

Sugar Beet Guide 2021

The best varieties for the UK

NEW! WITH
CONVISO®
SMART

SEEDING
THE FUTURE
SINCE 1856



Welcome to KWS' Sugar Beet Guide 2021

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

The rate of yield improvement has been a cornerstone of sugar beet breeding for many years and the bar has raised with high yielding varieties such as DAPHNA now part of the control group.

But with more on offer from KWS than just varieties to support you and your crop through the growing season we've changed the format of our traditional Variety Guide to provide you information about:

- Sugar Beet Varieties for 2021 drilling
- CONVISO® SMART varieties
- EPD 2.0 seed treatment
- Beet Seed Service
- Beet Cyst Nematodes
- Virus Yellows
- Beet Leaf Scan App

We hope you find the Sugar Beet Guide 2021 useful and informative.

Good luck for a safe and productive crop in 2021

Ben Bishop
Country Manager Sugar Beet UK



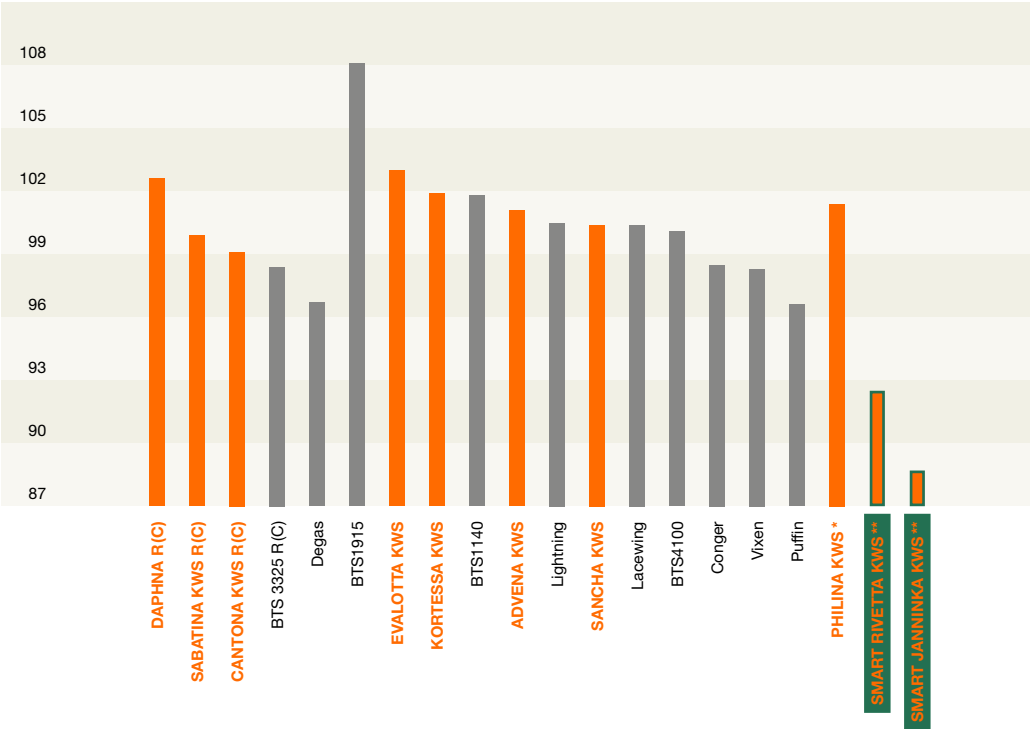
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Sugar beet varieties for drilling in 2021 – Adapted from BBRO recommended list of Sugar Beet varieties 2021																							
Rz1 rhizomania varieties						NEW	NEW							NEW	NEW	NEW					NEW		
	DAPHNA	SABATINA KWS	CANTONA KWS	BTS 3325	Degas	BTS1915	EVALOTTA KWS	KORTESSA KWS	BTS 1140	ADVENA KWS	CATRIONA KWS	ELDORANA KWS	Lightning	SANCHA KWS	Lacewing	BTS4100	Conger	Vixen	Puffin	PHILINA KWS	SMART RIVETTA KWS	SMART JANNINKA KWS	
Status: (C) = control variety ¹	R (C)	R (C)	R (C)	R (C)	R	PR1	PR1	PR3	PR3	PR2	PR1	PR1	PR2	PR1	PR1	PR1	PR2	PR2	PR2	PS3	PS1	PS1	
AYPR/BCN/ALS (per Breeder Claim)	BCN	–	BCN	–	–	–	–	–	–	–	–	–	–	–	BCN	–	–	–	–	AYPR	ALS	ALS	
CROP YIELDS	MEAN																						
Adjusted tonnes % of C=100 % ²	118.1t/ha	102.6	99.9	99.1	98.4	96.7	108.1	103.0	101.9	101.8	101.1	100.7	100.6	100.5	100.4	100.4	100.1	98.5	98.3	96.6	101.4	92.5	88.7
Sugar yield % of C=100 % ²	18.1t/ha	102.8	100.2	98.9	98.3	96.7	108.2	103.0	102.2	101.8	101.1	100.8	100.5	100.9	100.3	100.2	99.6	98.9	98.9	96.7	101.5	92.7	88.9
