

KWS UK

2020 Variety Guide

SEEDING
THE FUTURE
SINCE 1856



Contents

INTRODUCTION	04	The Oileed Establishment Partnership (OEP)	78
Thank you	05		
KEY CONTACTS	06	HYBRID RYE	80
Cereals 360	08	Hybrid Rye	81
Sowing for Peak Performance	09	The cereal with much to offer!	81
		Hybrid Rye varieties	82
WHEAT	13	OATS	84
Winter Wheat	14	Spring Oats	85
Wheat demand	14	Husked	85
Wheat Optimum Drilling Times	15	PEAS	87
Group 1	16	Peas	88
Group 2	18	Yellow Pea	89
Group 3	24	Large Blue Pea	89
Soft Group 4	30		
Hard Group 4	33	MAIZE	90
Upcoming Winter Wheats	42	SUGAR BEET	92
Spring Wheat	43	MORE INFORMATION	94
Group 2	43		
Group 4 Hard	44		
BARLEY	46		
Winter Barley	47		
Reasons to grow Winter Barley	47		
Two Row Feed	48		
BYDV Tolerance	54		
Six Rows	55		
Winter Barley Candidates	59		
Spring Barley	60		
Two Row Malting	60		
OILSEED RAPE	63		
Winter Oilseed Rape	64		
Establishment	65		
OSR Optimum Drilling Times	68		
Recommended For The UK	69		
Recommended For The E/W	72		
Recommended For The North	74		
Other Oilseed Rape Varieties	76		



Introduction

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

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 also included 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 tolerance to Barley Yellow Dwarf Virus (BYDV) works, and what it offers growers.

All figures in the guide are sourced from the AHDB 2020/21 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 06 for details.

Your commitment. Your energy. Our applause.



Thank you

We would like to thank farmers, our employees and everyone who is involved in the food supply chain.

We appreciate your hard work, ensuring we continue to have food on our tables.

www.kws-uk.com

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Key Contacts

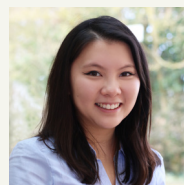
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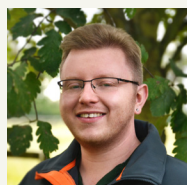
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Cereals 360 is here!

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 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?'



SOWING4PEAK PERFORMANCE

Helping to build the foundations of your future crops success

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, 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.

Tailored choices are important now and will become increasingly so in the future. In the years ahead we will be entering uncharted waters when it comes to crop production, and many of the accepted principles and practices we take for granted now, will come under increasing scrutiny:

- Much of the chemistry we have come to rely on is slowly being lost to revocation, and what remains is under pressure.
- Our use of essential Nitrogen (N) is also under threat due to growing environmental concerns.
- The reduction of carbon footprint in crop production will remain a challenge.
- There are worries over loss of N from the system in terms of leaching and its release into 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.

Meanwhile, all of 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 to be without substantial changes.

At KWS, we have 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 recognise 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 key requirements that growers should consider 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 needs 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 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 periods and buying you time. Note that varieties outside your different market segments may be used to widen spray windows and harvest timings.

2 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 and 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. Different market segments may be used to widen spray windows and harvest timings.

3 To reduce amount of all inputs used and associated costs

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

4 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.

5 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.

So how can SPP help me today?

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

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

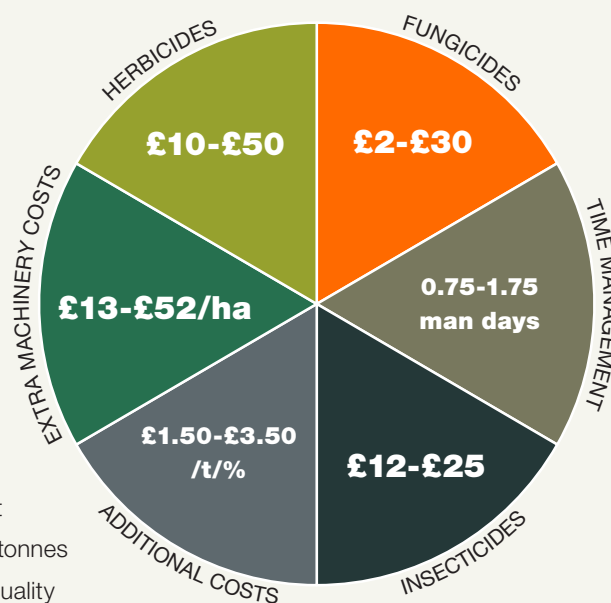


SAVINGS IN:

- Time management
- Extra machine costs (e.g. subsoiler)
- Fungicides
- Herbicides
- Insecticides
- Additional costs (e.g. drying)

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



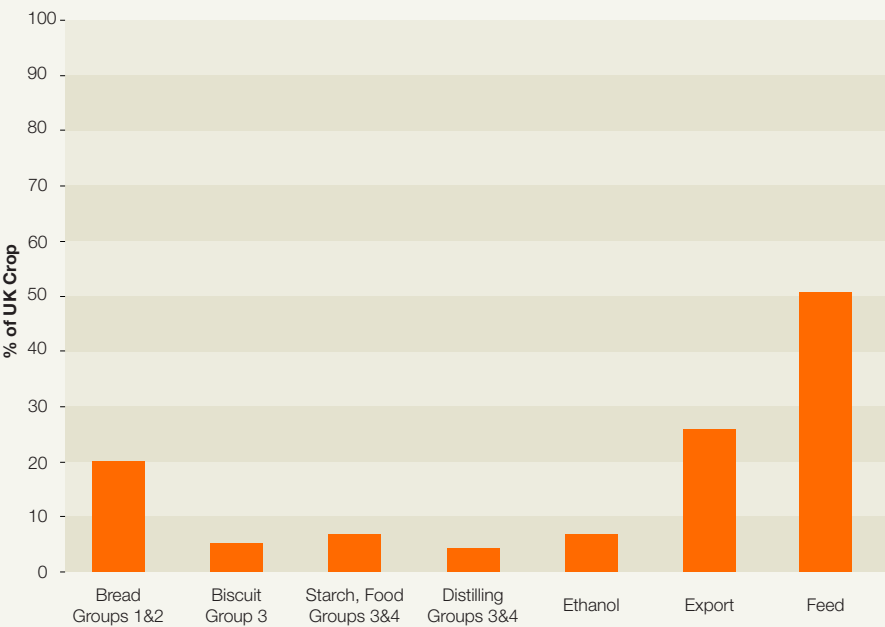
Data Source: Nix 2020

WHEAT

Winter Wheat

Wheat demand

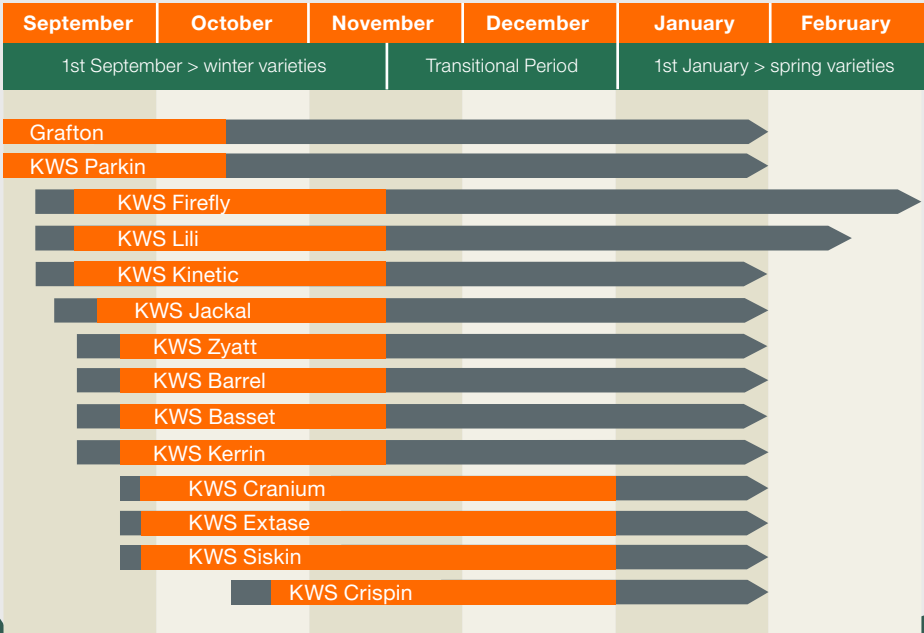
Graph 1: Demand



Data Source: 5 years average DEFRA Statistics

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 ingredients companies. (Data Source: nabim). Export and feed make up the balance of the UK wheat crop destination.

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 09.



Varieties featuring the **Cereals360** logo can be viewed on the KWS Virtual World

www.cereals360.co.uk

Group 1

Wheat varieties within this sector are used by millers for breadmaking and give a 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 for their precise requirements.

SPECIFICATION		
	Group 1 Spec	ukp Spec
Protein	13%	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



Group 1 Varieties

KWS ZYATT			
Details		AHDB RECOMMENDED	
Group 1	Year Listed 2017	UK treated yield 99%	Parentage Hereford x KWS Quartz
Comments			
<p>KWS Zyatt is the highest yielding Group 1 on the Recommended List. Commercial experience in the mill and bakery has shown that 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 269 seconds and a milling specification protein of 13.2%, which combined with its group-leading yield across all regions and soil types, together with its ukp status as an export-approved variety, make it the leading Group 1 wheat.</p> <p>KWS Zyatt has the highest untreated yield of all Group 1 varieties, at 83% of the treated controls. Its combination of excellent all-round disease resistances, including a score of 6.4 for <i>Septoria tritici</i>, a 7 for yellow rust and a 7 for eyespot combine to make it a compelling variety proposition. KWS Zyatt now has a strong farm following for its second wheat performance which combined with its disease resistance, stiff straw and mid-maturity make it the stand-out variety for both the first and second wheat position.</p>			

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. Those close to a flour mill or port should have KWS Zyatt at the top of the list of 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 is tried and tested by the UK baking industry and has been shown to deliver a wide range of good quality end products being supported by an excellent physical grain package too. Yields are 2% 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 so that 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 with its consistently good baking performance and versatility across a range of applications."

Shaun Taylor,
Technical Director
of Hovis Bakeries.





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Group 2

Varieties in Group 2 are routinely used in the bakery for bread making, but may have other bakery applications too. As a result they may have specific end use characteristics which are not suited to all grists. Subsequently 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		
	Group 2 Spec	ukp Spec
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



Group 2 Varieties

KWS LILI		 RECOMMENDED	Comments
Details			
Group	2		A proven variety that has strong straw and is slightly later to mature. Popular across all regions due to its yield reliability, ukp export approval and suitability to early drilling. It delivers its best performances in the north where it is 2% higher yielding than in other regions. It has delivered excellent performance on light land and has shown consistent first wheat yields across a range of sites and seasons.
Year Listed	2015		
Treated Yield	99%		
Parentage	KWS Horizon x Timaru		

KWS SISKIN



RECOMMENDED



Details

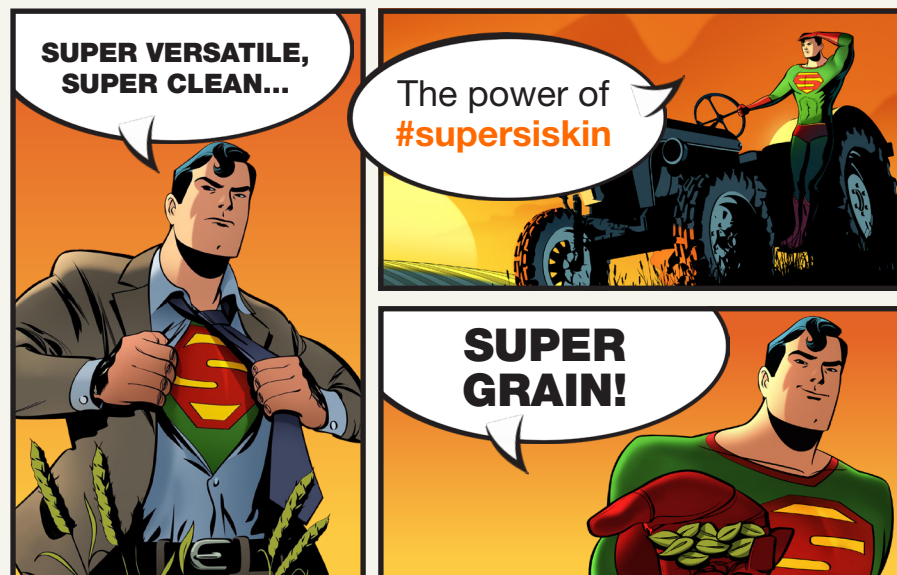
Group 2	Year Listed 2016	UK treated yield 101%	Parentage KWS Sterling x Timaru
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Comments

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 fulfills 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 77.2 kg/hl, a HFN of 286 seconds and a milling specification protein of 12.6% 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 83% of treated controls – the same as KWS Zyatt and KWS Crispin – in large part due to its *Septoria tritici* and yellow rust resistance for which it scores a 6.6 and a 9 respectively. Its vigorous growth habit makes it well-suited to later drilling while still offering medium maturity.



KWS EXTASE



Details

Group	Year Listed	UK treated yield	Parentage
2	2019	101%	Boisseau x Solheio

Comments

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.

A specific weight of 78.4 kg/hl, a HFN of 297 seconds – the highest score for both characteristics of any Recommended breadmaking wheat – and a milling specification protein of 12.6% 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.

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 *Septoria tritici*, for which it has a score of 8.1 – the first UK variety to be awarded a score of over 8.0 – a 9 for yellow rust and a 7 for brown rust.

