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frontier

AUTUMN SEED

my VARIETIES 2022

A comprehensive guide to varieties
including data on yield and disease risks
with drilling and rotation considerations

Winter OSR

Winter Beans

Winter Wheat

Winter Barley

Winter Oats

Winter Rye

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my VARIETIES 2022

MyVarieties gives a comprehensive description of all the main cereal and oilseed rape varieties being marketed by Frontier for the 2022/23 season. The data has been drawn from a combination of our own trials, AHDB Recommended List trials and information from plant breeders.

For each variety, we have included AHDB yield data, agronomic characteristics and technical comments. In addition you will find data from our own 3D Thinking trials and observations made throughout the season, such as vigour in oilseed rape and tillering capacity in wheat.

Each species section also includes relevant market information, and considerations for variety selection. These cover drilling timings, disease risk, geographical location, and rotation. This information does not constitute a recommendation but is designed as a guide to the varieties' agronomic characteristics.

If you have questions about any of the varieties and advice featured in this guide, please speak to your local Frontier farm trader or agronomist. Alternatively, you can email info@frontierag.co.uk or call 01522 860000.



If you'd like to learn more about some of the varieties featured in this catalogue, you can find a series of videos on the Frontier YouTube channel www.youtube.com/FrontierAgriculture. Keep an eye out for new videos in June, with the latest observations from autumn 2021 and spring 2022.

The logo for Frontier, featuring the word "frontier" in a lowercase, sans-serif font. The letter "i" is stylized with a teal and yellow swoosh behind it.

In this issue:

frontier



HEAR all about it

Find out how a premium OSR contract can boost your sales price by up to £55/tonne



NEW winter beans

For the first time, MyVarieties now includes winter beans. Check out the three key varieties for 2022



There's a new Champion in town

Read about the UK's highest yielding winter wheat variety for 2022, along with five other new varieties for sowing this autumn



BYDV tolerant barley

Learn how seed genetics can protect your yields with the UK's first AHDB recommended barley variety with tolerance to BYDV

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Don't miss our sister publication, the Kings Environmental Management and Specialist Crops Catalogue 2022



Turn to Kings for conservation, game cover, green cover and forage crops
www.kingscrops.co.uk

Turn to Kings for all your needs

'Farming is changing' - a topic that continues to be at the forefront of many conversations with growers, land managers and advisors throughout the UK. While the transition to new approaches and policy can feel overwhelming, the increase in support for sustainable land management practices from Government schemes and private sector funding offers exciting prospects.



Forage Crops



Helping you to implement a sustainable farming system

Conservation Crops



Agri-environment Advice



YOUR FARM



Game Cover Crops



Crop Inputs



Green Cover and Companion Crops



MyFarm



Countryside Stewardship (CS)

Applications for Countryside Stewardship in England must be submitted by 31st July 2022. The scheme offers several options and unlike SFI, they can be applied for by specific plot rather than at whole-field-parcel level.

Capital items are available as a standalone grant or within CS, including grants for boundaries, trees and orchards, water quality and air quality.

The payment rates for many options were reviewed earlier this year and some notable

increases were made. The uplift is applicable for both existing and new agreements, so the scheme is now even more financially attractive.

If you opt for CS, we can help you with the planning stages of your application right through to choosing compliant mixtures. Some parts of the scheme continue to be competitive, so seeking expert advice can maximise your chance of success and help you to deliver high-quality habitat on farm.

Your Kings Crops Contacts:



Sustainable Farming Incentive (SFI)

The SFI is now underway and is the first of three Environmental Land Management (ELM) schemes to be rolled out. Based on a defined set of standards, SFI is action-driven and relies on certain requirements being met on farm. Within it, you can apply for different land management standards on different field parcels, each containing three 'levels of ambition': introductory, intermediate and advanced.

The levels have a set of required actions and each one builds from the previous.

For example, if you applied for the intermediate level, you would also need to meet the requirements of the introductory level. You can select the standards most applicable to your farm business and sustainability goals.

The first standard to be released is the arable and horticultural soils standard. Providing overwinter cover and increasing soil organic matter is key to complying and we believe it is the standard that will be applicable for many growers.

Of course, between this and the other land management standards (plus a review) that are being introduced, it can be difficult to understand the opportunities available. Kings will help you assess the options against suitable locations on your farm, supporting you to create the appropriate agreement for your business. We offer help with seed selection, ensuring your mixtures complement the wider rotation while meeting scheme regulations.

We also provide a digital environment manager tool so you can plan, map and record all aspects of your agreement. To find out more visit:

www.kingscrops.co.uk/environmental-mapping



Richard Barnes

Sales Manager
Mob: 07834 098784
richard.barnes@frontierag.co.uk



Alan Johnson

Scotland Technical Advisor
Mob: 07827 842107
alan.johnson@frontierag.co.uk



Clive Wood

Business Development Manager/
Northern Technical Advisor
Mob: 07970 097523
clive.wood@frontierag.co.uk



Meehal Grint

West Midlands/Central Senior
Technical Advisor
Mob: 07919 013520
meehal.grint@frontierag.co.uk



Hannah Clarke

Central Technical Advisor
Mob: 07795 506154
hannah.clarke@frontierag.co.uk



Jim Egan

Midlands Technical Advisor
Mob: 07919 306309
jim.egan@frontierag.co.uk



Chris Jinks

Eastern Technical Advisor
Mob: 07917 828003
chris.jinks@frontierag.co.uk



Lee Ward

Western Technical Advisor
Mob: 07967 553010
lee.ward@frontierag.co.uk



Neil Harris

Western Technical Advisor
Mob: 07342 055216
neil.harris@frontierag.co.uk



Will Pratt

Western Technical Advisor
will.pratt@frontierag.co.uk



Will Moynan

Southern Technical Advisor
Mob: 07760 363451
will.moynan@frontierag.co.uk



Alicia Martin

Northern Technical Advisor
Mob: 07920 142741
alicia.martin@frontierag.co.uk



Paul Brown

Business Development Consultant



Rebecca Harrison

Supply Chain Manager
Tel: 01379 658109
rebecca.harrison@frontierag.co.uk



Claire Colchester

Technical and Commercial Support
Tel: 01379 658129
claire.colchester@frontierag.co.uk



Daisy Havers

Senior Customer Service Administrator
Tel: 01379 658127
daisy.havers@frontierag.co.uk



Amanda Hiscutt

Customer Service Administrator
Tel: 01379 658168
amanda.hiscutt@frontierag.co.uk



Jasmine Utting

Customer Service Administrator
Tel: 01379 658169
jasmine.utting@frontierag.co.uk

Winter Oilseed Rape

2022/23 Varieties

AHDB approved and Frontier preferred varieties

Considerations for 2022

Geographical region

The location of the farm is an important factor as different disease pressures will influence certain criteria that the variety will need to display. For example, light leaf spot pressure is far more of a consideration in the North and Scotland. Varieties such as DK Expectation or Ballad would therefore be more suitable.

Soil type

Different varieties will suit different situations and heavy or light soils can influence factors such as establishment or vigour, so crops need to be chosen accordingly. Soil-borne challenges, like the clubroot pathogen, will also be a key factor in selecting the right variety. Crocodile CR, a variety resistant to common strains of clubroot, offers a high yielding option for sites affected by this disease.

Soil conditions

The aim is to achieve good seed-to-soil contact to ensure rapid seed germination and good conditions for residual herbicides to work effectively.

Rotation

Short OSR rotations can result in higher pressure from trash-borne diseases such as stem canker and soil-borne diseases such as verticillium wilt. Consideration should be given to rotation length and disease resistance scores when making variety choices. For example, Murray offers excellent resistance to stem canker, whilst Flamingo has shown strong responses in verticillium trials.

Timing schedules

Early vigour and speed of development will influence decisions on drilling date and therefore help to manage the workload at the busiest time of year. Maturity windows can also be chosen to ensure that the optimum OSR harvest doesn't clash with other crops that might be on farm. Varieties that suit later drilling tend to be hybrids, with LG Antigua performing particularly well at later drilling dates. Conventional varieties like Acacia and Flamingo also have excellent vigour, and could therefore be an option for later drilling.

Agronomy input

With chemistry restrictions making weed control difficult, different input options might need to be considered; for example, the use of Clearfield technology where brassica weeds are problematic. The increase in use of post-emergence herbicides can work particularly well with Clearfield systems and variety options continue to improve. Matrix CL provides similar yields to many market leading varieties, with the added benefit of good broadleaf weed control from the imazamox herbicide.

End market

OSR has a more limited market than that of cereals; however, there are still options to consider, such as growing a specialist oil profile like high erucic acid rape (HEAR) or high oleic low linoleic (HOLL), to attract a premium. This does have some practical considerations, including isolation from other OSR crops, but offers options beyond the one market that double low OSR trades into. For more information on HEAR, see pages 10-11.

Genetic traits and characteristics

The selection of our preferred oilseed rape varieties is increasingly based on the presence of desirable seed genetic traits and characteristics. An established trait such as the RLM7 gene for stem canker resistance is now present in many varieties. More recently, we have seen the introduction of genetic resistance to turnip yellows virus (TuYV), and RLMS, a new major gene for stem canker resistance.

To make clear which varieties carry these different genetic benefits, we have introduced an easy to follow range of symbols on the variety profiles that follow.



TuYV resistant

Genetic resistance to the Turnip Yellows Virus



RLM7

Has the RLM7 major gene for stem canker resistance



RLMS

Has the new major gene RLMS for improved stem canker resistance



Pod shatter resistant

Exhibits a high level of pod shatter resistance, to avoid yield losses in bad weather



N-Flex

More resilient yields in situations with suboptimal nitrogen availability



Club root resistant

Genetic resistance to one or more of the major strains of club root found in UK soils



Flexible driller

Suited to a very wide drilling window, allowing for flexibility in sowing date



Early harvest

An early maturing variety likely to offer a significantly earlier harvest date



Frontier recommends

This variety has been picked out as particularly notable, either for overall performance or a specific feature

Double low

Double low refers to the level of glucosinolates and erucic acid within the oilseed, forming an oil profile that provides opportunities for specific markets. The majority of UK rapeseed oil is known as 'double low' and is used in the largest quantity by Cargill for various outlets such as frying, margarines and cosmetics.

NEW **Murray LSPB**



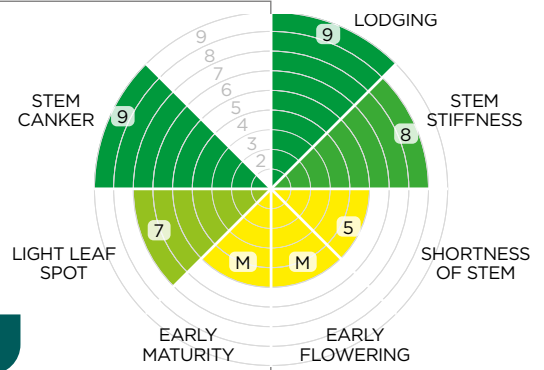
Gross output as a percentage of controls (AHDB Candidate 2022):
 UK: 107.1% East/West: 109.1% North: 102.2% Oil content: 43.6%

New: A candidate variety for the 2023 Recommended List, Murray offers a winning combination of outstanding yield and unmatched resistance to stem canker. Based on two years' of AHDB trials data, Murray is on course to out-yield the current top performing varieties. That yield is supported by a new major resistance gene for stem canker, known as "RLMS".



Growers looking for a fast-track to the latest seed genetics should jump at the chance to build RLMS into their rotation with this high yielding candidate.

Hybrid

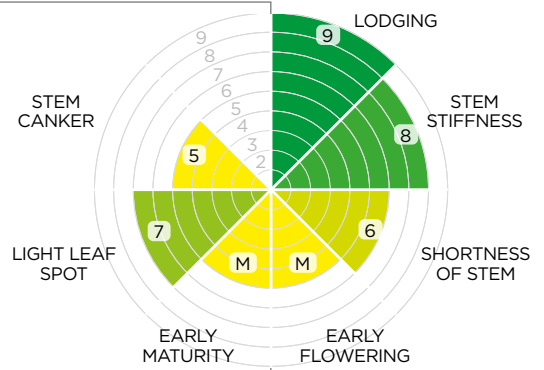


NEW **Turing LSPB**

Gross output as a percentage of controls (AHDB Candidate 2022):
 UK: 108.6% East/West: 109.1% North: 107.2% Oil content: 43.9%

New: Another candidate variety from LSPB, Turing matches other new LSPB variety Murray for East/West yield and significantly exceeds it in Scotland and Northumberland. A short plant type with good light leaf spot resistance, Turing has excellent agronomic merit for northern growers.

Hybrid



NEW **LG Wagner Limagrain**



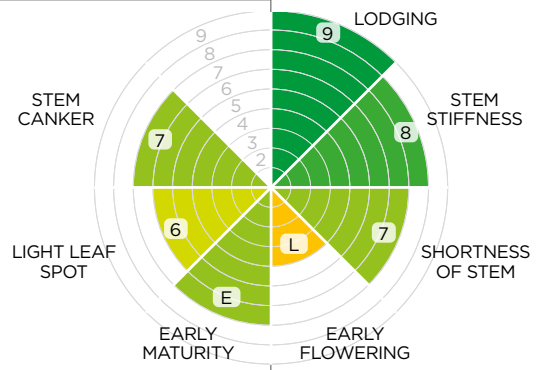
Gross output as a percentage of controls (AHDB Candidate 2022):
 UK: 105.7% East/West: 105.3% North: 108.3% Oil content: 44.3%

New: LG Wagner is a candidate variety, the latest in a succession of high potential varieties from Limagrain. Wagner is loaded with beneficial genetic traits and shows excellent resistance to stem-based diseases. A short plant type with very stiff stems make Wagner a good option for early sowing and an excellent performer in the northern AHDB region.



On course to be the new top performer for growers in northern England and Scotland, LG Wagner offers a fast-track opportunity to the latest in genetics from the UK's leading OSR breeder.

Hybrid



LG Antigua Limagrain



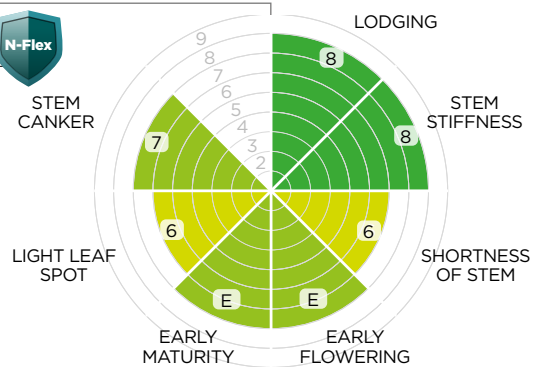
Gross output as a percentage of controls (AHDB RL 2022):
 UK: 103.9% East/West: 104% North: 102.9% Oil content: 45.4%

LG Antigua combines a comprehensive package of genetic traits including TuYV resistance, pod shatter resistance, and "N-Flex" - the ability to maximise yield in situations with suboptimal nitrogen availability.



Exceptional autumn and spring vigour, as well as a dynamic growth habit that sits well over winter, give Antigua one of the widest sowing windows and make it an excellent option for early drilling.

Hybrid



Click or tap this icon for more information about the variety.

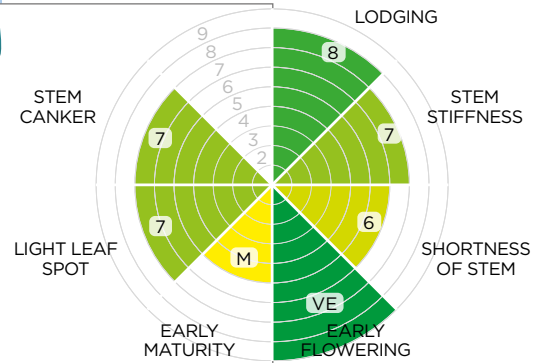
Hybrid

DK Expectation Bayer



Gross output as a percentage of controls (AHDB RL 2022):
 UK: 100.9% East/West: 101.6% North: 95.7% Oil content: 45.2%

The latest and highest performing variety from DeKalb. DK Expectation is fully loaded with genetic traits; pod shatter resistance, the RLM7 gene for phoma resistance, and TuYV resistance. Expectation also has good resistance scores to both stem canker and light leaf spot, making it an all round farm-friendly variety.



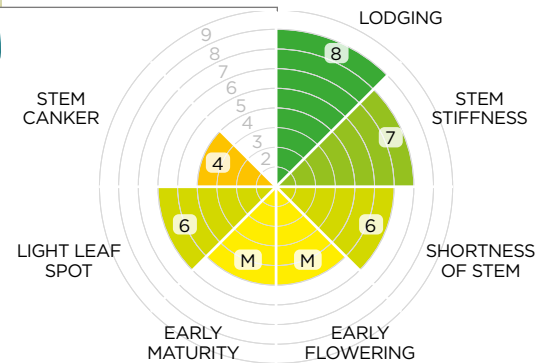
Hybrid

Crocodile DSV



Gross output as a percentage of controls (AHDB RL 2022):
 UK: 100.3% East/West: 101% North: 95.9% Oil content: 44.7%

For the third year in a row, Crocodile remains the highest yielding "CR" variety - known to carry genes for resistance to common strains of clubroot. With presence of this soilborne disease increasing in recent seasons, growers looking to manage this clubroot within their rotation should look no further than this consistent performer.



