

Winter wheat 2022/23

Market options, yield and grain quality



End-use group	UKFM Group 1				UKFM Group 2				UKFM Group 3				Soft Group 4				Hard Group 4				Average LSD (5%)																			
	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	E	UK	UK	UK	UK	UK	UK	UK	EAW		UK	UK	UK	UK	UK	UK	UK	UK											
Scope of recommendation	UKFM Group 1				UKFM Group 2				UKFM Group 3				Soft Group 4				Hard Group 4																							
Variety status	C				NEW C NEW				NEW				NEW +				NEW NEW C + NEW				Sp	W																		
United Kingdom (10.8 t/ha)	98	97	96	96	101	100	98	97	102	101	100	100	100	100	99	99	98	103	103	103	102	102	100	99	99	106	104	104	103	102	102	102	102	101	100	99	98	2.3		
East region (10.7 t/ha)	98	97	96	95	100	99	98	98	102	102	101	101	102	100	100	101	99	98	103	103	103	101	101	100	99	98	107	103	104	103	102	102	102	100	102	99	98	98	2.6	
West region (11.0 t/ha)	99	96	97	97	102	101	99	97	100	101	100	100	97	100	99	97	99	98	103	103	103	105	103	100	98	99	105	106	104	103	103	102	101	104	101	100	100	101	2.9	
North region (11.1 t/ha)	98	96	94	94	99	[99]	98	[96]	[101]	99	[101]	99	[97]	101	97	100	102	99	[103]	102	102	[104]	101	101	100	101	[103]	[106]	105	103	[101]	[102]	101	102	100	100	100	[91]	3.4	
<b>Main market options (The specific attributes of varieties are different, so, whenever possible, varieties should not be mixed in store)</b>																																								
UK bread-making	Y	Y	Y	Y	Y	Y	Y	Y	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
UK biscuit, cake-making	-	-	-	-	-	-	-	-	Y	Y	Y	Y	Y	Y	Y	Y	Y	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
UK distilling	-	-	-	-	-	-	-	-	[Y]	[Y]	[Y]	-	[Y]	[Y]	[Y]	-	Y	Y	[Y]	-	Y	[Y]	Y	[Y]	Y	-	-	-	-	-	-	-	-	-	-	-				
UK bread wheat for export	Y	-	Y	-	Y	-	Y	[Y]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
UK soft wheat for export	-	-	-	-	-	-	-	-	-	-	-	Y	-	[Y]	-	[Y]	Y	Y	-	-	-	-	-	Y	-	-	-	-	-	-	-	-	-	-	-	-	-			
<b>Grain quality</b>																																								
Endosperm texture	Hard	Hard	Hard	Hard	Hard	Hard	Hard	Hard	Soft	Soft	Soft	Soft	Soft	Soft	Soft	Soft	Soft	Soft	Soft	Soft	Soft	Soft	Soft	Soft	Soft	Hard	Hard	Hard	Hard	Hard	Hard	Hard	Hard	Hard	Hard	Hard				
Protein content (%)	12.2	12.2	12.7	12.2	11.9	11.8	11.9	11.9	11.3	11.1	11.5	11.7	11.1	11.8	11.7	11.5	11.2	11.5	11.2	11.3	11.4	11.3	11.3	11.5	11.1	11.2	11.4	11.2	10.8	11.2	10.7	11.1	11.2	11.3	11.8	11.0	12.0	0.2		
Protein content (%) - Milling spec	13.1	13.2	13.5	13.0	12.7	[13.1]	12.7	[12.9]	[12.0]	11.9	[12.3]	12.6	[11.8]	12.7	12.6	12.4	12.0	12.4	[12.2]	12.2	12.2	[12.8]	12.1	12.4	12.0	12.3	[12.4]	[12.1]	11.5	12.0	11.4	[11.8]	12.0	11.9	12.0	12.7	11.8	12.9	0.5	
Hagberg Falling Number	260	273	274	270	289	315	282	294	255	253	268	240	226	249	232	258	240	208	228	214	220	248	286	212	179	249	239	304	270	220	149	169	279	275	193	322	268	306	25.6	
Specific weight (kg/hl)	77.5	78.3	77.8	77.1	78.5	76.9	76.7	78.5	78.1	74.0	77.3	75.3	76.4	76.2	77.4	76.2	76.9	76.4	75.9	76.5	75.6	75.3	77.7	76.9	74.8	75.8	74.8	79.4	78.2	76.3	76.1	76.3	75.1	76.9	75.6	80.6	75.5	73.8	0.6	
Chopin Alveograph W	[175]	[251]	230	-	190	[179]	163	198	[56]	[71]	[74]	90	[72]	82	[132]	79	102	91	[50]	-	-	[61]	-	95	-	-	-	-	-	-	-	-	-	-	-	-	[147]	-	25.1	
Chopin Alveograph P/L	[0.7]	[0.9]	0.6	-	0.6	[0.6]	0.5	0.7	[0.3]	[0.2]	[0.3]	0.3	[0.3]	0.3	[0.4]	0.2	0.3	0.2	[0.3]	-	-	[0.3]	-	0.2	-	-	-	-	-	-	-	-	-	-	-	-	-	[0.7]	-	0.2

