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# AUTUMN SEED

## 2023

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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# Autumn Seed 2023

The Autumn Seed catalogue gives a comprehensive description of all the main varieties of cereals, pulses, and oilseed rape being marketed by Frontier for the 2023/24 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](mailto:info@frontierag.co.uk) or call 01522 860000.



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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](https://www.youtube.com/FrontierAgriculture).

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## In this issue:

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### Top of the pods for harvest 2024!

Find out about the highest yielding OSR varieties available to sow this summer



### Companion Crops

Understand how companion crops can assist with OSR establishment, and how you may be paid to grow them as part of SFI



### Firm foundations

The role of seed treatments: learn how small investments in your crops' foundations can yield big dividends



### Bigger is better?

A new wheat variety sits at the top of the Recommended List, and it's a monster!

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Don't miss our sister publication, the Kings Environmental Management and Specialist Crops Catalogue 2023



Turn to Kings for conservation, game cover, green cover and forage crops  
[www.kingscrops.co.uk](http://www.kingscrops.co.uk)



# Turn to Kings for all your needs



## Sustainable Farming Incentive (SFI)

The Environmental Land Management schemes (ELMs) currently include three scheme options: the Sustainable Farming Incentive, the Local Nature Recovery scheme and the Landscape Recovery scheme.

The Sustainable Farming Incentive, which was the first ELM scheme to be launched in June 2022, promotes sustainable land management practices on farm.

In the initial SFI launch, three standards were offered: Arable and Horticultural Soils, Moorland and Rough Grazing, and Improved Grassland Soils. DEFRA announced in early 2023 that a further six standards will become available this year: Hedgerows, Integrated Pest Management, Arable and Horticultural Land, Improved Grassland and Low Input Grassland standards. Furthermore, growers can enter the standards at different levels. The higher the level, the greater the commitment required.

Funding is also available under the SFI for an annual health and welfare review for farmers who keep cattle, sheep and pigs. Under this scheme, farmers can receive funding for a vet to perform an annual health and welfare check of livestock.

The SFI scheme is currently in its early stages with further changes set to be rolled out in the coming years. In these initial stages of the scheme, there is an emphasis on sustainable farming practices that promote soil health on farm.

Some growers may already be undertaking sustainable activities on farm that are covered within an SFI standard. If this is the case, you may already have met some of the requirements for funding and this activity can be counted towards your chosen standard should you apply.



## Countryside Stewardship (CS)

Countryside Stewardship continues to be beneficial to your farm business and should be considered when working towards a more sustainable approach on farm. It can be particularly beneficial where you have specialised habitat such as wet grassland, a scheduled monument, woodland or scrubland. A review of the current payment rates was undertaken earlier in the year with substantial increases seen for many options.

This year is the final year you can apply for the current Countryside Stewardship scheme. Countryside Stewardship agreements last five years and an application completed this year will commence from 1st January 2024.

If you're interested in joining a CS agreement, application packs are available through your Rural Payments Agency (RPA) account. It is important to take a look at all information early to check if there are any areas that will require additional planning.

Kings offers bespoke support for growers engaged in a Countryside Stewardship agreement. Our team of regional advisors can deliver expert advice on the requirements of agri-environment options and can help you prepare and plan your applications.

## Your Kings Crops Contacts:



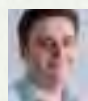
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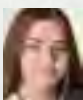
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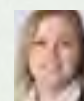
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## The Arable and Horticultural Soils Standard

Many of our customers will be interested in committing to the Arable and Horticultural Soils Standard of the SFI.

At the time of writing, the scheme offers two levels: introductory and intermediate. The requirements for these and the funding available is detailed below.

### Introductory level - £22/ha

Growers entering at this level are required to:

- Undertake a soil assessment and produce a soil management plan
- Test soil organic matter
- Add soil organic matter
- Ensure 70% over winter cropping

### Intermediate level - £40/ha

Growers entering at this level are required to complete all of the activities required at introductory level and must also ensure that 20% of the land entered into the scheme has established multi-species cover cropping.



# Winter Oilseed Rape

## 2023/24 Varieties

AHDB approved and Frontier preferred varieties

### Considerations for 2023

#### 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 LG Wagner or Tom 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, LG Wagner offers excellent resistance to light leaf spot, whilst Murray has shown strong tolerance 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 Murray performing particularly well at later drilling dates. Conventional varieties like 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 resistance

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 resistance

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

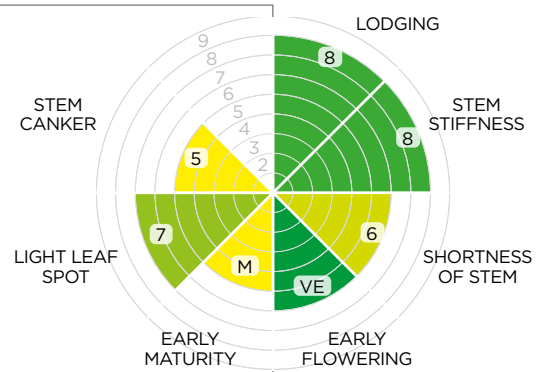
### Turing LSPB

Gross output as a percentage of controls (AHDB RL 2023):

UK: 107% East/West: 107% North: 107% Oil content: 44.3%

The highest yielding variety on the 2023 Recommended List, Turing has shown consistently excellent yield performance across the past three seasons and in all regions of the UK. Vigorous in both autumn and spring, and with excellent resistance to light leaf spot and good tolerance to verticillium stem stripe.

Hybrid



NEW

### Murray LSPB

Gross output as a percentage of controls (AHDB RL 2023):

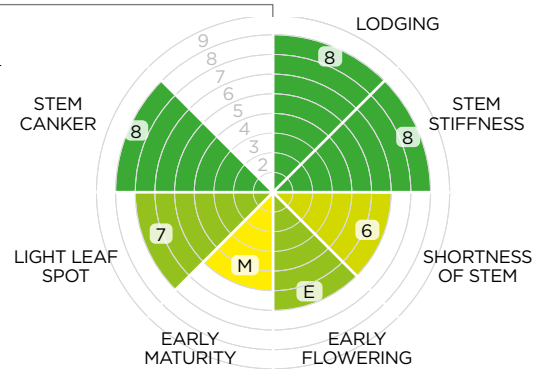
UK: 106% East/West: 106% North: 103% Oil content: 44.5%

Murray offers a winning combination of outstanding yield and excellent disease resistance, most notably through the new major gene for resistance to stem canker, known as RLMS. This is backed up by a good light leaf spot score and very high tolerance to verticillium stem stripe. Murray also has one of the fastest development speeds in the autumn, helping it to outgrow pest pressure.



Growers looking for a fast-track to the latest seed genetics should jump at the chance to build Murray into their rotation.

Hybrid



NEW

### LG Wagner Limagrain

Gross output as a percentage of controls (AHDB RL 2023):

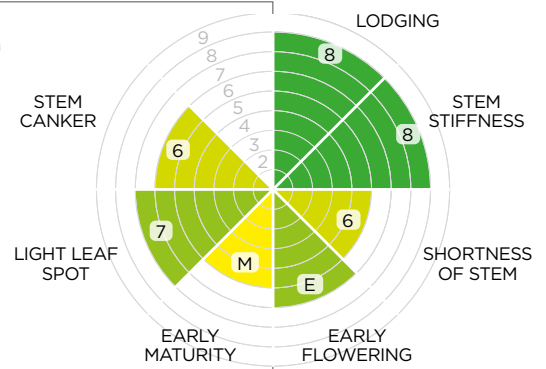
UK: 104% East/West: 104% North: 108% Oil content: 45.0%

LG Wagner is the highest yielding variety in the northern AHDB region, which covers northern England and Scotland. Limagrain have identified LG Wagner as having the strongest resistance to light leaf spot in their trials, particularly once this damaging disease reaches the stem.



Simply the best option for northern and Scottish growers, a clear 4% ahead of Aurelia for yield and with outstanding light leaf spot resistance.

Hybrid



NEW

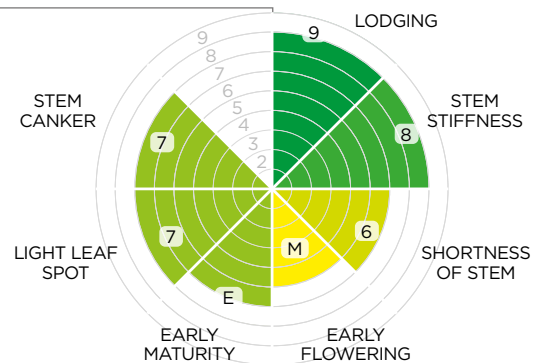
### LG Adeline Limagrain

Gross output as a percentage of controls (AHDB Candidate 2023):

UK: 107% East/West: 107% North: 108% Oil content: 44.9%

A candidate for next year's Recommended List, LG Adeline is on track to be the highest yielding variety available, with good resistance to both light leaf spot and stem canker. Showing excellent gross output performance across all regions, Adeline is currently 4% ahead of control variety Aurelia for UK yield. Available for sowing this summer, LG Adeline offers growers a fast-track to the next generation of hybrid varieties.

Hybrid



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

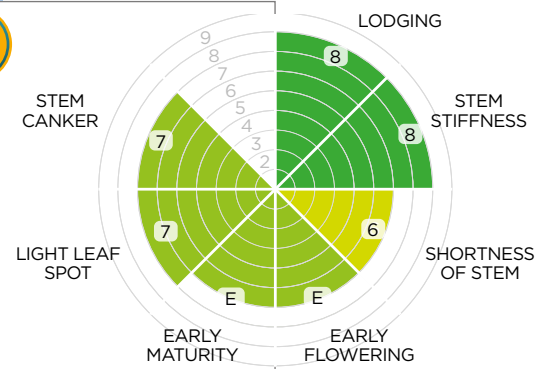


Hybrid

**LG Antigua** Limagrain

Gross output as a percentage of controls (AHDB RL 2023):  
UK: 101% East/West: 101% North: 101% Oil content: 45.2%

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.

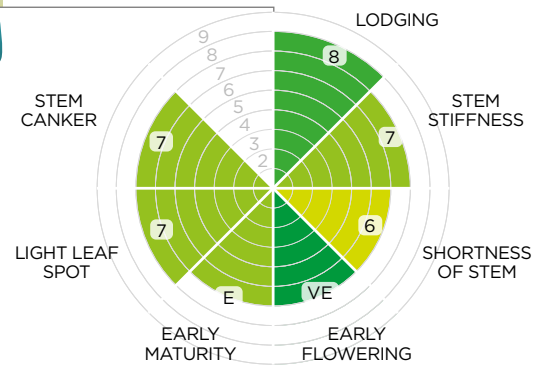


Hybrid

**DK Expectation** Bayer

Gross output as a percentage of controls (AHDB RL 2023):  
UK: 99% East/West: 100% North: 95% Oil content: 45.1%

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.



Clearfield

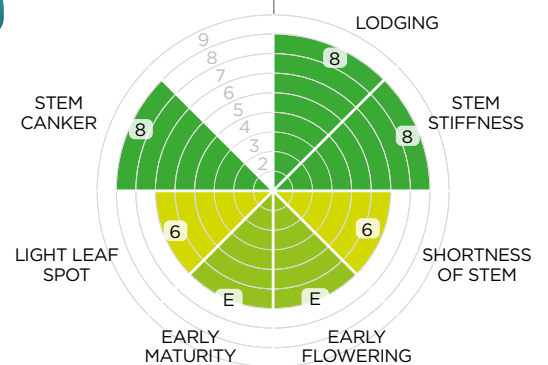
**Matrix CL** DSV

Gross output as a percentage of controls (AHDB RL 2023):  
UK: 98% East/West: 99% North: 95% Oil content: 45.6%

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.