Clearfield

NEW

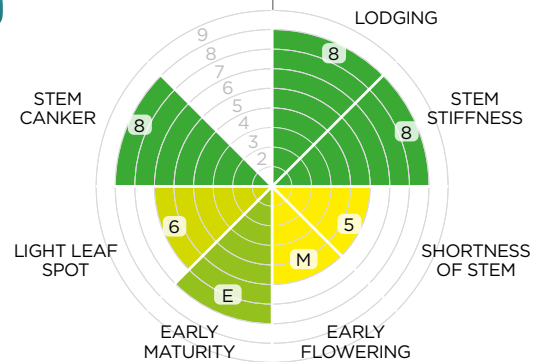
Matrix CL DSV



Gross output as a percentage of controls (AHDB RL 2022):
 UK: 99.3% East/West: 99.8% North: 95.7% Oil content: 45.8%

New: Matrix CL is the top yielding Clearfield variety and the first to team Clearfield herbicide tolerance with other important genetic traits, including TuYV resistance and pod shatter resistance. This package of genetics has reduced the yield gap traditionally associated with Clearfield varieties, putting Matrix CL within touching distance of the leading hybrids.

Matrix CL has taken Clearfield genetics to another level and should be the first choice variety for growers looking to manage cruciferous weeds or volunteers within their rotation.



Clearfield

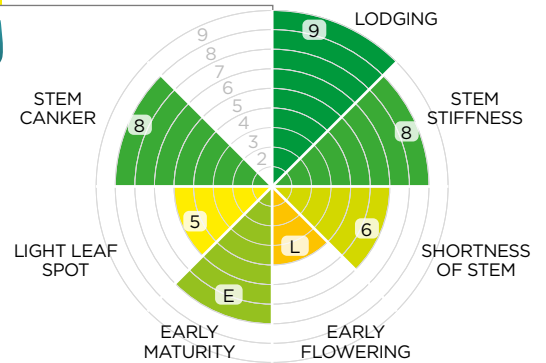
NEW

Beatrix CL DSV



Gross output as a percentage of controls (AHDB Candidate 2022):
 UK: 95.5% East/West: 98.7% North: 89.4% Oil content: 45.2%

New: Beatrix CL is the only Clearfield candidate for the 2023 Recommended List. Following hot on the heels of stablemate Matrix CL, Beatrix brings a similarly outstanding combination of genetic traits and yield potential. Slightly shorter and stiffer stemmed than Matrix, Beatrix will appeal to those looking for a more compact plant-type.



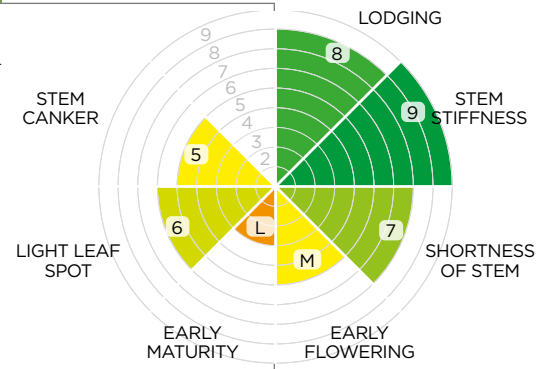
Click or tap this icon for more information about the variety.

Conventional

Acacia Limagrain

Gross output as a percentage of controls (AHDB RL 2022):
 UK: 103.6% East/West: 103.6% North: 103.6% Oil content: 45.3%

Acacia remains the highest yielding conventional variety on the 2022 Recommended List. With excellent performance across all regions of the UK, this variety also has a high oil content and superb standing strength due to its short and stiff straw. High autumn and spring vigour should help with establishment challenges.



NEW

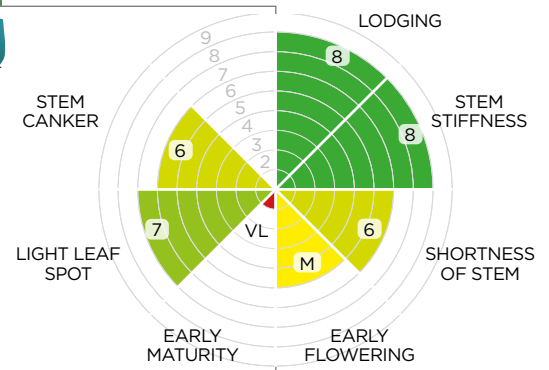
Conventional

Annika Limagrain



Gross output as a percentage of controls (AHDB RL 2022):
 UK: 102.6% East/West: 102.6% North: [102] Oil content: 45.2%

New: Annika is a new addition to the 2022 Recommended List, with similar yields to the top performing conventional variety Acacia. Annika has genetic resistance to turnip yellows virus and the best light leaf spot resistance of any open pollinated variety. A short plant with good stem stiffness and later harvest maturity, Annika is an excellent option for early drilling.

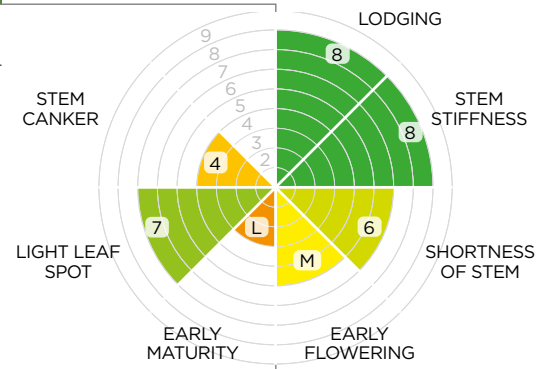


Conventional

Flamingo KWS

Gross output as a percentage of controls (AHDB RL 2020):
 UK: 101% East/West: 102% North: 101% Oil content: 46.1%

Flamingo is a well-established farm favourite variety with a history of consistent yields and strong vigour. In addition to being a standout performer in Frontier trials, there has been evidence of Flamingo coping well with pest pressures due to vigorous autumn establishment and early spring re-growth.



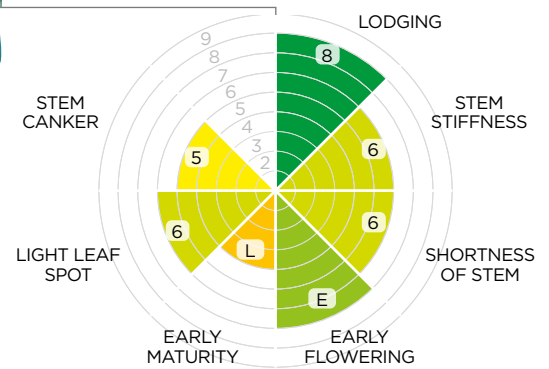
Hybrid

V367 OL Bayer



Gross output as a percentage of controls (Bayer trials)
 UK: 101% Oil content: 43.9%

V367 OL is the latest HOLL variety, successor to the widely grown variety V316 OL. More vigorous than V316, V367 suits the early and main drilling window and will provide faster autumn growth to combat pest pressure.



HOLL



Click or tap this icon for more information about the variety.

Focus feature: High erucic acid rape (HEAR)

High erucic acid rape (HEAR) can offer growers significant premiums

The benefits of growing HEAR

HEAR can command higher premiums.

The oil profile of HEAR is different to '00' oilseed rape, which makes it a niche crop in the market.

No specialist crop management required.

HEAR is the same plant species as standard oilseed rape so the work required to grow it is the same.

No need to compromise on yield.

Trials work has shown that HEAR varieties have the potential to yield just as well as 00 oilseed rape crops.



Excellent contract opportunities

Although the high erucic market is a niche one, it is one with significant demand and Frontier is able to offer HEAR growers competitive contracts as part of a secure, long term supply chain.

For 2022/2023 crops:



The 'produce of area' contract option involves no risk of default



Growers have the ability to fix their base price



There is potential to achieve an additional £55/tonne



Growers can receive an additional £1,600 per load of HEAR leaving the farm gate



The contracts are an opportunity to access new and exclusive varieties.



A 3-year contract is available, with a volume commitment offered in the second and third years

How does Frontier market HEAR?

HEAR supplies a key raw material for polymer additive production. This is used in the manufacture of erucamide which is a slip agent used in products such as printing inks, automotive components, engineering lubricants and food packaging - enabling fresh produce to have a greater shelf life resulting in reduced waste.

Part of the production process also results in a by-product of meal. This is produced after oil extraction and is used widely in ruminant animal feed.

Supply chain management

Growers who commit to a Frontier HEAR contract benefit from end-to-end transparency within the supply chain.

Our expert seed and trials teams monitor the performance of HEAR varieties to ensure we only supply high quality, vigorous varieties, while our BASIS-qualified agronomists are on hand to advise on establishment, crop health and overall management.

Once the crop is harvested it's taken to a crushing plant in Hull and supplied to Croda Europe Ltd, both of which are owned by our parent company.

HEAR Variety Choice

Varieties of HEAR oilseed rape are grown in exactly the same way as other varieties of double-low rapeseed; there are no special management considerations or additional inputs required.

Frontier offers three variety options on our HEAR contract for sowing in 2022.

Hybrid

Ramses ID Grain

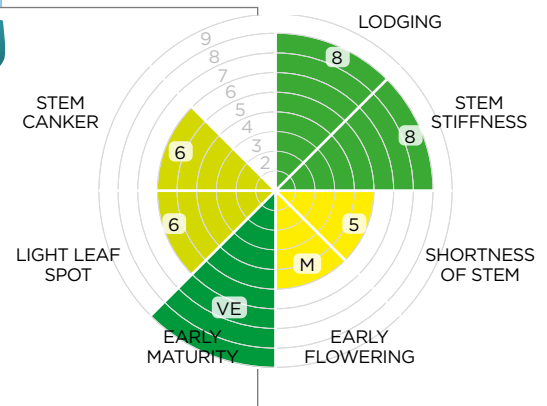


Gross output three year average 2019-2021 (Frontier trials):
UK: 4.88 t/ha Oil content: 45.3%

The top yielding HEAR variety in Frontier trials, Ramses offers a significant improvement over older HEAR varieties. Ramses is a large biomass plant type with excellent autumn and spring vigour which has helped to minimise losses to pest damage in recent seasons. An early harvest maturity will help to spread workload.



The most popular variety for growers on the Frontier HEAR contract in recent seasons, and with good reason.



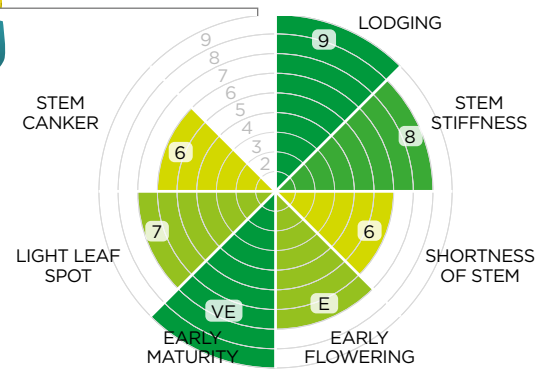
Hybrid

Rhodes ID Grain



Gross output three year average 2019-2021 (Frontier trials):
UK: 4.66 t/ha Oil content: 45.2%

Rhodes provides a useful improvement in light leaf spot resistance and stem stiffness over Ramses, making it an attractive option for growers in northern England and Scotland. Like Ramses, it also has genetic resistance to pod shatter, giving peace of mind during high winds or heavy precipitation in the run up to harvest.



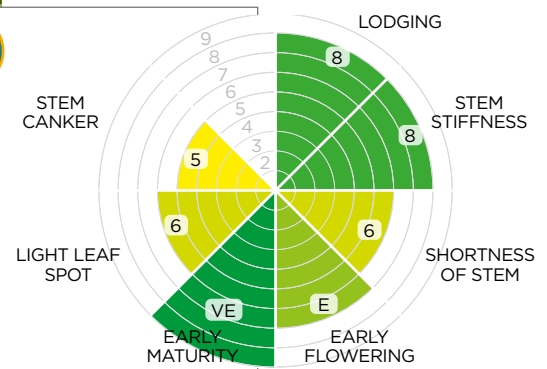
NEW

Resort LSPB



Gross output three year average 2019-2021 (Frontier trials):
UK: 4.67 t/ha Oil content: 46.1%

New: Resort is the newest variety available to growers on the Frontier HEAR contract, and the only one to appear on the AHDB Recommended List. Resort has a shorter plant height than either Ramses or Rhodes. An early flowering habit is mirrored with an early maturity, making all three HEAR varieties excellent options for an early harvest, before winter barley in many cases.



Hybrid



Click or tap this icon for more information about the variety.

Seedbed preparation, drilling, and establishment

Greater pressure on oilseed rape establishment means it is essential to pay close attention to seed rates, cultivation and creating a good seedbed.

Seedbed preparation

Irrespective of the cultivation system, there are a few key factors to consider during seedbed preparation. Soil that is free from compaction allows unrestricted tap root development and good seed-to-soil contact will improve germination consistency and promote early vigour. Consistent drilling depth ensures seed is planted into moisture and has sufficient soil cover to keep it safe from pre-emergence herbicides.

Previous crop residue management is also important, with exact requirements dependent on the material left after the previous crop. Turning damp residues on the soil surface can dry out slug eggs and reduce later pressure. Removing weeds and volunteers growing after harvest also removes their food source.

Moisture conservation should be the primary consideration for all establishment decision making. Adequate consolidation after drilling is also of great importance, improving tilth and seed-to-soil contact, whilst physically impeding slug mobility. Cambridge rolls follow surface contours well and can be particularly useful after direct or strip-till drills, whereas flat rolls can ride on high spots and mounds of trash, leading to uneven consolidation.

Drilling

Earlier drillings established in good conditions with adequate moisture suit slower developing varieties, avoiding the over-large canopies that are more prone to winter damage. Later in the drilling period, hybrids that grow away quickly are key to ensuring a robust crop that can withstand pest pressures.



Set sowing rates according to seed number/m² rather than by weight. Target 30-40 plants/m² after winter, working seed rates back to take into account likely in-field losses. For hybrid varieties this equates to drilling 50 seeds/m², which is the suggested drilling rate from most breeders. Conventional varieties will vary more due to conditions and date, although 80-110 seeds/m² is a sensible aim. Lower seed rates are possible in good conditions, but could leave you slightly more exposed if pigeon or cabbage stem flea beetle pressure is high.

Pest control

Growers must make every effort to establish crops that grow quickly through the vulnerable early stages. Drilling in dry conditions will slow emergence and increase the risk of flea beetle damage. To reduce the chances of an early crop write-off, alleviate potential stress factors as far as possible. Foliar insecticides are available to help manage early insect pressure, including cabbage stem flea beetle, rape winter stem weevil and turnip sawfly larvae. Use full rates of the more active pyrethroids, such as lambda-cyhalothrin, and ensure good coverage. Monitor the effectiveness of any insecticide application and avoid repeat spraying if resistance gives poor control of the target pest. Results are unlikely to improve and it may have a negative effect on beneficial insect populations.



OSR seed rates will vary based on various criteria. As a starting point, it is suggested hybrid varieties are drilled at 50 seeds/m² and conventional varieties at 100 seeds/m².

To adjust these, the following considerations need to be made: drilling date, soil type, seedbed quality, moisture, pest pressure, and drill accuracy. These will all influence the establishment percentage and can be used to adjust rates both above and below the average given previously.

Seed treatments and early nutrition

Providing the right protection, stimulation, and nutrition to your OSR crops is crucial to establishment.

Early root development

Promoting rapid emergence and earlier growth is vital to a successful crop. Winter survival and eventual crop yield are heavily influenced by early root development. The seed treatments applied to Frontier OSR are specifically chosen to improve rooting through a mixture of tailored nutrition and biological interactions. The potassium phosphite contained in Prosper ST leads to longer primary root growth and more lateral root development, ensuring the roots are then fed by a readily available mixture of micro- and macro-nutrition. Integral Pro, a *Bacillus* bacteria, also has positive effects on root growth through a mixture of root colonisation by beneficial microorganisms and stimulated plant activity. Through these different modes of action, the bespoke seed treatment combination works to provide OSR plants with a boost to early rooting that can underpin improved plant resilience and ultimately yield.

Seedbed nutrition

Adequate early OSR crop nutrition is critical for emergence, establishment and for maintaining green area through the period of pest damage and ultimately winter survival. Placement of fertiliser at drilling or applications immediately after drilling consistently demonstrate the biggest benefit in crop growth and yield increase, don't delay applications. The main product(s) of use tends to be DAP or NP Clear Liquids, but for the 2022-2023 season you may need to consider other options based on the potential cost and availability of fertiliser products. Some potential alternatives could be Seed Sprint Micro granules, or compound NPKs (eg YARA Actyva S 16-15-15+6.5S). Although potassium demand of OSR is relatively low, it plays important roles in Nitrogen Use Efficiency, water management and the crops ability to withstand frost damage. All autumn nitrogen application must comply with Nmax limit for OSR crops of 30kg N/ha.

Nutrino Pro

Nutrino Pro is a very safe foliar nitrogen product, which also contains magnesium, sulphur and biostimulants to increase the assimilation of nitrogen in the crop. It is suitable for a wide range of crops and is particularly useful in maintaining canopy or increasing the duration of canopy in crops such as maize, oilseed rape and potatoes. Nutrino Pro ensures the green biomass produced by the plant is fully utilised, helping to fill the grains, pods or tubers which account for yield, and as such it is ideally suited for the final nitrogen application to OSR crops.

Frontier's OSR seed treatments

Frontier produced OSR seed will be treated with the following treatments at no extra charge:

Integral® Pro

(*Bacillus amyloliquefaciens* MBI 600)

Bio-fungicide seed treatment.

