KWS UK

2024 Hybrid Rye Guide

SEEDING THE FUTURE SINCE 1856





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Hybrid rye: The cereal with much to offer

KWS Group is the leading breeder of hybrid rye, with a long term hybrid breeding programme established in the mid-1980s. We offer varieties for wholecrop (as silage, or AD/biogas feedstock) or grain production (for feed grain, flour and distilling). KWS believes this highly productive cereal offers new perspectives for farmers and end-users alike.

Thanks to its adaptability, hybrid rye has the potential to slot into most farming rotations.

Hybrid rye can be integrated into crop rotation systems effectively. Its flexibility allows farmers to rotate it with other crops, which helps in preventing soil depletion, managing pests and diseases, and improving overall soil health.

Hybrid rye has excellent straw yields making it ideal for livestock farmers who need their own straw or could offer an alternative income stream by selling the straw. The UK has a variety of markets, from grain for animal feed to more niche grain markets including distilling and rye bread flour.

Over recent years rye has become popular in being grown for whole crop to go into AD plants. Its large above ground biomass and a larger ear compared to conventional

varieties means that hybrid rye has the perfect plant architecture for this market.

Hybrid rye has an aggressive, deep rooting system, making it suitable for light land that is drought prone but still yields well on heavier land. This rooting system not only helps with water uptake in difficult seasons but also nutrient scavenging.

Rye typically has a nitrogen requirement of 120-150Kg per hectare which offers a big financial saving throughout the season and may be beneficial to those growers who are looking at reducing their carbon footprint.

Rye requires a robust PGR program due to its tall height. Its main disease threats come from brown rust and sometimes mildew. Always consult your agronomist, but rye is likely to have a lower fungicide cost than other cereal crops.



To view our current portfolio of varieties, scan the QR code or visit www.kws-uk.com



BREEDING

Why hybridise rye?

Although rye is a cereal just as wheat and barley is, there is a significant difference: Rye is a cross-pollinator while wheat and barley are self-pollinators. During the time the flower is open it is susceptible to ergot infection. Ergot sporangia over-winter in the field and germinate in the spring leaving the crop vulnerable to infection.



Hybrid Rye (left) v Winter Wheat (right)

Making rye into a hybrid was the most effective means of addressing this problem. While the process involved is complex, it is less so than in the case of wheat or barley because Rye has a shorter DNA sequence. By hybridising rye, KWS was able to influence several important aspects of the crop.

First, it was able to rapidly increase yield potential through influencing the number of grains produced per ear to the extent that the yield progression of hybrid rye outstrips that of conventionally bred cereals; and second, it could reduce the risk of ergot infection occurring through a reduction in the time taken for fertilisation to occur.



Combining Hybrid Rye – yields of 10 – 13 t/ha are typical even when grown as a 2nd or 3rd cereal in the rotation

What have we brought to the market?

The yield benefit of hybrid over conventional rye cultivars types has increased by almost 20% since the early 2000's and by over 45% since the 1980's – the start of hybrid rye breeding activities. Between 2009 and 2019, we have achieved a 10% grain yield improvement thanks to our breeding efforts. **Two major projects which have contributed to this increase are:**

Reducing the ergot risk with PollenPlus®

PollenPLUS[®] technology from KWS ensures significantly improved pollen formation in hybrid rye and effectively strengthens the plants' resistance to ergot.

The increased pollen shedding from the rye ear increases the potential of the ear being fertilized by the rye pollen, the glumes close sooner thus reducing the potential of ergot filling the grain site instead.

For KWS, the continuous improvement of ergot resistance is the most important breeding target, besides grain yield and stability of modern hybrid rye varieties.



PollenPlus®: The amount of pollen released by PollenPlus® hybrids (right) v a competitor hybrid (left)

Larger ear development

The ear contributes roughly 50% of the final yield of a rye crop. Breeding advances have focused on improving yields through bigger ears.

A key feature of modern hybrids is a higher harvest index (grains/ear). Improvements in varieties has led to a longer ears with more grain sites.



What's in the pipeline?



Dwarf hybrid rye

Dwarf hybrid rye has been selectively bred to have shorter stature compared to traditional rye varieties. This dwarfing trait represents an advancement in rye breeding, it is a new segment for KWS.

