

Morning session

09.50 Chair's welcome David Bell AHDB/SRUC

Cropping and Agronomy

10.00 New breeding policies for cereals and oilseeds, Jenna Watts, AHDB

10.30 Crop selection and variety performance. Steve Hoad, SRUC

11.00 Optimising fungicide inputs. Fiona Burnett, SRUC

**11.30 Adding innovation to IPM and evidence to regen.
Neil Havis & Henry Creissen, SRUC**

12.00 Learnings from AHDB's Strategic farms Henny Lowth, AHDB

12.30 -13.30 Lunch and networking session

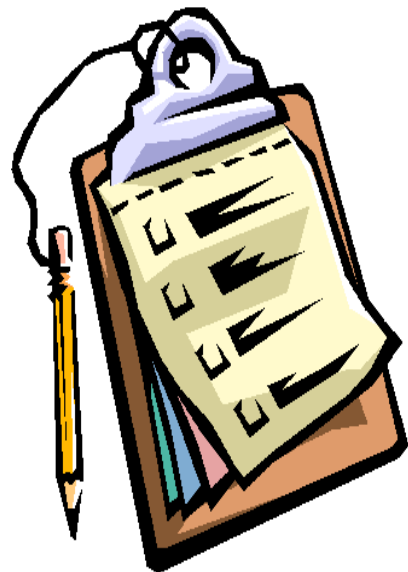


Welcome to the Agronomy Roadshow 2024

An evidence-based approach to productive and sustainable systems



Before we start... Housekeeping



BASiS

City & Guilds

NROSO
National Register Of Sprayer Operators



@AHDB_Cereals

@AHDB_Scot

@Cereals_Scot



Scotland C&O Meetings 2024

14 February

Making the most of managing manure

Hosted by John Weir, Lacesston Farm

13 March

Business integration

Hosted by Andrew Booth, Savock Farms

5 June

Arable farming technology and Market Strategies

Hosted by Colin McGregor, McGregor Farms

Register online at: ahdb.org.uk/events





Tuesday 2nd July 2024
Balruddery Farm, Invergowrie, Dundee



Arable farming into a new era!



Agrileader Forum 2024

Farming your network – playing your field



30-31 January, Manchester

A great opportunity for creating and developing connections to benefit both you and your farm business by networking with like-minded growers and hearing from inspirational, world-renowned speakers.

For more information or to book your place, visit: ahdb.org.uk/AgriLeaderforum-2024



Use your resource....



Sign up for newsletters, publications or to check your details here: ahdb.org.uk/keeping-in-touch



ahdb.org.uk/cereals-oilseeds



Webinars and AHDB Podcasts



Ask your question to AHDB researchers...



**‘Inspiring our farmers, growers
and industry to succeed in a
rapidly changing world’**



Agronomy Roadshows 2024

New Breeding Policies for Cereals & Oilseeds

Jenna Watts



Outline

- Development of the Recommended Lists (RL)
 - Key findings from RL review
 - Developments
- What's on the horizon?



Recommended List Review



RL Review activities

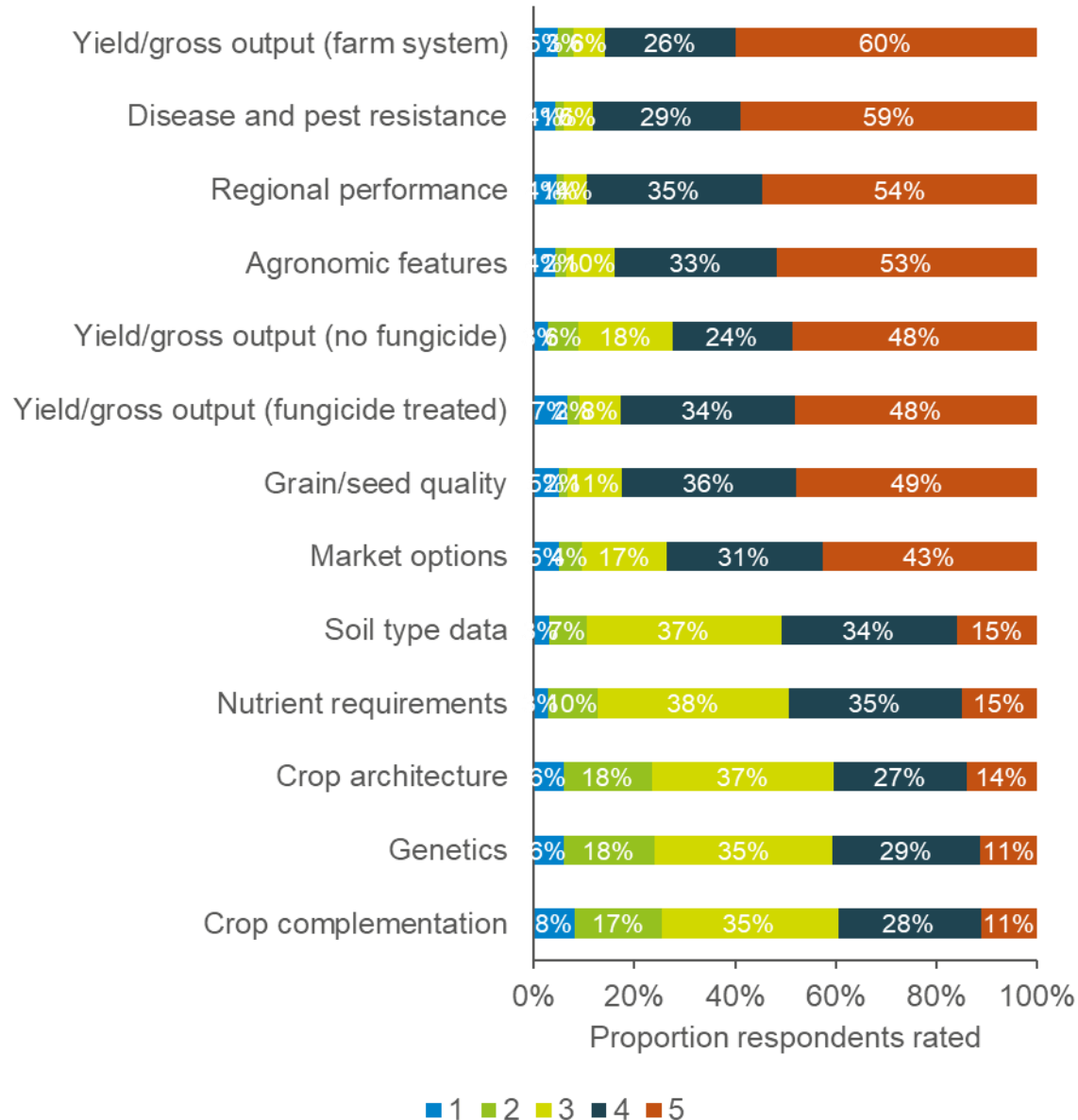
2023

- Questionnaire:
 - Over 900 responses (139 responses from Scotland)
- Online focus groups
- Stakeholder interviews
- Spring/summer 2023 events



Pest, disease resistance and agronomic features are important

What features are important? (Scotland)

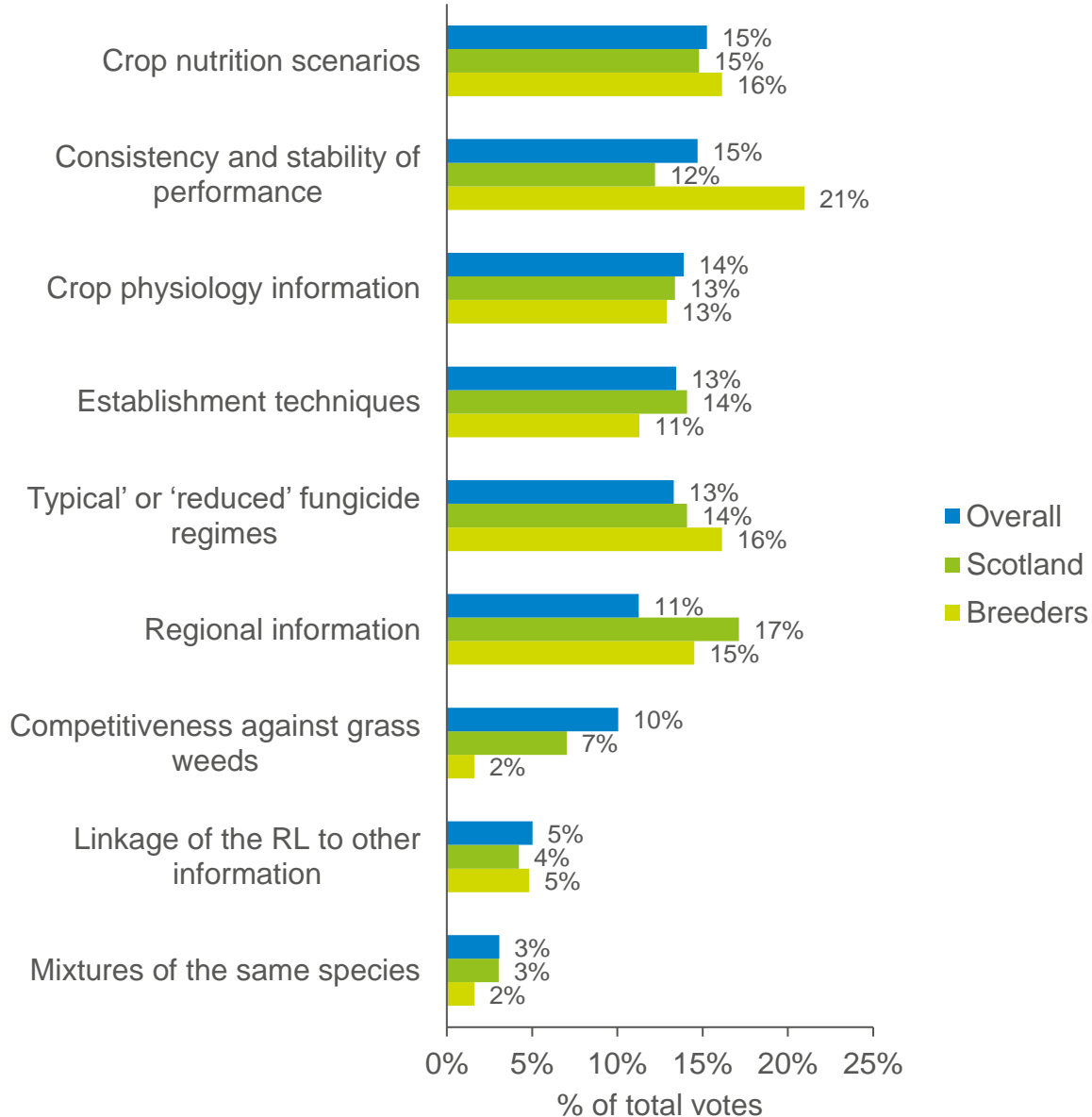


Each characteristic rated by 127-137 questionnaire respondents

AHDB RECOMMENDED LISTS					
Winter wheat 2024/25					
AHDB RECOMMENDED					
	KWS Zyatt	SY Cheer	Skyfall	Crusoe	RGT illustrious
End-use group	UKFM Group 1				
Scope of recommendation	UK	UK	UK	UK	UK
Variety status		NEW	C		
Fungicide-treated grain yield (% treated control)					
United Kingdom (11.0 t/ha)	99	97	96	95	95
East region (10.9 t/ha)	98	97	96	95	95
West region (11.2 t/ha)	99	98	96	96	96
North region (11.3 t/ha)	97	98	95	94	94
Untreated grain yield (% treated control)					
United Kingdom (11.0 t/ha)	71	84	66	75	82
Disease resistance					
Mildew (1-9)	7	[8]	6	7	6
Yellow rust (1-9)	3	7	3	8	7
Yellow rust (young plant)	s	-	s	s	s
Brown rust (1-9)	7	6	9	3	5
Septoria tritici (1-9)	6.3	6.0	5.8	6.3	5.9
Eyespot (1-9)	6@	4	6@	5	6@
Fusarium ear blight (1-9)	6	[7]	7	7	6
Orange wheat blossom midge	-	-	R	-	-
Agronomic features					
Resistance to lodging without PGR (1-9)	8	8	8	7	8
Resistance to lodging with PGR (1-9)	8	7	7	8	9
Lodging without PGR (%)	1	1	1	2	1
Lodging with PGR (%)	1	3	3	2	0
Straw length without PGR (cm)	86	91	87	84	91
Straw length with PGR (cm)	76	82	78	77	81
Ripening (days +/- Skyfall)	0	+1	0	+1	+1
Resistance to sprouting (1-9)	6	-	5	6	6

Additional criteria for automatic selection of winter wheat varieties

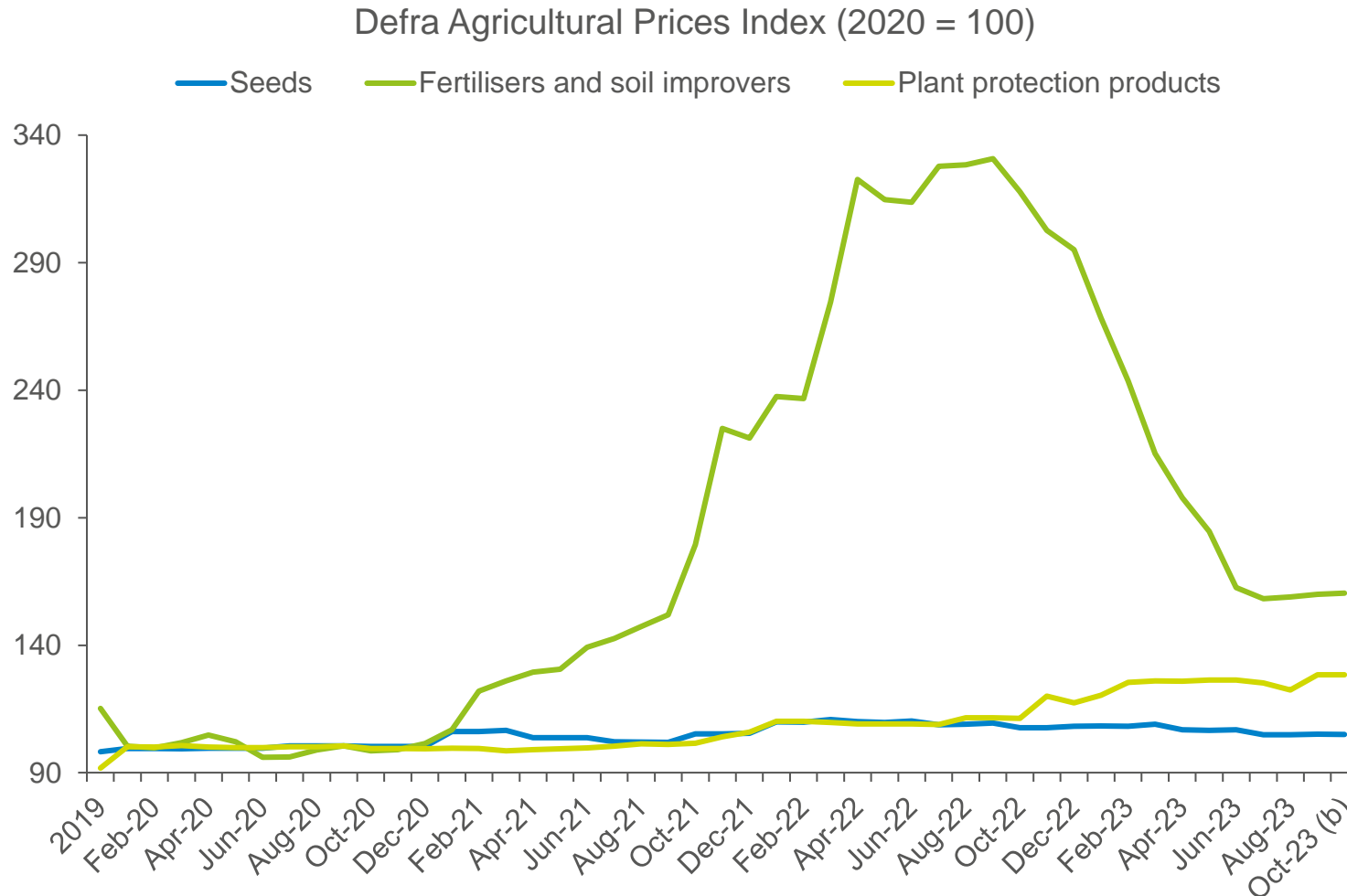
Potential areas of improvement



Demand for new/more information

Questionnaire respondents were asked to 'vote' for up to 3 areas
 (total votes: overall = 2728; Scotland = 426; Breeders = 61)

Varietal performance under lower inputs



Changes to the RL

- Further discussion is needed based on available evidence:
 - Scoping reviews to collate existing evidence
- Can existing RL data to be used to answer key questions?

Regionality & consistency and stability of performance

NEWS

Home | Israel-Gaza war | Cost of Living | War in Ukraine | Climate | UK | World | Business | Politics | Culture

Scotland | Scotland Politics | Scotland Business | Edinburgh, Fife & East | Glasgow & West | Highlands & Islands | Alba | Local News

Scotland's climate 'changing faster than expected'

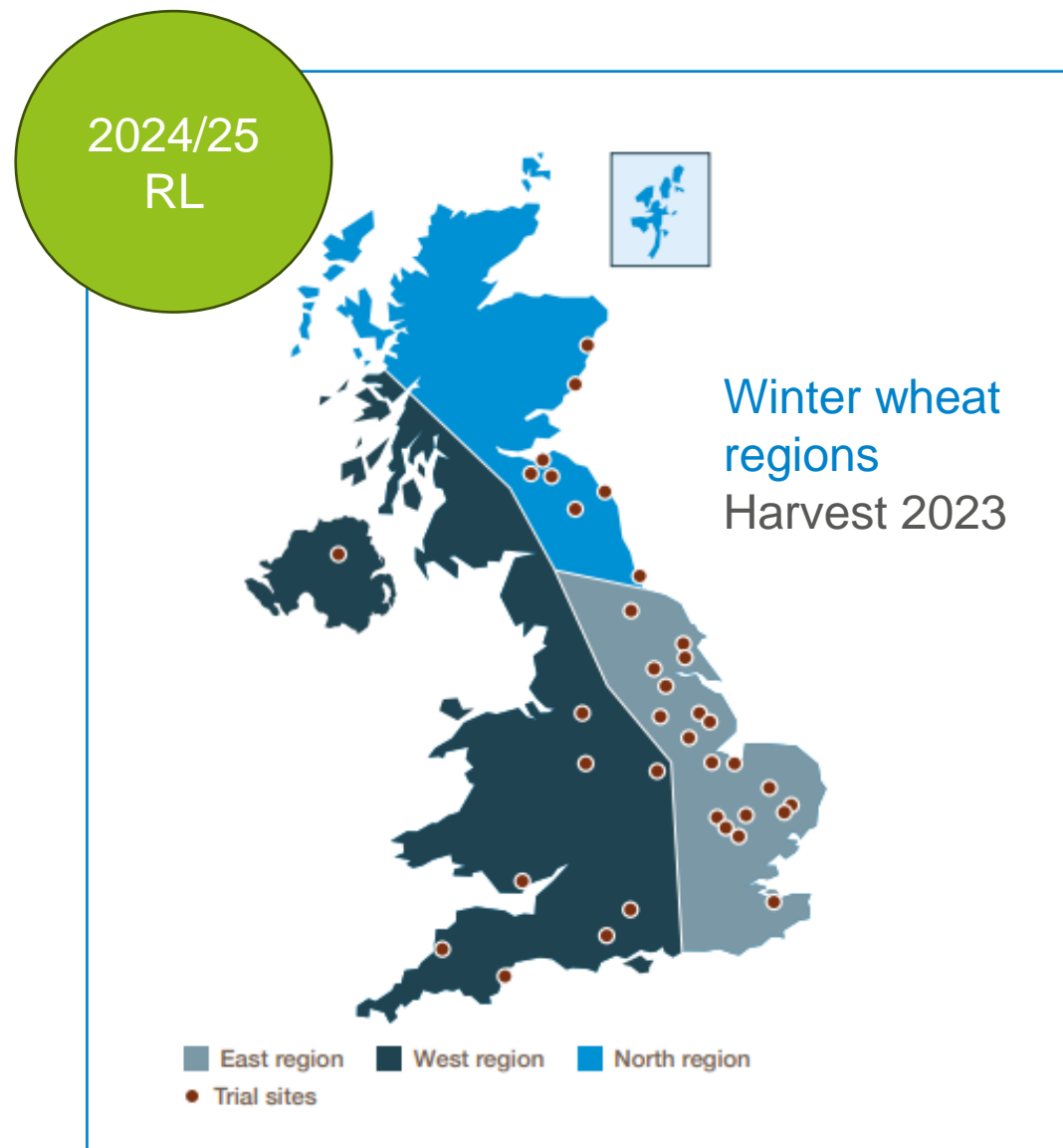
3 days ago



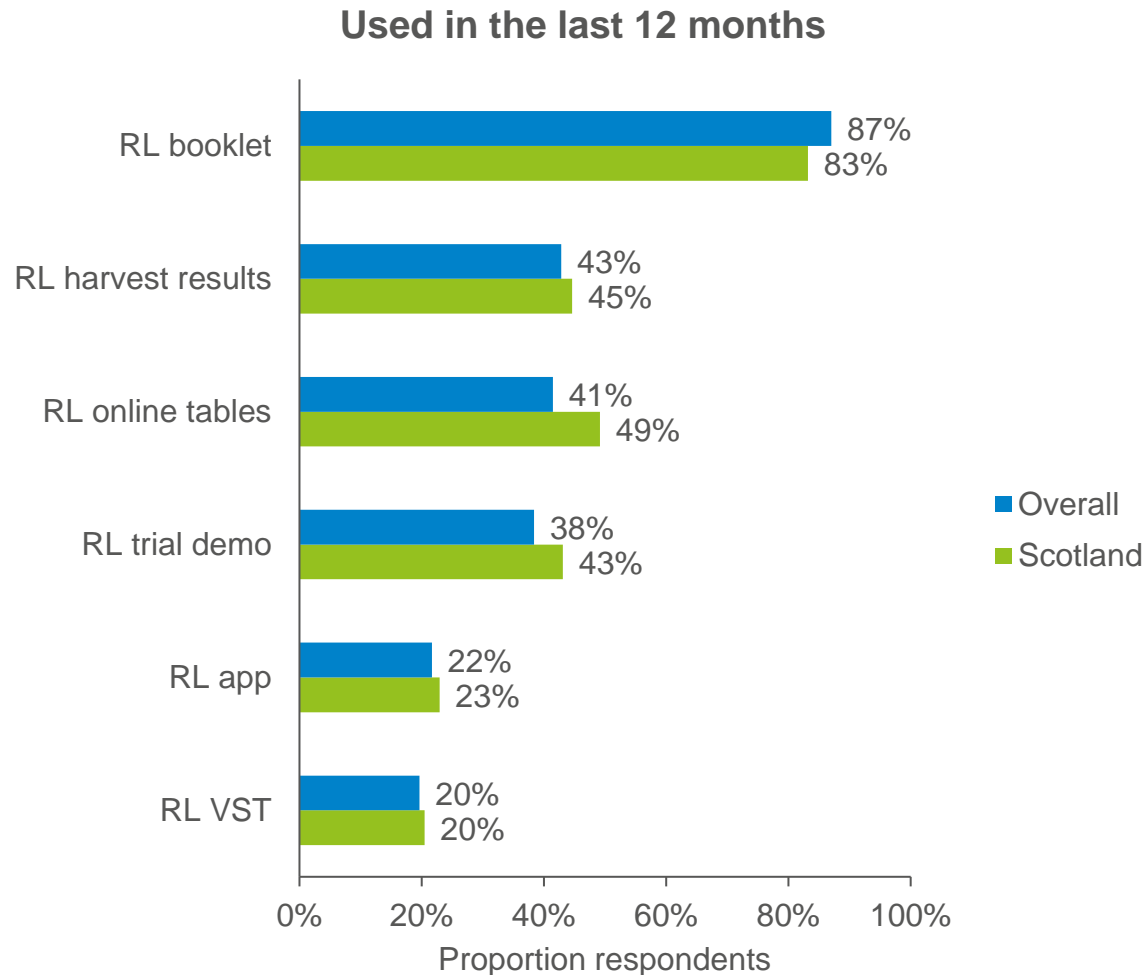
Storm Babet left huge areas of unharvested farmland under water

By Kevin Keane
BBC Scotland's environment correspondent

www.bbc.co.uk/news/uk-scotland-67752167



Potential improvements to improve RL outputs



- Further feedback on RL printed and online table design
- Requests for RL app development
- Demand for new ways to personalise RL information

Changes to barley tables


AHDB RECOMMENDED LISTS

Spring barley 2024



MBC malting varieties

	Skyway	Firefox	Laureate	LG Diablo	FGT Planet	KWS Sassy	SY Signet	Diviner	SY Tennyson	County ¹	NOS Gambit	Elder	NOS Munro	LG Aquarius	Cleen	Hurler	Fairing	CB Score	Average LSD (5%)
End-use group	Approved						Provisional			Under test for malting						Feed	Described		
Scope of recommendation	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK Gr.Dis	UK Null-Lox	
Variety status	C	C	C	C	C	C				NEW	NEW	NEW	NEW	NEW	NEW				
Fungicide-treated grain yield (% treated control)																			
United Kingdom (7.8 t/ha)	102	101	101	99	97	95	102	102	102	105	103	103	103	103	102	104	91	98	2.3
East region (7.9 t/ha)	103	101	101	99	97	93	103	101	102	107	104	104	102	105	103	104	90	98	3.1
West region (7.4 t/ha)	103	102	102	98	96	96	100	101	101	[105]	[105]	[103]	[103]	[102]	[101]	104	93	98	3.6
North region (8.2 t/ha)	101	102	100	100	97	96	103	103	102	105	101	103	103	101	102	104	90	99	2.7
Untreated grain yield (% treated control)																			
United Kingdom (7.8 t/ha)	91	90	92	88	87	86	91	90	88	91	94	94	92	91	92	91	82	90	3.0
Disease resistance																			
Mildew (1–9)	8	8	9	8	8	8	[8]	[9]	[8]	8	8	8	8	8	8	[8]	7	9	0.8
Brown rust (1–9)	4	4	5	5	4	5	5	5	4	4	5	5	5	4	4	5	5	5	1.1
Rhynchosporium (1–9)	7	6	7	6	6	6	5	4	5	[7]	[6]	[6]	[5]	[5]	[6]	6	9	7	1.5
Agronomic features																			
Resistance to lodging without PGR (1–9)	7	7	6	7	7	6	[7]	[7]	[7]	[8]	[8]	[7]	[7]	[8]	[8]	[9]	8	7	1.1
Straw length without PGR (cm)	77	72	72	73	75	80	73	68	72	71	70	70	73	72	72	68	72	72	1.8
Ripening (days +/- RGT Planet)	0	0	+1	+3	0	+1	+2	+1	+2	+2	+1	+2	+2	+1	+2	+1	-2	+1	0.9
Resistance to brackling (1–9)	8	8	8	8	8	6	8	8	7	8	9	9	8	8	8	9	8	8	0.7
Main market options																			
MBC malting approval for brewing use	F	-	F	F	F	Nt	P	Nt	P	T	T	T	-	T	T	-	-	-	-
MBC malting approval for malt distilling use	-	F	F	F	Nt	F	-	P	P	-	-	T	T	-	T	-	-	-	-