- Protects against the pathogenic fungi which can cause damping-off. Colonisation of the roots by beneficial microorganisms provides best available bio-fungicidal activity.
- Stimulates plant defences and activity to provide a range of benefits, including root and shoot growth
- Trials show significant improvements in establishment, spring vigour, and yield compared to untreated seed.

Prosper ST

(N, P, K, Zn, Mg, Mn, Cu, B, Fe, Mo) phosphite and nutrient based seed treatment.

- Prosper ST is proven to increase the speed of germination, particularly in colder seed beds
- Applying phosphite to the seed facilitates and encourages root growth immediately after germination
- Root growth is typically increased by 30% and the larger root system allows improved access to soil nutrients and moisture
- Nitrogen assimilation is also improved by the stimulation of the enzyme nitrate reductase, leading to subsequent increases in shoot growth.

Seed-Life™

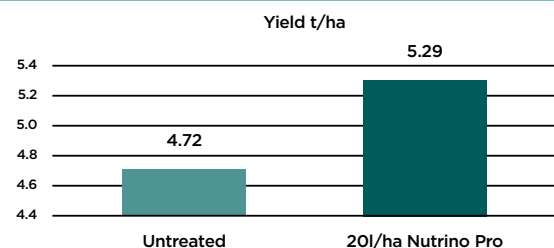
(N, P, K, Mg, Ca, Mg, S + Trace elements and growth promoters) nutrition and growth promoter.

- Seed-Life™ is a natural liquid nutrient formulation applied directly to the seed to improve emergence and provide a healthier, more vigorous start for the seedling
- Makes nutrients and trace elements available in the immediate zone around the seed which are easily accessed by young roots, thus promoting optimum availability for early growth
- 20 continuous years of Frontier Seed-Life™ trials show an average yield increase of 123kgs/ha, returning an additional £40/ha over single-purpose dressed seed.

PolySeia* 500S

- High quality unique formulation polymer coating that positively impacts on germination in dry conditions
- Helps reduce dust
- Provides even coverage of other treatments
- Coloured to allow visibility in field to check drilling accuracy.

Agronomist-led split field trial OSR. UK 2020



20l/ha Nutrino Pro applied at 90% petal fall. Data cleaned and analysed by ADAS



Click or tap this icon for more information about this product.

Oilseed rape and companion crops

Companion cropping can be a key component within cabbage stem flea beetle (CSFB) management in oilseed rape.



Berseem, clover and buckwheat

Companion crops are planted alongside the oilseed rape crop, either before or at planting, to help the crop establish effectively. Companion crops offer protection against CSFB and encourage overall crop establishment by providing:

- Disguise for the oilseed rape crop
- Beneficial insect attraction
- Overall crop nutrition
- Complementary soil health improvement
- Canopy protection from pigeons

We see many growers establishing oilseed rape successfully alongside companion crops.

Companion Crop Options

Companion crops should be spread onto the seedbed prior to drilling the oilseed rape or applied within separate hoppers (where available) within the seed drill. We do not advocate mixing companion crop seed with oilseed rape.

Companion Crop Mix 1

Fenugreek, berseem clover and buckwheat

Companion Crop Mix 2

Fenugreek and berseem clover

Companion Crop Mix 3

Berseem clover and buckwheat

Companion Crop Mix 4

Berseem clover, tataricum buckwheat and fenugreek


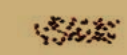


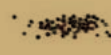



Companion Crop Mix 5

Berseem clover and tataricum buckwheat

Mixtures supplied in convenient 3ha packs.
Straight species are also available.



The difference between Frontier's oilseed rape marketing standards and the minimum standard

Number of impurities tolerated per 500g bag	Minimum standard	Marketing standard Frontier aims to achieve
	Seeds of other plants ▶	 0.3%
Wild oats ▶	0	0
Docks ▶	 25	0
Wild radish ▶	 50	0
Cleavers ▶	 NO STANDARD	0
Charlock ▶	 NO STANDARD	0
Fragments of sclerotia ▶	 50	0
Inert material ▶	 10 _g	 5 _g
Purity ▶	98%	99%
Germination ▶	85%	90%

All Frontier processed seed currently undergoes erucic acid testing before sale. We test both on farm and during production prior to chemical treatment. To date, all samples tested have been well below the required standard.

Winter Beans

2022/23 Varieties

Frontier preferred varieties

Considerations for 2022

Feed markets

Demand for winter beans remains strong in the UK with many feed consumers looking to increase the percentage of locally grown protein into animal diets and reduce reliance on imported protein sources, especially soybean meal from South America.

Traditionally beans have only featured in ruminant diets, but they are now being used increasingly in poultry and pig rations. Over the past two years we have seen this trend occurring in Europe as well. In Germany, milk producers are now asked to have no soybean meal in any dairy ration and with a relatively small domestic crop they have started importing feed beans from the UK.

Aquaculture is the biggest growth area for UK bean demand. The total market for farmed salmon diets in Scotland and Norway is over 1.5 million tonnes, with de-hulled beans now accounting for up to 11% of that total.

Frontier operates a specialist de-hulling plant at our site in Ruddington, Nottinghamshire. We de-hull over 50,000 tonnes of beans each year for the aquaculture market. To avoid wastage, the bean skins are blended with other UK protein products to make a high energy feed pellet ideally suited for feeding young stock.

Human consumption markets

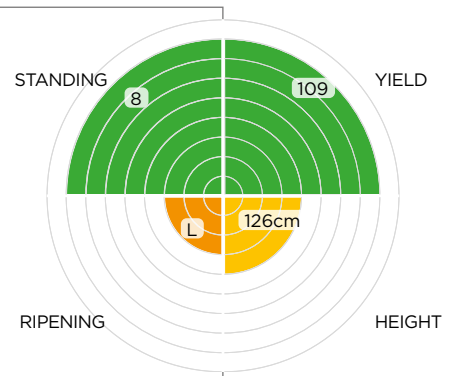
Demand for human consumption beans has generally been supplied by spring beans in recent years, due to improved quality and visual appearance of beans from spring sown varieties. This is by no means exclusive; we are always looking to buy winter beans that meet human consumption standards, are relatively low in bruchid levels, and with a nice creamy colour. We generally see this marketing opportunity early in the season, before the bulk of spring beans have been harvested in the North of England. Varieties like Vespa and Pantani may well fulfill this requirement, with the early harvest of Pantani in particular providing the widest possible marketing window, prior to the availability of spring beans.



Vespa Senova

Data from PGRO Descriptive List 2022

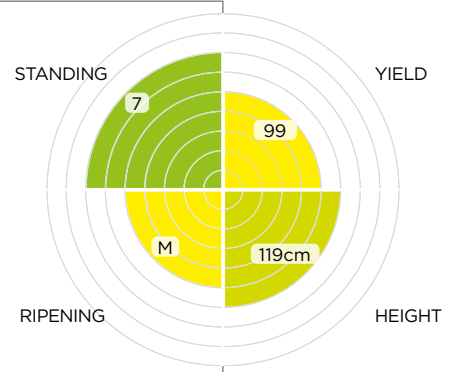
Vespa is the highest yielding winter bean on the latest PGRO Descriptive List. Vespa has a noticeably better standing ability than current marketing leading variety Tundra, and a slightly later harvest maturity.



Tundra Limagrain

Data from PGRO Descriptive List 2022

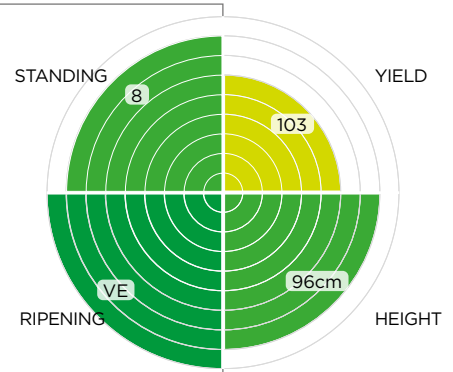
The most widely grown winter bean variety in the UK for a number of years, Tundra has remained popular due to its consistent yields and moderately early maturity.



Pantani LSPB

Data from LSPB trials 2 year average

A new option for 2022 and a recent addition to the PGRO 2023 Descriptive List, Pantani brings two sought after features for winter beans: a very early harvest maturity, and a short plant height with excellent standing ability. Data from the last two years puts Pantani comfortably ahead of Tundra for yield.



Click or tap this icon for more information about the variety.



Variable rate seed: the foundations of yield

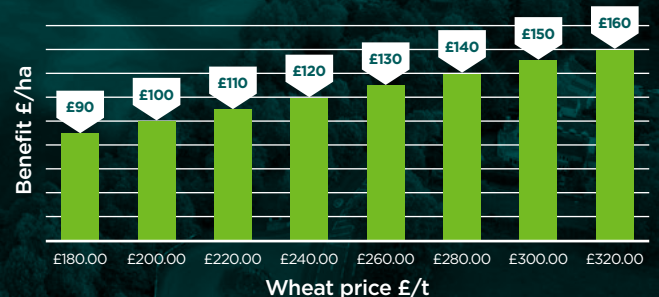
Drilling seed at variable rates can result in more even plant populations and reduce crop variation by up to 50%.



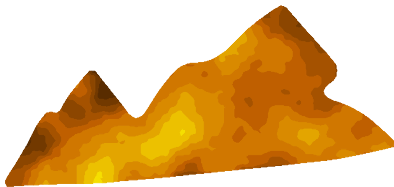
Establishing an optimum plant population and an even canopy in the spring is fundamental to achieving maximum yields. The benefits include reduced lodging risks, lower disease pressure and more efficient use of crop inputs.

Variable rate seed is proven to provide a financial benefit, with variably drilled fields providing an average yield increase of 5%.

The value of a 5% yield increase at different wheat prices

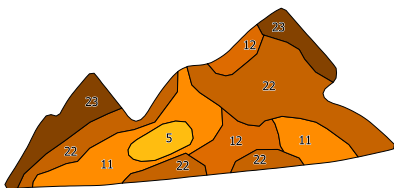


The most accurate way to introduce variable rate seed into your business is via the SOYL Seed system:



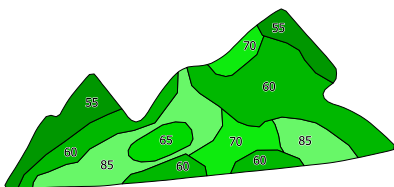
Stage 1 - Electrical conductivity scan

A non-intrusive survey of the soils' physical properties is undertaken. Soil conductivity correlates to its clay/moisture content, depth and stone content. The electrical conductivity scan will determine each soil type zone within the field.



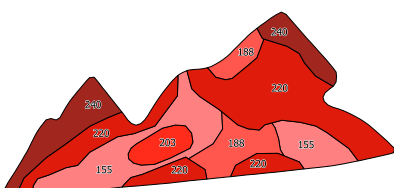
Stage 2 - Textural classification

An experienced soil scientist will texturally classify the soil types within your field. They will factor in texture, slope and stone content to create a soil type map.



Stage 3 - Establishment allocation

Each soil type zone is assessed for seedbed quality and potential winter losses. Local knowledge, such as that of black-grass or slug damage pressures, can be factored in here. From this, a percentage establishment layer is then created.



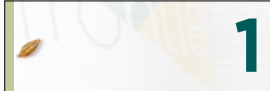
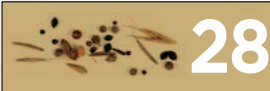







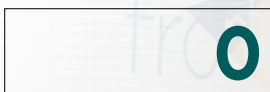
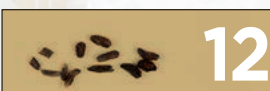
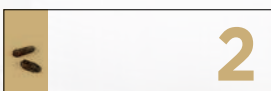
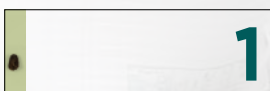
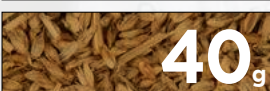

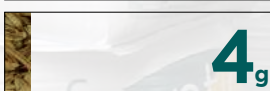


Stage 4 - Drilling plan

A variable drilling plan is compiled, using the establishment plan to vary the seed rate across the field. Drilling plans can be created in minutes on MySOYL ready for export to your drill controller.

For more information on variable rate seed visit www.soyl.com,
call 01635 204190 or email info@soyl.co.uk.

The difference between Frontier's cereals marketing standards and the minimum standard

Number of impurities tolerated per 2kg bag	Minimum standard	C2 Higher Voluntary Standard	Marketing standard Frontier aims to achieve
Seeds of other cereals ▶	 28	 6	 1
Seeds of other species ▶	 28	 4	 1
Maximum species total ▶	 40	 8	 1
Wild oats ▶	 2	 0	 0
Ergot pieces ▶	 12	 2	 1
Inert material ▶	 40 _g	 20 _g	 4 _g
Purity ▶	98%	99%	99.8%
Germination ▶	85%	85%	95% <small>Target</small>
Loose smut ▶	0.2%	0.2%	0.00% <small>(Control via seed treatment)</small>

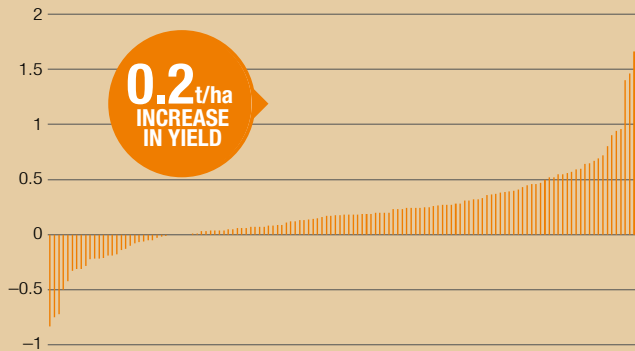
Whilst no specific quality standard exists for black-grass, we understand that growers will be anxious to know their seed is free of black-grass contamination.

We are confident that Frontier seed meets the highest standards. Having processed over 100,000t of cereal seed in the past two years, we have identified no black-grass seeds in any official samples.



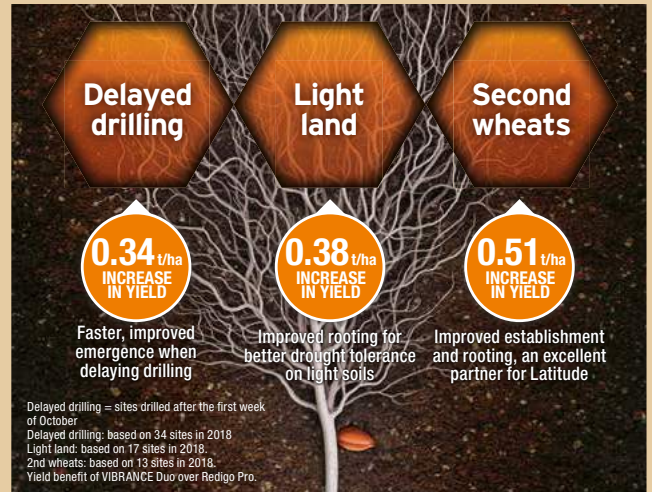
The first choice seed treatment for winter cereals

VIBRANCE® Duo is proven to consistently protect yield across multiple seasons and a huge number of trials



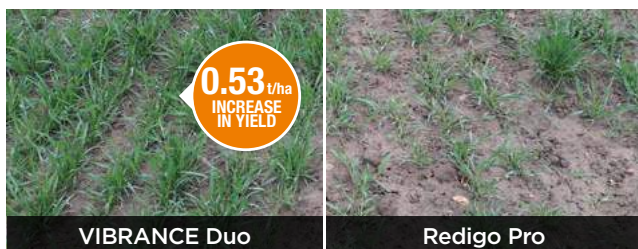
Yield difference (t/ha) VIBRANCE Duo vs Redigo Pro 2013-2021

VIBRANCE Duo excels in three key positions

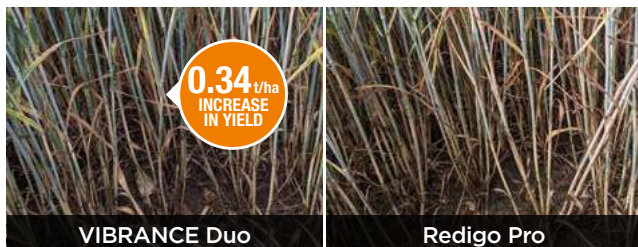


Build a resilient wheat crop to cope with weather uncertainties

Whether you plan to drill early or late, at the time you buy your seed you don't know what the weather has in store. Building a resilient crop gives insurance against adverse conditions.



Newark, Nottinghamshire drilled the season of the 'Beast from the East'



Rougham, Cambridgeshire, drilled 20/10/20.

Reliable performance across different cultivation and establishment systems



Shipston on Stour, Warwickshire. Heavy soil. Drilled 29/10/17.