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 maturity equal to that of Skyfall, and Group 2 counterpart KWS Siskin, it will appeal strongly to those in the east and those looking for complementary varieties to spread the harvest workload. Its maturity and good wet-weather disease resistance will also support its appeal to those in the west and north. RL data shows that KWS Extase matures at a similar rate to Skyfall, however, KWS information suggests earlier maturity when sown at the right time (see Graph 2 on P22).

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.

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.

After 20th May 2020, you will no longer be able to apply chlorothalonil which puts a hole in *Septoria* 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 thus preserving KWS Extase as a key variety on-farm today and in the future.

The Growers Experience

"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/m² is about right – around 25 seeds/m² less than you'd want for KWS Siskin".

Andrew Robinson of Heathcote Farms in Bedfordshire, who grew a 7.5ha trial field for harvest 2019

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



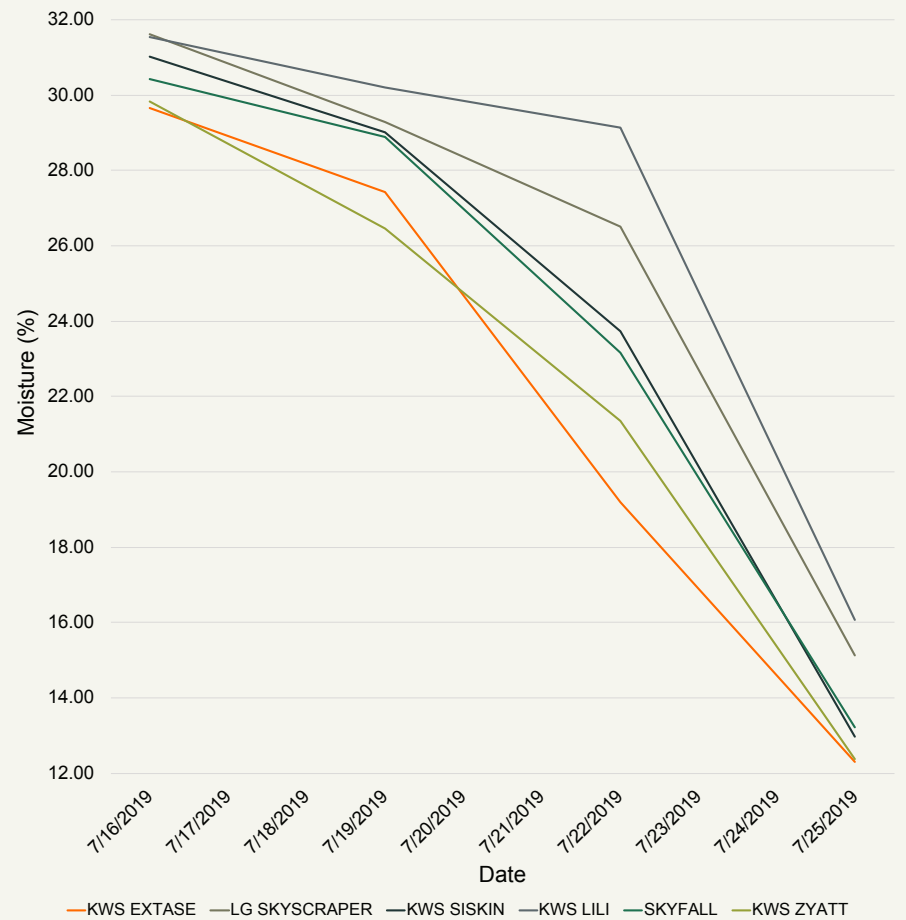
KWS Cordiale



KWS Lili

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

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



The Millers Experience

“Since issuing the buy-back contracts almost a year ago, we’ve been pleased with the response from growers who have made commitments going forward”.

“Obviously if a grower has fallen foul of the recent weather and been unable to plant for harvest 2020, then we’ll have to accept there’s little they or we can do to correct the issue. We’d hope though that their appetite for the variety would continue and that their intention would be to plant for harvest 2021.”

“There are 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 kindly thank CPM magazine in conducting interviews which were published in an article in CPM, March 2020 edition.



Original article published in CPM February 2020 edition: www.cpm-magazine.co.uk/2020/02/05/fit-for-the-future-your-new-tank-mix-partner/



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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		
	Group 3 Spec	uks Spec
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		The second-highest yielding Group 3 variety on the Recommended List and the highest yielding soft wheat variety for 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 77.1 kg/hl, a HFN of 224 seconds and a milling specification protein of 12.0%. 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		AHDB RECOMMENDED	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, while 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		



KWS FIREFLY

New to the Recommended List in 2019, KWS Firefly is the UK's highest yielding Group 3 milling wheat at 102% of controls.

It is a brilliant addition to the true biscuit sector, delivering on all fronts including yield, grain quality and agronomics. With the crop marketing challenges which lay ahead, KWS Firefly holds broad market appeal and is approved for export as uks.

With over 70% of Group 3 plantings in the AHDB Eastern region, KWS Firefly, either as a first or second wheat, is a first choice variety for growers looking to capture a number of premium markets in this area. A cross of Cougar and KWS Rowan, KWS Firefly has a 2% yield advantage across the UK, as well as the highest HFN of the Group 3s and OWBM resistance. With the best lodging scores (twin 8s) and an excellent *Septoria tritici* score of 7.0, it's a strong package that will also appeal to those in the West.

For growers looking for a variety for sowing mid to the end of September, KWS Firefly is a good option. Those still sowing at this time will benefit from KWS Firefly's plant type, high tillering, short and very stiff straw, coupled with early maturity.

Fully approved by nabim as Group 3, KWS Firefly delivers a strong grain package with the correct balance of resistance and is extensibility required by biscuit manufactures. Coupled with its fantastic grain quality and uks recommendation, it will also be a key variety for exporting regions and those growing for the feed sector too.

In short, KWS Firefly has one of the most complete packages on the Recommended List with a valuable combination of yield, good agronomics and quality grain.



KWS FIREFLY

AHDB

RECOMMENDED



Details

Group	Year Listed	UK treated yield	Parentage
3	2019	102%	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 70% 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 75.8 kg/hl and a protein of 11.9%. KWS Firefly has stiffer straw (with or without a PGR) than any other Group 3 variety and at 82cm is the shortest of any variety in this group. KWS Firefly is resistant to orange wheat blossom midge (OWBM).

Its all-round disease resistance is outstanding with a 7.0 for *Septoria tritici*, a 9 for yellow rust and an 6 for brown rust which support an untreated yield of 84% of treated controls. It has maturity similar to that of KWS Barrel and Elicit.

At 245 seconds KWS Firefly has the highest Hagberg Falling Number of any Group 3 variety. It 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.

Winter Wheat Recommended List 2020/21, Groups 1, 2 & 3

Page 1

	KWS Zyatt	Skyfall	Crusoe	RGT Illustrious	KWS Extase	KWS Siskin	LG Detroit	KWS Lili	KWS Firefly	KWS Barrel	Elicit	KWS Basset	Zulu
End-use group	nabim Group 1				nabim Group 2				nabim Group 3				
Scope of recommendation	UK	UK	UK	UK	UK	UK	E&W	UK	UK	UK	UK	UK	UK
	C				C				C		*		*
Fungicide-treated grain yield (% treated control)													
United Kingdom (11.2 t/ha)	99	97	96	96	101	101	100	99	102	100	100	98	97
East region (11.1 t/ha)	99	97	96	96	100	101	100	99	102	100	99	98	97
West region (11.2 t/ha)	99	97	97	96	101	101	101	99	102	100	100	98	97
North region (11.3 t/ha)	97	96	92	92	100	98	[93]	101	98	104	100	97	98
Main market options (The specific attributes of varieties are different so, whenever possible, varieties should not be mixed in store)													
UK breadmaking	Y	Y	Y	Y	Y	Y	Y	Y	-	-	-	-	-
UK biscuit, cake-making	-	-	-	-	-	-	-	-	Y	Y	Y	Y	Y
UK distilling	-	-	-	-	-	-	-	-	-	-	Y	-	[Y]
ukp bread wheat for export	Y	-	Y	-	[Y]	Y	[Y]	Y	-	-	-	-	-
uks soft wheat for export	-	-	-	-	-	-	-	-	[Y]	Y	Y	Y	Y
Grain quality													
Endosperm texture	Hard	Hard	Hard	Hard	Hard	Hard	Hard	Hard	Soft	Soft	Soft	Soft	Soft
Protein content (%)	12.4	12.4	12.9	12.2	12.0	11.9	12.3	11.5	11.9	11.3	11.7	11.6	11.7
Protein content (%) - Milling spec	13.2	13.3	13.5	13.0	12.6	12.6	12.9	12.2	12.6	12.0	12.3	12.3	12.4
Hagberg Falling Number	269	278	273	272	297	286	279	295	245	224	216	235	225
Specific weight (kg/hl)	77.8	78.3	77.9	77.2	78.4	77.2	77.6	77.3	75.8	77.1	76.9	77.5	76.0
Chopin alveograph W	181	-	217	-	199	164	212	[183]	[90]	96	90	93	103
Chopin alveograph P/L	0.7	-	0.6	-	0.6	0.5	0.7	[0.7]	[0.3]	0.4	0.3	0.4	0.3
Untreated grain yield (% treated control)													
United Kingdom (11.2 t/ha)	83	78	71	82	95	83	77	71	84	72	81	71	69
Agronomic features													
Resistance to lodging without PGR (1–9)	7	8	7	7	7	6	8	7	8	7	7	7	6
Resistance to lodging with PGR (1–9)	8	8	8	8	8	7	7	8	8	8	8	8	7
Height without PGR (cm)	84	83	81	89	90	84	85	81	82	83	85	85	89
Ripening (days +/- Skyfall, -ve = earlier)	-0	+0	+0	+1	-0	+0	+1	+2	+1	+1	+1	+1	+0
Resistance to sprouting (1–9)	[5]	5	6	6	[7]	5	[6]	7	[6]	6	[5]	6	5
Disease resistance													
Mildew (1–9)	7	6	6	6	6	8	5	8	5	7	6	5	7
Yellow rust (1–9) - see note below	7	5	9	9	9	9	9	7	9	9	9	8	5
Brown rust (1–9) - see note below	6	8	3	6	7	5	5	4	6	5	7	5	7

Winter Wheat Recommended List 2020/21, Groups 1, 2 & 3

Page 2

	KWS Zyatt	Skyfall	Crusoe	RGT Illustrious	KWS Extase	KWS Siskin	LG Detroit	KWS Lili	KWS Firefly	KWS Barrel	Elicit	KWS Bassett	Zulu
End-use group	nabim Group 1				nabim Group 2				nabim Group 3				
Septoria nodorum (1-9)	[6]	[6]	[6]	[6]	-	[6]	-	[6]	-	[6]	[6]	[6]	[6]
Septoria tritici (1-9)	6.4	5.8	6.2	6.0	8.1	6.6	5.3	5.9	7.0	4.3	5.5	5.0	5.4
Eyespot (1-9)	7@	6@	5	6@	[4]	5	[5]	4	[4]	5	4	5	4
Fusarium ear blight (1-9)	6	7	6	6	6	5	7	6	5	6	6	6	6
Orange wheat blossom midge	-	R	-	-	-	-	R	-	R	R	R	R	R
Breeder/UK contact													
Breeder	KWS	RAGT	Lim	R2n	Mom	KWS	LimEur	KWS	KWS	KWS	ElsW	KWS	Lim
UK contact	KWS	RAGT	Lim	RAGT	KWS	KWS	Lim	KWS	KWS	KWS	Els	KWS	Lim
Annual treated yield (% control)													
2015 (12.1 t/ha)	99	97	92	94	-	101	-	99	-	100	99	99	96
2016 (11.0 t/ha)	98	96	95	92	99	99	99	100	100	101	102	95	98
2017 (11.1 t/ha)	101	98	96	97	99	99	99	99	102	101	99	97	95
2018 (10.4 t/ha)	98	98	96	97	102	101	99	99	102	99	98	100	98
2019 (11.3 t/ha)	97	96	100	95	102	100	101	100	103	102	100	99	99
Rotational position													
First cereal (11.6 t/ha)	98	97	96	95	101	100	99	100	102	101	100	98	97
Second and more (9.8 t/ha)	99	98	93	94	100	100	100	98	100	100	100	98	96
Sowing date (most trials were sown in October)													
Early sown (before 25 Sept) (11.2 t/ha)	[[104]]	98	95	97	-	102	-	[[103]]	[103]	98	100	100	98
Late sown (after 1 Nov) (9.6 t/ha)	97	97	94	95	[102]	100	[99]	100	[102]	100	97	98	99
Soil type (about 50% of trials are on medium soils)													
Light soils (11.1 t/ha)	97	97	94	92	103	99	99	100	101	102	99	97	98
Heavy soils (11.3 t/ha)	100	97	97	97	101	101	101	99	103	100	99	98	97
Agronomic features													
Lodging % without PGR	3	1	2	3	3	17	1	2	1	3	5	2	10
Lodging % with PGR	1	2	3	1	2	7	4	2	1	2	3	1	8
Latest safe sowing date #	End Jan	End Feb	End Jan	Mid Feb	[End Jan]	End Jan	[End Jan]	Mid Feb	[End Feb]	End Jan	End Jan	End Jan	End Feb
Speed of development to growth stage 31 (days +/- average)													
Early sown (Sept)	-3	-3	+0	+1	[-5]	-8	[+6]	-1	[-4]	+5	-2	-4	-1
Med sown (Oct)	-4	-3	-1	+2	[-8]	-5	[+3]	-1	[-3]	+0	+3	+0	+0
Late sown (Nov)	-2	-2	-1	+0	[-2]	-3	[+1]	+3	[+1]	+3	+2	-2	+1
Status in RL system													
Year first listed	17	14	12	16	19	16	19	15	19	16	18	16	16
RL status	-	-	-	-	P2	-	P2	*	P2	-	-	*	*