<div></div> <div>RECOMMENDED</div>	KWS Zelett	SY Cheer	Skyfall	Cruise	RGT Illustrious	KWS Estee	KWS Ultimatum	KWS Palladium	Mayflower	Stanford	RGT Wilkinson	KWS Brum	RGT Rashid	Almera	LG Illumite	LG Astronomer
	UKFM Group 1					UKFM Group 2				UKFM Group 3						
	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	E	N	UK
End-use group																
Scope of recommendation	UK	NEW	C			C				NEW		*		NEW	*	
Variety status																
Fungicide-treated grain yield (% treated control)																
United Kingdom (11.0 t/ha)	99	97	96	95	95	101	101	100	97	106	100	100	99	99	98	98
East region (10.9 t/ha)	98	97	96	95	95	101	101	99	97	105	101	100	100	98	98	98
West region (11.2 t/ha)	99	98	96	96	96	102	101	101	97	107	99	99	98	99	99	98
North region (11.3 t/ha)	97	[98]	95	94	94	99	101	99	96	[105]	99	100	98	[102]	100	97
Untreated grain yield (% treated control)																
United Kingdom (11.0 t/ha)	71	84	66	75	82	93	90	90	91	92	83	80	78	87	83	85
Disease resistance																
Mildew (1–9)	7	[8]	6	7	6	7	7	8	7	[6]	7	7	3	[6]	5	4
Yellow rust (1–9)	3	7	3	8	7	7	9	9	9	7	7	9	8	8	7	8
Yellow rust (young plant)	5	-	5	5	5	5	r	r	r	-	5	5	r	-	r	r
Brown rust (1–9)	7	6	9	3	5	6	6	5	6	6	5	5	5	6	6	7
Septoria tritici (1–9)	6.3	6.0	5.8	6.3	5.9	7.4	6.5	7.3	8.9	6.7	5.5	5.7	6.1	6.0	5.6	5.9
Eyespot (1–9)	6½	4	6½	5	6½	4	6	6	6½	6½	6½	5	5	4	5	5
Fusarium ear blight (1–9)	6	[7]	7	7	6	6	6	6	6	[5]	6	6	7	[6]	6	6
Orange wheat blossom midge	-		R	-	-	-	-	-	-	-	-	-	R	R	R	R
Agronomic features																
Resistance to lodging without PGR (1–9)	8	8	8	7	8	7	6	8	6	7	8	8	8	6	7	7
Resistance to lodging with PGR (1–9)	8	7	7	8	9	8	7	8	7	7	8	7	8	7	7	9
Lodging without PGR (%)	1	1	1	2	1	3	6	2	6	3	1	2	2	6	3	2
Lodging with PGR (%)	1	3	3	2	0	2	4	2	4	4	1	4	2	3	3	0
Straw length without PGR (cm)	86	91	87	84	91	92	87	85	90	90	84	93	87	86	85	90
Straw length with PGR (cm)	76	82	78	77	81	86	77	78	83	83	78	85	80	79	77	80
Ripening (days +/- Skyfall)	0	+1	0	+1	+1	-1	+1	-1	0	+1	+2	+2	+3	+1	+1	+2
Resistance to sprouting (1–9)	6	-	5	6	6	6	[6]	[6]	[6]	-	[5]	[6]	[6]	-	[6]	[7]
Main market options (The specific attributes of varieties are different, so, whenever possible, varieties should not be mixed in store)																
UK bread-making	Y	Y	Y	Y	Y	Y	Y	Y	Y	-	-	-	-	-	-	-
UK biscuit, cake-making	-	-	-	-	-	-	-	-	-	Y	Y	Y	Y	Y	Y	Y
UK distilling	-	-	-	-	-	-	-	-	-	[Y]	[Y]	[Y]	[Y]	[Y]	[Y]	[Y]
ukp bread wheat for export	Y	-	-	Y	-	Y	[Y]	-	Y	-	-	-	-	-	-	-
uks soft wheat for export	-	-	-	-	-	-	-	-	-	[Y]	[Y]	-	-	[Y]	Y	-
Grain quality																
Endosperm texture	Hard	Hard	Hard	Hard	Hard	Hard	Hard	Hard	Hard	Soft	Soft	Soft	Soft	Soft	Soft	Soft
Protein content (%)	11.7	11.8	11.8	12.3	11.8	11.5	11.3	11.4	11.6	10.9	11.1	11.0	10.8	11.1	11.3	11.4
Protein content (%) – milling spec	12.5	13.0	12.9	13.2	12.5	12.3	12.2	12.2	12.5	11.6	12.1	11.8	12.0	12.2	12.4	12.5
Hagberg Falling Number	248	299	265	265	258	283	271	305	294	239	248	260	221	186	251	232
Specific weight (kg/hl)	78.3	79.5	79.1	78.3	78.0	79.1	79.6	77.6	79.1	78.5	75.4	78.0	77.1	77.6	77.0	78.1
Chopin Aivegraph W	-	[275]	266	243	-	203	189	[186]	207	103	105	[78]	[76]	98	88	-
Chopin Aivegraph P/L	-	[1.6]	1.0	0.6	-	0.7	0.7	[0.6]	0.8	0.5	0.4	[0.3]	[0.3]	0.3	0.3	-
Annual treated yield (% control)																
2019 (11.6 t/ha)	96	-	95	97	94	100	-	100	98	-	-	99	99	-	100	99
2020 (10.4 t/ha)	97	-	95	94	96	99	[102]	[100]	[96]	-	[101]	[102]	[100]	-	100	98
2021 (11.0 t/ha)	99	97	97	95	93	101	100	98	95	104	98	98	98	100	97	97
2022 (11.7 t/ha)	100	98	96	94	96	102	101	100	97	106	101	100	98	98	99	98
2023 (10.9 t/ha)	99	96	98	96	96	101	101	100	97	106	99	99	99	99	97	97
Rotational position																
First cereal (11.3 t/ha)	98	97	96	96	95	101	101	100	97	105	100	100	99	99	98	98
Second and more (10.2 t/ha)	98	95	97	94	93	101	101	99	98	106	100	100	99	98	98	97
Sowing date (most trials were sown in October)																
Early sown (before 25 Sept) (11.4 t/ha)	[100]	[977]	96	[98]	[99]	101	[103]	[999]	101	[104]	[100]	100	[988]	[1000]	101	99
Late sown (after 1 Nov) (9.5 t/ha)	97	[1000]	97	94	93	101	[101]	98	94	[1050]	[102]	101	103	[966]	97	97
Latest safe-sowing date	End Jan	[End Jan]	End Feb	End Jan	End Jan	End Jan	[End Jan]	End Jan	End Jan	[End Jan]	[End Jan]	End Feb	End Jan	[End Jan]	Mid Feb	End Jan
Soil type (about 50% of trials are on medium soils)																
Light soils (10.7 t/ha)	97	[96]	96	93	94	101	101	99	96	[105]	100	99	99	[102]	100	98
Heavy soils (11.4 t/ha)	99	97	96	96	96	101	101	99	97	106	100	99	99	98	98	98
Breeder/UK contact																
Breeder	KWS	SCP	RGT	Lim	R2n	Mom	KWS	KWS	ElsW	ElsW	R2n	KWS	RGT	KWS	LimEur	LimEur
UK contact	KWS	Syn	RGT	Lim	RGT	KWS	KWS	KWS	Els	Els	RGT	KWS	RGT	Sen	Lim	Lim
Status in RL system																
Year first listed	17	24	14	12	16	19	23	22	22	24	23	22	22	24	21	21
RL status	-	P1	-	-	-	-	P2	-	-	P1	P2	*	-	P1	*	-

Soft Group 4							Hard Group 4							Average LSD (5%)				
E&W	UK	N	UK	UK	N&W	N	UK	UK	UK	E&W	UK	UK	UK	UK	Sp	UK		
	NEW				C	*	NEW					C						
106	103	102	102	102	101	96	106	106	104	104	103	103	102	102	99	98	2.3	
105	103	103	102	103	100	96	106	106	104	104	103	103	101	102	100	99	99	2.7
107	101	102	103	103	101	96	106	106	105	104	104	103	104	100	100	100	98	3.0
104	[103]	102	102	101	103	100	[107]	103	105	101	105	103	102	102	101	99	99	3.4
89	87	84	84	83	83	76	91	90	79	88	91	80	89	79	89	72	83	4.8
5	[7]	7	6	7	6	6	[6]	7	7	5	8	6	6	5	7	6	8	1.5
7	9	9	8	7	7	7	9	8	4	8	9	5	7	9	9	4	9	0.6
8	-	7	7	8	7	7	-	7	5	7	7	5	5	7	7	8	7	0.6
7	6	5	6	5	5	5	5	5	6	6	7	6	5	4	6	7	5	0.6
6.5	6.2	6.1	5.9	4.9	6.0	5.1	6.7	7.9	6.4	6.6	6.3	5.7	6.6	5.8	7.2	6.0	5.8	0.7
4	5	5	4	5	4	4	6	4	5	5	5	5	4	5	6	5	5	1.5
6	[8]	7	6	6	6	6	[6]	6	7	6	7	6	6	7	6	6	7	0.4
R	R	R	R	R	-	R	R	R	R	R	-	R	-	R	R	-	-	
5	8	6	6	6	5	8	8	6	6	7	7	7	7	8	7	7	7	1.4
5	7	7	6	6	6	7	8	6	7	7	7	7	8	8	7	7	8	1.0
22	2	6	10	8	12	1	1	6	7	3	3	3	3	2	3	3	2	-
25	3	3	7	10	6	0	2	7	4	3	3	4	2	2	3	3	2	-
95	92	90	92	93	92	80	90	89	95	86	85	89	91	90	88	88	85	1.5
88	85	82	82	84	81	74	81	82	84	79	77	78	81	81	79	79	76	1.4
+2	+2	+2	+2	0	+3	+1	+2	0	+1	+2	+1	0	-1	+3	+2	+2	+2	0.7
[6]	-	[6]	[6]	6	[6]	[5]	-	[6]	5	[6]	[6]	6	6	[6]	[5]	[6]	6	1.1
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
[Y]	[Y]	[Y]	Y	[Y]	Y	Y	-	-	-	-	-	-	-	-	-	-	-	
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Soft	Soft	Soft	Soft	Soft	Soft	Soft	Hard	Hard	Hard	Hard	Hard	Hard	Hard	Hard	Hard	Hard	Hard	
10.7	10.9	10.7	10.8	11.0	10.9	10.9	11.1	11.0	10.5	11.2	10.8	10.9	11.0	10.9	10.8	10.7	11.4	0.2
11.4	11.7	11.6	11.7	12.0	11.9	11.8	12.3	11.9	11.2	12.2	11.7	11.5	11.8	11.7	11.8	11.4	12.3	0.5
147	299	202	224	204	240	255	253	235	261	202	299	215	271	286	164	271	321	21.8
75.2	78.2	76.8	76.6	77.1	76.2	76.6	78.3	75.4	78.6	76.1	79.9	76.9	77.7	75.8	77.1	76.3	81.1	0.6
-	124	[74]	[54]	-	[65]	-	-	-	-	-	-	-	-	-	-	-	-	30.1
-	0.5	[0.3]	[0.3]	-	[0.3]	-	-	-	-	-	-	-	-	-	-	-	-	0.3
-	-	-	103	103	103	98	-	104	105	-	104	102	102	101	102	101	98	-
[105]	-	[103]	[103]	102	[101]	101	-	[105]	103	[104]	[105]	103	102	103	[101]	101	99	-
106	102	101	101	101	102	97	107	105	105	102	103	104	103	99	100	95	99	-
106	103	102	102	102	101	98	105	105	105	102	103	103	103	102	99	101	98	-
105	102	102	102	100	101	94	106	106	106	105	104	104	102	102	101	100	98	-
106	103	102	102	102	101	97	106	105	104	104	104	103	102	101	100	100	99	2.3
106	102	104	103	103	101	98	106	107	105	104	104	102	101	102	98	97	97	3.4
[104]	[103]	105	101	102	101	99	[105]	107	[107]	104	106	103	101	[101]	103	100	99	4.3
[104]	[105]	[104]	104	102	99	97	[108]	106	102	[105]	103	102	99	104	100	99	100	4.6
[Mid Feb]	[Mid Feb]	[End Jan]	End Feb	End Jan	End Jan	End Feb	[End Jan]	Mid Feb	End Jan	[End Jan]	End Jan	Mid Feb	End Jan	Mid Feb	End Jan	End Jan	End Jan	
105	[102]	[101]	103	102	102	100	[105]	105	106	102	105	103	102	103	101	97	99	3.2
105	102	103	103	102	101	96	106	106	104	105	103	103	102	101	100	100	98	3.2
LimEur	ElsW	KWS	RAGT	LimEur	RAGT	BA	LimEur	DSV	SyP	DSV	KWS	SyP	SyP	KWS	LimEur	R2n	KWS	
Lim	Els	KWS	RAGT	Lim	RAGT	Sen	Lim	DSV	Syn	DSV	KWS	Syn	Syn	KWS	Lim	RAGT	Sen	
23	24	23	22	19	22	21	24	22	20	23	22	18	16	21	22	21	15	
P2	P1	P2	-	-	-	*	P1	-	-	P2	-	-	-	-	-	-	-	

RL app new comparison feature

- New comparison feature added:
 - Compare up to 3 varieties side by side
- RL 2024/25 app update in January



Back Skyway ☆

Skyway
RECOMMENDED

- Spring barley
- A very high-yielding malting variety with full MBC approval for brewing
- Parentage: RGT Planet x NOS 2105-11
- Region: UK ?

> UK contact

☆ Add to favourites

⚖ Add to compare

Grain yield (as % control)

UK	East	West	North	Untreated
105	106	106	102	94

Quality

Specific weight (kg/hl)	69.4	Medium
Screenings (% through 2.25 mm)	0.9	
Screenings (% through 2.5 mm)	2.4	

Home ☆ ⚖ Search

Back Compare

	Skyway	Firefoxx	Laureate
Remove all	☆	☆	☆
	Remove	Remove	Remove
	RL	RL	RL
	Spring barley	Spring barley	Spring barley

Grain yield (as % control)

	Skyway	Firefoxx	Laureate
UK	105	103	103
East	106	103	103
West	106	104	104
North	102	103	102
Untreated	94	92	94

Quality

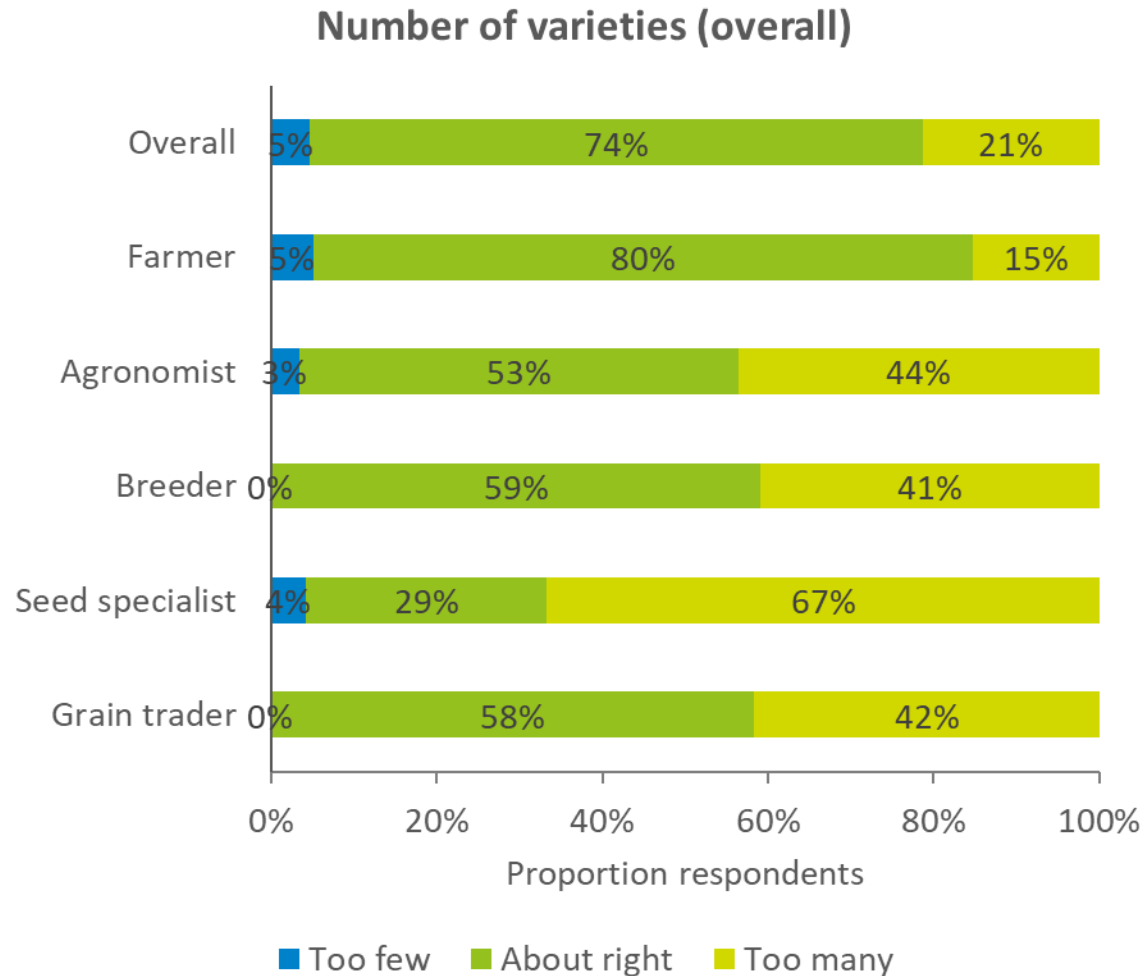
	Skyway	Firefoxx	Laureate
Specific weight (kg/hl)	69.4	67.1	67.2
Screenings (% through 2.25 mm)	0.9	1.4	1.2
Screenings (% through 2.5 mm)	2.4	3.6	3.0
Nitrogen content (%)	1.54	1.51	1.52

Agronomic features

	Skyway	Firefoxx	Laureate
Lodging resistance without PGR (1-9)	7	7	6
Straw length without PGR (cm)	75	69	70

Home ☆ ⚖ Search

Number of varieties



Only stakeholder groups in which >10 responses presented: overall 891; farmer 699; agronomist 177; breeder 22, seed specialist 24; grain trader 12

- Review criteria for addition to and removal from lists
- Demand for easier access information on previously recommended varieties

Variety index tool (new)

From Aardvark to Zuton, use this interactive tool to reveal the years when a variety was first and last listed on the Recommended Lists (RL).

Variety	Year first listed	Year last listed
Abbot	1997	1999
Access	2002	2007
Admiral	1992	1995
Alchemy	2006	2015
Almara	2024	
Ambrosia	2005	2009
Apollo	1988	1994
Avalon	1980	1992
Bamford	2024	
Battalion	2007	2012
Beaufort	1995	1998
Beaver	1990	1995
Belgrade	2016	2017
Beluga	2010	2015

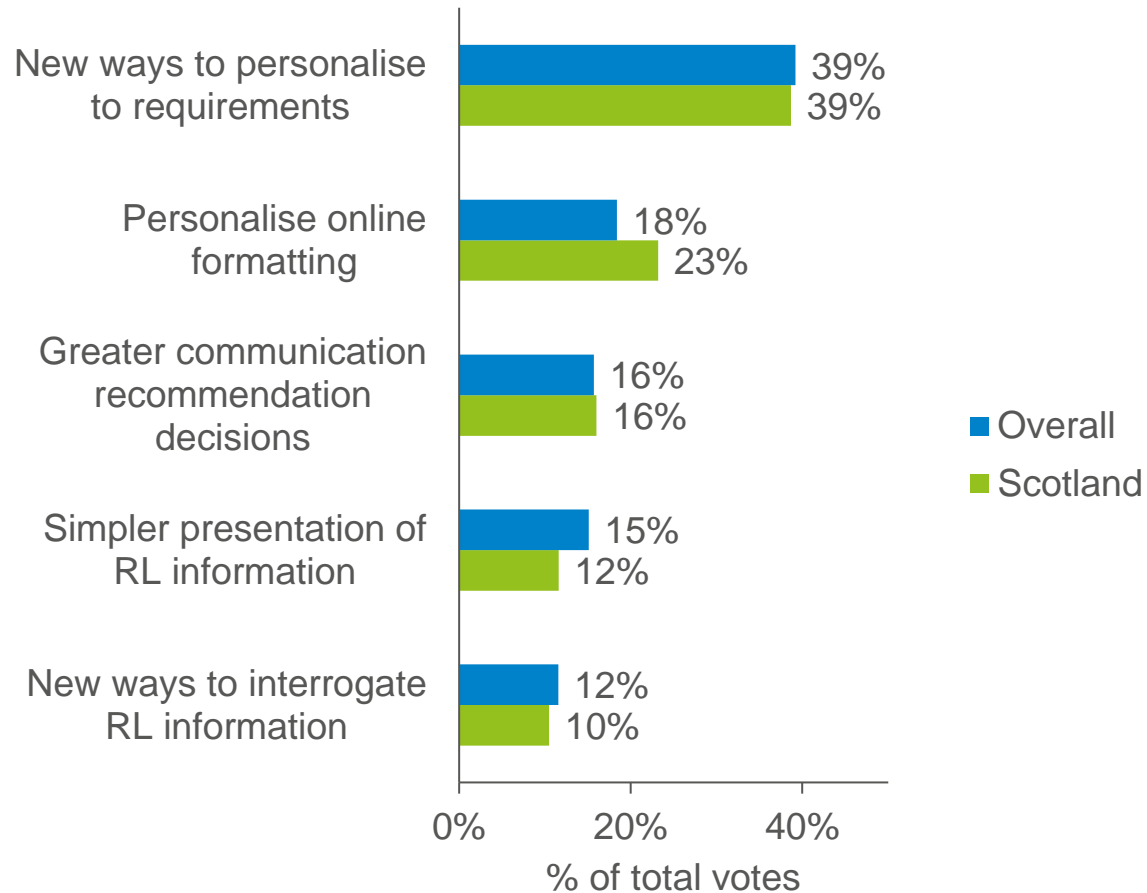
Search

- ☐ Spring Barley
- ☐ Spring Linseed
- ☐ Spring Oats
- ☐ Spring Oilseed Rape
- ☐ Spring Wheat
- ☐ Winter Barley
- ☐ Winter Oats
- ☐ Winter Oilseed Rape
- ☐ Winter Rye
- ☐ Winter Triticale
- ☒ Winter Wheat

Please note that the AHDB online archive contains editions of the RL from 2004/2005 onwards.

How would you like RL outputs to be improved?

Potential output improvements



More feedback needed!

Questionnaire respondents were asked to 'vote' for up to 2 areas
(total votes: overall = 1158; Scotland = 181)

What's on the horizon?



New breeding technologies

- Precision breeding?

- Scotland, Wales and NI: precision bred organisms (PBOs) continue to be classified as genetically modified organisms
- England: Genetic Technology (Precision Breeding) act March 2023:
 - FSA are developing authorisation framework to regulate use of PBOs
- Potential future changes to RL trials and presentation

What is precision breeding?

- *“a range of breeding technologies, such as gene editing (GE), that enable DNA to be edited “much more efficiently and precisely than current breeding techniques”*
- *“Precision breeding technologies can make targeted genetic changes to produce beneficial traits that can **also occur through traditional breeding and natural processes**. This makes it different to genetic modification (GM) where modern techniques are used to insert functional DNA from an unrelated species into another species.”*
- *commonslibrary.parliament.uk/research-briefings/cbp-9557/*

AHDB supported research on plant breeding

- Breeding for resistance to the CSFB:
 - Partnership between research and industry to combat CSFB, ending Nov '25 (sponsored by BBSRC)
- Yellowhammer: durable rust resistance in wheat, in the face of a rapidly changing pathogen landscape:
 - Partnership between research and industry on breeding for durable yellow rust resistance (sponsored by BBSRC)
- Scoping reviews on variety performance



Summary

Thank you!

The RL is developing

- Under investigation/consideration:
 - Varietal performance under lower inputs
 - Increased use of RL data
 - Potential new attributes
 - Personalisation of RL information
- Initial developments:
 - Additional criteria for automatic selection of winter wheat varieties
 - New look RL tables
 - More information on the RL programme in the 2024/25 RL
 - New RL app comparison feature
 - New RL archive index

New advances in plant breeding are on the horizon

RL Crop committee vacancies

- Committees agree on agronomic and quality definitions for recommendation
- Select candidate varieties for trial
- Propose new varieties to add to the RL
- **Barley, Oats and other cereals crop committee vacancies**
 - Grain trader with a particular interest in barley
 - Grain trader with a particular interest in oats
 - Grower
- **Oilseeds crop committee vacancies**
 - Independent pathologist
 - Grower

Applications close on the 19th January, with informal interviews held on 6th February
Send short CV and covering letter to paul.gosling@ahdb.org.uk

A vibrant landscape of a green field at sunset. A path leads from the foreground towards the horizon where the sun is setting, casting a warm glow over the scene. The sky is filled with colorful clouds, and the field is lush and green. In the background, there are rolling hills and a small village.

**‘Inspiring our farmers, growers
and industry to succeed in a
rapidly changing world’**

Crop selection and variety performance

Steve Hoad

SRUC

steve.hoad@sruc.ac.uk

Agronomy Roadshows 2024

An evidence-based approach to productive and sustainable systems

Outline

- Crop harvest: 2022/23 and trends
- Scottish Cereals List 2024/25: Review
 - Spring barley – Established *versus* new varieties
 - Winter barley – Variety improvement
 - Winter wheat – Old varieties off and opportunity for new
 - Spring wheat and spring oats – Good yield and quality
 - Looking at RL data - Specific weight and yield

Crop harvest: 2022/23 and trends

- <https://www.gov.scot/publications/cereal-and-oilseed-rape-harvest-2023-final-estimates/documents/>
- Barley and OSR areas up, wheat no change
- Crop yields down on 2021/22 (which was high)
- Total cereal production just above ten-year mean
- Oilseed rape production highest for 20 years
- Weather conditions and challenging harvest
- Production trends: National v Your Farm

Choose crop to add to chart

- ☒ Total cereals
- ☒ Spring barley
- ☒ Winter barley
- ☒ Wheat
- ☒ Oats
- ☒ Oilseed rape

Select All Deselect All

Select variable

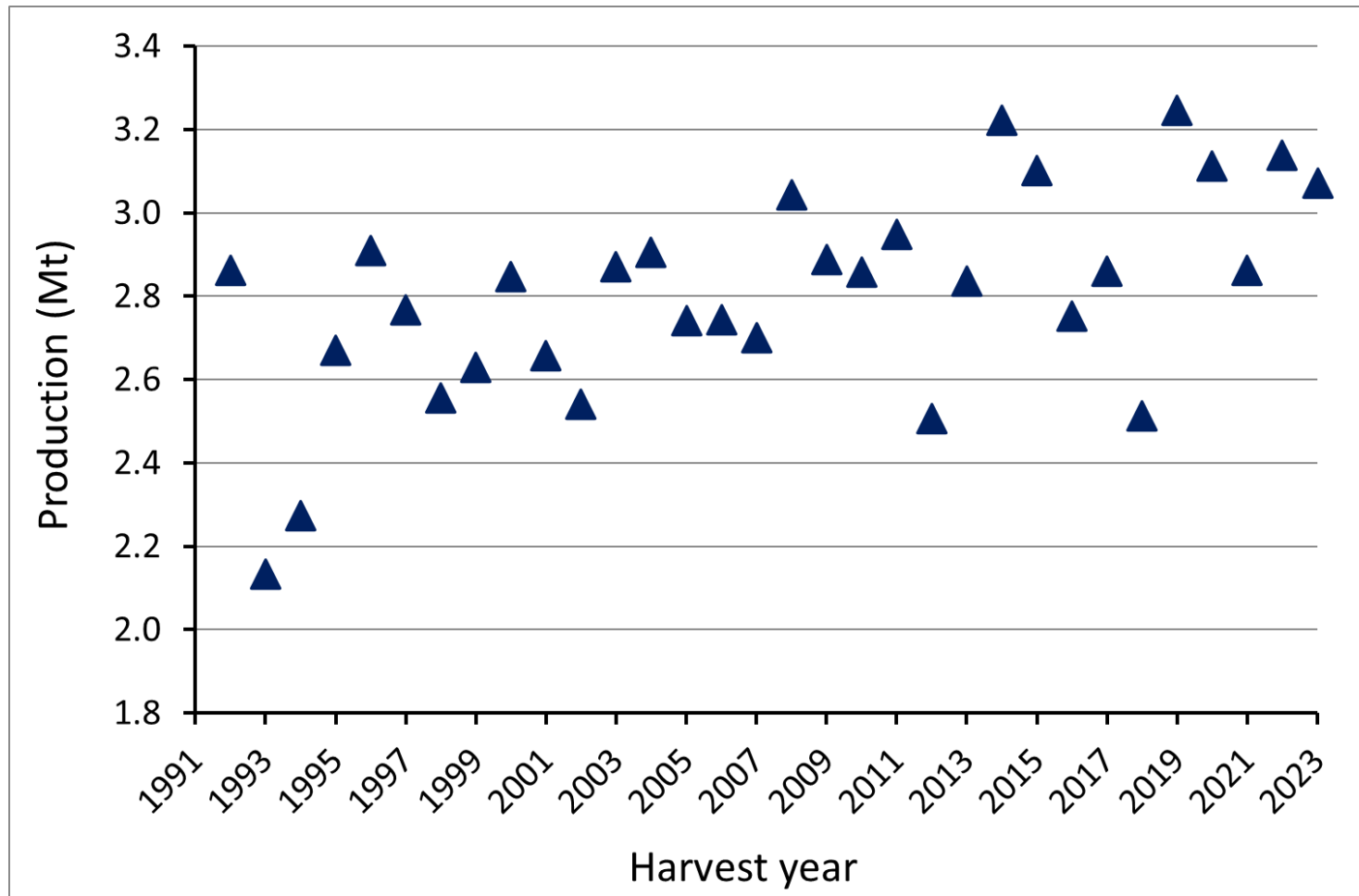
- ☐ Production
- ☐ Area
- ☒ Yield

Select year range

2007 2023

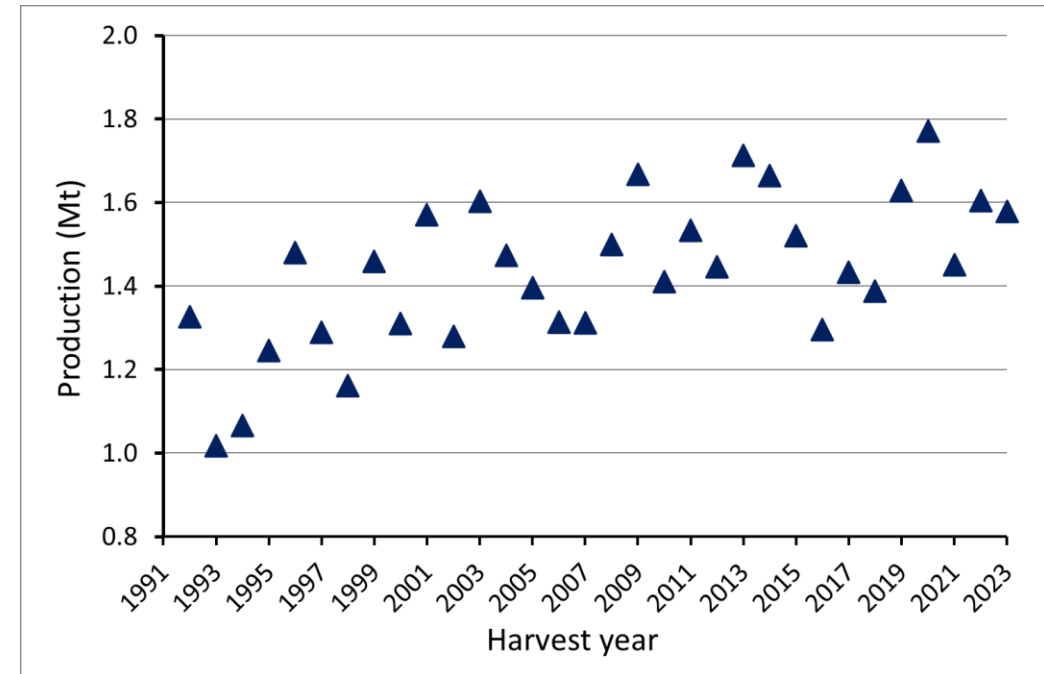
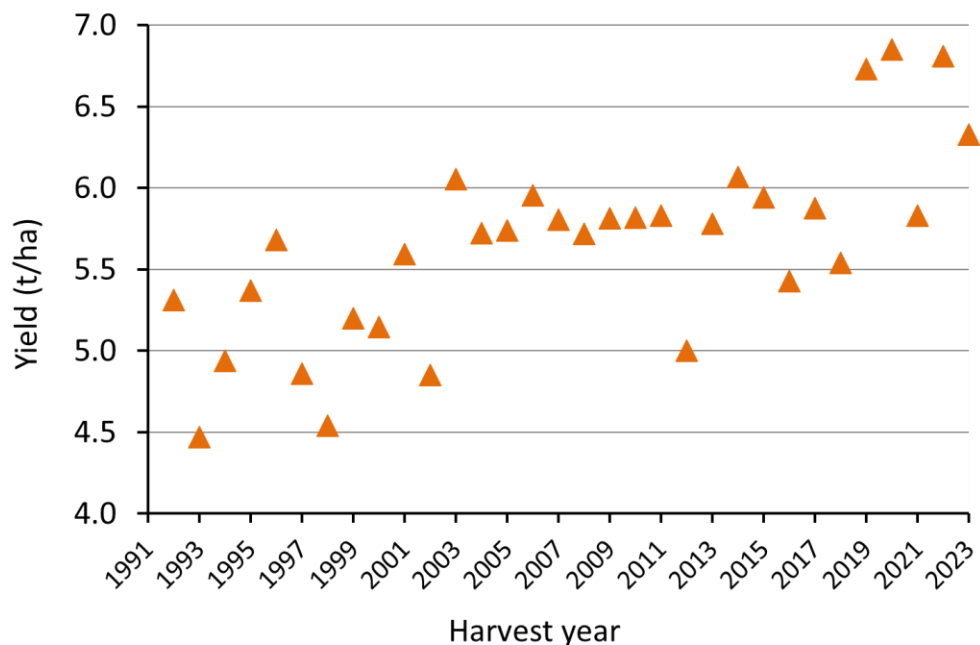
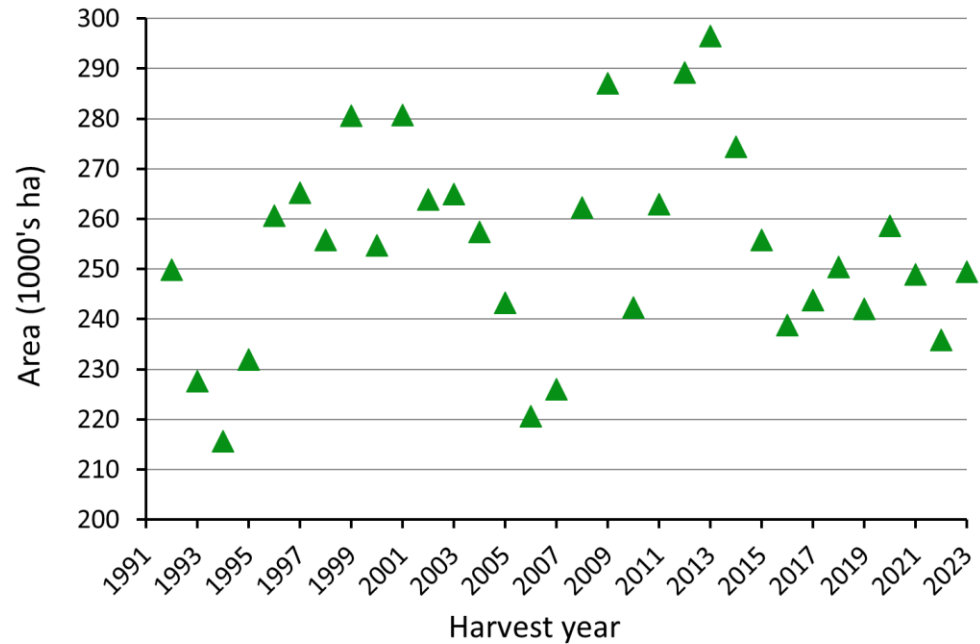
2003 2007 2011 2015 2019 2023

