Fungicide performance in wheat, barley and oilseed Rape (2023)

CEREALS & OILSEEDS

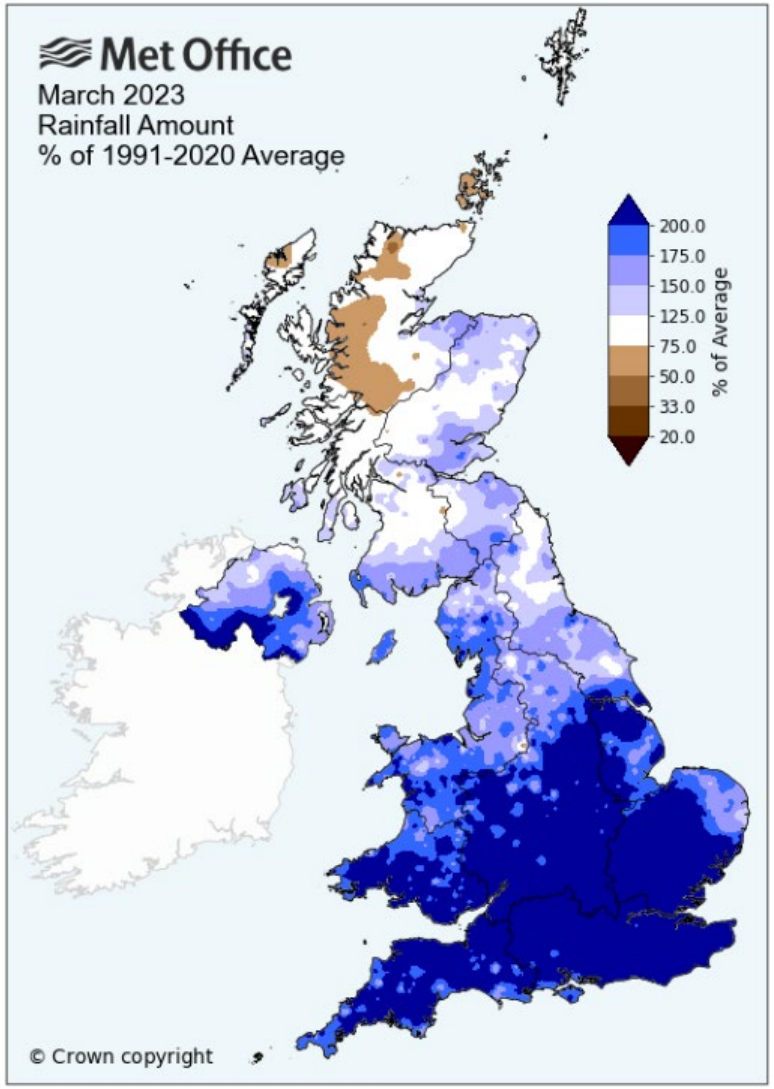
Background information

Choosing fungicides

- Match fungicides to the primary disease risk, which depends mainly on variety, sowing date, location and local weather
- Mixtures and alternations of fungicides with different modes of action, from different fungicide groups, are often most effective and reduce the likelihood that fungicide resistance will develop in pathogens
- Resistance poses a significant threat to the performance of fungicides. It is essential to take resistance management into account when planning fungicide programmes
- For further information, visit the Fungicide Resistance Action Group's (FRAG) web page: ahdb.org.uk\frag

2022–23 cropping season

- Mild and wet autumn (Oct/Nov 2022)
- Warm and dry February
- Very wet March across southern Britain
- Relatively few spray days in May
- Warm and dry June



Source: Met Office www.metoffice.gov.uk
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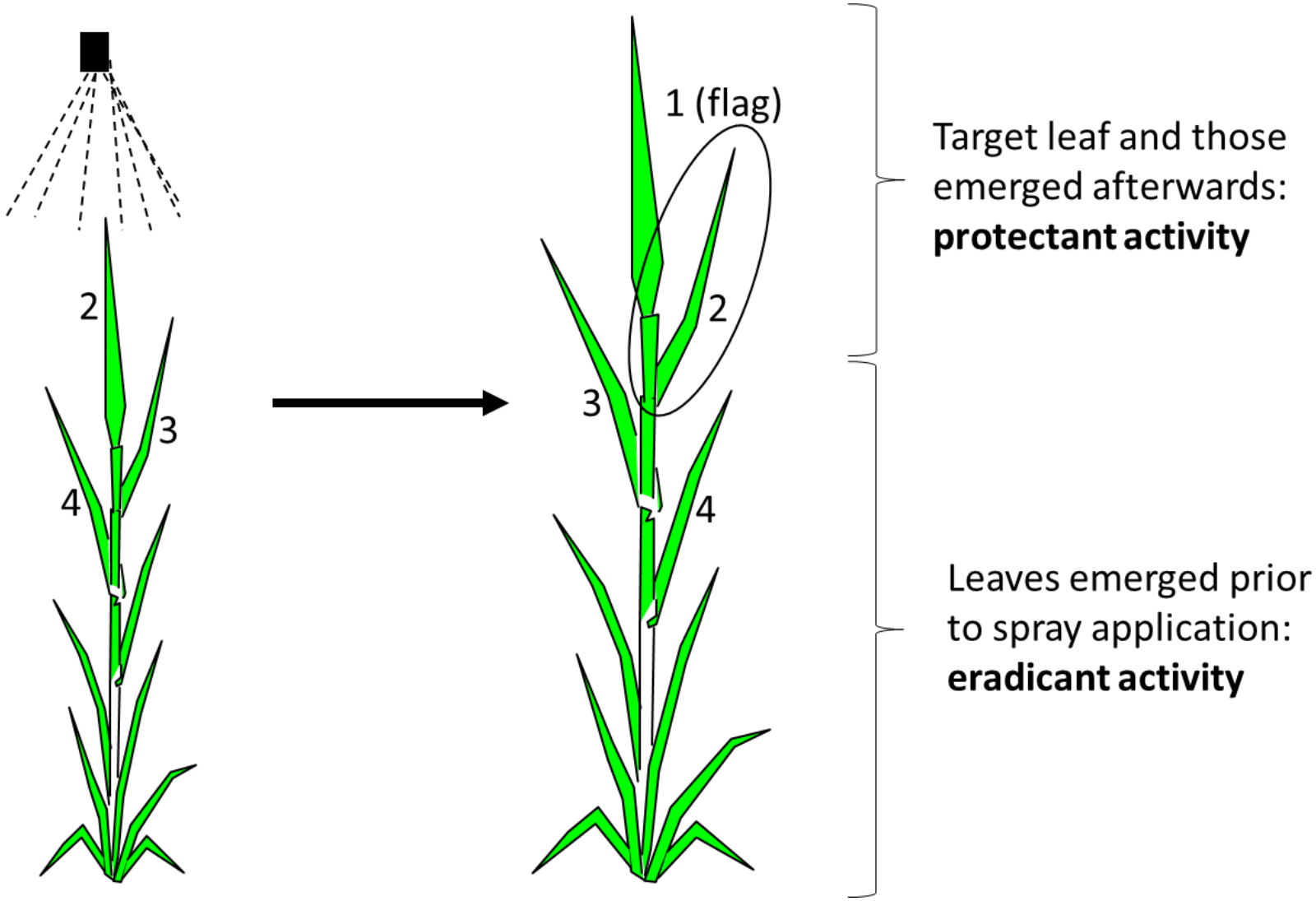
Wheat and barley (overview)

Trial methods

- To maximise differences between treatments on each disease:
  - High-risk locations
  - Highly susceptible varieties
  - One spray timing
- Dose-response graphs show average performance, measured across a range of sites, seasons and leaf layers
- Cover-sprays that are not active against the target disease are sometimes used to reduce the effect of other diseases on the trial

Protectant and eradicant activity



Fungicide performance update for wheat (2023)

Wheat trial sites in 2023

	Site	Spray timing	Target disease	Variety
1	Rosemaund	T2	Septoria tritici	Elation
2	Sutton Scotney	T1.5	Septoria tritici	LG Skyscraper
3	E. Lothian	T2	Septoria tritici	KWS Barrel
4	Terrington	T1	Yellow rust	KWS Zyatt
5	Cambridge	T2	Brown rust	Crusoe
6	Gleadthorpe	T3	Fusarium	RGT Illustrious
7	Carlow	T2	Septoria tritici	Graham
8	Cardigan	T2	Septoria tritici	Elation
9	Telford	T2	Septoria tritici	LG Skyscraper
10	Dundee	T1	Septoria tritici	KWS Barrel

Wheat – registered products

Product	Active(s)	Mode of Action
Arizona*	folpet	Multi-site
Proline 275*	prothioconazole	DMI**
Myresa	mefentrifluconazole (revysol)	DMI**
Peqtiga	fenpicoxamid (inatreq)	QII
Elatus Plus	benzovindiflupyr (solatenol)	SDHI
Vimoy **New**	isoflucypram (iblon)	SDHI
Ascra Xpro	bixafen + fluopyram + prothioconazole	SDHI + SDHI + DMI**
Revystar XE	fluxapyroxad + mefentrifluconazole	SDHI + DMI**
Univoq	fenpicoxamid + prothioconazole	QII + DMI**

A further six unregistered products were tested in 2023 (data will be released upon registration).

*Arizona and Proline only tested at full-dose (100%) on septoria.

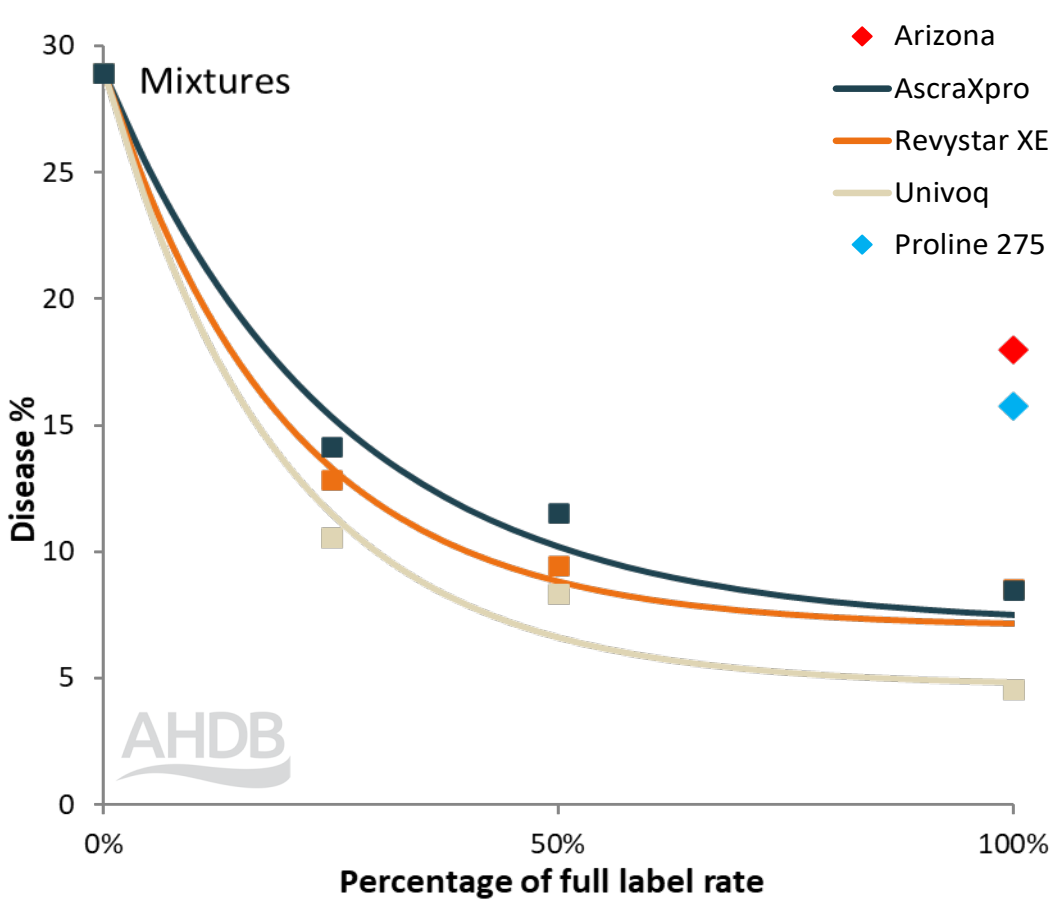
**Azole.

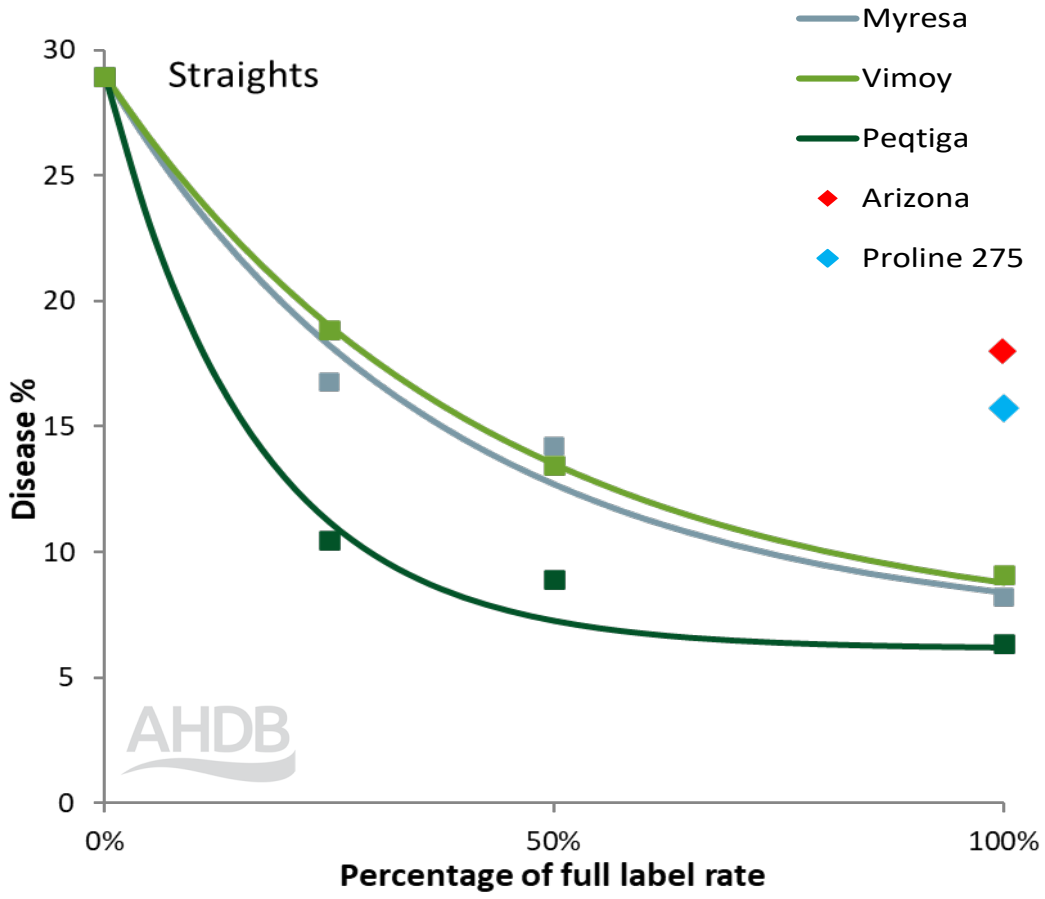
Check labels prior to use: Imtrex, Myresa, Peqtiga, Elatus Plus should be used in mixtures with at least one fungicide with an alternative mode of action that has efficacy against the target disease.

Wheat septoria tritici efficacy data in 2023

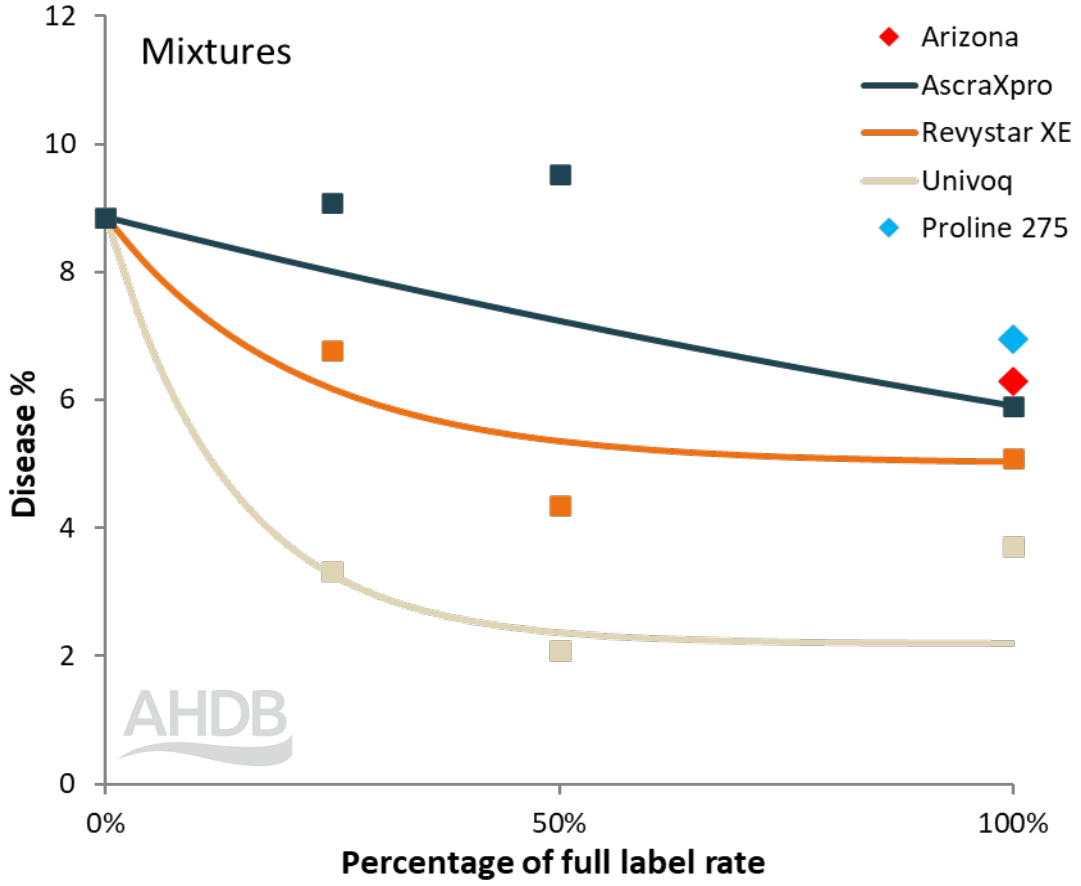
Trial site		Protectant	Eradicant	Mixed
1	Rosemaund T2		x	
2	Sutton Scotney T1.5	x		x
3	E. Lothian T2			x
7	Carlow T2	x		
8	Cardigan T2	x		
9	Telford T2			x
10	Dundee T1	x		

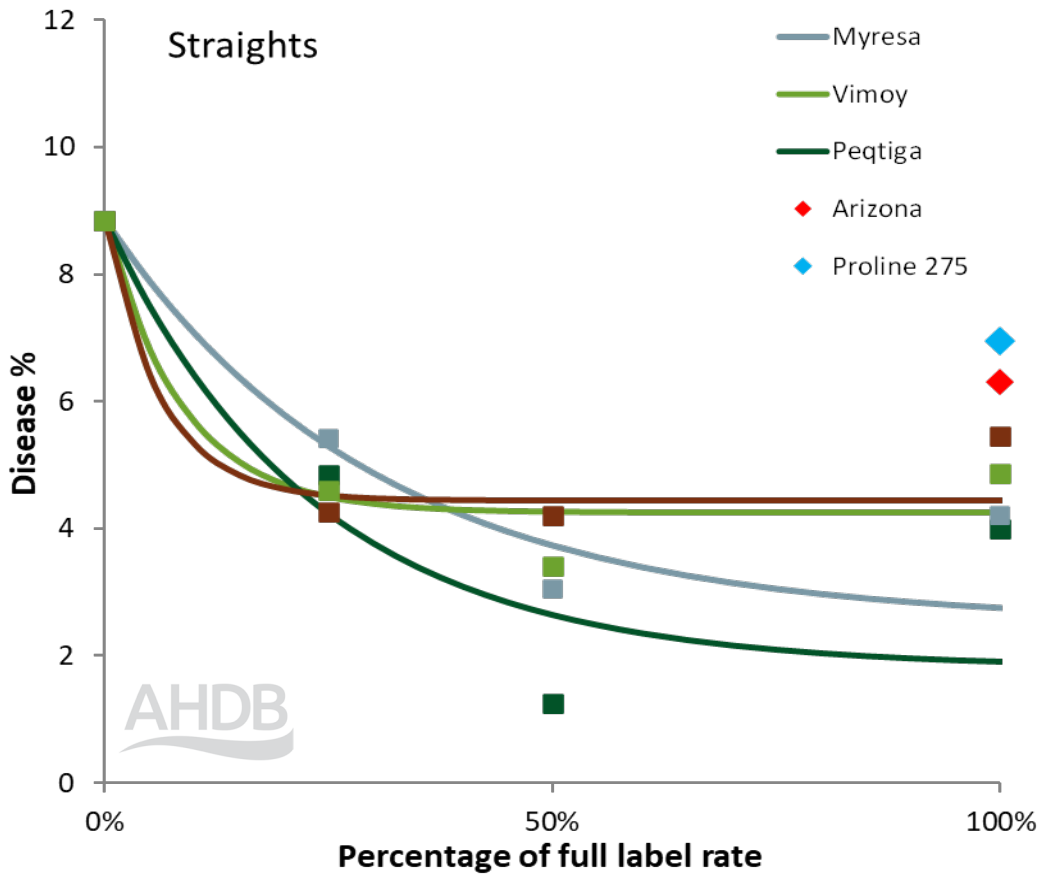
Septoria protectant overtrial 2023 (4 trials)



