET

The best sugar beet for the UK  
It's all in the seed



Your crop. Your choice. Our technology.

To request your KWS Sugar Beet Guide 2021 please  
mail [ukmarketing@kws.com](mailto:ukmarketing@kws.com) or contact your local  
Sugar Beet Consultant

KWS breeding continues to provide UK growers with exceptional choice for their sugar beet crop with new varieties added for the 2021 drilling season.

But there's more on offer than just varieties to support you and your crop through the growing season:



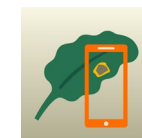
**Beet Seed Service** –  
peace of mind should  
you need to re-sow



**CONVISO® SMART** –  
innovation for excellent  
weed control



**EPD2.0 seed  
treatment** – giving your  
seed the best start



**Beet Leaf Scan App** –  
to check canopy health



# POWER at work

## CONVISO® SMART – Innovating Weed Control in Sugar Beet

CONVISO® SMART is a revolutionary weed control system for sugar beet growers, providing a step forwards in managing your crops.



### SMART KWS seeds

Innovative sugar beet hybrids tolerant to a new ALS-inhibitor based herbicide



### CONVISO® ONE herbicide

A new broad-spectrum herbicide in sugar beet based on ALS-inhibitors

## SMART CHOICE

More flexible and efficient weed control

- Broad weed spectrum including weed beet
- More independent from growth stage of the beet and growth conditions of the beet
- More independent from weather conditions before and after the application



Find out more at  
[www.convisosmart.co.uk](http://www.convisosmart.co.uk)  
or scan the QR code



## KWS Beet Seed Service

Your partner if you need to re-sow

The Beet Seed Service is available to all growers of KWS varieties with EPD treated seed.

The decision of re-sowing sugar beet is a last resort, not a decision to be taken lightly. A wide range of issues can cause an uneconomic plant stand within the establishing crop such as frost, windblow and pest damage.

To complement our offer of EPD treated seed for UK growers, we are offering KWS Beet Seed Service to provide a peace of mind if re-sowing is necessary.

### The Principle of the Beet Seed Service

Should you need to re-sow your beet crop we will offer the replacement seed at 50% of the initial sale price of the seed.

For example, if you were to spend £180 per unit on KWS EPD treated seed and needed to re-sow, the seed cost for re-sowing would be £90 per unit.

### How to use the Beet Seed Service

Register for Beet Seed Service by signing up to MyKWS at: [www.kws.com/gb/en/mykws/](http://www.kws.com/gb/en/mykws/)

Make sure to register your fields within 14 days of drilling.

- Name, address, contact details
- Field seed is drilled and date of drilling
- Proof of purchase of original seed order (invoice or delivery note) including lot number

If the crop fails to establish to a satisfactory level within 8 weeks of drilling, submit a damage report via the Beet Seed Service Website.



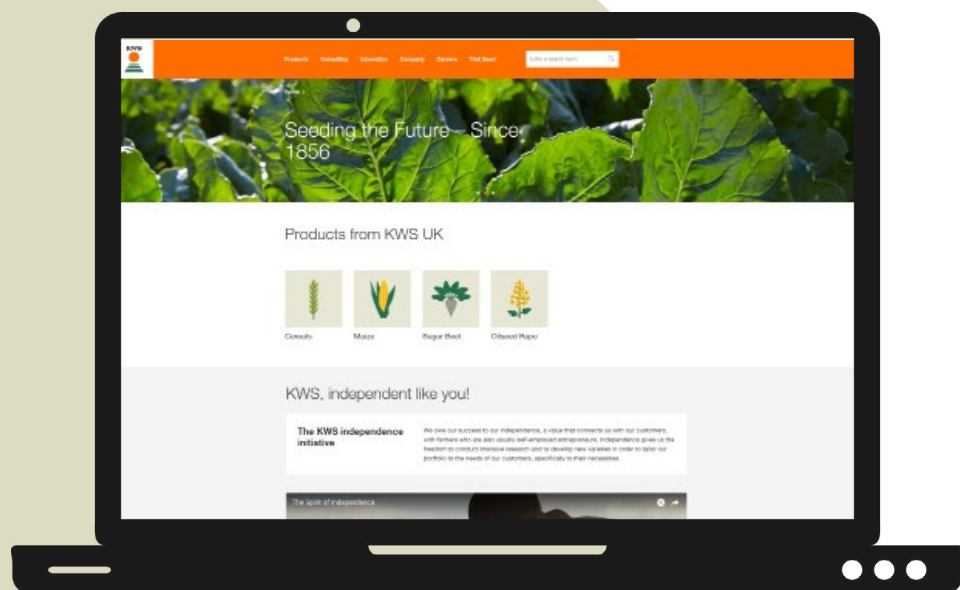
Replacement seed offered to growers through KWS Beet Seed Service must be re-sown in the year it is provided.

Terms and conditions apply - please visit [www.kws-uk.com](http://www.kws-uk.com) for full details.

# Want more information?

Visit our website for any additional information you may require on any of our varieties or crops.

The site is easy to navigate, mobile friendly, nice to look, at AND jam packed with content!



[www.kws-uk.com](http://www.kws-uk.com)



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@kwsukltd



KWS UK Ltd

Here's a selection of some of the great images you have already shared with us