Root yield % of C=100 % ²	101.4t/ha	104.3	101.7	98.0	97.3	96.8	108.8	102.9	103.5	102.4	100.3	101.5	99.5	103.8	99.8	99.1	97.1	100.3	101.0	97.4	102.4	93.6	89.6
Sugar content %	17.8 %	17.6	17.6	18.0	18.0	17.8	17.7	17.8	17.6	17.7	18.0	17.7	18.0	17.3	17.9	18.0	18.3	17.5	17.5	17.7	17.7	17.6	17.7
BOLTERS per 100,000 plants/ha	MEAN																						
“X” Unsuitable for sowing BEFORE Mid March for new (2021) list	–	X	–	–	X	X	X	–	X	–	–	–	–	–	X	–	–	–	–	X	–	–	
Early sowing, before 5 March ³	2,199/ha	2,690	3,457	3,256	1,780	4,058	8,484	3,498	1,972	4,495	2,681	1,265	2,083	3,295	1,667	4,916	1,570	2,034	1,871	1,716	6,278	1,564	2,733
Normal sowing	16/ha	9	16	7	9	50	0	0	7	35	9	0	0	0	0	9	0	0	9	0	26	67	0
PRE-GAPPING ESTABLISHMENT ⁴																							
Control	100 %	98.9	101.0	100.7	99.2	101.5	103.7	102.5	100.2	100.0	99.6	98.1	100.1	102.4	100.6	102.3	98.6	99.7	101.3	101.2	102.3	95.2	98.6
DISEASE 1 = high; 9 = very low (leaf infection) ⁵																							
Rust	4.3	4.3	4.9	4.3	3.8	6.0	(8.7)	(2.2)	7.7	5.0	(3.6)	(1.4)	(1.7)	(5.9)	(4.1)	(3.6)	(4.3)	(5.1)	(5.5)	(4.4)	3.0	(3.4)	(3.7)
Powdery mildew	5.5	5.6	5.0	5.8	5.5	2.5	(4.2)	(4.2)	5.7	4.6	(3.6)	(5.6)	(5.1)	(4.8)	(3.9)	(4.0)	(2.9)	(5.1)	(3.7)	(4.2)	4.6	(5.4)	(3.0)
Mean of control values include BTS 860 which is no longer listed.																							
¹ Newly listed varieties (PR1/PS1) have results from three years using approximately 2kgs breeders’ seed. Thereafter commercial seed should be used in RL trials. (See supplementary table).																							
² Yields based on an average plant population of 103,100 plants/ha in these trials. Differences in adjusted tonnes of less than 2.8 % should be treated with reserve.																							
³ The ratings from normal sowings are applicable for sowing after mid-March in most seasons.																							
⁴ Differences in establishment of less than 3.7 % should be treated with reserve.																							
⁵ Observations taken from inoculated trials that are not taken to yield.																							
() indicate figure derived from fewer than 3 years of data																							