Varieties featuring the **Cereals360** logo can be viewed on the KWS Virtual World

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Soft Group 4

These are feed varieties that may or may not have additional end use opportunities – some have been 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	360
Details		Comments	
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. Its SWRI approval supports its appeal to those supplying distilling contracts and it makes 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 4.9 which will need watching. KWS Jackal carries orange wheat blossom midge (OWBM) resistance.	
Year Listed	2018		
Treated Yield	101%		
Parentage	KWS Santiago x KWS W177		



RECOMMENDED

Winter Wheat Recommended List 2020/21, Soft Group 4 Page 1

	LG Skyscraper	RGT Saki	LG Spotlight	KWS Jackal	Elation	Bennington	LG Sundance	LG Motown	Leeds	Viscount	Revelation
End-use group	Soft Group 4										
Scope of recommendation	UK	UK	UK	N	UK	E&W	UK	UK	N	N	UK
		NEW			C	*		*	*	*	*
Fungicide-treated grain yield (% treated control)											
United Kingdom (11.2 t/ha)	105	104	103	101	101	101	100	99	97	96	96
East region (11.1 t/ha)	106	104	102	101	101	101	100	99	97	96	96
West region (11.2 t/ha)	104	104	104	101	101	102	100	99	96	96	95
North region (11.3 t/ha)	103	[101]	100	102	101	96	99	98	98	99	95
Main market options (The specific attributes of varieties are different so, whenever possible, varieties should not be mixed in store)											
UK breadmaking	-	-	-	-	-	-	-	-	-	-	-
UK biscuit, cake-making	-	-	-	-	-	-	-	-	-	-	-
UK distilling	[Y]	-	[Y]	[Y]	Y	-	[Y]	[Y]	[Y]	Y	Y
ukp bread wheat for export	-	-	-	-	-	-	-	-	-	-	-
uks soft wheat for export	-	-	-	-	Y	Y	-	-	Y	Y	Y
Grain quality											
Endosperm texture	Soft	Soft	Soft	Soft	Soft	Soft	Soft	Soft	Soft	Soft	Soft
Protein content (%)	11.4	11.6	11.4	11.1	11.6	11.7	11.3	11.4	11.4	11.4	11.8
Protein content (%) - Milling spec	12.1	12.1	12.1	12.0	12.3	12.3	12.1	12.0	12.2	12.2	12.5
Hagberg Falling Number	218	221	288	182	206	236	175	223	216	195	250
Specific weight (kg/hl)	76.9	75.7	77.9	75.6	77.4	77.5	73.9	75.6	77.8	75.9	76.4
Chopin alveograph W	-	-	[72]	[77]	94	91	[87]	[65]	-	-	-
Chopin alveograph P/L	-	-	[0.3]	[0.3]	0.3	0.4	[0.3]	[0.3]	-	-	-
Untreated grain yield (% treated control)											
United Kingdom (11.2 t/ha)	83	86	80	76	77	79	85	83	67	75	77
Agronomic features											
Resistance to lodging without PGR (1-9)	7	7	7	7	7	7	6	6	7	7	7
Resistance to lodging with PGR (1-9)	7	8	8	7	8	8	7	6	8	8	8
Height without PGR (cm)	91	87	93	86	82	91	86	83	85	80	85
Ripening (days +/- Skyfall, -ve = earlier)	+0	+3	+1	+1	+1	+1	+2	-0	+2	+1	+3
Resistance to sprouting (1-9)	[6]	[5]	[7]	[5]	[6]	[5]	[4]	[5]	6	5	5
Disease resistance											
Mildew (1-9)	7	6	6	7	7	7	7	7	3	6	6
Yellow rust (1-9) - see note below	8	9	8	9	9	5	9	9	6	6	9
Brown rust (1-9) - see note below	6	8	7	5	6	7	6	7	7	8	8

	LG Skyscraper	RGT Saki	LG Spotlight	KWS Jackal	Elation	Bennington	LG Sundance	LG Motown	Leeds	Viscount	Revelation
End-use group	Soft Group 4										
Septoria nodorum (1-9)	-	-	-	[5]	[6]	[7]	[6]	[6]	[6]	[6]	[7]
Septoria tritici (1-9)	5.0	6.8	5.1	4.9	4.3	6.6	7.9	5.4	4.8	4.8	6.0
Eyespot (1-9)	[4]	-	[5]	4	4	4	3	4	5	4	7@
Fusarium ear blight (1-9)	6	6	6	6	6	6	6	6	7	6	6
Orange wheat blossom midge	R	R	R	R	R	-	R	R	R	R	-
Breeder/UK contact											
Breeder	LimEur	RAGT	LimEur	KWS	ElsW	ElsW	LimEur	LimEur	Mom	KWS	Lim
UK contact	Lim	RAGT	Lim	KWS	Els	Els	Lim	Lim	KWS	KWS	Lim
Annual treated yield (% control)											
2015 (12.1 t/ha)	-	-	-	102	102	100	99	99	97	97	96
2016 (11.0 t/ha)	108	-	104	102	101	102	102	101	100	98	94
2017 (11.1 t/ha)	104	104	104	101	101	100	98	97	97	97	96
2018 (10.4 t/ha)	103	103	100	101	101	102	102	98	96	98	97
2019 (11.3 t/ha)	105	104	103	101	101	99	99	99	94	98	94
Rotational position											
First cereal (11.6 t/ha)	105	103	103	101	101	100	100	99	97	97	96
Second and more (9.8 t/ha)	104	[103]	101	102	102	100	101	99	97	[[99]]	95
Sowing date (most trials were sown in October)											
Early sown (before 25 Sept) (11.2 t/ha)	-	-	103	102	100	100	[98]	[96]	[98]	[96]	96
Late sown (after 1 Nov) (9.6 t/ha)	[104]	[[107]]	[102]	101	[100]	99	100	97	100	[[99]]	[[97]]
Soil type (about 50% of trials are on medium soils)											
Light soils (11.1 t/ha)	105	[102]	101	101	101	98	99	98	98	99	95
Heavy soils (11.3 t/ha)	105	104	103	101	101	102	100	98	98	96	96
Agronomic features											
Lodging % without PGR	7	8	4	5	4	3	10	18	4	6	2
Lodging % with PGR	11	4	2	10	2	3	12	20	2	3	3
Latest safe sowing date #	[End Jan]	[[End Jan]]	[End Feb]	End Jan	End Jan	End Jan	End Jan	End Jan	End Feb	Mid Feb	End Jan
Speed of development to growth stage 31 (days +/- average)											
Early sown (Sept)	[-5]	[+10]	[-6]	+5	+1	-6	+9	-3	-3	+1	+2
Med sown (Oct)	[0]	[+1]	[-3]	+3	-1	+0	+4	-5	+0	+0	+4
Late sown (Nov)	[-4]	[0]	[-1]	+1	-1	-1	+3	+0	+0	+2	+3
Status in RL system											
Year first listed	19	20	19	18	18	17	17	17	13	09	13
RL status	P2	P1	P2	-	-	*	-	*	*	*	*



Varieties featuring the **Cereals360** logo can be viewed on the KWS Virtual World
www.cereals360.co.uk

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 always 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	101%	
Parentage	Conqueror x Timaru	

KWS KERRIN		 RECOMMENDED	
Details			
Group	4 Hard	<p>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 76.3 kg/hl, a HFN of 151 seconds and a protein of 10.9%. It is a KWS Santiago cross but demonstrates better disease resistance to yellow rust and <i>Septoria tritici</i>. Like its parent it is resistant to orange wheat blossom midge (OWBM).</p>	
Year Listed	2017		
Treated Yield	102%		
Parentage	KWS Santiago x KWS W177		

KWS KINETIC		AHDB	360
Details		RECOMMENDED	
			Comments
Group	4 Hard	<p>KWS Kinetic is an impressive hard feed with a high yield, very stiff straw, mid maturity and orange wheat blossom midge (OWBM) resistance. It has good physical gran 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 262 seconds and a protein of 11.3%.</p> <p>KWS Kinetic is a high input, high output variety for those who value short stiff wheats. The <i>Septoria</i> score is 5.0 and a yellow rust score of a 6 does not reflect what has been seen in high yellow rust prone areas. Good mildew and brown rust scores of 6.0.</p> <p>KWS Kinetic has performed strongly in all regions thought its highest yields have come in the east and west. At 83cm it is of average height.</p>	
Year Listed	2020		
Treated Yield	104%		
Parentage	Reflection x KWS Silverstone		

KWS PARKIN

360

Details

Group 4 Hard	Year Listed Not added to RL	UK treated yield 102%	Parentage Reflection x Costello
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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 last autumn's weather still being 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, 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. From our own trials we've seen that it is highly suitable for both first and second wheat positions.

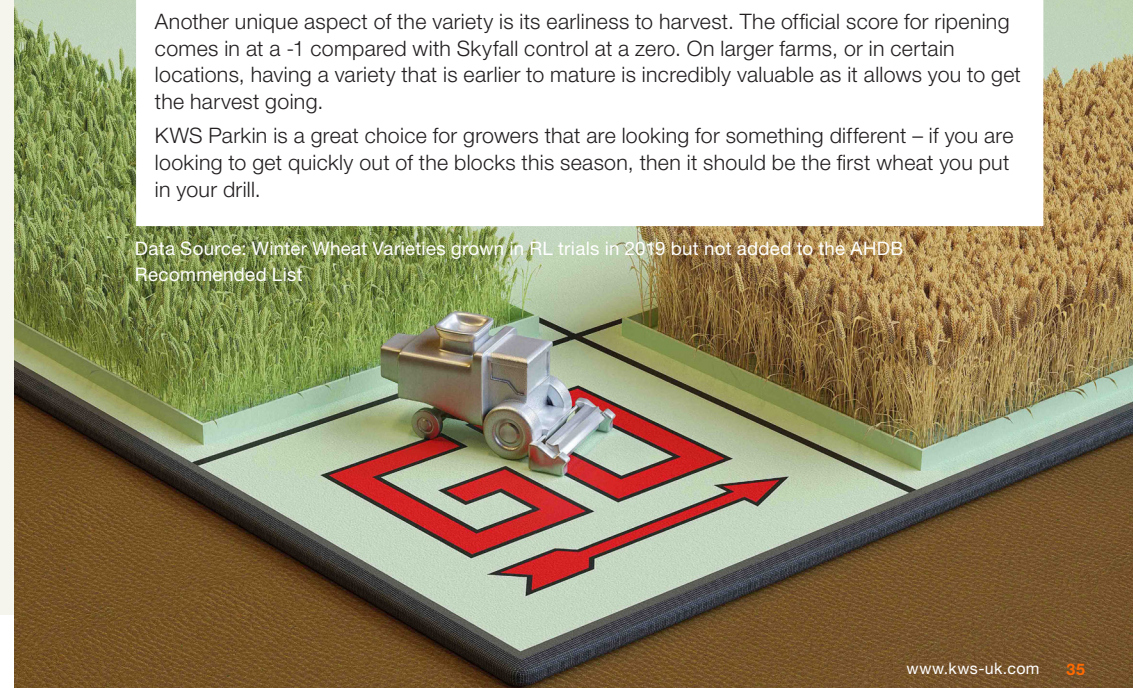
To get the best out of KWS Parkin, growers should consider drilling this variety before the 25th September. In AHDB and KWS trials. It was in this relatively early slot in AHDB and KWS trials that the true yield potential of KW Parkin was realised and the variety significantly outperformed well-known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

KWS 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; that enable PGR applications to be simplified; and allow more flexibility in spray windows that can be safely widened when workloads or weather conditions permit. It's the obvious choice for growers in the East and Yorkshire on more fertile soils, as well as those who use manures and digestate.

Another unique aspect of the variety is its earliness to harvest. The official score for ripening comes in at a -1 compared with Skyfall control at a zero. On 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.

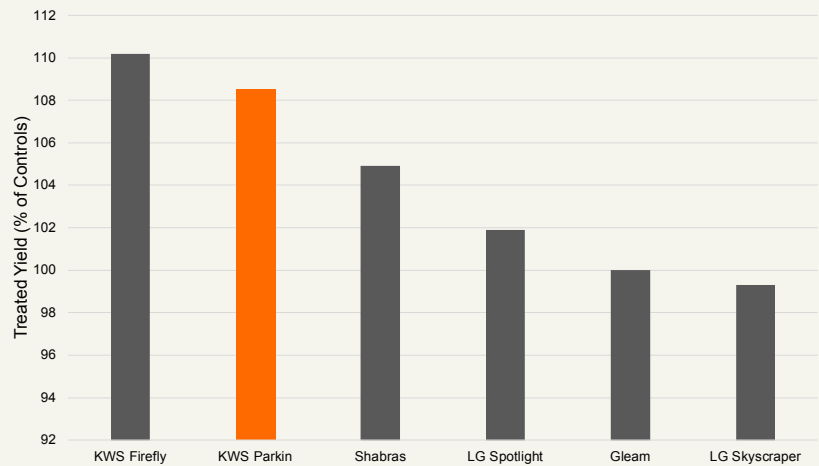
KWS Parkin is a great choice for growers that are looking for something different – if you are looking to get quickly out of the blocks this season, then it should be the first wheat you put in your drill.

Data Source: Winter Wheat Varieties grown in RL trials in 2019 but not added to the AHDB Recommended List



Unique Early Drilling Performance

Graph 3: Yield Performance in the Early Drilling Slot (before 25th Sept)



As mentioned on page 35, KWS Parkin performs best when drilled around September 25th. Graph 3, above, shows KWS Parkin and other variety's performance yields when drilled in this early drilling slot. To get the peak performance from your varieties on farm we always suggest drilling at a variety's optimum drilling time, which can be found on page 15.