Total cereal production



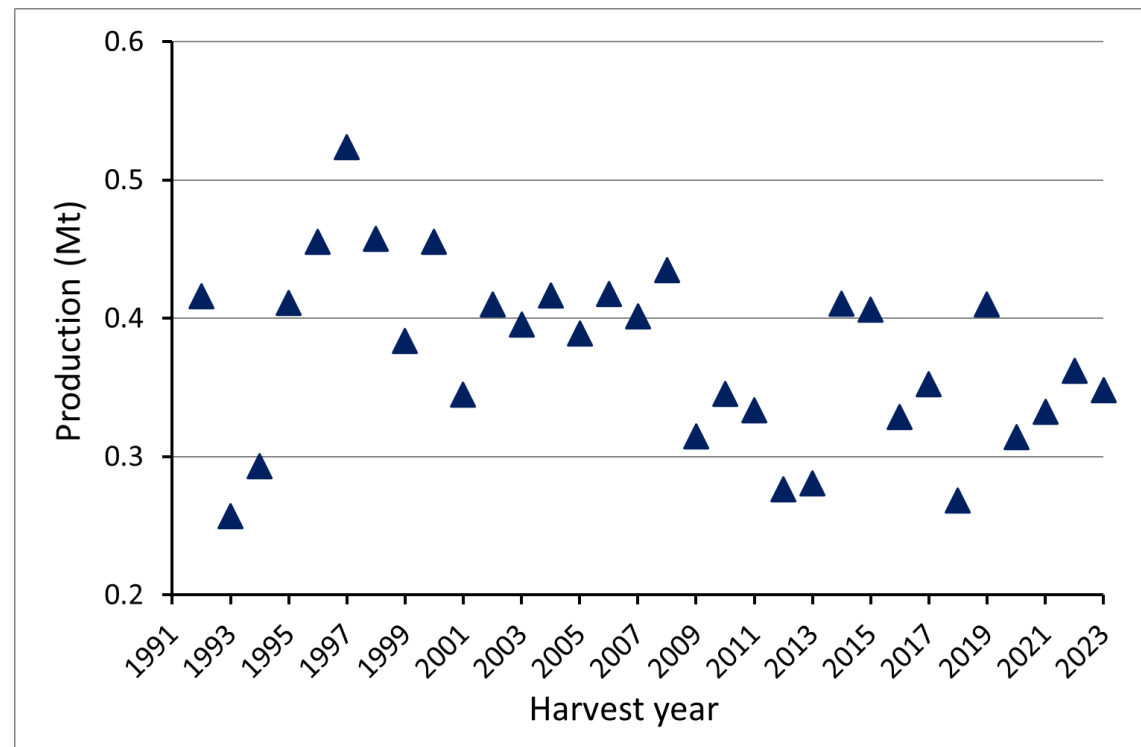
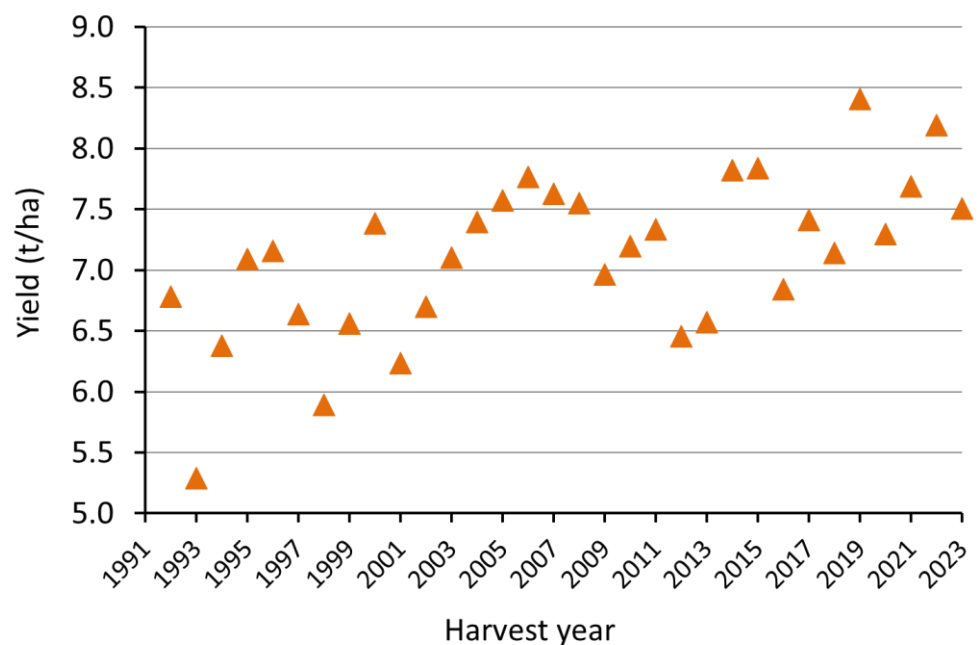
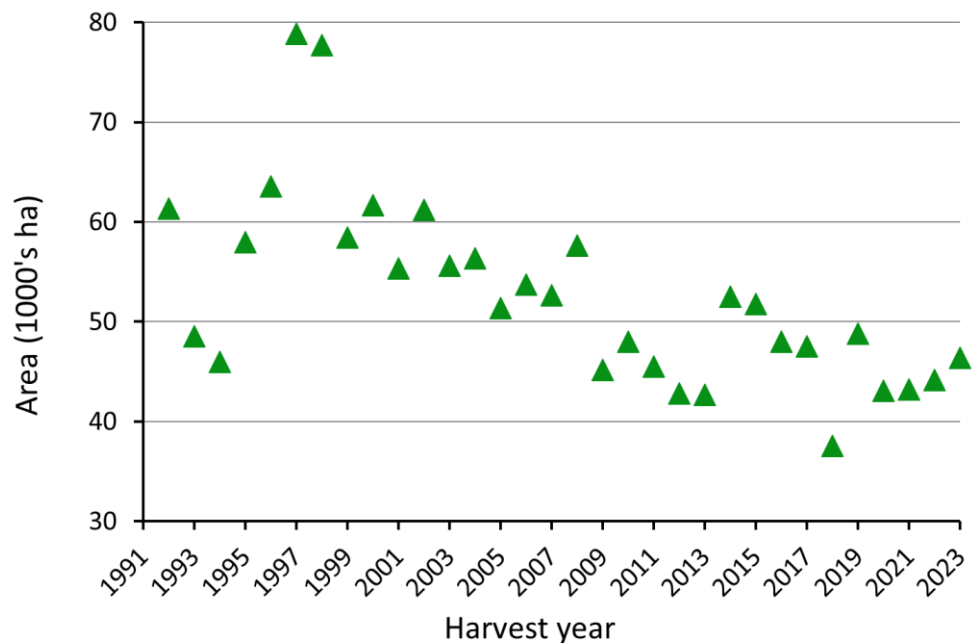
- Long term upwards trend
- Seasonal variation in area sown and yield
- Improved yields in new varieties

Spring barley production



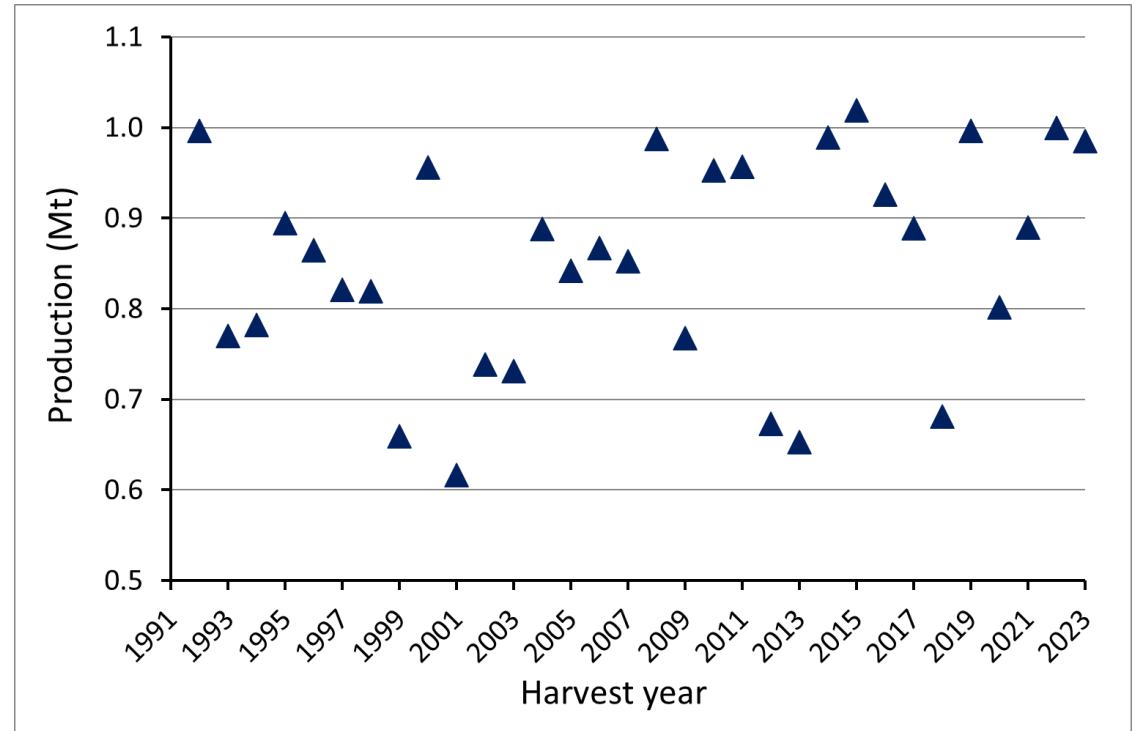
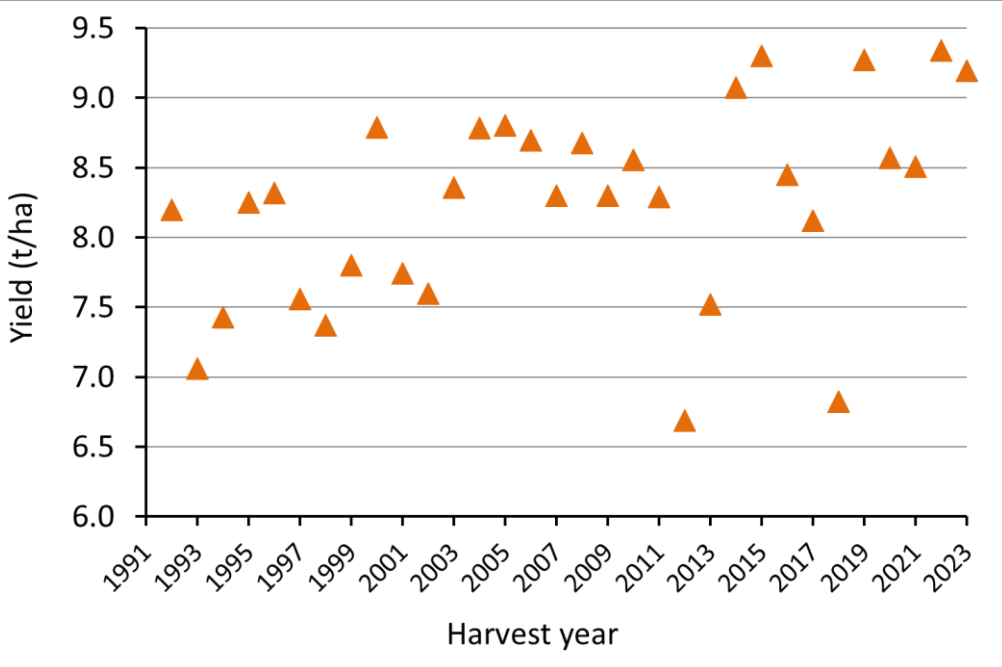
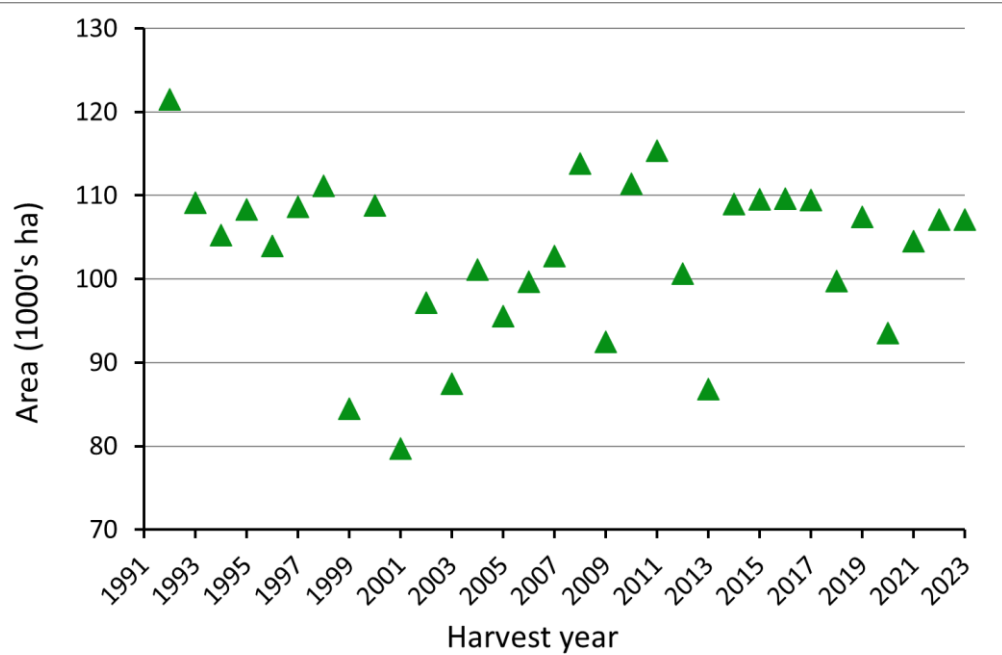
- 2023 area was close to average
- Good yield and production

Winter barley production



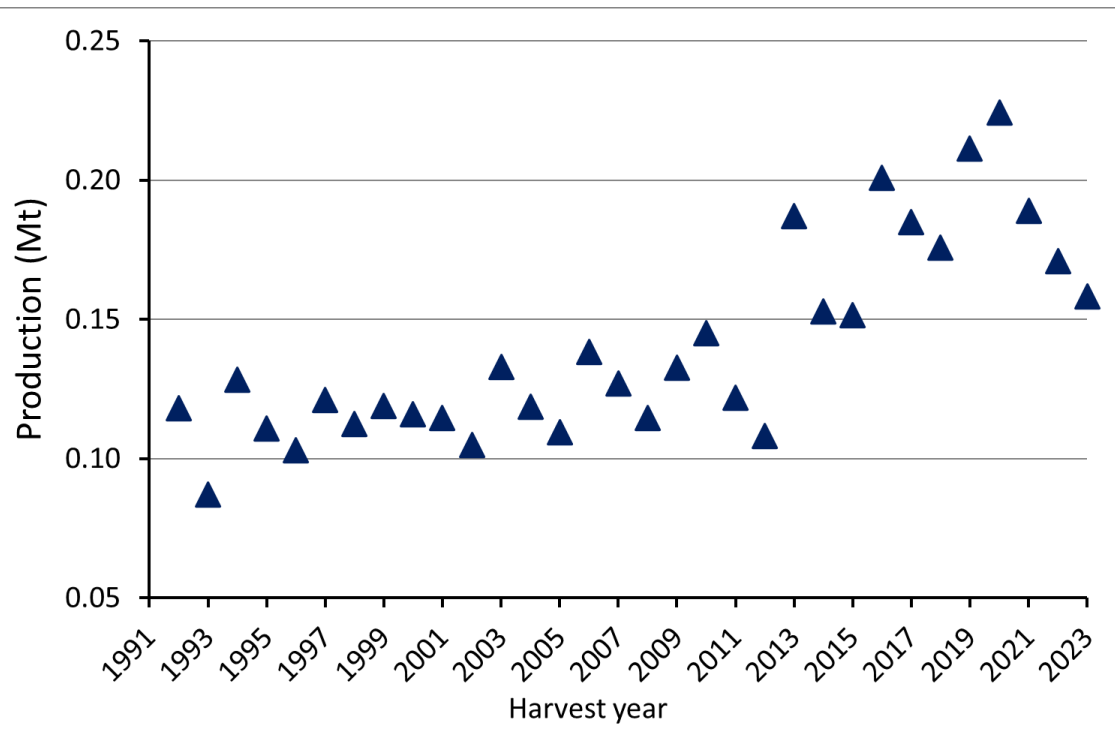
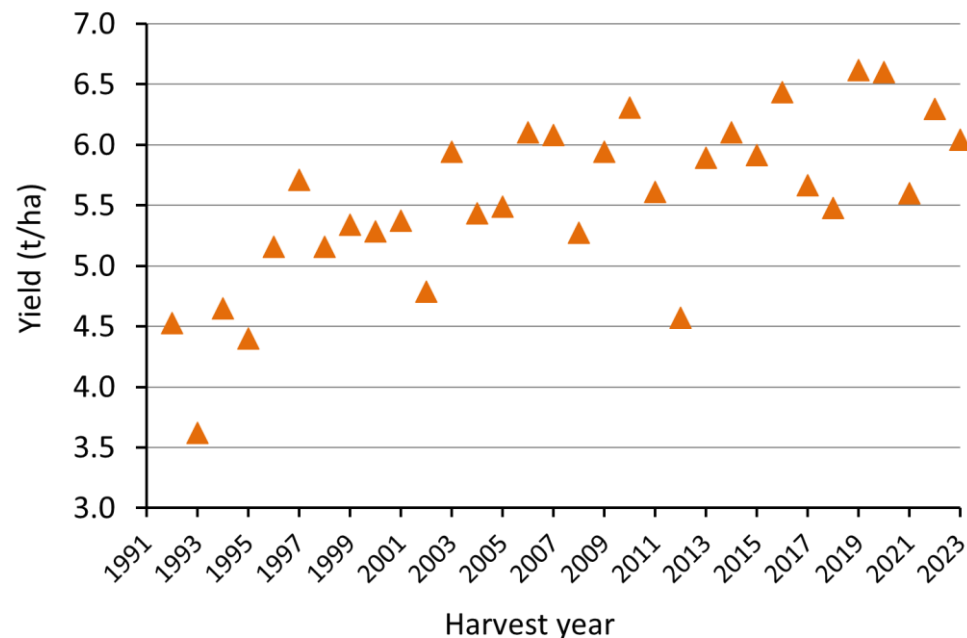
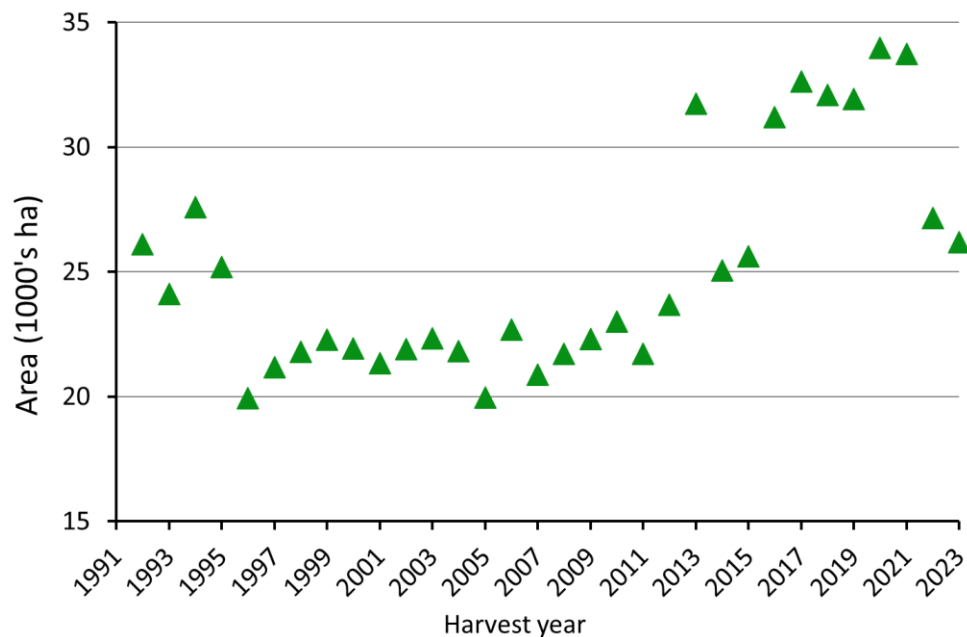
- 2022/23 below average production
- Area up, yield down

Winter wheat production



- Seasonal production swings
- 2022/23 had good yield & production

Oat production



- Production below recent years
- 2023 yield and area down

Scottish Cereals List 2023/24: Review

- Spring barley
- Spring wheat and spring oats
- Winter barley
 - Specific weight in barley
- Winter wheat
 - Treated and untreated yield in wheat

Spring barley Grain yield of 100 = 8.2 t/ha

Year First Listed	Recommendation		Grain yield as % of treated Control	Yield loss (%) if untreated	Malting market options and MBC† approval		
					Dist.	Brew	Grain
2023	P2	Diviner	103	12	P	---	---
2024	P1	Belter	103	9	T	T	---
2024	P1	NOS Munro	103	11	T	---	---
2020	R	Firefoxx	102	11	F	---	---
2023	P2	SY Tennyson	102	14	P	P	---
2024	P1	Olsen	102	10	T	T	---
2016	R	Laureate	100	9	F	F	---
2018	R	LG Diablo	100	11	F	F	---
2016	R	KWS Sassy	96	9	F	---	---
2016	S	Fairing	90	9	---	---	F

Spring barley: Malting options

- 5 established varieties
- Three new (P1) and two progressing (P2)

Spring barley Grain yield of 100 = 8.2 t/ha

Year First Listed	Recommendation		Grain yield as % of treated Control	Yield loss (%) if untreated	Malting market options and MBC† approval		
					Dist.	Brew	Grain
2024	P1	Bounty	105	14	---	T	---
2023	P2	SY Signet	103	11	---	P	---
2021	R	Skyway	101	11	---	F	---
2024	P1	NOS Gambit	101	9	---	T	---
2015	O	RGT Planet	97	10	---	F	---
2023	P2	Hurler	104	13	---	---	---
2023	P2	Florence ¹	102	10	---	---	---

Spring barley: Other malting and feed

- Two new varieties
- Brewing and feed uses

Spring barley agronomics: Malting options

Year First Listed	Recommendation		Screenings <2.5 mm (%)	Specific weight (kg/hl)	Maturity days +/- RGT Planet	Straw strength 1 to 9; weak to stiff (without PGR)	Straw length (cm) without PGR
2023	P2	Diviner	4.5	67.5	+1	[7]	68
2024	P1	Belter	2.5	67.7	+2	[7]	70
2024	P1	NOS Munro	6.5	65.7	+2	[7]	73
2020	R	Firefoxx	3.6	67.0	0	7	72
2023	P2	SY Tennyson	3.2	66.5	+2	[7]	72
2024	P1	Olsen	4.2	66.8	+2	[8]	72
2016	R	Laureate	3.2	67.2	+1	6	72
2018	R	LG Diablo	3.5	67.7	+3	7	73
2016	R	KWS Sassy	2.4	68.9	+1	6	80
2016	S	Fairing	2.7	68.8	-2	8	72

- Variation in key traits



Spring barley agronomics: Malting options

Year First Listed	Recommendation		Brackling risk 1 to 9; low to high	Disease resistance; 1 susceptible to 9 resistant	
				Mildew	Rhyncho- sporium
2023	P2	Diviner	8	[9]	4
2024	P1	Belter	9	8	[6]
2024	P1	NOS Munro	8	8	[5]
2020	R	Firefoxx	8	8	6
2023	P2	SY Tennyson	7	[8]	5
2024	P1	Olsen	8	8	[6]
2016	R	Laureate	8	9	7
2018	R	LG Diablo	8	8	6
2016	R	KWS Sassy	6	8	6
2016	S	Fairing	8	7	9

- Good brackling resistance
- Variation in resistance to *Rhynchosporium*

Spring barley agronomics: Other brewing and feed

- Variation in key traits

Year First Listed	Recommendation		Screenings <2.5 mm (%)	Specific weight (kg/hl)	Maturity days +/- RGT Planet	Straw strength 1 to 9; weak to stiff (without PGR)	Straw length (cm) without PGR
2024	P1	Bounty	4.3	65.7	+2	[8]	71
2023	P2	SY Signet	3.5	67.2	+2	[7]	73
2021	R	Skyway	2.3	69.3	0	7	77
2024	P1	NOS Gambit	2.0	67.5	+1	[8]	70
2015	O	RGT Planet	3.3	68.7	0	7	75
2023	P2	Hurler	4.3	66.2	+1	[9]	68
2023	P2	Florence ¹	3.1	68.1	0	[8]	70

Spring barley agronomics: Other brewing and feed

Year First Listed	Recommendation		Brackling risk 1 to 9; low to high	Disease resistance; 1 susceptible to 9 resistant	
				Mildew	Rhynchosporium
2024	P1	Bounty	8	8	[7]
2023	P2	SY Signet	8	[8]	5
2021	R	Skyway	8	8	7
2024	P1	NOS Gambit	9	8	[6]
2015	O	RGT Planet	8	8	6
2023	P2	Hurler	9	[8]	6
2023	P2	Florence ¹	9	[8]	5

- Good brackling resistance
- Variation in resistance to *Rhynchosporium*

Spring oats yield and quality

Spring oats Grain yield of 100 = 7.3 t/ha

Year first listed	Recommendation		UK Grain yield as % of treated control	Yield loss (%) if untreated	Kernel content (%)	Screenings <2.0mm (%)	Specific weight (kg/hl)
2022	R	Merlin	103	4	71.7	1.9	50.7
2024	P1	Asterion	102	5	73.2	2.6	51.3
2011	R	Canyon	101	4	71.6	2.9	50.9
2020	R	WPB Isabel	101	13	73.3	2.3	52.9
2014	O	Conway	97	8	71.7	2.6	49.1

- Well established varieties
- Check differences in quality

Spring oats agronomics

Year first listed	Recommendation		Maturity days +/- WPB Isabel	Straw strength 1-9; weak to stiff	Straw length (cm)	Crown rust (1 to 9)	Mildew (1 to 9)
2022	R	Merlin	-2	8	106	[4]	8
2024	P1	Asterion	0	[7]	110	[6]	8
2011	R	Canyon	-2	7	111	4	8
2020	R	WPB Isabel	0	7	111	5	5
2014	O	Conway	-1	7	103	4	6

- Variation in maturity and mildew resistance

Spring wheat yield and quality

Spring wheat Grain yield of 100 = 7.1 t/ha

Year first listed	Recommendation		UK Grain yield as % of treated control	UKFM Group	Protein content (%)	Hagberg falling number (s)	Specific weight (kg/hl)
2022	R	KWS Fixum	106	4	13.0	237	77.6
2023	P2	KWS Alicium	105	2	13.3	342	80.2
2024	P1	WPB Mylo	103	2	13.3	297	77.2
2023	P2	KWS Harsum	102	1	13.0	329	78.5
2017	R	KWS Cochise	101	2	13.6	259	78.6
2022	R	KWS Ladum	101	1	13.5	333	78.1
2011	O	Mulika	95	1	14.0	332	77.3

- Different UKFM Groups
- Good yield
- High grain quality

Spring wheat agronomics

Year first listed	Recommendation		Maturity days +/- Mulika	Straw strength (Lodging %)	Straw length (cm)	Septoria tritici (1 to 9)	Mildew (1 to 9)
2022	R	KWS Fixum	+1	[0]	78	[6]	[8]
2023	P2	KWS Alicium	-1	[3]	84	7	[8]
2024	P1	WPB Mylo	+1	[1]	74	[7]	[8]
2023	P2	KWS Harsum	+1	[2]	78	6	[7]
2017	R	KWS Cochise	0	[2]	77	6	8
2022	R	KWS Ladum	-1	[1]	75	[6]	[7]
2011	O	Mulika	0	[4]	78	6	6

- Variation in traits, but no significant weaknesses

Winter barley Grain yield of 100 = 10.5 t/ha

Year First Listed	Recommendation		Grain Yield as % of treated control	Yield loss (%) if untreated	Soil type: Yield as % of control	
					Light soil	Heavy soil
2024	P1	LG Capitol	[105]	17	[104]	[109]
2023	P2	LG Caravelle	104	16	103	106
2022	R	Lightning	103	13	103	103
2023	P2	Bolivia	103	15	104	103
2021	R	KWS Tardis	103	18	102	106
2021	R	Bolton	101	17	103	104
2019	O	LG Mountain	101	17	102	101