Don’t miss out on yield progress!

Adjusted tonnes % of the control varieties of the BBRO RL 2021

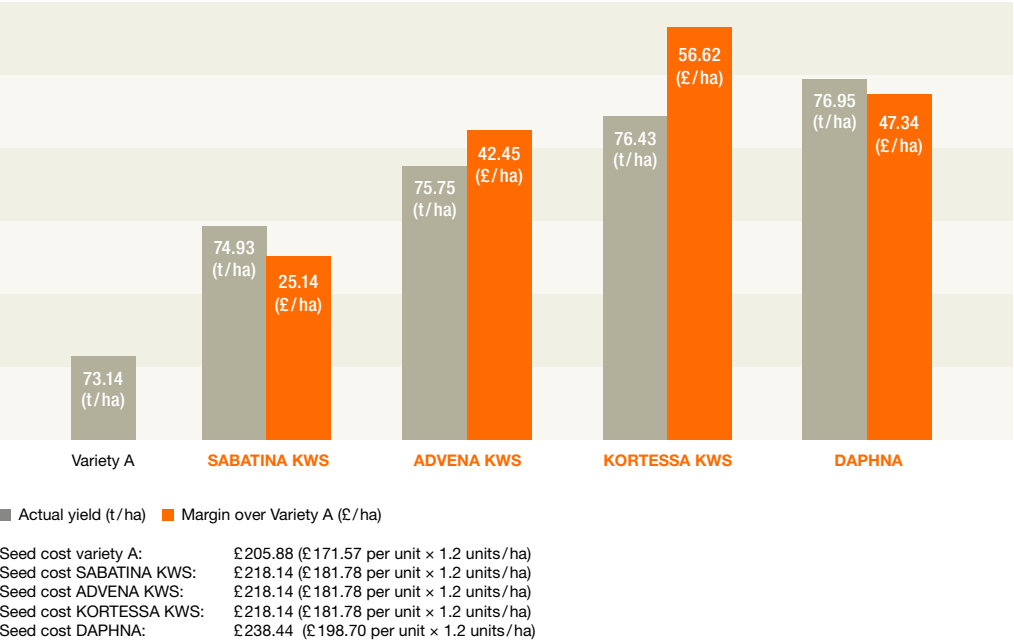


* AYPR resistant variety
** CONVISO® SMART variety

Source: BBRO recommended list of Sugar Beet varieties 2021

Margin over seed cost

What's the additional yield worth to you?



Assumed beet price: £ 20.99 per tonne
75t/ha was used as the base yield. Varieties that yield more than 100 % do yield more than 75t/ha in this example

With EPD your crop hits the ground running



EPD seed treatment is the result of years of development by KWS. In contrast to simple pre-treatment of seeds, EPD is a complete system approach which combines KWS specific seed preparation methods and seed coating components. This results in early and homogenous emergence of seed as well as improved early plant vigour – essential to a high yielding crop.

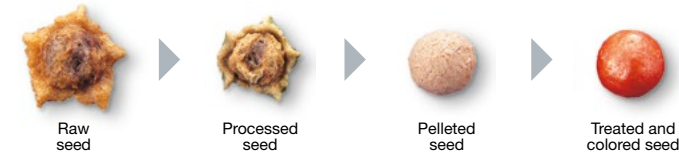
The benefits of choosing EPD for your sugar beet

- Fast and even germination
- Fast and even field emergence
- Early and rapid plant development for early plant vigour
- The best start to reach plant maturity and fast row closure

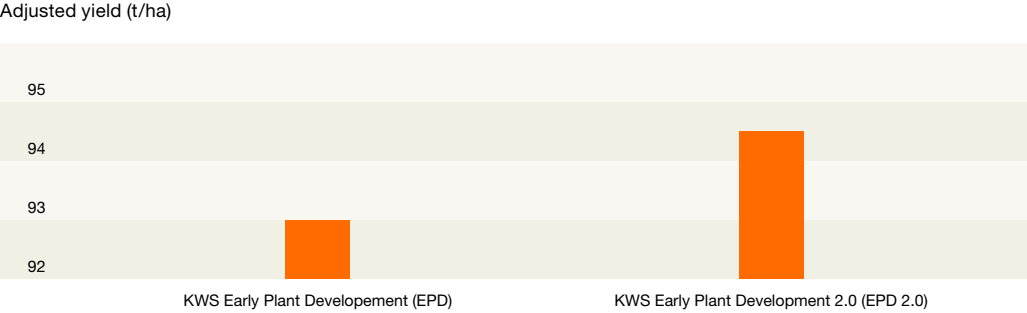


The KWS seed technology

The KWS seed lot specific processing and pelleting allows the highest level of quality control. Germination and emergence testing is completed under optimal and stress conditions at all stages to deliver you the best product.



Comparative performance of KWS EPD and EPD 2.0 processed seed



DAPHNA

- The first choice for BCN tolerance
- Low early sown bolters
- No need to compromise on yield

Nematode
PROTECT

SABATINA KWS

- Proven performance over the growing season
- Consistently high adjusted yields
- Good for late lifting

Leading the way in BCN tolerance

DAPHNA disproves the misconception of having BCN tolerance means lower yields.

With low bolters in the early sown window, good disease resistances and of course BCN tolerance, DAPHNA is suited to all farm situations and locations.



Still the UK's most reliable performer!