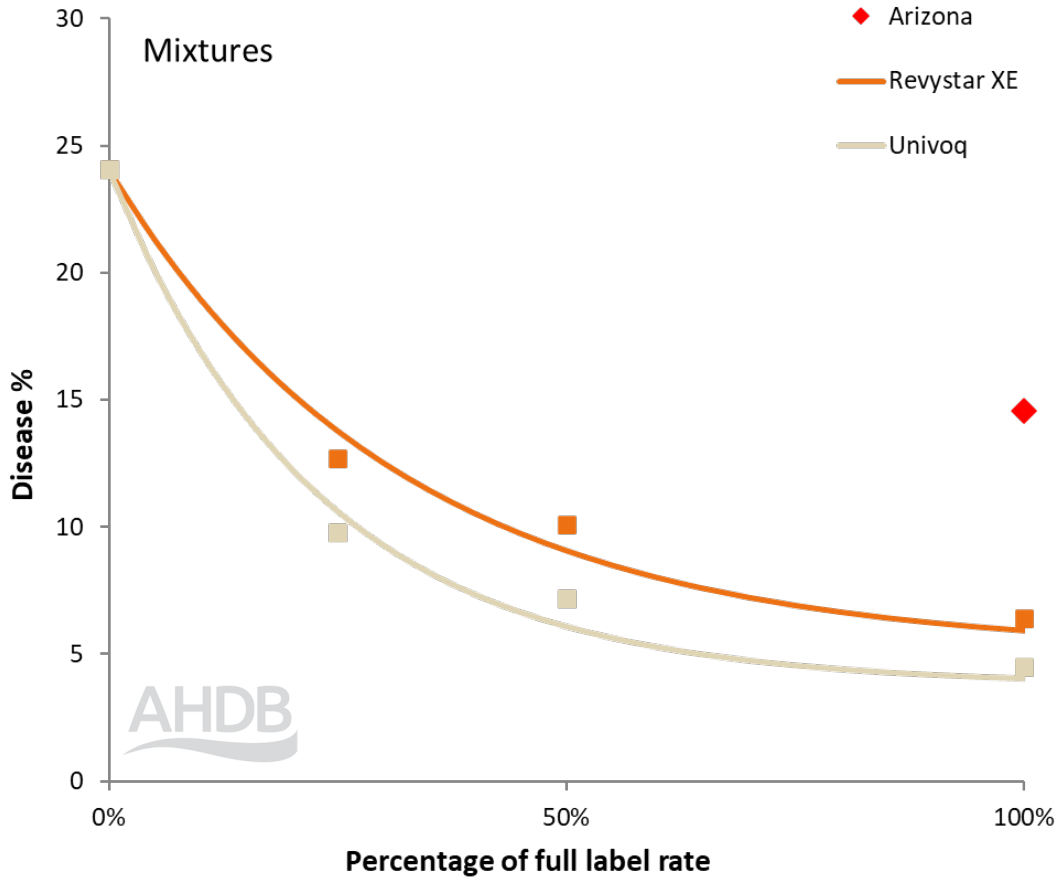


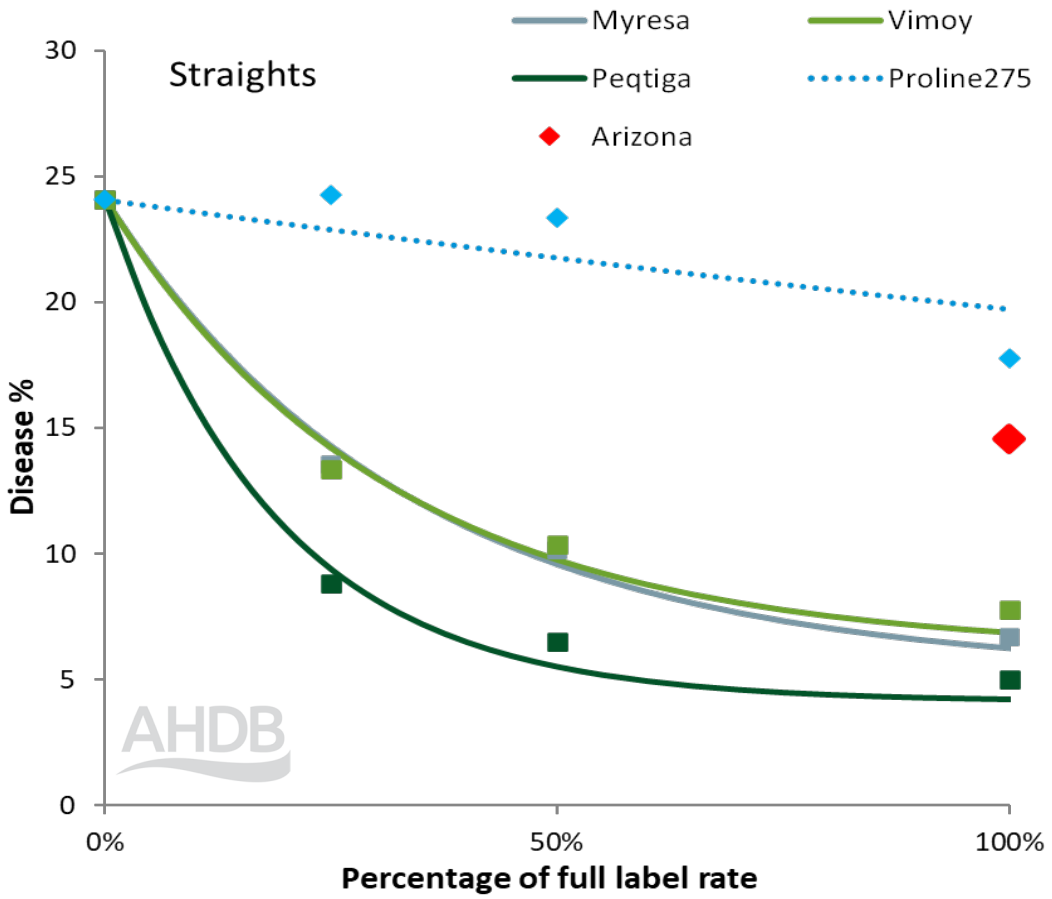
Septoria mixed overtrial 2023 (3 trials)



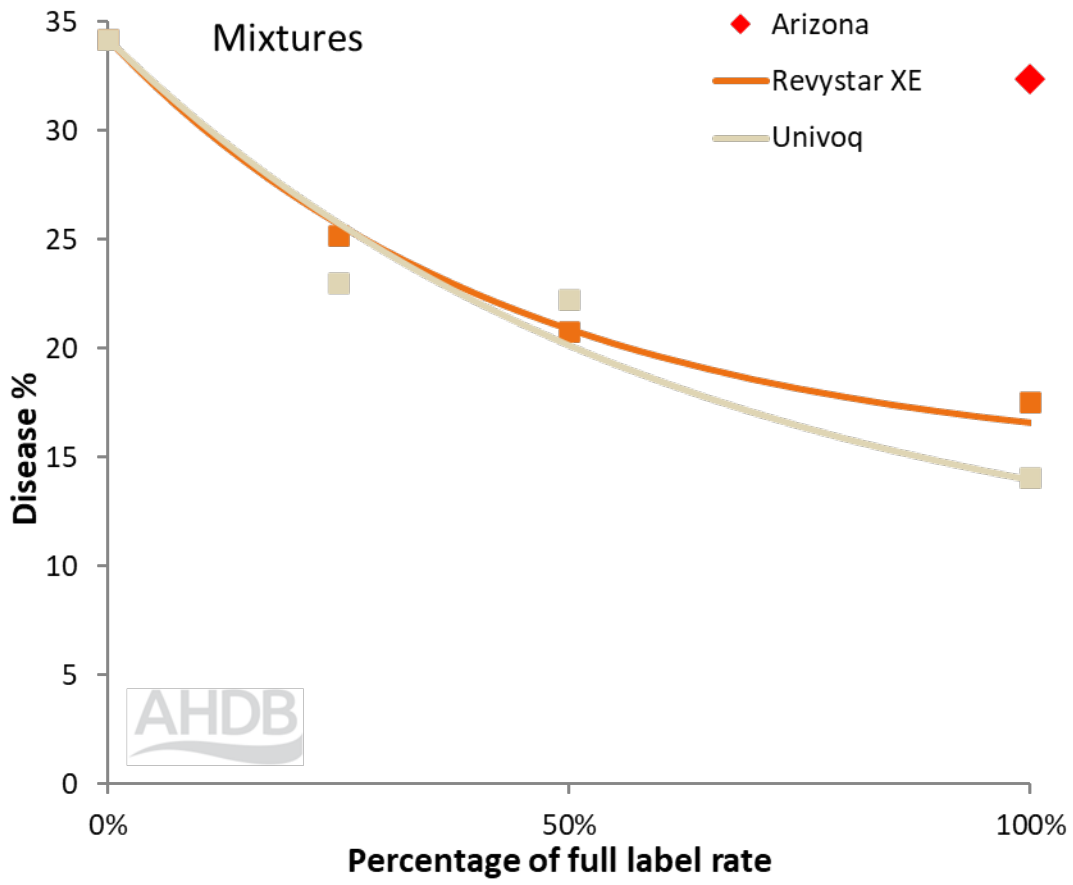


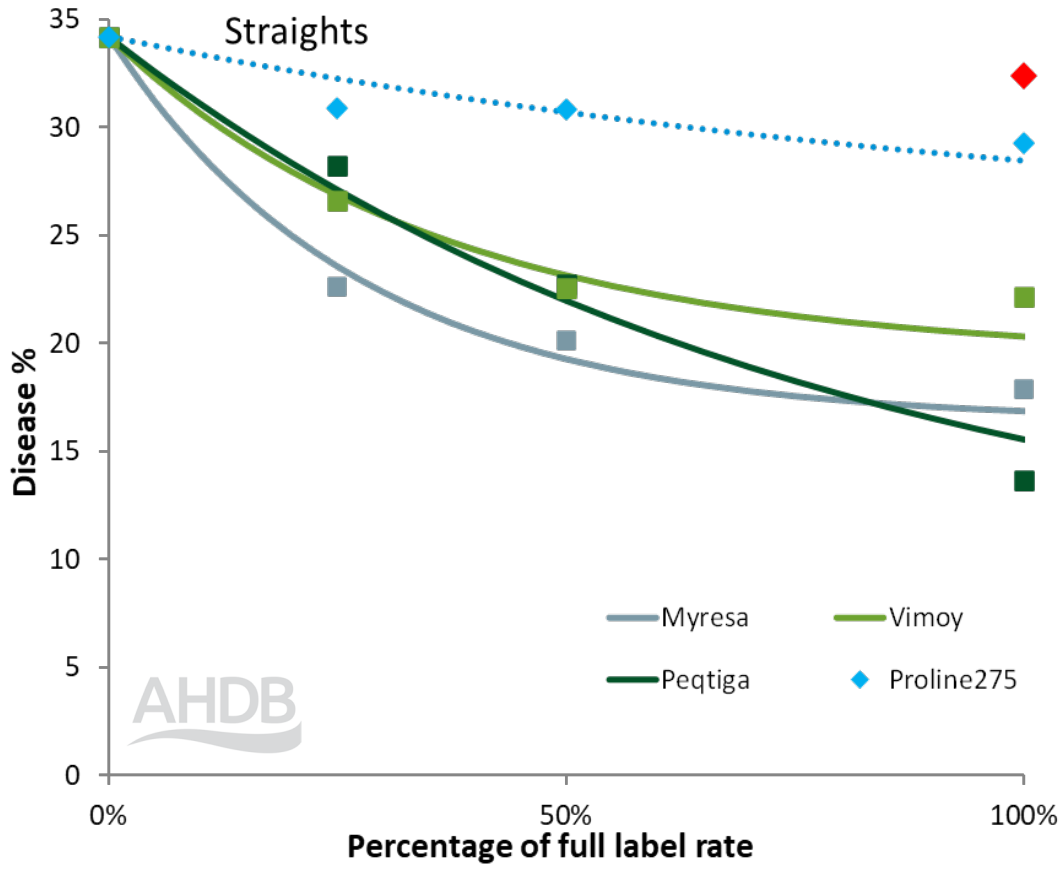
Septoria protectant overyear 2021-23 (17 trials)



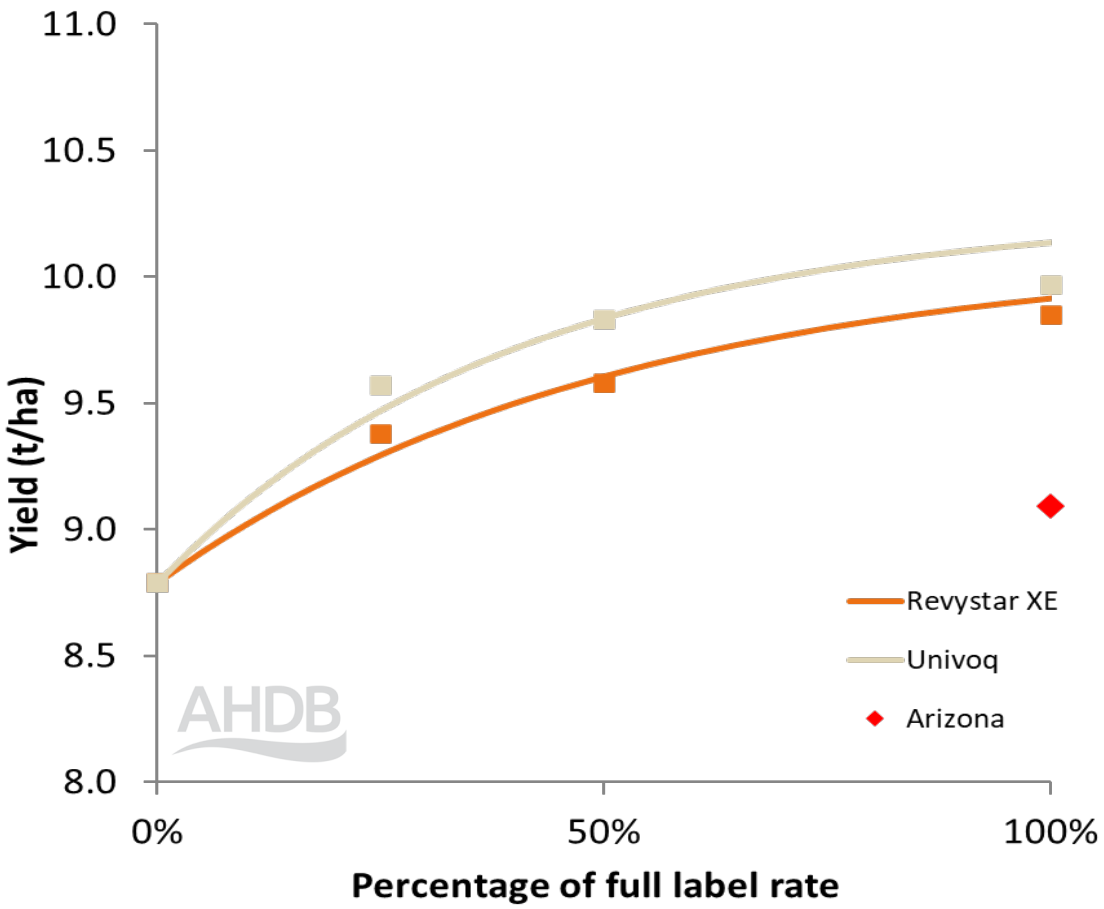


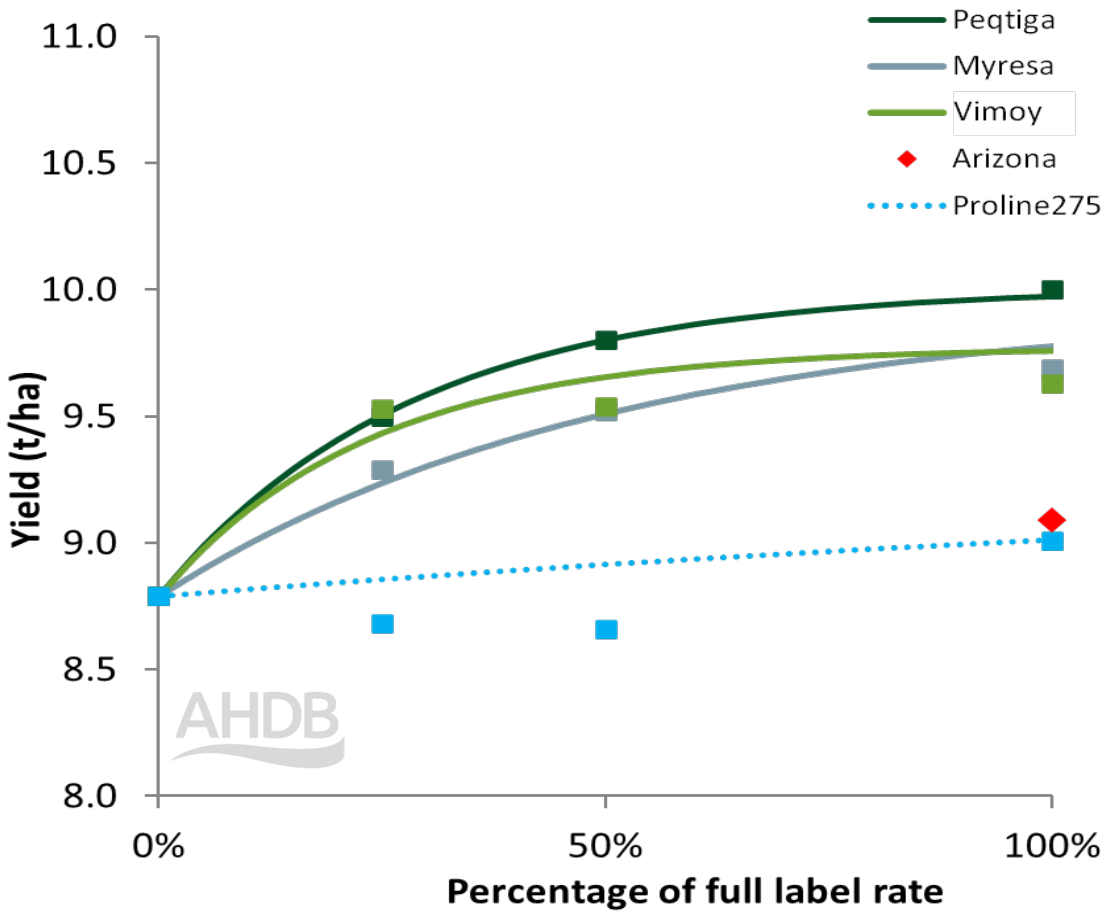
Septoria eradicant overyear 2021-23 (7 trials)