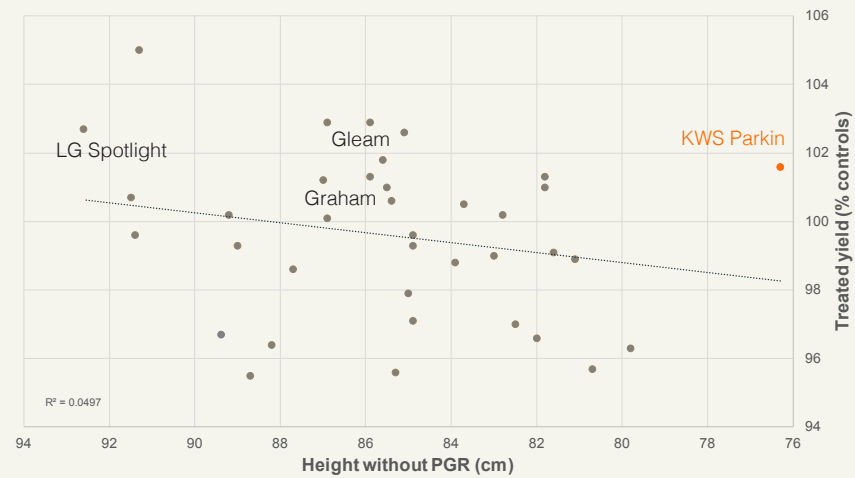
Unique Speed of Movement

Many varieties are quite similar in regards to speed of movement and maturity but sometimes we find varieties different enough to really help on farm, KWS Parkin is one such variety. We can utilise these benefits by scheduling the sowing of varieties. This may be able to ensure that those sown first reach significant growth stages before other crops, and may well get to harvest first. There are many variables involved such as soil type and weather but in terms of getting the best from a reducing chemical armoury, then timely application is everything.

Unique Plant Type

Cast your mind back 15 years or so... If we think of the RL at this time and what varieties were finding favour on farm, then products such as Equinox, Cordiale, and Grafton may jump to mind. What did all these popular types have in common? They were all short and stiff, enabled simplified PGR applications and introduced spray window flexibility - as is with the case with KWS Parkin. Fast forward to today and those on the RL have a very different profile.

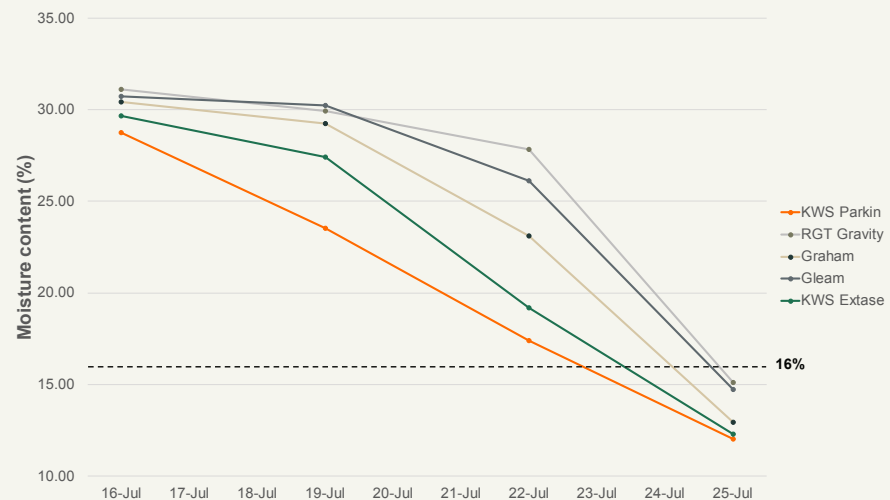
Graph 4: Difference in Height and Yield



Unique Earliness

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 at a -1. This has been confirmed in our own KWS trials.

Graph 5: KWS 2019 Dry Down Data



THE TALE OF KWS PARKIN

To be continued...



Scan the QR Code to follow KWS Parkin's adventures online!

	SY Insitor	KWS Kinetic	Glean	RGT Gravity	KWS Kerrin	Shabras	Graham	KWS Crispin	Theodore	Dunston	Costello
End-use group	Hard Group 4										
Scope of recommendation	UK	UK	UK	UK	E&W	UK	UK	UK	W	UK	UK
	NEW	NEW						*	NEW	*	
Fungicide-treated grain yield (% treated control)											
United Kingdom (11.2 t/ha)	105	104	103	103	102	102	102	101	100	100	99
East region (11.1 t/ha)	104	104	103	103	102	102	101	101	100	100	99
West region (11.2 t/ha)	105	105	103	103	102	102	104	101	102	99	101
North region (11.3 t/ha)	[105]	[102]	102	102	103	102	99	96	[[91]]	99	98
Main market options (The specific attributes of varieties are different so, whenever possible, varieties should not be mixed in store)											
UK breadmaking	-	-	-	-	-	-	-	-	-	-	-
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 (%)	10.7	11.3	11.3	11.4	10.9	11.4	11.4	11.7	12.1	11.6	12.0
Protein content (%) - Milling spec	11.2	12.0	12.0	12.0	11.5	12.1	11.9	12.5	12.7	12.4	12.5
Hagberg Falling Number	265	262	219	204	151	209	276	273	307	229	321
Specific weight (kg/hl)	78.3	78.5	76.3	76.0	76.3	75.9	76.8	77.0	73.8	76.9	80.7
Chopin alveograph W	-	-	-	-	-	-	[124]	-	-	-	-
Chopin alveograph P/L	-	-	-	-	-	-	[0.5]	-	-	-	-
Untreated grain yield (% treated control)											
United Kingdom (11.2 t/ha)	82	79	84	79	79	81	88	83	90	82	81
Agronomic features											
Resistance to lodging without PGR (1-9)	6	7	7	7	7	7	7	7	7	7	7
Resistance to lodging with PGR (1-9)	7	8	7	7	7	7	8	7	8	8	8
Height without PGR (cm)	93	83	86	87	85	86	87	86	82	92	82
Ripening (days +/- Skyfall, -ve = earlier)	+1	+0	+0	+1	+1	-0	-0	+1	-0	+1	+2
Resistance to sprouting (1-9)	[5]	[6]	[5]	[4]	[5]	[4]	7	5	[7]	[5]	6
Disease resistance											
Mildew (1-9)	6	6	6	4	7	6	7	6	7	5	8
Yellow rust (1-9) - see note below	7	6	7	8	7	7	8	9	9	7	9
Brown rust (1-9) - see note below	4	6	6	6	7	5	6	5	7	6	5

	SY Insitor	KWS Kinetic	Glean	RGT Gravity	KWS Kerrin	Shabras	Graham	KWS Crispin	Theodore	Dunston	Costello
End-use group	Hard Group 4										
Septoria nodorum (1-9)	-	-	[6]	[6]	[6]	[6]	[6]	[6]	-	[6]	[6]
Septoria tritici (1-9)	6.6	5.0	6.3	4.8	4.9	6.3	6.8	5.9	8.2	6.6	6.1
Eyespot (1-9)	-	-	4	4	5	4	4	4	-	6@	5
Fusarium ear blight (1-9)	6	6	6	6	6	5	6	6	6	6	6
Orange wheat blossom midge	R	R	R	R	R	-	-	R	-	-	-
Breeder/UK contact											
Breeder	SyP	KWS	SyP	R2n	KWS	SyP	SyP	KWS	DSV	ElsW	KWS
UK contact	Syn	KWS	Syn	RAGT	KWS	Syn	Syn	KWS	DSV	Els	Sen
Annual treated yield (% control)											
2015 (12.1 t/ha)	-	-	102	102	102	102	97	98	-	102	98
2016 (11.0 t/ha)	-	-	103	106	103	103	102	100	-	99	97
2017 (11.1 t/ha)	104	104	102	103	101	101	102	99	98	96	101
2018 (10.4 t/ha)	104	103	104	101	103	101	101	102	100	101	101
2019 (11.3 t/ha)	107	105	104	102	103	103	104	101	101	99	100
Rotational position											
First cereal (11.6 t/ha)	105	104	103	103	102	102	102	100	100	99	100
Second and more (9.8 t/ha)	[103]	[102]	104	103	103	102	100	98	[[99]]	100	98
Sowing date (most trials were sown in October)											
Early sown (before 25 Sept) (11.2 t/ha)	-	[100]	103	[100]	-	[[105]]	100	[[97]]	[[101]]	101	99
Late sown (after 1 Nov) (9.6 t/ha)	[[110]]	[[103]]	104	103	104	98	[100]	102	[[100]]	99	100
Soil type (about 50% of trials are on medium soils)											
Light soils (11.1 t/ha)	[108]	[104]	102	103	102	102	100	99	-	99	98
Heavy soils (11.3 t/ha)	104	105	103	102	101	101	102	101	101	100	100
Agronomic features											
Lodging % without PGR	11	4	4	5	6	9	5	9	6	2	2
Lodging % with PGR	4	4	4	7	9	11	3	8	2	1	2
Latest safe sowing date #	[[End Jan]]	[[End Jan]]	Mid Feb	End Jan	End Jan	End Jan	End Jan	Mid Feb	[[End Jan]]	End Jan	End Jan
Speed of development to growth stage 31 (days +/- average)											
Early sown (Sept)	[-2]	[-4]	+8	+6	+0	+2	+2	-5	[-3]	+5	-2
Med sown (Oct)	[0]	[+9]	+3	+3	+3	+0	+0	-6	[-4]	+2	-2
Late sown (Nov)	[+2]	[-2]	+4	-2	+0	+0	-3	-5	[0]	+1	-2
Status in RL system											
Year first listed	20	20	18	18	17	17	16	16	20	17	15
RL status	P1	P1	-	-	-	-	-	*	P1	*	-



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Upcoming Winter Wheats

KWS CRANIUM		AHDB	360
Details		CANDIDATE	
			Comments
Group	4 Hard Candidate		KWS Cranium is in essence, as fast as KWS Crispin and as short and stiff as KWS Kielder. Its very vigorous upright early movement is similar to Crispin. From the Kielder it has only 2% lodging without PGR in NL trials and no recorded lodging in treated trials. Its grain quality is reasonable with a specific weight of 75.3 kg/hl, HFN of 256 and protein of 11.5%. It is a later maturity type, like Kielder, being recorded at 2+. Mildew does need watching at 4, <i>Septoria</i> is 6, yellow rust 9, brown rust 5. KWS Cranium is OWBM resistance. This is a vigorous establishing mid to late sower.
Year Listed	Candidate		
Treated Yield	103%		
Parentage	KWS Crispin x KWS Kielder		

Data source: WW trials harvest 2020, AHDB

KWS W383 (KWS DAWSUM)		
Details		Comments
Group	NL2	KWS W383 has delivered a high treated and very high untreated yield in NL 1 trials. These yields and its fantastic all round agronomic package are the reason it has been fast-tracked in the KWS production process. KWS W383 offers a robust disease resistance package. Its specific weight is nearly as high as its parent Costello. KWS W383 also has an excellent HFN and good protein levels, making it a variety worth looking out for in the future.
Year Listed	NL2 Harvest 2020	
Treated Yield	Confidential	
Parentage	KWS Kerrin x Costello	

Data source: NL1 trials



KWS W383 is still to complete National List Trials and is not National Listed at the time of going to print.



This information does not constitute an offer for sale.

Spring Wheat

Group 2



KWS COCHISE		 RECOMMENDED	
Details			
Group	2	<p>KWS Cochise is the highest-yielding spring wheat on the 2020/21 Recommended List. It is 11% higher yielding than Mulika and 1% higher yielding than the newest feed addition KWS Talisker. Its specific weight of 79.1 kg/hl is outstanding while its HFN of 226 seconds and protein of 12.9% make it a good Group 2 option. Its high untreated yield of [82%] of the treated controls reflects its good all-round disease resistance. KWS Cochise is orange wheat blossom midge (OWBM) resistant. At 84cm it is of average height.</p>	
Year Listed	2017		
Treated Yield	105%		
Parentage	Ashby x Lapis		

KWS CHILHAM		 RECOMMENDED	
Details		Comments	
Group	2	<p>KWS Chilham is a Group 2 with excellent grain quality. It performs strongly when sown in both the late autumn (101%) and spring sowing (99%) 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 ([85%] of treated controls). Its high specific weight of 78.2 kg/hl, impressive HFN of 314 seconds and protein of 12.7% make it an outstanding Group 2 quality wheat. It is orange wheat blossom midge (OWBM) resistant. At 78 cm it is slightly shorter than the average of varieties on the RL.</p>	
Year Listed	2017		
Treated Yield	99%		
Parentage	Sparrow x Azurite		

KWS GIRAFFE		AHDB RECOMMENDED	Comments
Details			
Group	2		New for Spring 2020, is the high yielding nabim Group 2 wheat, KWS Giraffe. A truly dynamic wheat, KWS Giraffe yields well in both spring and autumn sown slots, delivering yields on a par with market leader KWS Cochise and the highest Group 4 spring wheat KWS Talisker.
Year Listed	2020		
Treated Yield	103%		
Parentage	KWS Recoletta x KWS Kilburn		It also boasts the highest protein level (13.3%) 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.