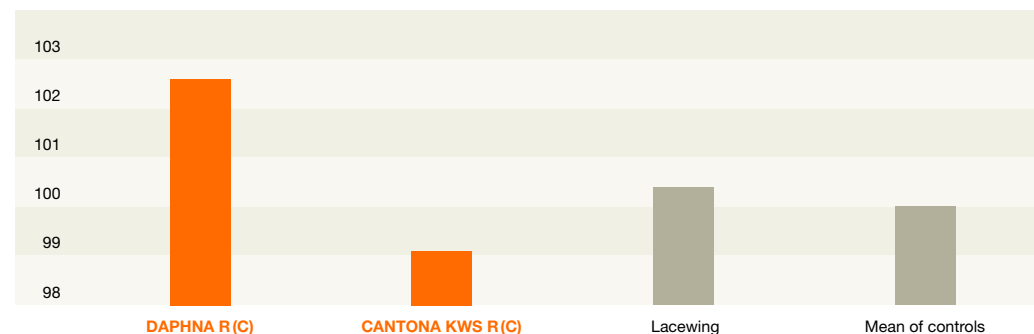
SABATINA KWS is continuing to prove a consistent variety which has gained a loyal following through the campaigns. After six different seasons on farm you can see why it has become such a popular variety.

With noted yield increases in November in BBRO trials in 2017 and 2018, SABATINA KWS is expected to be a continued inclusion on seed order forms.



No compromise to have BCN tolerance with DAPHNA

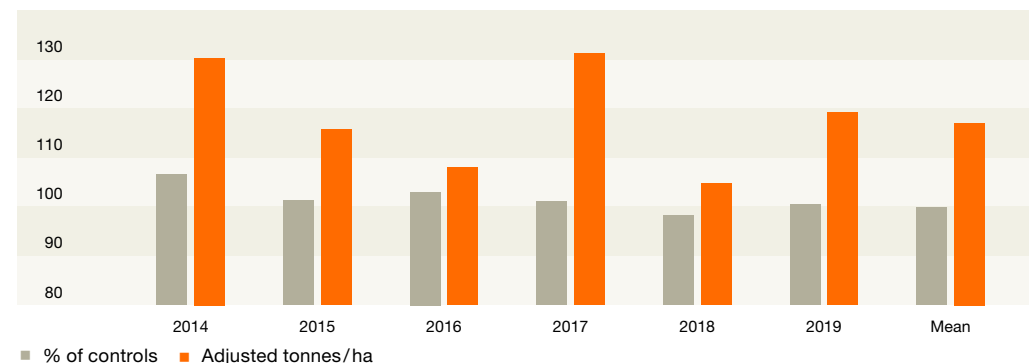
Adjusted tonnes % of control varieties



Source: BBRO recommended list of Sugar Beet varieties 2021 (Based on trials from 2017–2019)

SABATINA KWS consistently achieving 100+ tonnes per hectare

Adjusted tonnes per hectare



Source: Recommended list of sugar beet varieties 2021 (based on trials from 2017–2019) & supplementary data for the sugar beet rl varieties for 2018

CANTONA KWS

- High sugar content – 18.0 % *
- A useful combination of high rust and mildew resistance
- Good for late lifting

Nematode

PROTECT

*2021 BBRO Recommended List

The well rounded BCN partner

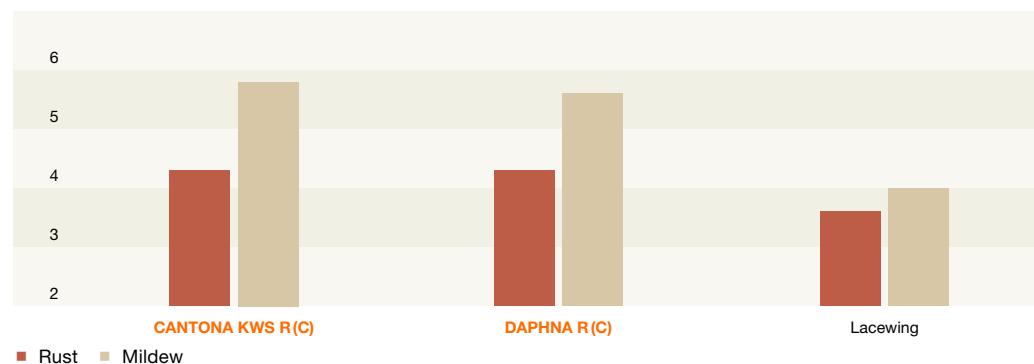
CANTONA KWS is still an excellent performer and the useful second choice variety for those suffering with positive BCN samples.

With its high sugar content of 18 % CANTONA KWS is a good choice for those further away from the factories. A competitive disease package to rust and powdery mildew combined with good early sown performance widens the appeal of CANTONA KWS.



CANTONA KWS offers a robust disease package in the BCN segment

BBRO disease scoring (1 = high leaf infection; 9 = very low leaf infection)



Source: BBRO recommended list of Sugar Beet varieties 2021 (Based on trials from 2017–2019)

Beet Cyst Nematode – Identify, Act and Protect Yields

www.kws-uk.com

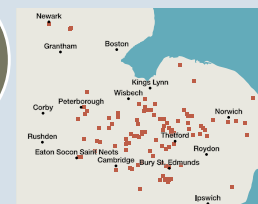
SEEDING
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SINCE 1856



What are Beet Cyst Nematodes (BCN)?