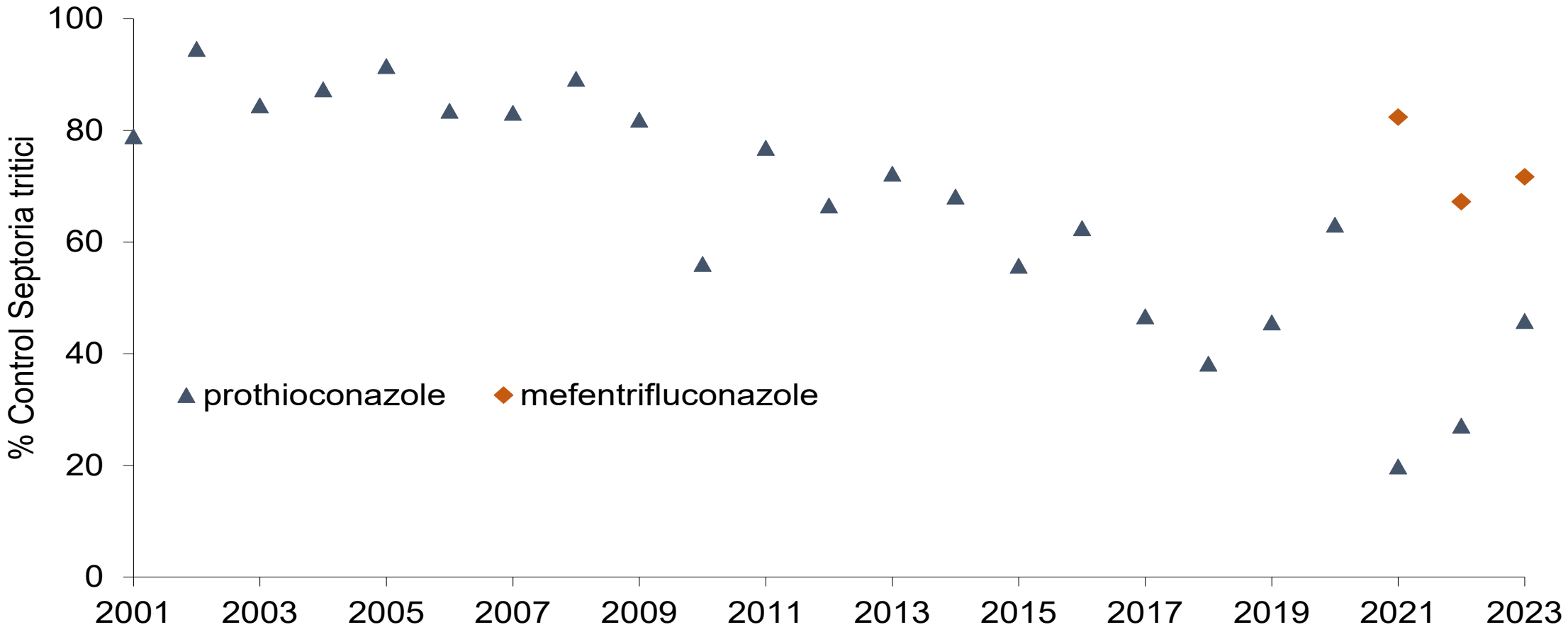


Septoria yield overyear 2021-23 (19 trials)

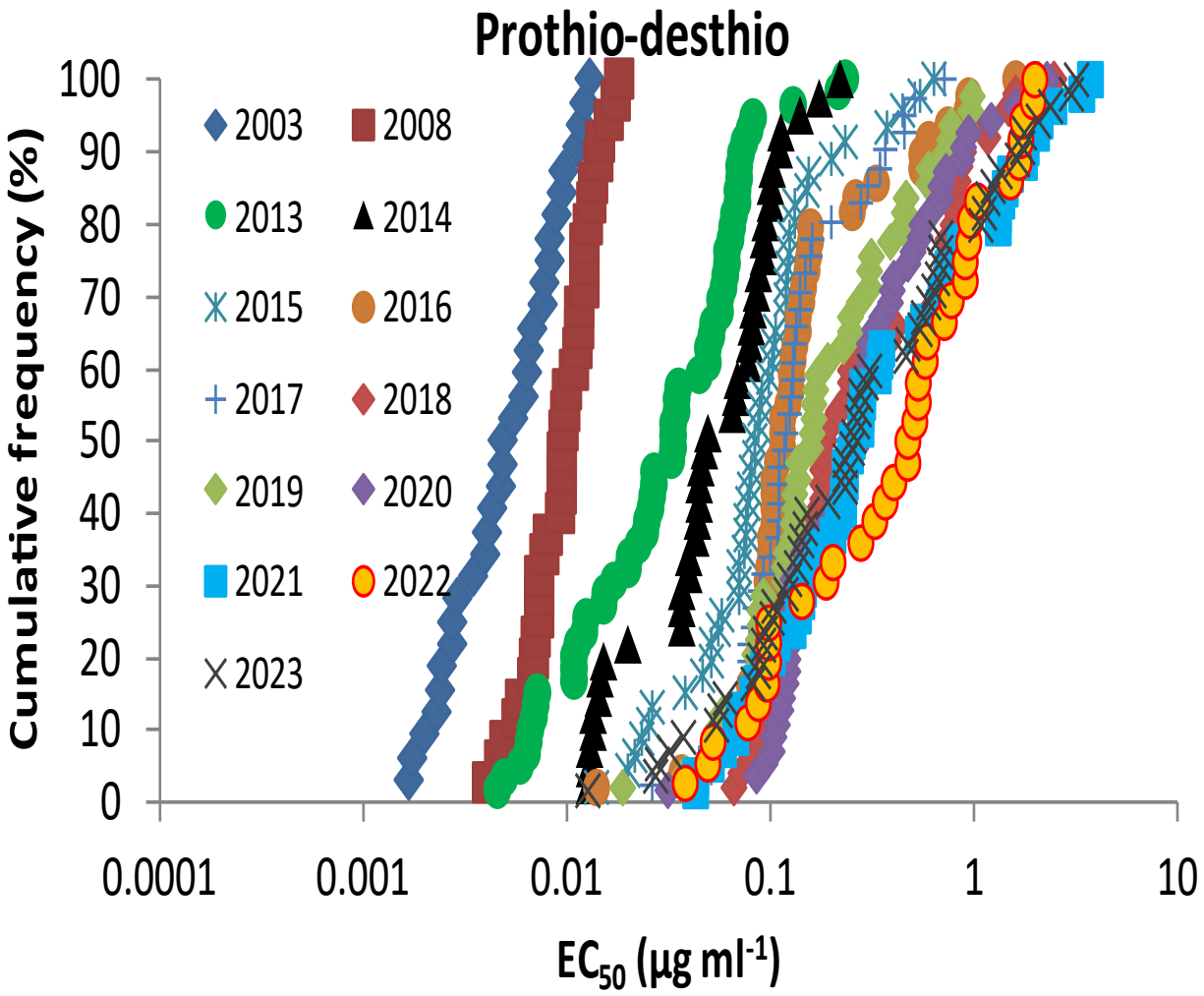


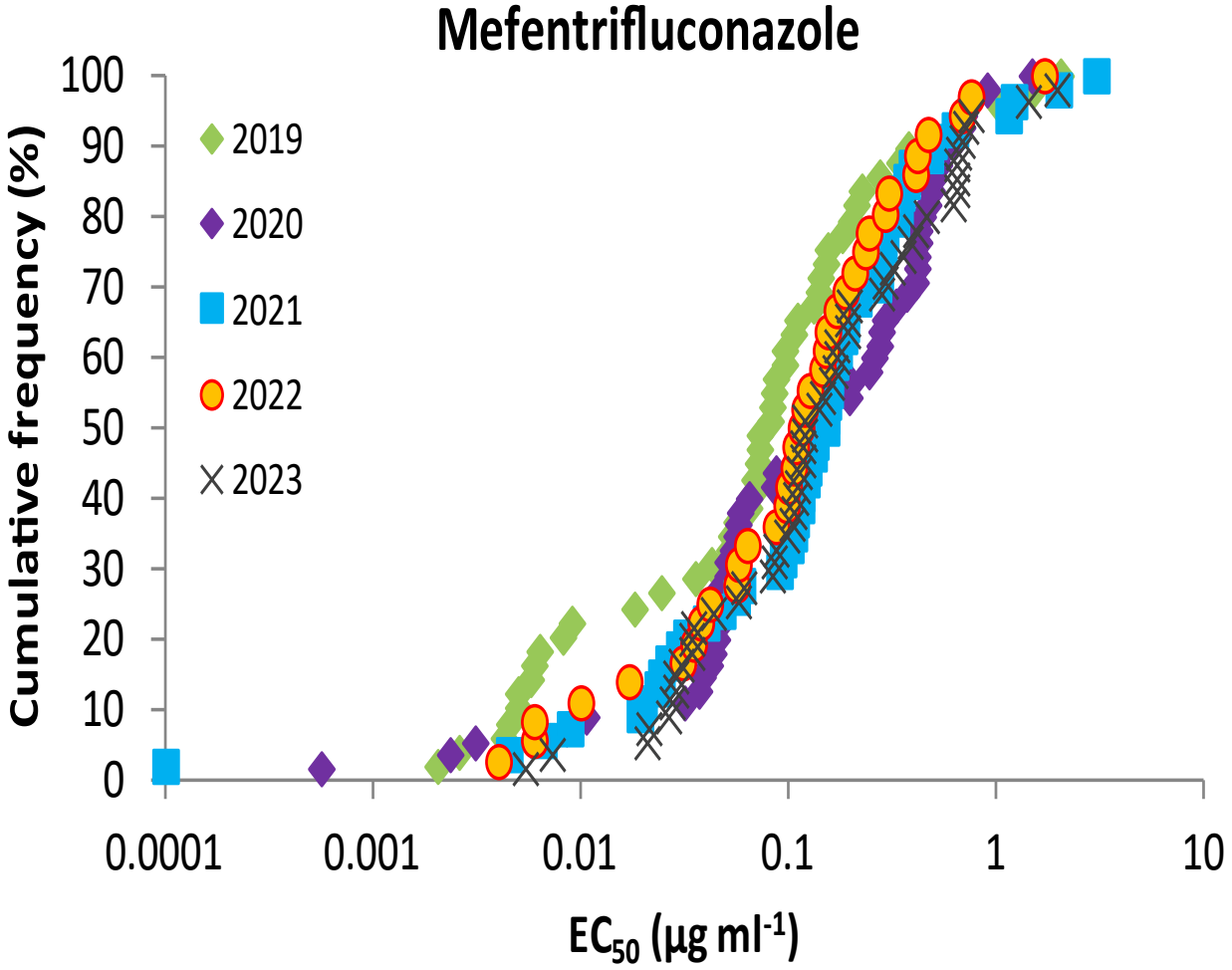


Changes in septoria protectant activity of Azoles (full label rates)

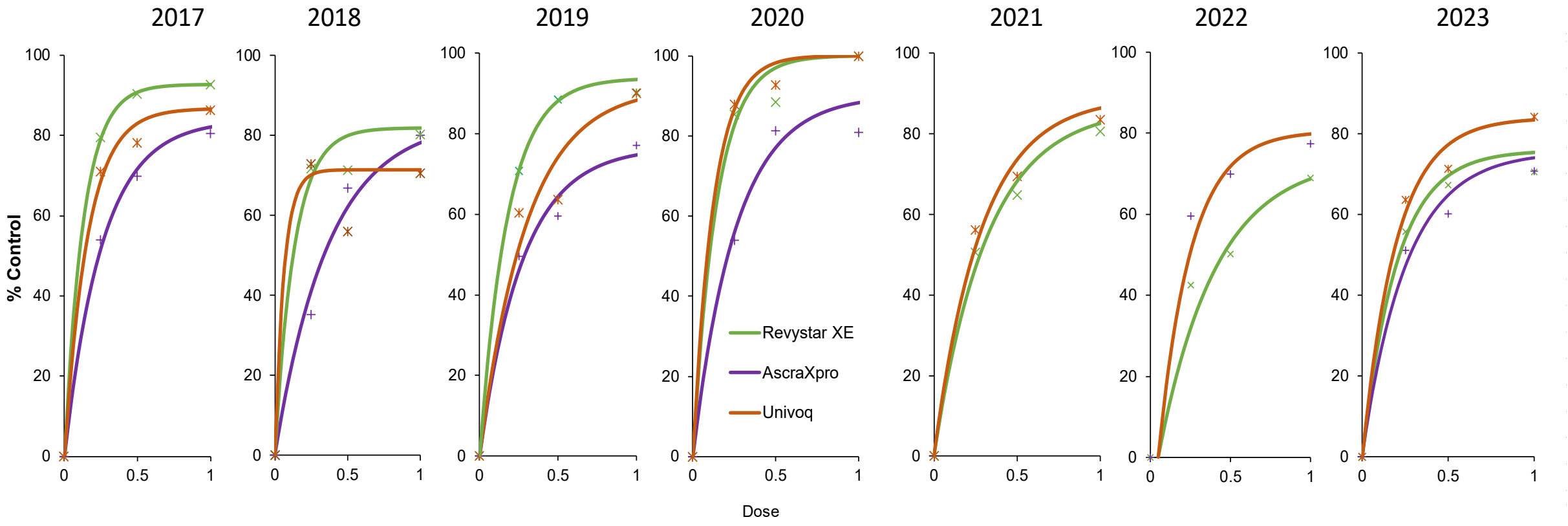


Septoria sensitivity to azole fungicides overyear (Rothamsted, early season)

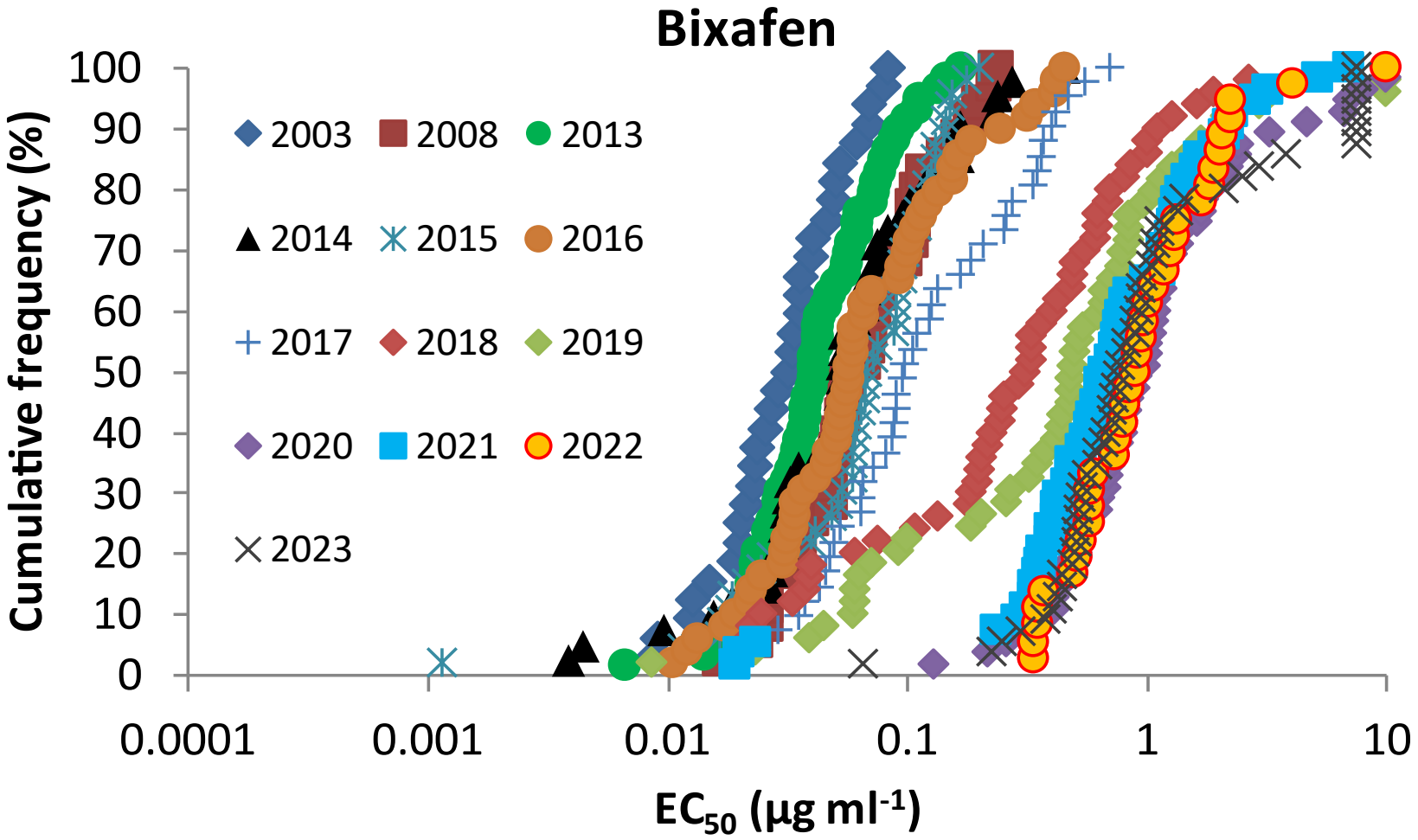




Changes in septoria protectant activity of mixture products



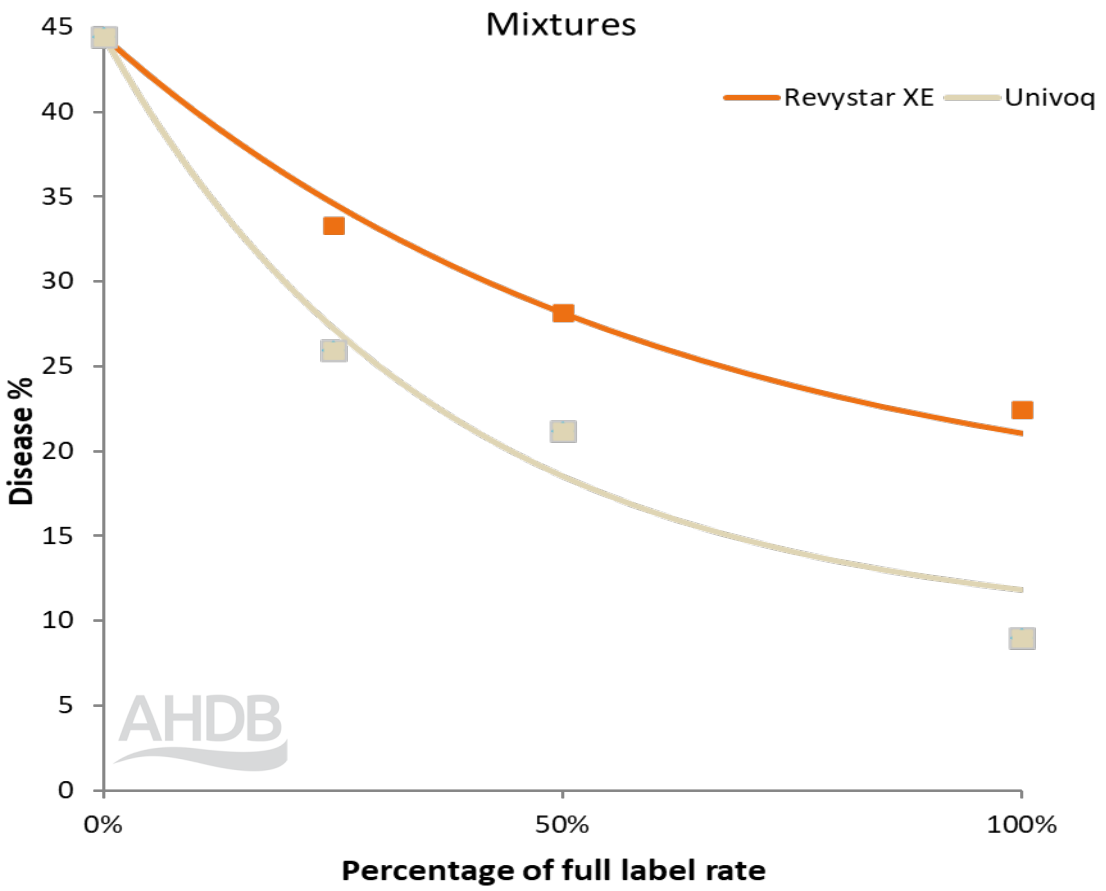
Septoria sensitivity to SDHI fungicide (bixafen) overyear (Rothamsted, early season)