5:1 return on investment

A £10/ha investment in Vibrance Duo returns an average of £54/ha in yield*

*Based on an average yield difference of 0.2t/ha and a November 2023 wheat price of £270/T

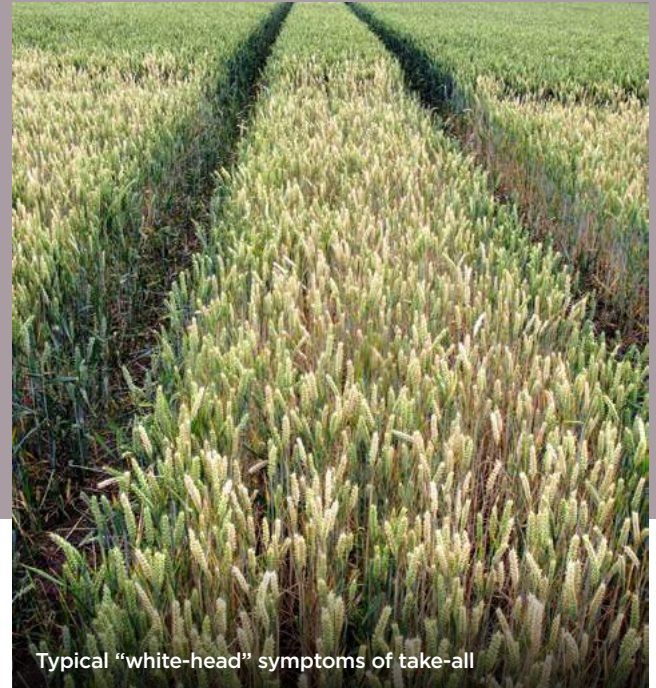
Winter
wheatWinter
barley

The specialist seed treatment for reducing take-all losses



Secure your crop with Latitude

- Protects yield, quality and profits
- Reduces take-all in wheat and barley
- Enables flexibility of drilling date
- Improves nutrient and water uptake



Typical "white-head" symptoms of take-all

Take-all: major risk factors

Climate
34%

- Take-all will thrive in a warm wet autumn, followed by a warm wet winter

Rotation
33%

- Situations where take-all is likely include: second and third wheat; winter barley following a cereal; first wheat after a fallow or a spring cereal

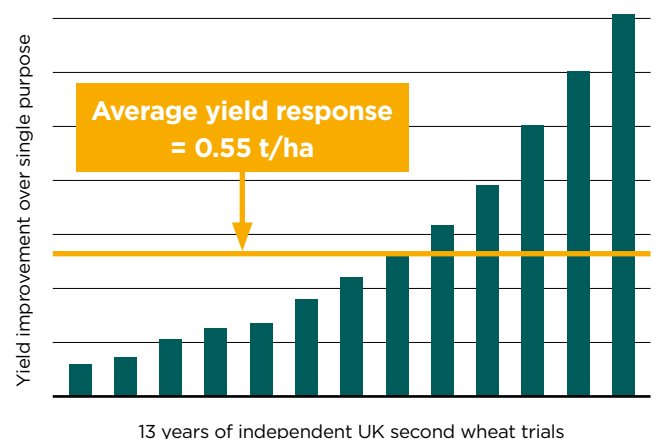
Sowing date
17%

- Earlier drilled crops are more susceptible, early October drilling is optimum

Soil type
16%

- Soil texture (7%), pH (6%) and organic matter (3%) can all have an influence on take-all risk.

Yield benefit, wheat after wheat



£116/ha
gross margin

Average yield and gross margin benefit = 0.55 tonne or £116/ha*.

Yield response required to break even = 0.12 t/ha.

*Based on a Latitude cost of £37/ha and a November 2023 wheat price of £270/t

Winter Wheat

2022/23 Varieties

AHDB approved and Frontier preferred varieties

For further variety data see pages 30-31.

Wheat markets and variety choices are extremely important and we encourage growers to review their individual situation. Grain markets for harvest 2023 are likely to remain volatile, with knock on effects for domestic demand as well as export opportunities. Having a clear target market, linked to expected local demand, should be central to variety decision making. To aid marketability, growers may need to consider a range of bread, biscuit and soft export grades, selecting varieties that combine high yields with human consumption characteristics.

Drilling Recommendations

Early September	KWS Colosseum, ★ KWS Parkin, LG Astronomer, KWS Barrel, RGT Wolverine, ★ Grafton
Mid-September	★ KWS Dawsum, ★ KWS Colosseum, Gleam, RGT Saki, ★ KWS Parkin, LG Prince, KWS Firefly, LG Astronomer, ★ KWS Palladium, KWS Barrel, RGT Wolverine, Mayflower, Crusoe, RGT Illustrious
Early part of main drilling window	KWS Dawsum, KWS Colosseum, Gleam, RGT Saki, Graham, KWS Parkin, LG Prince, KWS Firefly, LG Astronomer, KWS Palladium, KWS Barrel, RGT Wolverine, Mayflower, Crusoe, RGT Illustrious
Late part of main drilling window	Champion, KWS Dawsum, KWS Colosseum, SY Insitor, RGT Bairstow, LG Skyscraper, Gleam, RGT Saki, KWS Cranium, Graham, KWS Extase, KWS Firefly, KWS Siskin, KWS Zyatt, Skyfall
Late drilling	★ Champion, RGT Bairstow, ★ SY Insitor, ★ KWS Cranium, LG Skyscraper, ★ KWS Extase, KWS Firefly, ★ Skyfall, Belepi
Light land	★ SY Insitor, ★ KWS Dawsum, LG Skyscraper, KWS Extase, Graham
Heavy land	KWS Colosseum, KWS Dawsum, ★ KWS Parkin, KWS Firefly, LG Prince, LG Astronomer
Second and continuous wheat	★ Champion, KWS Colosseum, RGT Bairstow, KWS Dawsum, LG Skyscraper, ★ LG Prince, KWS Cranium, KWS Extase, ★ KWS Zyatt, Mayflower, Skyfall
High disease resistance (yellow rust and Septoria tritici, 1-9)	Mayflower (9, 8.4), KWS Palladium (9, 7.4), KWS Extase (8, 7.8), Champion (8, 7.7), KWS Siskin (9, 6.5), KWS Colosseum (8, 7.0), LG Astronomer (8, 6.8), KWS Dawsum (9, 6.3)

★ *These varieties are particularly well suited to this drilling situation*

Considerations for 2022

Drilling dates

The factors affecting drilling dates are varied and certain aspects become more important depending on the geographic region. These factors include:

Soil conditions

- Aim for good seed-to-soil contact to ensure rapid seed germination and good conditions for residual herbicides to work effectively.

Grass-weed control

- Very much linked to black-grass emergence. In some seasons, for example of low dormancy and moist soils, delaying drilling will allow early glyphosate treatments, but in dry autumns with high dormancy this approach does not work.

Acreage to drill

- Spreading the workload is important, but there will be compromises for crop emergence, weed and pest control if drilling in non-ideal conditions.

Acreage to spray/harvest

- A spread of drilling dates combined with varieties of differing development speeds and maturities will spread the spring/summer workload as they reach key growth stages a few days apart.

Geographical region

- The colder the field aspect and the further north, the earlier crops can safely be drilled with lower risk of running into early pest problems. Early September drilling is much more feasible in the north, while late drillings can be slow to emerge and, in cold winters, crops will stop growing sooner, with a potential knock-on effect and late harvest.
- In East Anglia and parts of Lincolnshire, the opportunity to drill throughout winter is possible and harvest date will not be significantly later.
- In Scotland, the harvest date of the previous crop will have an influence, with the opportunity for stale seed beds very narrow compared to southern England.

Disease and pest risk

- One of the most significant threats to winter wheat crops is the transmission of barley yellow dwarf virus, either through root-to-root contact in the soil, or via infected aphids. Earlier drilled crops are at much higher risk and may require several insecticide sprays or the use of a variety with genetic resistance, such as RGT Wolverine.
- Risk of disease in highly susceptible varieties will only increase if drilled early. Mid-September plantings having considerably higher levels of septoria and yellow rust than that drilled in October.
- Frontier trials illustrate how the more resistant varieties withstand septoria and rust pressure while achieving relatively high yields; for example, KWS Extase, Champion, KWS Dawsum, and KWS Colosseum.
- Under higher septoria pressure, the more susceptible varieties will be more costly to grow and the risk of losing yield increases where sprays are delayed.
- Second wheat should not be drilled early. In high, take-all risk situations, even Latitude-treated seed should be left until the start of October at the earliest.
- For late drilled crops, wheat bulb fly may be an issue so use of the seed treatment Signal is advised.

Very early drilling

- Ideally, varieties drilled in early September should be slow developing, disease resistant and have good resistance to lodging. KWS Parkin and LG Astronomer are key varieties at this time.

20th September to early October (main drilling window)

- Most varieties can be drilled during this period. If a range of varieties is on farm, segregate by speed of early development and straw strength.

Late drilling

- Attributes should include fast early development and good tillering capacity to ensure good ground cover going into winter, for example Champion, KWS Extase, KWS Cranium, SY Insitor, and Skyfall.
- In recent seasons, some varieties have proven themselves as capable performers from ultra-late drilling dates. KWS Firefly (end of February) and Skyfall (early March) are two of the best examples.
- As we move towards the end of the normal autumn sowing window, growers should consider switching to “alternative wheats”, those capable of being drilled in the late autumn or spring. Belepi and Nisaba are two such varieties.

Second wheat

- Most varieties perform much as they would in the first wheat slot. Ideally, varieties should have good resistance to eyespot, but this is not always reflected in final yield.
- Varieties that appear to be less suited include Crusoe, Costello, and Graham.
- Varieties that perform better as second wheats compared to their performance as a first wheat include; KWS Zyatt, Skyfall, LG Prince, RGT Bairstow, and Champion.
- Quality wheats such as Zyatt, Crusoe, Siskin and Skyfall are often drilled in this slot, as the reduced yield potential can help maintain grain protein content.

Genetic traits and characteristics

To make clear which varieties carry these different genetic benefits, we have introduced an easy to follow range of symbols on the variety profiles that follow.



Pch1

This variety has the major Pch1 gene which provides superior resistance to eyespot, ideal for second cereal situations



OWBM resistant

This variety has genetic resistance to damage and yield loss from Orange Wheat Blossom Midge



BYDV resistant

This variety has genetic resistance to infection and yield loss from the Barley Yellow Dwarf Virus



Second cereal

Particularly well suited to being sown as a second or continuous cereal



Flexible driller

Suited to a very wide drilling window, allowing for flexibility in sowing date



Early driller

Suited to being drilled earlier than the main drilling window



Late driller

Suited to being drilled later than the main drilling window



Frontier recommends

This variety has been picked out as particularly notable, either for overall performance or a specific feature

KWS Zyatt

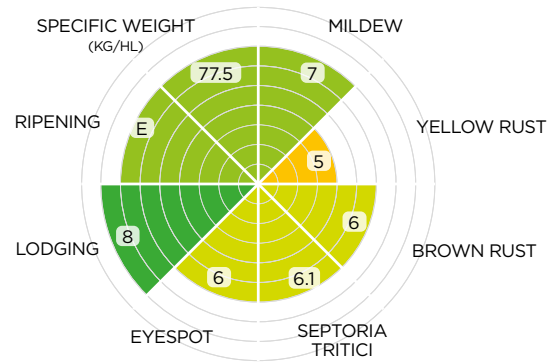
Group 1

KWS Quartz x Hereford

Yield as a percentage of controls (AHDB RL 2022):

UK: 98% East: 98% West: 99% North: 98%

The highest yielding Group 1 variety with a wide range of baking uses and a good specific weight. The Pch1 gene for eyespot resistance makes KWS Zyatt an attractive second wheat option. Stiff strawed and early maturing, KWS Zyatt should perform well throughout the United Kingdom.



Skyfall

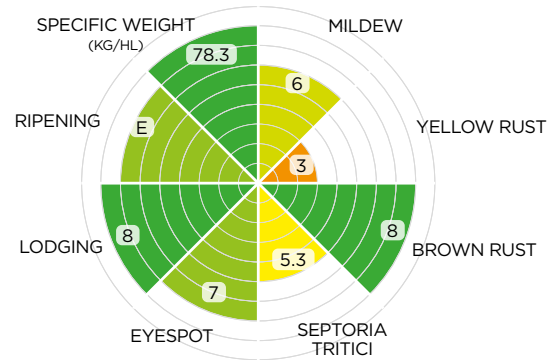
Group 1

RAGT C1418 x Hurricane

Yield as a percentage of controls (AHDB RL 2022):

UK: 97% East: 97% West: 96% North: 96%

Well established bread making wheat with reliable yields. The only Group 1 variety with orange wheat blossom midge resistance. A rapid developer when drilled early. Skyfall carries the Pch1 gene for eyespot resistance. Some evidence of a sprouting risk means Skyfall should be harvested early. A proven performer from very late drilling dates, Skyfall offers one of the widest sowing windows and can be drilled as late as the end of February.



Crusoe

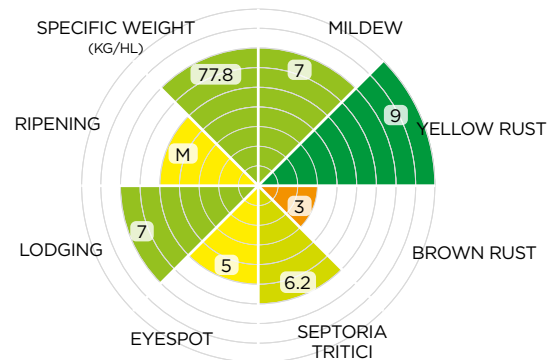
Group 1

Limagrain Cordiale x Gulliver

Yield as a percentage of controls (AHDB RL 2022):

UK: 96% East: 96% West: 97% North: 94%

Crusoe is a bread making variety, that can be drilled earlier than Zyatt and Skyfall. Crusoe has good disease resistance, apart from brown rust where it is particularly poor. Crusoe is widely considered to be the most reliable milling wheat for hitting protein requirements.



RGT Illustrious

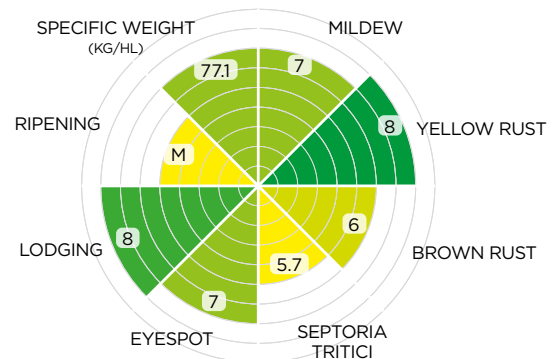
Group 1

RAGT Qplus x Battalion

Yield as a percentage of controls (AHDB RL 2022):

UK: 96% East: 95% West: 97% North: 94%

Excellent milling and baking performance make RGT Illustrious a favourite for end users. With taller straw and a slightly later maturity setting it apart from the other Group 1 quality wheats, RGT Illustrious also has a solid disease resistance package with no real weaknesses. Illustrious is suited to early drilling and performs well in the West.



Click or tap this icon for more information about the variety.

KWS Extase

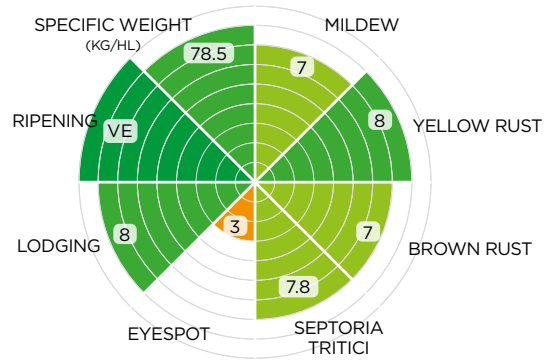
Group 2

KWS *Boisseau x Solheio*

Yield as a percentage of controls (AHDB RL 2022):

UK: 101% East: 100% West: 102% North: 98%

KWS Extase is now firmly established as a farm-favourite variety. Excellent grain quality is supported by a 7.8 for septoria tritici resistance and good resistance to both yellow and brown rust. With tall straw and a very vigorous growth habit, Extase is well-suited to later drilling.



NEW

KWS Palladium

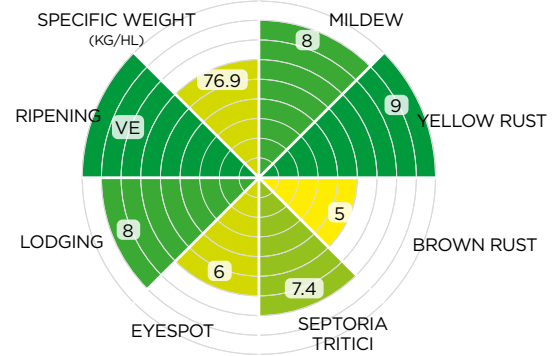
Group 2

KWS *KWS Zyatt x KWS Trinity*

Yield as a percentage of controls (AHDB RL 2022):

UK: 100% East: 99% West: 101% North: [99%]

New: KWS Palladium is a new addition to the Group 2 milling list. Excellent scores for mildew, yellow rust, and Septoria tritici resistance will draw comparisons with farm-favourite KWS Extase. Shorter and stiffer straw make Palladium a better option than Extase for early drilling. With good grain quality, there are hopes that Palladium will pick up interest from millers and end users.



KWS Siskin

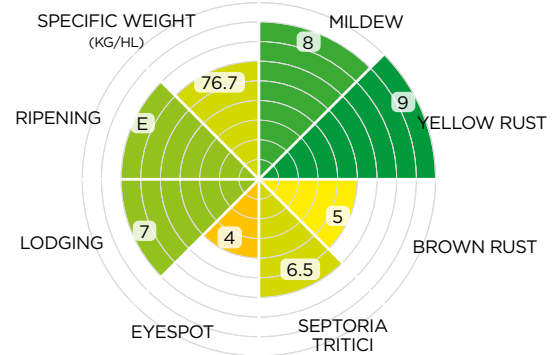
Group 2

KWS *KWS Sterling x Timaru*

Yield as a percentage of controls (AHDB RL 2022):

UK: 98% East: 98% West: 99% North: 98%

A high yielding Group 2 wheat, KWS Siskin is grown by many as a feed variety due to its strong disease resistance. A consistent performer in Frontier trials, Siskin has a vigorous growth habit and does require a robust PGR programme to minimise lodging risk.