1 mm long eelworms that invade and feed from the root cells. Each cyst holds up to **200 eggs** and larvae.

The first **10 %** of yield losses mostly shows no visible symptoms.



Beet Cyst Nematode in the UK

■ positive BCN soil samples

Common risk factors

- Warm and moist soils
- Tight crop rotation
- Host plants e.g. OSR
- Spread by cultivation & machinery

The effect:
30–60 %
Yield losses

Source: BBRO, 2016

What to do against nematodes?

1. Observation + Soil sampling



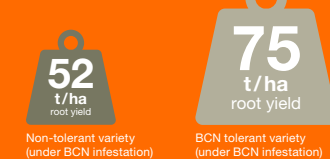
Regularly check soil and crop for BCN infestation. Annual soil sampling will indicate population levels.

2. Crop rotation



BCN infestation decreases by approx. –40 % per year in non-host plants. A wide crop rotation helps to reduce infestation.

3. Choose BCN tolerant varieties



There are now no yield penalties for BCN tolerant varieties. Drill BCN tolerant varieties alongside non-tolerant varieties in suspected fields. Monitor for any differences during the season.



Virus Yellows

Yield loss by Virus Yellows infection

With the loss of neonicotinoid sugar beet seed treatment, Virus Yellows present a serious threat to the sugar beet crop. When we talk about Virus Yellows we use the term to include different yellowing viruses. The most relevant viruses are **Beet Yellow Virus (BYV)** with a potential yield loss up to 49 % and **Beet Mild Yellowing Virus (BMV)** being able to reduce yields up to 30 %. In many cases infection with both viruses is found. Virus Yellows is spread in almost all sugar beet growing countries.



Source: KWS Agroservice

Aphids as virus transmitter

Virus Yellows is mainly transmitted by the **Peach Potato aphid** (*Myzus persicae*) and the **Black Bean aphid** (*Aphis fabae*). To acquire and spread the virus a minimum feeding time of 5–10 minutes is necessary. Favourable conditions are mild winters allowing the adults and host crops (e.g. beet or weeds such as Fat hen, Shephard's purse) to survive and thus cause early infections in sugar beet. In general, the earlier the infection the higher the yield loss.



Source: Bayer AG – Division Crop Science

Virus Yellows – an integrated approach to control

Control of Virus Yellow requires an integrated approach including the development of tolerant sugar beet varieties and cultural controls. KWS' current breeding focus comprises greenhouse and field trials to develop varieties with multiple tolerances. Virus Yellow tolerant varieties are in the early stages of variety trials in the UK and until these pass through the Listing process, cultural control measures should be taken:

- **Check your crop** – also refer to the BBRO Aphid Survey Map to check the number of aphids in your region
- **12 true leaves** – early and well developed sugar beet can reduce migration of aphids and slow the spread of virus in adult plants
- **Field hygiene** – removal of crop debris, ground keepers and weeds after sugar beet harvest to reduce host crops
- **Chemical treatment** – foliar insecticides according to your agronomist's recommendation and thresholds



Source: Courtesy of BBRO

EVALOTTA KWS

- Our highest yielding variety*
- Very low bolting in normal sown window
- Strong performance in untreated disease trials in 2018 & 2019*

*2021 BBRO Recommended List

KORTESSA KWS

- Excellent yield
- Low bolting
- Excellent rust resistance

Pushing yields!



New for 2021 EVALOTTA KWS is our highest yielding variety – even beating DAPHNA!

Offering its best performance when drilled from mid March, EVALOTTA KWS performed strongly in Recommended List untreated trials in 2018 & 2019 which will give confidence to growers looking to protect their yields from foliar diseases.

EVALOTTA KWS is a sound choice for 2021.



The variety with all the answers

Very high yields? Suitable for early drilling? Outstanding rust resistance? KORTESSA KWS answers yes to all three!

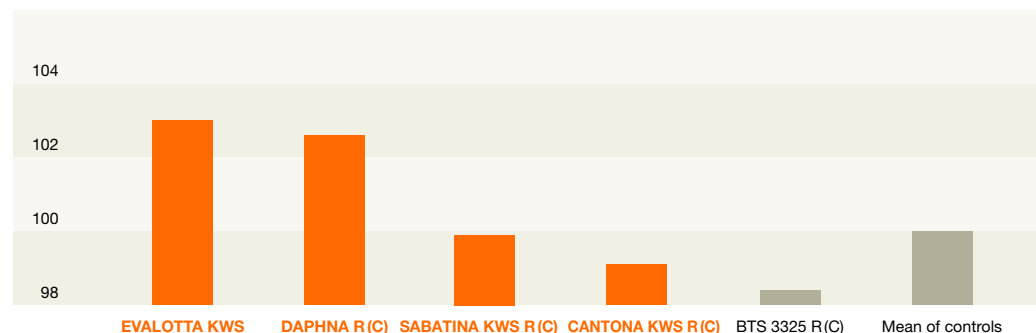
Yielding comfortably above controls above with an incredibly clean canopy KORTESSA KWS is suitable for almost any situation on farm.