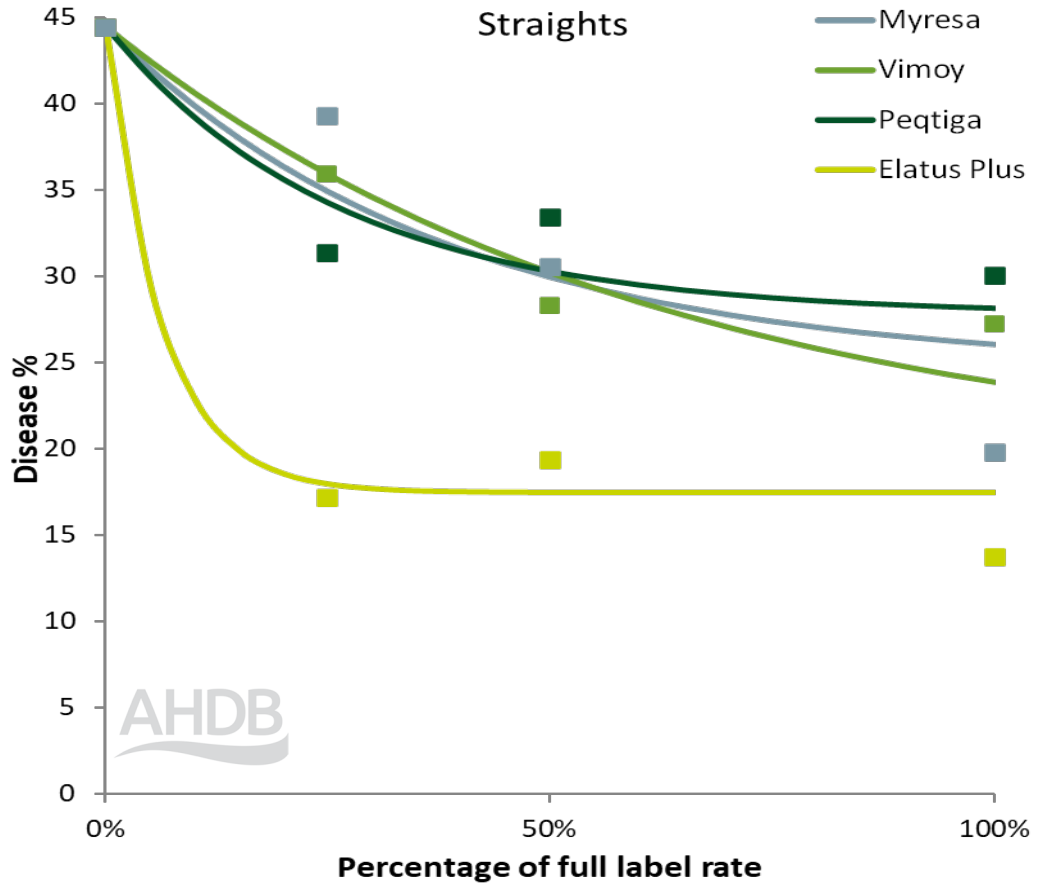


Rust trial data in 2023

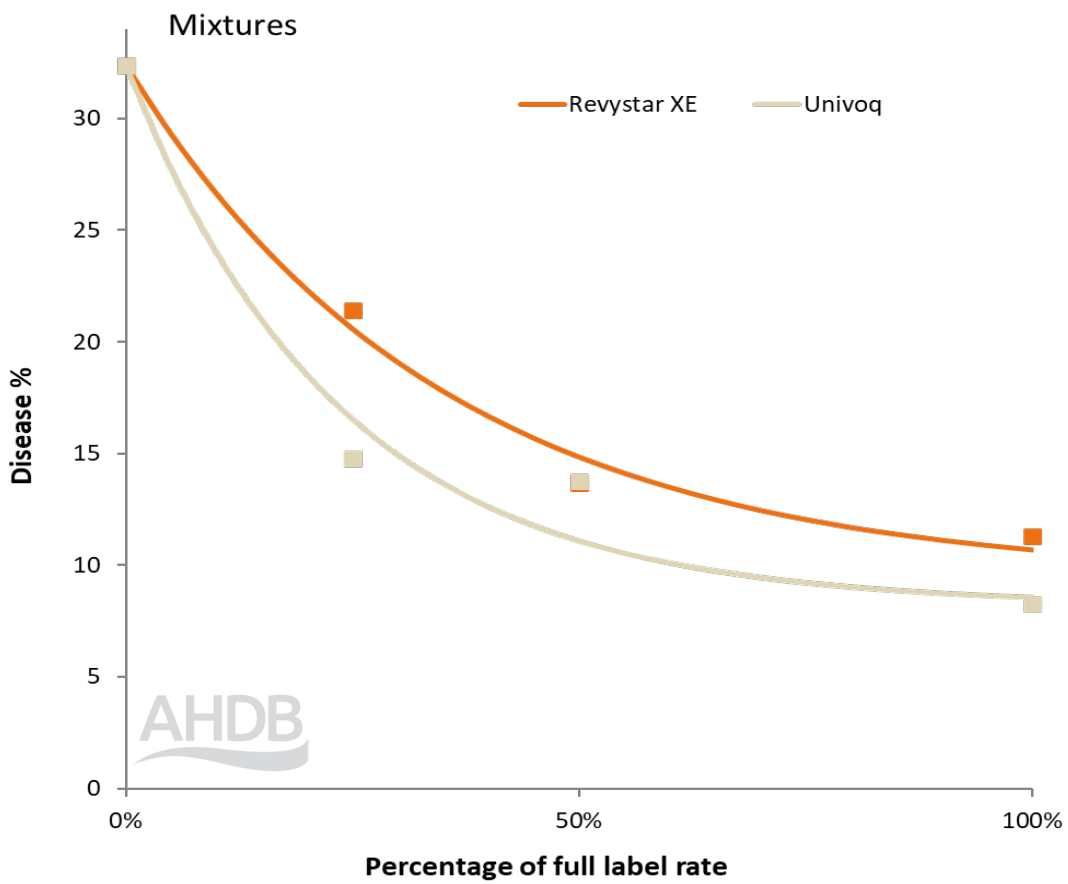
Site	Yellow rust	Brown rust	Yield
Terrington	x		x
Cambridge		x	x

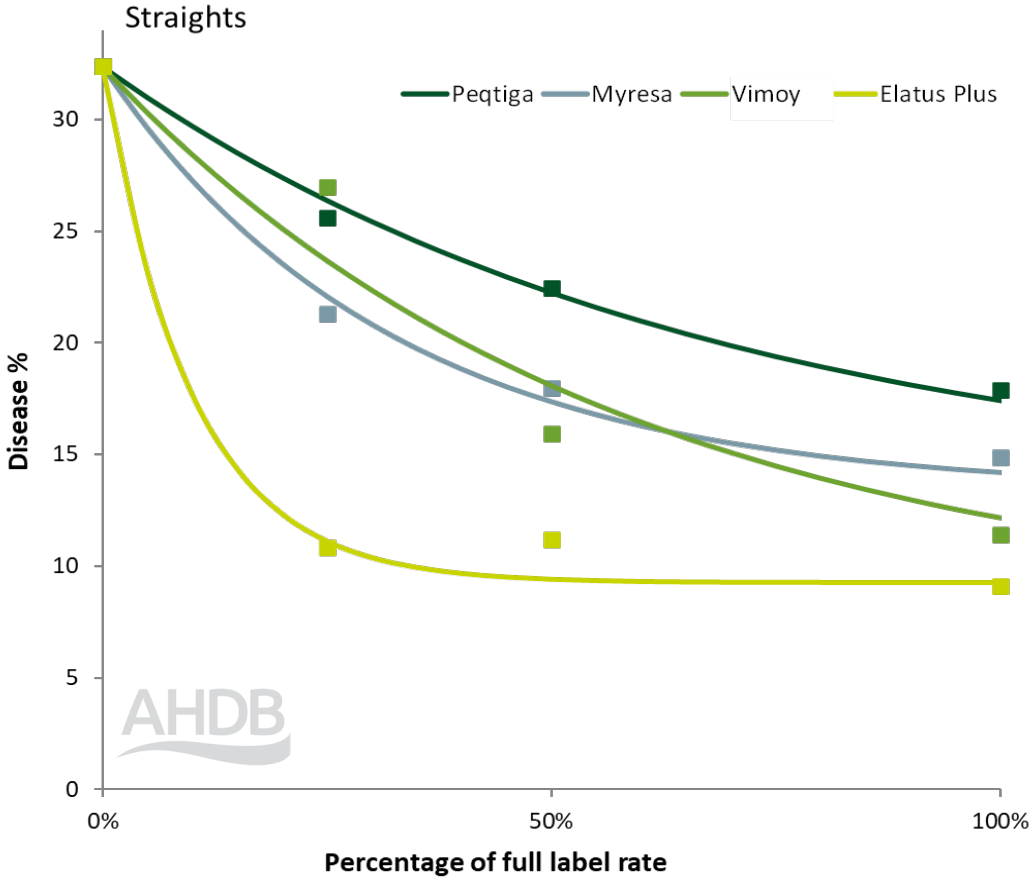
Yellow rust 2023 (1 trial)



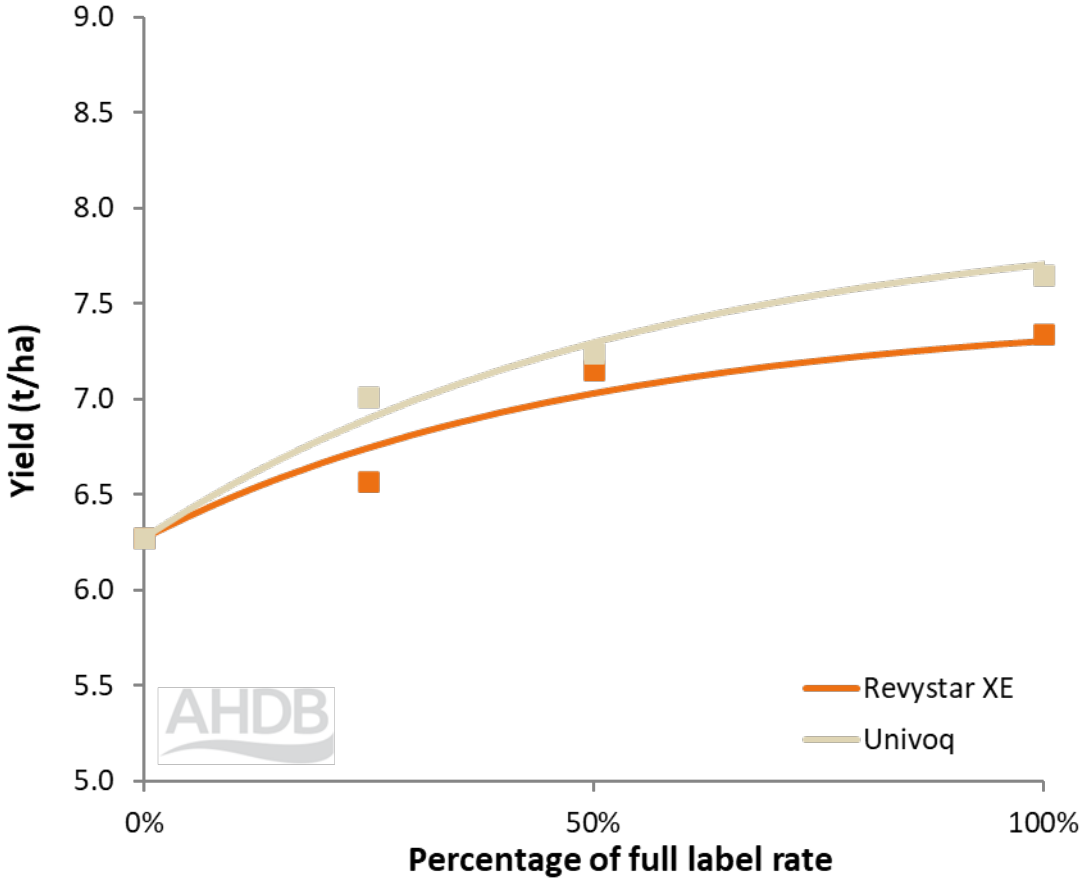


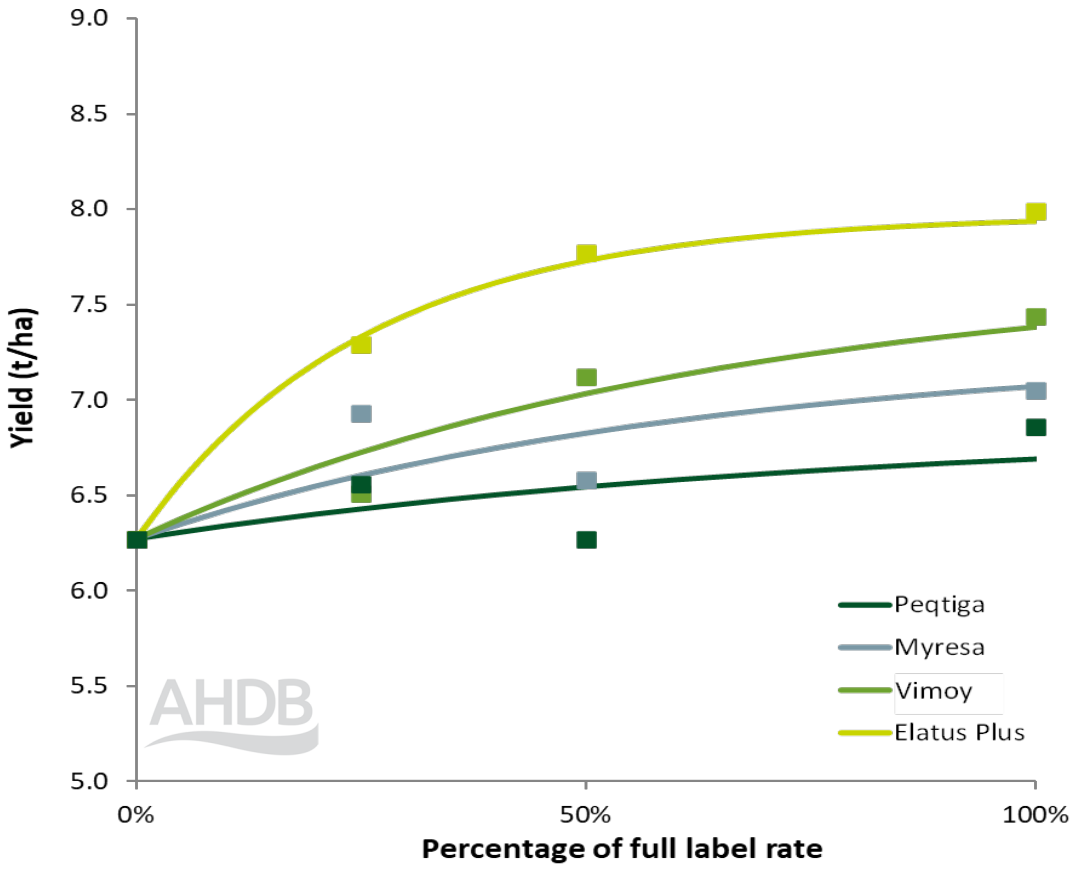
Yellow rust overyear 2021-23 (3 trials)



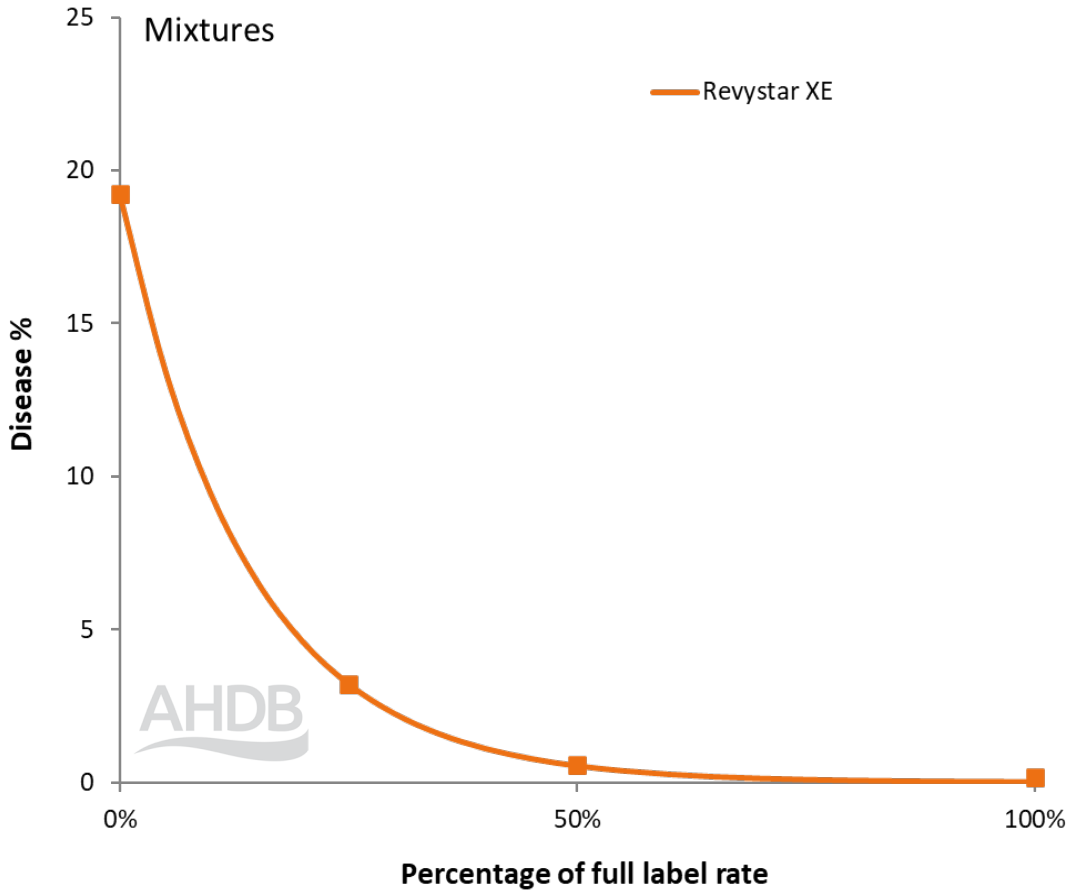


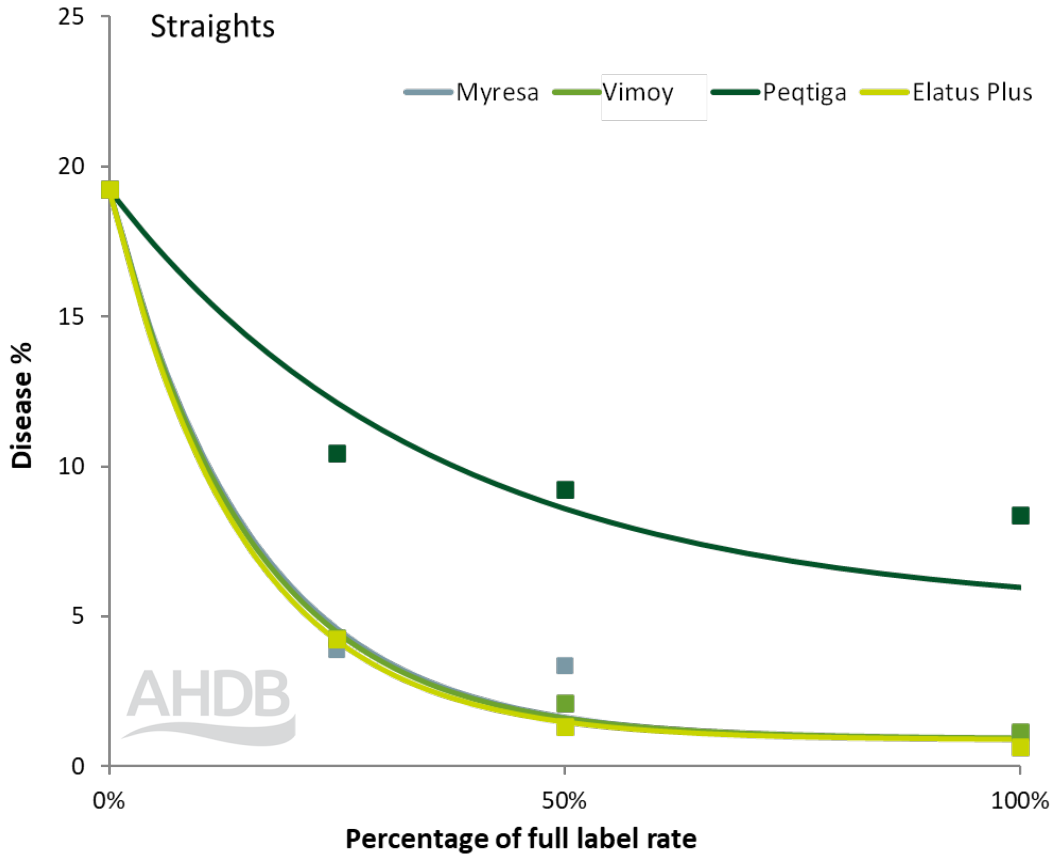
Yellow rust yield overyear 2021-23 (3 trials)