The advantages of dwarf hybrid rye include:

- PollenPLUS[®] technology; reducing ergot risk
- Reduced N requirement
- Yield stability
- Reduced lodging risk

We currently have two varieties that have been entered into National List Testing. .Early trials have shown they have a similar yield to KWS Tayo, the current yield benchmark for KWS in the UK.

Forage varieties

Hybrid rye silage is a high energy, nutrient dense feedstuff that provides high quality soluble fibers critical to rumen health and animal performance.





Forage (Early Cut)						
Harvested in flag leaf/ear emergence stage						
Focus on protein yield						
Farly harvest with maize following						





What are the benefits of hybrid rye?

Hybrid Rye delivers a range of rotational and management benefits, including:



High grain yields

Many growers have found it outperforms wheat and barley as a second or third cereal. A focus on breeding is delivering yield gains of about 1-2% each season.

Spreads seasonal workload

A fast-growing crop with a long drilling window that spans mid-September through to early November means it can be sown when conditions suit, and time allows. Harvest is typically early too. For grain, maturity falls after winter barley, but before winter wheat making it an attractive choice ahead of oilseed rape. Alternatively, it can be made into whole-crop silage, typically in June.

High straw yield

Modern hybrids are being selected for shorter stem lengths in exchange for a higher harvest index, however straw yield remains around 25 – 30% higher than wheat or barley – a useful additional income on farm.

Exceptional drought tolerance

A water requirement of around 25% less than wheat or barley of only 300 litres (400 for wheat) of water per tonne of grain / per hectare makes hybrid rye better suited to light land or drought prone regions.

High Take-all Resistance

Rye is highly resistant to take-all and is considerably better than triticale and significantly better than wheat. Only oats have zero take-all carryover.



Source: Rothamsted Research

Reduced Inputs

Rye requires significantly less nitrogen than other cereal crops and less fungicide too.

Minimal Ergot risk with PollenPlus®

KWS Hybrid Rye's produce immense quantities of pollen cutting the time needed for fertilisation to occur from several days to a matter of hours. The effect of this has been to significantly reduce the risk of ergot infection. Since the introduction in modern hybrids ergot infections has been virtually eliminated. KWS produces only 100% F1 seed to maximise ergot defence.



Hybrid rye requires around **25% less water / ton of grain yield** (300 ltr / t) than winter wheat (400 ltr / t).



If the pollen count is low, ergot spores can penetrate the stigmas of the rye.



This results in an ergot infestation, which can jeopardize the harvest. The PollenPLUS® technology ensures greater pollen counts that repel floating ergot spores.



The result: a strong and healthy rye harvest!

AGRONOMY



Drilling and establishment

Best locations to drill rye

Due to its strong root system, rye grows well in drought prone locations, and is one of the most resistant and robust cereal species.

Rye can germinate in low temperatures (1-2 °C) and growth begins at temperatures of 1-3 °C. This allows rye to continue its growth even in very cold phases of winter and to regenerate guickly in the spring. It has the highest frost tolerance of all cereals and survives frosts up to - 25 °C.

Rve is suitable for low rainfall areas (ie less than 650mm / year), but can be very successfully grown in higher rainfall areas, due to its low susceptibility to Septoria.

Rye will thrive on light and sandy soils, but will lose tillering capacity in heavy or clay based soils, where slug damage can occur.



Position in the rotation

Rye has the flexibility to be placed in multiple positions in the crop rotation, its deep rooting gives it a natural able to scavenge for nutrients, as well as a low take all index makes it a suitable 2nd or 3rd cereal option. The graph below shows data from trials we have run from 2021-2023 highlighting rye's yield performance particularly as a 3rd cereal option vs wheat and barley.



Average Yield of Crops in Different Rotational Positions

Seedbed and drilling

Rye is particularly sensitive to un-even or poorly aerated seedbeds. The primary shoot (coleoptile) must break the soil surface from a shallow depth. Soil tillage should be carried out in as dry soil conditions as possible. If the seedbed is prepared when the soil is too moist, the seed is deposited irregularly and above all, too deep.