With very low early sown bolters combined with an excellent rust score of 7.7*, KORTESSA KWS is the number one choice to utilise the longest growing period.



Pushing yields

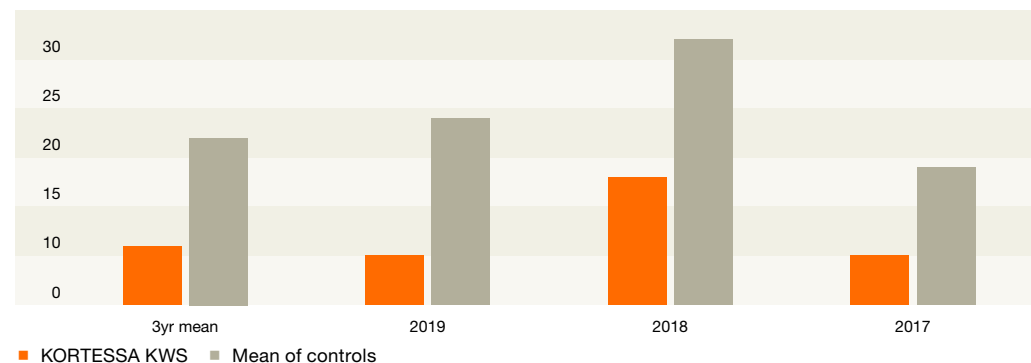
Adjusted tonnes % of control varieties



Source: BBRO recommended list of Sugar Beet varieties 2021 (Based on trials from 2017–2019)

KORTESSA KWS shows very low rust infection levels

% Leaf infection with rust



Source: BBRO recommended list of Sugar Beet varieties 2021 (Based on trials from 2017–2019)

ADVENA KWS

- Very low bolting
- High sugar content – 18.0 % *
- High yielding

*2021 BBRO Recommended List

SANCHA KWS

- Excellent bolting for normal and early sowing
- Top 10 for adjusted yield *
- High sugar content

*2021 BBRO Recommended List

The all rounder

ADVENA KWS delivers strong yields and bolting performance.

With low early sown bolters meaning growers can drill in confidence before mid-March, ADVENA KWS will be a popular choice for a long growing season while a high sugar content of 18 % will favour growers needing their beet further to the sugar factory.



The answer to early sowing



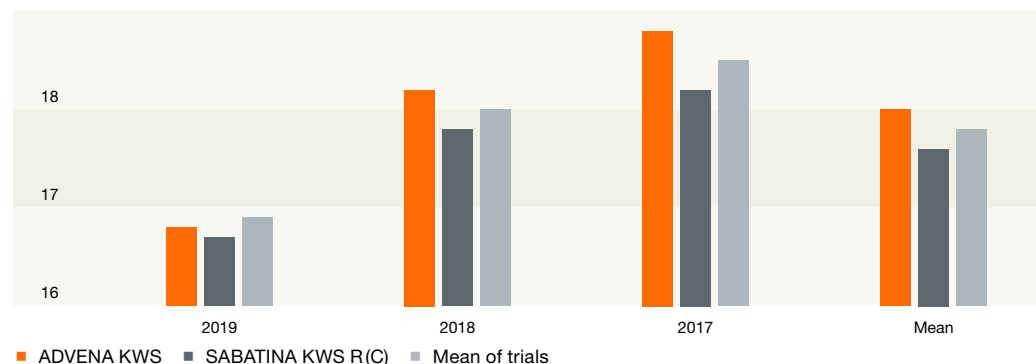
New for 2021 SANCHA KWS delivers good yields and outstanding bolting performance.

With one of the lowest early sown bolting scores on the RL SANCHA KWS will be a popular with growers who like to drill their beet early in the season. A solid disease resistance package and sugar content make SANCHA KWS a good choice for 2021.