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 supported and 6 for Spetoria tritici. 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	104%		
Parentage	KWS Westfield x KWS Pepito		



RECOMMENDED

Spring Wheat Recommended List 2020/21

	Mulika	KWS Cochise	KWS Giraffe	KWS Chilham	KWS Talisker	Hexham	KWS Alderon	KWS Kilburn
End-use group	nabim Group 1	nabim Group 2			Hard Group 4			
Scope of recommendation	UK	UK	UK	UK	UK	UK	UK	UK
	C	C	NEW				C	
UK yield as % control (spring sowing)								
Fungicide-treated (7.2 t/ha)	94	105	103	99	104	103	101	101
Untreated (% treated control) (7.2 t/ha)	[79]	[82]	-	[85]	[89]	[93]	[83]	[80]
UK yield as % control (autumn sowing)								
Fungicide-treated (9.2 t/ha)	96	103	[104]	101	102	106	101	[103]
Grain quality (spring sowing)								
Endosperm texture	Hard	Hard	Hard	Hard	Hard	Hard	Hard	Hard
Protein content (%)	13.2	12.9	13.3	12.7	12.2	12.4	12.8	13.0
Hagberg Falling Number	307	226	271	314	271	271	315	264
Specific weight (kg/hl)	77.1	79.1	79.8	78.2	79.0	77.7	77.3	76.2
Agronomic features (spring sowing)								
Resistance to lodging with PGR ∞	-	-	-	-	-	-	-	-
Straw height without PGR (cm)	82	84	80	78	84	83	78	85
Ripening (+/- Mulika, -ve = earlier)	0	+1	-0	+0	+1	+2	+2	+3
Resistance to sprouting ∞	-	-	-	-	-	-	-	-
Disease resistance								
Mildew (1-9)	6	8	8	7	8	7	7	7
Yellow rust (1-9)	7	5	6	7	9	9	6	5
Brown rust (1-9)	5	7	5	4	3	5	7	[8]
Septoria tritici (1-9)	6	6	6	7	6	7	6	6
Orange wheat blossom midge	R	R	-	R	-	-	-	-
Annual treated yield (% control, spring sowing)								
2015 (8.2 t/ha)	[95]	[102]	-	[98]	-	-	[103]	[99]
2016 (8.5 t/ha)	[93]	[102]	-	[99]	[104]	[107]	[106]	[103]
2017 (7.3 t/ha)	93	107	[103]	102	[105]	[103]	100	102
2018 (5.5 t/ha)	[95]	[107]	[107]	[99]	[105]	[100]	[98]	[100]
2019 (6.9 t/ha)	94	107	102	98	105	105	99	100
Breeder/UK contact								
Breeder	BA	KWS	KWS	KWS	KWS	Sen	KWS	KWS
UK contact	Sen	KWS	KWS	KWS	KWS	Sen	KWS	KWS
Status in RL system								
Year first listed	11	17	20	17	19	19	12	14
RL status	-	-	P1	-	P2	P2	-	-

BARLEY

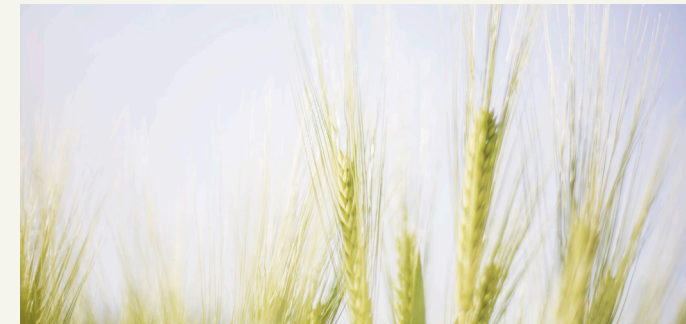
Winter Barley

Winter barley warrants greater consideration

For all its appeal and rotational benefits, the area of winter barley across England has remained steady at around 350,000 hectares, since the Fischler Reforms of 2003 broke the link between farm incomes and production. The need to increase crop diversity in the rotation, limit the risk associated with other break crops, and the introduction of varieties with the yield potential to out-perform wheat as a second cereal, is supporting a resurgence of winter barley.

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.





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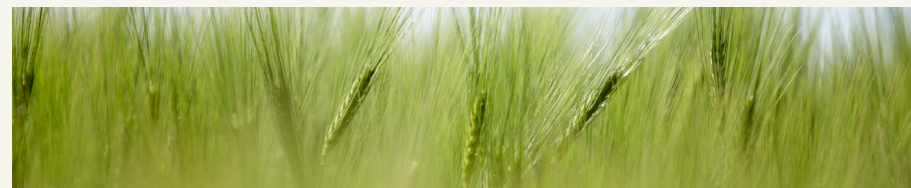
Two Row Feed

KWS CASSIA		AHDB RECOMMENDED	Comments
Details			
Group	Two Row Feed		<p>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.</p> <p>A good average yield – a reliable 97% 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 71.2 kg/hl, it has low screenings, good straw strength and an untreated yield that is better than its average disease scores suggest. At 88cm with PGR, it is of average height while its average maturity will appeal to those wanting to prepare ground in good time for oilseed rape.</p>
Year Listed	2010		
Treated Yield	97%		
Parentage	(Eden x Carat) x Saffron		

KWS GIMLET		AHDB RECOMMENDED	Comments
Details			
Group	Two Row Feed		<p>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 106% 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 <i>Rhynchosporium</i> and net blotch, with scores of 6 and 6 respectively. It is resistant to Barley Yellow Mosaic Virus (BYMV).</p> <p>At about 92cm (with PGR), Gimlet is taller than its parents, while being earlier to mature than KWS Glacier and is higher yielding than KWS Orwell. Straw strength is good, though experience suggests the use of a PGR is advised.</p>
Year Listed	2019		
Treated Yield	103%		
Parentage	(California x Matros) x KWS Glacier		

KWS ORWELL		AHDB RECOMMENDED	Comments
Details			
Group	Two Row Feed		<p>An extremely stiff strawed variety of average maturity that delivers consistently high yields across all regions of the UK, are just some of the reasons why KWS Orwell has gained so much favour on farm, and why it's the most widely grown winter barley in the UK. Apart from mildew, which will need watching carefully, KWS 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.</p>
Year Listed	2016		
Treated Yield	102%		
Parentage	KWS Tower x KWS Salsa		

KWS HAWKING		AHDB RECOMMENDED	Comments
Details			
Group	Two Row Feed		<p>KWS Hawking is the highest-yielding two-row feed barley on the market with a high specific weight of 68.5 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. KWS Hawking has maturity equal to KWS Orwell.</p> <p>KWS Hawking will in high demand for drilling in Autumn 2020 and will be set to become a significant variety in the market.</p>
Year Listed	2020		
Treated Yield	104%		
Parentage	(11-12 x California) x KWS Tower		



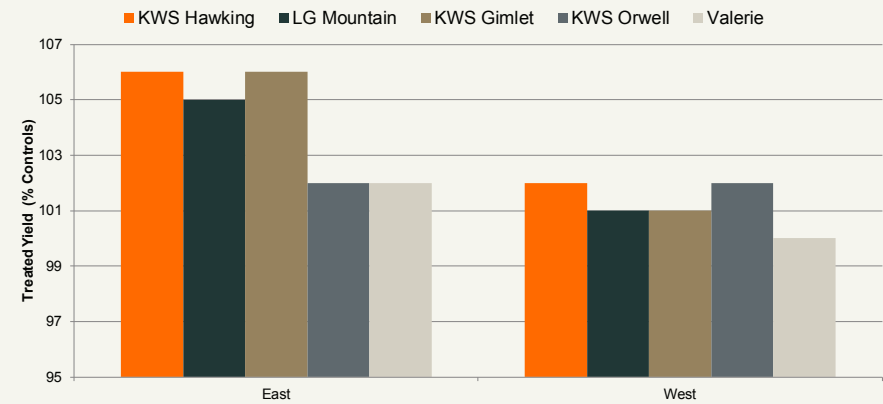
KWS HAWKING

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 104% of controls, KWS Hawking is recommended for the whole of the UK, but KWS trials and experience has shown that it comes into its element in the East (106% controls). It is in the East that has recorded its best performance to date.

Graph 6: Barley Yields



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.



Winter Barley Recommended List 2020/21, Two Row Feed

Page 1

	KWS Hawking	LG Mountain	KWS Gimlet	Jordan	LG Flynn	KWS Orwell	Valerie	Surge	KWS Creswell	KWS Tower	KWS Glacier	California	KWS Cassia
End-use group	Two-row feed												
Scope of recommendation	UK	UK	UK	UK	UK	UK	UK	UK	N	UK	UK	W	UK
	NEW			NEW		C					*		
Fungicide-treated grain yield (% treated control)													
United Kingdom (10.0 t/ha)	104	104	103	103	102	102	101	101	100	99	99	99	97
East region (9.9 t/ha)	106	105	106	105	103	102	102	102	99	99	98	99	97
West region (10.2 t/ha)	102	101	101	103	101	102	[100]	101	100	99	98	99	97
North region (9.9 t/ha)	102	105	102	101	102	101	[101]	98	102	101	100	[97]	98
Untreated grain yield (% treated control)													
United Kingdom (10.0 t/ha)	83	83	83	89	82	80	86	87	72	73	78	79	81
Main market options													
MBC malting approval for brewing use	-	-	-	-	-	-	-	-	-	-	-	-	-
Grain quality													
Specific weight (kg/hl)	68.5	69.1	68.3	68.9	70.2	67.9	70.2	69.3	68.0	67.4	69.1	68.1	71.2
Screenings (% through 2.25 mm)	2.7	2.4	2.5	1.9	1.7	2.0	0.8	1.9	2.1	2.2	2.7	1.9	1.6
Screenings (% through 2.5 mm)	8.3	8.0	7.9	5.8	5.2	6.3	2.0	6.0	7.7	7.4	9.4	6.6	5.3
Nitrogen content (%)	-	-	-	-	-	-	-	-	-	-	-	-	-
Status in RL system													
Year first listed	20	19	19	20	19	16	19	16	17	14	13	13	10
Agronomic features													
Resistance to lodging (1-9)	7	7	7	7	7	8	8	7	7	8	7	8	7
Straw height without PGR (cm)	[90]	85	98	[85]	94	86	89	86	87	90	84	92	91
Straw height with PGR (cm)	84	84	92	82	90	84	85	84	85	85	80	88	88
Ripening (+/-KWS Orwell, -ve = earlier)	0	-1	0	0	0	0	-1	-1	-1	0	-1	-1	0
Winter hardiness #	-	-	-	-	-	-	-	-	-	-	-	-	-
Disease resistance													
Mildew (1-9)	5	5	6	5	4	3	6	6	5	5	4	6	4
Yellow rust (1-9)	-	-	-	-	-	[7]	-	[8]	[8]	[8]	[8]	[7]	[5]
Brown rust (1-9)	6	7	6	8	7	7	9	8	6	6	7	5	7
Rhynchosporium (1-9)	6	5	6	7	6	6	6	7	6	6	4	6	5
Net blotch (1-9)	6	6	6	5	6	5	6	6	4	4	6	6	6
BaYMV	R	R	R	R	R	R	R	R	R	R	R	R	R

Winter Barley Recommended List 2020/21, Two Row Feed

Page 2

	KWS Hawking	LG Mountain	KWS Gimlet	Jordan	LG Flynn	KWS Orwell	Valerie	Surge	KWS Creswell	KWS Tower	KWS Glacier	California	KWS Cassia
End-use group	Two-row feed												
Breeder/UK contact													
Breeder	KWS	LimEur	KWS	Ack	LimEur	KWS	Bre	SyP	KWS	KWS	KWS	Lim	KWS
UK contact	KWS	Lim	KWS	El-sAck	Lim	KWS	Sen	Syn	KWS	KWS	KWS	Lim	KWS
Annual treated yield (% control)													
2015 (10.5 t/ha)	-	-	-	-	-	101	-	99	100	100	100	96	96
2016 (9.5 t/ha)	-	104	102	-	102	102	101	101	100	100	99	99	98
2017 (9.9 t/ha)	103	103	104	103	101	101	101	100	99	98	97	100	97
2018 (10.2 t/ha)	104	104	102	102	103	101	102	100	101	102	100	98	98
2019 (9.9 t/ha)	103	104	104	103	102	101	-	102	100	99	100	98	98
Soil type (about 50% of trials are medium soils)													
Light soils (9.9 t/ha)	102	104	102	102	102	100	101	100	101	100	100	97	97
Heavy soils (9.8 t/ha)	106	107	104	103	104	102	[101]	102	99	99	99	100	97
Agronomic characteristics													
Lodging without PGR (%)	8	13	16	12	7	2	4	4	7	3	8	3	4
Lodging with PGR (%)	2	6	6	6	4	2	1	3	4	3	8	2	3
Malting quality													
Hot water extract (l deg/kg)	-	-	-	-	-	-	-	-	-	-	-	-	-
Status in RL system													
Year first listed	20	19	19	20	19	16	19	16	17	14	13	13	10
RL status	P1	P2	P2	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 was 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. Yield losses of up to 63% have been observed. Spring infections have delayed symptoms and 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. However, infective aphids do not pass on the virus to their progeny.