NEW

Mayflower

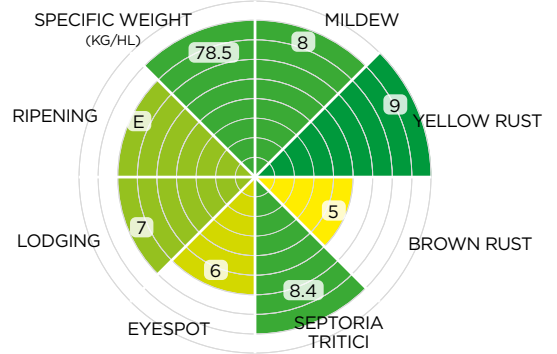
Group 2

Elsoms *Armada x Ascott*

Yield as a percentage of controls (AHDB RL 2022):

UK: 97% East: 98% West: 97% North: [96%]

New: Another new addition to the 2022 Recommended List, Mayflower could lay claim to the title of “cleanest milling wheat” due to its excellent disease resistance ratings, including an outstanding 8.2 for Septoria tritici. Mayflower’s grain quality is another standout feature, though yields lag behind other Group 2 varieties. A tall strawed variety which requires a robust PGR programme.



Click or tap this icon for more information about the variety.



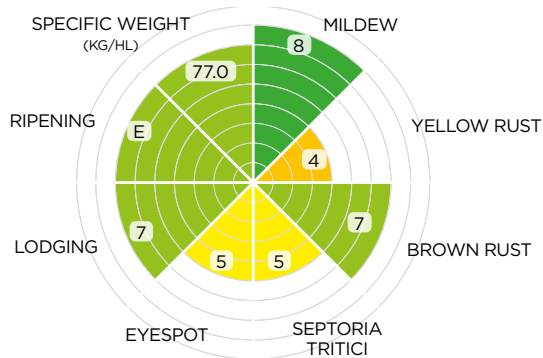
Gefion

Group 3

KWS Luther x KWS Kerrin

Yield as a percentage of controls (AHDB Candidate 2022): 104%

High yielding candidate. A candidate for the 2023 Recommended List, Gefion is an extremely high yielding soft wheat variety. Data for the past two seasons puts Gefion ahead of Gleam and LG Skyscraper for both yield and grain quality. A limited quantity is available for drilling this autumn.



LG Prince

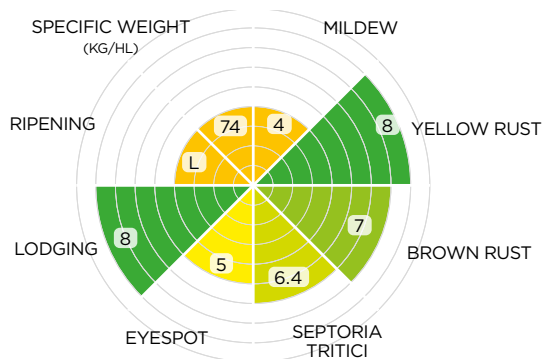
Group 3

Limagrain (Cougar x KWS Kielder) x Revelation

Yield as a percentage of controls (AHDB RL 2022):

UK: 101% East: 102% West: 101% North: 99%

LG Prince is a high yielding Group 3 biscuit variety. Strong rust and septoria tritici resistance make it a good candidate for sowing early. LG Prince performs particularly well as a second or continuous cereal and is well-suited to heavier soils. LG Prince has a lower bushel weight, so those with light land or drought-prone soils may be better off with another variety.



KWS Firefly

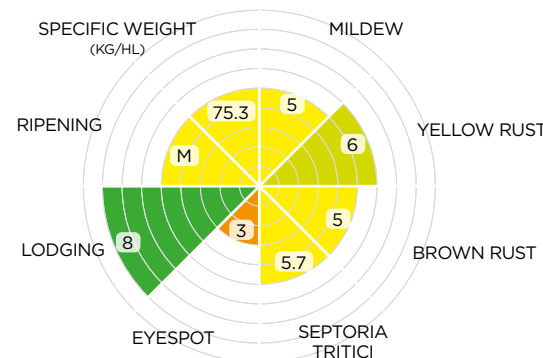
Group 3

KWS KWS Rowan x Cougar

Yield as a percentage of controls (AHDB RL 2022):

UK: 100% East: 101% West: 100% North: 99%

KWS Firefly has won a strong on farm following in recent years, in part due to its versatility across different sites and drilling dates. Exceptionally stiff straw makes it a candidate for September sowing but, should autumn weather disrupt drilling, Firefly will also perform well from January and February sowing dates.



LG Astronomer

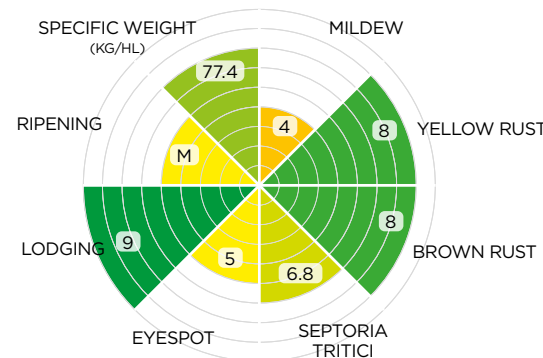
Group 3

Limagrain (Cougar x Leeds) x Britantia

Yield as a percentage of controls (AHDB RL 2022):

UK: 100% East: 100% West: 99% North: 97%

LG Astronomer will appeal to growers looking for peace of mind. Easy to keep clean, easy to keep standing, and providing consistent yields of good quality grain, there's a lot to like in this Group 3 variety. LG Astronomer compares favourably with the rest of the crowded biscuit wheat sector, offering the highest untreated yield, earlier maturity and good resistance to sprouting.



Click or tap this icon for more information about the variety.

KWS Colosseum

Group 4 Soft

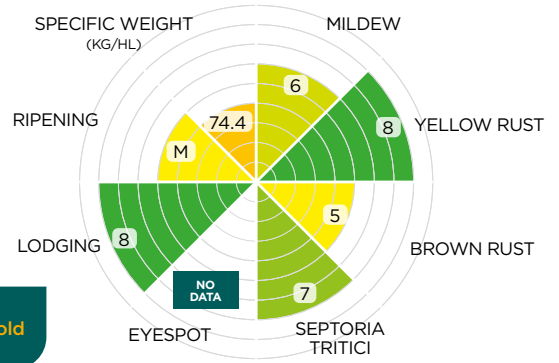
KWS *Cougar x Beluga*

Yield as a percentage of controls (Frontier trials): 105%

Double YEN Gold Medal Winner. Suitable for earlier drilling with stiff straw and a good Septoria Tritici resistance, KWS Colosseum has shown yields comparable with leading varieties such as LG Skyscraper and Gleam. Colosseum's growth habit is slow to move but vigorous once it does, ending with a similar maturity to KWS Kerrin.



Colosseum outperformed all other Recommended List varieties across our 5-site average in 2020 and provided the foundation for two YEN gold medal winning crops in 2020 and 2021, with yields of over 15T/Ha



RGT Bairstow

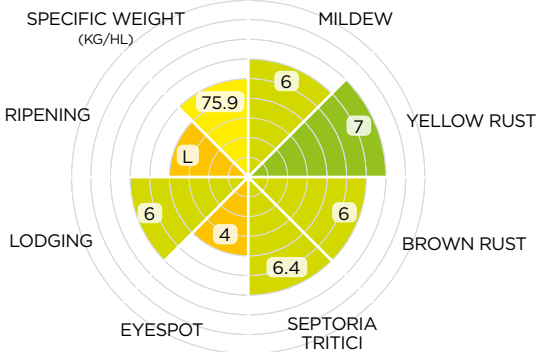
Group 4 Soft

RAGT (*Revelation x KWS Santiago*)x *Cougar*

Yield as a percentage of controls (AHDB RL 2022):

UK: 103% East: 103% West: 103% North: [103%]

New: RGT Bairstow is a new soft feed variety with high yields and a well-rounded disease resistance package. Consistently impressive yields across all regions and on both light and heavy soils. A tall-strawed variety which will need careful PGR management to minimise lodging risk.



LG Skyscraper

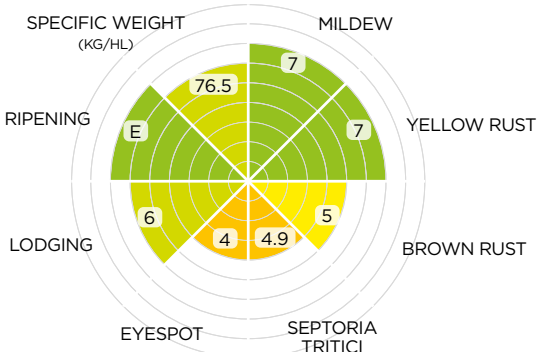
Group 4 Soft

Limagrain (*Cassius x NAWW 29*) x *KWS Santiago*

Yield as a percentage of controls (AHDB RL 2022):

UK: 103% East: 103% West: 103% North: 102%

LG Skyscraper remains one of the highest yielding feed wheat options, despite being eclipsed this year by newcomers Champion and KWS Dawsum. A consistent performer across the different regions, soil types, and rotational positions. LG Skyscraper is a quick developing variety with tall straw that responds well to PGRs.



RGT Saki

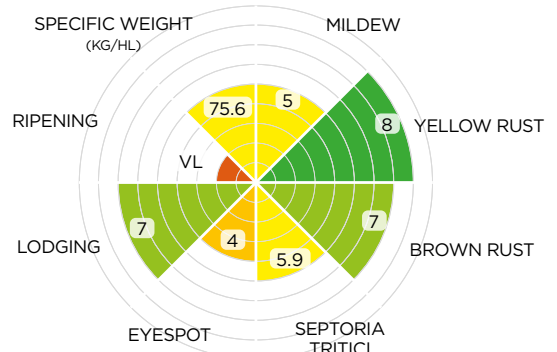
Group 4 Soft

RAGT *Cougar x KWS Santiago*

Yield as a percentage of controls (AHDB RL 2022):

UK: 103% East: 103% West: 103% North: 102%

RGT Saki is a high yielding soft feed wheat with good untreated yield. Despite a decline in Septoria tritici resistance, Saki remains a sound option with good potential for early drilling, particularly in the north. A late harvest maturity can be used to spread workload.



Click or tap this icon for more information about the variety.



Champion

Group 4 Hard

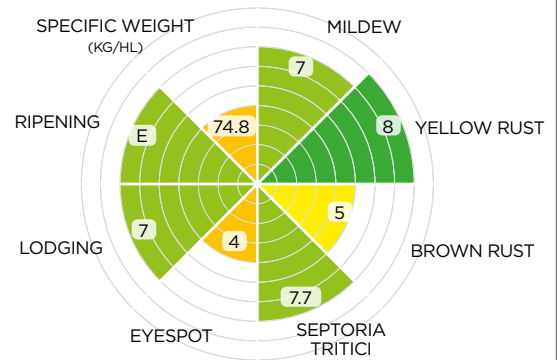
DSV DSV20122 x Reflection

Yield as a percentage of controls (AHDB RL 2022):
UK: 106% East: 107% West: 105% North: [103%]

New: Aptly named, Champion stormed to the top of the 2022 Recommended List with yield performance head and shoulders above the rest of the field. This yield comes without any compromise in disease resistance or harvest date - Champion has excellent resistance to both yellow rust and Septoria tritici, and a maturity similar to Gleam. A vigorous variety, Champion excels when late drilled but should not be drilled early.



It has been years since we've seen a package of yield and disease resistance this good. Certain to be in huge demand this autumn, and with good reason - book your seed early or risk missing out.



KWS Dawsum

Group 4 Hard

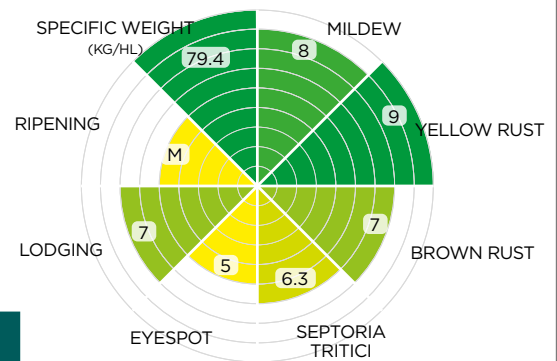
KWS KWS Kerrin x Costello

Yield as a percentage of controls (AHDB RL 2022):
UK: 104% East: 103% West: 106% North: [106%]

Higher yields than Gleam? Tick. Grain quality on par with Costello? Tick. The best untreated yield of any feed wheat? Tick. Need we go on? KWS Dawsum delivers across the board, with good potential for early drilling as the cherry on the cake. A perfect partner for late-driller Champion, with each variety complementing the strengths and weaknesses of the other.



With the hallmarks of reliability and consistency, there is every likelihood that KWS Dawsum will become the new mainstay in UK feed wheat rotations.



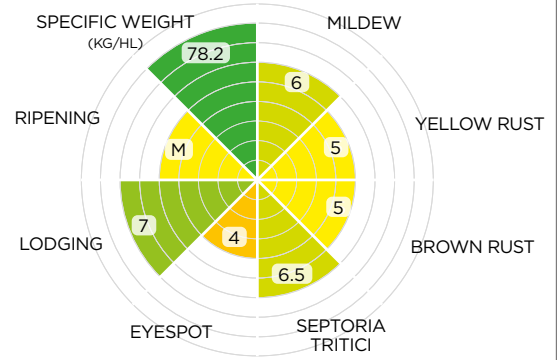
SY Insitor

Group 4 Hard

Syngenta (Hereford x Oakley) x Hereford

Yield as a percentage of controls (AHDB RL 2022):
UK: 104% East: 104% West: 104% North: 105%

SY Insitor performs well in all regions and across all soil types, with standout performance in the Northern AHDB region and on light soils. The variety has a respectable disease resistance profile and excellent bushel weight. High biomass potential is used to drive yield, but will require a robust PGR programme to manage lodging risk.



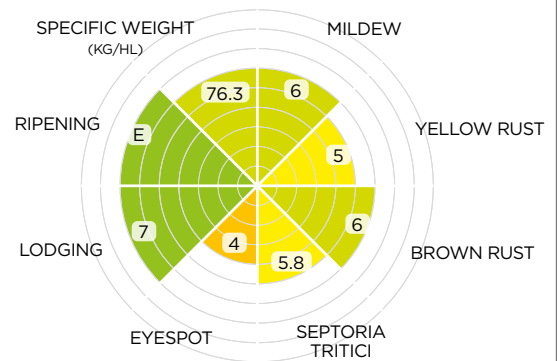
Gleam

Group 4 Hard

Syngenta Hereford x KWS Kielder

Yield as a percentage of controls (AHDB RL 2022):
UK: 103% East: 103% West: 103% North: 103%

Gleam's status as long-term farm-favourite was confirmed with yet another strong performance in Harvest 2021. Though Gleam is now slipping behind the frontrunners for yield, the consistency we've seen across varying seasons still make it a reliable option for all regions and all situations. Disease management does now require closer attention, for yellow rust in particular.



Click or tap this icon for more information about the variety.

KWS Cranium

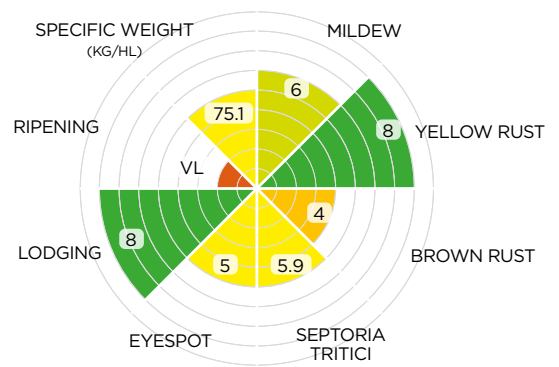
Group 4 Hard

KWS *KWS Crispin x KWS Kielder*

Yield as a percentage of controls (AHDB RL 2022):

UK: 102% East: 102% West: 101% North: 101%

KWS Cranium has a couple of notable features that distinguish it from the crowded feed wheat sector. The first is very stiff straw, despite being amongst the taller feed varieties. The second is excellent performance from late sowing. With a highly competitive growth habit, inherited from its parent variety KWS Crispin, Cranium can work well as part of an integrated grassweed management plan.



Graham

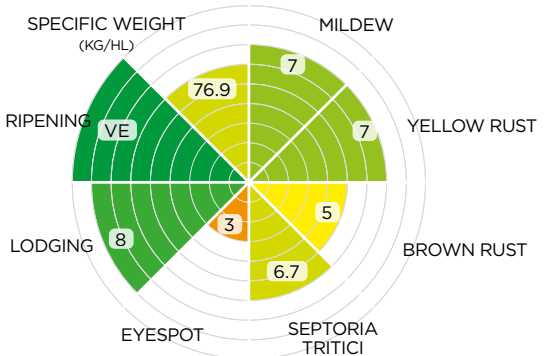
Group 4 Hard

Syngenta *Premio x Expert*

Yield as a percentage of controls (AHDB RL 2022):

UK: 102% East: 100% West: 104% North: 102%

As Graham enters its seventh year on the Recommended List, it remains a popular and reliable option. Early harvest maturity, stiff straw, and a robust resistance to Septoria tritici continue to provide good yield performance in the West and North. The only concern for growers may be the lack of OWBM resistance, so consider pairing Graham with resistant varieties.