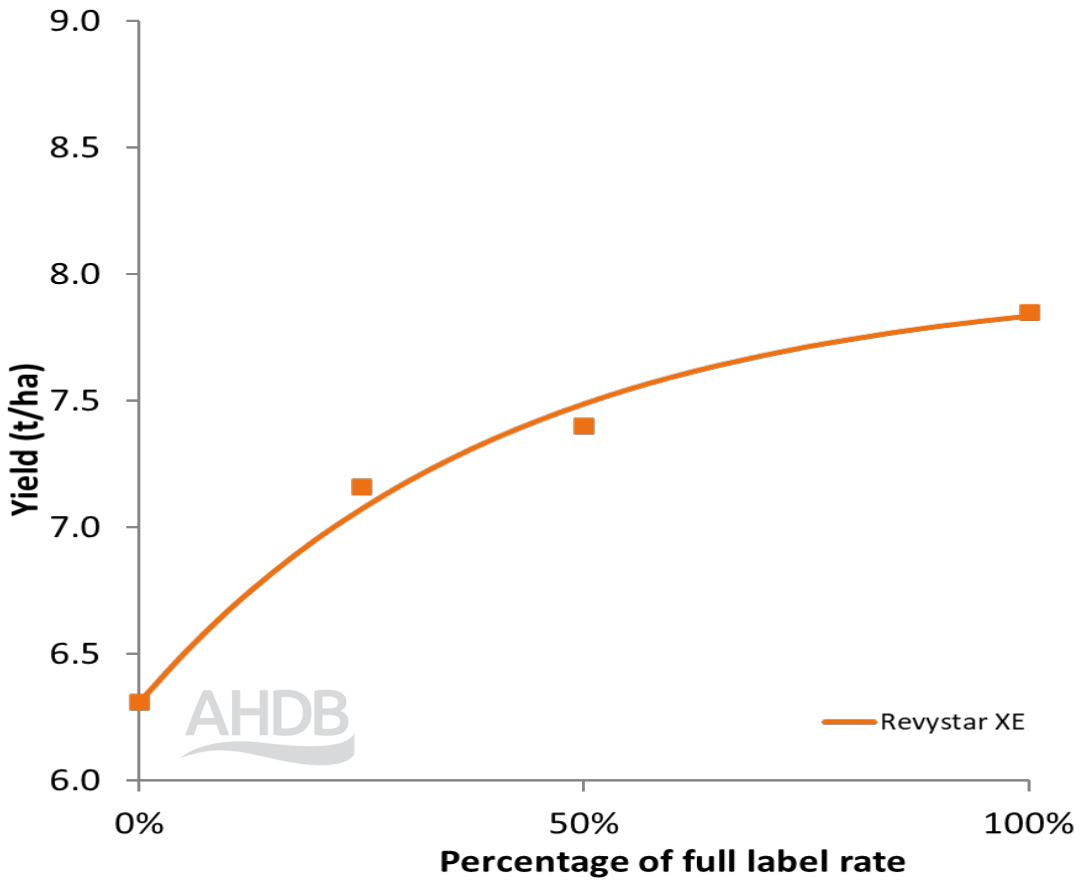


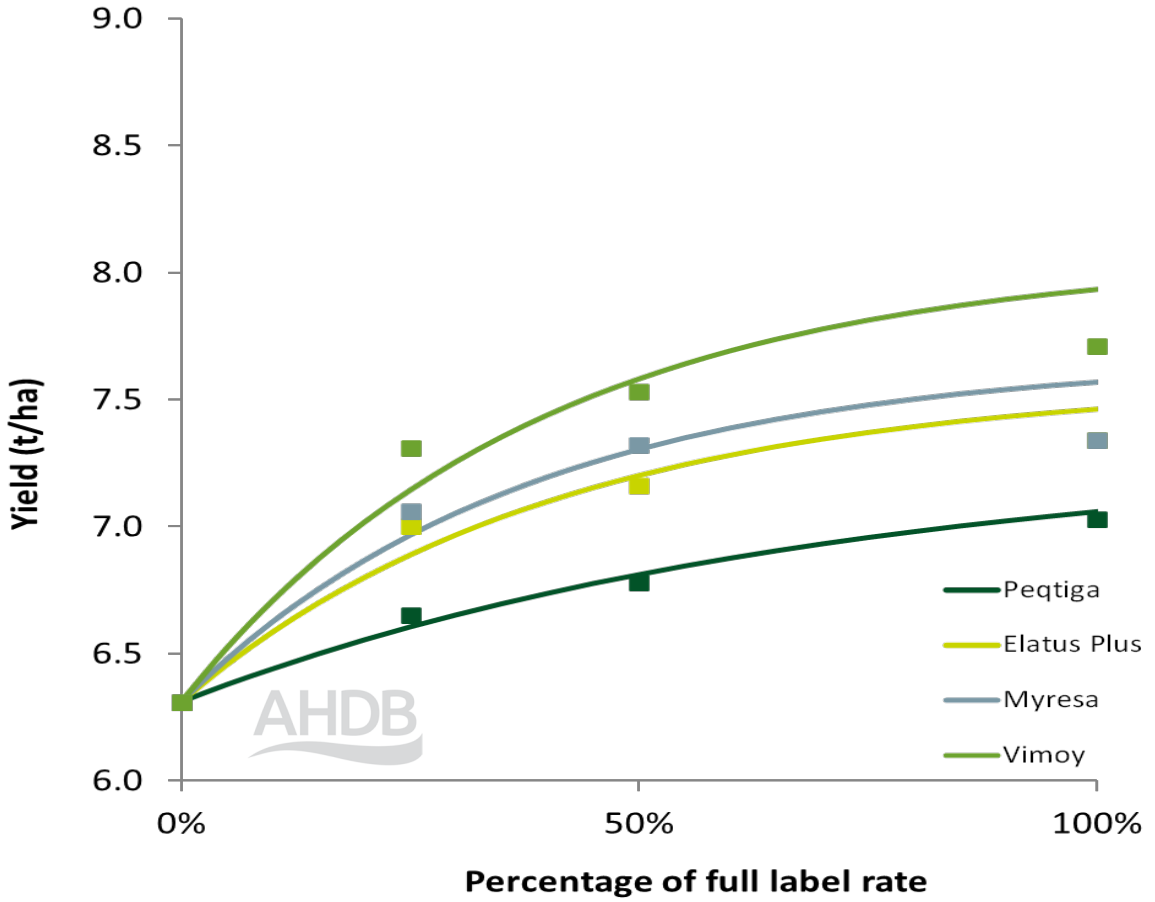
Brown rust overyear 2021-23 (3 trials)



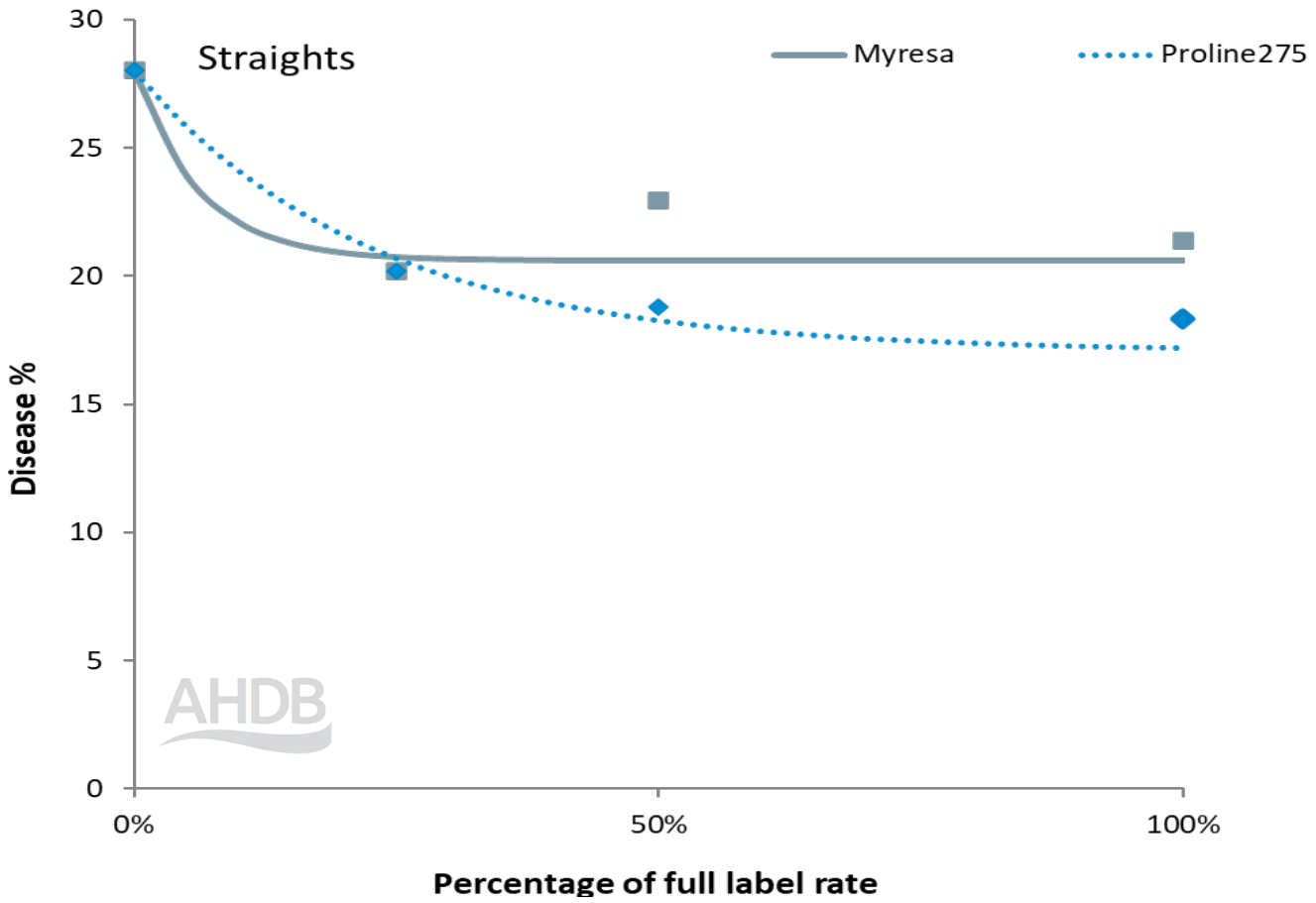


Brown rust yield overyear 2021-23 (3 trials)





Fusarium overyear 2021-23 (3 trials)



No new data on mycotoxin (DON) levels in 2023

Wheat summary

- Of the approved actives tested, fenpicoxamid (Peqtiga) has given 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 Plus) and mixtures (Univoq, Revystar XE) are most effective
- Isoflucypram and mefentrifluconazole are both highly active against brown rust
- No major shifts in fungicide sensitivity seen in pathogen populations in 2023
- In programmes, use a combination of septoria-active fungicide groups to reduce the risk of resistance development

Fungicide performance update for barley (2023)

Barley trial sites in 2023

	Site	Spray timing	Target disease	Diseases present	Variety
1	Lanark	T1	Rhynchosporium	Rhynchosporium, Ramularia	LG Mountain
3	Cardigan	T1	Rhynchosporium	Net blotch, Rhynchosporium, Brown rust	Bordeaux
4	High Mowthorpe	T2	Net blotch	Mildew, Net blotch, Rhynchosporium	LG Dazzle
5	Newton Abbot	T2	Net blotch	Septoria nodorum, Net blotch, Rhynchosporium	LG Dazzle
6	Midlothian	T2	Ramularia	Ramularia	Laureate
7	Carlow	T1.5	Rhynchosporium	Rhynchosporium	KWS Cassia
8	Carlow	T2	Ramularia	Ramularia	Pixel

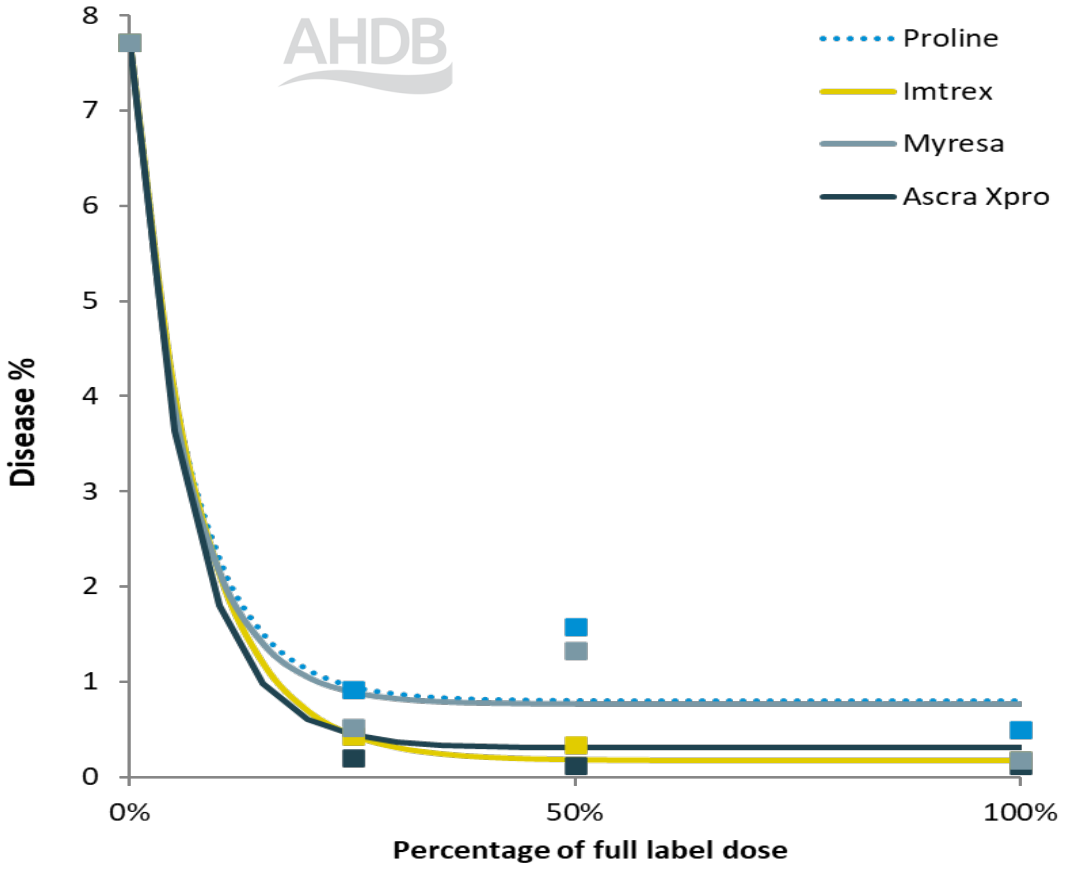
Barley – registered products

Product	Active(s)	Mode of Action
Proline 275	prothioconazole	DMI (azole)
Myresa	mefentrifluconazole (revysol)	DMI (azole)
Comet 200	pyraclostrobin	QoI (strobilurin)
Imtrex	fluxapyroxad	SDHI
Ascra Xpro	bixafen + fluopyram + prothioconazole	SDHI + SDHI + DMI (azole)
Revystar XE	fluxapyroxad + mefentrifluconazole	SDHI + DMI (azole)

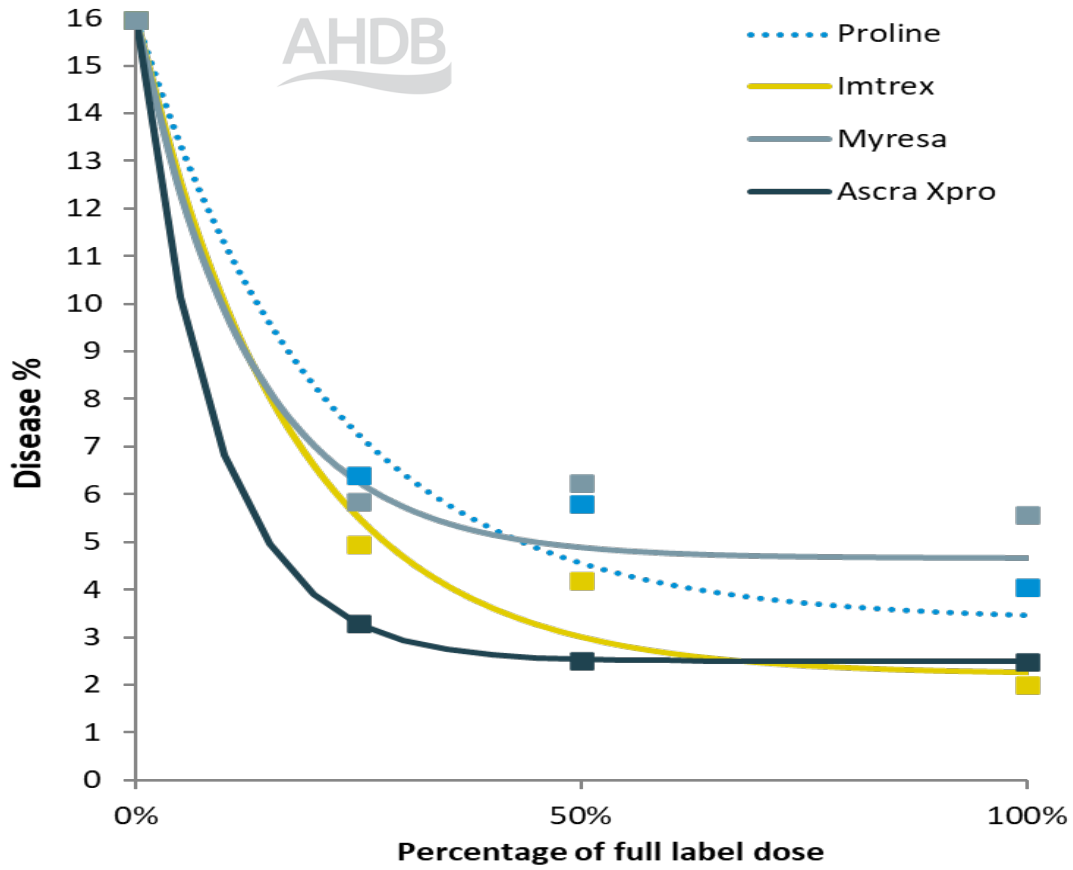
A further six unregistered products were tested in 2023.
Data on these will be released upon registration.

Check labels prior to use: Comet, Imtrex and Myresa should be used in mixtures with at least one fungicide with an alternative mode of action that has efficacy against the target disease.

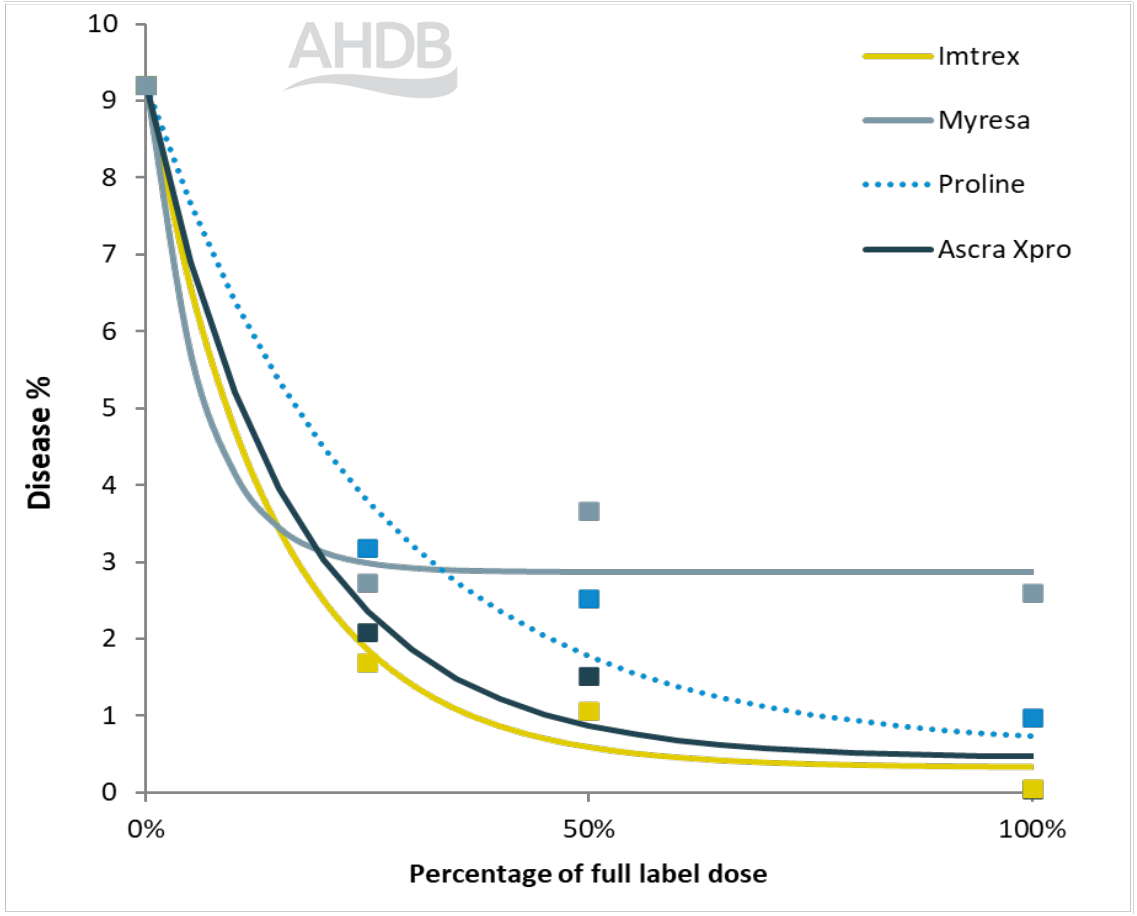
Rhynchosporium protectant 2023 (1 trial)