Winter barley: two-rowed

- Strong list
- Some difference in treated and untreated yield
- Good spec. weights
- Check performance on soil type

Winter barley Grain yield of 100 = 10.5 t/ha

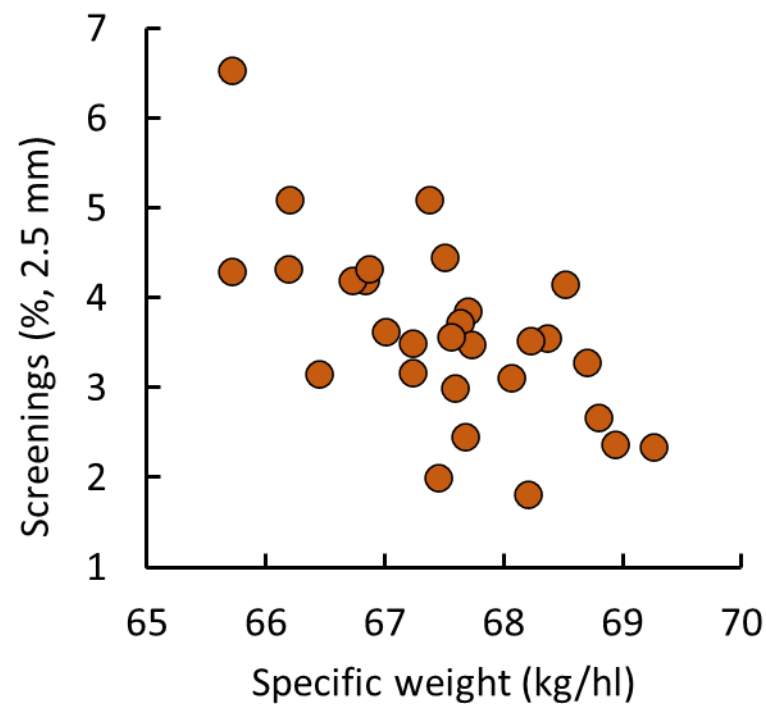
Year First Listed	Recommendation		Grain Yield as % of treated control	Yield loss (%) if untreated	Soil type: Yield as % of control	
					Light soil	Heavy soil
2023	P2	Buccaneer	100	12	98	98
2016	S	Craft	93	13	94	93
2022	S	KWS Feeris ¹	100	18	101	102
2019	R	SY Kingsbarn	107	24	107	103
2021	R	SY Thunderbolt	107	19	106	105
2021	R	SY Kingston	106	20	106	101
2022	R	SY Canyon	106	15	107	102
2024	P1	SY Buzzard ¹	[102]	21	[101]	[100]

Winter barley: malting and six-rowed

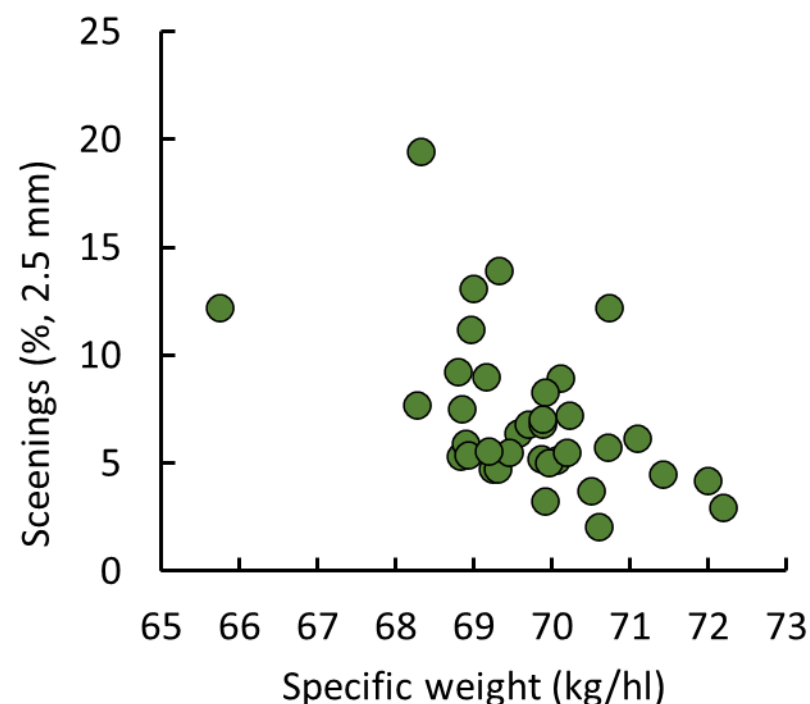
- Conventional 6-row options very limited
- Choice in hybrids
- Good spec. weights
- 6-row v 2-row yield gap is smaller (2-3%)

Specific weight in barley varieties – versus screenings

Spring barley



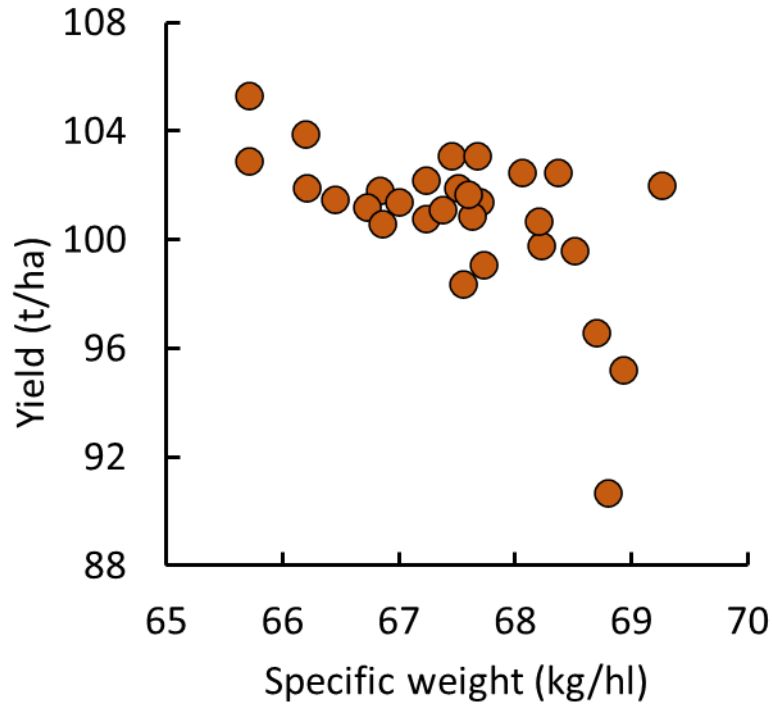
Winter barley



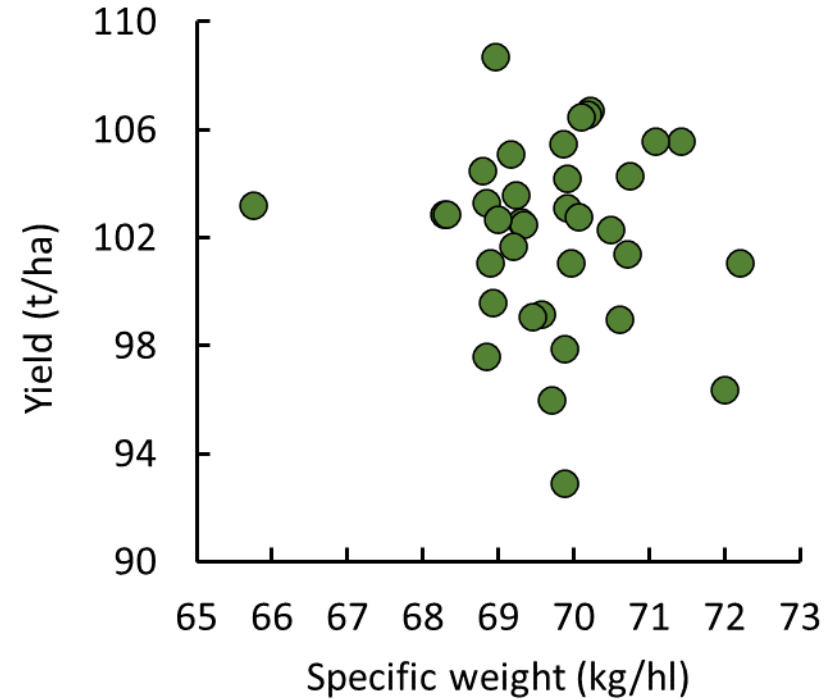
Each point is a variety or candidate from the AHDB RL dataset

Specific weight in barley varieties – versus yield

Spring barley



Winter barley



Winter wheat: Soft Group 4 and Group 3

Winter wheat Grain yield of 100 = 11.3 t/ha

Year First Listed	Recommendation		Grain yield as % of treated Control	Yield loss (%) if untreated	Use as a 2 nd cereal	Quality markets		Specific weight (kg/hl)	HFN (s)
						Distilling	UK Milling		
2022	R	RGT Stokes	103	18	Mod	Good	---	76.2	240
2024	P1	Blackstone	[103]	16	Mod	Med	---	78.2	299
2022	R	RGT Bairstow	102	18	Good	Good	---	76.6	224
2023	P2	KWS Zealum	102	18	Good	Med	---	76.8	202
2019	R	LG Skyscraper	101	19	Good	Med	---	77.1	204
2021	O	Swallow	100	20	Mod	Good	---	76.6	255
2024	P1	Bamford	[105]	14	Good	Med	Biscuit	78.5	239
2021	O	LG Illuminate	100	15	Mod	Med	Biscuit	77.0	251
2022	O	KWS Brium	100	20	Mod	Med	Biscuit	78.0	260

- Choices for autumn 2024
- Variation in T and UT yield
- Good 2nd wheats
- Variation in grain quality

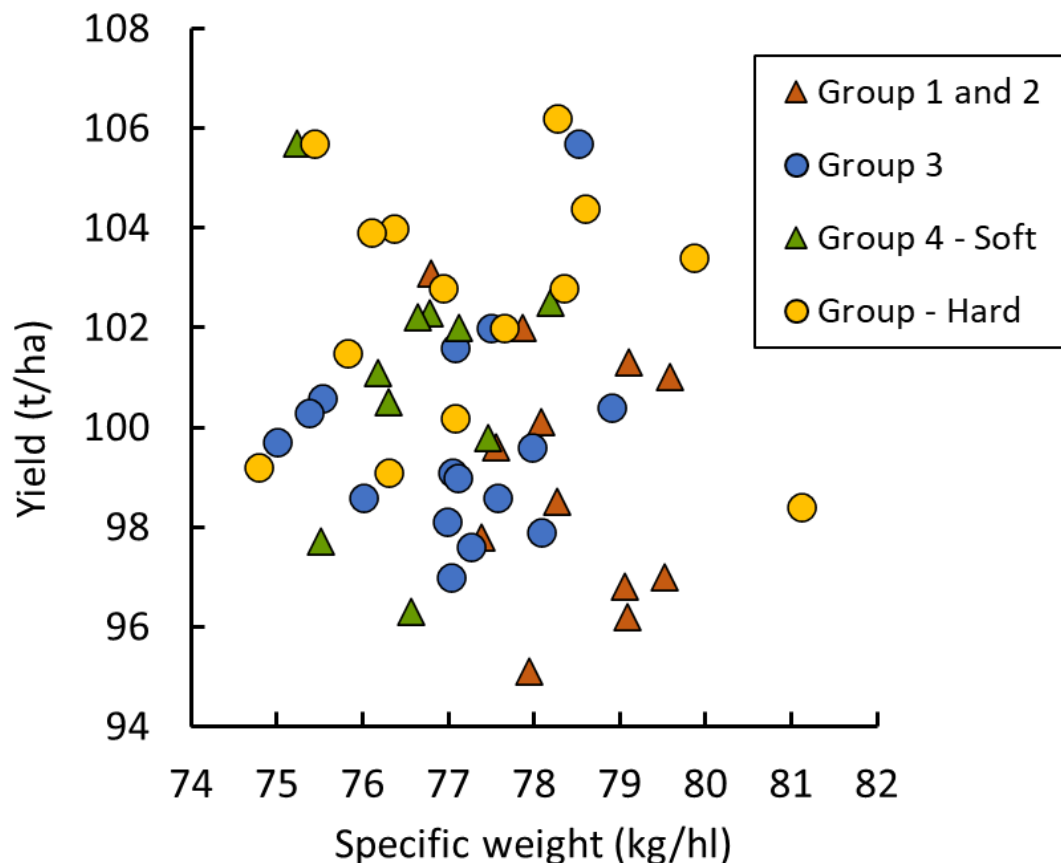
Winter wheat: Hard wheats – Groups 4 and 2

Winter wheat Grain yield of 100 = 11.3 t/ha

Year First Listed	Recommendation		Grain yield as % of treated Control	Yield loss (%) if untreated	Use as a 2 nd cereal	Quality markets		Specific weight (kg/hl)	HFN (s)
						Distilling	UK Milling		
2024	P1	LG Beowulf	[107]	15	Good	---	---	78.3	253
2020	R	SY Insitor	105	25	Good	---	---	78.6	261
2022	R	KWS Dawsum	105	12	Good	---	---	79.7	299
2022	R	LG Typhoon	101	11	Mod	---	---	77.1	164
2023	P2	KWS Ultimatum	101	11	Mod	---	Bread	79.6	271
2019	S	KWS Extase ¹	99	8	Mod	---	Bread	79.1	283
2022	P2	KWS Palladium	99	10	Mod	---	Bread	77.6	305

- Check uT yield
- Other features e.g. maturity, stem strength and disease resistance

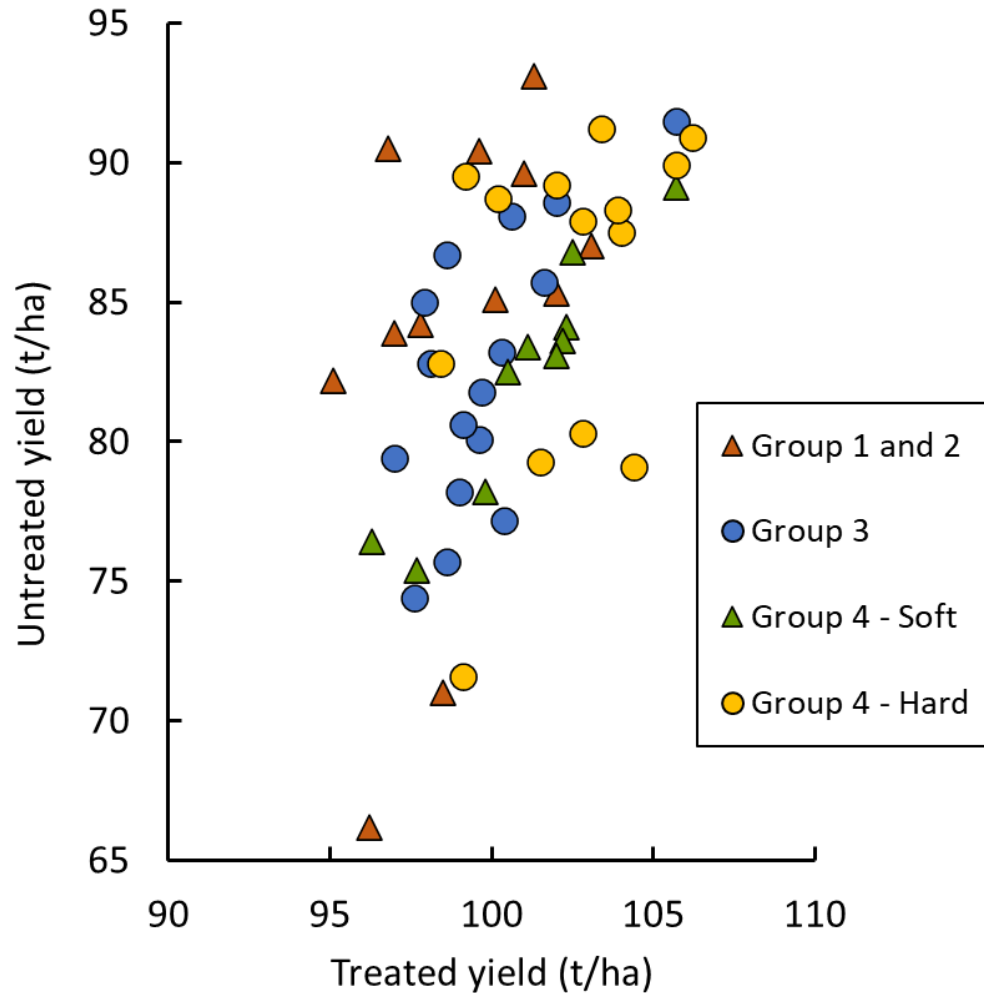
Specific weight in wheat varieties – compared to yield



- Wide variation within and between UKFM Groups
- No spec. weight v yield trend

Each point is a variety or candidate from the AHDB RL dataset

Treated and untreated yield in wheat



- Wide variation within and between UKFM Groups
- Distilling varieties in middle of pack, weaker varieties are 'Off' or 'O'
- Towards agronomic value
- Set new thresholds?

Each point is a variety or candidate from the AHDB RL dataset

Variety review: Take home messages

- Older and/or weaker varieties are *Off* or *Becoming Outclassed*
- Spring barley list invests in the future
- Spring oats and spring wheat options in yield and quality
- Winter barley remains a strong list
- Winter wheat has new varieties (P1 and P1) to compete with leader
- Evidence for improved farm yield with new varieties
- Check your yield trends against Scottish Government crop data

Thank you

Further information:

www.sruc.ac.uk/cereals-list

<https://ahdb.org.uk/rl>

<https://www.gov.scot/publications/cereal-and-oilseed-rape-harvest-2023-final-estimates/documents/>

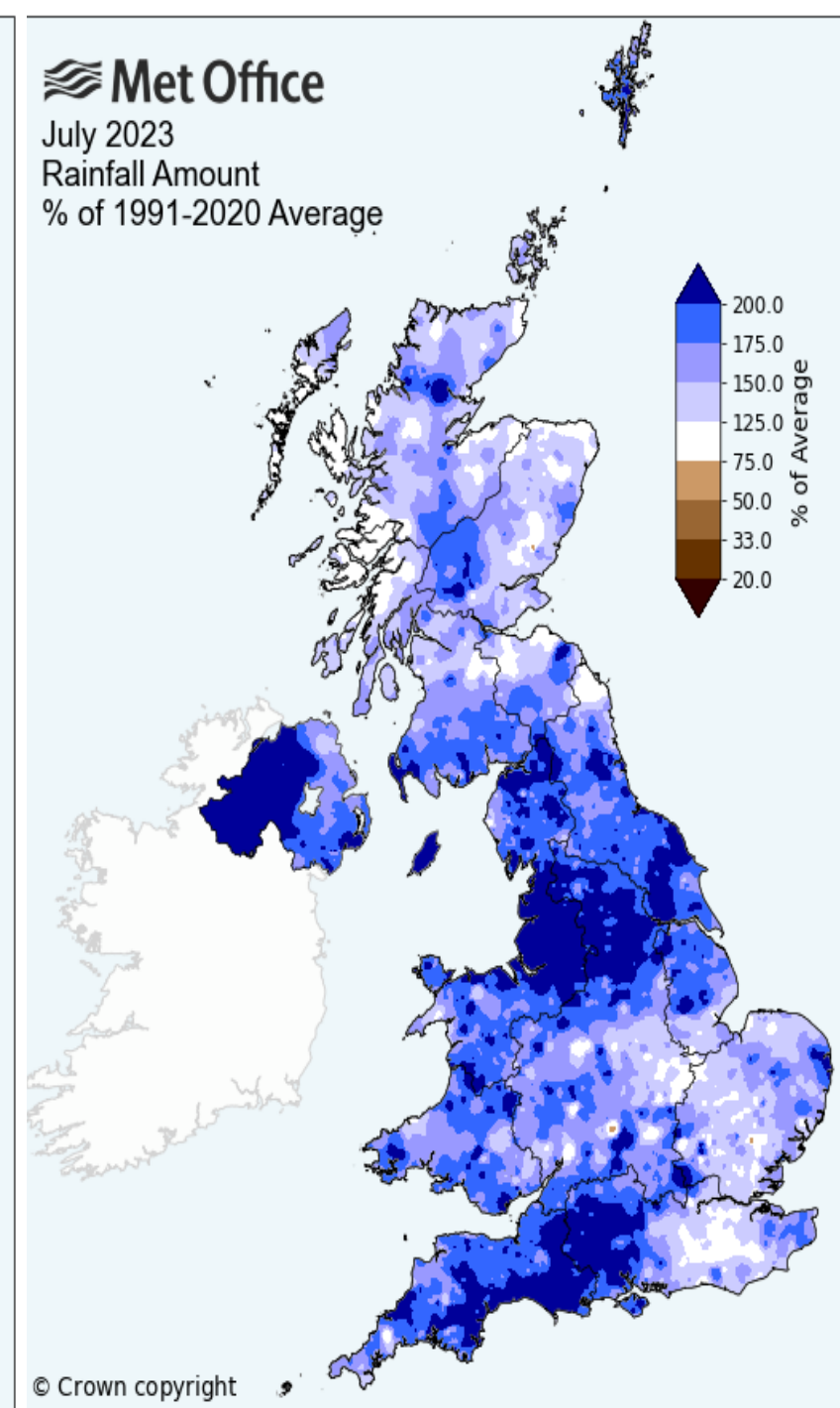
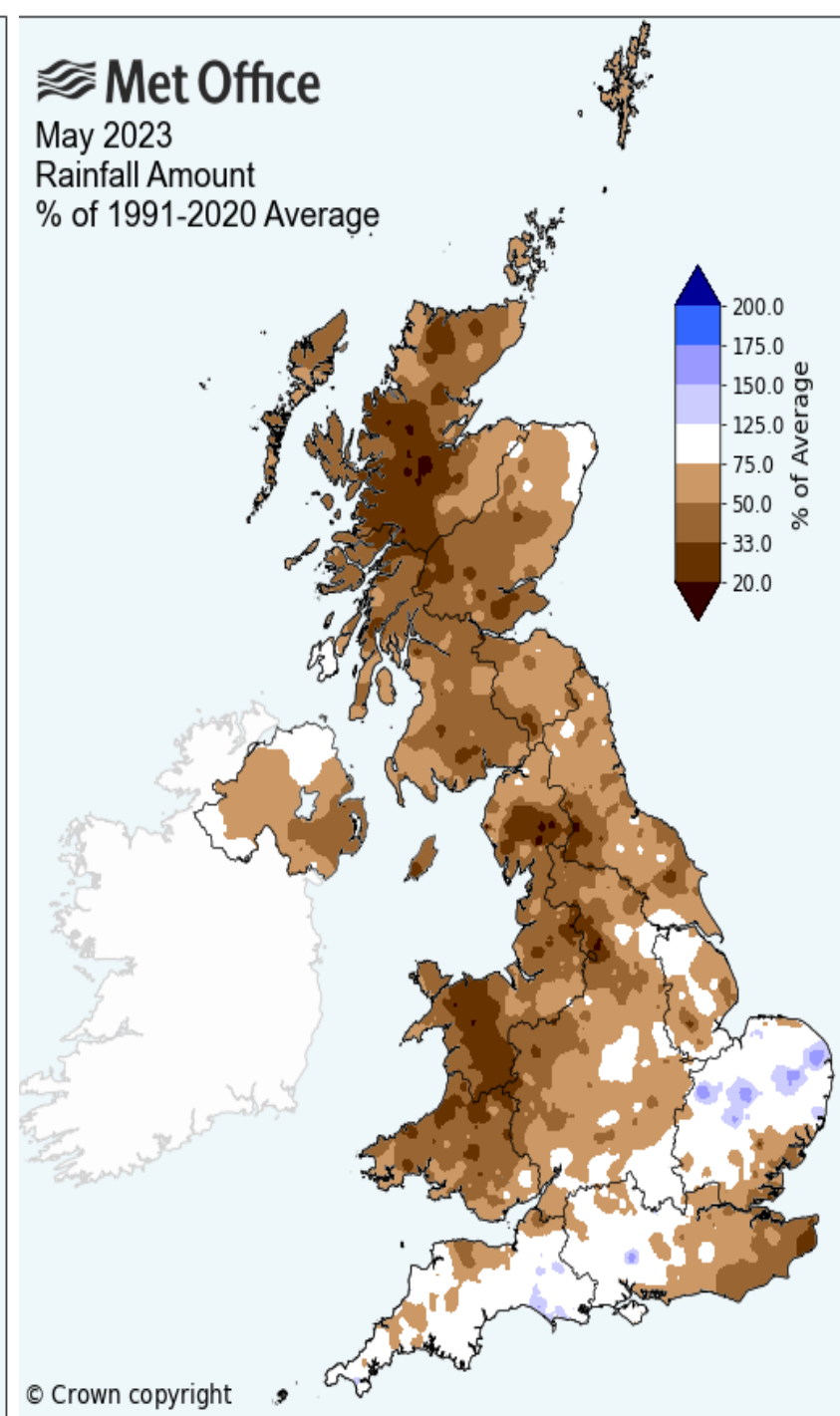
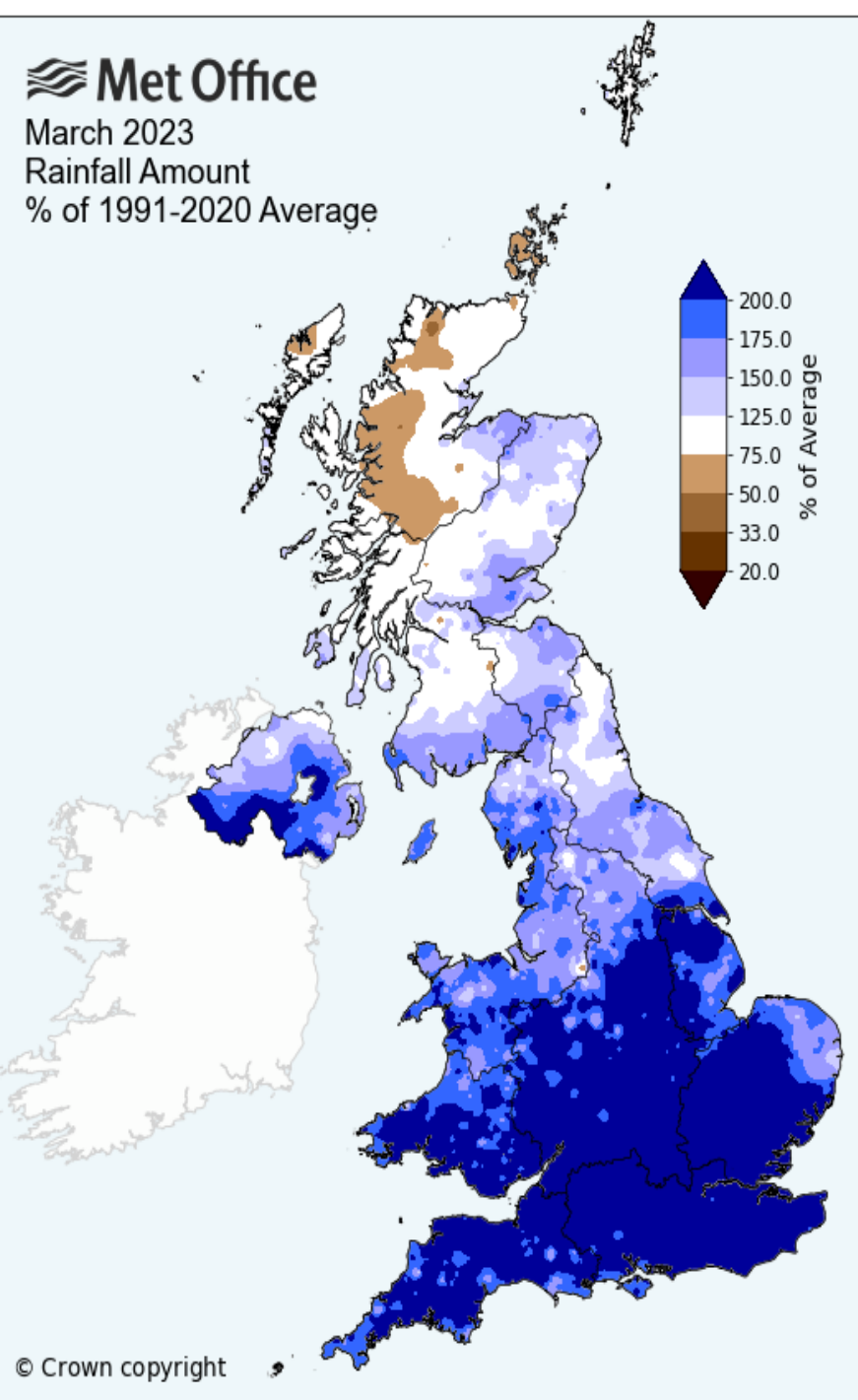
Optimising fungicide inputs 2024

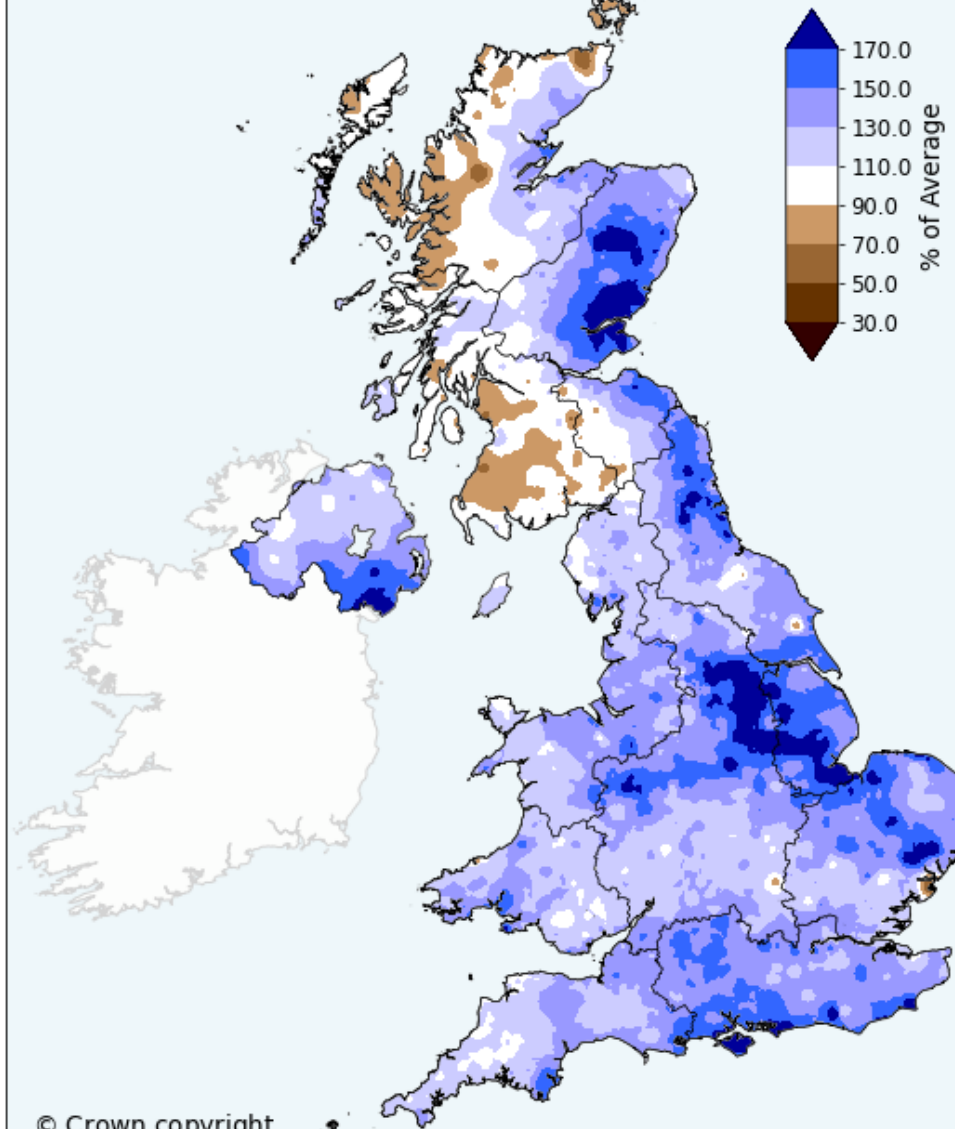
Fiona Burnett
Professor Applied Plant Pathology
SRUC