RGT Wolverine

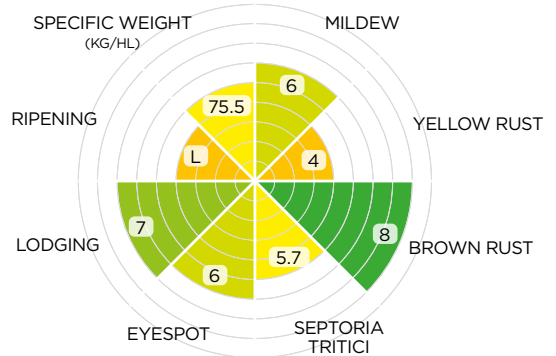
Group 4 Hard

RAGT *(09TC2654 x Panorama) x Coronation*

Yield as a percentage of controls (AHDB RL 2022):

UK: 99% East: 98% West: 100% North: 100%

The first wheat variety with genetic resistance to the Barley Yellow Dwarf Virus. RGT Wolverine pairs this valuable new genetic trait with a yield performance on a par with mainstream varieties like KWS Extase and Costello. RGT Wolverine is a candidate for early drilling, where the BYDV risk is highest, though a robust fungicide regime is recommended.



KWS Parkin

Group 4 Hard

KWS *Reflection x Costello*

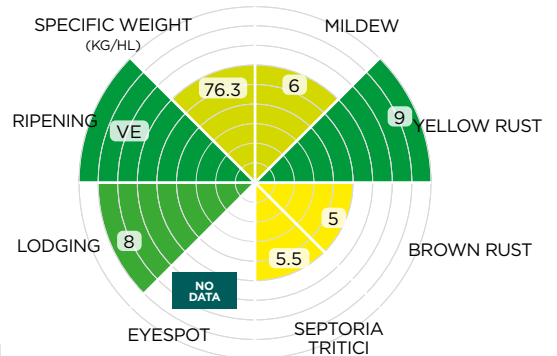
Yield as a percentage of controls (AHDB RL 2022):

UK: 102% East: 102% West: 101% North: [101%]

KWS Parkin remains a unique proposition for growers in 2022. The shortest and stiffest straw available paired with an earlier maturity than anything on the Recommended List will draw comparisons to old favourite Grafton. Suitable for drilling from the second week of September onwards and with yields comparable to KWS Extase and RGT Gravity, Parkin offers something genuinely different and should not be overlooked.



An unparalleled combination of straw strength and early harvest put KWS Parkin in a class of its own. There is simply nothing else like it.



Click or tap this icon for more information about the variety.

Winter Wheat 2022/23

Fungicide-treated grain yield (% treated control)

	In Frontier seed production	Scope of recommendation	United Kingdom (10.8 t/ha)	East region (10.7 t/ha)	West region (11.0 t/ha)	North region (11.1 t/ha)	Untreated yield (10.8 t/ha)	Light soils (10.9 t/ha)	Heavy soils (10.9 t/ha)	First cereal (11.1 t/ha)	Second and more (9.6 t/ha)	Early sown (before 25 Sept) (11.3 t/ha)	Late sown (after 1 Nov) (9.2 t/ha)	Suitability as second wheat	Suitability for early drilling	Speed of development
UKFM Group 1																
KWS Zyatt	Y	UK	98	98	99	98	76	97	99	98	99	[100]	98	***	No	Mod
Skyfall	Y	UK	97	97	96	96	70	97	97	96	98	96	97	***	No	Fast
Crusoe	Y	UK	96	96	97	94	72	94	97	96	94	96	95	*	Yes	Mod/Slow
RGT Illustrious	Y	UK	96	95	97	94	81	94	96	96	94	97	95	***	Yes	Slow
UKFM Group 2																
KWS Extase	Y	UK	101	100	102	99	93	102	100	101	101	[[97]]	102	***	No	Fast
KWS Palladium	Y	UK	100	99	101	[99]	90	[98]	98	100	100	-	[99]	***	No	Moderate
KWS Siskin	Y	UK	98	98	99	98	83	98	98	98	98	99	98	***	No	Fast
Mayflower	Y	UK	97	98	97	[96]	90	[97]	97	97	99	-	[95]	***	No	Moderate
UKFM Group 3																
KWS Guium		UK	102	102	100	[101]	78	[101]	102	101	101	[103]	[101]	**	No	Moderate
LG Prince	Y	UK	101	102	101	99	83	102	101	100	103	102	101	***	Yes	Moderate
KWS Brium		UK	100	101	100	[101]	80	[100]	99	100	101	[101]	[101]	**	Yes	Mod/Slow
KWS Firefly	Y	UK	100	101	100	99	79	100	101	100	101	101	101	**	No	Moderate
RGT Rashid		E	100	102	97	[97]	79	[99]	100	100	100	-	[103]	**	Yes	Moderate
LG Illuminate		UK	100	100	100	101	84	101	100	100	100	104	98	**	Yes	Slow
LG Astronomer	Y	UK	100	100	99	97	86	100	101	99	100	[103]	100	**	Yes	Mod/Slow
Merit		E	99	101	97	100	81	101	100	99	100	[100]	102	***	No	Fast
KWS Barrel	Y	UK	99	99	99	102	73	100	99	100	98	100	100	**	Yes	Slow
Elicit		UK	98	98	98	99	78	98	97	98	98	99	97	***	No	Moderate
Soft Group 4																
KWS Colosseum	Y	UK	105	-	-	-	-	-	-	-	-	-	-	***	Yes	Moderate
RGT Bairstow	Y	UK	103	103	103	[103]	85	[104]	104	103	104	-	[104]	***	No	Mod/Fast
LG Skyscraper	Y	UK	103	103	103	102	82	103	103	103	104	103	103	**	No	Moderate
RGT Saki	Y	UK	103	103	103	102	85	102	102	103	103	104	104	**	Yes	Mod/Slow
RGT Stokes		UK	102	101	105	[104]	83	[104]	102	103	103	-	[100]	***	Yes	Moderate
LG Spotlight		UK	102	101	103	101	77	101	102	102	101	101	102	**	No	Moderate
Elation		N	100	100	100	101	77	101	100	100	102	100	101	***	No	Moderate
KWS Jackal	Y	N	99	99	98	100	74	99	100	99	100	101	100	***	Yes	Slow
Swallow		N	99	98	99	101	79	101	98	99	100	101	97	*	Yes	Moderate
Hard Group 4																
Champion	Y	UK	106	107	105	[103]	90	[105]	106	105	107	[106]	[106]	***	No	Fast
KWS Dawsum	Y	UK	104	103	106	[106]	92	[105]	104	105	104	[108]	[104]	**	Yes	Moderate
SY Insector	Y	UK	104	104	104	105	78	106	104	104	104	[[107]]	104	**	No	Fast
Gleam	Y	UK	103	103	103	103	80	103	103	103	103	103	103	***	Yes	Moderate
KWS Kerrin		E&W	102	102	103	[101]	73	102	101	102	102	[[102]]	103	***	No	Moderate
LG Typhoon		UK	102	102	102	[102]	89	[102]	101	101	104	[105]	[101]	***	Yes	Slow
KWS Cranium	Y	UK	102	102	101	101	79	103	100	102	102	[[102]]	104	***	No	Fast
Graham	Y	UK	102	100	104	102	88	102	101	102	101	100	100	*	Yes	Moderate
KWS Parkin	Y	UK	102	102	101	[101]	81	-	-	-	-	-	-	**	Yes	Moderate
RGT Gravity		UK	101	102	101	100	77	102	101	101	103	100	103	***	No	Fast
Costello	Y	UK	100	99	100	100	81	99	99	100	99	99	102	**	Yes	Moderate
RGT Wolverine	Y	Sp	99	98	100	100	69	97	99	99	99	[100]	99	***	Yes	Slow
Theodore		W	98	98	101	[91]	88	[[97]]	99	98	[100]	97	[99]	**	Yes	Moderate

Data sources: Frontier 3D Thinking trials, AHDB Recommended List, breeder information.

[] = limited data [[]] = very limited data @ = believed to carry the Pch1 resistance gene to eyespot.

	Tillering capacity	Latest safe-sowing dat	Protein content (%)	Hagberg Falling Number	Specific weight (kg/hl)	Resistance to lodging without PGR (1-9)	Resistance to lodging with PGR (1-9)	Height without PGR (cm)	Ripening (days +/- Skyfall, -ve = earlier)	Resistance to sprouting (1-9)	Mildew (1-9)	Yellow rust (1-9)	Brown rust (1-9)	Septoria tritici (1-9)	Septoria tritici (1-9) - one-year rating	Eyespot (1-9)	Fusarium ear blight (1-9)	Orange wheat blossom midge	
UKFM Group 1																			
High		End Jan	12.2	260	77.5	8	8	85	0	5	7	4	6	6.1	5.8	6@	6	-	KWS Zyatt
Low/Mod		End Feb	12.2	273	78.3	8	8	84	+0	5	6	3	8	5.3	5.1	7@	7	R	Skyfall
Moderate		End Jan	12.7	274	77.8	8	7	82	+1	6	7	9	3	6.2	5.9	5	7	-	Crusoe
Mod/High		Mid Feb	12.2	270	77.1	7	8	89	+1	6	7	8	6	5.7	5.4	7@	6	-	RGT Illustrious
UKFM Group 2																			
Mod/High		End Jan	11.9	289	78.5	7	8	90	-1	[7]	7	8	7	7.8	7.3	3	6	-	KWS Extase
High		[[Mid Feb]]	11.8	315	76.9	7	8	84	-1	-	8	9	5	7.4	7.2	[6]	6	-	KWS Palladium
Mod/High		End Jan	11.9	282	76.7	6	7	84	+0	5	8	9	5	6.5	6.5	4	6	-	KWS Siskin
Moderate		[[Mid Feb]]	11.9	294	78.5	6	7	89	-0	-	8	9	6	8.4	8.2	[6]@	6	-	Mayflower
UKFM Group 3																			
High		[[Mid Feb]]	11.3	255	78.1	7	7	90	+3	-	5	9	3	4.7	5.0	[4]	7	R	KWS Guium
Moderate		[End Jan]	11.1	253	74.0	7	8	83	+2	[6]	4	8	7	6.4	5.8	5	6	R	LG Prince
Moderate		[[End Feb]]	11.5	268	77.3	7	7	92	+2	-	7	9	5	5.4	5.6	[6]	6	-	KWS Brium
Mod/High		End Feb	11.7	240	75.3	8	8	83	+1	[6]	5	6	5	5.7	4.9	3	5	R	KWS Firefly
Mod/High		[[Mid Feb]]	11.1	226	76.4	8	8	86	+3	-	4	8	6	6.9	6.4	[4]	7	R	RGT Rashid
Moderate		[Mid Feb]	11.8	249	76.2	7	7	83	+1	[7]	5	7	7	6.1	5.4	5	5	R	LG Illuminate
Moderate		[Mid Feb]	11.7	232	77.4	7	9	88	+1	[7]	4	8	8	6.8	6.2	5	6	R	LG Astronomer
High		[Mid Feb]	11.5	258	76.2	6	7	88	+1	[6]	4	8	7	5.8	5.2	3	6	R	Merit
High		End Jan	11.2	240	76.9	8	8	84	+1	6	6	6	5	4.3	4.4	4	6	R	KWS Barrel
Moderate		Mid Feb	11.5	208	76.4	6	7	86	+1	5	6	8	6	4.9	5.2	3	6	R	Elicit
Soft Group 4																			
Mod/High		[End Jan]		295	74.4	8	8	80	+1	-	6	8	5	7.0	-	-	7	-	KWS Colosseum
High		[[Mid Feb]]	11.2	228	75.9	6	6	91	+2	-	6	7	6	6.4	6.0	[4]	6	R	RGT Bairstow
Mod/High		End Jan	11.3	214	76.5	6	6	92	+0	[5]	7	7	5	4.9	4.6	4	6	R	LG Skyscraper
Mod/High		End Jan	11.4	220	75.6	6	7	88	+3	[6]	5	8	7	5.9	5.1	4	6	R	RGT Saki
High		[[End Jan]]	11.3	248	75.3	5	7	91	+2	-	5	7	5	6.9	6.2	[4]	6	-	RGT Stokes
High		End Feb	11.3	286	77.7	7	8	93	+1	[7]	6	5	6	5.1	4.9	5	6	R	LG Spotlight
Moderate		Mid Feb	11.5	212	76.9	7	8	83	+1	5	7	8	5	4.0	3.9	4	6	R	Elation
High		End Jan	11.1	179	74.8	7	6	87	+1	5	7	8	5	4.6	4.6	4	6	R	KWS Jackal
Mod/High		[End Feb]	11.2	249	75.8	[8]	9	80	+1	[5]	6	6	6	5.5	4.9	2	5	R	Swallow
Hard Group 4																			
High		[[Mid Feb]]	11.4	239	74.8	6	7	88	+0	-	7	8	5	7.7	8.0	[4]	6	R	Champion
High		[[End Jan]]	11.2	304	79.4	7	7	84	+1	-	8	9	7	6.3	6.1	[5]	6	-	KWS Dawsum
High		End Jan	10.8	270	78.2	6	7	95	+1	[5]	6	5	5	6.5	6.1	4	7	R	SY Initor
High		Mid Feb	11.2	220	76.3	7	7	87	-0	5	6	5	6	5.8	5.5	4	6	R	Gleam
High		End Jan	10.7	149	76.1	7	7	88	+1	5	7	4	7	4.6	4.9	4	5	R	KWS Kerrin
Moderate		[[Mid Feb]]	11.1	169	76.3	7	7	88	+2	-	7	9	6	7.2	6.9	[6]	6	R	LG Typhoon
High		[Mid Feb]	11.2	279	75.1	8	8	89	+3	[6]	6	8	4	5.9	5.7	5	6	R	KWS Cranium
Moderate		End Jan	11.3	275	76.9	7	8	88	-1	7	7	7	5	6.7	6.4	3	7	-	Graham
Moderate		[End Jan]	11.3	259	76.3	8	8	79	-1	[6]	6	9	5	5.5	5.5	-	6	-	KWS Parkin
High		End Jan	11.3	193	75.6	6	7	89	+1	5	5	6	6	4.7	4.6	4	6	R	RGT Gravity
Mod/High		End Jan	11.8	322	80.6	8	8	83	+2	6	8	9	5	5.8	5.6	4	6	-	Costello
Moderate		[End Jan]	11.0	268	75.5	7	7	87	+2	[6]	6	4	8	5.7	5.7	6	6	-	RGT Wolverine
Moderate		End Jan	12.0	306	73.8	[6]	8	84	-0	[7]	[7]	9	8	8.5	9.0	[4]	5	-	Theodore

Winter Barley

2022/23 Varieties

AHDB approved and Frontier preferred varieties

For further variety data see page 36.

Winter barley is an important crop on many farms, providing an early entry for oilseed rape and useful sources of grain and straw for livestock farms. Malting varieties should be at least provisionally approved by the Malting Barley Committee (MBC) to ensure marketability, or grown on a named variety contract. Contracts usually specify certain criteria, including specific weight, nitrogen content, moisture and admixture.

For feed barley, a high yield would be an important requirement but in conjunction with a reasonable specific weight. Six-row varieties have improved in this respect over the years, with many now having the same specific weight as their two-row counterparts.

All varieties should have a good all-round disease resistance. In particular, resistance to barley mosaic virus is increasingly important and most varieties now have this trait. Short, stiff strawed varieties are beneficial where crops are being grown on heavier or more fertile soil.

Some varieties with a genetic tolerance to barley yellow dwarf virus (BYDV) are now available, such as KWS Feeris. These will become increasingly important following the loss of insecticidal seed treatments such as Deter, which had previously provided effective control of the aphids that spread BYDV.

Considerations for 2022

Soil conditions

- Aim for good seed-to-soil contact to ensure rapid seed germination and provide good conditions for residual herbicides to work effectively.

Geographical region

- The colder the field aspect and the further geographically north, the earlier crops can safely be drilled with lower risk of running into early pest problems. Early September drilling is much more feasible in the north, while late drillings can be slow to emerge. In cold winters, crops will stop growing sooner, with a potential knock on effect and late harvest.

Disease and pest risk

- Risk of disease in highly susceptible varieties will only increase if drilled early. BYDV infection can occur from early September until the temperature drops consistently below 5°C.

Drilling dates

- Winter barley should not be drilled late if at all possible as establishment will suffer and few tillers will be present. The use of manganese seed treatment can help to mitigate yield-reducing tiller loss. This is crucial as winter kill is more common in barley than wheat.

Hybrid barley

- Seed rates are significantly reduced for hybrid barley with 200seeds/m² advised. The speed of development helps to compensate for the lower seed rate, but management of the crop needs to be slightly different to conventional barley. Most important is the nitrogen fertiliser split. 3 splits are advised, with the first application of 30% at GS25, 50% at or just before GS31 and 20% 2-3 weeks after this. Even when tiller numbers are high, early nitrogen is advised.

Genetic traits and characteristics

To make clear which varieties carry these different genetic benefits, we have introduced an easy to follow range of symbols on the variety profiles that follow.



BYDV tolerant

This variety has genetic tolerance to symptoms and yield loss from the Barley Yellow Dwarf Virus



Late driller

This variety is suited to being drilled later than the mainstream drilling window



Frontier recommends

This variety has been picked out as particularly notable, either for overall performance or a specific feature

Hybrid barley

Hybrid barley is the name given to varieties of barley that are multiplied from two genetically different cross-pollinating parents. F1 Hybrid crops provide exceptional yields of feed quality grain and offer a number of other benefits such as increased vigour, wider sowing windows, and grassweed suppression.