ADVENA KWS – High yield, high sugar and low bolting all in one package

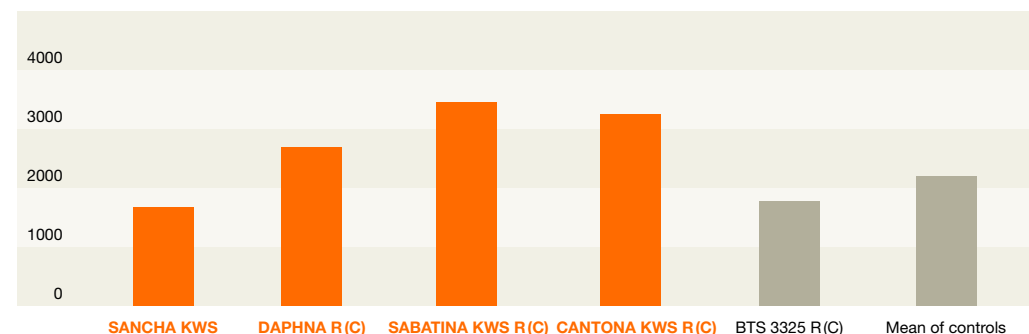
Sugar content %



Source: BBRO recommended list of Sugar Beet varieties 2021 (Based on trials from 2017–2019)

SANCHA KWS – Ultra low early sown bolters

Early Sown Bolters per hectare

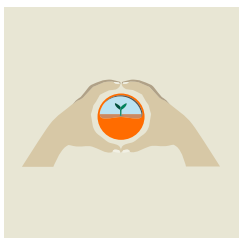


Source: BBRO recommended list of Sugar Beet varieties 2021 (Based on trials from 2017–2019)



BEETSEEDSERVICE

Your partner if you need to re-sow



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

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

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

The Principle of the Beet Seed Service

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

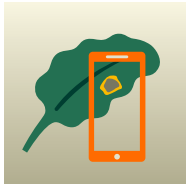
For example, if you were to spend **£180** per unit on KWS EPD treated seed and needed to re-sow, the seed cost for re-sowing would be **£90** per unit.



The steps for using the Beet Seed Service

- 1** Ensure you have EPD treated seed.
- 2** Register for myKWS online.
- 3** Enter the field details in the Beet Seed Service portal.
- 4** Only if necessary, you can register a claim for poor establishment, and we will discuss your options.
- 5** If re-sowing is required KWS shall supply new seed directly and invoice at 50 % of your initial invoice price.

KWS Leaf Scanner: identifying leaf diseases in sugar beet



KWS and the German Information System for Integrated Plant production (ISIP e.V.) jointly developed a new app for smartphones to identify leaf spot diseases in sugar beet.

The KWS Leaf Scanner supports you in the field to identify leaf diseases in your sugar beet. The five most common leaf spot diseases in sugar beet are:

- Cercospora (Cercospora beticola)
- Ramularia (Ramularia beticola)
- Beet rust (Uromyces betae)
- Bacterial leaf spot (Pseudomonas syringae)
- Phoma leaf spot (Phoma betae)

Once the leaf spot has been scanned the app provides further details on the disease and advice on how to control it.

Your benefits

1. Analysis and identification of leaf spot diseases
2. Further information on
 - Symptoms
 - Favourable conditions
 - Control
 - Similar diseases

Download the app from the store or just scan the QR-Code.



Android



iOS

PHILINA KWS

- Rz2.0 provides the best protection against rhizomania
- Top 10 for adjusted yield *
- Specifically recommended for use against AYPR strains

Rhizomania
PROTECT 2.0

* 2021 BBRO Recommended List

The best choice for AYPR Rhizomania situations

With adjusted yields higher than controls*, PHILINA KWS means there is no longer a yield penalty for those growers suffering from soils containing the AYPR strain of rhizomania.

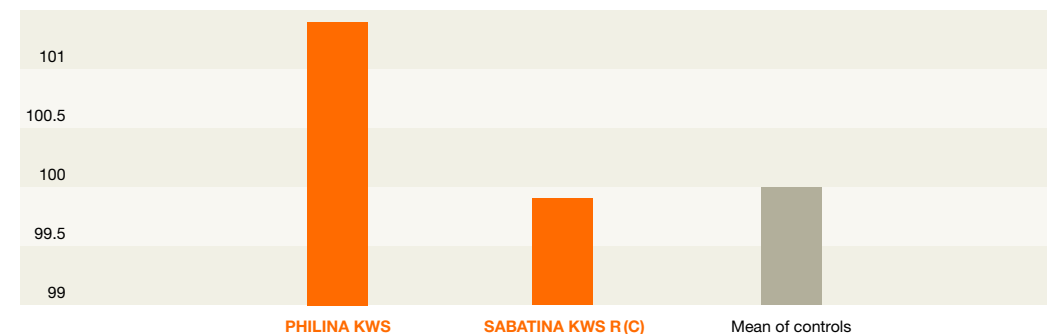
Containing the Rz2 gene in addition to the standard Rz1 all other varieties in the recommended list have, PHILINA KWS has double rhizomania protection and provides growers the only tool to beat the problem.