Varieties no longer listed: KWS Kinetic, LG Detroit, LG Quasar, LG Sundance and Shabras.  
 Comparisons of varieties across regions are not valid.  
 All yields in this table are taken from treated trials receiving a full fungicide and PGR programme.

UKFM = UK Flour Millers  
 UK = Recommended for the UK  
 E = Recommended for the East region  
 W = Recommended for the West region  
 N = Recommended for the North region

Sp = Specific recommendation. RGT Wolverine has a specific recommendation for resistance to *Barley yellow dwarf virus* (BYDV). Resistance to BYDV has not been verified in Recommended List tests

C = Yield control (for current table)  
 \* = Variety no longer under test in RL trials  
 PGR = Plant growth regulator  
 [] = Limited data

Y = Suited to that market  
 [Y] = May be suited to that market

LSD = Least significant difference  
 Average LSD (5%): Varieties that are more than one LSD apart are significantly different at the 95% confidence level

Winter wheat 2022/23

Yield, agronomy and disease resistance



End-use group

Scope of recommendation

Variety status

Fungicide-treated grain yield (% treated control)

United Kingdom (10.8 t/ha)

East region (10.7 t/ha)

West region (11.0 t/ha)

North region (11.1 t/ha)

Untreated grain yield (% treated control)

United Kingdom (10.8 t/ha)

Agronomic features

Resistance to lodging without PGR (1-9) - see note below

Resistance to lodging with PGR (1-9) - see note below

Height without PGR (cm)

Ripening (days +/- Skyfall, -ve = earlier)

Resistance to sprouting (1-9)

Disease resistance

Mildew (1-9)

Yellow rust (1-9)

Brown rust (1-9)

Septoria tritici (1-9)

Septoria tritici (1-9) - one-year rating - see note below

Eyespot (1-9)

Fusarium ear blight (1-9)

Orange wheat blossom midge

On the 1-9 scales, high figures indicate that a variety shows the character to a high degree (e.g. high resistance). Comparisons of varieties across regions are not valid.

UKFM = UK Flour Millers  
 UK = Recommended for the UK  
 E = Recommended for the East region  
 W = Recommended for the West region  
 N = Recommended for the North region