SY Thunderbolt [£]

Six-row hybrid feed

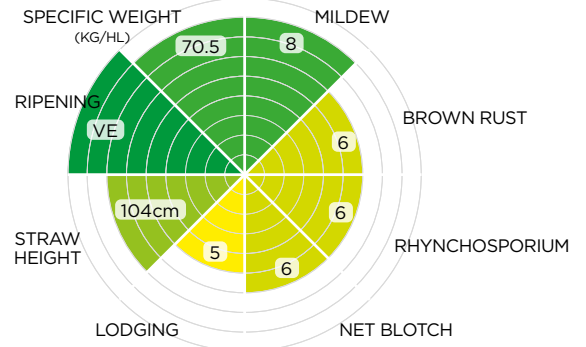
Syngenta F1 Hybrid

Yield as a percentage of controls (AHDB RL 2022):
UK: 107% East: 106% West: 108% North: 106%

SY Thunderbolt was the highest yielding variety in AHDB trials during 2021, a tricky year for late disease pressure where Thunderbolt was no doubt supported by its excellent disease ratings. Like SY Kingston, it is also an early maturing option, though slightly weaker straw will make it a priority for timely harvest.



Nothing beats SY Thunderbolt for yield potential, so those looking to push their crops to the maximum should consider it. Just keep on top of the PGRs.



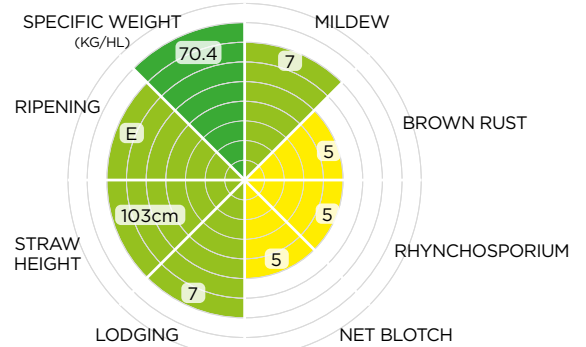
SY Kingsbarn [£]

Six-row hybrid feed

Syngenta F1 Hybrid

Yield as a percentage of controls (AHDB RL 2022):
UK: 106% East: 106% West: 107% North: 106%

SY Kingsbarn is a high yielding hybrid barley variety with a reputation for consistency across the extremely varied seasons of recent years. Whilst its disease ratings and untreated yield now sit towards the lower end of the hybrid varieties, it remains one of the stand out performers for straw strength.



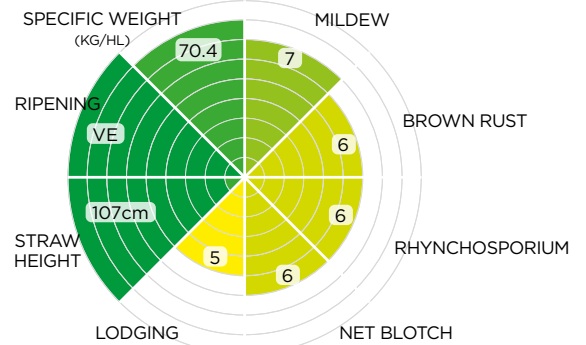
SY Kingston [£]

Six-row hybrid feed

Syngenta F1 Hybrid

Yield as a percentage of controls (AHDB RL 2022):
UK: 106% East: 105% West: 108% North: 106%

SY Kingston sits alongside farm-favourite SY Kingsbarn as a reliable option for hybrid barley growers across the UK. Kingston provides good grain quality, strong all round disease resistance, and is also the earliest maturing hybrid barley variety, making it a good option for spreading harvest dates and an early entry for the following crop.



Click or tap this icon for more information about the variety.

KWS Tardis [UK] Two-row conventional feed

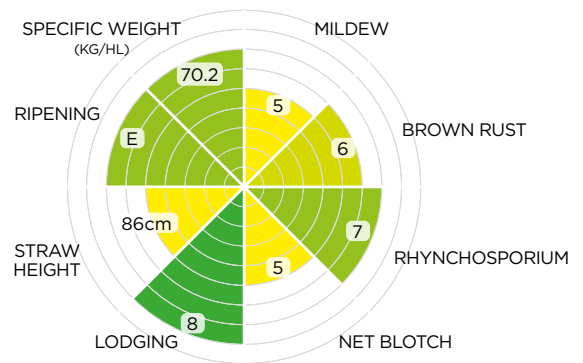
KWS 11-12 x KWS Orwell

Yield as a percentage of controls (AHDB RL 2022):
UK: 105% East: 106% West: 104% North: 104%

The highest yielding conventional barley on the 2022 Recommended List, KWS Tardis seems destined to become a mainstay variety for years to come. Drawing clear comparisons with long-lived favourite and parent variety KWS Orwell, Tardis outperforms Orwell on yield, specific weight, and mildew resistance whilst matching it for height and straw strength.



The conventional barley with hybrid yield. The question isn't "why would you grow KWS Tardis?" but "why would you not?"

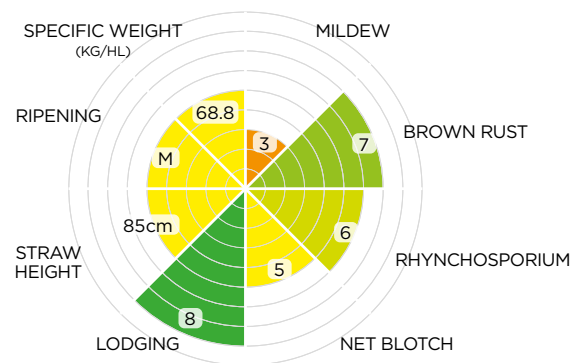


KWS Orwell [UK] Two-row conventional feed

KWS KWS Tower x KWS Salsa

Yield as a percentage of controls (AHDB RL 2022):
UK: 100% East: 100% West: 101% North: 99%

Now in its seventh year on the Recommended List, KWS Orwell remains a firm farm-favourite. Whilst still consistent across all regions, it now sits some way behind the highest yielding options. Known for having some of the stiffest straw available, but a susceptibility to mildew.

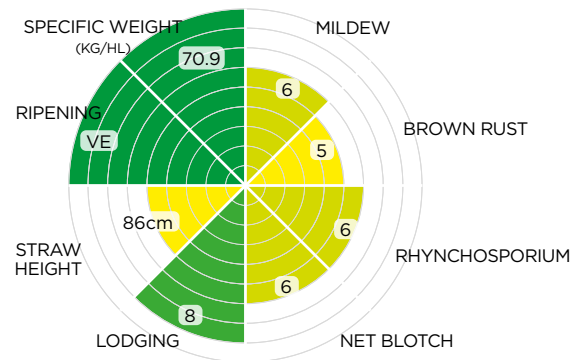


Valerie [UK] Two-row conventional feed

Senova 207-589 x Sandra

Yield as a percentage of controls (AHDB RL 2022):
UK: 99% East: 100% West: 99% North: 99%

With excellent grain quality, early maturity and similarly strong straw to Orwell, Valerie will be an exciting proposition for many growers, particularly those who have favoured KWS Cassia for similar reasons. Valerie offers a 3% yield improvement over Cassia and will appeal to mixed farms where bold grain for on-farm feeding is desirable.

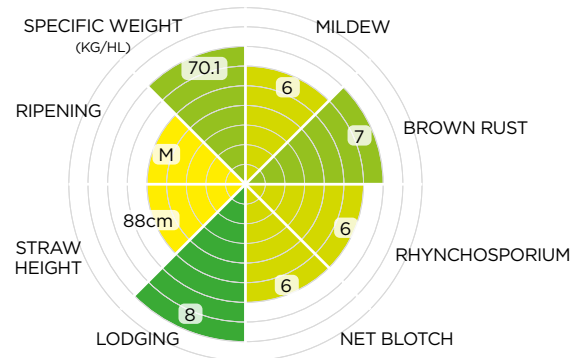


Craft [UK] Two-row conventional malting

Syngenta SY208-56 x SY Venture

Yield as a percentage of controls (AHDB RL 2022):
UK: 95% East: 95% West: 94% North: 96%

Fully approved by the MBC for the production of malt for brewing. Maltsters like the variety and it has a good hot water extract value. It has relatively short, stiff straw and has average disease resistance. Craft has a grain N value of 1.67%, with a good specific weight and lower screening levels.



Click or tap this icon for more information about the variety.



BYDV tolerant winter barley

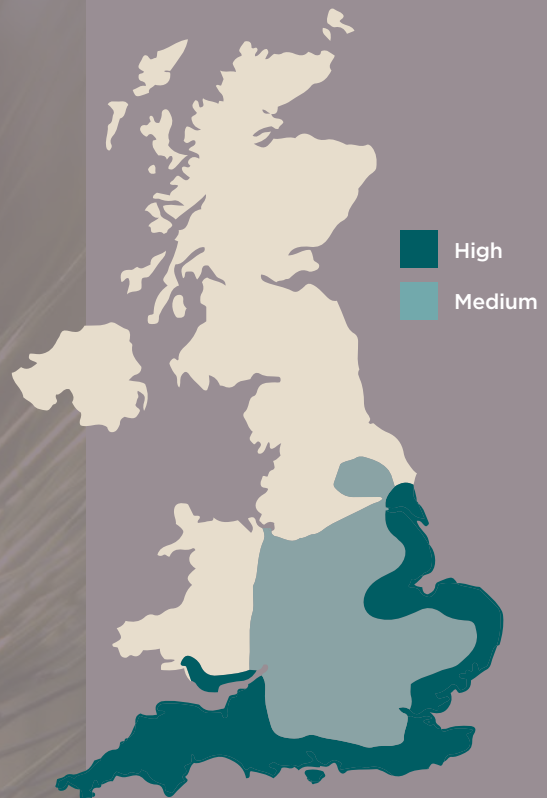
Barley Yellow Dwarf Virus (BYDV) had, by 2015, almost become one of the forgotten threats of UK agriculture. However, with the range of effective insecticide sprays shrinking, and the necessity to drill winter barley at the optimum period for aphid activity, BYDV is once again posing a challenge to UK farmers.

Following the revocation of the Deter seed treatment in 2018, growers are left with no options for early protection beyond cultural controls like delayed drilling and multiple applications of insecticide sprays. After the difficult late-autumn weather patterns of 2019 and 2020, delayed drilling may itself seem more of a risk than BYDV for many growers.

With infection levels on the rise and warmer and wetter autumns making insecticidal control more difficult and costly, it seems clear that BYDV is once again a significant threat to our cereal crops. This threat is most pronounced in winter barley crops, which experience both higher potential yield losses and a greater impact from the main cultural control of delayed drilling.

Against this backdrop, 2022 sees the arrival of the first AHDB recommended winter barley variety with genetic tolerance to BYDV. KWS Feeris, a 6-row conventional variety, is an excellent example of how new plant genetics can support growers in the fight against insect-born viruses.

Regional BYDV risk

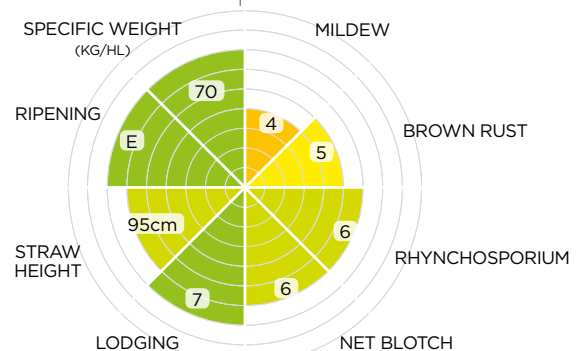


KWS Feeris [UK] **Six-row conventional feed**

KWS *KWS Amistar x Kosmos*

Yield as a percentage of controls (AHDB RL 2022):
 UK: 103% East: 103% West: [105%] North: 101%

The first variety with BYDV tolerance to be added to the AHDB Recommended List. KWS Feeris combines these new genetics with high yields, very good straw strength, and a respectable disease resistance package.



New genetic traits often come with a compromise on yield, but that's far from the case with KWS Feeris. The opportunity to build BYDV tolerance into the rotation whilst maintaining overall yield performance will appeal to many growers.



Click or tap this icon for more information about the variety.

Winter Barley 2022/23

Data sources: Frontier 3D Thinking trials, AHDB Recommended List, breeder information.

[] = limited data # = Hybrid variety

	Frontier seed production	Scope of recommendation	United Kingdom (9.8 t/ha)	East region (9.6 t/ha)	West region (10.0t/ha)	North region (10.0 t/ha)	Light soils (9.5 t/ha)	Heavy soils (9.5 t/ha)	MBC malting approval for brewing use	Specific weight (kg/hl)	Screenings (% through 2.25 mm)	Hot water extract (l deg/kg)	Resistance to lodging with PGR(1-9) - see note below	Straw height with PGR (cm)	Ripening (+/-KWS Orwell, -ve = earlier)	Mildew (1-9)	Brown rust (1-9)	Rhynchosporium (1-9)	Net blotch (1-9)	BaYMV
Two-row malting																				
Electrum	-	UK	96	96	95	95	95	97	F	70.0	2.0	3036	7	90	-1	6	7	6	5	R
Craft	Y	UK	95	95	94	96	96	93	F	70.1	2.0	3094	8	88	0	6	7	6	6	R
Two-row feed																				
KWS Tardis	Y	UK	105	106	104	104	103	109	-	70.2	1.4	-	8	86	0	5	6	7	[5]	R
Bolton	Y	UK	104	105	102	103	104	105	-	69.5	1.3	-	8	83	0	6	6	5	[5]	R
Lightning		UK	104	104	[103]	103	102	102	-	68.6	1.9	-	6	88	0	7	8	6	[5]	R
Bordeaux		UK	103	105	101	103	103	104	-	70.7	0.9	-	8	85	0	6	6	4	[5]	R
LG Dazzle		UK	103	104	[101]	102	102	105	-	68.9	1.8	-	7	85	0	6	8	7	[4]	R
LG Mountain	Y	UK	102	103	102	102	102	103	-	70.5	1.9	-	6	83	-1	5	7	6	5	R
KWS Gimlet		UK	102	104	100	99	100	102	-	69.5	2.0	-	6	95	1	7	6	6	5	R
Jordan		UK	101	103	101	98	100	102	-	69.8	1.3	-	6	84	1	6	8	7	5	R
KWS Hawking		UK	101	102	101	99	99	104	-	69.4	1.8	-	8	85	1	5	6	6	6	R
Surge		UK	101	102	100	98	100	103	-	70.1	1.5	-	7	85	0	6	7	7	5	R
LG Flynn		UK	101	101	100	100	101	101	-	70.9	1.3	-	7	91	1	5	7	5	5	R
KWS Orwell	Y	UK	100	100	101	99	99	100	-	68.8	1.6	-	8	85	0	3	7	6	5	R
KWS Creswell		N	100	100	99	100	101	[99]	-	69.4	1.8	-	7	88	0	4	6	6	5	R
Valerie	Y	UK	99	100	99	99	99	[99]	-	70.9	0.4	-	8	86	-1	6	5	6	[6]	R
California		W	98	100	98	[96]	96	[100]	-	68.8	1.8	-	7	90	0	6	5	6	6	R
KWS Cassia		UK	97	97	98	96	97	98	-	72.1	1.2	-	7	89	1	5	7	5	5	R
Six-row feed																				
SY Thunderbolt #	Y	UK	107	106	108	106	103	107	-	70.5	1.8	-	5	104	-1	8	6	6	[6]	R
SY Kingsbarn #	Y	UK	106	106	107	106	105	104	-	70.4	1.4	-	7	103	0	7	5	5	5	R
SY Canyon #		UK	106	105	[108]	105	105	105	-	71.2	1.8	-	5	106	-1	8	6	6	[5]	R
SY Kingston #	Y	UK	106	105	108	106	105	103	-	70.4	2.5	-	5	107	-1	7	6	6	6	R
Belmont #	Y	UK	106	106	106	105	104	103	-	69.3	2.4	-	6	105	0	5	4	7	5	R
Belfry #		UK	104	104	106	104	102	106	-	69.1	2.4	-	7	101	0	6	6	7	5	R
Bazooka #	Y	UK	104	104	104	104	104	104	-	70.0	2.2	-	6	107	0	5	5	6	5	R
KWS Feeris	Y	Sp	103	103	[105]	101	101	104	-	69.5	0.7	297.0	7	95	0	4	5	6	[6]	R
Funky	Y	UK	103	102	104	103	102	103	-	69.8	3.4	-	7	91	-1	5	7	6	5	R

Winter Oats 2022/23 Varieties

AHDB approved and
Frontier preferred varieties

Winter oats are a good alternative cereal where a take-all break is required. Typically lower input than winter wheat, oats are useful as a feed grain, but more commonly used in the premium market for oat milling. The crop is usually grown not more than one year in four. Contracts exist in the form of buybacks, allowing growers to secure some attractive premiums and reduce the marketing risk associated with free market oats.

Most widely grown as a second cereal (due to the take-all break), oats have a lower requirement for fertiliser and also extract lower levels of nutrients than other winter cereals.

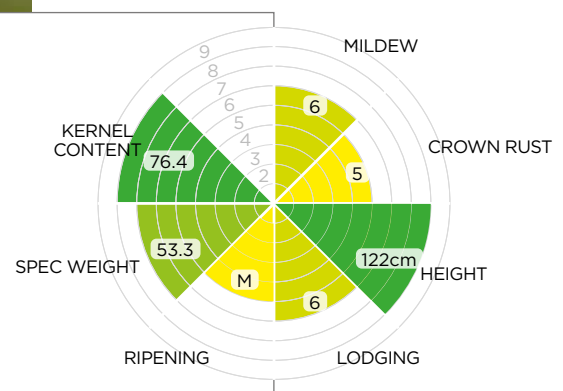
Key characteristics for winter oats are high yield, stiff straw and good kernel content for the milling market.