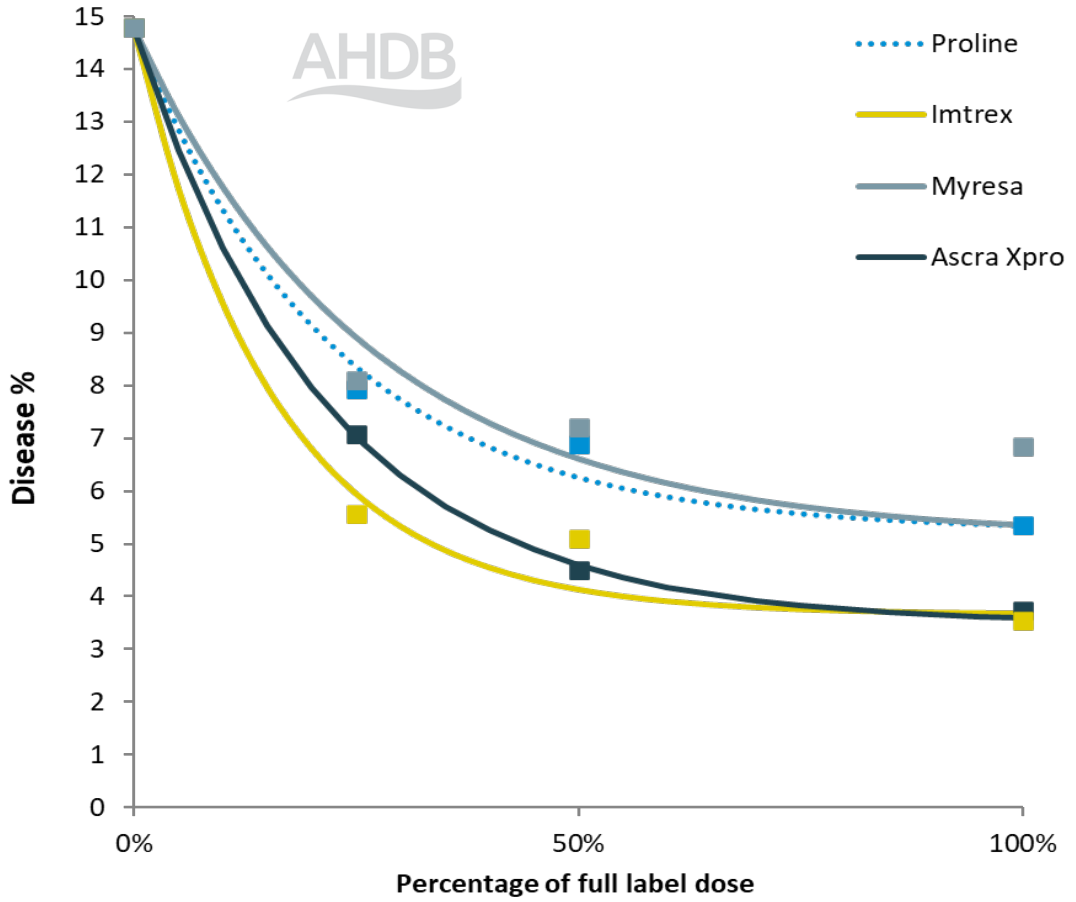
Rhynchosporium eradicant 2023 (2 trials)



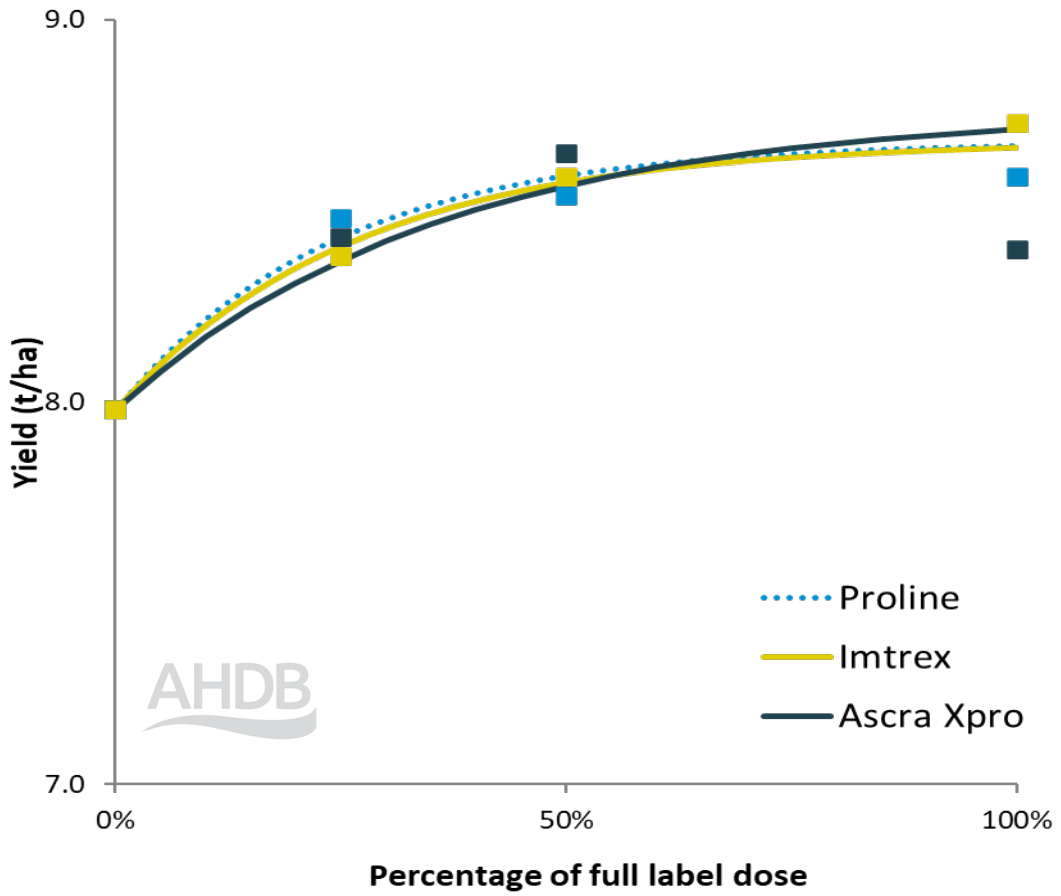
Rhynchosporium protectant overyear 2021-23 (5 trials)



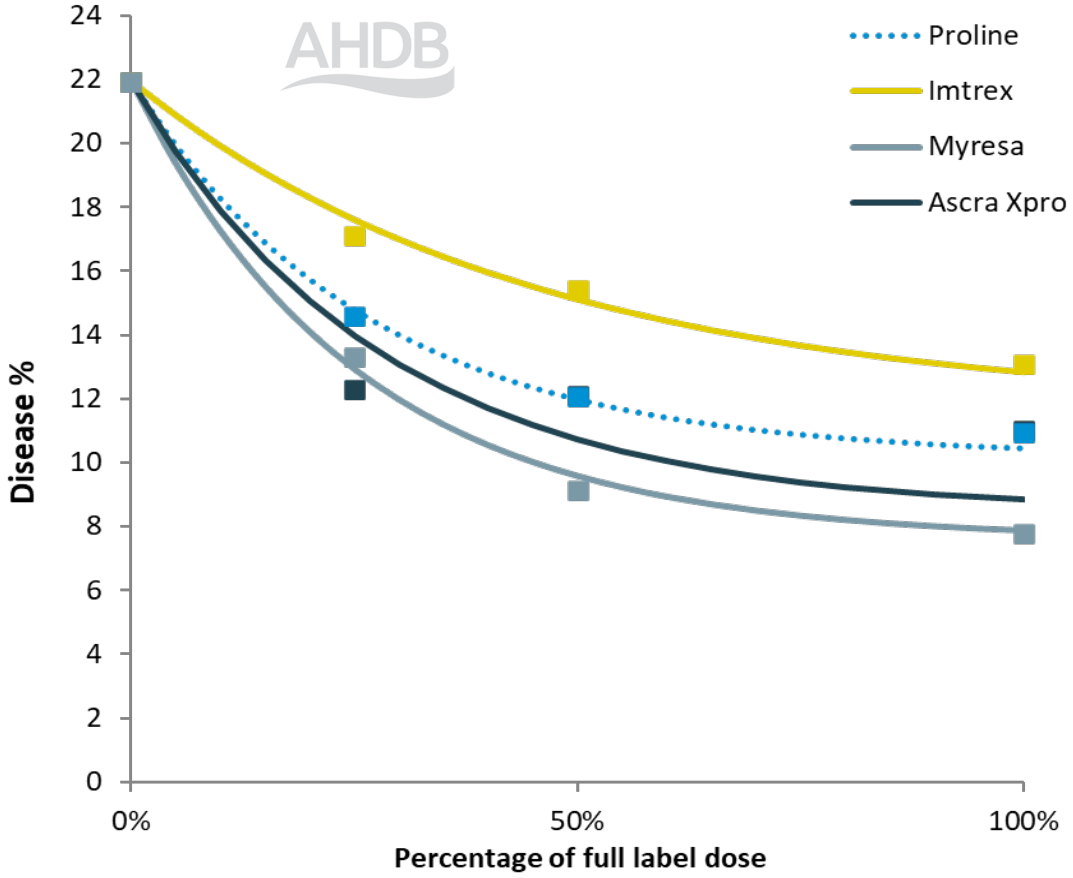
Rhynchosporium eradicant overyear 2021-23 (6 trials)



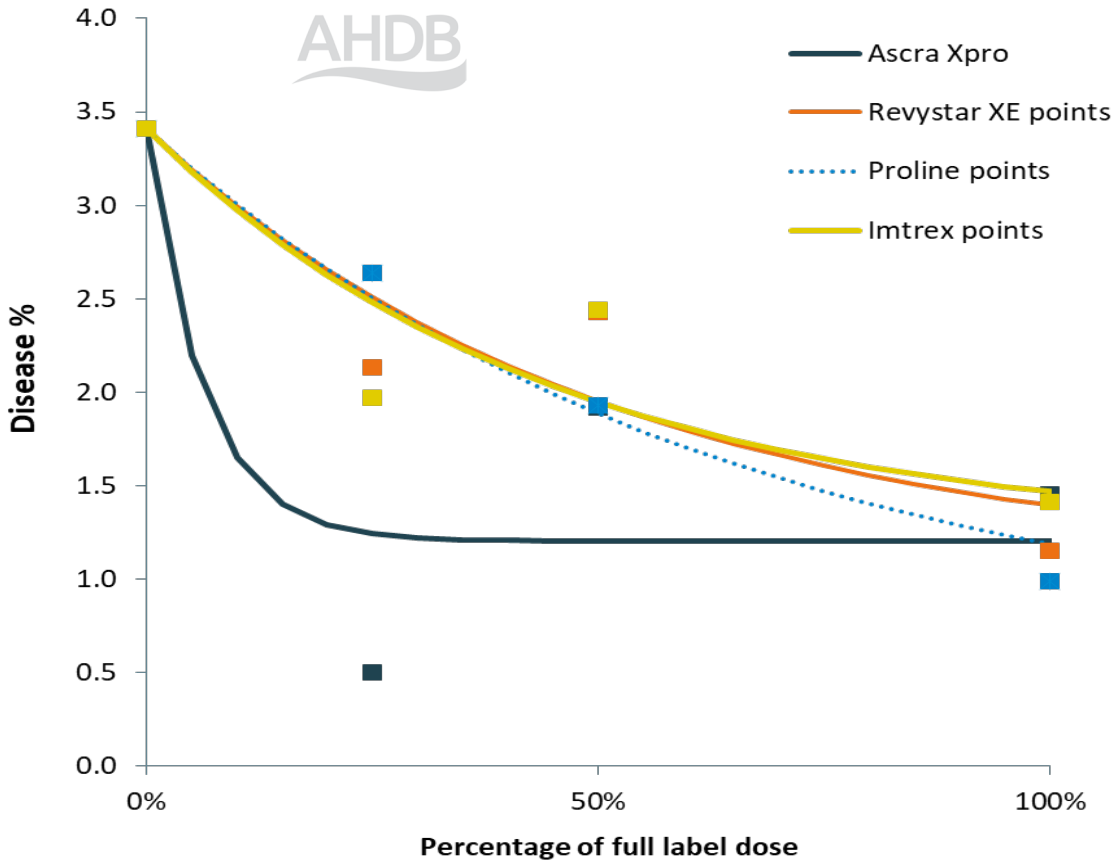
Rhynchosporium yield overyear 2021-22 (5 trials)



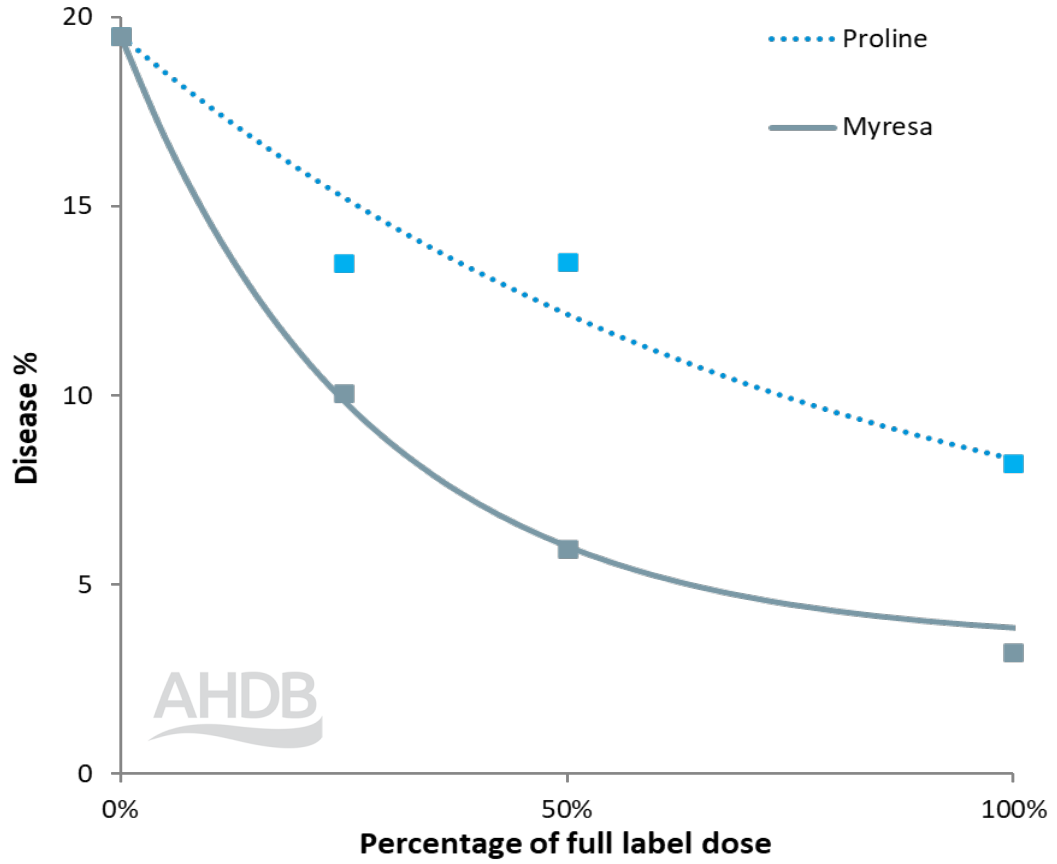
Net blotch protectant overyear 2022-23 (2 trials)



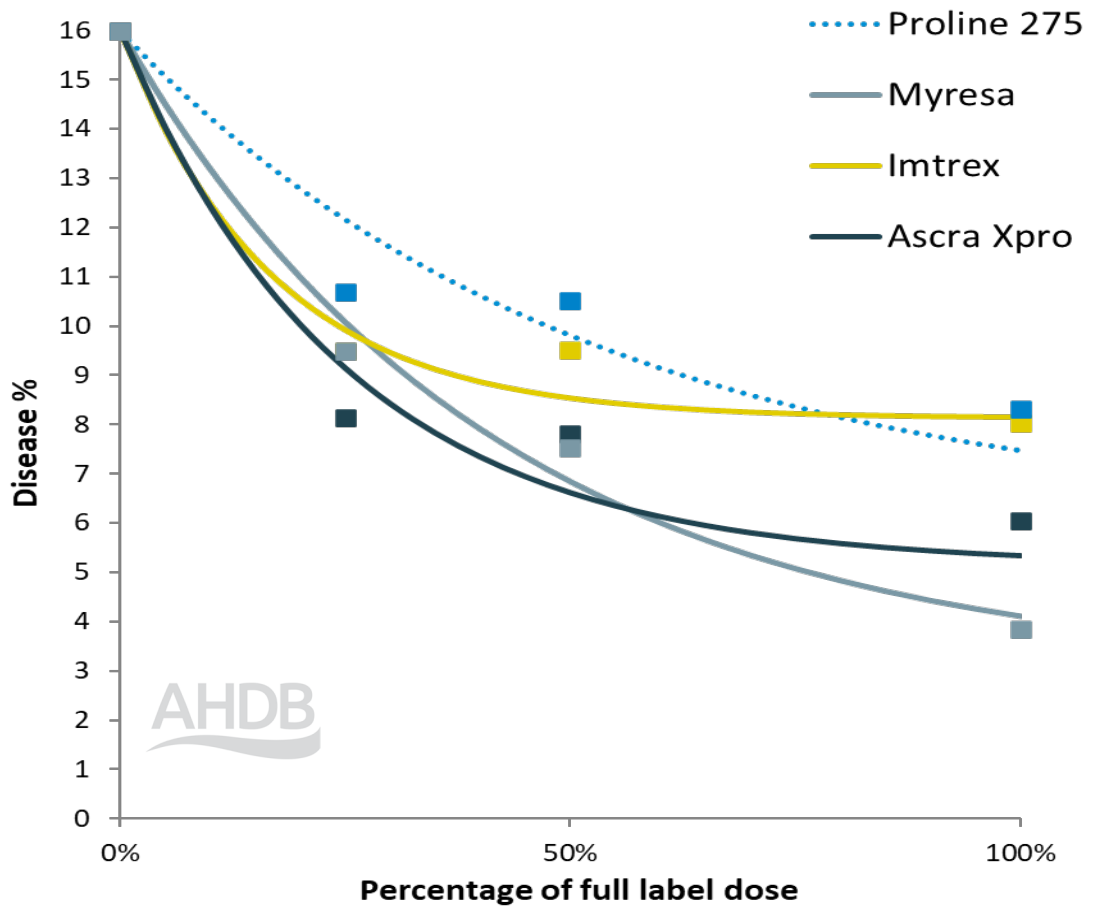
Net blotch eradicant overyear 2020-22 (3 trials)



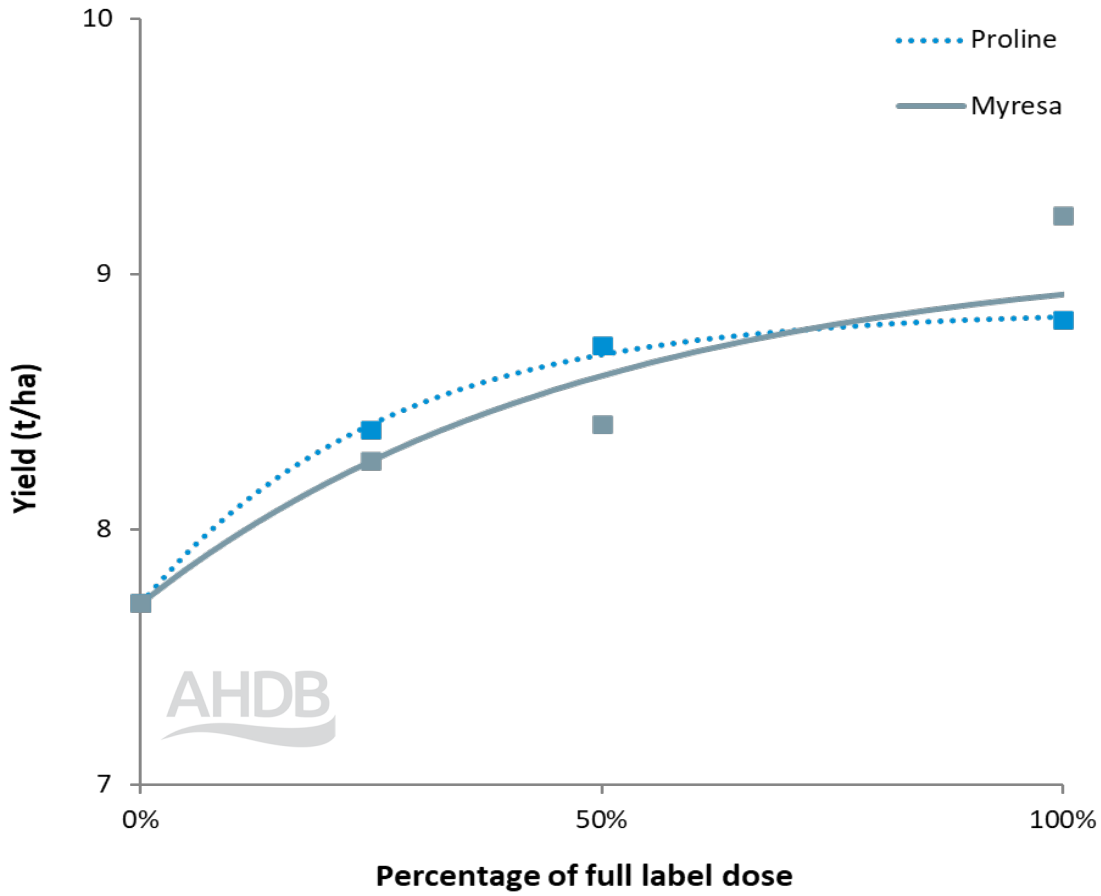
Ramularia protectant 2023 (2 trials)