Many challenges for arable crops

- Unpredictable weather extremes
- High costs of establishing crops
- Market and policy drivers to produce crops more sustainably
- Pesticide withdrawals
- Evolving diseases and resistance
- Fewer new products / slower to the market
- Particular threats to multisite fungicides
- Fungicide updates for wheat, barley and OSR
- New chemistry is exciting but it also needs protecting



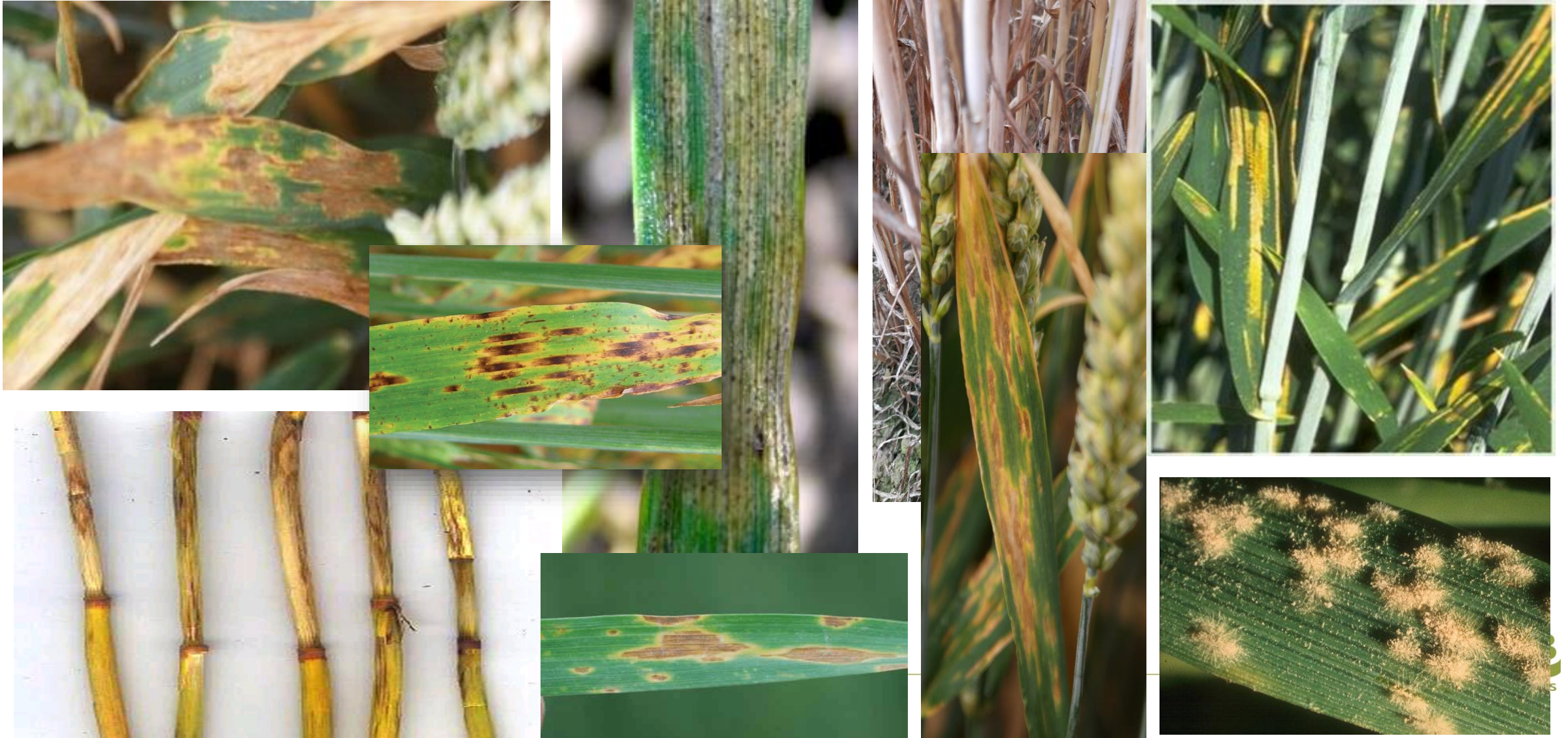




Crop health issues in 2023



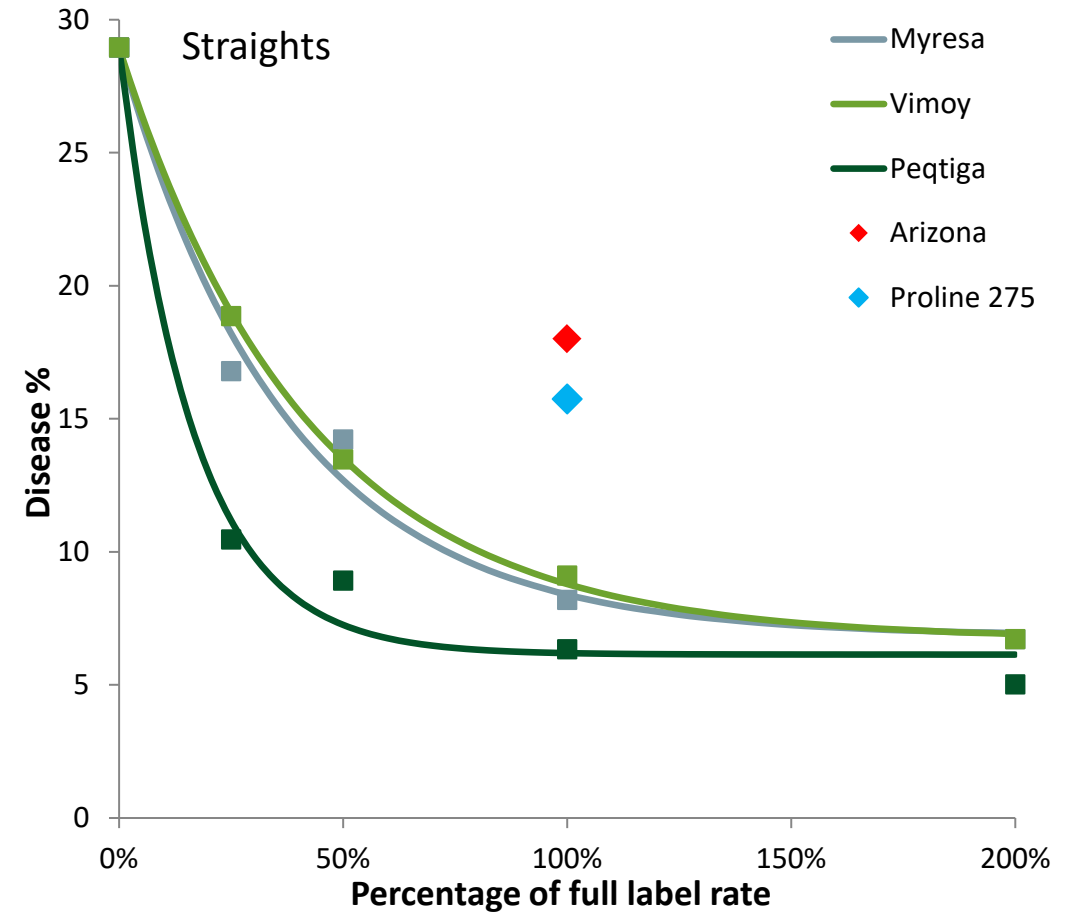
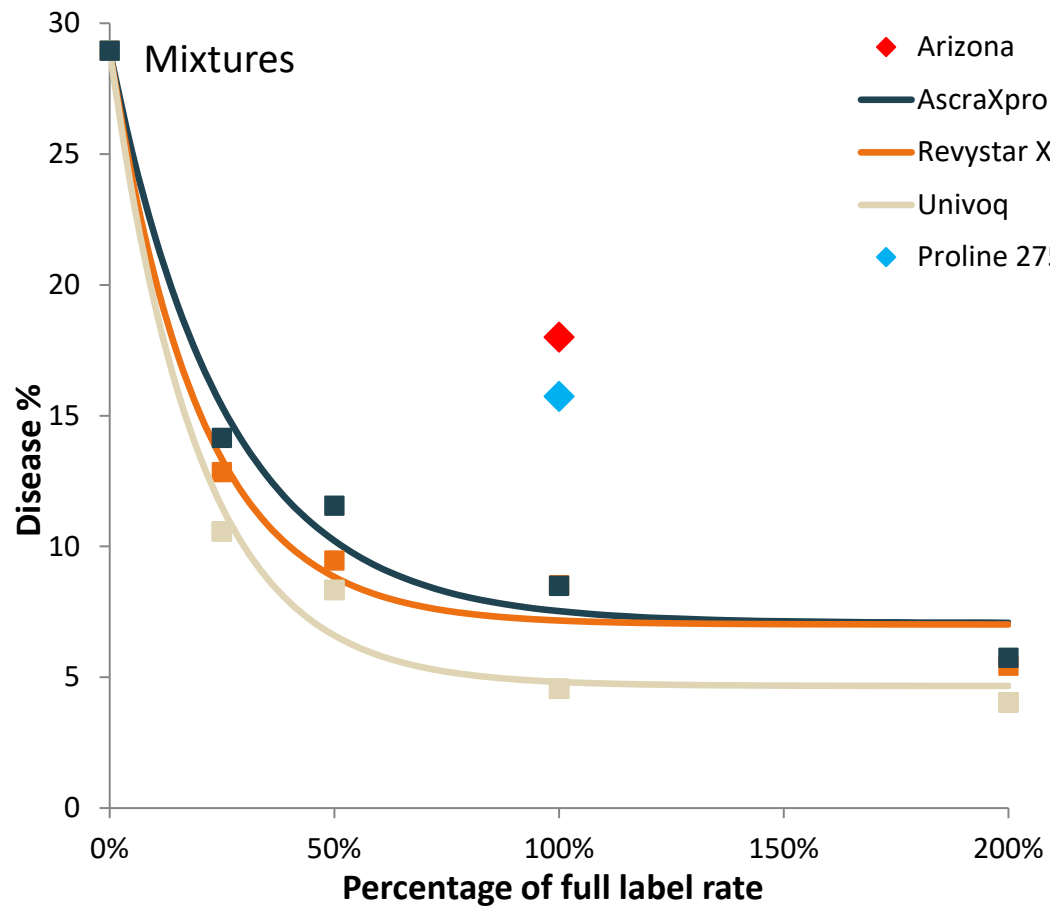
Multiple disease challenges so optimising inputs is vital



Trial evidence is vital to understanding efficacy and best fit in programmes

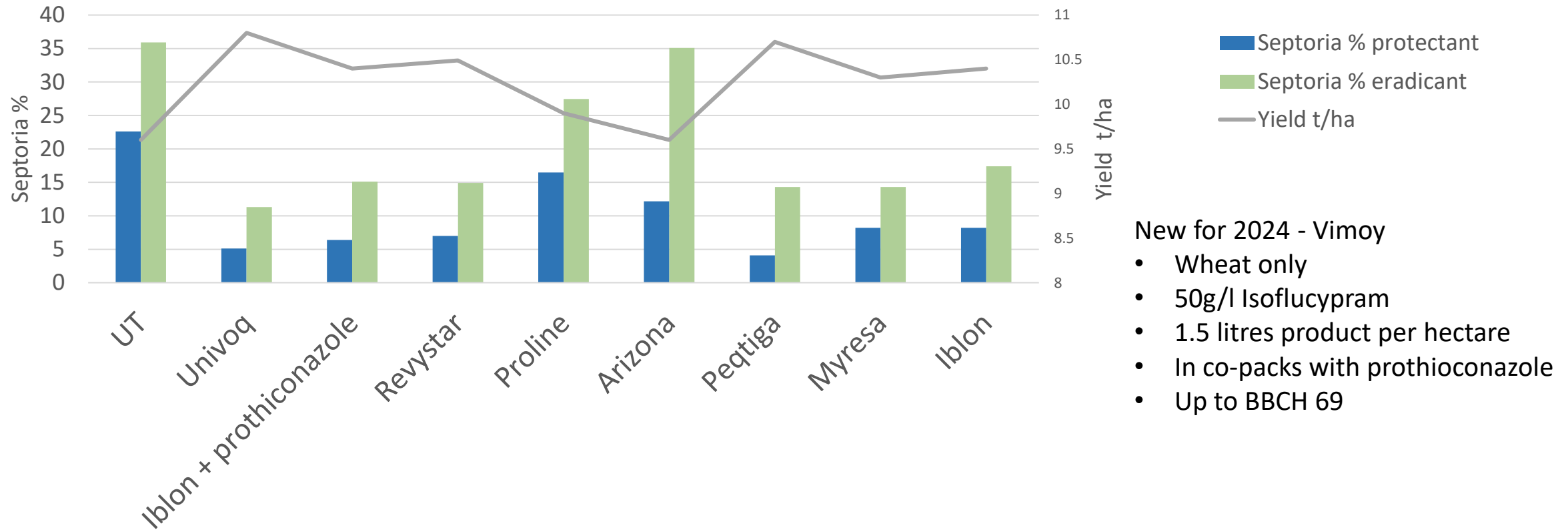


Septoria protectant overtrial 2023 (4 trials)



Septoria 2022 Fungicide Performance overtrials

protectant (7 trials) eradicant (2 trials)



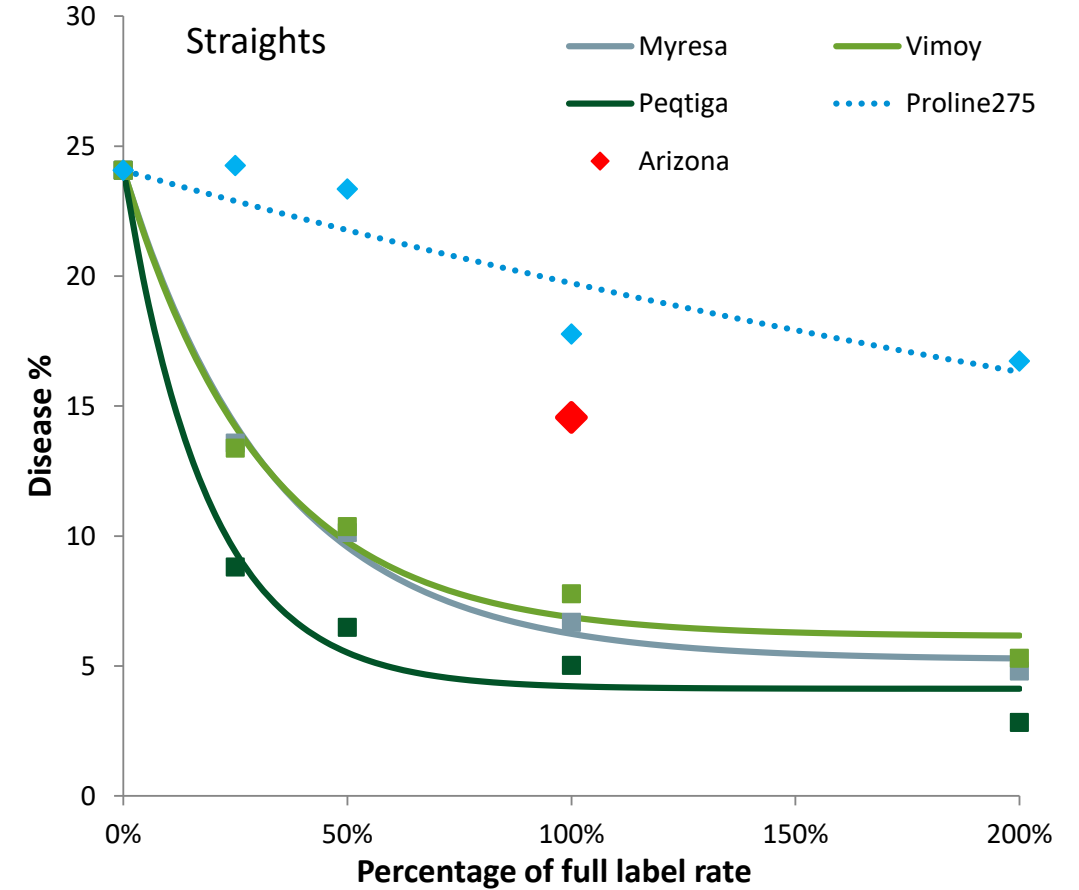
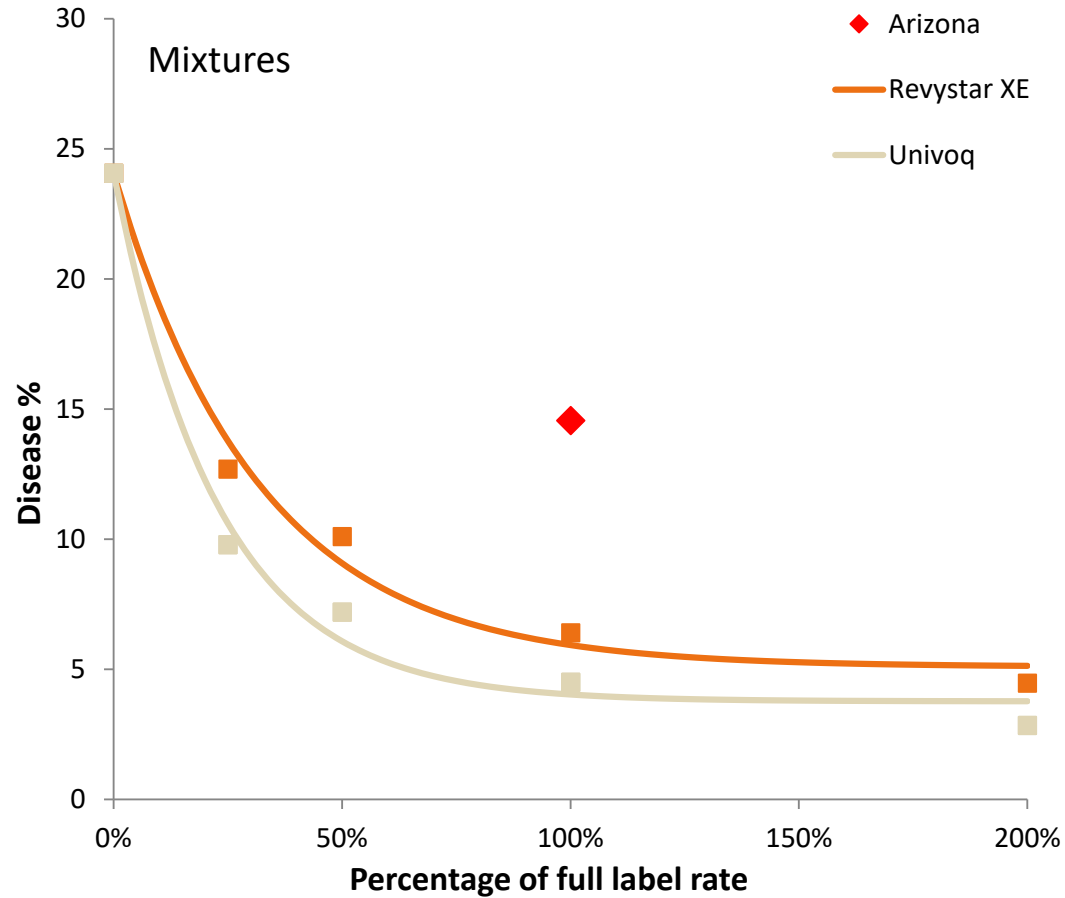
Full dose: Extracted from Fungicide Performance trial series



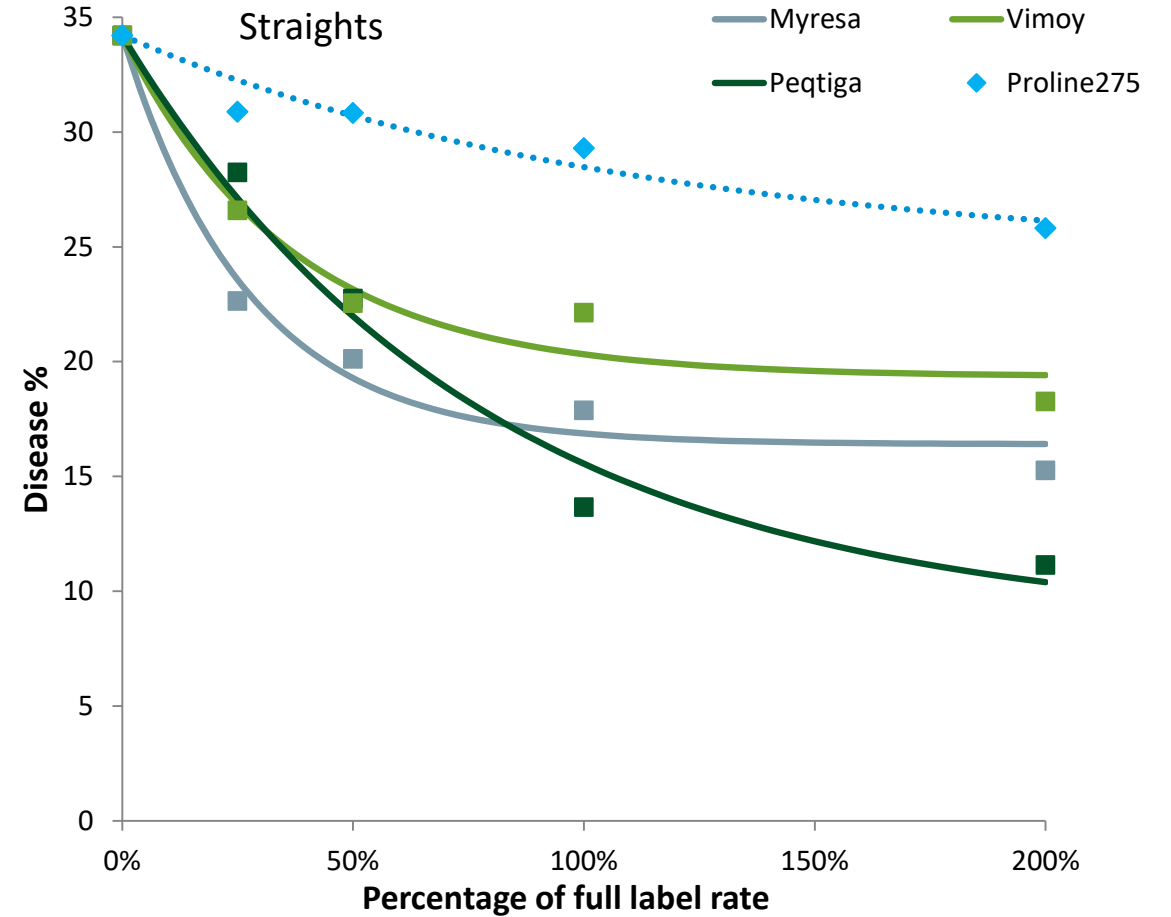
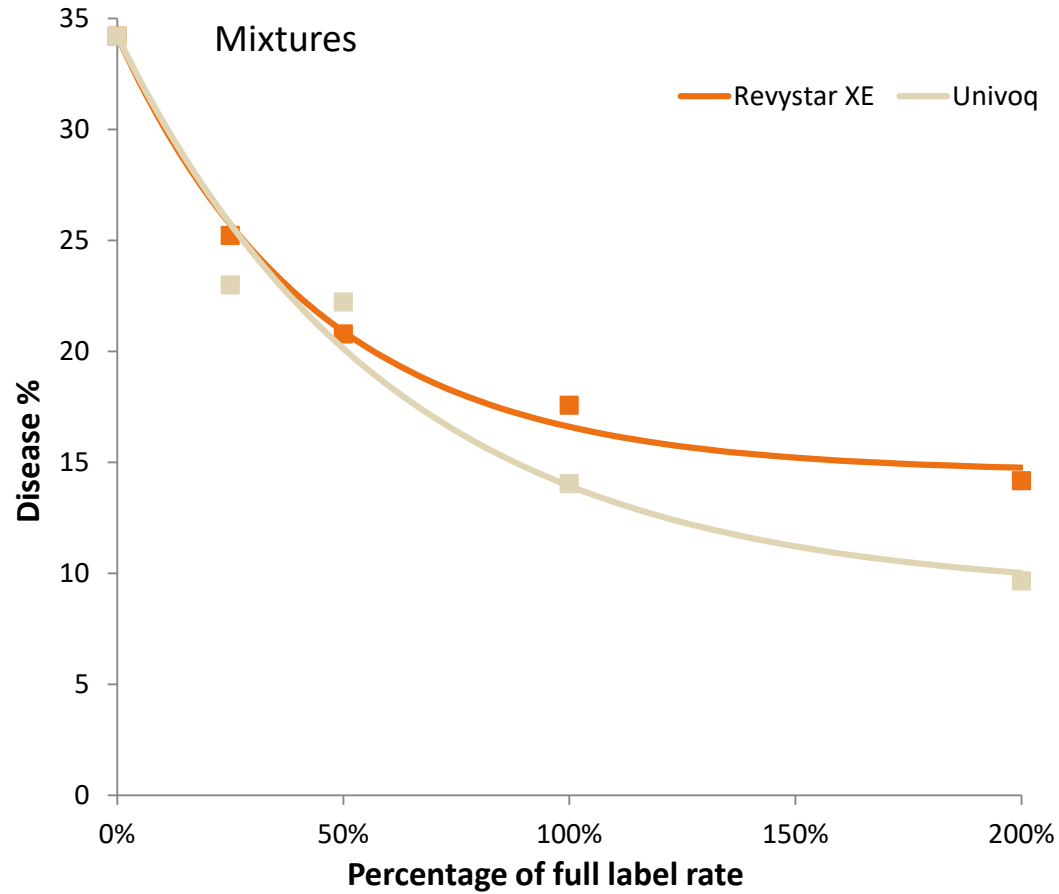
Farm
Advisory
Service



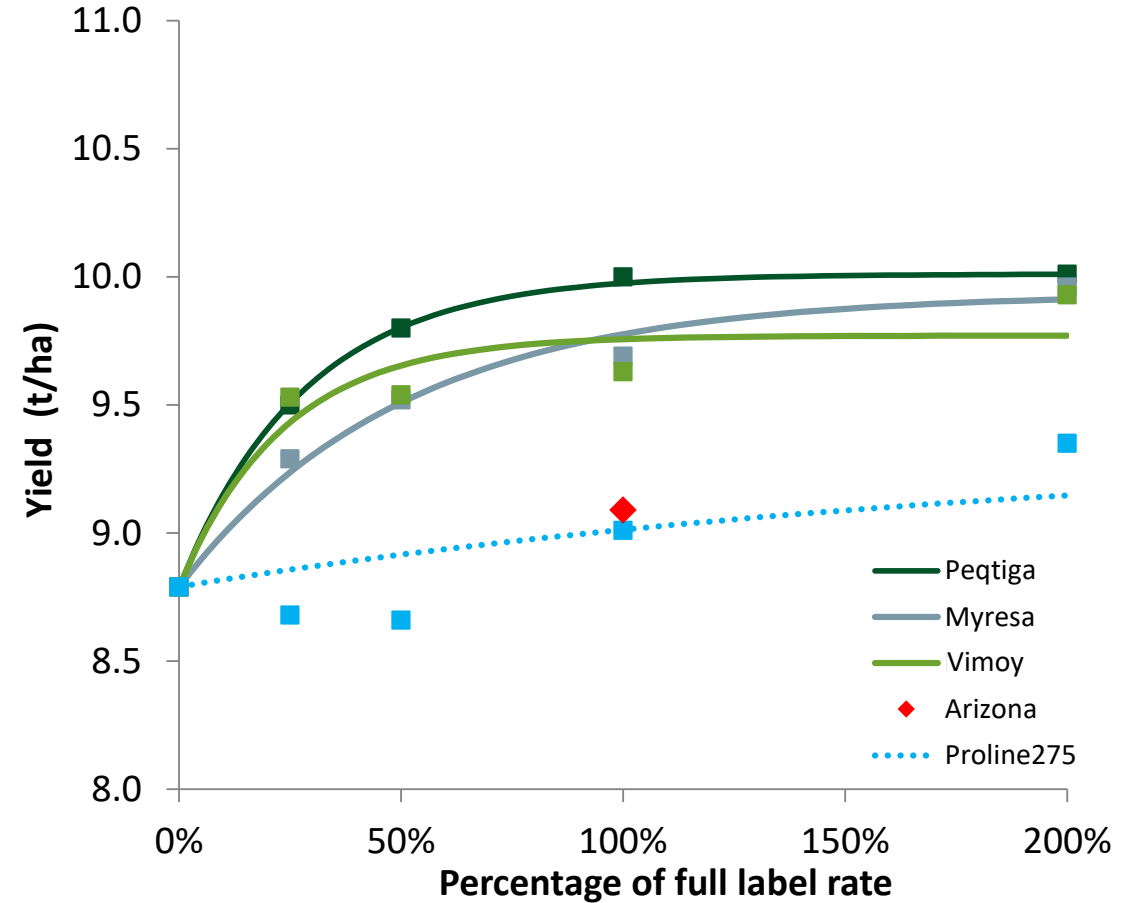
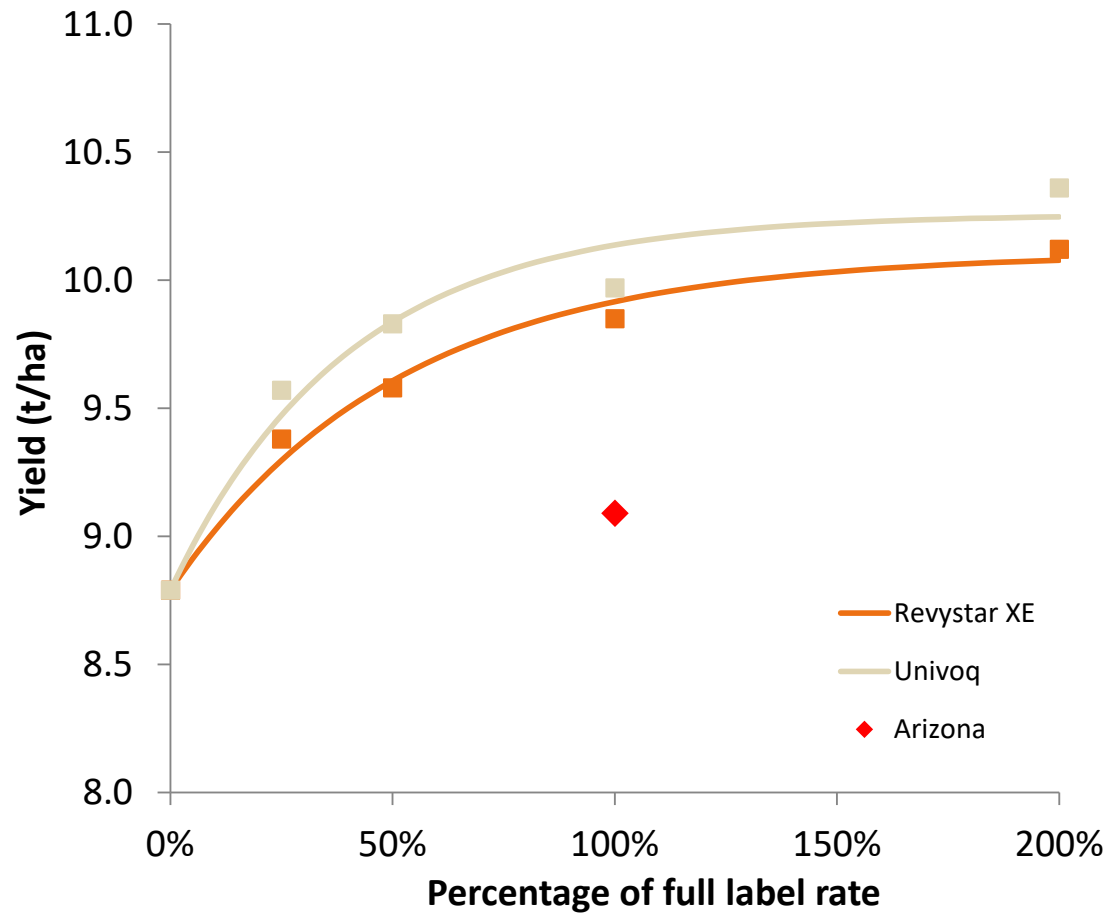
Septoria protectant overyear 2021-23 (17 trials)