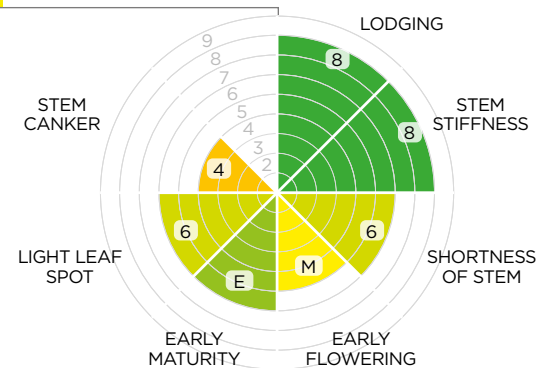


Clubroot Hybrid

**Crocodile** DSV

Gross output as a percentage of controls (AHDB RL 2023):  
UK: 100% East/West: 101% North: 96% Oil content: 44.7%

For the fourth 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 clubroot within their rotation should look no further than this consistent performer.



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



NEW

**Tom** Cluser

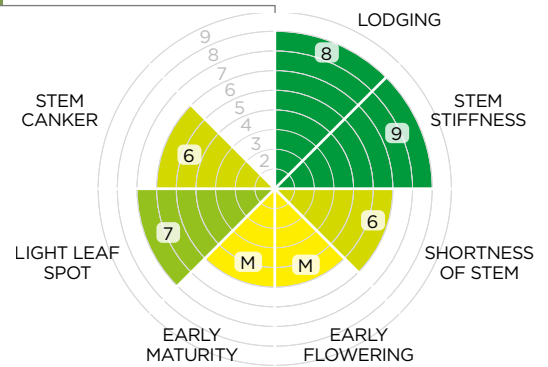
**Gross output as a percentage of controls (AHDB RL 2023):**  
 UK: 102% East/West: 102% North: [102]% Oil content: 45.1%

There's a new king of the conventionals for harvest 2024, and he's called Tom! The only open-pollinating variety added to the 2023 Recommended List, Tom offers improvements to yield and disease resistance over current market leader Acacia, and a significant step on from older varieties such as Campus.



The number one choice for conventional OSR growers, Tom offers improved yield and disease resistance over older varieties.

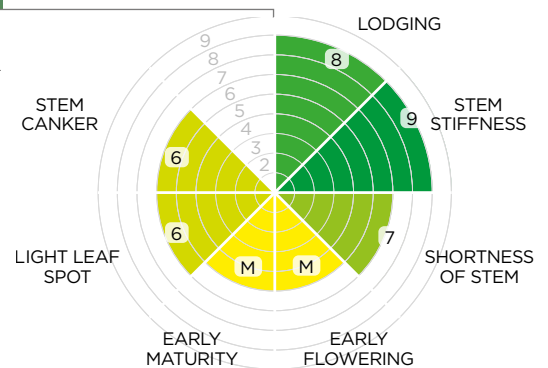
Conventional

**Acacia** Limagrain

**Gross output as a percentage of controls (AHDB RL 2023):**  
 UK: 101% East/West: 101% North: 101% Oil content: 45.0%

The most widely grown conventional variety today, Acacia remains a sound option across all regions of the UK. This variety has a high oil content and superb standing strength due to its short and stiff straw. Good autumn and spring vigour should help with establishment challenges.

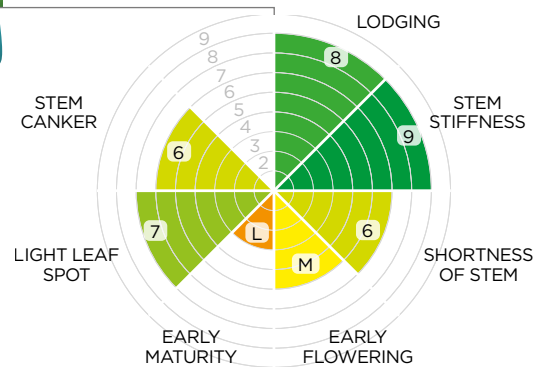
Conventional

**Annika** Limagrain

**Gross output as a percentage of controls (AHDB RL 2023):**  
 UK: 101% East/West: 101% North: 101% Oil content: 45.0%

Annika is another high yielding conventional variety, with similar gross output to Acacia. Annika has genetic resistance to the turnip yellows virus and a strong light leaf spot resistance. A short plant with good stem stiffness and later harvest maturity, Annika is an excellent option for early drilling.

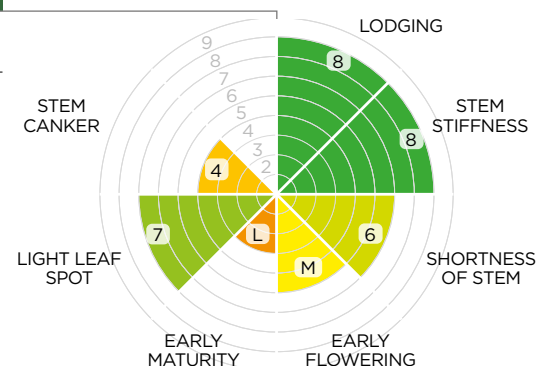
Conventional

**Flamingo** KWS

**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.

Conventional



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



# Managing clubroot in your oilseed rape rotation

Clubroot is one of the most serious threats to oilseed rape performance and can, in severe cases, make it unviable to grow OSR in infected soils. With a recent run of warmer autumns and a move by many growers towards earlier drilling, both of which increase the risk of clubroot, it is not surprising that we are seeing more examples of infection across the UK.

Whilst clubroot is easily diagnosed, with visible yellowing and stunting of infected plants and the characteristic swollen root “clubs”, there is no single curative treatment or management change. Instead, growers will need to take an integrated management approach to clubroot within their soils.

## 5 steps to managing clubroot

**1 Lengthen your OSR rotation**  
Keep as long a gap between OSR crops as possible. The longer the break, the lower the level of clubroot within the soils will be. A minimum of 5 years is advised.

**2 Manage your soils**  
Clubroot thrives in low pH soils, so regular soil testing and applications of lime to bring soils up to pH7 can help to reduce infection. High soil moisture can also increase clubroot pressure, so avoid drilling areas prone to waterlogging.

**3 Don't drill too early**  
Clubroot activity is higher in warmer soils, so early drilling maximises exposure to the pathogen. Delay drilling into the second half of August or September, to lower the risk of infection.

**4 Be aware of other hosts**  
OSR is not the only host of the clubroot pathogen, so be aware of other potential carriers of infection. Weeds, other brassicas, and some cover crop components such as mustard should be avoided in areas of clubroot pressure.

**5 Grow a variety with clubroot resistance**  
Several AHDB recommended varieties have genetic resistance to common strains of clubroot. Varieties such as Crocodile can be sown in land with low levels of clubroot pressure. However, genetic resistance is not a miracle cure, and should be used in combination with the other management practices outlined here.

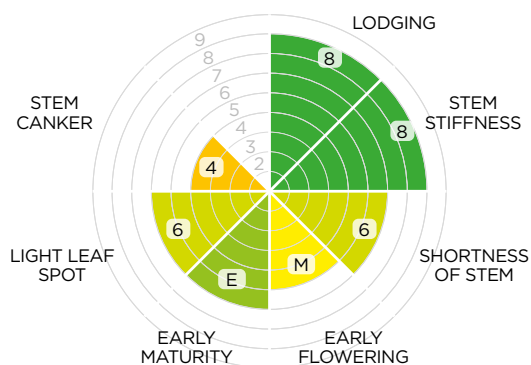


### Crocodile DSV



**Gross output as a percentage of controls (AHDB RL 2023):**  
UK: 100% East/West: 101% North: 96% Oil content: 44.7%

For the fourth 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 clubroot within their rotation should look no further than this consistent performer.



Hybrid



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



# High erucic acid rape

## Variety choice for the Frontier HEAR contract

High erucic acid rape (HEAR) can offer growers significant premiums over double-low varieties. For harvest 2024, the Frontier HEAR contract offered an astonishing £700/T fixed price and is now fully subscribed.

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.

Growers planning for harvest 2024 can find information on the two key HEAR varieties below:

### Ramses ID Grain

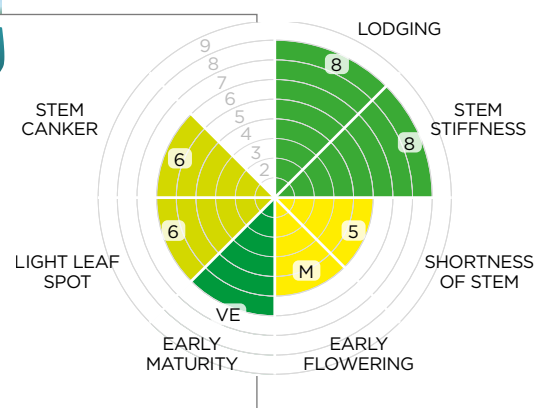


**Gross output four year average 2019-2022 (Frontier trials):**  
UK: 5.05 t/ha

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.

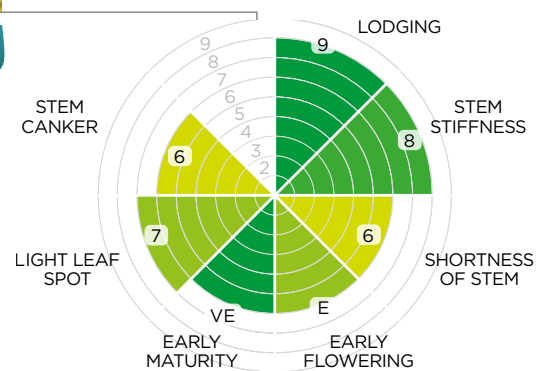


### Rhodes ID Grain



**Gross output four year average 2019-2022 (Frontier trials):**  
UK: 4.77 t/ha

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.



Find out more about our HEAR varieties, as well as information on the Frontier HEAR contract, by visiting our YouTube channel:

[www.youtube.com/FrontierAgriculture](https://www.youtube.com/FrontierAgriculture)



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/m<sup>2</sup> rather than by weight. Target 30-40 plants/m<sup>2</sup> after winter, working seed rates back to take into account likely in-field losses. For hybrid varieties this equates to drilling 50 seeds/m<sup>2</sup>, which is the suggested drilling rate from most breeders. Conventional varieties will vary more due to conditions and date, although 80-110 seeds/m<sup>2</sup> 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/m<sup>2</sup> and conventional varieties at 100 seeds/m<sup>2</sup>.

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.



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



# 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, so don't delay applications. Nitrogen and Phosphate are the two key nutrients to drive both shoot and root growth so the main products of use tends to be DAP or NP Clear Liquids but there are other products available that may work better for your establishment system and/or soil nutrient levels. Some potential alternatives could be Physiostart micro granules, or compound NPKs (eg YARA Actyva S 16-15-15+6.5SO<sub>3</sub>). Although the autumn potassium demand of OSR is relatively low, it plays an important role in Nitrogen Use Efficiency, water management and the crops ability to withstand frost damage so it's worth applying if soil levels are low. 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 at 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 to increase yield, and as such it is ideally suited for the final nitrogen application to OSR crops immediately post petal fall.

## 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.

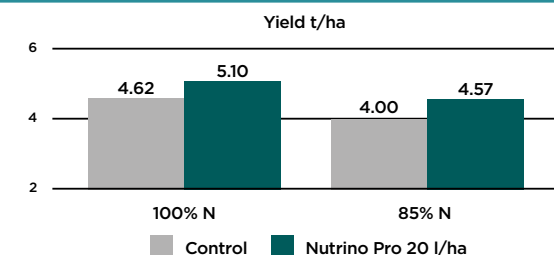
- Prosper ST is proven to increase the speed of germination, particularly in colder seed beds
- Applying phosphite to the seed facilitates and encourages root growth immediately after germination
- Root growth is typically increased by 30% and the larger root system allows improved access to soil nutrients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



### 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.

## Newcastle University Farm, replicated trials 2022



20l/ha Nutrino Pro applied at 90% petal fall.



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



# Oilseed rape companion crops



Companion Mix 3 and oilseed rape

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

Companion crops should be spread into the seedbed prior to drilling the oilseed rape or applied within separate hoppers (where available) within the seed drill. Companion crops in oilseed rape can make a difference to the establishment success of the rape crop whilst also helping contribute to wider soil health.

**We do not advocate mixing companion crop seed with oilseed rape as seed size variability can lead to separation and seed rate inaccurate.**



Berseem clover and oilseed rape

Establishing a companion crop will be eligible for payment of £55/Ha as part of the Integrated Pest Management Standard, one of the 6 new standards set to launch within the Sustainable Farming Incentive later in 2023..