It is the variety to choose is aggressive rhizomania is affecting your business performance.



PHILINA KWS – Very high yield and AYPR resistance in the same variety

Adjusted tonnes % of control varieties



Source: Recommended list of sugar beet varieties 2021 3 year data (Based on trials from 2017–2019)

P^OWER at work



CONVISO® SMART – Innovating Weed Control in Sugar Beet

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



SMART KWS seeds

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



CONVISO® ONE herbicide

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

SMART CHOICE

More flexible and efficient weed control

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

SMART RIVETTA KWS

- Highest yielding herbicide tolerant variety available*
- Best drilled from mid-March onwards
- For use with the CONVISO® SMART weed control system for sugar beet

CONVISO®
SMART

*2021 BBRO Recommended List

SMART JANNINKA KWS

- Herbicide tolerant
- Low bolting
- For use with the CONVISO® SMART weed control system for sugar beet

CONVISO®
SMART

POWER at work

Bringing higher yields with CONVISO® SMART technology

The second herbicide tolerant variety added to the Recommended List, SMART RIVETTA KWS offers a useful increase in yield for the CONVISO® SMART technology. In addition an improved disease resistance package – particularly powdery mildew make SMART RIVETTA KWS a good choice for growers in 2021.

With one of the lowest early bolting scores on the 2021 RL, SMART RIVETTA KWS is below the threshold for early sown drilling but it is recommended to drill CONVISO® SMART varieties from mid March onwards to limit vernalisation.



The original game changer

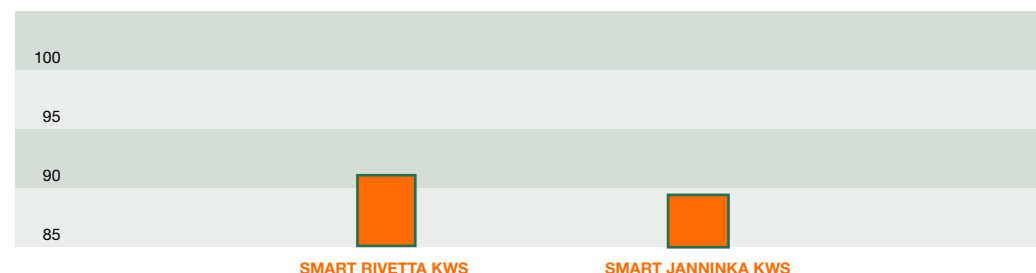
Bred specifically to be used in the CONVISO® SMART weed control system for sugar beet, SMART JANNINKA KWS is the first herbicide tolerant variety to enter the BBRO Recommended List to provide the next step in weed control.

Offering its best performance when drilled from mid-March onwards and using the dedicated CONVISO® ONE herbicide, SMART JANNINKA KWS is the choice for more convenient, more effective weed control in sugar beet.



Leading the field in CONVISO® SMART yield**

Adjusted tonnes % Controls (when used with classical herbicides)

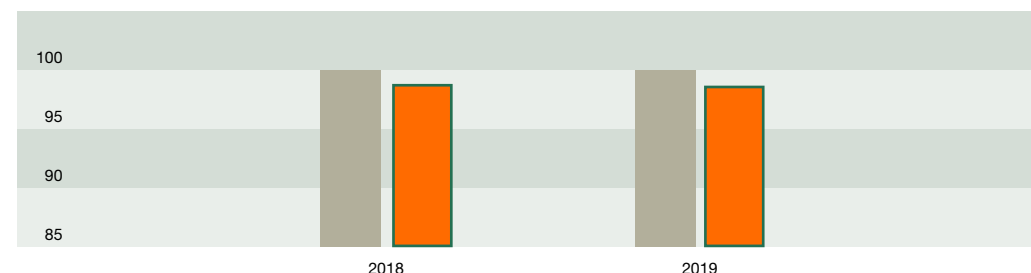


Source: Recommended list of sugar beet varieties 2021 3 year data (Based on trials from 2017 – 2019)

**Currently the Recommended List trials use a classical herbicide programme on the ALS tolerant varieties. SMART RIVETTA KWS will be used with the dedicated CONVISO® ONE herbicide, with improved crop safety and weed control providing a yield benefit over classical herbicides.

SMART JANNINKA KWS – for the CONVISO® SMART weed control system

Adjusted tonnes %



■ SMART JANNINKA KWS with CONVISO® ONE ■ Classical hybrids with classic herbicides

Source: CONVISO® SMART System Trials, 2018 & 2019; KWS (plots harvested and analysed by BBRO)

KWS Contacts

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James Kennedy

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