Variety	UKFM Group 1				UKFM Group 2				UKFM Group 3				Soft Group 4				Hard Group 4								Average LSD (5%)															
	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	E	UK	UK	E	UK	UK	UK	UK	UK	UK	E&W	UK	UK		UK	UK	UK	UK	Sp	W									
	C				NEW	C	NEW		NEW		NEW	NEW					*C	UK	NEW	NEW	UK	UK	C	*	NEW	UK	UK	UK	UK	W										
United Kingdom (10.8 t/ha)	98	97	96	96	101	100	98	97	102	101	100	100	100	100	99	99	98	103	103	103	102	102	100	99	99	106	104	104	103	102	102	102	102	101	100	99	98	2.3		
East region (10.7 t/ha)	98	97	96	95	100	99	98	98	102	102	101	101	102	100	100	101	99	98	103	103	103	101	101	100	99	98	107	103	104	103	102	102	100	102	99	98	98	2.8		
West region (11.0 t/ha)	99	96	97	97	102	101	99	97	100	101	100	100	97	100	99	97	99	98	103	103	103	105	103	100	98	99	105	106	104	103	103	102	101	104	101	100	100	101	2.9	
North region (11.1 t/ha)	98	96	94	94	99	[99]	98	[96]	[101]	99	[101]	[97]	101	97	100	102	98	[103]	102	102	[104]	101	101	100	101	[103]	[106]	105	103	[101]	[102]	101	102	100	100	100	[91]	3.4		
Untreated grain yield (% treated control)	76	70	72	81	93	90	83	90	78	83	80	79	79	84	86	81	73	78	85	82	85	83	77	77	74	79	90	92	78	80	73	89	79	88	77	81	69	88	6.0	
United Kingdom (10.8 t/ha)	8	8	8	7	7	7	6	6	7	7	7	8	8	7	7	6	8	6	6	6	6	5	7	7	7	[8]	6	7	6	7	7	7	8	7	6	8	7	[6]	1.1	
Resistance to lodging without PGR (1-9) - see note below	8	8	7	8	8	8	7	7	7	8	7	8	8	7	9	7	8	7	6	6	7	7	8	8	6	9	7	7	7	7	7	7	8	8	7	8	7	8	1.0	
Resistance to lodging with PGR (1-9) - see note below	85	84	82	89	90	84	84	89	90	83	92	83	86	83	88	88	84	86	91	92	88	91	93	83	87	80	88	84	95	87	88	88	89	88	89	83	87	84	1.7	
Height without PGR (cm)	0	0	+1	+1	-1	-1	0	0	+3	+2	+2	+1	+3	+1	+1	+1	+1	+1	+2	0	+3	+2	+1	+1	+1	+1	0	+1	+1	0	+1	+2	+3	-1	+1	+2	+2	0	0.7	
Ripening (days +/- Skyfall, -ve = earlier)	5	5	6	6	[7]	-	5	-	-	[6]	-	[6]	-	[7]	[7]	[6]	5	-	[9]	[6]	-	[7]	5	5	[5]	-	-	[5]	5	5	-	[6]	7	5	6	[6]	[7]	1.3		
Resistance to sprouting (1-9)	7	6	7	7	7	8	8	8	5	4	7	5	4	5	4	4	6	6	6	7	5	5	6	7	7	6	7	8	6	6	7	7	6	7	5	8	6	[7]	1.3	
Mildew (1-9)	4	3	9	8	8	9	9	9	9	8	9	6	8	7	8	8	6	8	7	7	8	7	5	8	8	6	8	9	5	5	4	9	8	7	6	9	4	9	0.6	
Yellow rust (1-9)	6	8	3	6	7	5	5	6	3	7	5	5	6	7	8	7	5	6	6	5	7	5	6	5	5	6	5	7	5	6	7	6	4	5	6	5	8	8	1.0	
Brown rust (1-9)	6.1	5.3	6.2	5.7	7.8	7.4	6.5	8.4	4.7	6.4	5.4	5.7	6.9	6.1	6.8	5.8	4.3	4.9	6.4	4.9	5.9	6.9	5.1	4.0	4.6	5.5	7.7	6.3	6.5	5.8	4.6	7.2	5.9	6.7	4.7	5.8	5.7	8.5	1.3	
Septoria tritici (1-9)	5.8	5.1	5.9	5.4	7.3	7.2	6.5	8.2	5.0	5.8	5.6	4.9	6.4	5.4	6.2	5.2	4.4	5.2	6.0	4.6	5.1	6.2	4.9	3.9	4.6	4.9	8.0	6.1	6.1	5.5	4.9	6.9	6.4	4.6	5.6	5.7	9.0	1.2		
Septoria tritici (1-9) - one-year rating - see note below	6@	7@	5	7@	3	[6]	4	[6]@	[4]	5	[6]	3	[4]	5	5	3	4	3	[4]	4	4	[4]	5	4	4	2	[4]	[5]	4	4	4	[6]	5	3	4	4	6	[4]	2.9	
Eyespot (1-9)	6	7	7	6	6	6	6	6	7	6	6	5	7	5	6	6	6	6	6	6	6	6	6	6	6	5	6	6	7	6	5	6	6	7	6	6	6	5	4	0.4
Fusarium ear blight (1-9)	-	R	-	-	-	-	-	-	R	R	-	R	R	R	R	R	R	R	R	R	R	-	R	R	R	R	R	-	R	R	R	R	R	R	-	-	-	-	-	
Orange wheat blossom midge																																								

C = Yield control (for current table)  
 - = Variety no longer under test in RL trials  
 PGR = Plant growth regulator  
 [] = Limited data

@ = Believed to carry the *Pch1* Rendezvous resistance gene to eyespot, but this has not been verified in Recommended List tests  
 R = Believed to be resistant to orange wheat blossom midge (OWBM), but this has not been verified in Recommended List tests

LSD = Least significant difference  
 Average LSD (5%): Varieties that are more than one LSD apart are significantly different at the 95% confidence level