Rye benefits particularly from even seedbeds that have been ploughed and pressed. This is particularly important in second rye crops, to reduce ergot contamination risk to a minimum.

To get the best establishment with hybrid rye – ensure optimum drilling depth is set to 2-3cm. Yield can be suppressed at depths deeper than 4cm. Rye seed is guite small and not very vigorous at germination, so it is best to sow the seed shallower than you would for other cereal crops.

Ensure adequate soil cover and drill into soil moisture for a faster germination. Soil consolidation is essential to improve seed to soil contact, help reduce slug movement and reduce the risk of damage from soil acting herbicides.

Drill date and seed rate

Depending on the location, the ideal sowing date is between the end of August and mid-October. The optimum period for sowing ranges between 5th to 25th of September.

Seed Rate m ²	Hectares Drilled / 12 M. Seed Unit.				
175	6.9				
190	6.3				
200	6.0				
210	5.7				
220	5.5				
230	5.2				
240	5.0				
250	4.8				
260	4.6				
270	4.4				
290	4.1				
300	4.0				

Hybrid Rye is supplied in 12 million seed packs, depending on thousand grain weight the actual weight of the pack can vary. Based on a seed rate of 200 seeds per m2 1 pack should cover 6Ha.

If increasing/decreasing the seed rate then 1 pack will cover a different hectarage, see the table below on how much a pack will cover based on your desired seed rate, so you know how many packs of hybrid rye you require.



Suggested seed rates:

- Sept: 175 200 seeds / m²
- Oct: 220 260 seeds / m²
- Nov: 300 + seeds / m²

Online Seed Rate Tool

- Use KWS' online seed rate tool to find vour ideal seed rate:
- Enter your seed rate/m²
- Enter your pack weight (see label) dep. on TGW
- Your drilled weight kg/ha is automatically calculated

Herbicide Use

In general, in the application of herbicides, it is important to observe the manufacturer's product information on the compatibility and the advice of your responsible plant protection service.

The products in some cases differ considerably in compatibility. Use only agents with good compatibility. When using especially flufenacete-containing agents, please note the good professional practice, the product and application instructions of the manufacturer in particular to the compatibility and the advice of your responsible plant protection service. Incorrect use may lead to damage to the plants and thus loss of yield.

Caution is especially important during autumn treatment after very shallow drilling, on sandy sites, in waterlogged conditions and heavy rainfall.

Agronomy, Fertiliser, Trials Data and Disease Profile

Hybrid Rye has relatively simple agronomy, requiring less fertiliser, and fungicide compared to wheat or barley.

The reason for this lies in its powerful root system, thanks to which rye can make good use of winter moisture and survive long dry periods. The key success to rye yield performance are a focus on the principle Fertiliser requirements, adequate PGR programs and control of brown rust.

Fertiliser Management

Nitrogen (N) promotes growth and has a direct effect on the development of quality features (TGW, grain count/ear). If certain yield components are to be promoted, N must be applied at the beginning of plant development. It is necessary to keep in mind that rye responds to an excessive N supply by lodging.

Nitrogen applications can be split into 2/3 timings based on crop requirements, weather conditions and location.



Below is the table for N recommendations from RB209 for winter sown rye.

Table 4.20 Nitrogen for winter-sown rye

	N recommendation (kg N/ha)							
Soil category	SNS Index							
	0	1	2	3	4	5	6	
Light sand soils	110	70	20–50	0–20	0	0	0	
All other mineral soils	150	120	90	60	30	0–20	0	
Organic soils	-	-	-	60	30	0–20	0	
Peaty soils	-	-	-	-	-	0–20	0–20	

Reduce the recommended rate by 25 kg N/ha for rye if lodging risk is high.

Main crop	Crop Offtake	Nutrient content kg t/FM N P2O5 K2O MgO					
Hybrid Rye	Grain (86% DM)	15	8	6	1		
	Straw (86% DM)	5	3	20	2		

For advice on nutrient applications to hybrid rye it is best to speak to a **FACTS** qualified advisor. The above crop offtake figures are an indicative example only.

Rye straw volumes are quite large and **P & K** offtakes are higher than those listed in **RB209** for other cereals.