BYDV Trial field

Six Row

AMISTAR			
Details			
Group	Year Listed	UK treated yield	Parentage
Six Row Feed	EU Common Catalogue	103%*	Confidential
Comments			
<p>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.</p> <p>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.</p> <p>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%.</p> <p>Amistar offers the opportunity to reduce insecticidal use in certain situations. 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 so 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.</p> <p>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.</p>			

*Data source: KWS Trials 2017

KWS FARO		
Details		Comments
Group	Six Row Malting	KWS Faro is a French-bred six-row malting barley with good yields, especially in the east region, physical grain quality that is demonstrated in its specific weight of 67.7 kg/hl and low screenings. It has shown good lodging and brackling resistance and is close to Cassata in maturity. Already established in France, it brings something new to the UK malting sector due to its combination of high FAN and high DP characteristics, allowing for flexibility in the malting process. It is currently undergoing large volume maltster testing.
Year Listed	EU Common Catalogue	
Parentage	Henriette x Cargo	

*Data source: KWS Momont Trials

FUNKY		AHDB RECOMMENDED	Comments
Details			
Group	Six Row Feed		Funky is a high-yielding conventional six-row that performs well across all regions of the UK. It has a high untreated yield of 89% of controls due in part to its excellent all-round disease resistance, is early to mature, is the stiffest strawed of all six-row varieties and, at 93 cm without PGR, is the shortest six-row too. It has a high specific weight of 68.9 kg/hl.
Year Listed	2017		
Treated Yield	104%		
Parentage	Gigga x KWS Meridian		



	Belmont \$	Sy Kingsbarn \$	Sy Baracooda \$	Bazooka \$	Belfry \$	KWS Astaire	Funky	Libra \$
End-use group	Six-row feed							
Scope of recommendation	UK	UK	UK	UK	UK	UK	UK	UK
	C					*	C	
Fungicide-treated grain yield (% treated control)								
United Kingdom (10.0 t/ha)	108	108	108	106	106	105	104	103
East region (9.9 t/ha)	108	108	107	107	105	103	103	103
West region (10.2 t/ha)	107	107	108	106	107	108	106	104
North region (9.9 t/ha)	107	107	107	105	105	103	104	103
Untreated grain yield (% treated control)								
United Kingdom (10.0 t/ha)	77	88	88	87	91	89	89	83
Main market options								
MBC malting approval for brewing use	-	-	-	-	-	-	-	-
Grain quality								
Specific weight (kg/hl)	68.5	69.8	68.8	68.9	68.2	65.7	68.9	70.8
Screenings (% through 2.25 mm)	2.5	1.8	2.0	2.4	2.6	2.4	4.2	2.1
Screenings (% through 2.5 mm)	9.5	7.0	7.3	8.8	9.9	8.3	16.4	8.1
Nitrogen content (%)	-	-	-	-	-	-	[1.57]	-
Status in RL system								
Year first listed	18	19	19	16	16	18	17	18
Agronomic features								
Resistance to lodging (1–9)	7	7	7	7	8	8	8	7
Straw height without PGR (cm)	109	111	118	114	108	105	93	108
Straw height with PGR (cm)	104	101	108	107	100	98	90	102
Ripening (+/-KWS Orwell, -ve = earlier)	-1	-1	-1	-1	-1	0	-2	-1
Winter hardiness #	-	-	-	-	-	-	-	-
Disease resistance								
Mildew (1–9)	5	6	7	5	5	6	5	5
Yellow rust (1–9)	-	-	-	[9]	[8]	-	[9]	-
Brown rust (1–9)	4	5	5	5	7	6	8	6
<i>Rhynchosporium</i> (1–9)	6	6	7	6	6	7	7	7
Net blotch (1–9)	6	5	5	6	5	6	5	6
BaYMV	R	R	R	R	R	R	R	R
Breeder/UK contact								
Breeder	SyP	SyP	SyP	SyP	SyP	KWS	KWSMR	SyP

	Belmont \$	SY Kingsbarn \$	SY Baracooda \$	Bazooka \$	Belfry \$	KWS Astaire	Furky	Libra \$
End-use group	Six-row feed							
Annual treated yield (% control)								
2015 (10.5 t/ha)	107	-	-	107	105	104	105	103
2016 (9.5 t/ha)	109	107	108	107	106	106	104	103
2017 (9.9 t/ha)	107	107	107	106	106	105	105	104
2018 (10.2 t/ha)	108	107	108	104	105	104	103	103
2019 (9.9 t/ha)	107	108	108	106	106	105	105	104
Soil type (about 50% of trials are medium soils)								
Light soils (9.9 t/ha)	106	106	105	105	104	103	104	102
Heavy soils (9.8 t/ha)	107	108	106	107	109	106	104	105
Agronomic characteristics								
Lodging without PGR (%)	9	7	6	5	4	2	1	7
Lodging with PGR (%)	9	2	5	4	2	3	2	4
Malting quality								
Hot water extract (l deg/kg)	-	-	-	-	-	-	[294.9]	-
Status in RL system								
Year first listed	18	19	19	16	16	18	17	18
RL status	-	P2	P2	-	-	*	-	-



Upcoming Winter Barleys

KWS B134 (KWS TARDIS)


AHDB
CANDIDATE

Details		Comments
Group	Two Row Feed	KWS B134 heralds a new dawn in 2-row winter barley breeding from KWS – it out-performs all commercial 2-row and 6-row feed types and yields more than, or on par with the best hybrids. It performs especially well in the East. Furthermore, the variety has an excellent disease package boasting good scores for <i>Rhynchosporium</i> and net blotch, as well as being stiff strawed and having excellent specific weigh. KWS B134 is BaYMV resistant.
Year Listed	Candidate	
Parentage	11-12 x KWS Orwell	

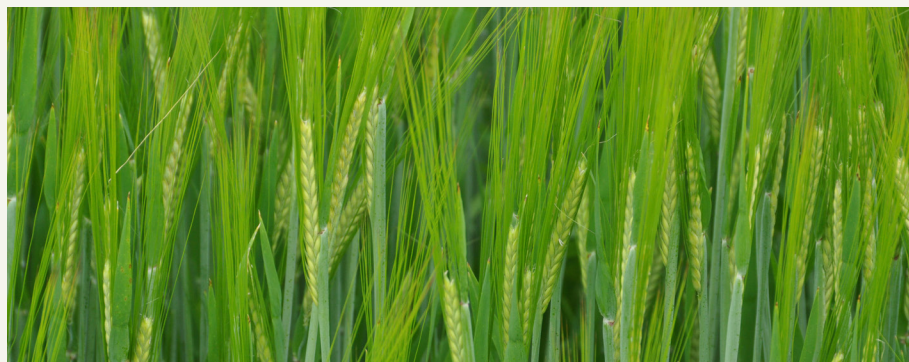
Data Source: NL1 trials KWS Tardis is still to complete National List Trials and is not National Listed at the time of going to print. This information does not constitute an offer for sale.

Spring Barley

Two Row Malting

KWS IRINA		 RECOMMENDED	Comments
Details			
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	2014		
Treated Yield	102%		
Parentage	Conchita x Quench		

KWS SASSY		 RECOMMENDED	Comments
Details			
Group	Two Row Distilling		KWS Sassy is a high yielding non GN producing spring malting variety with particularly high yields in the North (103% controls) – the traditional home of the distilling industry. KWS Sassy has excellent spirit yield and grain quality. KWS Sassy has the lowest screenings of any distilling type and is one of the earliest distilling types to mature - similar to Concerto. It has full MBC approval for malt distilling use.
Year Listed	2016		
Treated Yield	101%		
Parentage	Concerto x Publican		



	SY Splendor	Firefox	Cosmopolitan	SY Tungsten	LG Diablo	Laureate	RGT Planet	RGT Asteroid	Iconic	KWS Sassy	Sienna	Propino	Fairing	Concerto
End-use group	Malting varieties													
Scope of recommendation	UK	UK	UK	UK	UK	UK	UK	UK	W	UK	UK	UK	Sp	UK
	NEW	NEW		NEW		C	C		NEW			C		C
Fungicide-treated grain yield (% treated control)														
United Kingdom (7.5 t/ha)	107	106	105	105	105	104	103	103	102	101	101	98	96	95
East region (7.7 t/ha)	105	105	105	103	106	105	103	104	101	99	98	96	96	95
West region (7.4 t/ha)	[106]	[106]	105	[105]	102	104	104	102	[103]	100	100	98	97	96
North region (7.5 t/ha)	107	107	106	107	107	104	103	102	103	103	102	98	95	93
Main market options														
MBC malting approval for brewing use	T	-	P	T	P	F	F	P	T	N	-	F	-	F
MBC malting approval for malt distilling use	-	T	-	T	F	F	N	P	-	F	F	N	-	F
MBC malting approval for grain distilling use	-	-	-	-	-	-	N	P	-	-	N	N	F	N
Grain quality														
Specific weight (kg/hl)	68.1	66.4	66.2	67.7	67.1	66.5	67.8	68.3	67.2	68.4	70.4	68.2	68.3	68.8
Screenings (% through 2.25 mm)	[1.5]	[1.6]	1.6	[1.8]	1.4	1.5	1.4	1.2	[1.7]	1.1	1.6	0.9	1.1	1.2
Screenings (% through 2.5 mm)	[3.9]	[3.7]	3.6	[4.7]	3.4	3.6	3.6	3.1	[4.1]	2.6	3.8	2.1	2.6	2.9
Nitrogen content (%)	1.47	1.46	1.44	1.43	1.44	1.48	1.50	1.48	1.45	1.50	[1.51]	1.56	1.59	1.52
Status in RL system														
Year first listed	20	20	19	20	18	16	15	18	20	16	15	10	16	09
Untreated grain yield (% treated control)														
United Kingdom (7.5 t/ha)	95	95	97	95	97	97	95	97	96	94	93	86	87	87
Agronomic features														
Resistance to lodging (no PGR) (1-9)	[7]	[7]	7	[7]	7	7	7	7	[7]	6	7	7	7	7
Straw height (cm)	73	71	70	72	73	71	73	73	76	78	77	75	72	77
Ripening (+/-Concerto, -ve = earlier)	+1	+0	+0	+1	+1	+1	+0	+1	+0	+0	+1	-1	-2	+0
Resistance to brackling (1-9)	9	8	7	8	8	8	8	8	8	6	7	8	8	8
Disease resistance														
Mildew (1-9)	9	9	9	9	9	9	9	9	9	9	9	6	9	9
Yellow rust (1-9)	-	-	-	-	-	[5]	[4]	-	-	[6]	[6]	[4]	[9]	[8]
Brown rust (1-9)	4	4	4	4	5	5	5	5	5	5	5	5	4	5
Rhynchosporium (1-9)	[4]	[5]	6	[4]	5	6	5	4	[6]	6	5	5	6	4

	SV Splendor	Firefox	Cosmopolitan	SV Tungsten	LG Diablo	Laureate	RGT Planet	RGT Asteroid	Iconic	KWS Sassy	Sienna	Propino	Fairing	Concerto
End-use group	Malting varieties													
Breeder	-	Ack	Sej	-	LimEur	SyP	RAGT	R2n	Sec	KWS	LimEur	SyP	SyP	Lim
UK contact	Syn	El-sAck	Sen	Syn	Lim	Syn	RAGT	RAGT	Agr	KWS	Lim	Syn	Syn	Lim
Annual treated yield (% control)														
2015 (8.6 t/ha)	-	-	-	-	105	104	103	101	-	101	99	97	95	94
2016 (7.6 t/ha)	-	-	105	-	104	103	104	103	-	101	101	99	97	93
2017 (7.3 t/ha)	107	106	106	105	106	103	103	103	104	101	101	98	95	96
2018 (6.6 t/ha)	107	107	107	107	105	105	101	103	103	100	99	98	97	96
2019 (7.6 t/ha)	107	106	105	104	105	105	104	103	100	101	101	96	96	96
Malting quality														
Hot water extract (l deg/kg)	315.7	315.4	314.4	316.8	315.5	315.4	315.2	315.0	316.7	315.7	315.7	312.7	310.9	315.9
Status in RL system														
Year first listed	20	20	19	20	18	16	15	18	20	16	15	10	16	09
RL Status	P1	P1	P2	P1	-	-	-	-	P1	-	-	-	-	-



OILSEED RAPE

Winter Oilseed Rape

Oilseed rape is well recognised as a great break crop, but over recent years, since the loss of neonicotinoid seed treatments it has proved to be an ever more problematic crop to get to harvest. However, where it can be grown successfully it is still one of the most profitable crops on the farm.

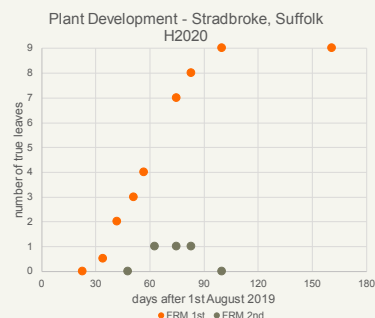
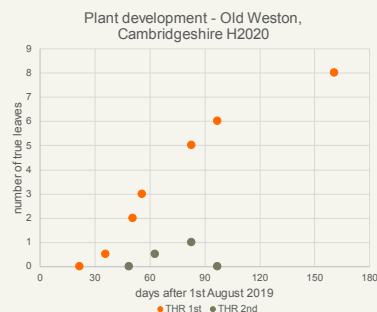
At KWS we have been involved with the oilseed rape crop since it was first introduced into the UK and would like to share what we have learnt about the crop over the years. The key criteria of our breeding programmes aimed specifically for the UK, other than gross output, are:

- Autumn vigour
- Disease resistance
- Standing ability

Since the loss of the neonicotinoids the main concern is around establishment and this has increased our focus on autumn vigour to an even greater extent. 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
 - Stubble height
- Companion cropping
- 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
- Spring vigour important with early drilled material
 - Plants may be more developed and need to grow away from larval attack

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. Spring vigour is also key – well established oilseed rape crops in the autumn are not immune to the ravages of CSFB larval attack. 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 neighboring 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.

The other areas that we looked at have had some success from anecdotal reports:

- Tall stubble seems to deter the CSFB in the first instance and certainly is a deterrent for pigeon attacks.
- The use of companion crops has grown in popularity and this is an area where we will be carrying out further work.

Risk reduction is also important and at KWS we have introduced the KWS Oilseed Establishment Partnership. For more information please see [page 78](#).