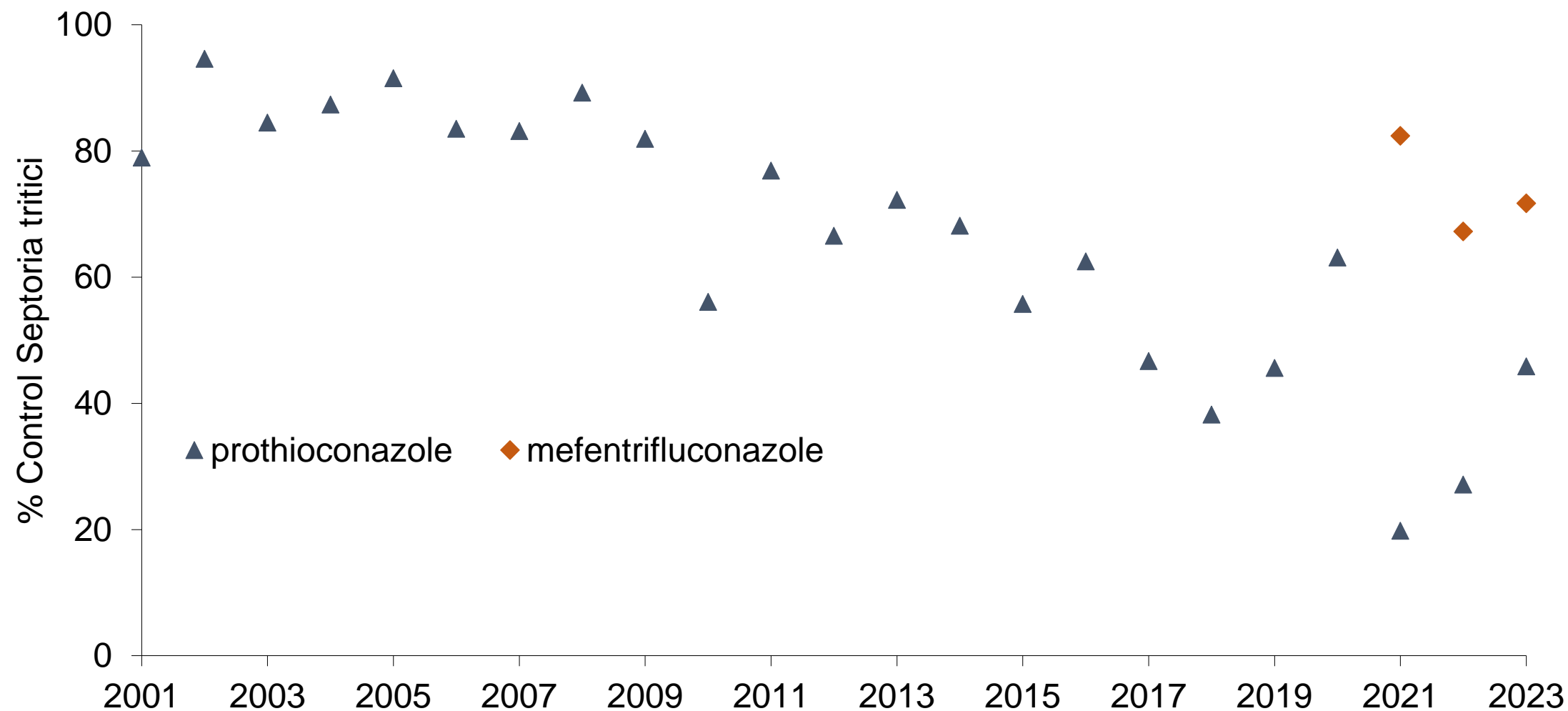
Septoria eradicant overyear 2021-23 (7 trials)



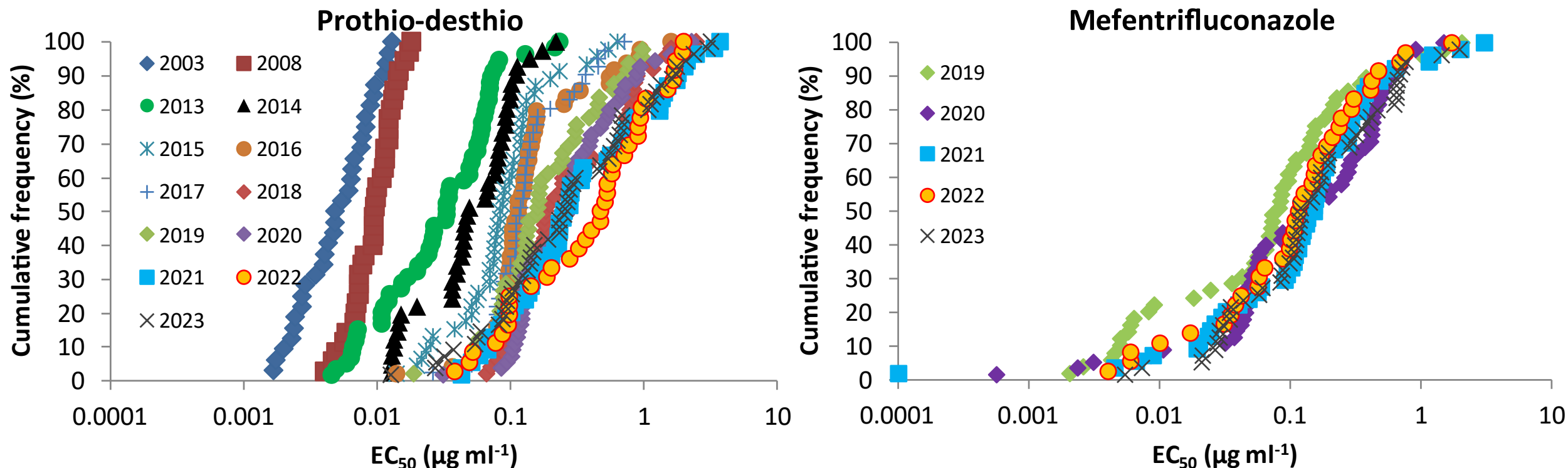
Septoria yield overyear 2021-23 (19 trials)



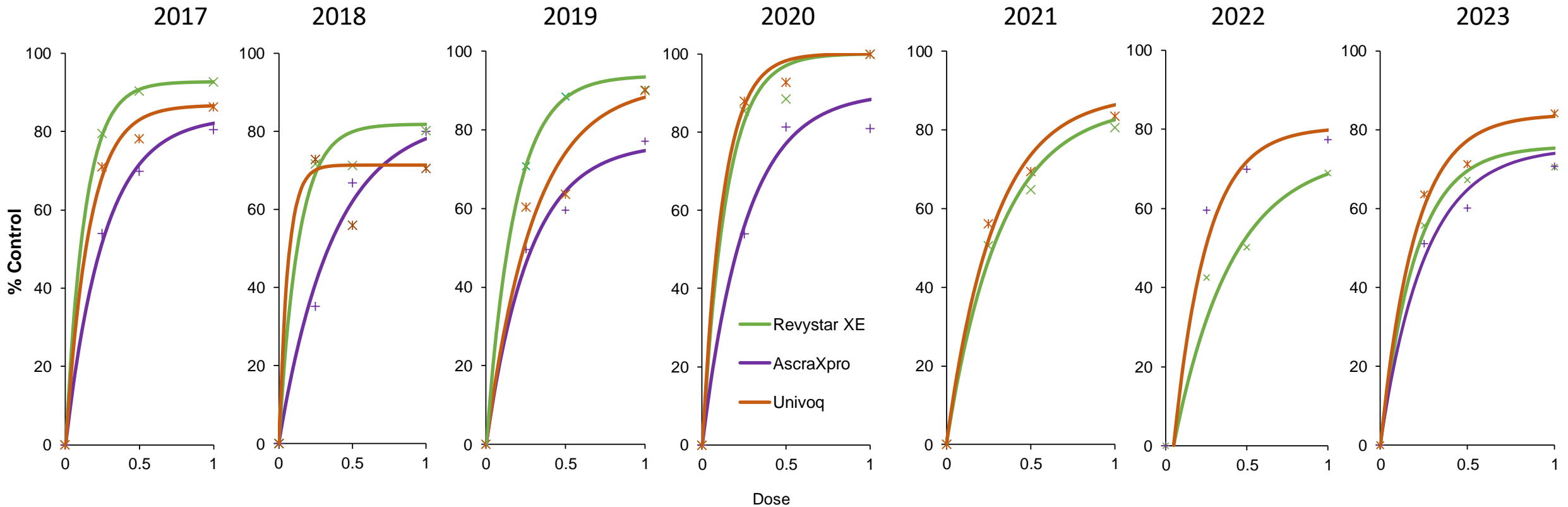
Changes in septoria protectant activity of Azoles (full label rates)



Septoria sensitivity to azole fungicides over time (Rothamsted, early season)

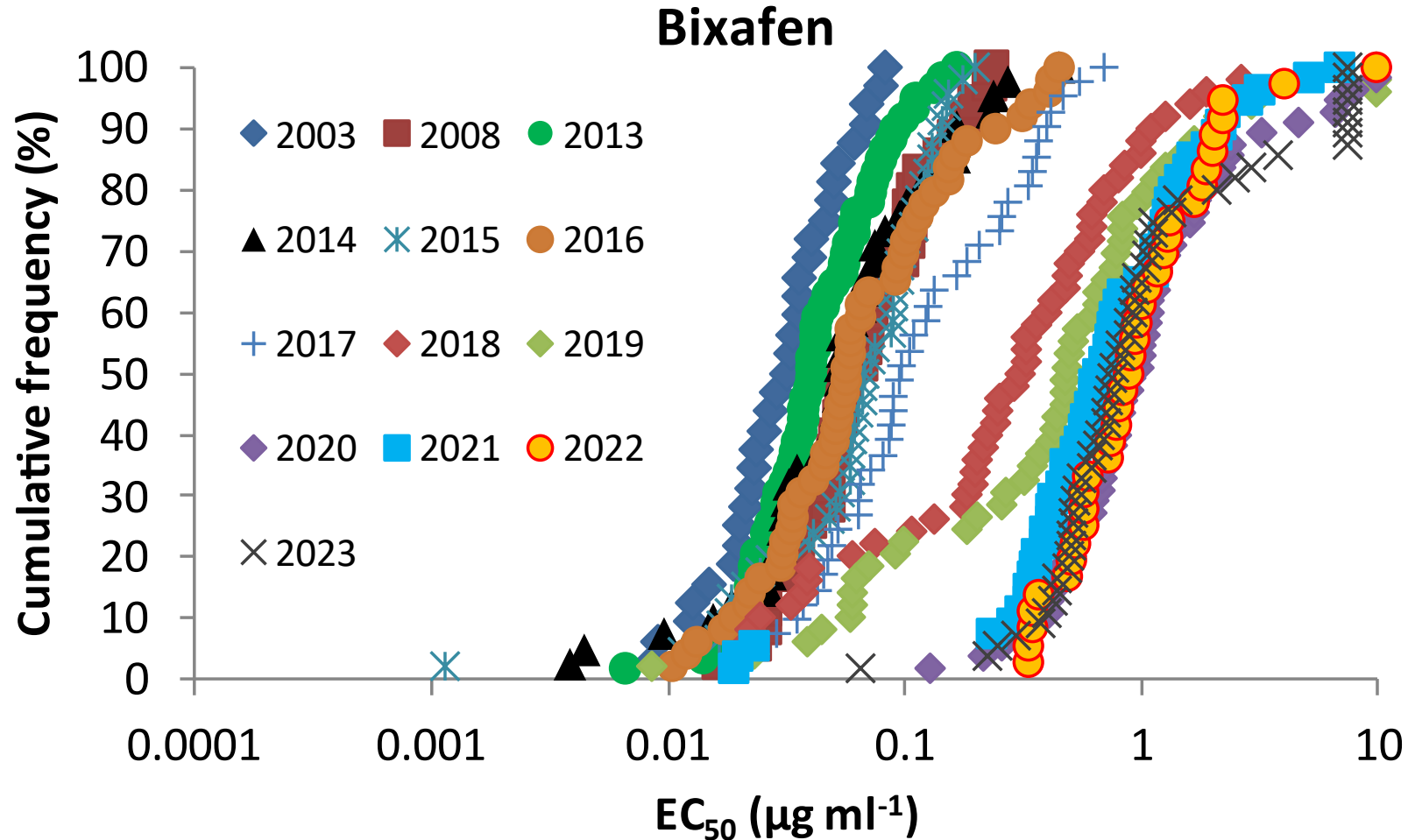


Changes in septoria protectant activity of mixture products

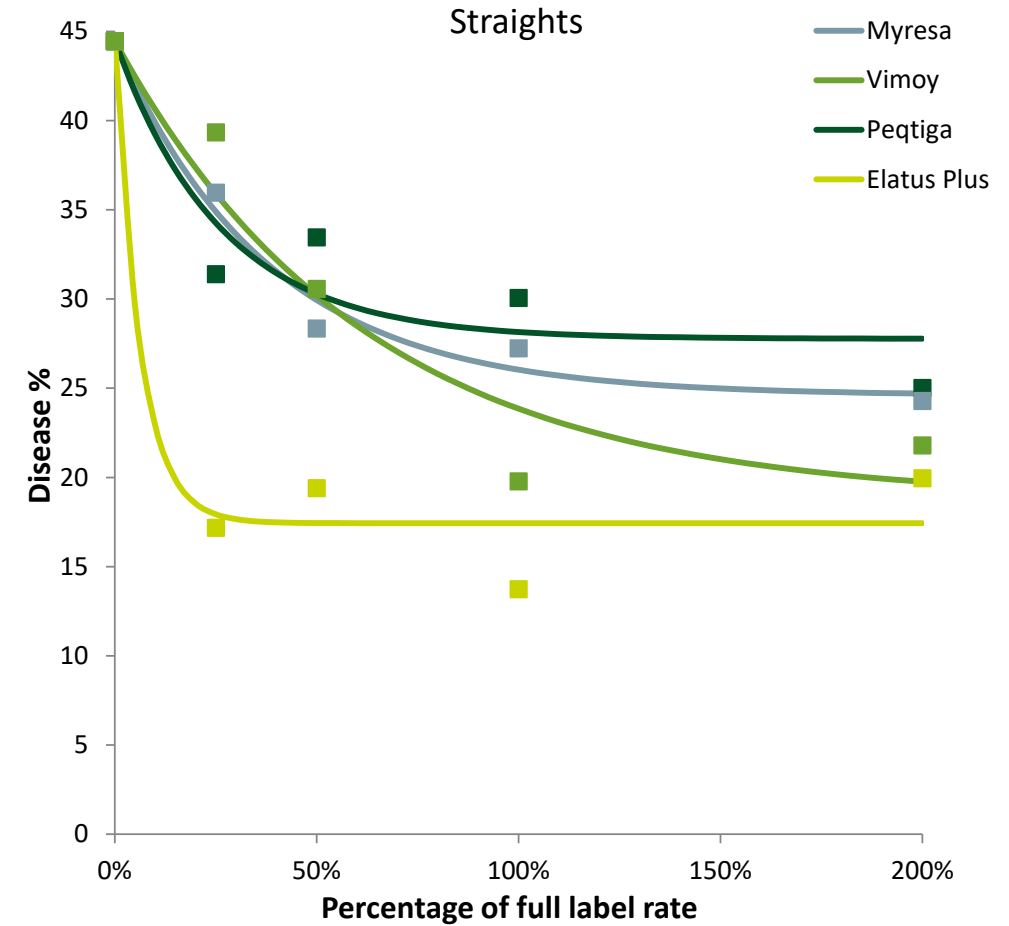
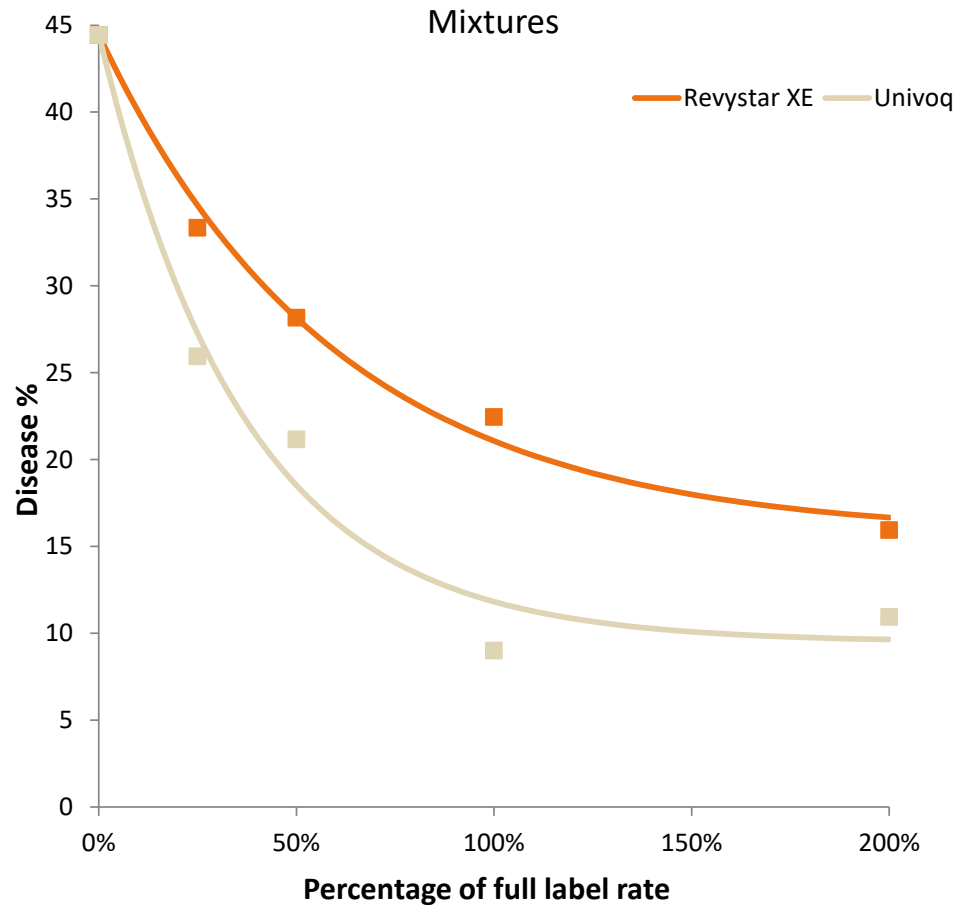


Septoria sensitivity to SDHI fungicide (bixafen)

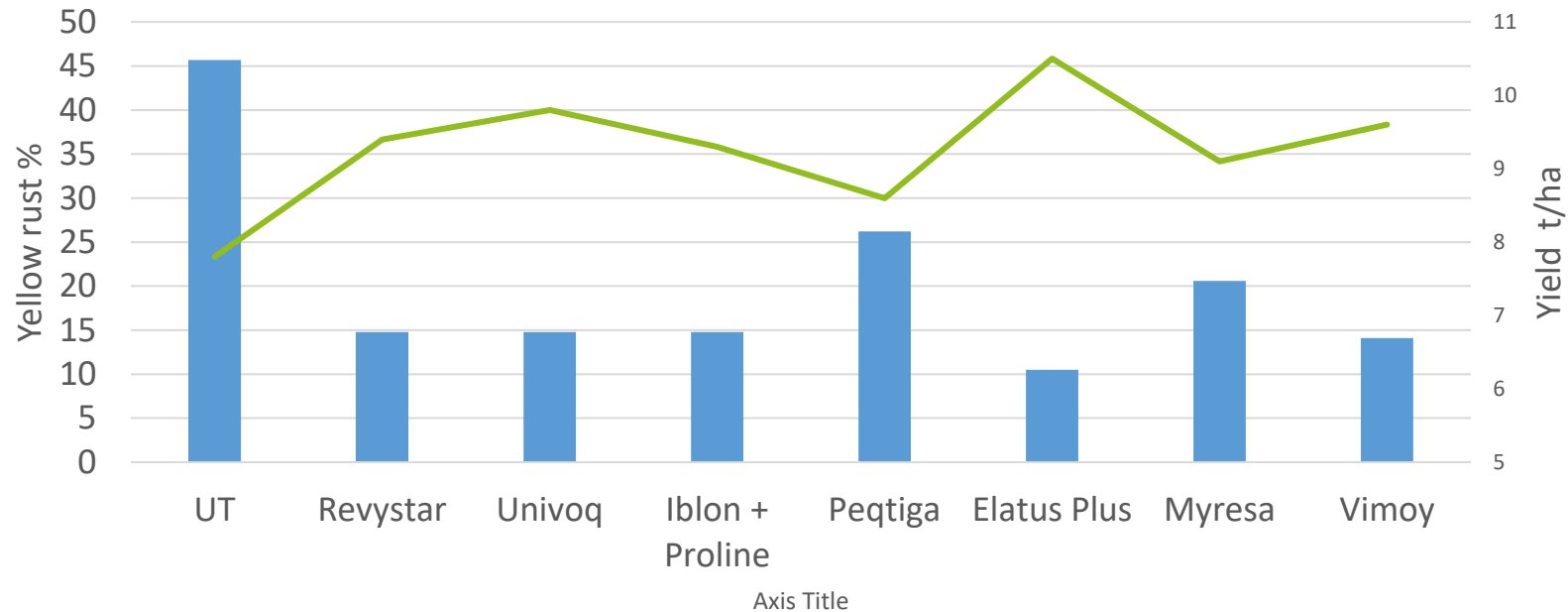
(Rothamsted, early season)



Yellow rust 2023 (1 trial)

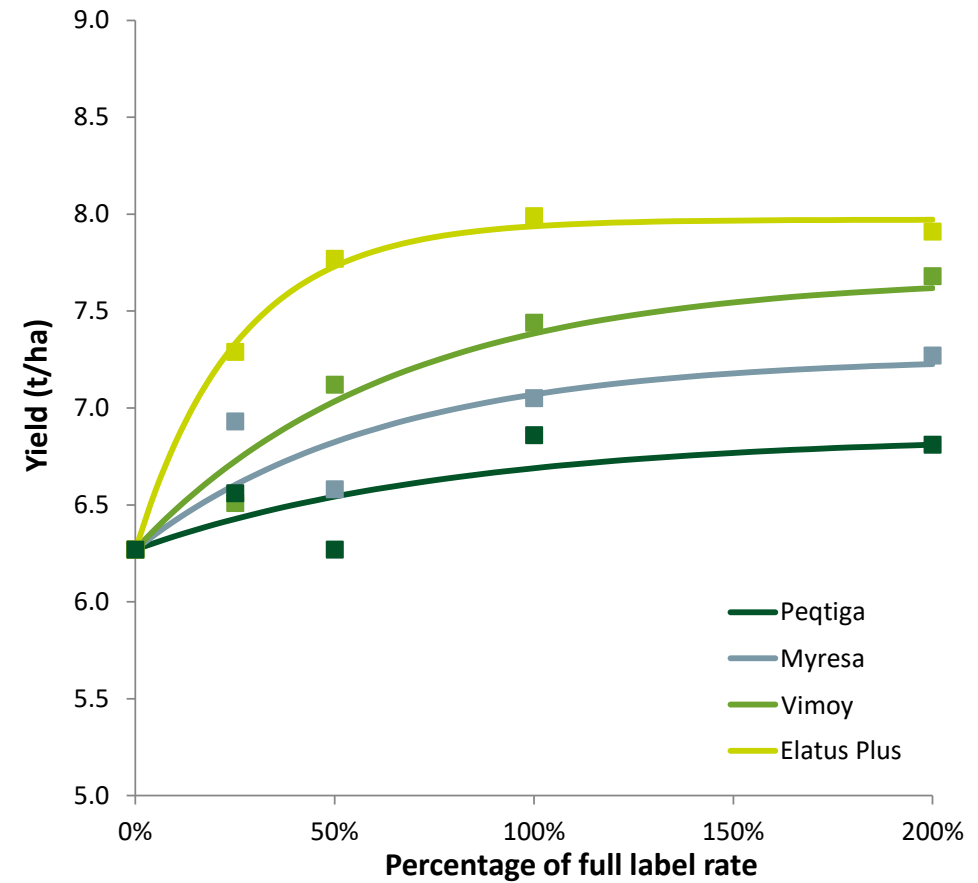
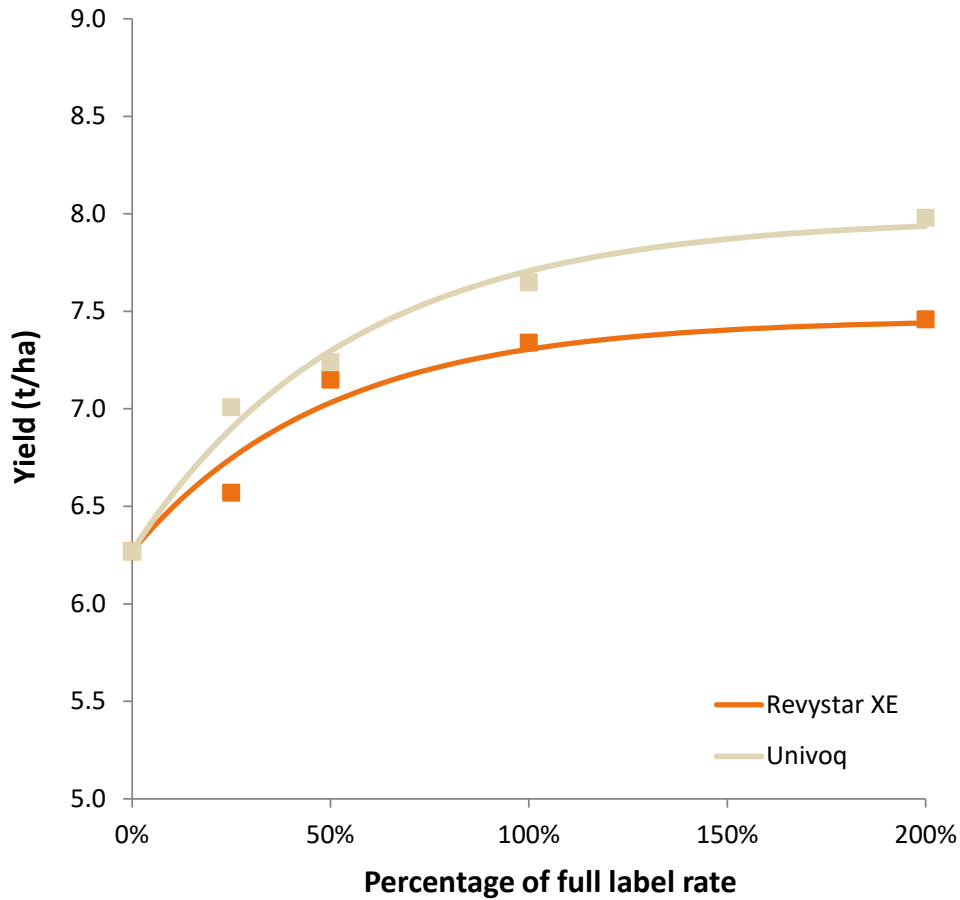


Yellow rust 2022 (one trial)