Specific nutrient removal figures for **P**, **K**, **Mg0** and **Sulphur** are not currently published in RB209.



Timing of N applications

First application:

Rye can be quite quick to move through its growth stages in the early spring. It is key to get the first dose on early to encourage tillering and tiller survival. The first dose should be applied between GS21-25 if conditions allow. The amount of nitrogen applied at this stage should be between 40-80Kgs N/Ha, depending on the development of the crop.

An excessively high initial N application can negatively affect the crops standing ability as well as potential lead to nutrient losses in the environment depending on weather conditions. Only in weakly developed crop stands (less than 2 tillers per plant) should more than 30% of the total nitrogen be applied.

Second application:

The second application should be made at the start of stem extension, around GS29-32. This will have an impact on the effect of tillers surviving to produce ears and the number of grains per ear. Nitrogen and water deficiency in this period can lead to a reduction in ears developed and thus a reduction in yield. The quantity of Nitrogen should not exceed 50% of the total amount.

Third application:

Where there is adequate water supply, the crop may benefit from the final 3rd of the nitrogen total being applied between GS39-49 to help influence the formation of storage cells in the grain. Ammonium based fertilsier are preferred at this point.

Other nutrient requirements

Phosphorus

Ρ Phosphorus plays an important role in the plant's energy metabolism. If phosphates are lacking, growth is inhibited and flowering and ripening are delayed. Phosphate availability is strongly influenced by pH. Mobility is highest at pH values between 5.5 and 7.0. Rye, like other cereals, absorbs 70% of its phosphate requirements in the period from the beginning of March to the end of May.

Potassium

Especially in areas with a pronounced early summer drought, an adequate potassium supply must be ensured, as potassium has a decisive influence on the water balance of the plant. Fertilisation is best done directly with the crop as NPK

(40 - 70 kg KO2/ha). With an optimal potassium supply, the water can be used efficiently by the plant, i.e. drought tolerance can be increased, and converted into yield. Potassium increases the cell strength of plants. This reduces the susceptibility to storage and fungus, which in turn has a positive effect on the yield.

Sulphur

Sulphur is crucial for S-containing amino acids and enzymes. Since the mid-1980s, air S emissions have sharply decreased, reducing plants' sulphur intake from the air. Therefore, sulphur needs to be supplemented with minerals. Applying 20-30 kg

of sulphur with the initial nitrogen application in weak crops enhances the nitrogen effect. In strong crops, sulphur must be available at the start of the shooting stage.

Rye is less susceptible to leaf diseases compared to other cereals. The most important disease in rye is brown rust. Powdery mildew and Rhynchosporium usually occur earlier, but infestation rarely increases on the upper leaf levels. Rye should be treated like a rust susceptible wheat and action taken with appropriately chemistry to control brown rust.

Brown Rust

Rye suffers from a specific strain of brown rust (puccinia recondita) - this strain is not known to cross infect with wheat or barley and rye is not affected by sp. tritici or sp. hordei either.



- Despite loss of some active ingredients the fungicide spectrum of products available for brown rust in rye is very strong; some of the newer SDHI's available are very effective, providing an alternative to a strobulurin / triazole programme.
- **T1 (GS29 30)** Early season control is essential given the autumn infections the susceptibility to secondary infections
- T2 (GS39 47) Flag leaf, this is the most important time to maximize protection
- T3 (GS 51 59) Flowering and grain fill
- Brown rust in the late season can be exacerbated by high temperatures (20 26°C and warm nights (15°C) causing yield losses in rye - grain yield (number of grains per ear and thousand-grain weight)
- Infection also impairs grain quality by reducing the protein content

Mildew

Rye is attacked by a special form of mildew - Blumeria graminis f.sp. secalis and despite being relatively easy to control in rye, mildew can cause yield losses of up to 25% in extreme cases.

Temperatures between 18°C - 20°C and high relative humidity (but no rain) are required for heavy sporulation. Under unfavorable conditions however, the infestation can stagnate, since the spores can only survive for a few days.



- Many fungicide labels include rye and there may be EAMU's in place for others
- Farmers and agronomists are advised to check the latest information directly with chemical manufacturers

S

Septoria tritici

Septoria tritici is the most important foliar disease on winter wheat in the UK - however there is growing concern around the loss of some key active ingredients and slippage in performance of others.