Winter wheat 2022/23

Supplementary data



End-use group Scope of recommendation Variety status	UKFM Group 1				UKFM Group 2				UKFM Group 3				Soft Group 4				Hard Group 4				Average LSD (5%)																								
	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK		UK	UK	UK	UK																				
<b>Breeder/UK contact</b>	UK contact				KWS				KWS				KWS				KWS				KWS																								
<b>Breeder</b>	KWS				KWS				KWS				KWS				KWS				KWS																								
<b>Annual treated yield (% control)</b>	KWS				KWS				KWS				KWS				KWS				KWS																								
2017 (11.2 t/ha)	100	97	95	96	99	-	98	-	-	-	-	100	-	-	-	-	101	98	-	-	-	-	-	-	103	102	-	103	100	100	-	-	-	-	103	102	101	-	-	102	102	100	-	96	-
2018 (10.7 t/ha)	98	97	95	96	101	-	100	-	-	-	100	-	101	-	100	99	100	99	98	-	-	102	102	-	100	100	100	100	-	-	-	103	103	102	-	102	101	100	100	100	97	-			
2019 (11.6 t/ha)	96	95	98	94	100	100	99	98	100	101	100	101	98	101	100	100	101	99	103	103	103	104	102	99	100	99	104	104	105	103	102	102	101	102	101	99	101	97	-						
2020 (10.3 t/ha)	97	96	95	97	100	[100]	97	[96]	[103]	102	[102]	100	[100]	101	99	100	101	98	[104]	103	104	[102]	103	101	100	101	[105]	[106]	103	103	102	[102]	103	102	102	100	101	[96]	-						
2021 (10.8 t/ha)	100	97	96	94	103	99	97	96	100	99	100	98	98	98	98	98	97	102	102	102	104	103	101	97	98	106	105	106	105	103	102	100	104	101	100	96	97	-							
<b>Rotational position</b>	KWS				KWS				KWS				KWS				KWS				KWS																								
First cereal (11.1 t/ha)	98	96	96	96	101	100	98	97	101	100	100	100	100	99	99	100	98	103	103	103	103	102	100	99	99	105	105	104	103	102	101	102	102	101	100	99	98	2.3							
Second and more (9.6 t/ha)	99	98	94	94	101	100	98	99	101	103	101	101	100	100	100	98	98	104	104	103	103	101	102	100	100	107	104	104	104	103	102	104	102	101	103	99	99	[100]	3.6						
<b>Sowing date (most trials were sown in October)</b>	KWS				KWS				KWS				KWS				KWS				KWS																								
Early sown (before 25 Sept) (11.3 t/ha)	[100]	96	96	97	[97]	-	99	-	[103]	102	[101]	101	-	104	[103]	[100]	100	99	-	103	104	-	101	100	101	101	[106]	[108]	[107]	103	[102]	[105]	[102]	100	100	99	[100]	97	5.4						
Late sown (after 1 Nov) (9.2 t/ha)	98	97	95	95	102	[99]	98	[95]	[101]	101	[101]	101	[103]	98	100	102	100	97	[104]	103	104	[100]	102	101	100	97	[106]	[104]	104	103	103	[101]	104	100	103	102	99	[99]	3.7						
<b>Soil type (about 50% of trials are on medium soils)</b>	KWS				KWS				KWS				KWS				KWS				KWS																								
Light soils (10.9 t/ha)	97	97	94	94	102	[98]	98	[97]	[101]	102	[100]	100	[99]	101	100	101	100	98	[104]	103	102	[104]	101	101	99	101	[105]	[105]	106	103	102	[102]	103	102	102	101	99	[97]	3.5						
Heavy soils (10.9 t/ha)	99	97	97	96	100	98	98	97	102	101	99	101	100	100	100	99	97	104	103	102	102	102	100	100	98	106	104	104	103	101	101	100	101	101	101	99	99	3.0							
<b>Agronomic features</b>	KWS				KWS				KWS				KWS				KWS				KWS																								
Lodging % without PGR	2	1	2	3	4	4	13	8	3	5	3	1	2	4	3	13	2	10	12	9	9	30	4	3	6	1	11	5	13	5	5	4	2	7	8	3	5	9							
Lodging % with PGR	1	3	3	1	2	2	8	6	4	3	5	1	2	5	1	8	3	4	10	13	4	8	2	3	10	1	8	3	5	5	8	5	3	2	8	2	5	2							
<b>Speed of development to growth stage 31 (days +/- average)</b>	KWS				KWS				KWS				KWS				KWS				KWS																								
Early sown (Sept)	-2	-2	-1	0	-4	[-2]	-3	[-4]	[+2]	[-2]	[+2]	-2	[+2]	[-2]	[-8]	[0]	+5	-1	[+3]	-4	+7	[+2]	-2	0	+4	[+5]	[-2]	[0]	+2	+6	+1	[+5]	[-3]	+1	+4	-2	[-3]	-1	8.0						
Mid sown (Oct)	-4	-4	-2	+1	-7	-	-5	-	0	[-1]	-	-3	-	[-3]	[0]	[-6]	-1	+2	-	-1	[-2]	-	-3	-1	+3	[+2]	-	-	[-2]	+3	0	-	[-3]	0	+2	-2	[0]	[-3]	9.3						
Late sown (Nov)	-2	-2	0	-1	-4	-	-2	-	[0]	[+1]	-	-1	-	[-2]	[+1]	[-1]	+2	+2	-	-3	0	-	-1	-1	+1	[+3]	[-5]	[+3]	+2	+2	0	-	[-4]	-3	-1	-2	[0]	-1	5.3						
<b>Status in RL system</b>	KWS				KWS				KWS				KWS				KWS				KWS																								
Year first listed	17	14	12	16	19	22	16	22	22	21	22	19	22	21	21	21	16	18	22	19	20	22	19	18	18	21	22	22	20	18	18	17	22	21	16	18	15	21	20						
RL status	-	-	-	-	-	P1	-	P1	P1	P2	P1	P1	P1	P2	P2	P2	-	-	P1	-	-	P1	*	-	-	P2	P1	P1	-	-	*	-	P1	P2	-	-	-	P2	-	-					