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	8	6	6	7
Stem canker	7	6	7	4
Stem stiffness	8	8	9	8
Flowering time	6	5	6	6
Maturity	4	6	5	5

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

*Variety no longer on AHDB Recommended List



OSR Optimum Drilling Times



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

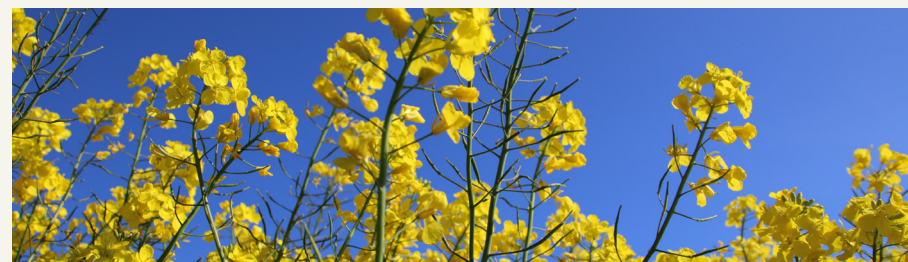
One of the important factors is to get good seed to soil contact and sufficient moisture levels.

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

Recommended For The UK

BALLAD AHDB RECOMMENDED 360		
Details	Comments	
Recommendation	UK	Ballad is a high yielding oilseed rape recommended for the whole of the UK. It is relatively short and has a long flowering period. Its high oil content supports its high gross output figure. It has good resistance to lodging and is rated 6 for LLS and 5 for stem canker.
Year Listed	2019	
Treated GO	105%	

CAMPUS 360		
Details	Comments	
Recommendation	Control variety	Extremely consistent variety both on farm and in trials. One of the most widely grown varieties in the UK – reflecting the consistency in its on farm performance. Growers have embraced this variety because of its exceptional vigour and performance year on year. Good tolerance to verticillium stem stripe and twin 6s for LLS and stem canker.
Year Listed	No longer listed	
Treated GO	102%	



Winter Oilseed Rape Recommended List 2020/21, UK

Recommended for the UK (both East/West and North regions)													
	Acacia	Ambassador	Aurelia	Artemis	Aspire	Aardvark	Ballad	DK Expansion	Temptation	Architect	Nikita	V 316 OL ~	PT279CL &
Variety type	Conv	RH	RH	RH	Conv	Conv	Conv	RH	RH	RH	Conv	RH	RH
Scope of recommendation	UK	UK	UK	UK	UK	UK	UK	UK	(Sp)	(Sp)	UK	Sp	Sp
	NEW	NEW	NEW	NEW		NEW				*	*C	C	
Gross output, yield adjusted for oil content (% treated control)													
United Kingdom (5.1 t/ha)	109	108	108	107	106	105	105	103	103	101	100	98	96
East/West region (5.0 t/ha)	110	108	107	107	106	105	105	103	103	101	99	98	96
North region (5.7 t/ha)	108	[104]	108	[106]	105	106	102	104	98	97	102	97	92
Seed yield (% treated control)													
United Kingdom (4.7 t/ha)	109	108	108	106	105	105	104	103	102	101	99	98	96
East/West region (4.7 t/ha)	109	109	108	106	105	105	104	103	102	102	99	99	96
North region (5.2 t/ha)	107	[105]	109	[106]	105	105	102	104	97	98	102	97	93
Untreated gross output, yield adjusted for oil content (% untreated control) ◊													
United Kingdom (5.3 t/ha)	-	-	-	-	105	-	101	100	106	101	101	98	95
Untreated seed yield (% untreated control) ◊													
United Kingdom (5.0 t/ha)	-	-	-	-	105	-	101	101	105	101	101	98	95
Agronomic features													
Resistance to lodging (1–9)	[8]	[8]	[8]	[8]	8	[8]	8	8	8	8	8	8	8
Stem stiffness (1–9)	9	8	8	8	9	8	8	8	7	8	8	8	8
Shortness of stem (1–9)	7	6	6	5	7	6	7	5	6	6	7	6	6
Earliness of flowering (1–9)	6	7	7	6	7	8	7	6	6	6	7	6	6
Earliness of maturity (1–9)	5	6	5	6	5	5	4	5	5	6	5	5	6
Seed quality (at 9% moisture)													
Oil content, fungicide-treated (%)	45.7	45.3	45.2	45.7	45.7	45.7	45.8	45.5	46.0	45.0	45.7	45.3	44.9
Glucosinolate (µmoles/g of seed)	8.1	10.9	10.2	12.3	9.9	10.0	10.8	10.1	12.0	14.4	8.6	12.3	10.9

Recommended for the UK (both East/West and North regions)													
	Acacia	Ambassador	Aurelia	Artemis	Aspire	Aardvark	Ballad	DK Expansion	Temptation	Architect	Nikita	V 316 OL ~	PT279CL &
Variety type	Conv	RH	RH	RH	Conv	Conv	Conv	RH	RH	RH	Conv	RH	RH
Disease resistance													
Light leaf spot (1–9)	6	7	8	6	7	7	6	6	6	5	7	6	6
Stem canker (1–9)	5	8	8	7	6	6	5	7	5	5	4	5	5
TuYV	-	R	R	R	R	-	-	-	R	R	-	-	-
Breeder/UK contact													
Breeder	LimEur	LimEur	LimEur	LimEur	LimEur	LimEur	KWSMR	MonTec	DSV	LimEur	LimEur	MonTec	PionOS
UK contact	Lim	Lim	Lim	Lim	Lim	Lim	KWS	Bay	DSV	Lim	Lim	Bay	Cor
Annual treated gross output, yield adjusted for oil content (% control) - UK													
2016 (5.1 t/ha)	-	-	-	-	103	-	104	105	98	95	102	99	93
2017 (5.7 t/ha)	109	107	108	106	106	107	104	102	100	99	102	97	94
2018 (5.5 t/ha)	108	105	107	105	105	105	101	101	102	100	101	97	95
2019 (5.2 t/ha)	110	108	109	108	107	105	104	105	102	103	99	97	94
Agronomy													
Plant height (cm)	150	161	155	167	147	154	150	165	154	161	148	157	156
Status in RL system													
Year first listed	20	20	20	20	19	20	19	19	19	18	16	15	19
RL status	P1	P1	P1	P1	P2	P1	P2	P2	P2	*	*	-	P2



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



RECOMMENDED

Winter Oilseed Rape Recommended List 2020/21, East/West


Recommended for the East/West region only							
	Dazzler	Darling	PT275	Windozz	George	Elgar	Nizza CL &
Variety type	RH	RH	RH	RH	RH	Conv	RH
Scope of recommendation	E/W	E/W	E/W	E/W	E/W	E/W	Sp
	NEW	NEW		*		*C	NEW
Gross output, yield adjusted for oil content (% treated control)							
United Kingdom (5.1 t/ha)	103	103	102	102	102	100	96
East/West region (5.0 t/ha)	104	103	103	103	102	101	96
North region (5.7 t/ha)	[101]	[102]	98	99	101	98	[90]
Seed yield (% treated control)							
United Kingdom (4.7 t/ha)	102	103	102	104	102	101	97
East/West region (4.7 t/ha)	103	103	103	104	102	101	97
North region (5.2 t/ha)	[100]	[101]	98	101	100	98	[91]
Untreated gross output, yield adjusted for oil content (% untreated control) ^o							
United Kingdom (5.3 t/ha)	-	-	101	101	98	100	-
Untreated seed yield (% untreated control) ^o							
United Kingdom (5.0 t/ha)	-	-	101	102	98	101	-
Agronomic features							
Resistance to lodging (1-9)	[8]	[8]	8	8	8	8	[8]
Stem stiffness (1-9)	9	8	8	8	8	8	8
Shortness of stem (1-9)	6	6	6	7	7	6	6
Earliness of flowering (1-9)	8	7	5	8	7	6	7
Earliness of maturity (1-9)	6	5	5	5	5	6	5
Seed quality (at 9% moisture)							
Oil content, fungicide-treated (%)	46.2	46.0	45.5	44.5	45.4	45.1	45.0
Glucosinolate (µmoles/g of seed)	11.1	12.2	8.4	9.6	9.6	9.6	14.9
Disease resistance							
Light leaf spot (1-9)	6	6	6	5	6	7	4
Stem canker (1-9)	8	8	5	5	9	6	6
TuYV	R	R	-	-	-	-	-
Breeder/UK contact							
Breeder	DSV	DSV	PionOS	R2n	SyP	Els	R2n
UK contact	DSV	DSV	Cor	RAGT	Syn	Els	RAGT
Annual treated gross output, yield adjusted for oil content (% control) - UK							
2016 (5.1 t/ha)	-	-	99	99	99	98	-
2017 (5.7 t/ha)	102	103	101	102	103	99	93
2018 (5.5 t/ha)	100	101	101	101	101	99	93
2019 (5.2 t/ha)	105	104	99	102	102	101	95
Agronomy							
Plant height (cm)	155	160	156	150	151	154	153
Status in RL system							
Year first listed	20	20	19	16	19	16	20
RL status	P1	P1	P2	*	P2	*	P1

Recommended For The North

BARBADOS		AHDB	360
Details	RECOMMENDED	Comments	
Recommendation	North	High yielding variety with outstanding disease resistance – 8 for LLS and 7 for 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 the good disease resistance.	
Year Listed	2016		
Treated GO	102%		

BLAZEN		AHDB	360
Details	RECOMMENDED	Comments	
Recommendation	North	Blazen is a high yielding variety recommended for the North with excellent standing ability. It is marketed under the KWS OEP scheme* . It has a 6 rating for LLS and a 7 for stem canker and good tolerance to verticillium stem stripe.	
Year Listed	2020		
Treated GO	105%		

Oilseed Rape Candidates

HERMIONE		<div>AHDB CANDIDATE</div>	Comments
Details			
Recommendation	UK		Hermione is a hybrid candidate for addition to the UK RL from the KWS Momont programme. It is high yielding with excellent standing power, relatively late to flower and medium maturity. It is rated 6 for LLS and 8 for stem canker.
Year Listed	RL Candidate		
Treated GO	103%		

*To find out more on the KWS Oilseed Establishment Partnership (OEP), see [page 78](#)



RECOMMENDED

Winter Oilseed Rape Recommended List 2020/21, North

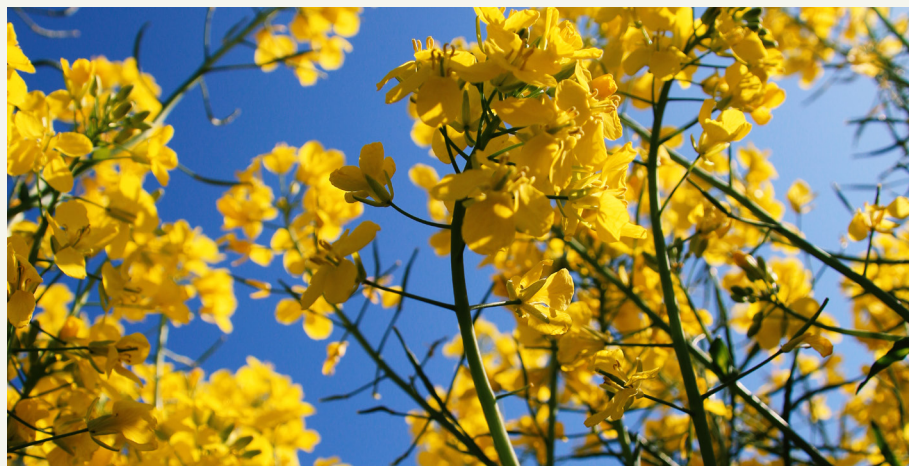
Recommended for the North region only								
	Blazen	DK Exsteel	Elevation	Barbados	Anastasia	Kielder	Broadway	Butterfly
Variety type	Conv	RH	Conv	Conv	Conv	Conv	Conv	Conv
Scope of recommendation	N	N	N	N	N	N	N	N
	NEW		*		*	*	*	*
Gross output, yield adjusted for oil content (% treated control)								
United Kingdom (5.1 t/ha)	103	101	98	99	98	96	94	99
East/West region (5.0 t/ha)	102	101	97	98	97	95	93	99
North region (5.7 t/ha)	[105]	103	102	102	101	99	98	98
Seed yield (% treated control)								
United Kingdom (4.7 t/ha)	104	101	98	99	99	96	94	99
East/West region (4.7 t/ha)	103	101	97	99	98	95	93	99
North region (5.2 t/ha)	[107]	103	102	103	102	99	98	98
Untreated gross output, yield adjusted for oil content (% untreated control) □								
United Kingdom (5.3 t/ha)	-	103	100	98	99	96	95	100
Untreated seed yield (% untreated control) □								
United Kingdom (5.0 t/ha)	-	103	99	99	101	95	95	100
Agronomic features								
Resistance to lodging (1–9)	[8]	8	8	8	8	8	8	8
Stem stiffness (1–9)	9	8	8	8	8	9	8	8
Shortness of stem (1–9)	6	5	7	6	7	6	6	7
Earliness of flowering (1–9)	6	6	5	6	6	7	7	6
Earliness of maturity (1–9)	5	5	5	4	5	5	5	4
Seed quality (at 9% moisture)								
Oil content, fungicide-treated (%)	44.8	45.5	45.6	45.0	44.6	45.9	45.2	45.4
Glucosinolate (µmoles/g of seed)	10.7	11.9	10.6	11.1	11.1	13.3	8.2	10.2
Disease resistance								
Light leaf spot (1–9)	6	7	6	8	7	7	7	7
Stem canker (1–9)	7	8	5	7	5	3	4	6
TuYV	-	-	-	-	-	-	-	-
Breeder/UK contact								
Breeder	KWSMR	MonTec	Pick	KWSMR	Lim	Pars	Pick	KWSMR
UK contact	KWS	Bay	DLF	KWS	Lim	Els	DLF	KWS
Annual treated gross output, yield adjusted for oil content (% control) - UK								
2016 (5.1 t/ha)	-	102	99	[99]	[99]	98	98	96
2017 (5.7 t/ha)	106	102	102	102	99	100	97	99
2018 (5.5 t/ha)	104	101	101	100	99	95	95	99
2019 (5.2 t/ha)	104	103	99	101	100	96	93	98
Agronomy								
Plant height (cm)	152	165	151	154	149	159	152	149
Status in RL system								
Year first listed	20	19	18	16	13	18	18	18
RL status	P1	P2	*	-	*	*	*	*

Other Oilseed Rape

CODEX		
Details		Comments
Recommendation	NL variety	Codex is a high gross output variety with very 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 KWS OEP scheme* .
Treated GO	101%	

*To find out more on the KWS Oilseed Establishment Partnership see [page 78](#)

CRISTIANO KWS		
Details		Comments
Recommendation	Common Catalogue Variety	Cristiano KWS 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	Feliciano KWS 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 its new resistance to stem canker is proving valuable. The resistance is multigenic and includes 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	Ernesto KWS 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 Oileed Establishment Partnership

Going 50:50 with oilseed rape establishment

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

The KWS oilseed establishment partnership (OEP) launched last year 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 producers out there that recognise oilseed rape is still the best break crop option they have.