- Chlorothalonil (CTL) and its removal from use
- Concern about the continued slippage in triazole and SDHI performance
- Limited new or replacement chemistry available to date although new actives could become available in 2020
- Growers are making use of more resistant wheat varieties to underpin septoria control

Evidence to date indicates that hybrid rye offers an alternative but complementary option to septoria control that may help spread the workload, especially in a difficult spraying season.

Hybrid rye is a completely different species and does not seem to suffer significantly from septoria (either *tritici* or *nodorum*) thus offering an extra benefit to those considering growing the crop.

Rhynchosporium

Rhynchosporium is one of the main diseases of winter barley, but rye is also affected by this pathogen. On winter hybrid rye, the lower leaves are usually affected. However, epidemic spread to upper leaves rarely takes place, since rye expresses a powerful stem elongation and is able to outgrow any leaf damage caused.



Rye can also be affected by **Snow Mould** (*Microdochium nivale*) but this is not typical under UK conditions.

There is a potential for rye in the rotation to help on farm control of two of the most topical diseases in UK cereal cropping.

Ramularia

Chlorothalonil (CTL) and its removal from use also concerns barley growers worried about controlling ramularia (*ramularia collo-cygni*) without future multi-site fungicide activity in the future becoming a possibility – so called "evolved resistance" may increase to the disease especially affecting barley production, although newer actives with more specific modes of action may offer some "ramularia relief".

Rye is not immune but does not suffer to the same extent as barley, as the leaf area (20%) is not so important for yield-generation in rye compared to the stem (57%) and ear (23%) which might be an extra benefit to rye in the rotation.

Given the regulatory pressures on existing fungicides including those responsible for control of both septoria and ramularia – hybrid rye can offer an opportunity for extended rotational control and more diversity in the on farm cereal rotation.



Fusarium free (left) and infected (right) rye grain

Fusarium

Fusarium ear blight is a fungal disease of all cereals, including wheat, barley, oats, rye and triticale and affects both the yield and feeding quality of the harvested grain.

- It is often associated with contamination by mycotoxins, and can result in high levels of DON (deoxynivalenol) present in the harvested grain.
- Over several harvests measuring the average DON content in harvested wheat and rye samples between 2006 -2015, it has been determined that rye has significantly lower DON values compared to wheat. (see graph)

Average DON content in harvested wheat and rye samples 2006 -2015 (Bavarian State Institute for Agriculture (2017)



Source: Average DON content in harvested wheat and rye samples 2006 -2015 (Bavarian State Institute for Agriculture (2017)

Timing of fungicide applications

Depending on location, climate and disease pressure, usually rye requires less fungicide inputs than both wheat and barley.

Rye builds it yield very differently to wheat with the stem and the ear contributing a lot to final yield, and the flag leaf contributing significantly less than wheat. With rye it is important to keep the upper 3 leaves and stem free from infection up to milk development in the grain.

To help minimize the risk of brown rust the following measure should be considered:

- Destruction of volunteer cereals
- Well managed nitrogen programme
- Variety choice
- Avoid early sowing if possible

A 3 spray program may be required depending on the season and disease pressure with the timings giving below:

T1: GS29-30 – early season control T2: GS 39-47 – protect yield and maintain grain quality T3: GS51-59 – protect yield and maintain grain quality

Using a combination of triazoles, strobilurins and SDHIs, the T2 timing is the most important to protect against brown rust late in the season. Treatment during flowering is not recommended for cross pollinated rye as this increases the risk of ergot infection. In crops destined for wholecrop a T3 spray would not be economically viable and not required.





Scottish Agronomy and KWS Fungicide Programme Trial SAG Central Site H23



Presented below are the 2023 grain yields and specific weights for hybrid rye grown using different fungicide programmes at Scottish Agronomy's Central Trial Site.

Programme	T1 GS 31-32	T2 GS 39-45
1	Untreated	Untreated
2	Proline 0.35L	Proline 0.35L
3	Prosaro 0.8L	Prosaro 0.8L
4	Revystar 0.75L	Revystar 0.75L







PGR Recommendation

Rye varieties are renowned for being tall crops with early vigorous growth. Both of these attributes require PGR management to ensure full yield potential can be achieved and maintained through to harvest.