All yields in this table are taken from treated trials receiving a full fungicide and PGR programme.

UKFM = UK Flour Millers  
 UK = Recommended for the UK  
 E = Recommended for the East region  
 W = Recommended for the West region  
 N = Recommended for the North region  
 Sp = Specific recommendation. RGT Wolverine has a specific recommendation for resistance to Barley yellow dwarf virus (BYDV). Resistance to BYDV has not been verified in Recommended List tests

C = Yield control (for current table)  
 - = Variety no longer under test in RL trials  
 PGR = Plant growth regulator  
 = Latest safe-sowing date is the advised latest sowing time to give a sufficient cold period for flowering  
 [ ] = Limited data  
 [ ] = Very limited data  
 P1 = First year of recommendation  
 P2 = Second year of recommendation

BA = Blackman Agriculture  
 DSV = DSV UK Ltd (dsv-uk.co.uk)  
 Eis = Elsom Seeds Ltd (elsoms.com)  
 EisW = Elsom Wheat Ltd (elsoms.com)  
 KWS = KWS UK (kws-uk.com)  
 Lim = Limagrain UK (lgseeds.co.uk)

LimEur = Limagrain Europe SA (lgseeds.co.uk)  
 Mom = Momont, France (kws-uk.com)  
 R2n = RAGT, France (ragt.co.uk)  
 RAGT = RAGT Seeds (ragt.co.uk)  
 Sen = Senova (senova.uk.com)  
 SyP = Syngenta Participations AG (syngenta.co.uk)  
 Syn = Syngenta UK Ltd (syngenta.co.uk)

LSD = Least significant difference  
 Average LSD (5%): Varieties that are more than one LSD apart are significantly different at the 95% confidence level

Lodging ratings for RL 2022/23

The scales used to calculate the lodging ratings for the RL 2022/23 have been adjusted to include susceptible and resistant fixed points. The aim is to make the ratings more representative of what is seen in the field and improve consistency of the ratings over years. This has contributed to a drop in ratings for some varieties, compared to the 2021/22 RL. However, this does not mean that these varieties have become more susceptible since last year. As for all ratings, statistical significance (LSD) should be taken into account when deciding if varieties have a different susceptibility to the trait.

Winter wheat septoria tritici disease resistance ratings

In 2021, disease ratings declined for many winter wheat varieties, with the largest reductions in varieties with Cougar in their parentages. For the RL 2022/23, the ratings are based on a standard three-year (2019-21) dataset, in addition to a one-year (2021) dataset. The latter ratings reveal the influence of the 2021 season and help highlight varieties that may benefit from closer monitoring. For more information, visit ahdb.org.uk/rl