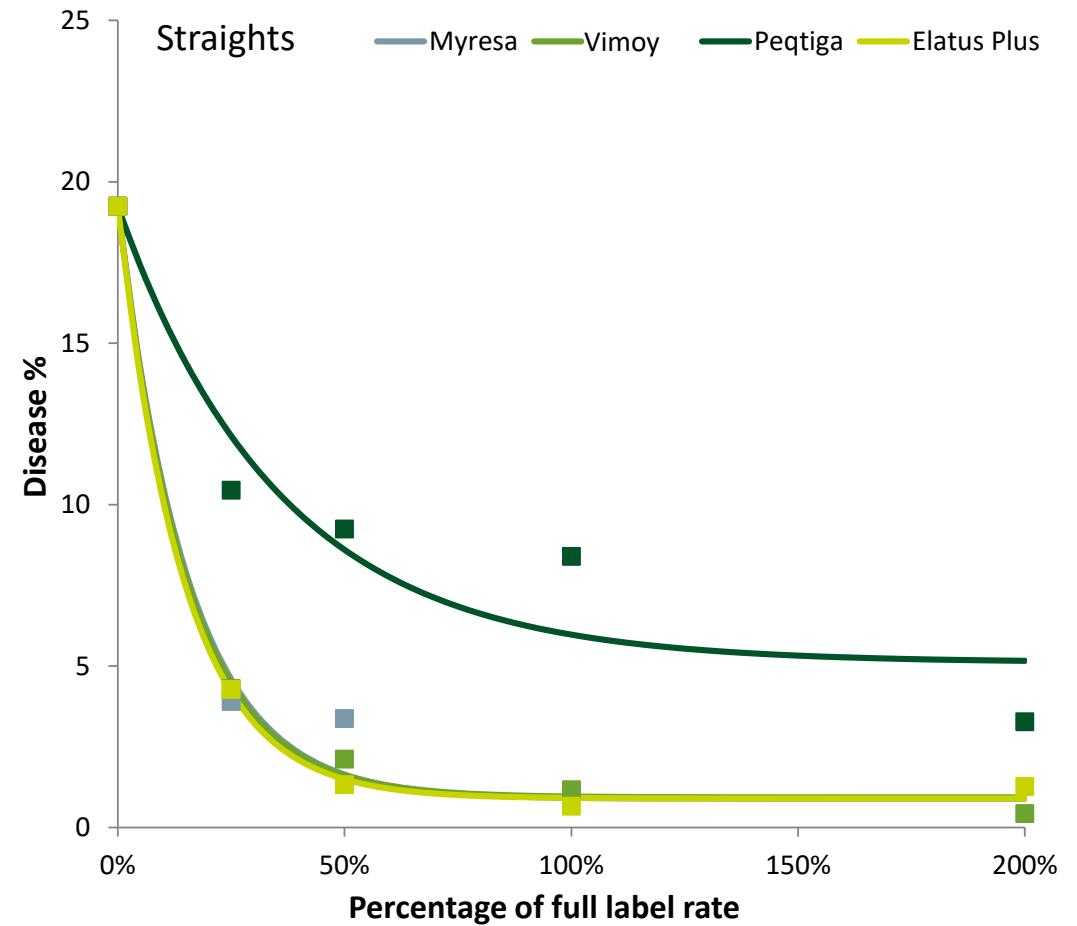
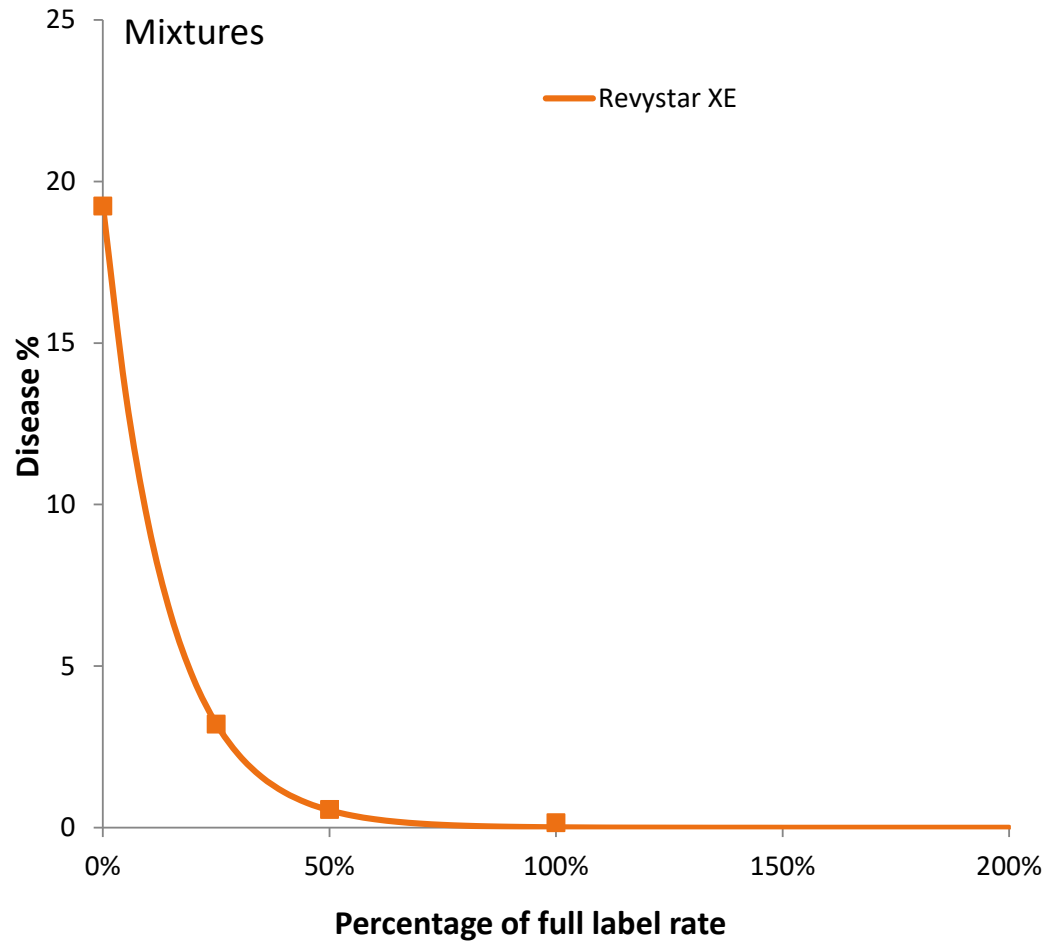


Full dose: Extracted from Fungicide Performance trial series

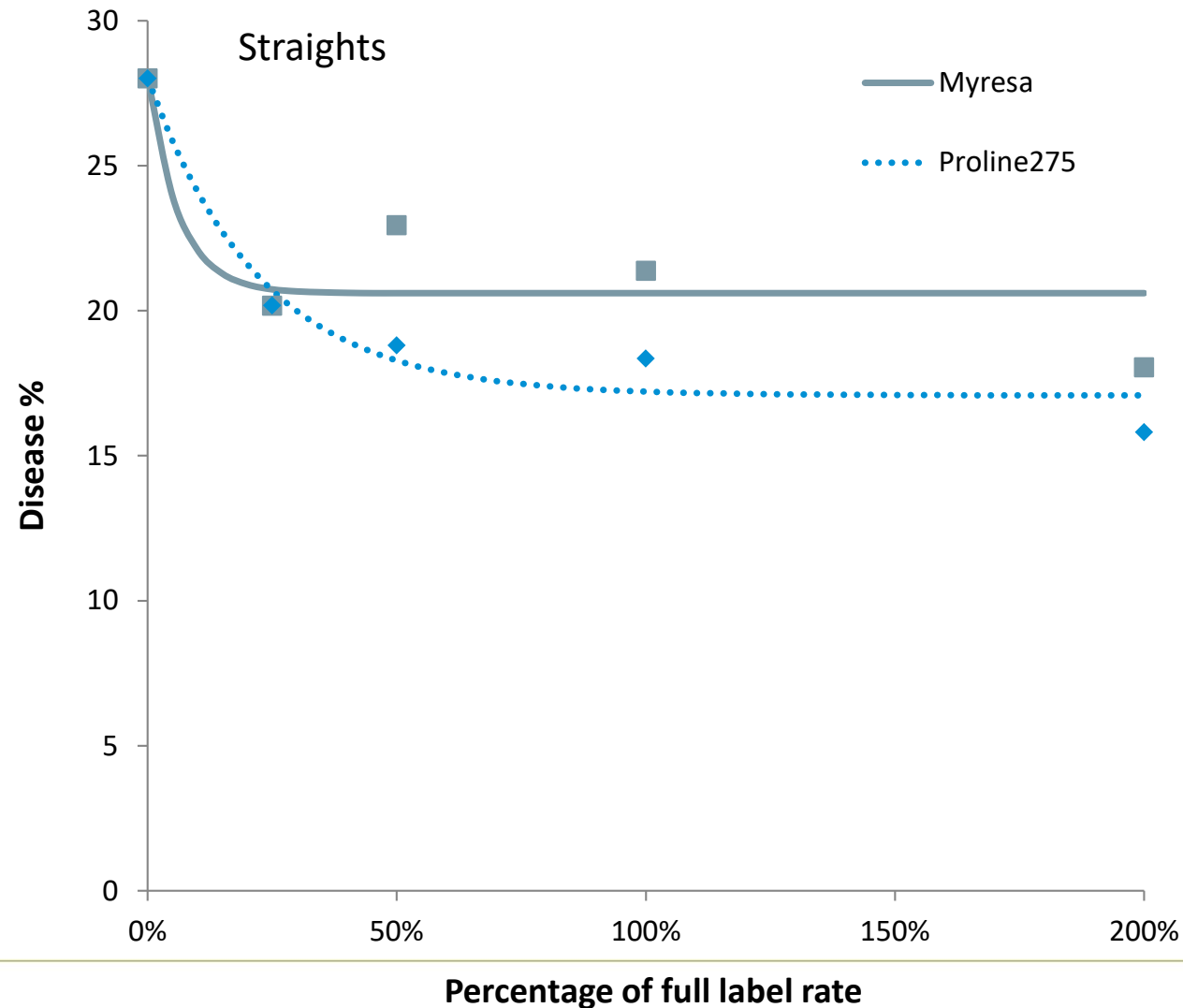
Yellow rust yield overyear 2021-23 (3 trials)



Brown rust overyear 2021-23 (3 trials)



Fusarium overyear 2021-23 (3 trials)



No new data on
mycotoxin (DON)
levels in 2023

Wheat summary

- Fenpicoxamid (Peqtiga) gave the highest level of septoria control.
- Isoflucypram (Vimoy) and mefentrifluconazole (Myresa) also have good activity, especially as protectants
- Mixtures (Univoq, Revystar XE) give more robust control than the straights
- Good yellow rust control from isoflucypram and mefentrifluconazole, but benzo-vindiflupyr (Elatus Era) and mixtures (Univoq, Revystar XE) were the most effective
- Isoflucypram and mefentrifluconazole are both highly active against brown rust



Stewarding fungicides in programmes



- No major shifts in fungicide sensitivity seen in Septoria populations in 2023
- However...some of the most complex and shifted isolates in the FP programme were found at Scottish sites
- SDHI and azole isolates with reduced sensitivity are slowly accounting for an increasing proportion of the population
- Great to have a new SDHI but it and other chemistry still needs stewarding
- **Critical that resistance management measures are built into programmes**

Stewardship meets practice

- Reducing the risk of disease – IPM (varietal resistance, drilling dates, rotations etc.)
- Reducing reliance on individual actives
- ✓ Appropriate reduced doses – balanced mixes
- ✓ Reducing application numbers
- ✓ Increasing diversity of actives – mixtures and alternations
- ✓ Maximising use of lowest risk option - multisites



Wheat programmes – what do we really need?

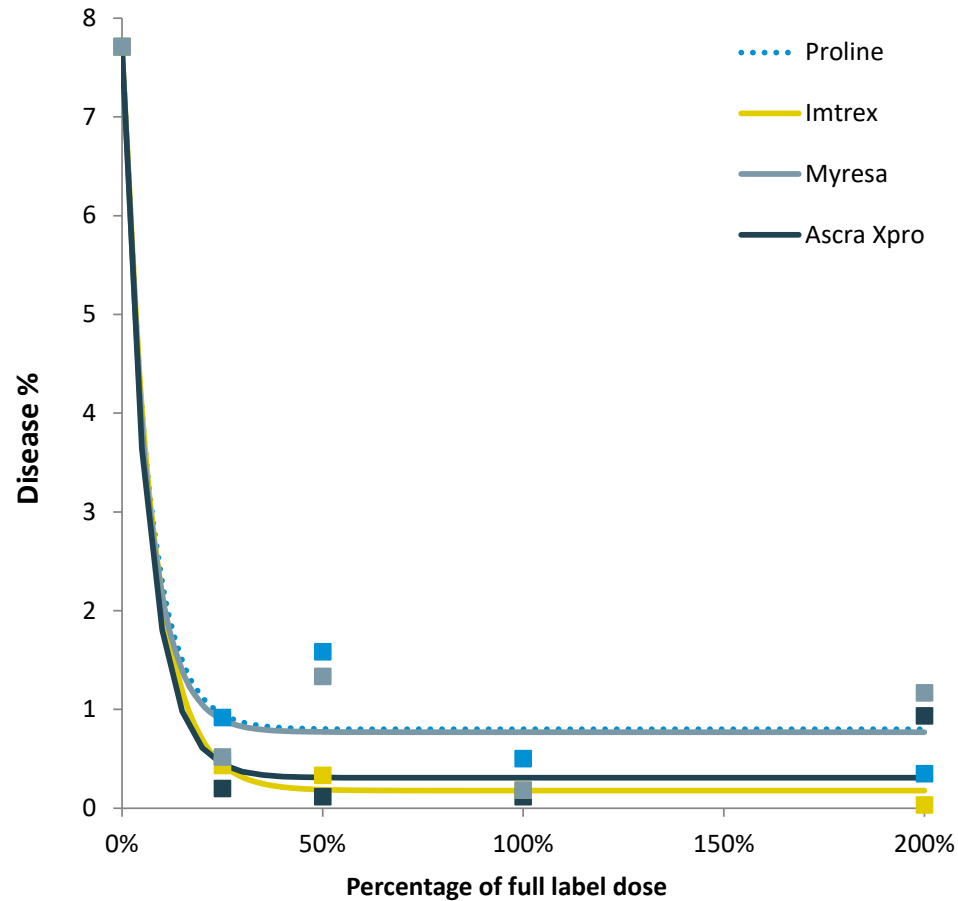
- T minus – autumn or winter clean up
- T0 – only for early rust protection
- T1 – stem-base disease and protection of yield important leaves (risk based – multisite use maximised)
- T1.5 – protection of leaf 2 is gap between T1 and T2 is stretched
- T2 – protection of yield important flag – deploy best chemistry, maximising lowest risk options
- T3 – continued green leaf retention and protection from ear diseases
- T4 – continued ear disease protection
- Maximise use of folpet split doses where possible
- Limit dose and application number of individual actives where you can
- Use balanced mixtures of systemics



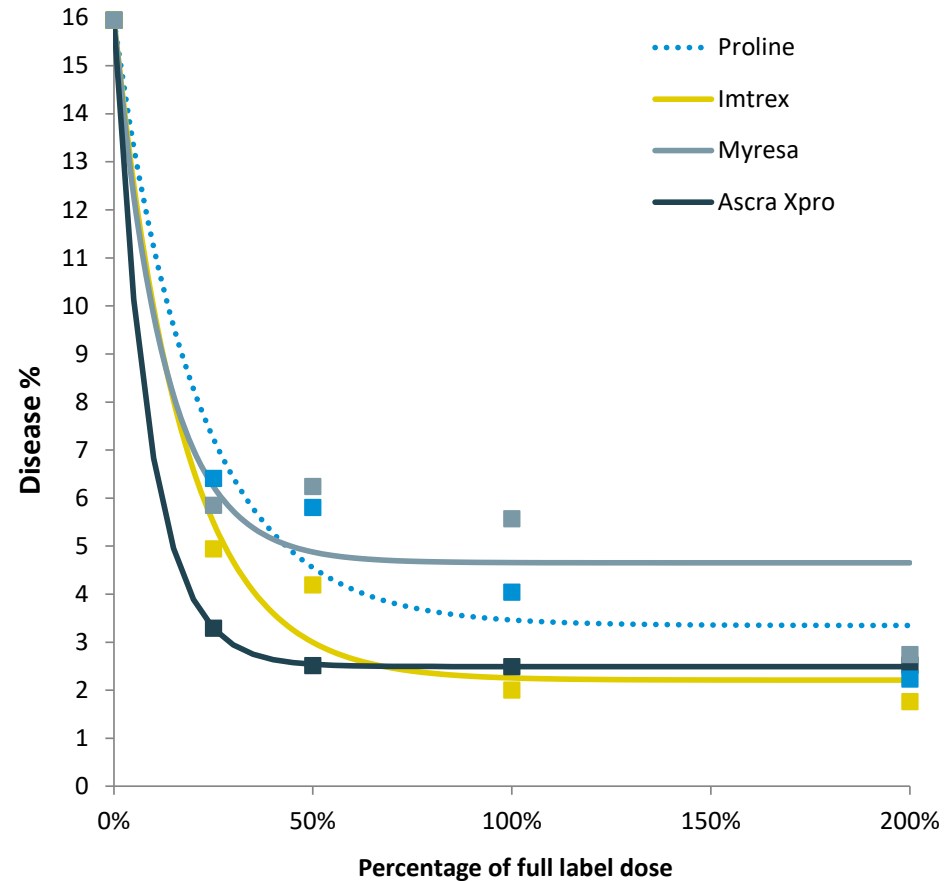
Barley fungicides



Protectant 2023 (1 trial)



Eradicant 2023 (2 trials)



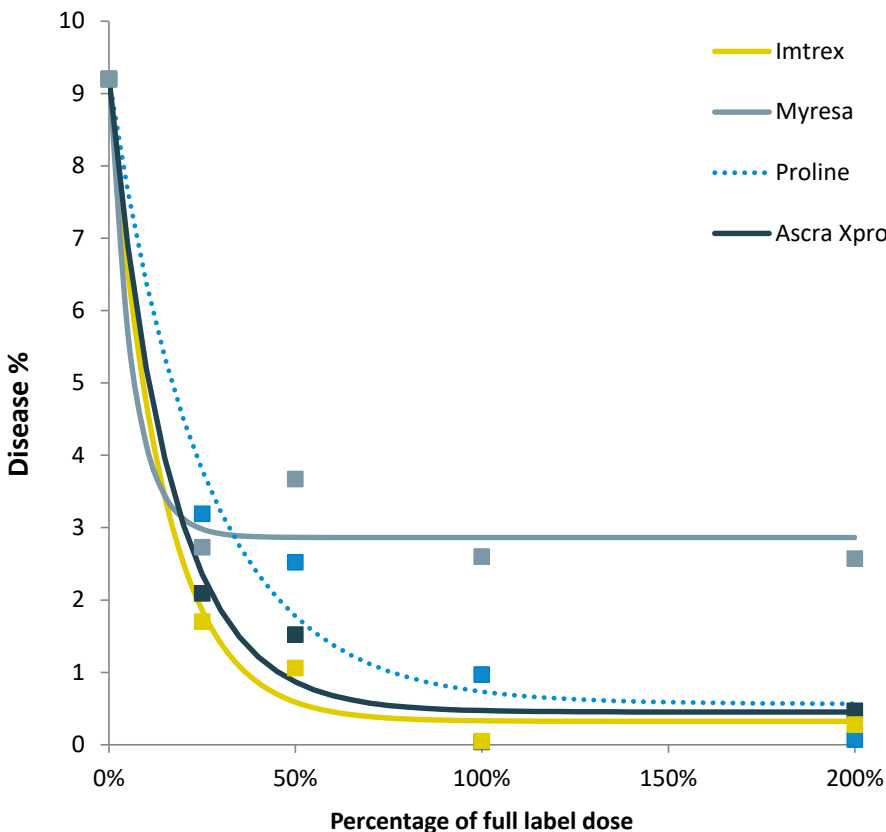
Rhynchosporium



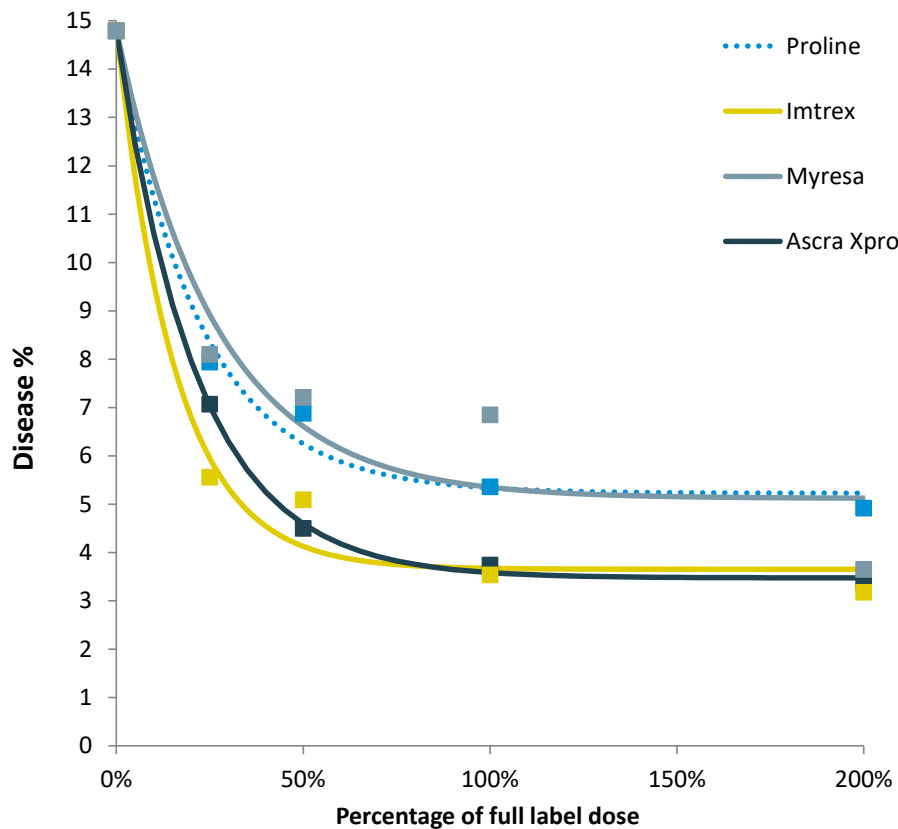
Farm
Advisory
Service



Protectant overyear 2021-23 (5 trials)

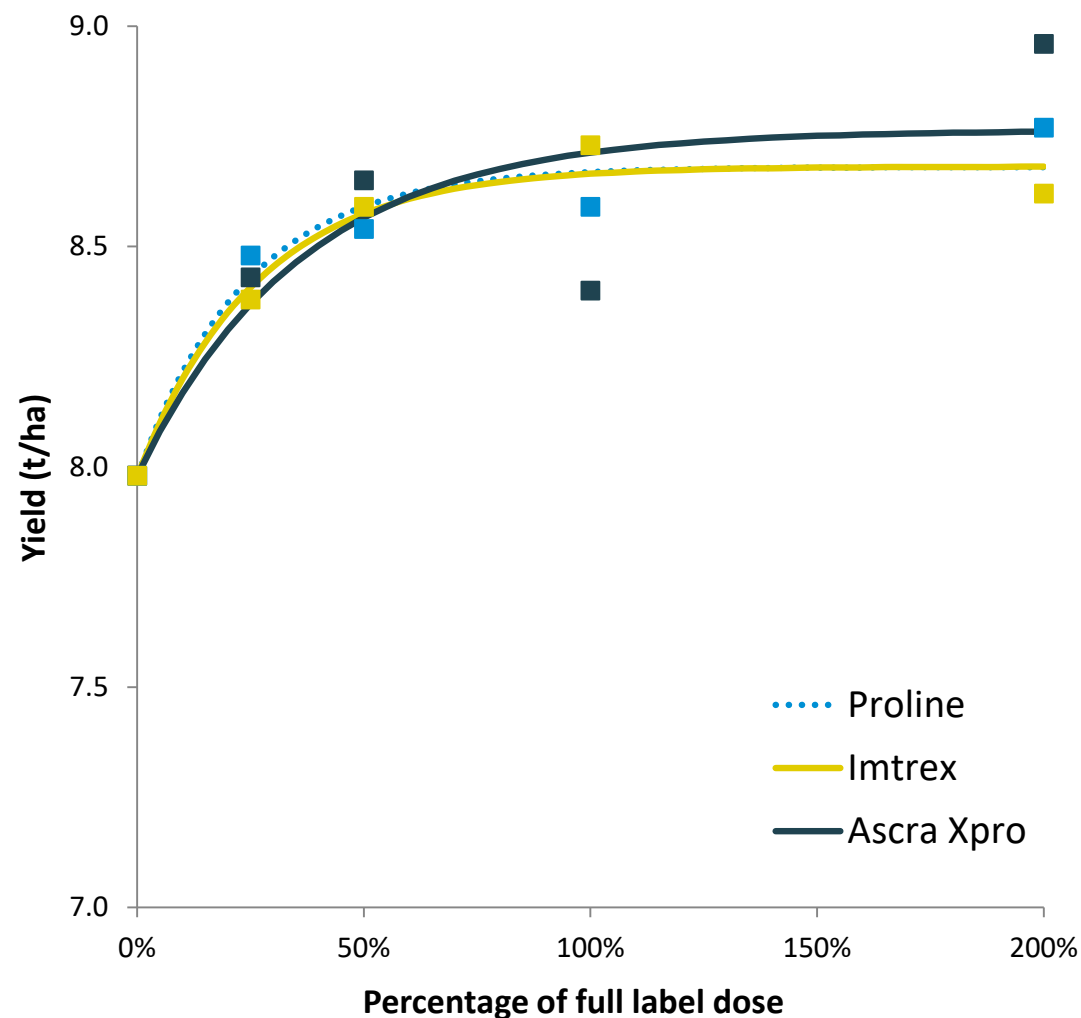


Eradicant overyear 2021-23 (6 trials)

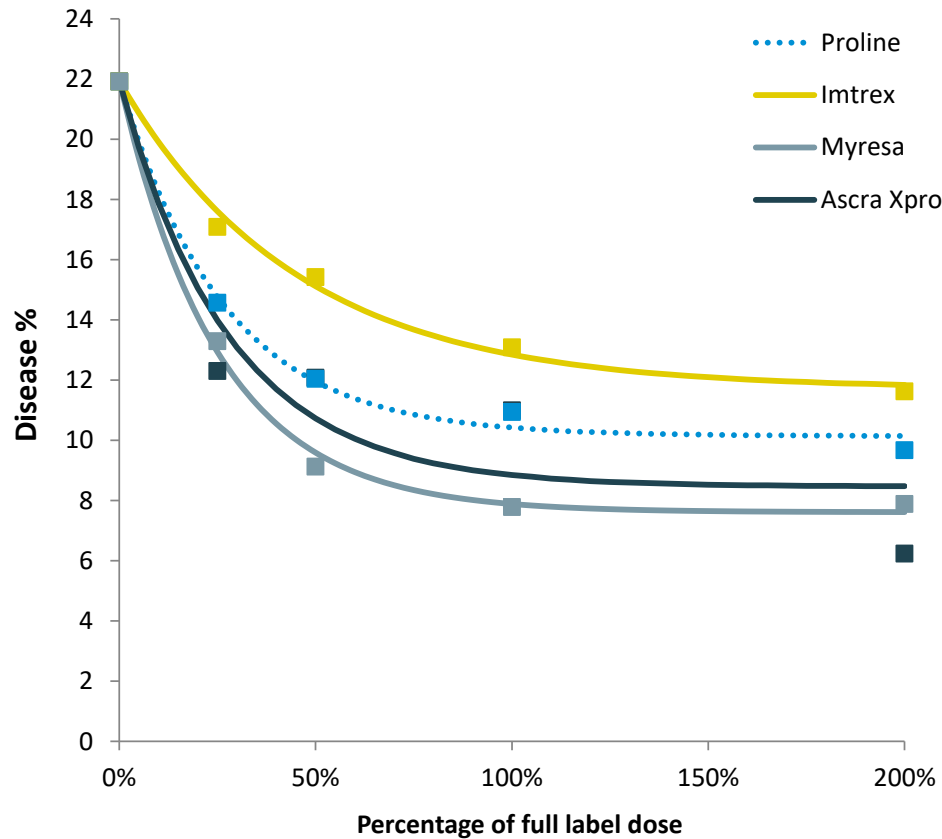


Rhynchosporium

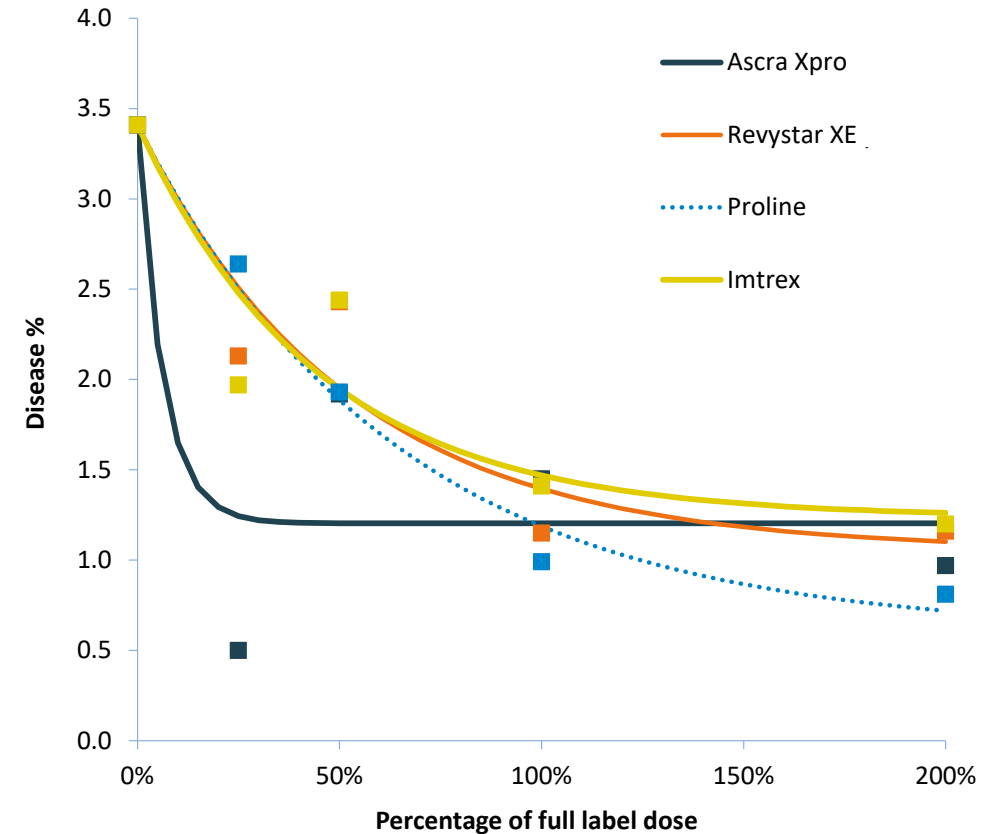
Rhynchosporium yield overyear 2021-22 (5 trials)



Protectant overyear 2022-23 (2 trials)