As a tall crop with a large ear, rye can exert a large leverage force on the stem and root plate. This can lead to root lodging if no control measures are taken. Most anchorage strength develops between growth stages 30-39. It is between these stages that applying a robust PGR to the crop will increase the root plate spread, providing better anchorage against root lodging, and shorten the internodes, which will reduce plant height, and therefore reduce the leverage force which can be exerted. PGRs at this timing will also thicken the stem wall, strengthening the stems to further assist in the management of lodging.



Rye crops move through the growth stages earlier than other winter cereals in the UK. When rye is at GS30 it can still be early in the spring and conditions may be cool and cloudy. Product that has good performance in colder conditions may be beneficial at this timing.





Wholecrop or rye for grain?

KWS hybrid varieties are classed as dual purpose meaning they are suitable for the two main end markets: whole crop or grain.

Wholecrop Rye

The ear contributes to roughly 50-55% of the final whole crop yield so by producing varieties with more grains per ear, KWS has been able to make improvements in yield since we hybridized our portfolio. With a number of anaerobic digestion plants being built in recent years, the demand for green material to feed these 'concrete cows' has risen. The area of rye grown for AD plants has risen rapidly, as rye helps to spread the workload during the season with other feed stocks such as maize and energy beet. Rye poses a lower risk to soils as it is sown into good ground conditions in the autumn and harvesting is in June where the weather is more stable compared to maize harvests in the autumn.

Hybrid rye for wholecrop also offers potential to be included in ruminant rations for beef finishing or dairy cow in modern year round calving diary systems. See the graph below of some of KWS hybrid rye varieties in a wholecrop yield trial.

Average Whole Crop Yield of Varieties



Source: Agrii whole crop yield trials H23 York and Aberdeen sites



Rye for grain

Fructan

Phytase

There are a few market options for rye being grown for grain, namely: animal feed, flour and distilling. KWS has conducted a lot of research into the benefits of using rye in animal feeds in recent years, of which the outcomes are highlighted over the next few pages.

Rye nutritional composition and benefits in pig rations.

Hybrid rye is inherently high in fructan, native phytase and together with its highly digestible lysine profile, offers excellent properties for pig nutrition.

Fructan is a storage carbohydrate digested

production which promotes intestinal health.

All common cereals contain an intrinsic level of the enzyme phytase, which acts as to

supplementation has increased in pig diets

to lower the need for mineral phosphate

break down phosphorus in the ration.

Over the past 10-15 years, phytase

in the pig's hind gut, it supports butyrate

slurry are both a benefit to the soil indices remaining manageable, and reducing eutrophication of water courses.

Precaecal digestibility of Lysine

Lysine digestibility can be defined as either total tract or precaecal, depending on whether the undigested nitrogen is measured in the feces (total tract) or ileal (precaecal) content.

Lysine from rye has a higher precaecal digestibility compared to wheat, leading to reduced non-digested nitrogen and ammonia loss.



Data sources:

1) HPLC LfL Sachsen - 2017 (measurement of native phytase activity) at 88% DM

2) Rodehutscord et al - 2016

3) Rodehutscord et al - 2016, DLG 2014

*Graph percentages are percentage increase vs. wheat

Other references:

Application of resistant starch in swine and poultry diets with particular reference to gut health and function. A. Regassa, C. Nyachoti, Department of Animal Science, University of Manitoba, Winnipeg, Canada – 2018 Apparent and standardized ileal digestibility of AA and starch in hybrid rye, barley, wheat, and corn fed to growing pigs

McGhee, Stein. Department of Animal Sciences, University of Illinois - 2018

Latest findings on the use of rye in modern pig feed

Feeding concepts for fattening pigs are often primarily based on wheat, triticale or corn. The latest research shows that the use of high levels of rye in diets for fattening pigs has various advantages in relating to its high-fiber content (fructans and arabinoxylans).