## K12 Companion Crop Mix 1

Contains fenugreek, berseem clover and buckwheat

## K16 Companion Crop Mix 2

Contains fenugreek and berseem clover

## K18 Companion Crop Mix 3

Contains berseem clover and buckwheat

## K86 Companion Crop Mix 4

Contains berseem clover, tataricum buckwheat and fenugreek

## K91 Companion Crop Mix 5

Contains berseem clover and tataricum buckwheat

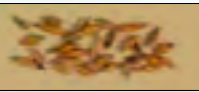



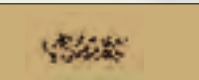
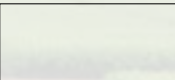

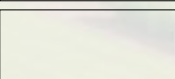
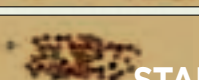
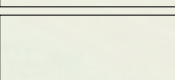
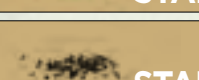
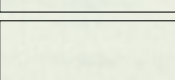
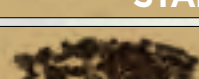
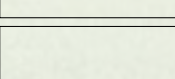
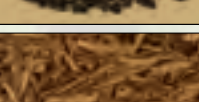
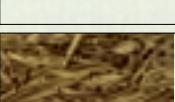
All companion crop mixtures are supplied in 3ha packs. Straight species of the above are also available.



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



# 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%		0
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 <sub>g</sub>		5 <sub>g</sub>
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

## 2023/24 Varieties

### Frontier preferred varieties

#### Considerations for 2023

##### Feed markets

Year on year demand for feed beans has increased by 10-15% and looks to rise further.

Winter beans continue to be in strong demand as a protein source for the livestock sector, with all major species having beans incorporated into their rations. With the continued pressure to reduce the level of imported soya meal in high protein feeds, beans are a natural alternative.

Some of the biggest UK milk contracts now strongly favour the use of domestic proteins such as beans or rapeseed meal. Several feed compounders are now producing soya free rations and many beef farms are including an element of field beans in their home-mix rations.

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.

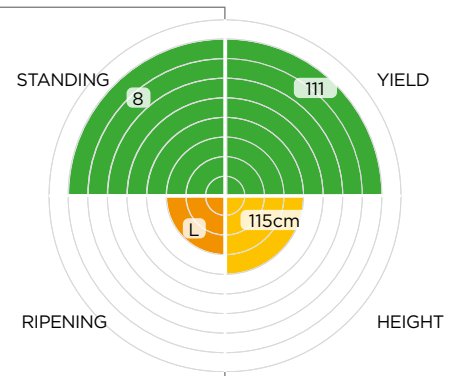


## Vespa Senova

### Data from PGRO Descriptive List 2023

Vespa remains the highest yielding variety on the PGRO Descriptive List, after consistently strong performances during the past five years.

Vespa has a later harvest maturity compared to Tundra and Pantani.



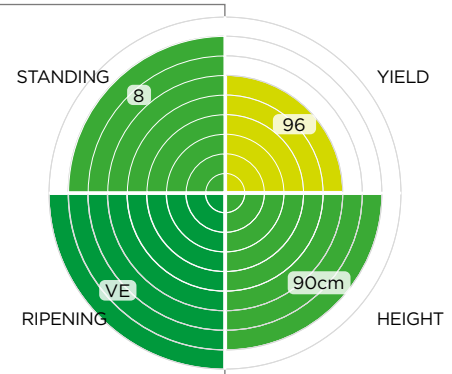
NEW

## Pantani LSPB

### Data from PGRO Descriptive List 2023

One of the newest options for winter bean growers, Pantani is notable for having both the shortest straw and earliest harvest maturity of the currently listed varieties.

The maturity may be of particular appeal to growers in northern and western areas where an early harvest is desirable.

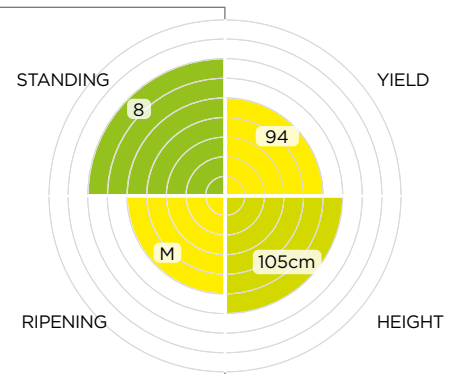


## Tundra Limagrain

### Data from PGRO Descriptive List 2023

Following several years as the most widely grown bean variety in the market, Tundra has been overtaken this year by Vespa.

Nonetheless, Tundra remains a popular variety known for reliable performance and a moderately early harvest maturity.



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





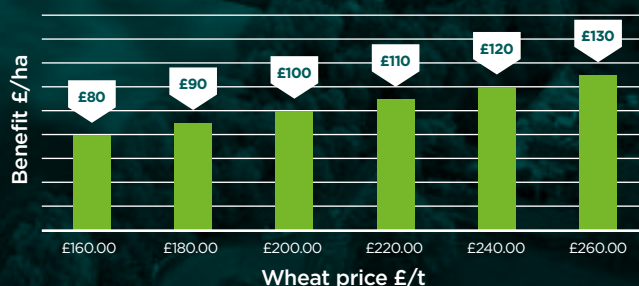
# Variable rate seed: the foundations of yield

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

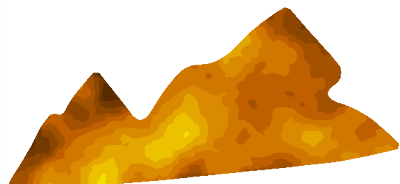
Establishing an optimum plant population and an even canopy in the spring is fundamental to achieving maximum yields. The benefits include reduced lodging risks, lower disease pressure and more efficient use of crop inputs.

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

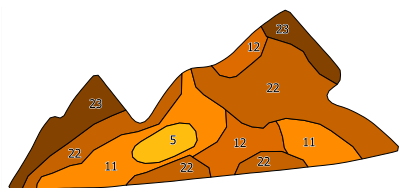


The most accurate way to introduce variable rate seed into your business is via the SOYL Seed system:



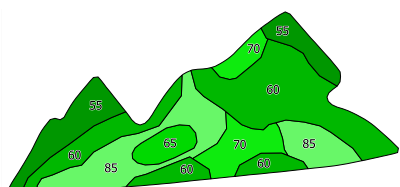
## Stage 1 – Electrical conductivity scan

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.



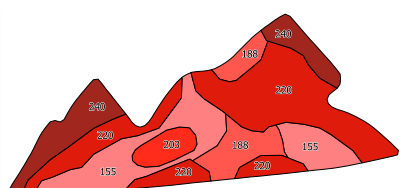
## Stage 2 – Textural classification

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](http://www.soyl.com),  
call 01635 204190 or email [info@soyl.co.uk](mailto:info@soyl.co.uk).

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

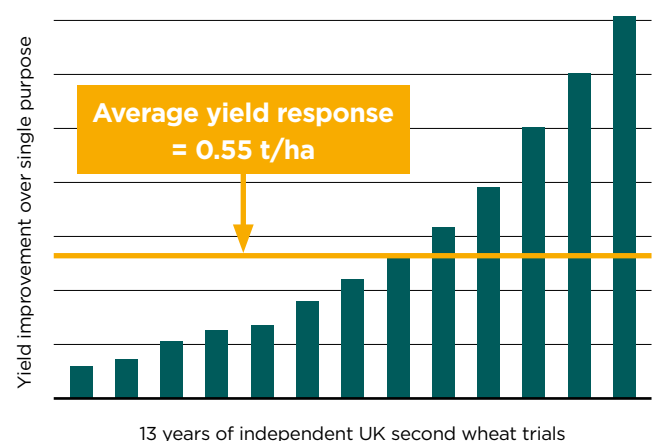
Sowing date  
**17%**

- 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



**£70/ha**  
gross margin

Average yield and gross margin benefit = 0.55 tonne or £70/ha\*.

Yield response required to break even = 0.18 t/ha.

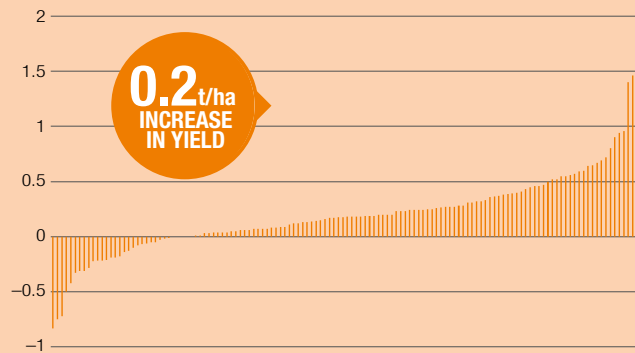
\*Based on a Latitude cost of £40/ha and a November 2024 wheat price of £200/t



Winter  
wheatWinter  
barleyWinter  
ryeWinter  
triticale

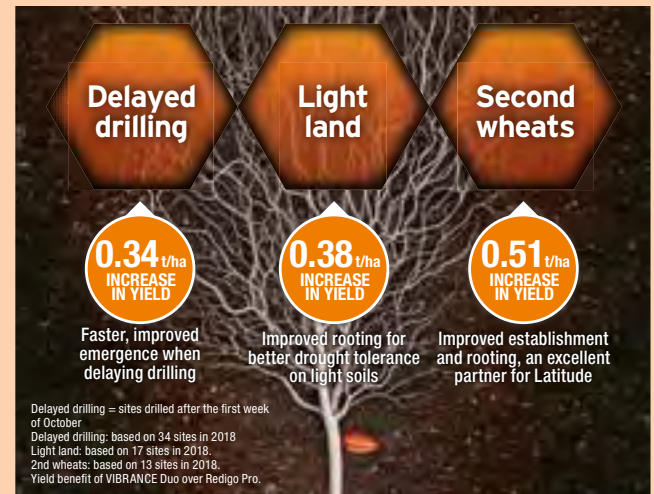
## The first choice seed treatment for winter cereals

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



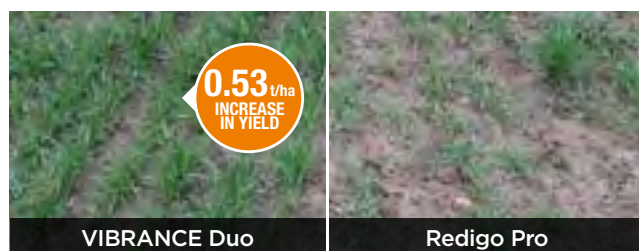
Yield difference (t/ha) VIBRANCE Duo vs Redigo Pro 2013–2021

VIBRANCE Duo excels in three key positions

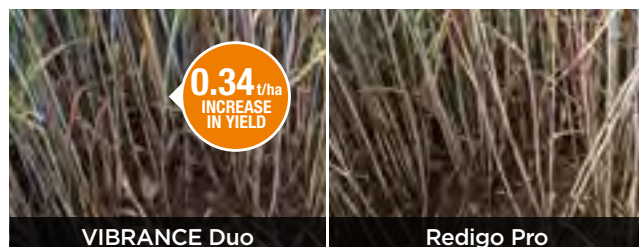


### Build a resilient wheat crop to cope with weather uncertainties

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.



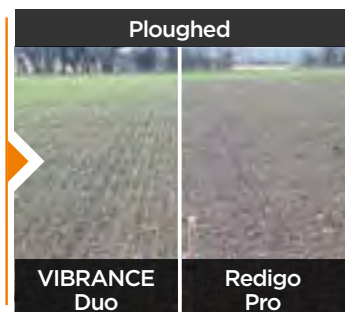
Newark, Nottinghamshire drilled the season of the 'Beast from the East'



Rougham, Cambridgeshire, drilled 20/10/20.