KWS want 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.

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).
- Farmers signing up to the partnership will also have access to the KWS OEP knowledge network, featuring email updates and other advice.

To find out more about the partnership, visit our website:

www.kws-uk.com

or scan the QR code.



A large, close-up photograph of hybrid rye spikes, showing the intricate details of the grain heads and the long, thin awns. The background is a soft, out-of-focus field of similar plants under a bright sky.

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 2020:

- 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

KWS BONO



Details

Centre stage for grain yield and drought tolerance!

Breeder	KWS
Year Launched	2015
Wholecrop Yield	35-45 t/ha
Grain Yield	9-11 t/ha
End Use	Dual purpose hybrid (AD or Grain; Feed, Flour & Distilling)

KWS EDMONDO



Details

New horizons for Hybrid Rye!

Breeder	KWS
Year Launched	2018
Wholecrop Yield	35-45 t/ha
Grain Yield	10-13 t/ha
End Use	Dual purpose hybrid (AD or Grain; Feed, Flour & Distilling)

KWS ETERNO



Details

2 in 1 Hybrid Rye from KWS!

Breeder	KWS
Year Launched	2018
Wholecrop Yield	35-45 t/ha
Grain Yield	10-13 t/ha
End Use	Dual purpose hybrid (AD or Grain; Feed, Flour & Distilling)

All Rye data sources: Danish farmer union trials, KWS UK Obs, KWS Lochow Breeder Obs, Bundessortenamt

KWS SERAFINO



Details

Fire up your rye yields and grain quality!

Breeder	KWS
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)

KWS TAYO

Details

Join the ryevolution!

Breeder	KWS
Year Launched	2020
Wholecrop Yield	35-45 t/ha
Grain Yield	11-13 t/ha
End Use	Dual purpose hybrid (AD or Grain; Feed, Flour & Distilling)



OATS

Spring Oats

Spurred on by reports that oats are the 'healthy cereal' offering a natural way to reduce cholesterol, a good source of manganese and vitamin B12 – consumer demand for oats and oat-based foods is steadily increasing. What is more, there is considerable opportunity for more growth: the UK has one of the lowest per capita consumption rates of any country with the likes of China, Mexico and Brazil all eating more while Canada and Australia dominate.

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 ELYANN		AHDB RECOMMENDED	Comments
Details			
Type	Husked		WPB Elyann is an appealing spring oat that delivers high yields and broad market appeal due in large part to the highest kernel content of any recommended variety and low hulling losses. It combines good agronomics including stiff straw and resistance to lodging. Its suitability for human consumption has not gone unnoticed and there are several end-user contracts available with a number of merchants.
Year Listed	2017		
Treated Yield	98%		
Parentage	(Ivory x LW 00W035-01) x LW 97W020-01		

WPB ISABEL		AHDB RECOMMENDED	Comments
Details			
Type	Husked		WPB Isabel is a husked spring oat with a yield of 104% of controls and a high kernel content of 76.8%. It has impressively low screenings, average maturity and at 114 cm is amongst the taller varieties on the Recommended List. Its disease resistance is good and it has a high untreated yield of 89%.
Year Listed	2020		
Treated Yield	104%		
Parentage	Husky Cross		

Spring Oats Recommended List 2020/21, Husked Varieties

	Delfin	WPB Isabel	Elison	Yukon	Aspen	Canyon	WPB Elyann	Conway	Firth
Variety type	Husked varieties								
Scope of recommendation	UK	UK	UK	UK	UK	UK	UK	UK	UK
		NEW			C	C	C		
UK yield (% treated control)									
Fungicide-treated (7.5 t/ha)	105	104	104	103	102	101	98	95	94
Untreated (% of treated control)	99	89	96	98	85	93	87	86	81
Grain quality									
Kernel content (%)	73.6	76.8	73.7	74.3	75.2	74.0	78.1	75.6	75.9
Specific weight (kg/hl)	52.0	55.7	52.6	51.9	52.8	52.9	52.1	51.9	50.9
Screenings (% through 2.0mm)	3.1	2.3	3.0	3.0	2.3	2.2	2.7	2.8	3.0
Agronomic features									
Resistance to lodging (1–9)	8	[9]	[8]	8	7	7	6	8	7
Straw length (cm)	116	[114]	[113]	109	101	113	104	109	102
Ripening (days +/- Firth, -ve = earlier)	+0	+0	+0	+0	+0	+0	-1	+0	+0
Disease resistance									
Mildew (1–9)	9	6	8	8	6	8	6	7	6
Crown rust (1–9)	4	5	3	5	5	4	5	4	4
Annual treated yield (% control)									
2015 (8.8 t/ha)	[101]	-	[103]	[101]	[104]	[98]	[97]	[89]	[94]
2016 (8.3 t/ha)	[104]	[103]	[104]	[102]	[100]	[101]	[99]	[97]	[95]
2017 (7.2 t/ha)	[112]	[111]	[102]	[106]	[101]	[103]	[96]	[98]	[101]
2018 (6.3 t/ha)	[105]	[100]	[102]	[100]	[102]	[96]	[103]	[96]	[95]
2019 (6.8 t/ha)	[104]	[106]	[111]	[106]	[102]	[105]	[93]	[98]	[85]
Breeder/ UK contact									
Breeder	Nord	Weir	SE	Nord	Bau	Nord	Wier	IBERS	KWS
UK contact	SU	KWS	Sen	SU	Sen	SU	KWS	Sen	KWS
Status in RL system									
Year first listed	18	20	19	17	15	11	17	14	00
RL status	-	P1	P2	-	-	-	-	-	-



Peas

Most growers will be aware of the obvious benefit of growing peas; the fact that they are leguminous and therefore require no fertiliser, 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 more attractive.

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

And 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 2019/2020 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.



White Pea

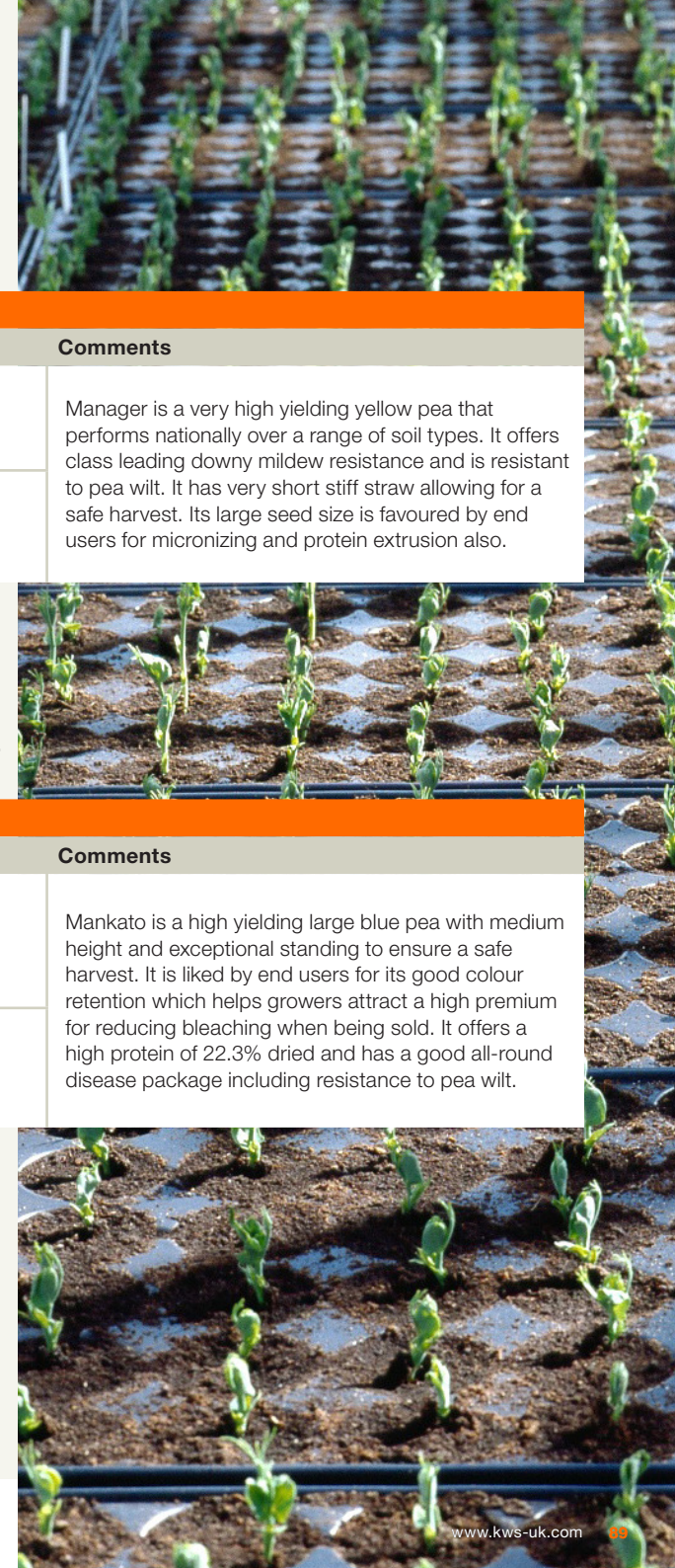
MANAGER		AHDB RECOMMENDED	Comments
Details			
Year Listed	2018		Manager is a very high yielding yellow pea that performs nationally over a range of soil types. It offers class leading downy mildew resistance and is resistant to pea wilt. It has very short stiff straw allowing for a safe harvest. Its large seed size is favoured by end users for micronizing and protein extrusion also.
Treated Yield	105%		

Data source: PGRO Recommended List 2020/21

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 22.3% dried and has a good all-round disease package including resistance to pea wilt.
Treated Yield	103%		

Data source: PGRO Recommended List 2020/21



MAIZE

KWS Maize Demonstration Site



Lydney, Gloucestershire -
Open during September

To book your visit please contact your
merchant, or the KWS Office.

The KWS Maize demonstration sites at Lydney and St Briavels are unique in the UK, showcasing all aspects of Maize breeding and the full KWS maize portfolio, which includes:

- Breeding demonstration
- Population wheel
- All current commercial hybrids
- New KWS forage and energy hybrids prior to commercialisation
- Seed rate and row width drilling trials
- Comparison of the UK's top 20 bestselling maize hybrids

Second demonstration site at nearby St Briavels at 600ft above sea level demonstrates the different growing and varietal effects experienced at altitude.

Tour of adjoining
AD Plant - optional

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 email 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

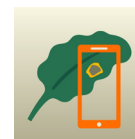
Innovation for excellent weed control



EPD 2.0 EARLY PLANT DEVELOPMENT

EPD2.0 seed treatment

Giving your seed the best start



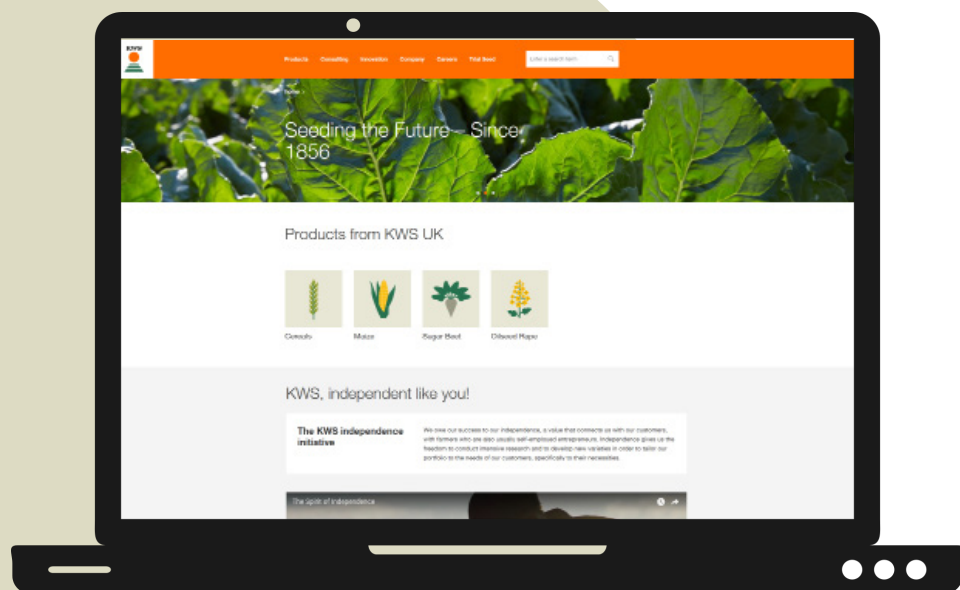
Beet Leaf Scan App

To check canopy health

Want more information?

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

The new site is easier to navigate, mobile friendly, nicer to look at AND jam packed with even more content!



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