Ramularia protectant overyear 2021-23 (10 trials)



Ramularia yield overyear 2021-23 (3 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
- Mefentrifluconazole is giving good protectant control of ramularia, with useful activity from prothioconazole and SDHIs (fluxapyroxad, and in Ascra Xpro)
- Prothioconazole continues to be effective against mildew
- Mixture products give the broadest spectrum and most robust control

Fungicide performance update for oilseed rape (2023)

Fungicide performance in oilseed rape

Trial site	Target disease	Data Used
Terrington	Phoma stem canker	Canker index Yield
Rosemaund	Phoma stem canker	Canker index Yield
High Mowthorpe	Light leaf spot	LLS (leaf severity) Yield
Midlothian	Light leaf spot	None

Oilseed rape products

Product	Active(s)	Mode of action
Proline 275	prothioconazole	DMI
Priori Gold*	azoxystrobin + difenoconazole	QoI + DMI
Aviator 235 Xpro	bixafen + prothioconazole	SDHI + DMI
Plover	difenoconazole	DMI
Toledo	tebuconazole	DMI
Propulse	prothioconazole + fluopyram	SDHI + DMI

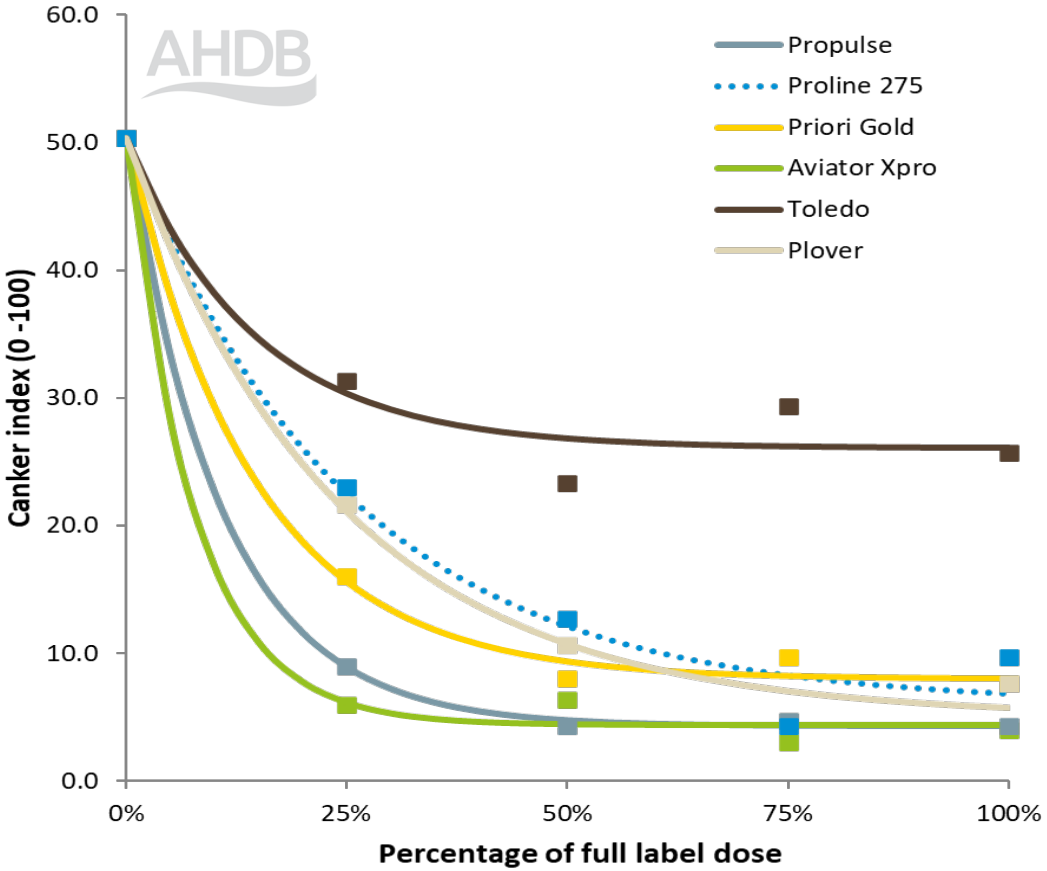
A further two unregistered products were tested in 2023. Data on these will be released upon registration.

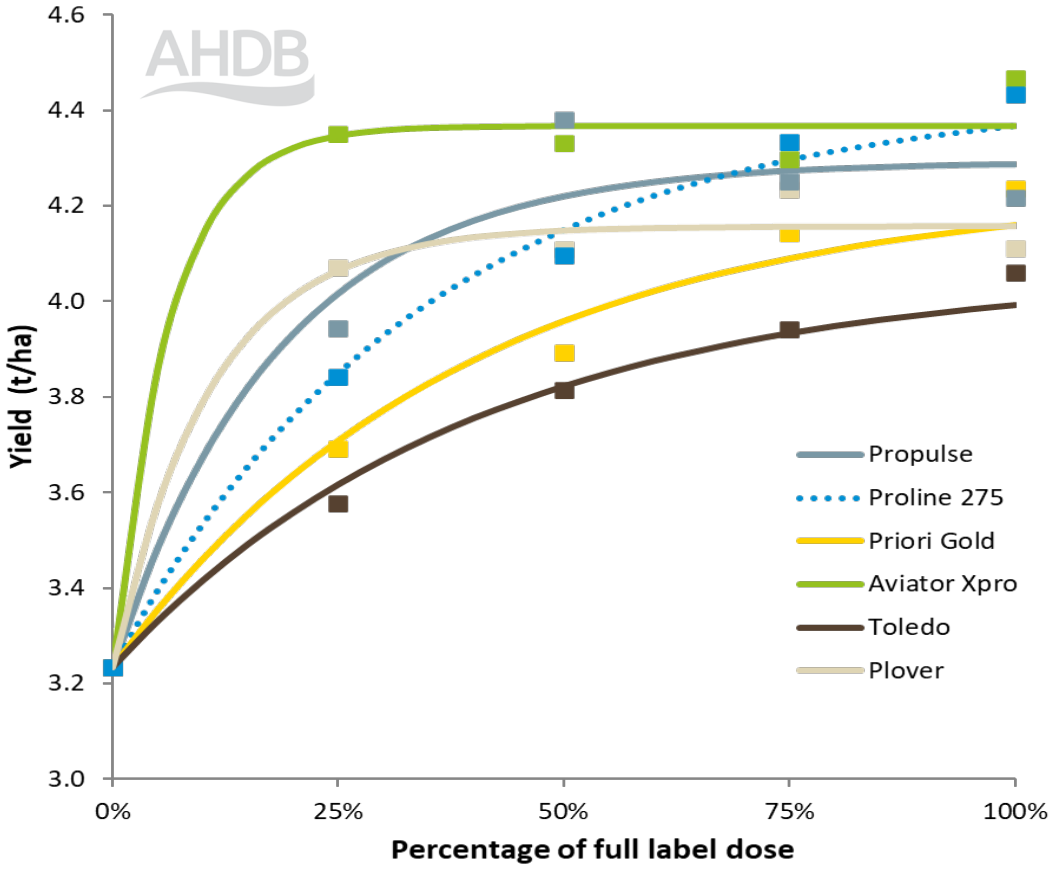
*Products do not have a label recommendation for light leaf spot control but may be applied at the appropriate time, for the control of other diseases.

Terrington

- Location: Norfolk
- Target: Phoma
- Variety: Flamingo
- T1 spray: 25/11/22
- T2 spray: 05/01/23
- Data used
  - Canker index
  - Yield

Phoma stem canker and yield (Terrington, 2023)

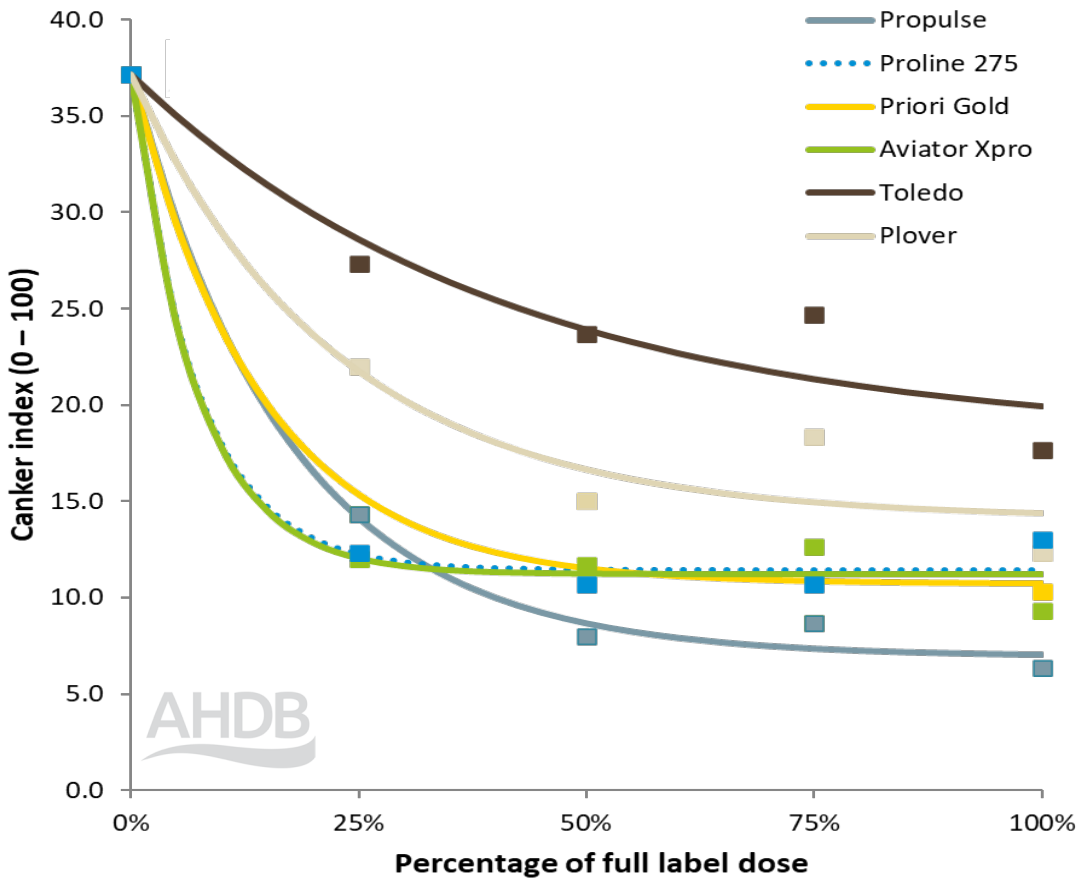


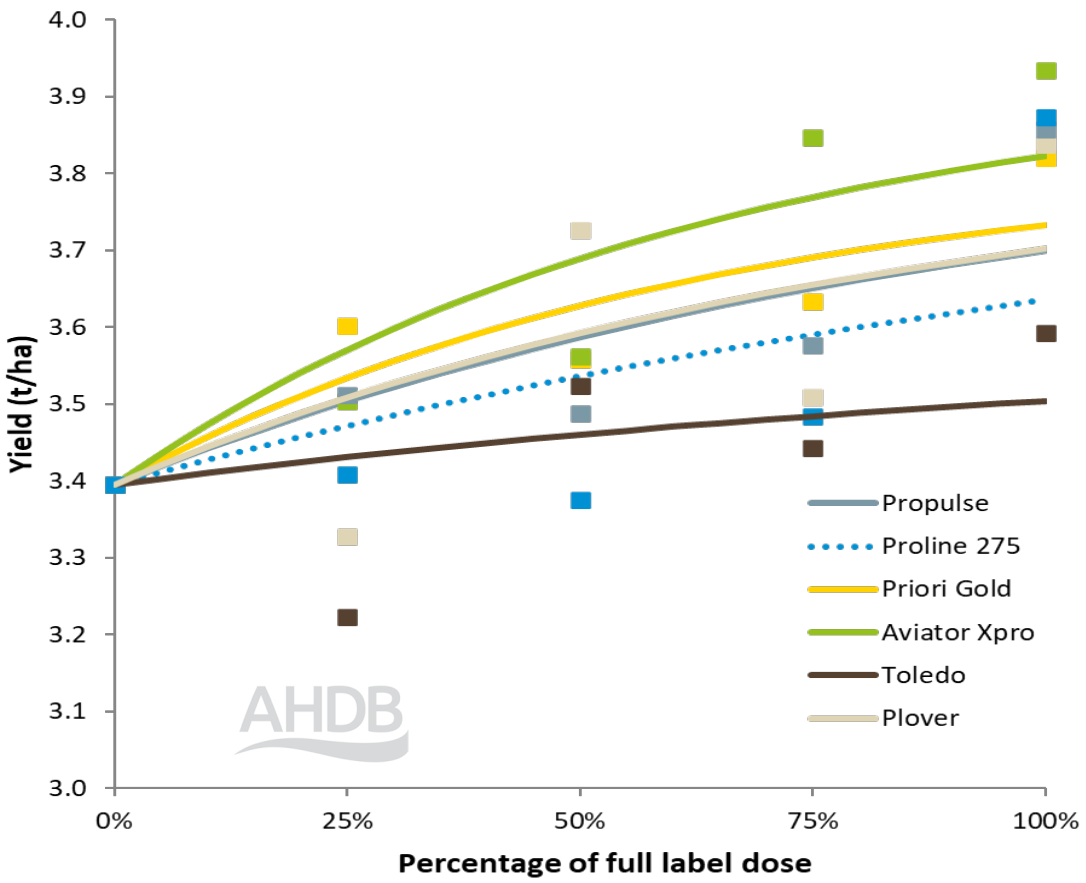


Rosemaund

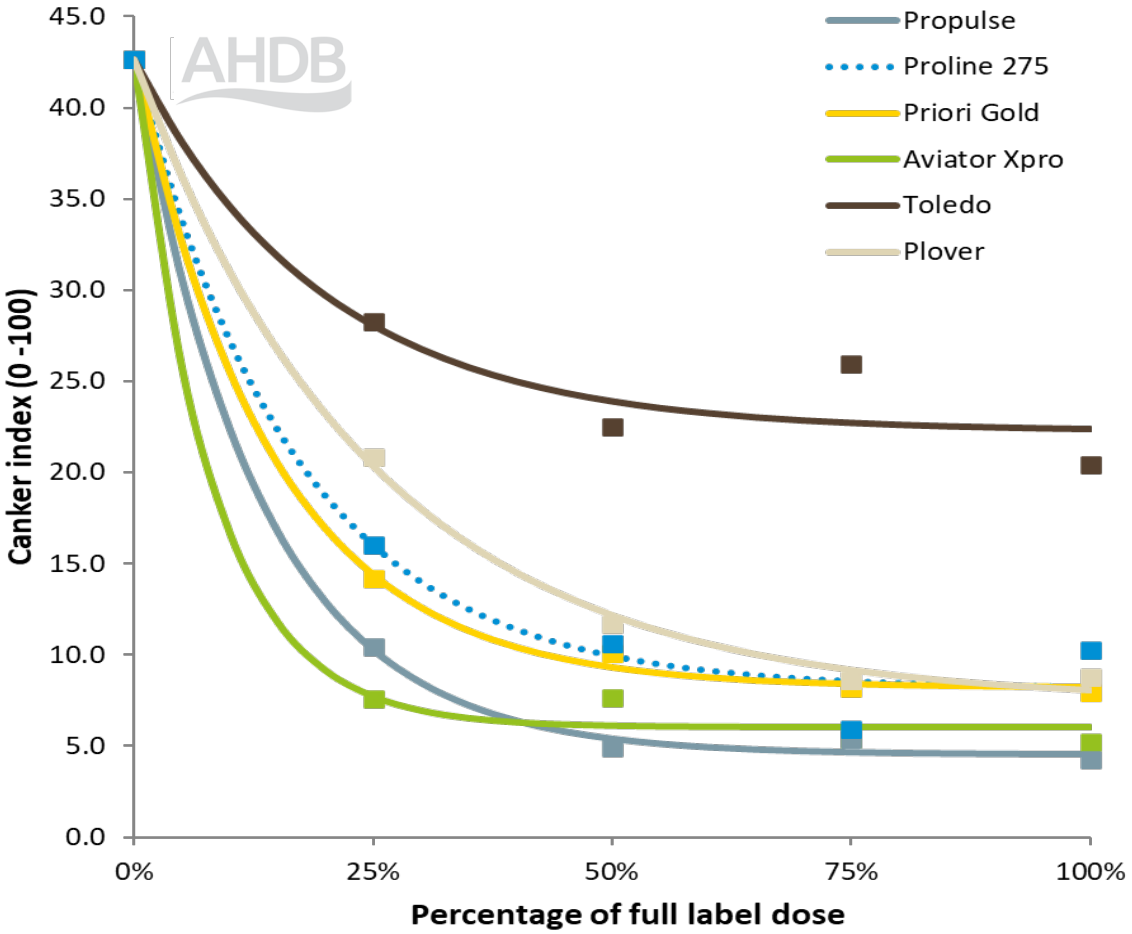
- Location: Herefordshire
- Target: Phoma
- Variety: Acacia
- T1 spray: 18/11/22
- T2 spray: 06/01/23
- Data used
  - Canker index
  - Yield

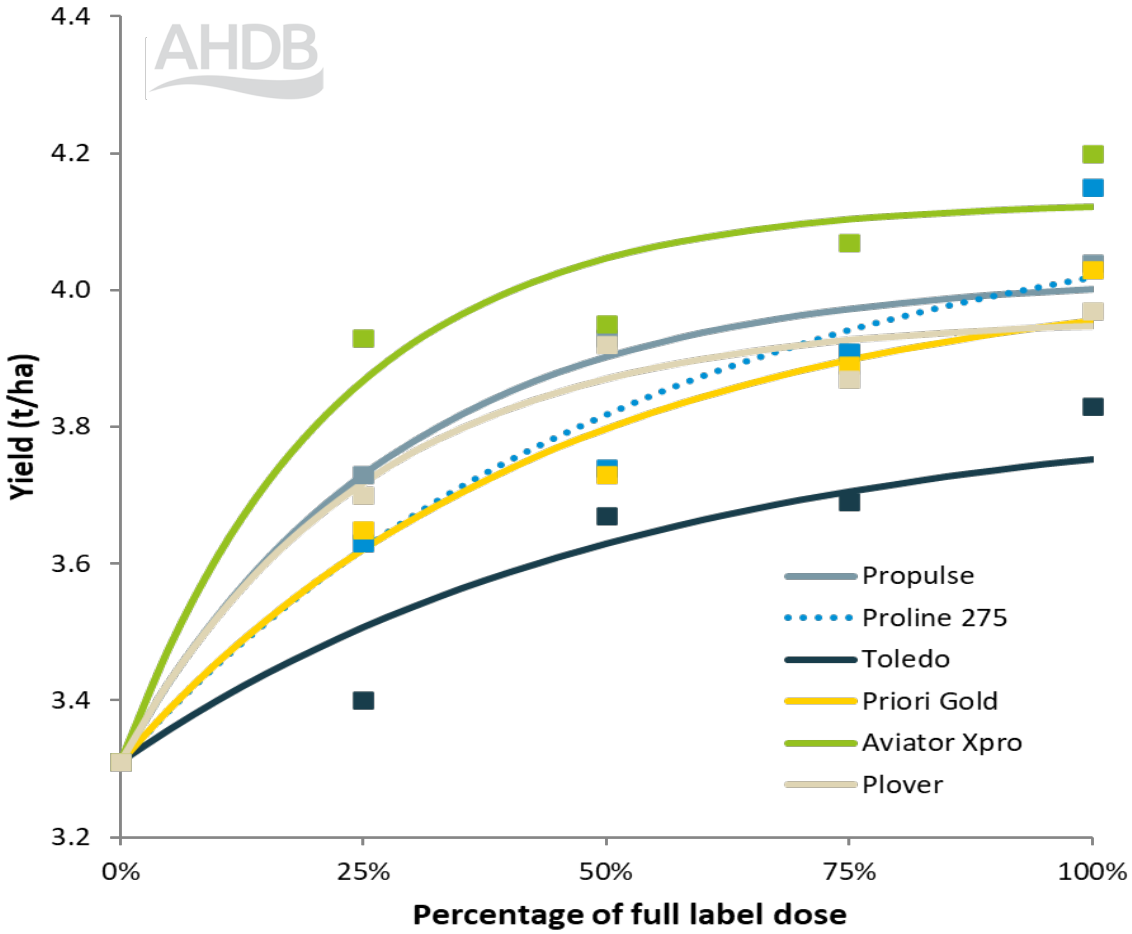
Phoma stem canker and yield (Rosemaund, 2023)