Varieties should have good disease resistance to both crown rust and mildew, particularly important in the south and west.

Mascani [UK]

Senova

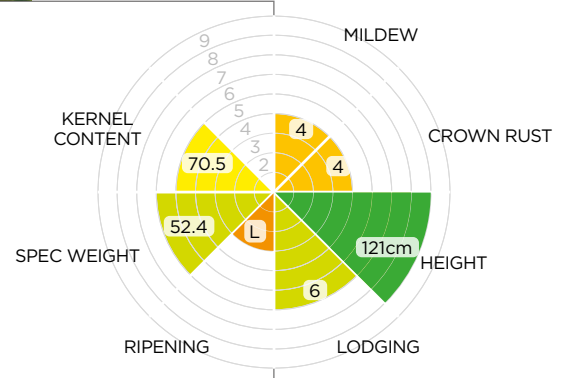
The leading variety across the UK and well liked by all end users. The variety has good winter hardiness and low screenings. Yields are a bit behind the best but its consistent performance and good specific weight will keep it in the market for a few more years.



Gerald [SCOT]

Senova

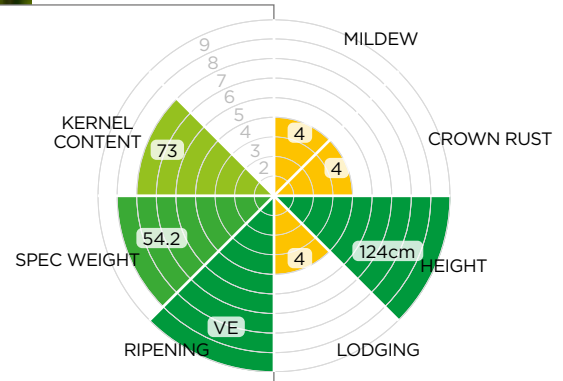
Despite the market leading position of Mascani for the UK as a whole, Gerald has been the clear favourite for the Scottish market due to its consistent performance, good specific weight and stiff straw.



Dalguise [SCOT]

Senova

A familiar name to many northern and Scottish growers, Dalguise continues to hold a place in the oat market with consistently high yields and good grain quality. Taller straw does make this variety more prone to lodging.



Click or tap this icon for more information about the variety.

Winter Hybrid Rye

2022/23 Varieties

Frontier preferred varieties

Considerations for 2022

Markets

Hybrid rye can be grown for both grain and wholecrop. Grain can be sold into feed and milling markets, whilst wholecrop rye is commonly used as a high value substrate in biogas plants. When used for anaerobic digestion, rye helps to balance the high productivity of energy beet or maize substrates, providing an alternative nutrient source for the bacteria in the digester and stabilising gas output.

Correct harvest timing for wholecrop silage is important to ensure optimal yield, quality, and ensiling conditions. Crops should be between 35 - 40% dry matter. This allows for maximum grain fill which is a large contributor to yield and quality. Approaching harvest, the dry matter of the crop will increase by around 1% per day allowing for a narrow harvest window. It is important to have the harvesting capacity available for your acreage so that you can achieve close to optimum maturity across the crop.

Agronomy

Hybrid rye is a moderate input crop, with input costs significantly lower than those required for winter wheat, and producing a rewarding yield where crops are well managed. Hybrid rye establishes and grows very quickly, particularly in the early spring, so growers should be ready to apply all inputs in good time to ensure they meet the correct growth stages. This is especially important for timing of plant growth regulators. Hybrid rye has a well-developed root system that extracts nutrients and water from greater soil depths than most cereals. This minimises N-loss during the winter and can also help minimise soil erosion, acting both as a cover crop and cash crop.

Rye performs particularly strongly as a second cereal crop, in many cases out-yielding both second wheat and barley crops. Rye is a hybrid cereal benefiting from lower seed rates, therefore reducing the requirement for handling and storage of seed bags and improving the logistics of drilling larger areas.



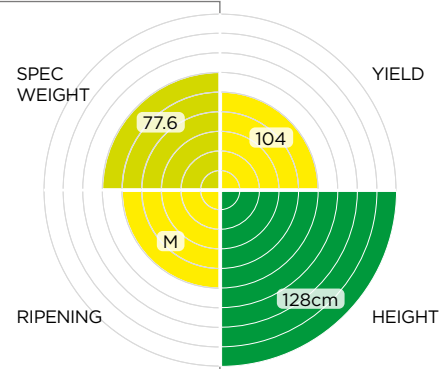
KWS Tayo

KWS

Exceptional harvest index (ear size) resulting in the highest grain yield of any trialed variety, KWS Tayo also has very high dry matter yields for use in AD. This dual purpose variety has a high specific weight and a wider sowing window than most hybrid rye varieties. Tayo benefits from the Pollen Plus gene, which helps to reduce ergot levels. It is suitable for sowing in all regions.



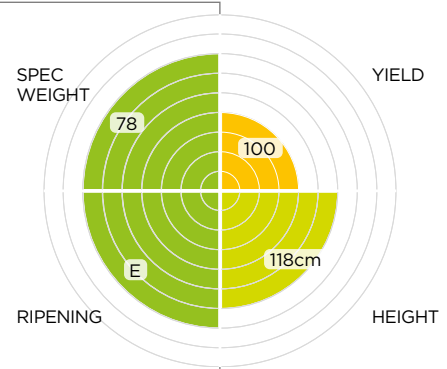
With the highest yield potential, lowest lodging scores, best resistance to brown rust, not to mention suited to almost all soil types, KWS Tayo is the 1st choice for both grain production and AD.



KWS Bono

KWS

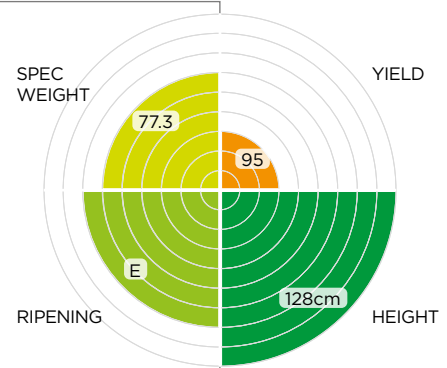
A widely grown and well liked variety, KWS Bono provides a useful contrast to KWS Tayo in several areas. It is significantly earlier to mature, allowing a spread of dates for optimum harvesting when used alongside a later maturing variety like Tayo. It is also shorter and stiffer than other hybrid rye options, and performs particularly well on light soils. Bono has good grain quality and the potential to find more specialist baking markets.



SU Mephisto

Saaten Union

The preferred variety for milling use, SU Mephisto has shown consistent yield performance across a wide range of sites. It remains unmatched for milling quality and is the preferred variety for several key rye end consumers. Mephisto is slightly more susceptible to brown rust than other varieties. It is sold as a technical mix with 10% inclusion of the variety Dukato, which serves to improve pollination and reduce ergot levels.



Click or tap this icon for more information about the variety.

Cereal Seed Treatments

Single-purpose treatments

Single-purpose treatments are one of the great unheralded heroes of modern agriculture. Over the past forty years they have become so widespread and so efficient at their jobs that many of the diseases they protect crops against have faded from memory. Yet these “forgotten diseases” still present a very real threat to UK cereal crops.

Seed and soil borne disease such as bunt, seedling blight, and smut can have significant impacts on crop yield and marketability. In seed treatment trials during 2019/20, we saw establishment losses of 56% from *Microdochium nivale* in untreated seed. Fungicidal seed treatments not only protect against these diseases, but limit their multiplication and spread between soils, fields, and farms.



Microdochium nivale impact on untreated seed April 2020, Frontier trials

Frontier only applies the best-in-class single-purpose treatments to our certified cereal seed. We base our decisions on extensive research and trials work which takes into account the following criteria:

- Health and safety – how safe the treatments are for everyone involved in the treating, transport, and drilling process
- Efficacy – how well the treatments protect against the key seed and soil borne diseases for each cereal crop
- Quality – looking at all practical aspects of the treatment including seed coverage, flowability through the drill, and compatibility with other seed treatments

Our preferred single-purpose treatments for 2021 are:

Beret Gold (25g/l fludioxonil) Wheat, oats, triticale and rye

- Wheat: Snow mould (*Microdochium nivale*), foot rot and seedling blight (*Fusarium* spp), bunt and stinking

smut (*Tilletia caries*), septoria seedling blight (*Septoria nodorum*)

- Oats: Snow mould (*Microdochium nivale*), foot rot and seedling blight (*Fusarium* spp), leaf spot (*Pyrenophora*)
- Triticale: Snow mould (*Microdochium nivale*), foot rot and seedling blight (*Fusarium* spp)
- Rye: Snow mould (*Microdochium nivale*), foot rot and seedling blight (*Fusarium* spp), striped smut (*Urocystis occulta*).

Rancona i-Mix (20g/l ipconazole, 50g/l imazalil) Wheat, barley

- Wheat: Snow mould (*Microdochium nivale*), foot rot and seedling blight (*Fusarium* spp), bunt and stinking smut (*Tilletia caries*)
- Barley: Snow mould (*Microdochium nivale*), foot rot and seedling blight (*Fusarium* spp), loose and covered smut (*Ustilago* spp), leaf stripe (*Pyrenophora graminea*)

Raxil Star (20g/l fluopyram + 100g/l prothioconazole + 60g/l tebuconazole) Winter barley

- Winter barley: Snow mould (*Microdochium nivale*), foot rot and seedling blight (*Fusarium* spp), loose and covered smut (*Ustilago* spp), leaf stripe (*Pyrenophora graminea*), seed-borne net blotch (*Pyrenophora teres*.)

Redigo Pro (150g/l prothioconazole + 20g/l tebuconazole) Wheat, barley and oats

- Barley: Snow mould (*Microdochium nivale*), foot rot and seedling blight (*Fusarium* spp), loose and covered smut (*Ustilago* spp), some activity against ergot.

Enhanced seed treatments

Signal 300ES (300g/l Cypermethrin) Winter wheat and winter barley

- Signal is the only insecticidal seed treatment with approval for use in winter cereal crops during 2022/23
- Provides effective control against wheat bulb fly, frit fly, and wireworm. Particularly advised for crops following a grass ley.
- Crops dressed with Signal 300ES must be sown by 31st January. Care should be taken not to drill seed too deep, with an ideal depth of 2.5cm-4cm.



Click or tap this icon for more information about the seed treatment.

Vibrance Duo (25g/l fludioxonil + 25g/l sedaxane) Wheat, barley, winter rye, winter triticale, spring oats

- An enhanced single-purpose treatment, Vibrance Duo brings the same level of disease control as Beret Gold and additionally promotes stronger root and shoot growth to aid establishment and early crop development.
- Vibrance Duo can provide benefits in a wide range of situations and excels as a treatment for use in delayed drilling, light land, and second second cereal situations. The larger root systems can also help to mitigate drought and water-logging stress.

Latitude (125g/l silthiofam) Winter wheat, spring wheat and winter barley

- Latitude is the only seed treatment to provide protection against Take-all (*Gaeumannomyces tritici*), a soil and trash borne disease which can have devastating effects on yield
- Particularly prevalent in second and continuous cereal situations, Take-all affects wheat and barley and is most commonly identified by crop stunting, whiteheads, and blackened roots
- Latitude can provide a benefit for any cereal crop following another cereal crop, including second and third wheats, winter barley following a cereal, winter barley or wheat following a spring cereal, and first wheats following a fallow.

Prosper ST (N, P, K, Zn, Mg, Mn, Cu, B, Fe, Mo) All crops

- A potassium phosphite and nutrient seed treatment, Prosper ST is scientifically proven to promote primary and lateral root growth by an average of 30%. The larger root system allows for improved access to soil nutrients and moisture, mitigating against stressful conditions and ultimately improving yield potential
- Prosper ST also provides faster germination and plant development, particularly in cooler soils, and research has demonstrated an increase in nitrogen assimilation and shoot growth, with Prosper-dressed plants showing 27% larger shoot biomass after 39 days.

Mn-Tain - (597gm/t Mn in nitrate form) All crops

- A high concentration manganese nitrate seed treatment to provide essential early Mn to the developing plant
- Provides a high dose of readily available Mn, improving emergence and early plant growth and lowering reliance on foliar applications (or the weather conditions required for them)
- Specially formulated for excellent seed coverage, adherence, and flowability. MnTain is compatible with all other Frontier recommended seed treatments.

Cereal seed treatment compatibility

	Single purpose treatments (SPDs)				Enhanced seed treatments				
	Beret Gold	Rancona i-Mix	Redigo Pro	Raxil Star	Vibrance Duo	Prosper ST	MnTain	Latitude	Signal
Winter Barley				Frontier standard	See note 1				See note 2
Winter Wheat	Frontier standard								See note 2
Winter Oats	Frontier standard								
Winter Rye	Frontier standard								

 Approved for use  Not approved for use

Frontier standard: Our standard single purpose treatment for this crop, based on an assessment of the technical merits of all available treatments and the individual disease requirements of the different cereal crops.

Note 1: Vibrance Duo does not carry a label claim for loose smut control. It is recommended that winter barley treated with Vibrance Duo also be treated with a companion single purpose treatment to provide the best possible protection against loose smut.

Note 2: Signal can only be used on crops sown in the “winter”, which includes all crops sown between 1st August and 31st January. Signal-dressed seed cannot be sown from 1st February onwards.



Click or tap this icon for more information about the seed treatment.

Anglia Grain Services

A division of Frontier Agriculture



THE LEADING MOBILE SEED CLEANING & TREATMENT SPECIALISTS

Established in 1986, Anglia Grain Services is the largest UK processor of Farm Saved Seed, operating a fleet of high specification mobile seed processing units nationwide. Our experienced team of operators, sales and support engineers offer an unrivalled professional service.

Our Farm Saved Seed Service Allows:

- Savings on seed inputs
- Improved cash flow at a critical time of year
- Full seed traceability
- Flexible processing for optimum drilling dates
- Uniform quality seed
- Seed treatments tailored to your requirements
- Precision application of seed treatments with our batch treaters

Conforming to the Highest Standards:

We are a member of the National Association of Agricultural Contractors and registered on the Verified Seed Scheme conforming to producing a safe, fully traceable seed processing service to meet the requirements of national quality assurance programmes.

We are a British Society of Plant Breeders registered collector of plant royalties.

Email: enquiries@angliagrainservices.co.uk

www.angliagrainservices.co.uk

 @AngliaGrainSeed

1 Conventional Screen & Aspiration Cleaner

Law Denis D200 - Compact high capacity seed dresser, incorporating double aspiration, scalping and screening.

3 Gravity Separator

High capacity gravity table separators remove shrivelled and diseased grains to produce a superior seed sample.

2 Seed Elevators and Conveyors

Our bespoke belt and bucket seed elevator and conveyor system ensures seed quality remains by minimising physical damage.

4 Bayer Vanguard Batch Treaters

Serviced by Bayer, our batch treaters precisely apply seed treatments to bold viable seed, complying with environmental stewardship.



5 Anglia Grain Power

Each mobile seed processing unit is self-contained and powered by a specially designed 3 phase generating set.

6 Bag Support & Roller System

This allows a safer and more seamless removal of bulk bags. Each machine also includes trading standard approved bulk bag weighing system.

Experienced Trained Operators:

High capacity seed cleaning and chemical treatment machinery will only work efficiently if set up by skilled operatives.

Anglia Grain Services employ fully trained, experienced operators to ensure correct, precise machine adjustment and quality control.

They are also competent in the safe, precise and accurate application of seed treatments.

The Benefits of Our Full Gravity Table Separation:

- Seeds are separated by specific weight
- Uniform quality seed samples give greater seed rate accuracy when drilling
- Advanced purity and germination
- Removes shriveled, diseased, and damaged grains
- Removal of weed seed (some of which may be resistant)
- Improved vigour and establishment
- Only apply seed treatments to bold, superior seed.

Head Office (Suffolk)
Tel: 01206 263334

Peterborough Office
Tel: 01832 274093

Kent Office
Tel: 01797 252216

Frontier Agriculture Regional Offices

Berwick-upon-Tweed

Windmill Way West
Ramparts Business Park
Berwick-upon-Tweed
TD15 1TB

t: 01289 330303
f: 01289 308145

Diss

Sandy Lane, Diss
Norfolk
IP22 4HY

t: 01379 642936

Perth

Jura Suite 3/1
King James VI Business Centre,
Riverview Business Park
Friarton Road
Perth PH2 8DY

t: 01738 500570
f: 01522 866537

Sandy

Georgetown Road
A1 Trunk Road, Sandy
Bedfordshire
SG19 2UB

t: 01767 680351
f: 01767 692412

Cranswick

Beverley Road
Cranswick, Driffield
East Yorkshire
YO25 9PF

t: 01377 270441
f: 01377 271248

Hermitage

Red Shute Mill
Hermitage, Thatcham
Berkshire,
RG18 9QL

t: 01635 204100
f: 01635 201417

Ross-on-Wye

Phocle Green
Ross-on-Wye
Herefordshire
HR9 7XU

t: 01989 780555
f: 01989 780510

Witham St Hughs

Witham St Hughs,
Lincolnshire
LN6 9TN

t: 01522 860000
f: 01522 868244

www.frontierag.co.uk

Frontier is grateful to AHDB and all other organisations involved for allowing us to use their 2022/23 Recommended Lists.

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