### Reliable performance across different cultivation and establishment systems

**32% INCREASE  
IN ROOTING**  
**54% INCREASE  
IN FOLIAGE  
WEIGHT**  
**17% INCREASE  
IN TILLERING**  
**8% INCREASE  
IN PLANT  
ESTABLISHMENT**



**91% INCREASE  
IN ROOTING**  
**47% INCREASE  
IN FOLIAGE  
WEIGHT**  
**30% INCREASE  
IN TILLERING**  
**7% INCREASE  
IN PLANT  
ESTABLISHMENT**



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

**4:1 return on  
investment**

A £10/ha investment in Vibrance Duo returns an average of £40/ha in yield\*

\*Based on an average yield difference of 0.2t/ha and a November 2024 wheat price of £200/t



Previously marketed as:

Winter  
wheatWinter  
barley

## A biostimulant treatment that improves plant nitrogen uptake

### Nuello iN improves nitrogen use efficiency:

- N-fixing bacteria capture nitrogen directly from the atmosphere
- These “always on” bacteria provide a back-up generator to the plant, even in nutrient limiting conditions
- Enhanced crop biomass and root development improve the plant's ability to scavenge for nutrients from the soil.



Leicestershire split field trial, drilled October 2021.



Bacterial endophytes enter and colonise the plant through root cracks and fix nitrogen from the atmosphere

### Where to use Nuello iN:

- **Complement current nitrogen strategies:** apply Nuello iN on crops receiving standard nitrogen applications, as an additional source of N
- **Manage nitrogen limiting situations:** use Nuello iN in soils and rotational positions where nutrient access may be limited: light land, drought prone soils, and second cereals
- **Substitute small amounts of nitrogen inputs:** where synthetic N applications are planned to be reduced, Nuello iN can help maintain yield by replacing up to 30kg N/Ha.

### Stay-green benefits extend the grain fill period



SY Kingsbarn control



SY Kingsbarn with Nuello iN

Syngenta trials, Newark, harvest 2022.

**+30kg  
Nitrogen**

UK trials demonstrate a nitrogen benefit from Nuello iN equivalent to up to 30Kg N/Ha

Nuello iN does not offer any protection against seed and soil borne disease. It is advised that Nuello iN be co-applied with a fungicidal seed dressing such as Beret Gold or Vibrance Duo.



# Winter Wheat

## 2023/24 Varieties

AHDB approved and Frontier preferred varieties

For further variety data see pages 30-32.

Wheat markets and variety choices are extremely important and we encourage growers to review their individual situation. Grain markets for harvest 2024 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

<b>Early September</b>	KWS Colosseum, ★ KWS Parkin, LG Astronomer, ★ Grafton
<b>Mid-September</b>	★ KWS Dawsum, ★ KWS Colosseum, Gleam, ★ S Parkin, LG Astronomer, ★ KWS Palladium, Mayflower, Crusoe, RGT Illustrious, ★ RGT Grouse
<b>Early part of main drilling window</b>	KWS Dawsum, KWS Colosseum, Gleam, Graham, KWS Parkin, LG Astronomer, KWS Palladium, Mayflower, Crusoe, RGT Illustrious, ★ RGT Grouse
<b>Late part of main drilling window</b>	LG Redwald, Champion, KWS Dawsum, KWS Colosseum, SY Insitor, RGT Bairstow, LG Skyscraper, Gleam, Graham, KWS Extase, KWS Zyatt, Skyfall, ★ RGT Grouse
<b>Late drilling</b>	★ LG Redwald, ★ Champion, RGT Bairstow, ★ SY Insitor, LG Skyscraper, ★ KWS Extase, ★ Skyfall
<b>Light land</b>	★ SY Insitor, ★ Champion, ★ KWS Dawsum, LG Skyscraper, RGT Bairstow, KWS Extase, Graham
<b>Heavy land</b>	Champion, KWS Dawsum, KWS Colosseum, ★ KWS Parkin, LG Astronomer
<b>Second and continuous wheat</b>	★ LG Redwald, ★ Champion, KWS Colosseum, RGT Bairstow, KWS Dawsum, LG Skyscraper, KWS Extase, ★ KWS Zyatt, Mayflower, Skyfall
<b>High disease resistance</b> (yellow rust and Septoria tritici, 1-9)	Mayflower (9, 8.9), KWS Palladium (9, 7.4), Champion (8, 8.1), KWS Extase (8, 7.8), KWS Dawsum (9, 6.4), LG Astronomer (9, 6.2)

★ These varieties are particularly well suited to this drilling situation

### Considerations for 2023

#### 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 Grouse.
- 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, KWS Dawsum 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 drilling a range of varieties, prioritise drilling of those with slower autumn development, stiffer straw, or high disease resistance.

### 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. New variety LG Redwald is an outstanding performer when late drilled.
- In recent seasons, some varieties have proven themselves as capable performers from ultra-late drilling dates. RGT Bairstow (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. Spring wheat variety KWS Ladum would be a good option.

### 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, Mayflower, RGT Bairstow, and Champion.
- Quality wheats such as Zyatt, Crusoe, RGT Illustrious 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



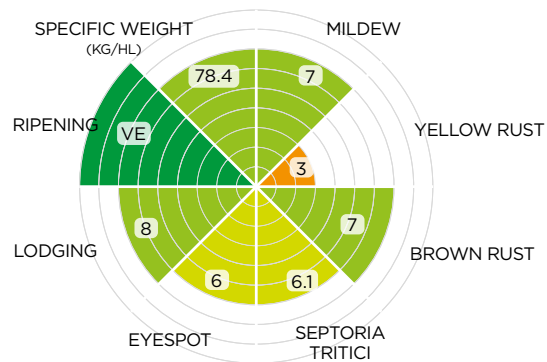
**KWS Zyatt****Group 1**

KWS Quartz x Hereford

Yield as a percentage of controls (AHDB RL 2023):

UK: 99% 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.

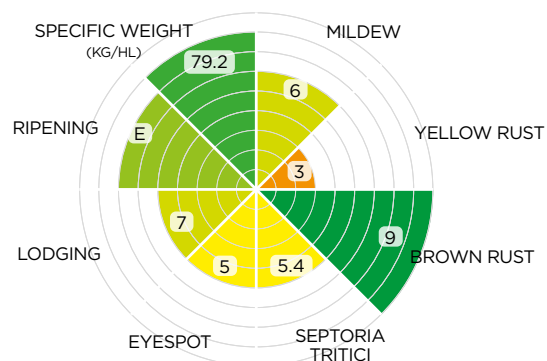
**Skyfall****Group 1**

RAGT C1418 x Hurricane

Yield as a percentage of controls (AHDB RL 2023):

UK: 97% East: 97% West: 97% 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.

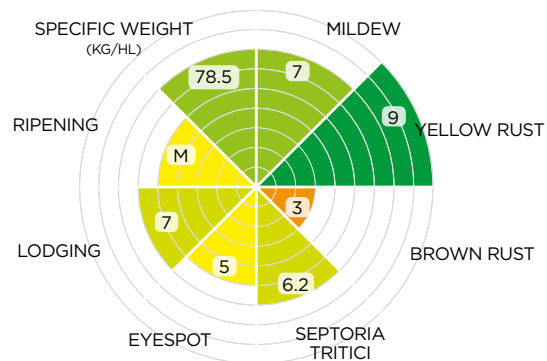
**Crusoe****Group 1**

Limagrain Cordiale x Gulliver

Yield as a percentage of controls (AHDB RL 2023):

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.

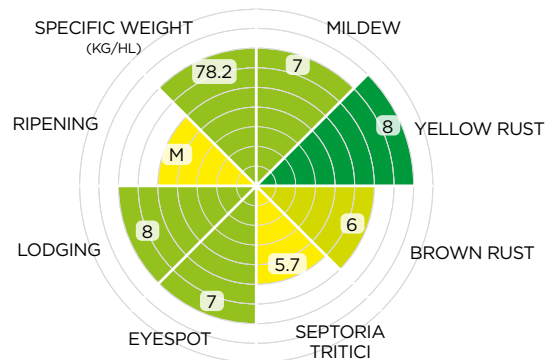
**RGT Illustrious****Group 1**

RAGT Qplus x Battalion

Yield as a percentage of controls (AHDB RL 2023):

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

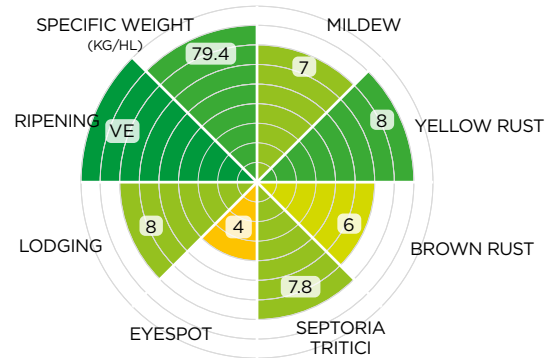
Excellent milling and baking performance make RGT Illustrious a favourite for end users. With taller straw and a slightly later maturity setting it apart from the other Group 1 quality wheats, RGT Illustrious also has a solid disease resistance package with no real weaknesses. Illustrious is suited to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



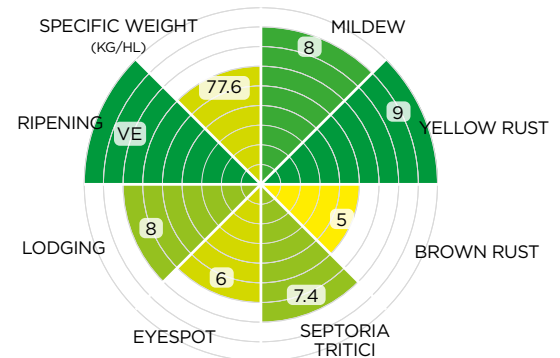
Click or tap this icon for more information about the variety.

**KWS Extase****Group 2****KWS** *Boisseau x Solheio***Yield as a percentage of controls (AHDB RL 2023):****UK: 102% East: 102% West: 102% North: 100%**

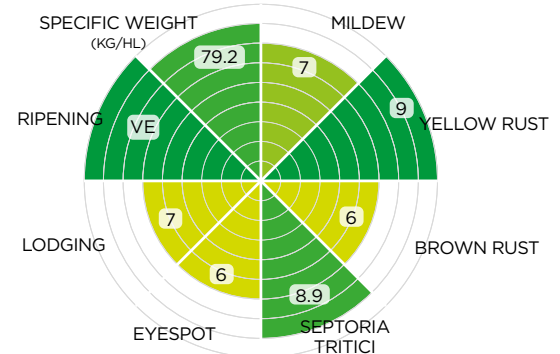
KWS Extase is now firmly established as a farm-favourite variety. Excellent grain quality is supported by good resistance to the three key wheat diseases of septoria tritici and yellow and brown rust. With tall straw and a very vigorous growth habit, Extase is well-suited to later drilling. A susceptibility to eyespot should be considered when planning to use Extase as a second cereal.

**KWS Palladium****Group 2****KWS** *KWS Zyatt x KWS Trinity***Yield as a percentage of controls (AHDB RL 2023):****UK: 100% East: 100% West: 101% North: 99%**

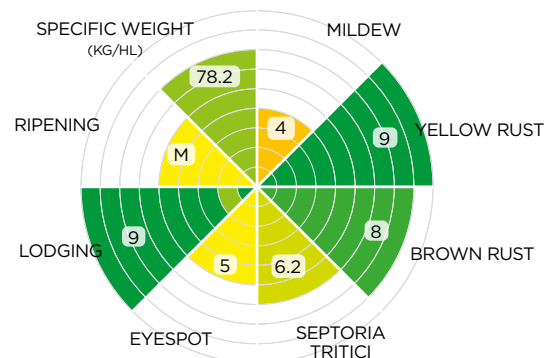
KWS Palladium has excellent scores for mildew, yellow rust, and Septoria tritici resistance and will draw comparisons with farm-favourite KWS Extase. Shorter and stiffer straw make Palladium a better option than Extase for early drilling. With good grain quality, there are hopes that Palladium will pick up interest from millers and end users.

**Mayflower****Group 2****Elsoms** *Armada x Ascott***Yield as a percentage of controls (AHDB RL 2023):****UK: 97% East: 97% West: 98% North: 96%**

Mayflower could lay claim to the title of "cleanest milling wheat" due to its excellent disease resistance ratings, including an outstanding 8.9 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.

**LG Astronomer****Group 3****Limagrain** *(Cougar x Leeds) x Britantia***Yield as a percentage of controls (AHDB RL 2023):****UK: 99% East: 99% 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 and good resistance to sprouting.