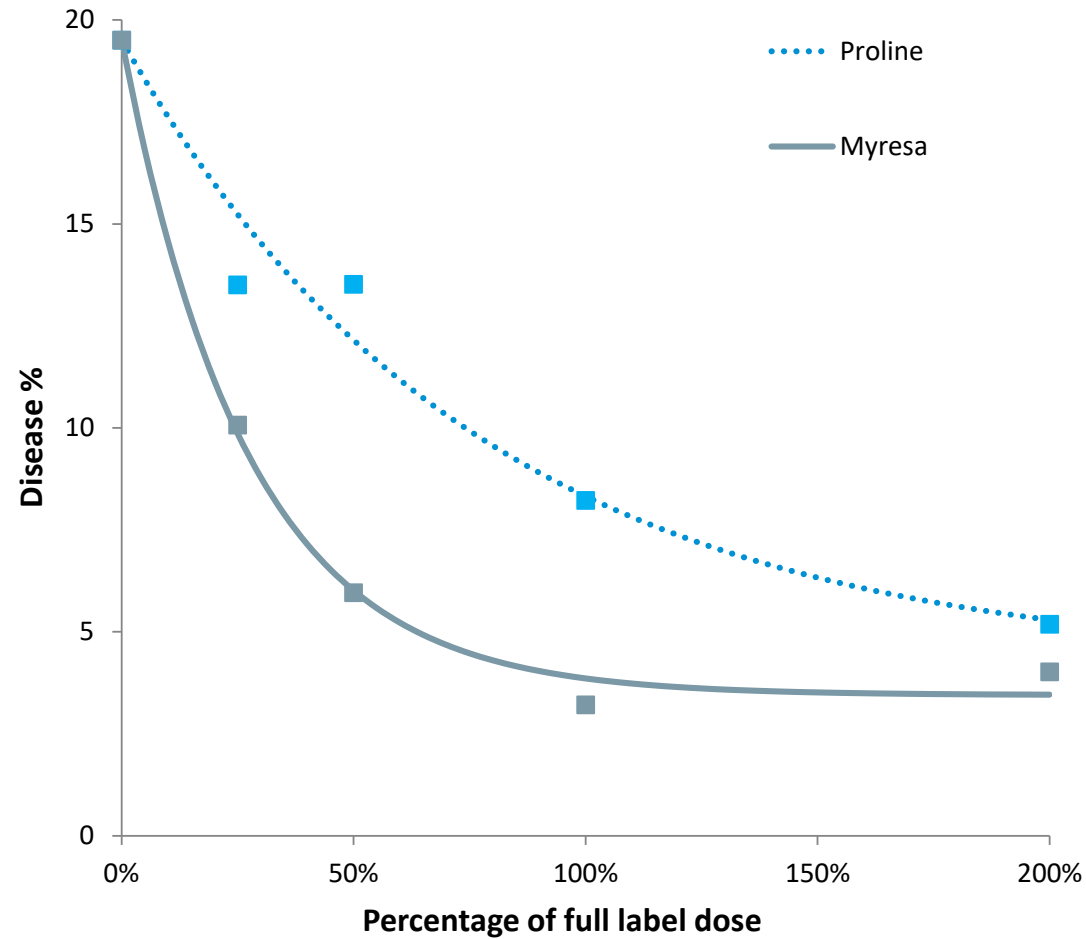


Eradicant overyear 2020-22 (3 trials)

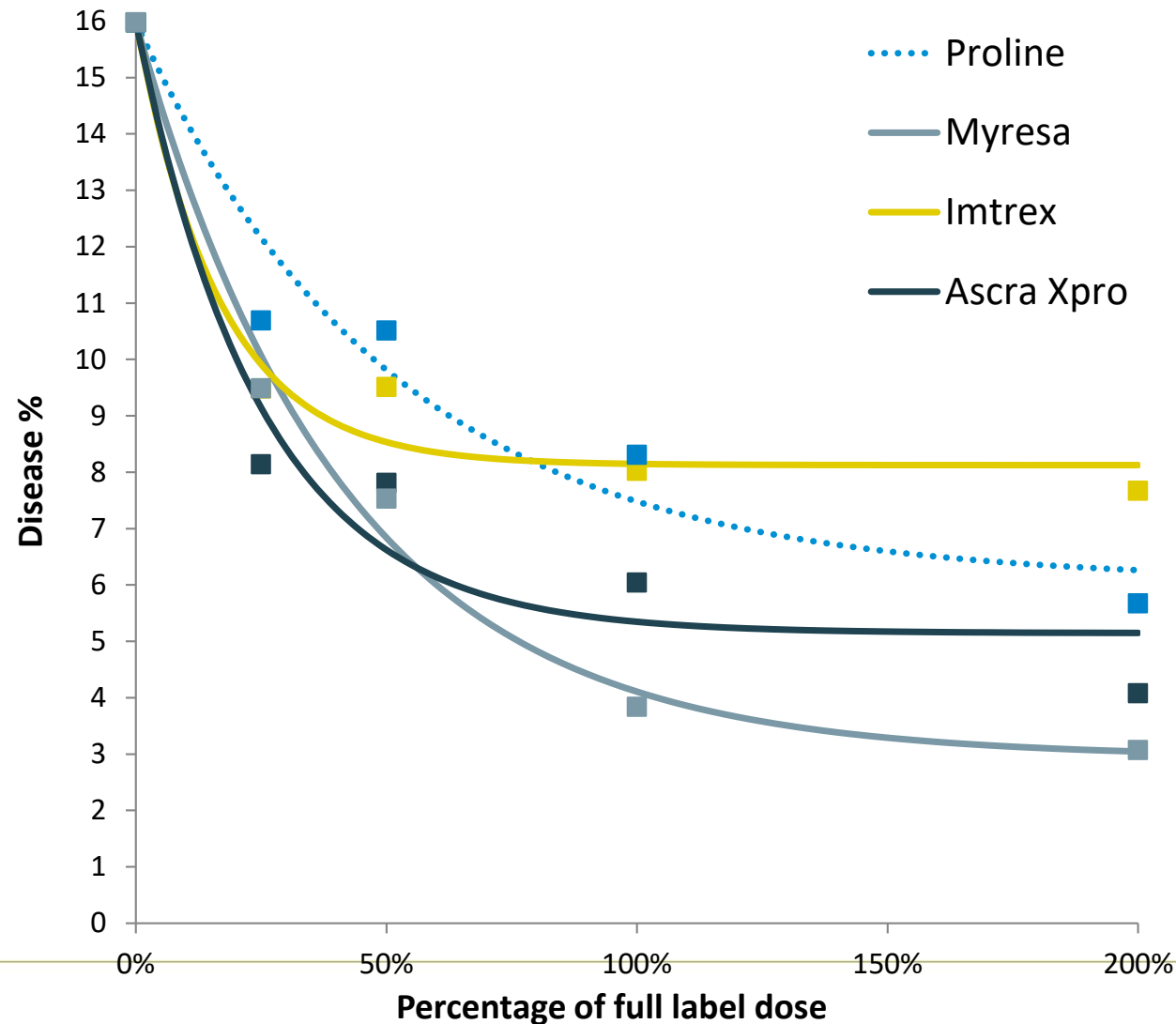


Net blotch

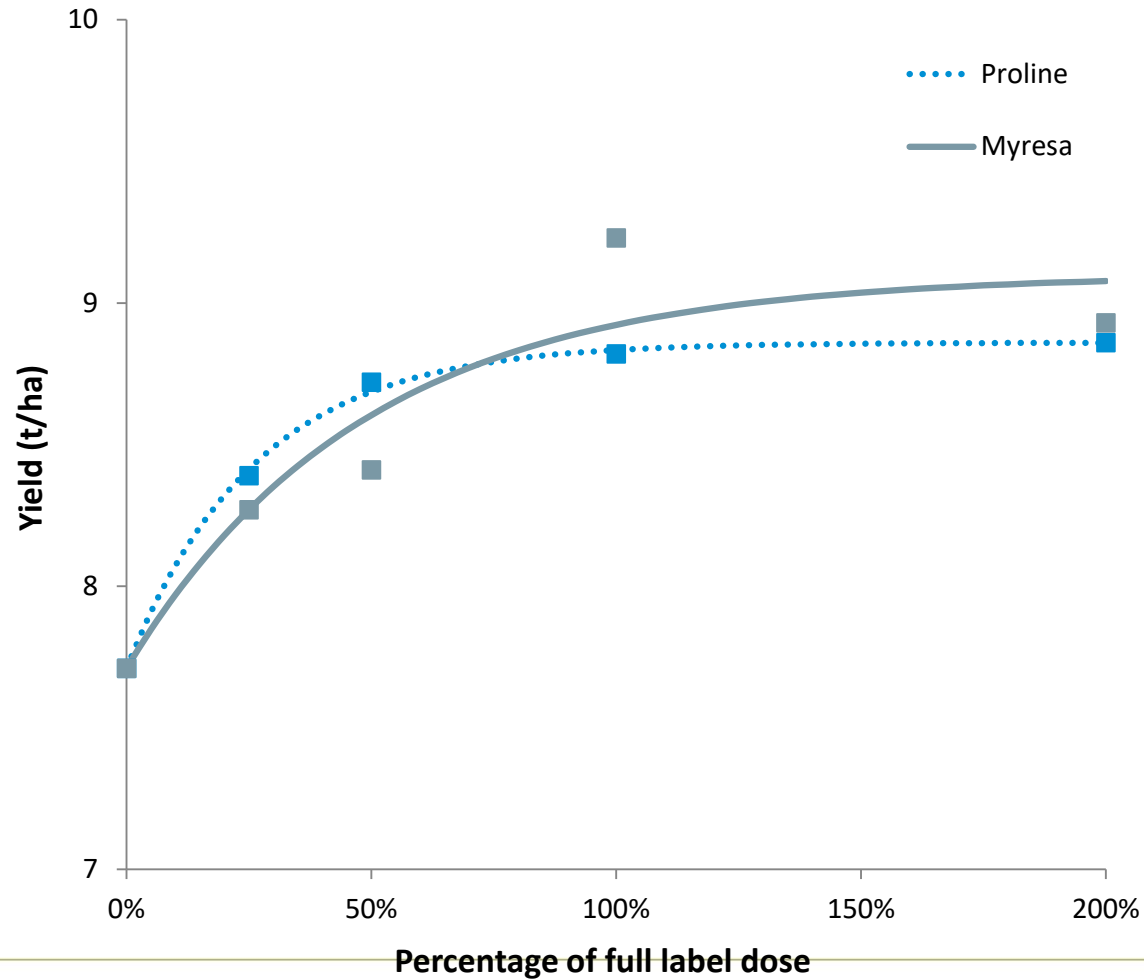
Ramularia protectant 2023 (2 trials)



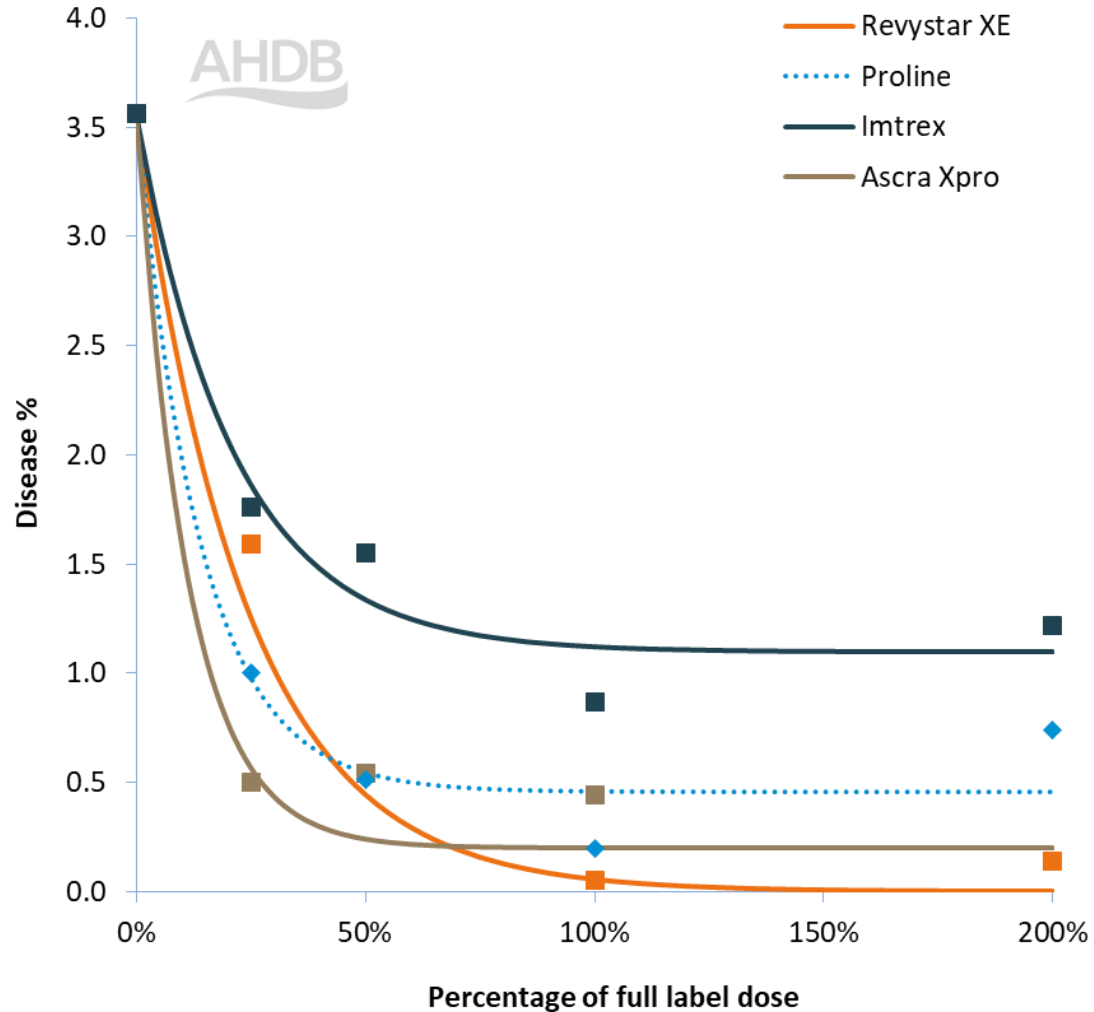
Ramularia protectant overyear 2021-23 (10 trials)



Ramularia yield overyear 2021-23 (3 trials)



Mildew protectant overyears 2020–22 (4 trials)

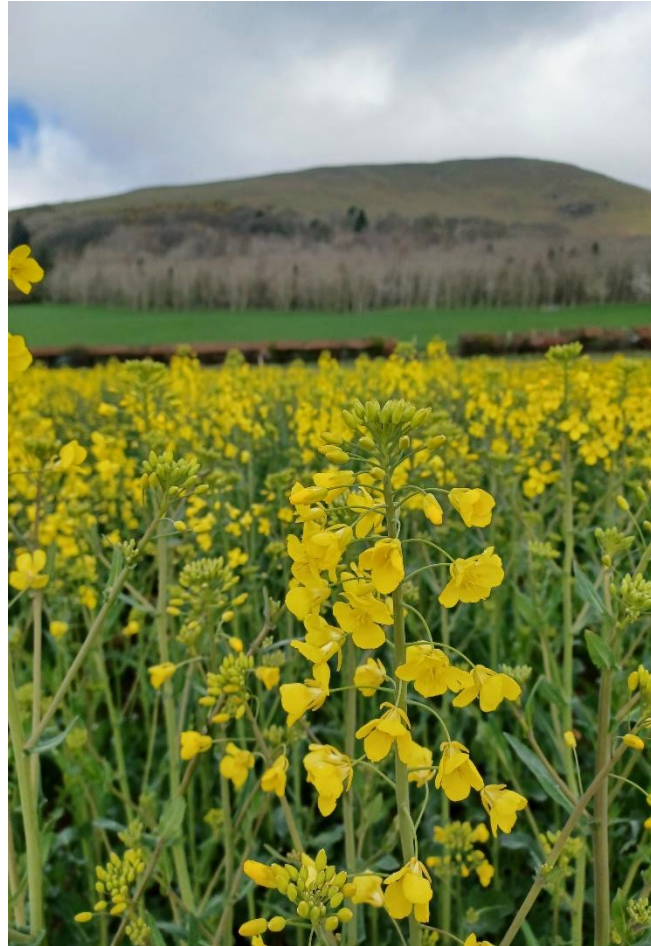


Barley summary

- SDHI products Ascra Xpro and Imtrex (fluxapyroxad) still very effective against rhynchosporium
- Azoles prothioconazole (Proline) and mefentrifluconazole (Myresa) also active
- On net blotch, azoles (prothioconazole and mefentrifluconazole) and mixtures containing them (Ascra Xpro and Revystar XE) are currently giving best control
- On ramularia, mefentrifluconazole is giving good protectant control of ramularia, with useful activity from prothioconazole. Small benefit from SDHIs (as in Ascra Xpro)
- Prothioconazole continues to be effective against mildew
- Mixture products give the broadest spectrum and most robust control

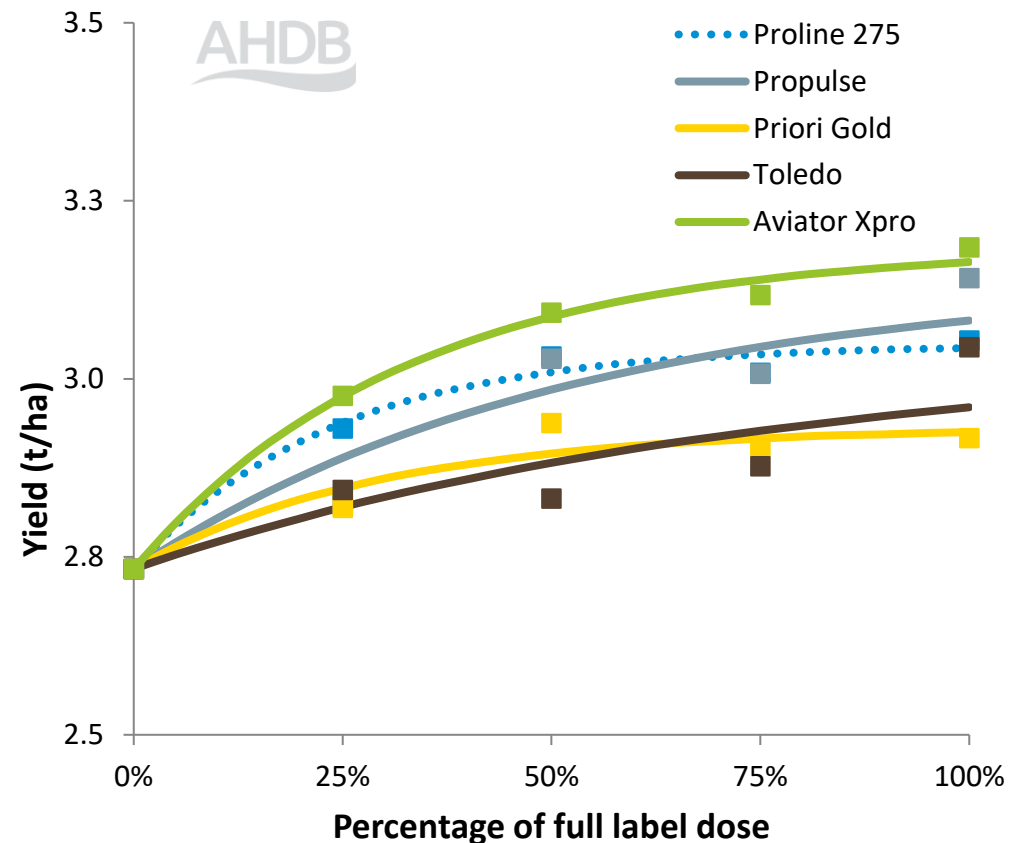
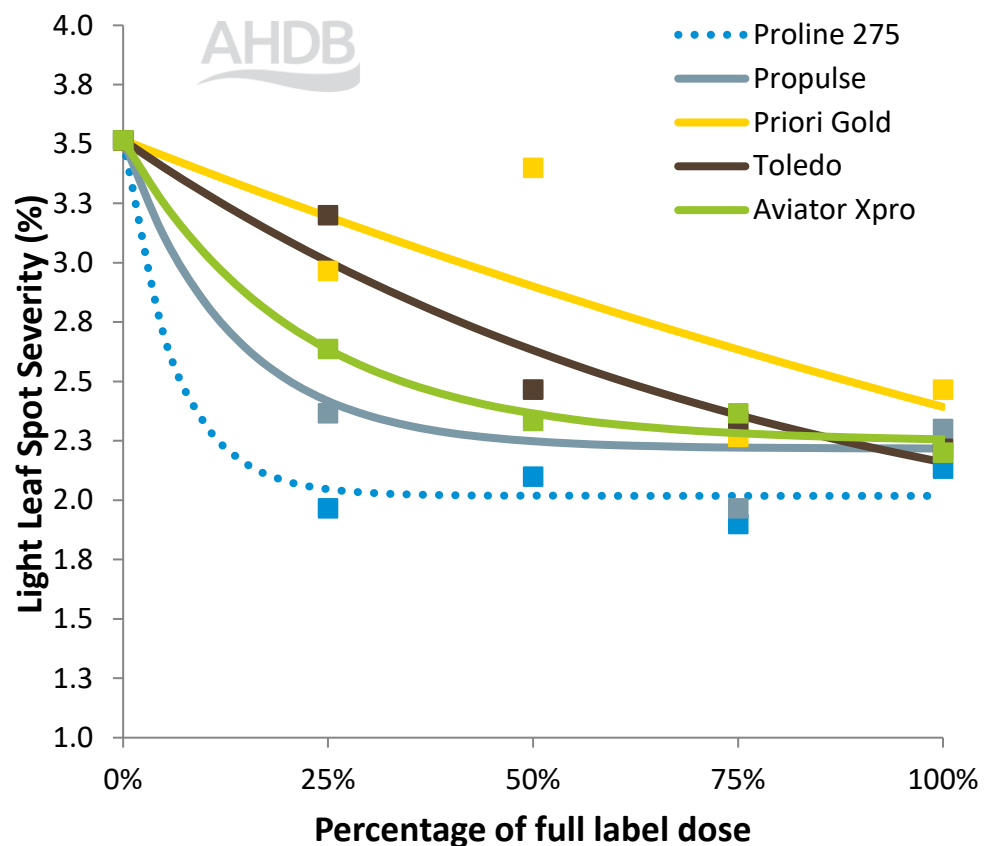


Oilseed rape – light leaf spot management



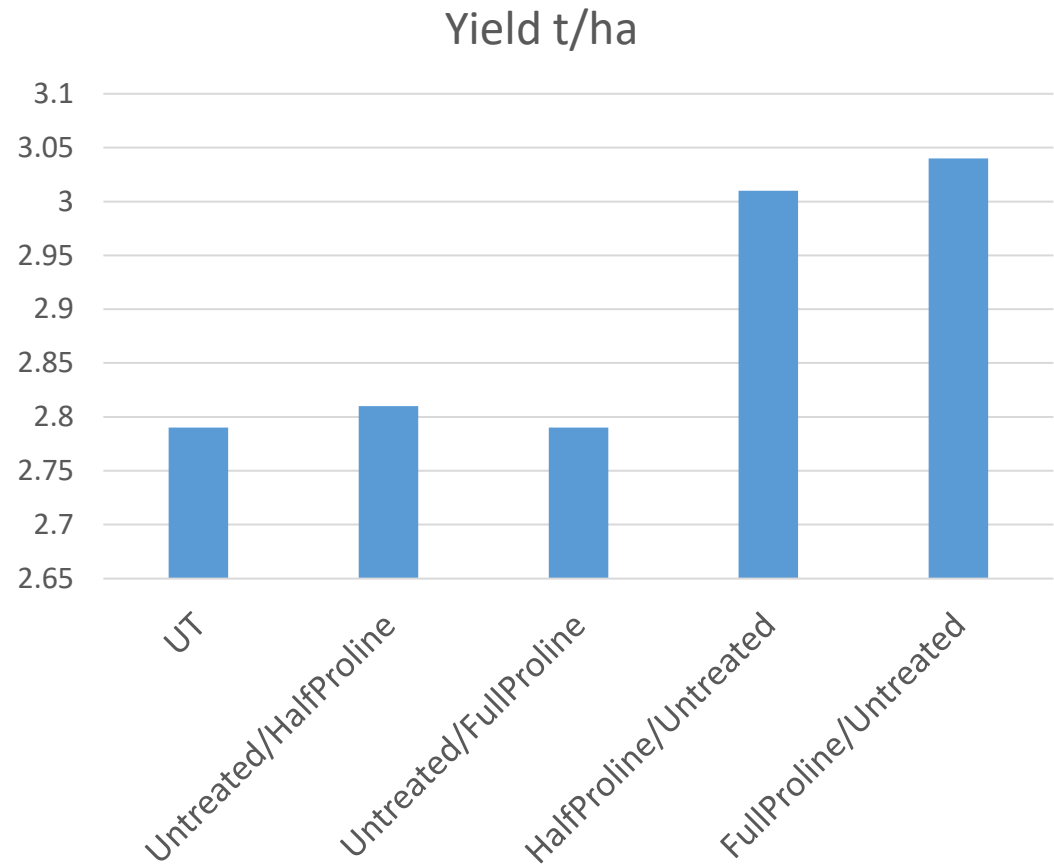
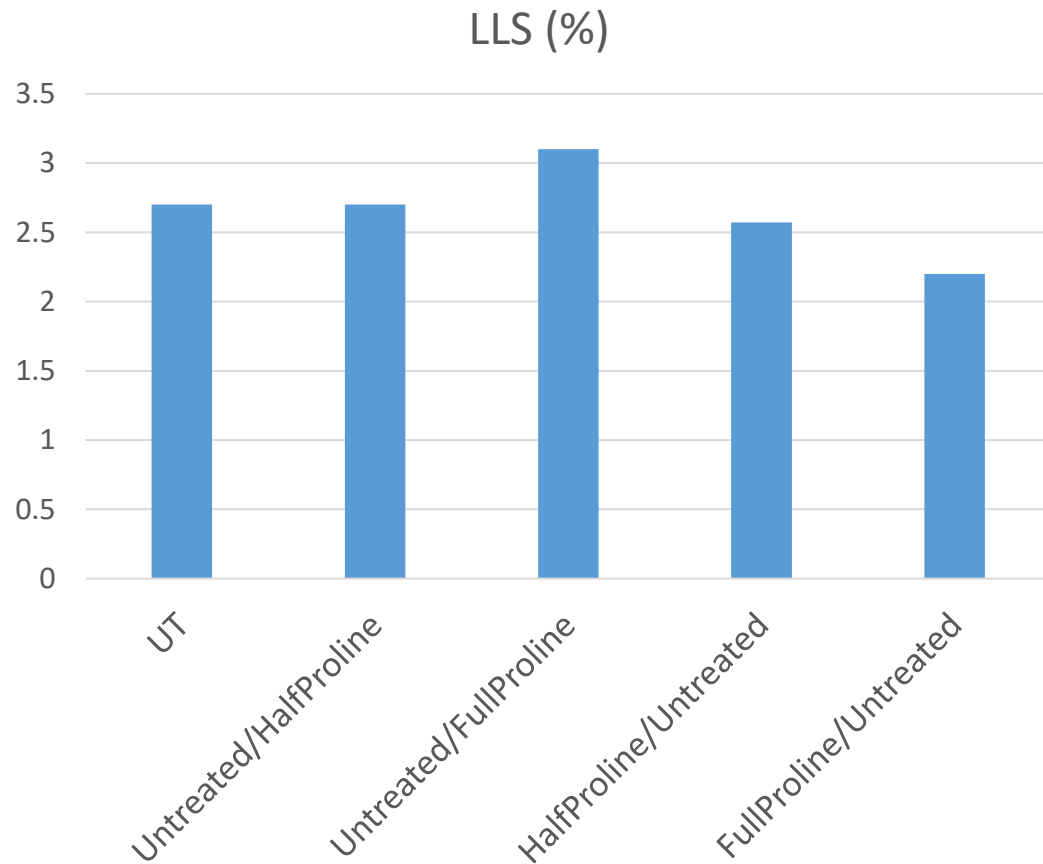
Light leaf spot disease and yield

High Mowthorpe, 2023



Timing of sprays - autumn vis spring

(Latent infection at Nov spray timing)



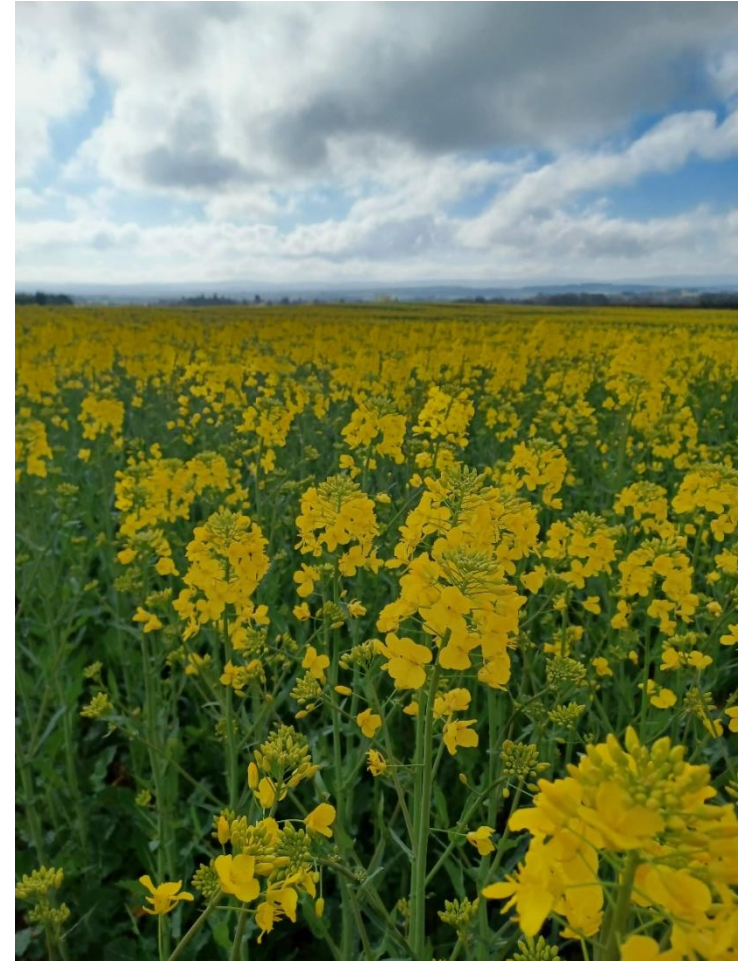
Oilseed rape summary

Light leaf spot

- Both azole and non-azole chemistry effective
- Prothioconazole based products gave best control
- Tebucuconazole (Toledo) more dose dependent
- Sprays work protectantly so timing is important to achieve control and yield protection
- Latent infection at the site. Harder to manage LLS in a fully curative scenario

Sclerotinia stem rot

- All modes of action available for sclerotinia control can now be used elsewhere in the fungicide programme
- Use alternation and mixtures for resistance management



Take home messages

- Diversifying chemistry with a new SDHI brings benefits
- We are on the very limits of being able to manage disease in wheat
- Sensible and stewarded use of fungicides (new and old) is vital to retaining actives longer term
- Use in integrated programmes brings win:wins
- Same principles of optimising fungicide choice and minimising reliance on any individual active apply over all crops