Improved animal welfare with rye feed



Own representation (KWS LOCHOW, 2020)

Other positive effects of rye feed:

- High energy content
- Highest grain phytase activity
- High daily grains

- Great carcass quality
- Improved animal health and welfare
- Product safety due to low Fusarium



Field study on rye feed

Animal welfare is becoming an increasingly important issue for farmers. In addition to husbandry, species-appropriate animal nutrition can promote animal welfare and food quality. For this reason, Viehvermarktungsgemeinschaft Aller-Weser-Hunte eG, in cooperation with KWS Getreide, launched a field study in spring 2017 to investigate the benefits of rye in the fattening of pigs.

The aim of the project is to optimize the economics of fattening farms and increase animal welfare through the use of rye feed.



- 40% rye in the finisher diet (5% in the starter phase, 20% in the grower phase)
- 25% barley
- The rye is ground as coarsely as possible
- The lysine/energy ratio should be at least 0.75 g/MJ ME

Criteria compliance was verified by LUFA in Oldenburg.



The farm managers were able to achieve significantly lower Salmonella levels together with reduced boar taint, while animal performance remained the same and carcass traits were good. This is a great advantage for all parties involved and these rewards are likely to pay off even further. Conditions that require no docking or castration are very likely to become an issue in the future, and without a feeding concept of this nature these conditions will be difficult to meet.

Wilhelm Behrens Managing Director, Viehvermarktungsgemeinschaft Aller-Weser-Hunte eG

Reduced Salmonella levels at the trial farms

Salmonella rates were reduced by up to 50% across all farms.

Maximum*

Decreased Salmonella levels due to rye feeding.



Salmonella status of all 9 farms in field study until 31.12.2019; n = 117,455 (KWS LOCHOW, 2020

Results for individual farms using the specified feeding concept:

- Reduction of Salmonella levels by up to 50%
- Significant improvement in the Salmonella category status
- Reduction or avoidance of boar taint in boar fattening
- Simultaneous high performance spectrum (> 800 g daily gains)
- Calmer animals due to uniform satiation

Recommendations for using rye in feed.

The key factor is the composition of the ration and what should be replaced. To achieve measurable effects when using rye in feed, the minimum application quantities should be observed.



Own representation based on information from the field study and Wilke 2020, KWS LOCHOW 2020) ¹Verlied in the field study with approx. 12:0:00 animals ¹Verlied by the University of Verlingary Medicine Hannover

Using rye in feed for laying hens

In 2022, in conjunction with Jonathan Stokes and Harbro a trials was conducted to look at the effect of feeding hybrid rye vs wheat & barley to laying hens on performance, hen health and egg quality. Some of the data with conclusions are outlined below.

Average overall	Rye						
per week	# Samples	Average	SD	# Samples	Average	SD	p-value
Total eggs	58	44538	8806	58	45359	9548	0.179
% seconds	56	1.95	1.09	56	1.34	0.67	0.002 *
Egg weight	60	60.9	11.7	58	62.6	3.4	0.948
Water consumption	60	142.1	34.7	60	158.5	26.2	0.003*
% mortality	60	0.13	0.11	60	0.22	0.17	0.008*

*= significant (p-value<0.05)

Diet had no significant impact on average weekly measures of total eggs or egg weight. However, birds fed rye on average per week had significantly higher % seconds, lower water consumption and lower mortality.

Conclusions:

- Birds fed a rye-based diet showed no difference in performance in terms of egg weight, shell strength or yolk pigment in comparison to those on a non-rye diet.
- There was an effect of flock age on egg weight and shell strength in both houses of birds, ie across both treatment groups, which is expected in line with existing data.
- Egg weight, shell strength and yolk pigment were impacted by worm burden and/or deworming, but recovery was demonstrated after anthelmintic treatment.



"I farm 104,000 free range laying hens. I was keen to look at feeding rye to my hens in conjunction with Harbro. They home mix and do the nutrition for me.

Over the year we started feeding rye at 5% and increased it to 25%. We fed 8,000 birds on this rye inclusion and had 8,000 birds on a normal ration. Each group performed remarkably similarly in terms of egg numbers, egg guality and litter.

The positives of feeding rye were definitely financial, the key challenge was storing an extra ingredient."

Jonathan Stokes C Stokes & Son

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