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





## LG Redwald

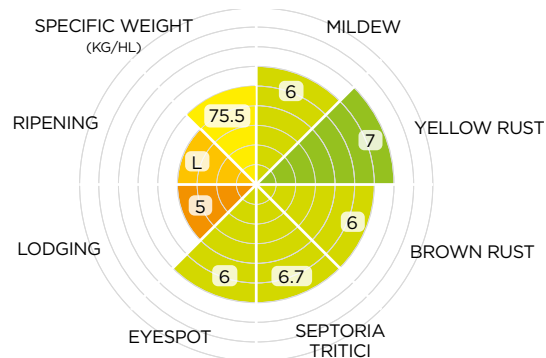
## Group 4 Soft

**Limagrain** *LG Sundance x Generation*

**Yield as a percentage of controls (AHDB RL 2023):**

**UK: 107% East: 107% West: 109% North: [103]%**

Highest yielding variety on the 2023 Recommended List LG Redwald offers enormous yield potential, underpinned by enormous biomass. As one of the most vigorous varieties available with a very high tillering capacity, Redwald suits a later drilling window. This tall plant type has a susceptibility to lodging, so PGRs will need to be carefully considered.



## KWS Colosseum

## Group 4 Soft

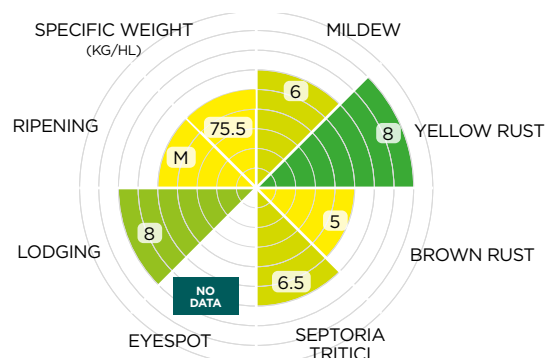
**Limagrain** *(Cougar x KWS Kielder) x Revelation*

**Yield as a percentage of controls (Frontier Trials): 104%**

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 Dawsum.



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



## LG Skyscraper

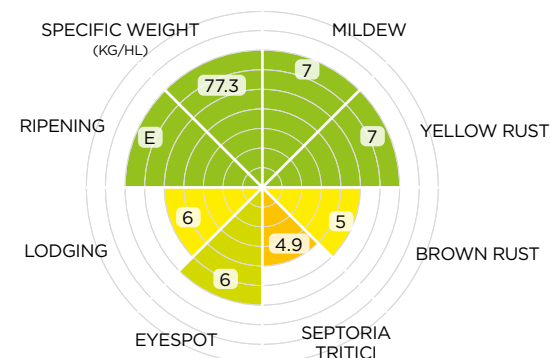
## Group 4 Soft

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

**Yield as a percentage of controls (AHDB RL 2023):**

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

LG Skyscraper remains one of the highest yielding feed wheat options, despite being eclipsed by newcomers LG Redwald, 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 Bairstow

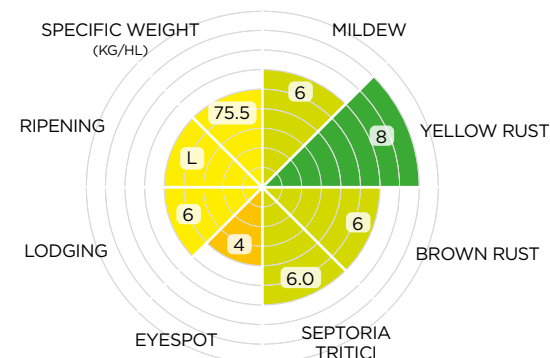
## Group 4 Soft

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

**Yield as a percentage of controls (AHDB RL 2023):**

**UK: 103% East: 103% West: 103% North: 103%**

RGT Bairstow is a 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.



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

**Champion****Group 4 Hard**

DSV DSV20122 x Reflection

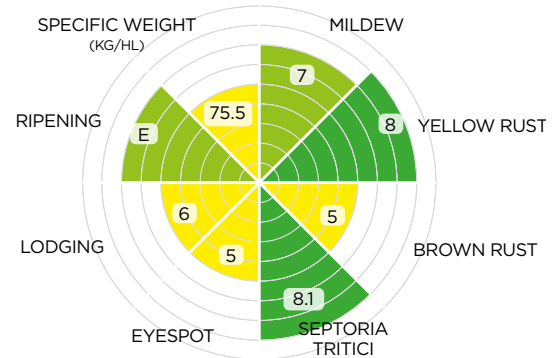
Yield as a percentage of controls (AHDB RL 2023):

UK: 106% East: 107% West: 106% North: 102%

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. Champion is our top pick for the mid and late drilling window.

**KWS Dawsum****Group 4 Hard**

KWS KWS Kerrin x Costello

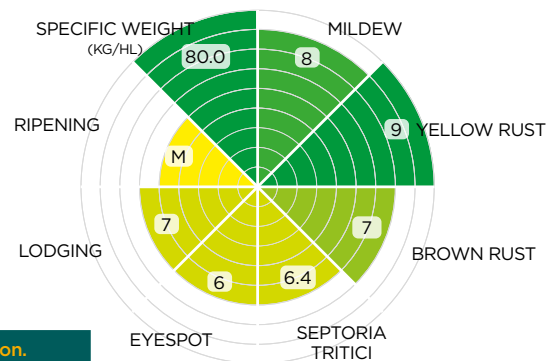
Yield as a percentage of controls (AHDB RL 2023):

UK: 104% East: 104% West: 105% North: 105%

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.



The top selling variety of 2022, and with good reason. Dawsum looks set to cement its place as the mainstay of many growers' wheat rotations.

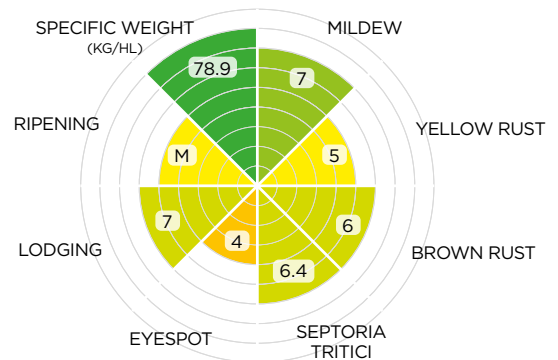
**SY Insitor****Group 4 Hard**

Syngenta (Hereford x Oakley) x Hereford

Yield as a percentage of controls (AHDB RL 2023):

UK: 104% East: 103% West: 105% 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.

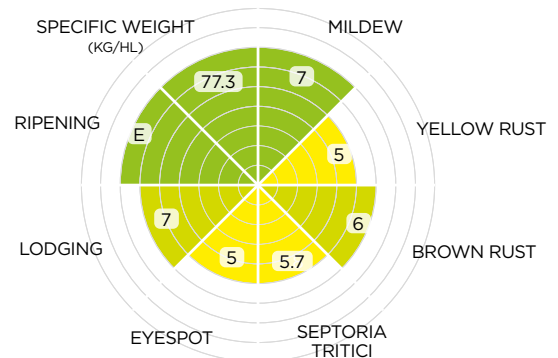
**Gleam****Group 4 Hard**

Syngenta Hereford x KWS Kielder

Yield as a percentage of controls (AHDB RL 2023):

UK: 103% East: 103% West: 104% North: 103%

Gleam's status as long-term farm-favourite was confirmed with yet another strong performance in Harvest 2022. 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.

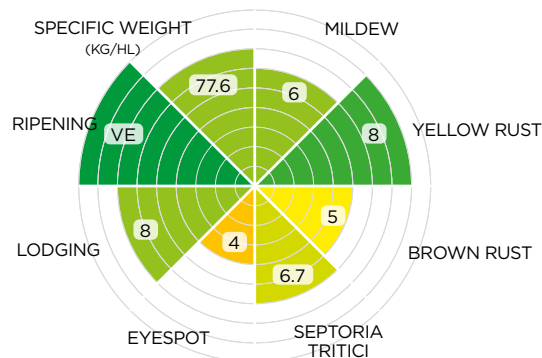


**Graham****Group 4 Hard**Syngenta *Premio x Expert*

Yield as a percentage of controls (AHDB RL 2023):

UK: 102% East: 101% West: 105% North: 102%

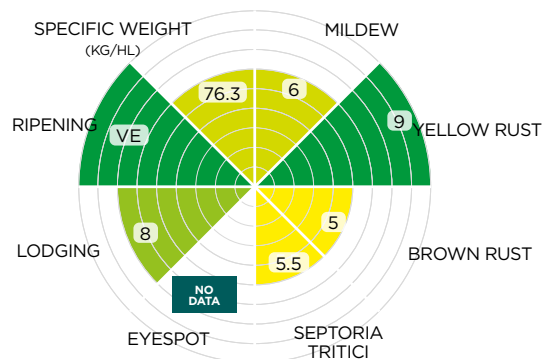
As Graham enters its eighth year on the Recommended List, it remains a popular and reliable option. Early harvest maturity, stiff straw, and a robust resistance to Septoria tritici continue to provide good yield performance in the West and North. The only concern for growers may be the lack of OWBM resistance,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

**KWS Parkin****Group 4 Hard**KWS *Reflection x Costello*

Yield as a percentage of controls (AHDB RL 2023):

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

KWS Parkin remains a unique proposition for growers in 2023. 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.

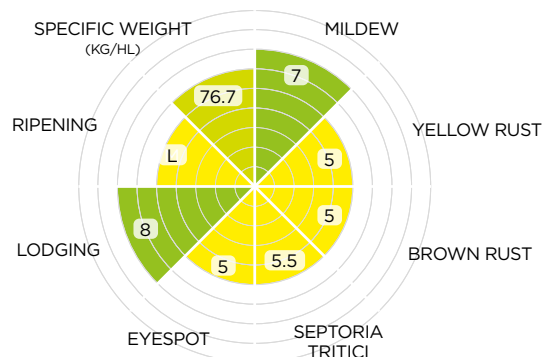


An unparalleled combination of straw strength and early harvest put KWS Parkin in a class of its own. There is simply nothing else like it.

**BYDV resistant winter wheat****RGT Grouse****Group 4 Hard**

RAGT

As the first variety to team OWBM and BYDV resistance RGT Grouse is the latest step forward in the use of seed genetics as a replacement for the use of insecticides. With genetic resistance to aphid-borne BYDV and orange wheat blossom midge damage, Grouse has no requirement for pyrethroid applications and is suitable for early drilling. With the latest Sustainable Farming Incentive (SFI) schemes offering a payment of £45/Ha to growers who avoid the use of insecticides, varieties such as RGT Grouse could find a place within the rotation as a way to embrace the SFI opportunity and mitigate risk from insect-borne viruses. Discuss SFI options with your sustainable farming advisor for more information.

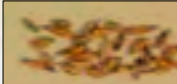


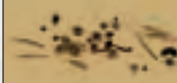








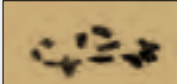







Growers looking to remove insecticides from their rotation should be delighted by the timely arrival of RGT Grouse, coinciding with the option of SFI support payments for avoiding insecticides.



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

# 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 <sub>g</sub>	 20 <sub>g</sub>	 4 <sub>g</sub>
Purity ▶		98%	99%	99.8%
Germination ▶		85%	85%	95% Target
Loose smut ▶		0.2%	0.2%	0.00% (Control via seed treatment)

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.



# Winter Wheat 2023/24

		Fungicide-treated grain yield (% treated control)										Grain quality			
	In Frontier seed production	United Kingdom (10.9 t/ha)	East region (10.7 t/ha)	West region (11.1 t/ha)	North region (11.3 t/ha)	First cereal (11.2 t/ha)	Second and more (9.7 t/ha)	Early sown (before 25 Sept) (11.3 t/ha)	Late sown (after 1 Nov) (9.2 t/ha)	Light soils (10.8 t/ha)	Heavy soils (11.1 t/ha)	Protein content (%)	Protein content (%) - milling wheat	Hagberg Falling Number	Specific weight (kg/hl)
UKFM Group 1 (Hard)															
KWS Zyatt	Y	99	98	99	98	98	99	[101]	98	97	99	12.0	12.6	271	78.4
Skyfall	Y	97	97	97	96	96	97	96	97	96	97	12.0	13.1	290	79.2
Crusoe	Y	96	96	97	94	96	94	[95]	95	94	96	12.5	13.4	279	78.5
RGT Illustrious	Y	96	95	97	95	96	94	[97]	95	94	95	12.0	12.6	276	78.2
UKFM Group 2 (Hard)															
KWS Extase	Y	102	102	102	100	101	102	[99]	102	102	101	11.7	12.5	294	79.4
KWS Palladium	Y	100	100	101	99	100	100	[[98]]	[99]	99	99	11.6	12.4	320	77.6
Mayflower	Y	97	97	98	96	97	99	[100]	[95]	97	96	11.8	12.8	304	79.2
UKFM Group 3 (Soft)															
RGT Wilkinson		101	102	101	[100]	101	[101]	-	[[103]]	[102]	101	11.2	[12.0]	264	75.4
LG Illuminate		100	100	100	100	100	100	103	98	101	100	11.5	12.6	262	77.0
LG Astronomer	Y	99	99	99	97	99	98	100	99	99	100	11.5	12.5	245	78.2
Soft Group 4															
LG Redwald	Y	107	107	109	[103]	107	[109]	[106]	[[108]]	[105]	107	11.1	[11.5]	172	75.5
KWS Colosseum	Y	104	-	-	-	-	-	-	-	-	-	-	-	295	74.4
KWS Zealum	Y	103	103	103	[102]	103	[104]	[106]	[[105]]	[[102]]	104	10.9	[12.0]	218	76.7
LG Skyscraper	Y	103	103	103	102	103	104	103	103	103	103	11.2	12.1	227	77.3
RGT Bairstow	Y	103	103	103	103	103	103	[[104]]	[105]	105	104	11.1	12.0	239	76.8
Swallow	Y	98	98	98	101	99	99	100	97	101	98	11.1	12.1	269	76.7
Hard Group 4															
Champion	Y	106	107	106	102	106	107	106	[107]	106	107	11.2	12.1	251	75.5
SY Insitor	Y	104	104	105	105	104	105	[[107]]	103	106	104	10.7	11.2	279	78.9
KWS Dawsum	Y	104	103	105	105	104	105	107	[104]	105	104	11.1	11.9	311	80.0
Gleam	Y	103	103	104	103	103	103	103	103	103	103	11.1	11.8	237	77.3
Graham	Y	102	101	105	102	102	102	101	100	102	102	11.1	11.9	281	77.6
KWS Cranium	Y	102	103	101	102	102	103	[[102]]	105	103	101	11.1	11.9	293	75.8
KWS Parkin	Y	102	102	101	[101]	81	-	-	-	-	-	11.3	-	259	76.3
LG Typhoon	Y	101	101	100	101	100	103	103	[101]	102	100	11.0	11.9	183	77.1
Costello	Y	99	99	98	101	99	99	99	102	99	99	11.6	12.4	324	81.2

	Agronomic features							Disease resistance								
	Resistance to lodging without PGR (1-9)	Resistance to lodging with PGR (1-9)	Straw length without PGR (cm)	Straw length with PGR (cm)	Ripening (days +/- Skyfall)	Resistance to sprouting (1-9)	Latest safe-sowing date	Untreated grain yield (% treated control) (10.9 t/ha)	Mildew (1-9)	Yellow rust (1-9)	Yellow rust (young plant)	Brown rust (1-9)	Septoria tritici (1-9)	Eyespot (1-9)	Fusarium ear blight (1-9)	Orange wheat blossom midge
UKFM Group 1 (Hard)																
KWS Zyatt	8	8	85	75	-1	6	End Jan	75	7	3	s	7	6.1	[6]@	6	-
Skyfall	8	7	85	77	0	6	End Feb	70	6	3	s	9	5.4	[5]@	7	R
Crusoe	8	7	82	75	+1	6	End Jan	76	7	9	r	3	6.2	[5]	7	-
RGT Illustrious	7	8	89	80	+1	6	End Jan	85	7	8	s	6	5.7	[7]@	6	-
UKFM Group 2 (Hard)																
KWS Extase	7	8	91	85	-1	6	End Jan	97	7	8	r	6	7.8	[4]	6	-
KWS Palladium	7	8	83	78	-1	[6]	[End Jan]	94	8	9	r	5	7.4	[6]	6	-
Mayflower	6	7	89	82	-1	[6]	[Mid Feb]	93	7	9	r	6	8.9	[6]@	6	-
UKFM Group 3 (Soft)																
RGT Wilkinson	[8]	8	83	77	2	[5]	[[End Jan]]	87	8	7	s	5	5.5	[7]@	6	-
LG Illuminate	7	7	83	76	1	[6]	Mid Feb	87	5	7	r	6	5.8	[6]	6	R
LG Astronomer	7	9	88	79	+1	[6]	End Jan	88	4	9	r	8	6.2	[5]	6	R
Soft Group 4																
LG Redwald	[5]	5	94	89	2	[6]	[[Mid Feb]]	92	6	7	s	6	6.7	[6]	6	R
KWS Colosseum	7	8	80	77	1	-	[End Jan]	-	6	8	r	5	6.5	-	7	-
KWS Zealum	[6]	8	88	81	+2	[6]	[[End Jan]]	86	7	9	r	5	5.8	[6]	7	R
LG Skyscraper	6	6	92	83	0	6	End Jan	86	7	7	s	5	4.9	[6]	6	R
RGT Bairstow	6	6	91	83	2	[6]	[End Feb]	87	6	8	r	6	6.0	[4]	6	R
Swallow	8	9	79	73	+1	[5]	End Feb	80	6	6	r	5	5.3	[4]	6	R
Hard Group 4																
Champion	6	6	88	82	0	[6]	[Mid Feb]	93	7	8	r	5	8.1	[5]	6	R
SY Insitor	6	7	94	83	1	5	End Jan	82	7	5	s	6	6.4	[4]	7	R
KWS Dawsum	7	7	84	76	+1	[7]	[End Jan]	95	8	9	r	7	6.4	[6]	7	-
Gleam	7	7	87	77	0	6	Mid Feb	84	7	5	s	6	5.7	[5]	6	R
Graham	7	8	88	80	-1	6	End Jan	93	6	8	s	5	6.7	[4]	7	-
KWS Cranium	8	8	89	80	+3	[6]	Mid Feb	82	6	9	r	4	5.9	[5]	7	R
KWS Parkin	8	8	79	73	-2	[6]	[End Jan]	81	6	9	r	5	5.5	-	6	-
LG Typhoon	7	7	87	78	1	[5]	[End Jan]	92	6	9	r	6	7.3	[6]	6	R
Costello	7	8	84	75	+2	6	End Jan	86	8	9	r	5	5.8	[4]	7	-



	Supplementary information					Market information						
	Suitability as a second cereal	Suitability for early drilling (1st-15th Sept)	Suitability for late drilling (Nov. onwards)	Speed of development	Tillering capacity	UK bread-making	UK biscuit, cake-making	UK distilling	ukp bread wheat for export	uks soft wheat for export	Breeder	Scope of recommendation
UKFM Group 1 (Hard)												
KWS Zyatt	***	*	**	Moderate	High	Y	-	-	Y	-	KWS	UK
Skyfall	***	*	***	Fast	Low/Mod	Y	-	-	-	-	RAGT	UK
Crusoe	*	**	**	Slow/Mod	Moderate	Y	-	-	Y	-	Lim	UK
RGT Illustrious	***	**	**	Slow	Mod/High	Y	-	-	-	-	RAGT	UK
UKFM Group 2 (Hard)												
KWS Extase	**	*	***	Fast	Mod/High	Y	-	-	Y	-	KWS	UK
KWS Palladium	***	**	**	Moderate	High	Y	-	-	-	-	KWS	UK
Mayflower	***	**	**	Moderate	Moderate	Y	-	-	[Y]	-	Els	UK
UKFM Group 3 (Soft)												
RGT Wilkinson	***	**	**	Mod/Fast	Moderate	-	Y	[Y]	-	[Y]	RAGT	UK
LG Illuminate	**	***	**	Slow	Moderate	-	Y	[Y]	-	Y	Lim	UK
LG Astronomer	**	***	**	Mod/Slow	Moderate	-	Y	[Y]	-	-	Lim	UK
Soft Group 4												
LG Redwald	***	*	***	Fast	High	-	-	[Y]	-	-	Lim	E&W
KWS Colosseum	***	***	**	Moderate	Mod/High	-	-	-	-	-	KWS	-
KWS Zealum	***	***	*	Slow/Mod	Mod/High	-	-	[Y]	-	-	KWS	N
LG Skyscraper	**	*	***	Moderate	Mod/High	-	-	[Y]	-	-	Lim	UK
RGT Bairstow	***	*	***	Mod/Fast	High	-	-	Y	-	-	RAGT	UK
Swallow	*	**	**	No Data	No Data	-	-	Y	-	-	Sen	N
Hard Group 4												
Champion	***	*	***	Fast	High	-	-	-	-	-	DSV	UK
SY Insitor	**	*	***	Fast	High	-	-	-	-	-	Syn	UK
KWS Dawsum	**	***	**	Moderate	High	-	-	-	-	-	KWS	UK
Gleam	***	**	**	Moderate	High	-	-	-	-	-	Syn	UK
Graham	*	**	**	Moderate	Moderate	-	-	-	-	-	Syn	UK
KWS Cranium	***	*	***	Fast	High	-	-	-	-	-	KWS	UK
KWS Parkin	**	***	**	Moderate	Moderate	-	-	-	-	-	KWS	-
LG Typhoon	***	***	**	Slow	Moderate	-	-	-	-	-	Lim	UK
Costello	**	**	**	Moderate	Mod/High	-	-	-	-	-	Sen	UK

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.

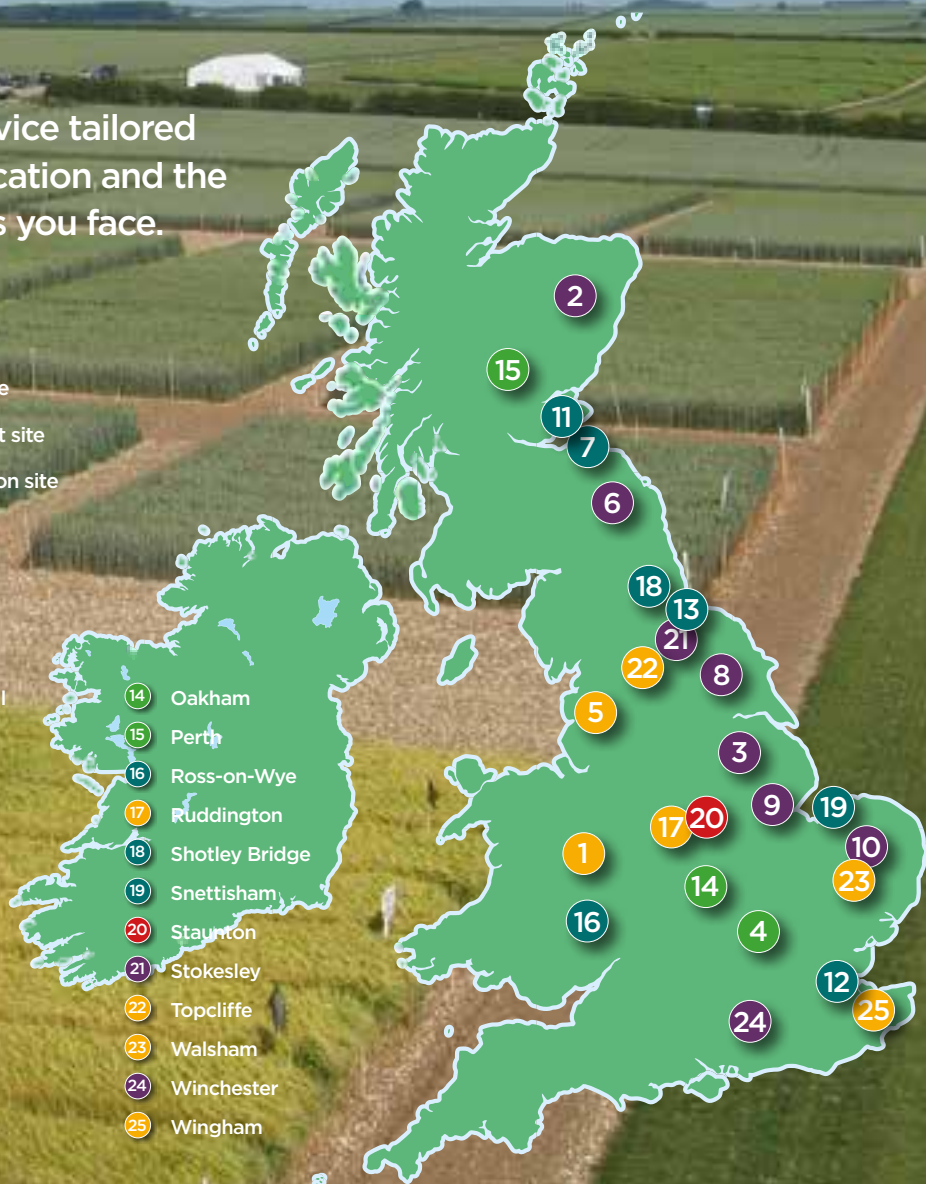
Every year, we establish  
more than  
**12,000 trial plots**  
**across the UK**  
to find solutions to  
crop production challenges

Expert advice tailored  
to your location and the  
challenges you face.

Key

- Discovery site
- Development site
- Demonstration site
- Soil Life site
- Kings site

- |                 |                   |
|-----------------|-------------------|
| 1 Acton Burnell | 14 Oakham         |
| 2 Barra         | 15 Perth          |
| 3 Bleasby       | 16 Ross-on-Wye    |
| 4 Buckingham    | 17 Ruddington     |
| 5 Burscough     | 18 Shotley Bridge |
| 6 Coldstream    | 19 Snettisham     |
| 7 Haddington    | 20 Staunton       |
| 8 Haywold       | 21 Stokesley      |
| 9 Holbeach      | 22 Topcliffe      |
| 10 Honingham    | 23 Walsham        |
| 11 Leven        | 24 Winchester     |
| 12 Longfield    | 25 Wingham        |
| 13 Molescroft   |                   |





# Winter Barley

## 2023/24 Varieties

AHDB approved and Frontier preferred varieties

For further variety data see page XX.

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 or resistance to barley yellow dwarf virus (BYDV) are now available, such as the hybrid variety SY Buzzard.. These will become increasingly important following the loss of insecticidal seed treatments such as and a desire from many growers to move towards reduced use of pyrethroid applications, supported by the recently announced SFI payments for growing crops without insecticides.

### Considerations for 2023

#### 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/m<sup>2</sup> 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. Early nitrogen in the spring is really important, so apply 3 splits, with the first application of 30% at GS25, 50% at or just before GS31 and 20% 2-3 weeks after this. An alternative would be a 2 split programme with 40-50% at GS25 and the balance at or just before GS31. 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

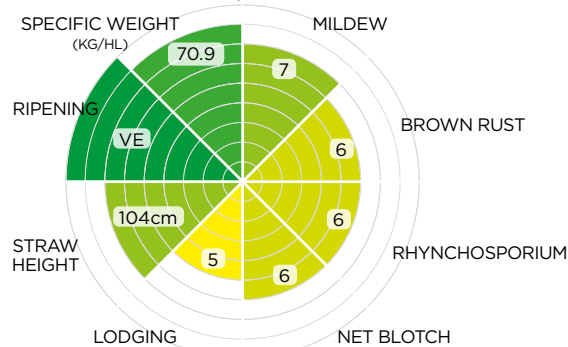
#### Six-row hybrid feed

Syngenta F1 Hybrid

Yield as a percentage of controls (AHDB RL 2023):

UK: 106% East: 106% West: 108% North: 105%

SY Thunderbolt remains the joint highest yielding barley variety on the 2023 Recommended List, a whisker ahead of the other hybrid varieties SY Kingston and Kingsbarn. Thunderbolt is an early maturing option with good disease resistance, though slightly weaker straw will make it a priority for timely harvest.



### SY Kingsbarn

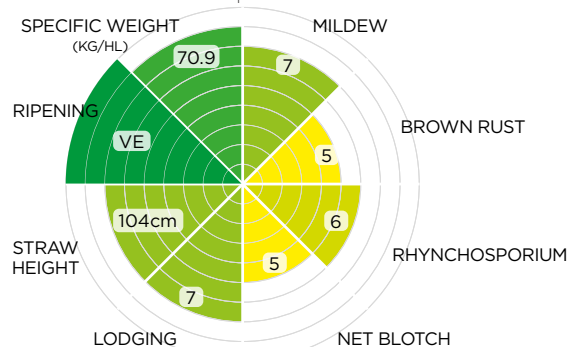
#### Six-row hybrid feed

Syngenta F1 Hybrid

Yield as a percentage of controls (AHDB RL 2023):

UK: 106% East: 106% West: 106% North: 107%

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

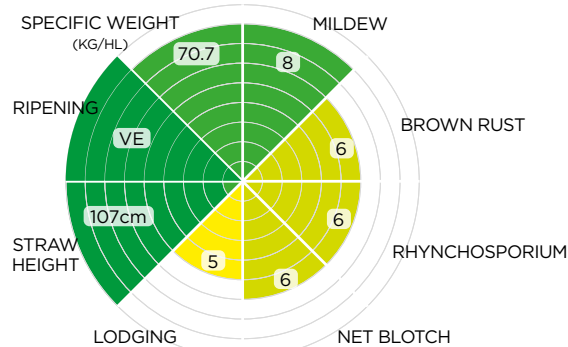
#### Six-row hybrid feed

Syngenta F1 Hybrid

Yield as a percentage of controls (AHDB RL 2023):

UK: 106% East: 105% West: 107% North: 106%

SY Kingston sits alongside farm-favourite SY Kingsbarn as a reliable option for hybrid barley growers across the UK. Kingston has the strongest all-round disease resistance available, including a rare 8 for resistance to mildew. As the earliest maturing hybrid barley variety, Kingston is 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.





# BYDV tolerant winter barley

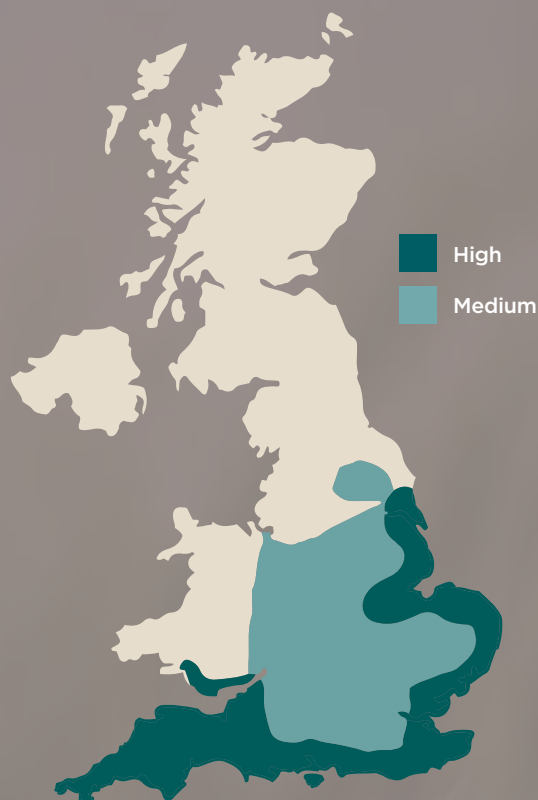
Barley Yellow Dwarf Virus (BYDV) had, by 2015, almost become one of the forgotten threats of UK agriculture. However, with the range of effective insecticide sprays shrinking, and the necessity to drill winter barley at the optimum period for aphid activity, BYDV is once again posing a challenge to UK 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, 2023 sees the arrival of the first hybrid winter barley variety with genetic tolerance to BYDV. SY Buzzard, a candidate for the 2024 AHDB Recommended List, is an excellent example of how new plant genetics can support growers in the fight against insect born viruses.

Regional BYDV risk



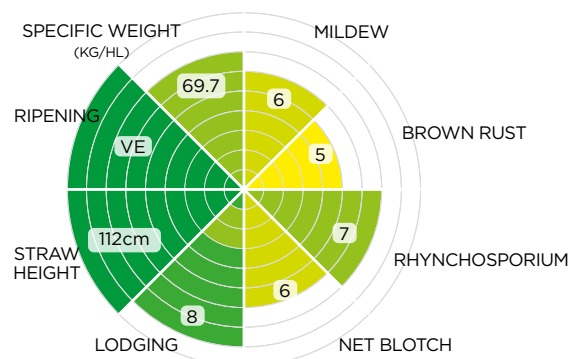
## SY Buzzard

## Six-row hybrid feed

Syngenta

**Yield as a percentage of controls (AHDB RL 2023):**  
UK: 104% East: [106]% West: [100]% North: [103]%

The first hybrid barley variety with BYDV tolerance SY Buzzard can fully capitalise on the wide drilling window that hybrids are known for, without concerns about aphid pressure or dwarf virus infection. An exciting new option for growers in high pressure areas or those looking to reduce insecticide use.



## LG Caravelle Two-row conventional feed

Limagrain LGBU11-5493B x KWS Moselle

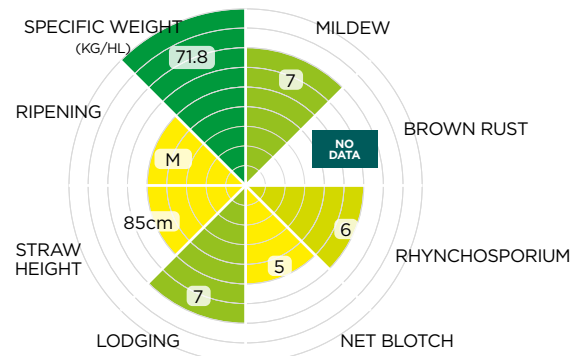
Yield as a percentage of controls (AHDB RL 2023):

UK: 106% East: 109% West: [105]% North: [104]%

The highest yielding barley on the 2023 Recommended List, LG Caravelle has outstripped the hybrid varieties for yield in some areas. More impressive still is the teaming of yield with grain quality - Caravelle has an excellent specific weight, only beaten by KWS Cassia, which Caravelle outyields by some 9%.



A truly outstanding combination of yield and bushel weight make LG Caravelle the most sought after barley variety for harvest 2023.



## KWS Tardis Two-row conventional feed

KWS 11-12 x KWS Orwell

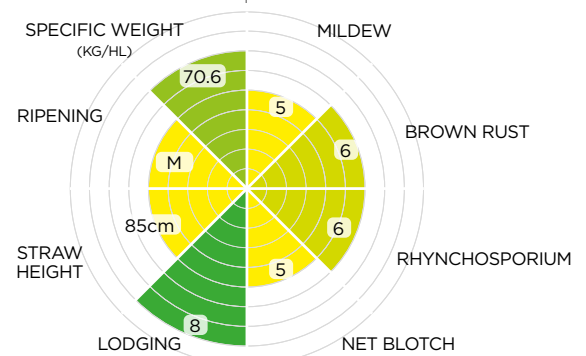
Yield as a percentage of controls (AHDB RL 2023):

UK: 103% East: 105% West: 102% North: 102%

KWS Tardis is the most widely-grown winter barley variety in the UK. 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.



Sure to remain the most popular variety for drilling this autumn, KWS Tardis would be our top pick for heavy soils where that combination of yield and straw strength provide maximum value.



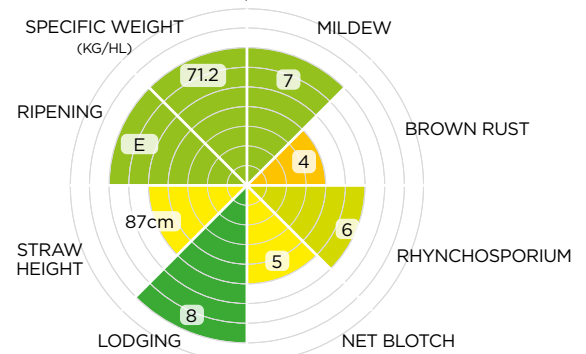
## Valerie [UK] Two-row conventional feed

Senova 207-589 x Sandra

Yield as a percentage of controls (AHDB RL 2023):

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

With excellent grain quality, early maturity and similarly strong straw to Orwell, Valerie has found favour with many growers, particularly those who grew KWS Cassia for similar reasons. Valerie will appeal to mixed farms where bold grain for on-farm feeding is desirable.



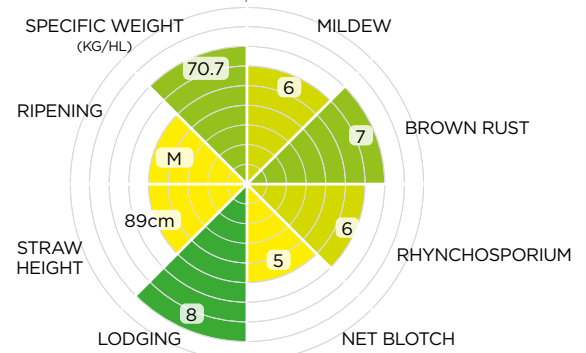
## Craft [UK] Two-row conventional malting

Syngenta SY208-56 x SY Venture

Yield as a percentage of controls (AHDB RL 2023):

UK: 94% East: 94% West: 94% North: 94%

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 1.71%, with a good specific weight and lower screening levels.



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



# Winter Barley 2023/24

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

[ ] = limited data # = Hybrid variety

\$ = carry tolerances to barley yellow dwarf virus (BYDV)

	Fungicide-treated grain yield (%treated control)							Grain Quality		Agronomic features					Disease reistance					
	Frontier seed production	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)	Specific weight (kg/hl)	Screenings (% through 2.25 mm)	Resistance to lodging without PGR (1-9)	Resistance to lodging with PGR(1-9)	Straw length without PGR (cm)	Straw length with PGR (cm)	Ripening (days +/-KWS Orwell)	Untreated grain yield (% treated control)	Mildew (1-9)	Brown rust (1-9)	Rhynchosporium (1-9)	Net blotch (1-9)	BaYMV
Two-row malting																				
Buccaneer	-	100	101	[97]	[102]	99	[99]	70.3	2.2	-	7	[99]	90	+1	+87	6	-	7	[6]	R
Electrum	-	96	96	96	96	96	97	70.5	2.3	7	7	98	90	-1	+79	6	7	5	5	R
Craft	Y	94	94	94	94	95	95	70.7	2.2	7	8	96	89	0	+79	6	7	6	5v	R
Two-row feed																				
LG Caravelle	Y	106	109	[105]	[104]	103	[106]	71.8	1.5	-	7	[93]	85	0	+89	7	-	g	[5]	R
Bolivia		104	105	[104]	[102]	104	[104]	70.2	1.1	-	8	[91]	89	0	+89	7	-	6	[6]	R
KWS Tardis	Y	103	105	102	102	102	[1]	70.6	1.7	8	8	95	85	0	+85	5	6	6	5	R
Bolton	Y	103	105	101	102	103	105	69.9	1.5	7	8	94	83	0	+86	6	6	5	5	R
Lightning		103	104	102	103	102	103	69.4	1.9	[6]	6	92	88	0	+90	7	8	7	5	R
Bordeaux		103	105	101	102	102	104	71.1	1.2	7	8	93	84	0	+83	6	6	4	5	R
LG Mountain	Y	102	102	102	101	102	102	71.1	1.9	6	7	91	84	-1	+83	5	7	5	5	R
LG Dazzle		101	104	99	101	102	104	69.5	1.9	[7]	7	93	85	1	88	6	8	7	5	R
Surge		101	102	100	99	100	103	70.6	1.7	7	7	92	85	0	88	5	8	7	5	R
KWS Hawking		100	102	99	98	99	102	69.8	2.0	7	8	95	86	1	83	6	7	6	5	R
KWS Orwell		100	100	101	98	99	101	69.3	1.8	7	8	94	86	0	82	3	7	6	5	R
Valerie	Y	99	100	97	100	99	[100]	71.2	0.8	7	8	93	87	-1	78	7	4	6	5	R
California		98	100	97	94	96	[99]	69.1	2.2	7	7	96	91	0	80	6	6	6	5	R
KWS Cassia		97	97	97	95	95	99	72.4	1.5	7	7	95	90	0	82	5	7	5	5	R
Six-row feed																				
SY Thunderbolt#	Y	106	106	108	105	104	107	70.9	2.1	5	5	111	104	-1	89	7	6	6	6	R
SY Kingsbarn#	Y	106	106	106	107	105	105	70.9	1.4	6	7	111	104	0	85	7	5	6	5	R
SY Kingston#	Y	106	105	107	106	106	104	70.7	2.7	6	5	117	107	-1	88	8	6	6	6	R
SY Canyon #		106	106	107	105	105	105	71.7	2.0	[7]	5	115	107	0	91	7	7	6	5	R
Belmont#		106	105	105	104	104	69.9	2.6	6	6	112	106	0	78	6	5	7	5	R	R
SY Nephin#		105	106	[103]	[105]	104	[104]	71.4	3.1	-	6	[110]	102	0	90	6	-	8	[5]	R
Belfry#		104	104	104	104	103	104	69.7	2.6	7	7	109	102	0	88	6	6	7	5	R
Bazooka#		104	104	103	104	103	105	70.5	2.4	6	6	117	108	0	84	5	5	7	5	R
SY Buzzard#\$	Y	104	[106]	[100]	[103]	-	-	69.7	-	[7]	[8]	-	[112]	0	[84]	6	5	7	6	R
KWS Feeris\$		103	103	103	100	101	105	69.8	1.2	[8]	7	100	95	0	85	4	6	6	6	R
Funky	Y	102	101	103	103	102	102	70.0	3.5	8	7	95	91	-1	88	5	7	6	5	R

# Winter Oats

## 2023/24 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.

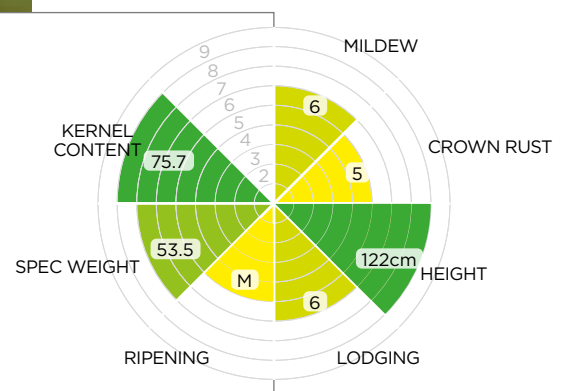
Key characteristics for winter oats are high yield, stiff straw and good kernel content for the milling market.

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

### Mascani [UK]

#### Senova

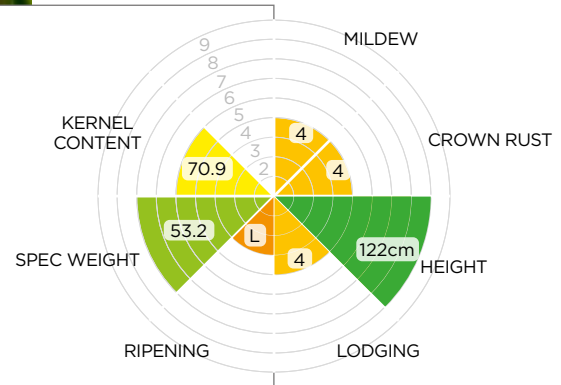
The leading variety across the UK and well liked by all end users. The variety has good winter hardiness and low screenings. Yields are a bit behind the best but its consistent performance and good specific weight will keep it in the market for a few more years.



### Gerald [SCOT]

#### Senova

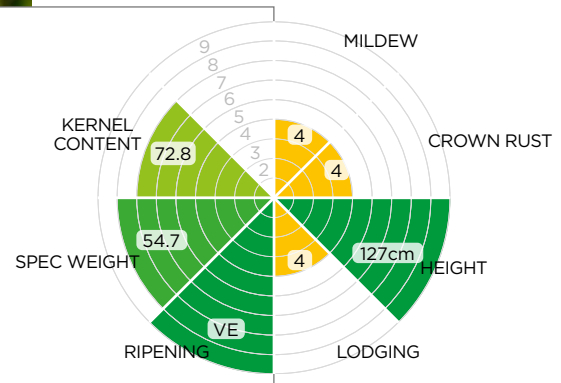
Despite the market leading position of Mascani for the UK as a whole, Gerald has been the clear favourite for the Scottish market due to its consistent performance, good specific weight and stiff straw.



### 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

## 2023/24 Varieties

### Frontier preferred varieties

#### Considerations for 2023

##### 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.





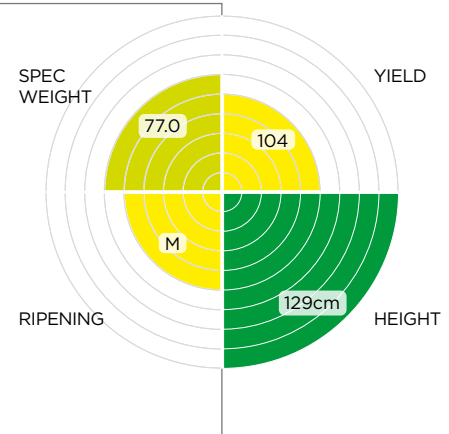
## KWS Tayo

### KWS

Exceptional harvest index (ear size) resulting in the highest grain yield of any trialled 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.



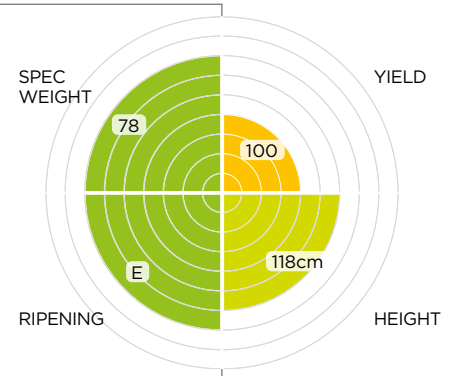
With the highest yield potential, lowest lodging scores, best resistance to brown rust, not to mention suited to almost all soil types, KWS Tayo is the 1st choice for both grain production and AD.



## KWS Bono

### KWS

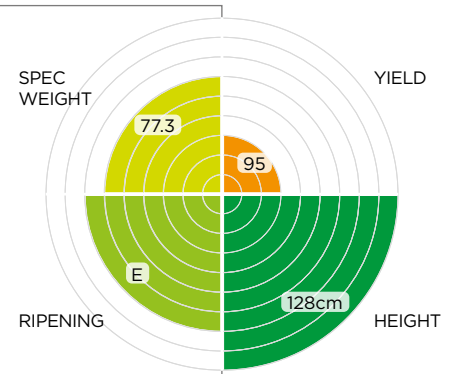
A widely grown and well liked variety, KWS Bono provides a useful contrast to KWS Tayo in several areas. It is significantly earlier to mature, allowing a spread of dates for optimum harvesting when used alongside a later maturing variety like Tayo. It is also shorter and stiffer than other hybrid rye 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 2023 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*)

## 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.

### **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.

**Nuello iN (formerly sold as Tiros ST) All crops**

- A biological seed treatment containing two naturally occurring bacterial strains, co-applied with a prebiotic biostimulant. Nuello iN was formerly sold in the UK under the brand name Tiros ST.
- Nuello iN works within the plant to take freely available nitrogen from the atmosphere and convert it into a form that the crop can readily use. This can help provide improved N to the plant and give greater flexibility to the timing and quantity of nitrogen applications.
- Alongside these nitrogen efficiency benefits, Nuello iN also provides benefits to germination, root and shoot weight, establishment, and green leaf area.

**Cereal seed treatment compatibility**

	Single purpose treatments (SPDs)				Enhanced seed treatments			
	Beret Gold	Rancona i-Mix	Vibrance Duo	Prosper ST	Nuello iN (Tiros)	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.



# 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.

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 @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.

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Frontier is grateful to AHDB and all other organisations involved for allowing us to use their 2023/24 Recommended Lists.

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