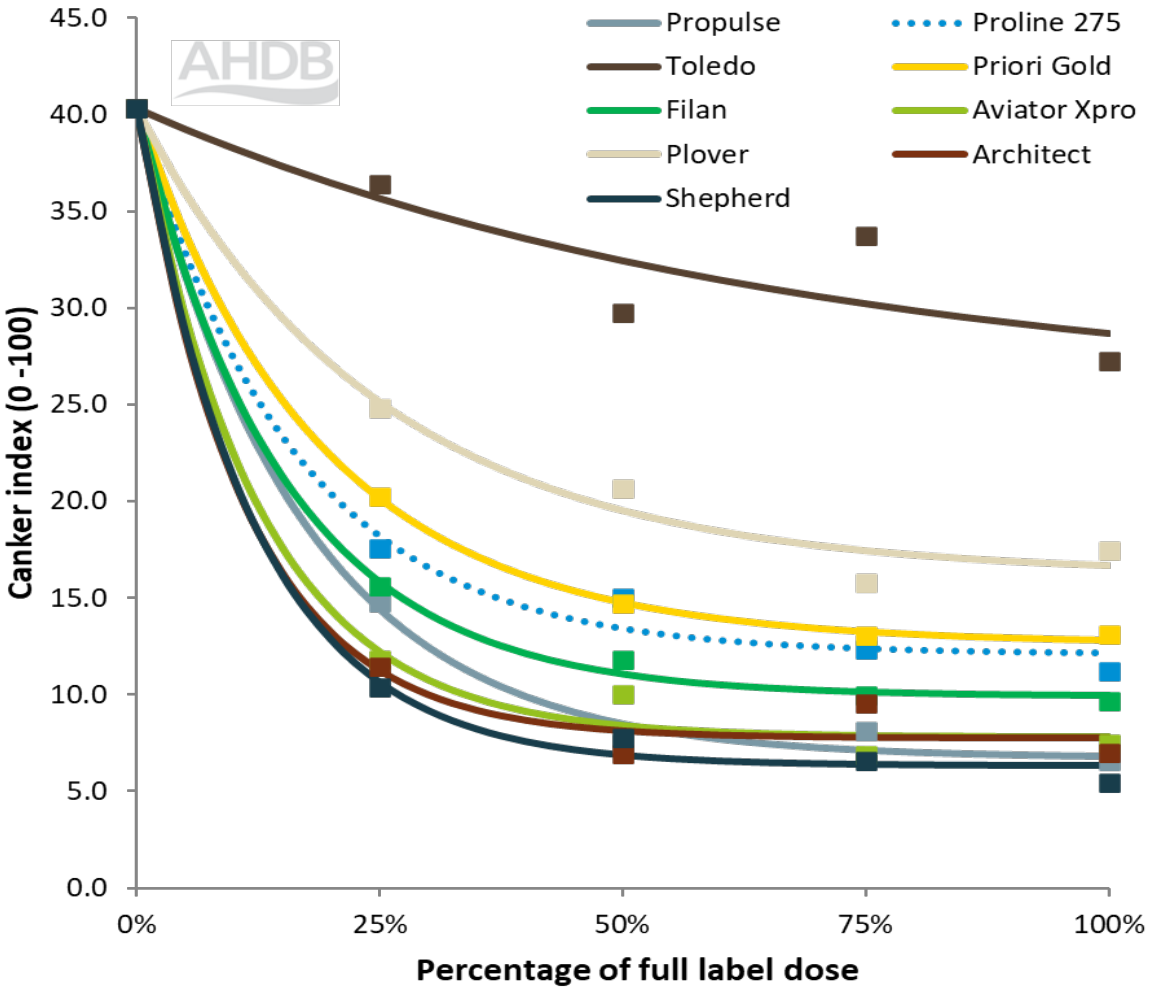
Phoma stem canker and yield (Terrington and Rosemaund, 2023)

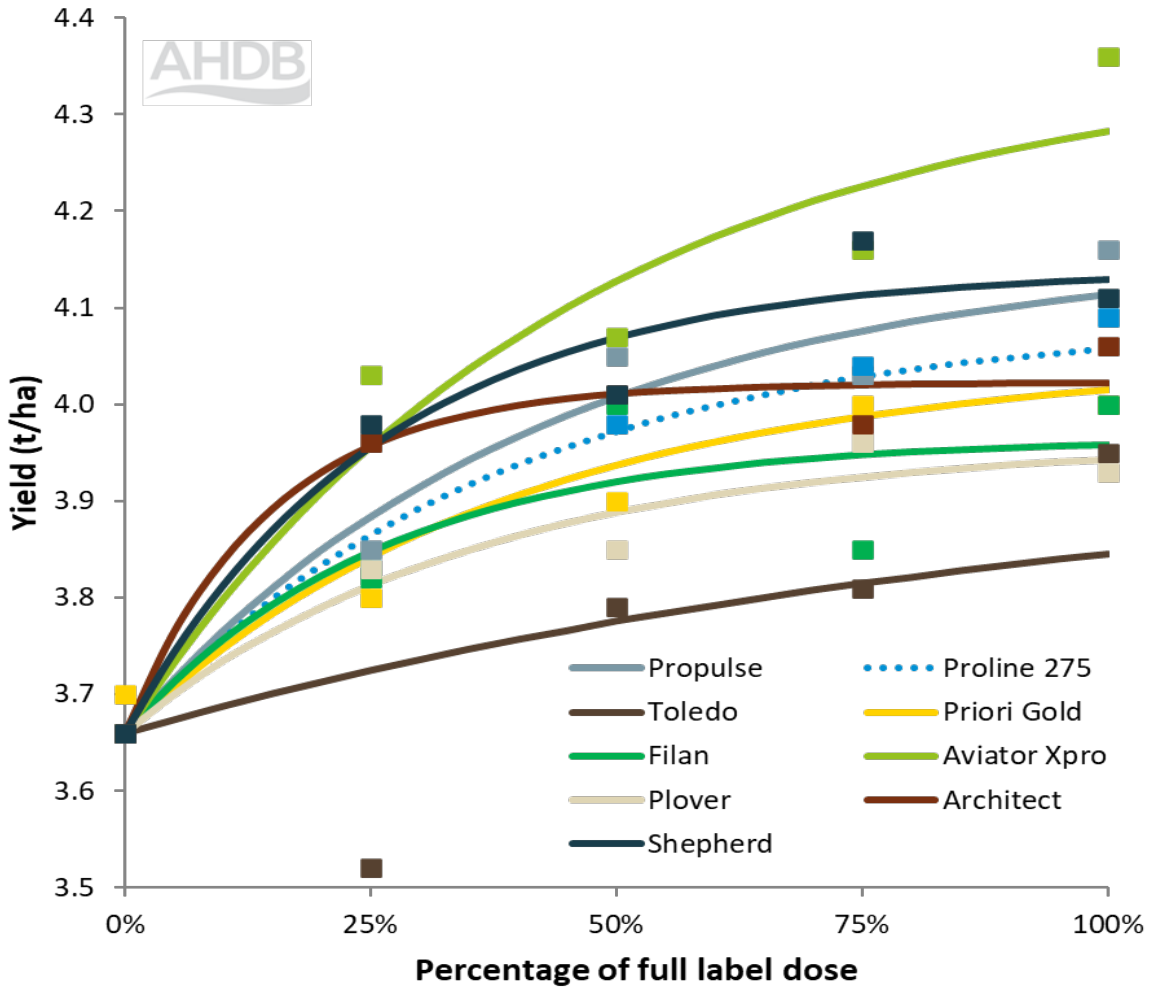




Stem canker and yield 2015–23(14 trials)

Toledo and Propulse only data from 2023

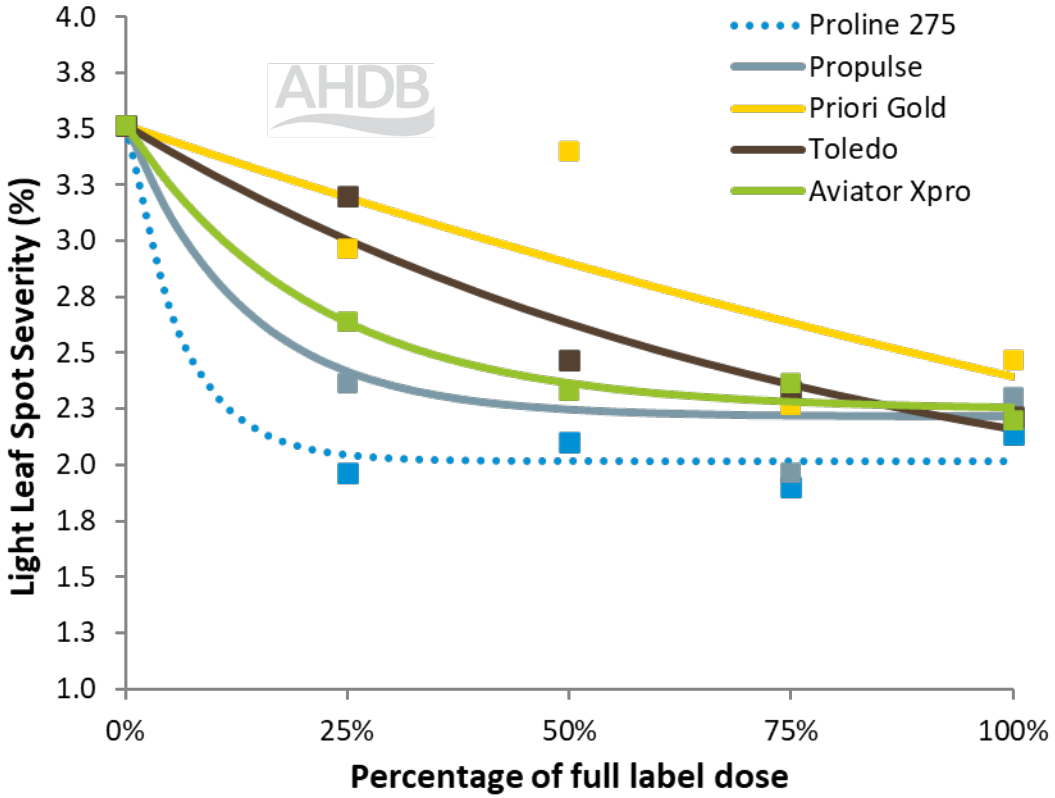




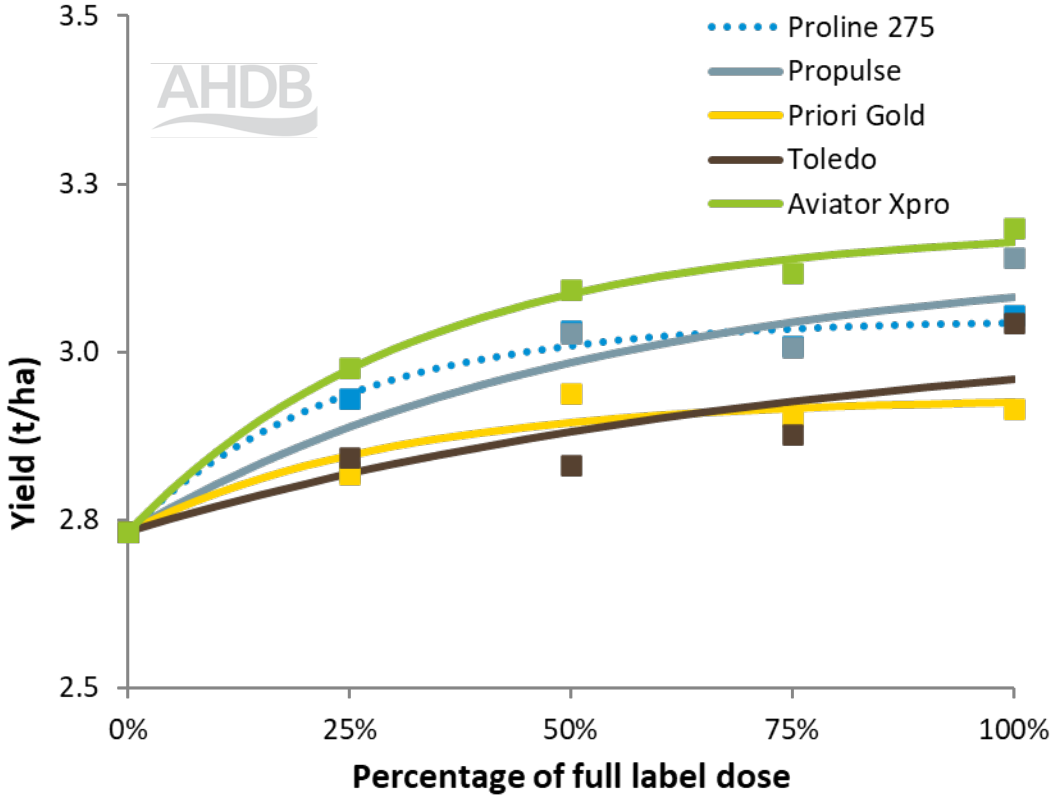
High Mowthorpe

- Location: North Yorkshire
- Target: Light Leaf Spot
- Variety: Darling
- T1 spray: 30/11/22
- T2 spray: 27/03/23
- Data used
  - Light Leaf Spot severity
  - Yield

Light leaf spot disease and yield (High Mowthorpe, 2023)

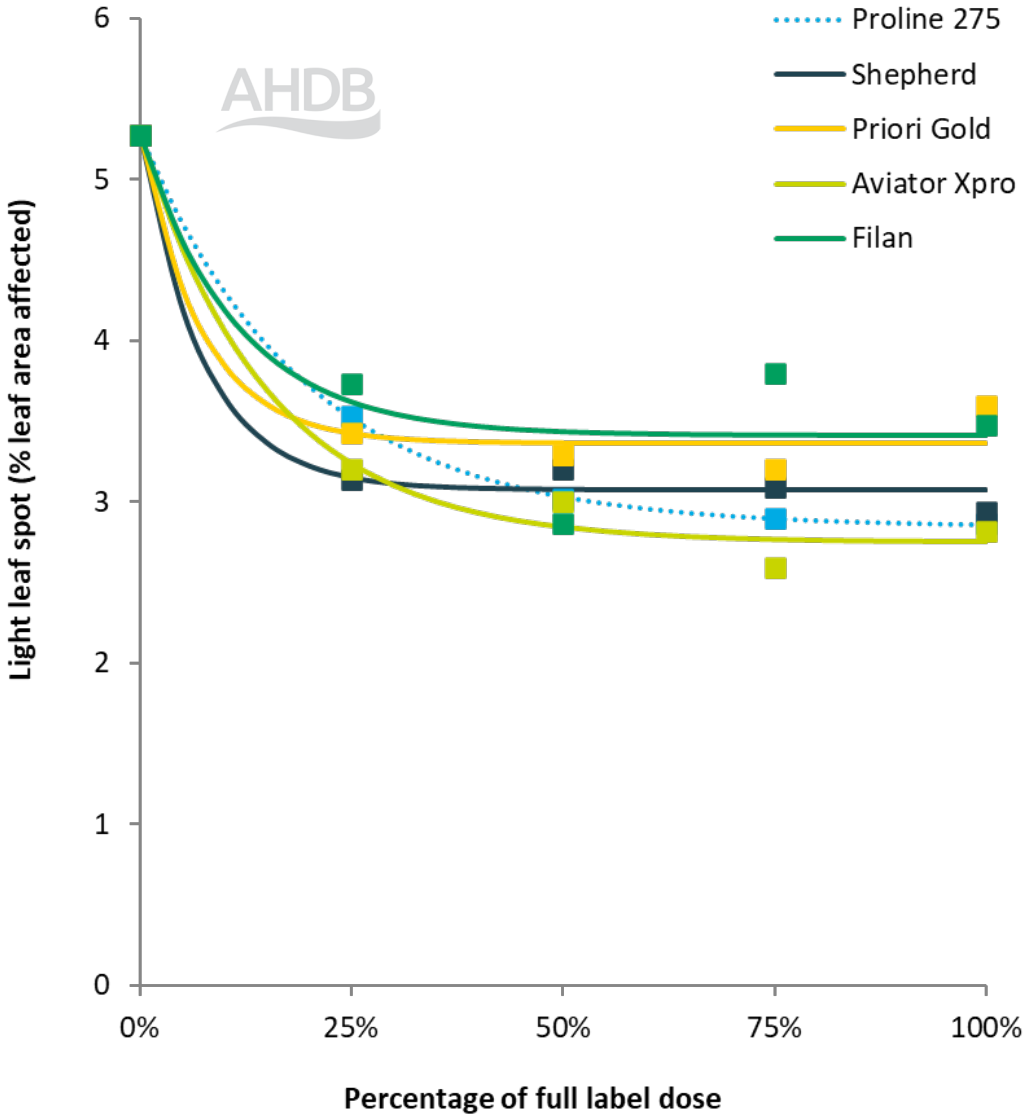


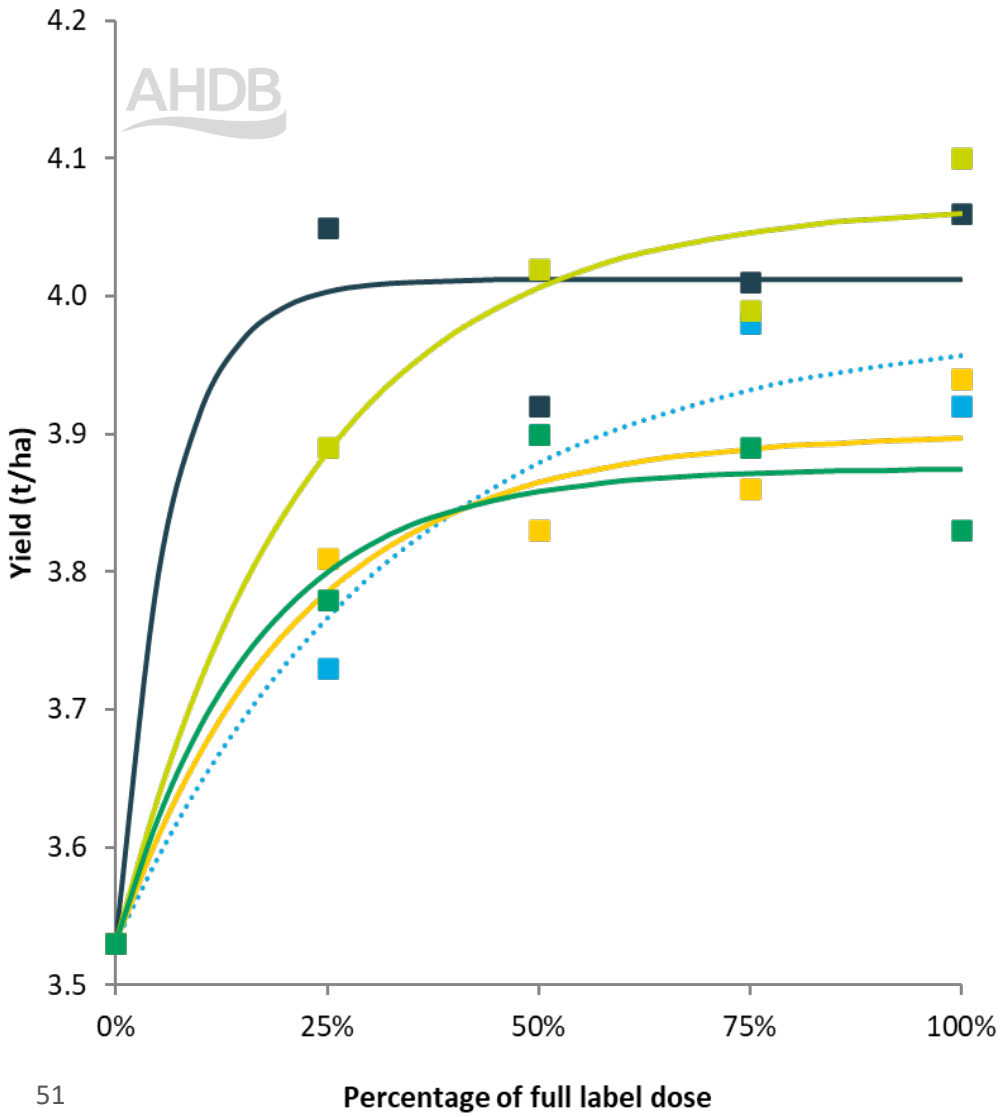
Treatment	Application Timing	Data (%)
Untreated/Half Proline	T2 March 27	2.70
Untreated/Full Proline	T2 March 27	3.10
Half Proline/Untreated	T1 November 30	2.57
Full Proline/Untreated	T1 November 30	2.20



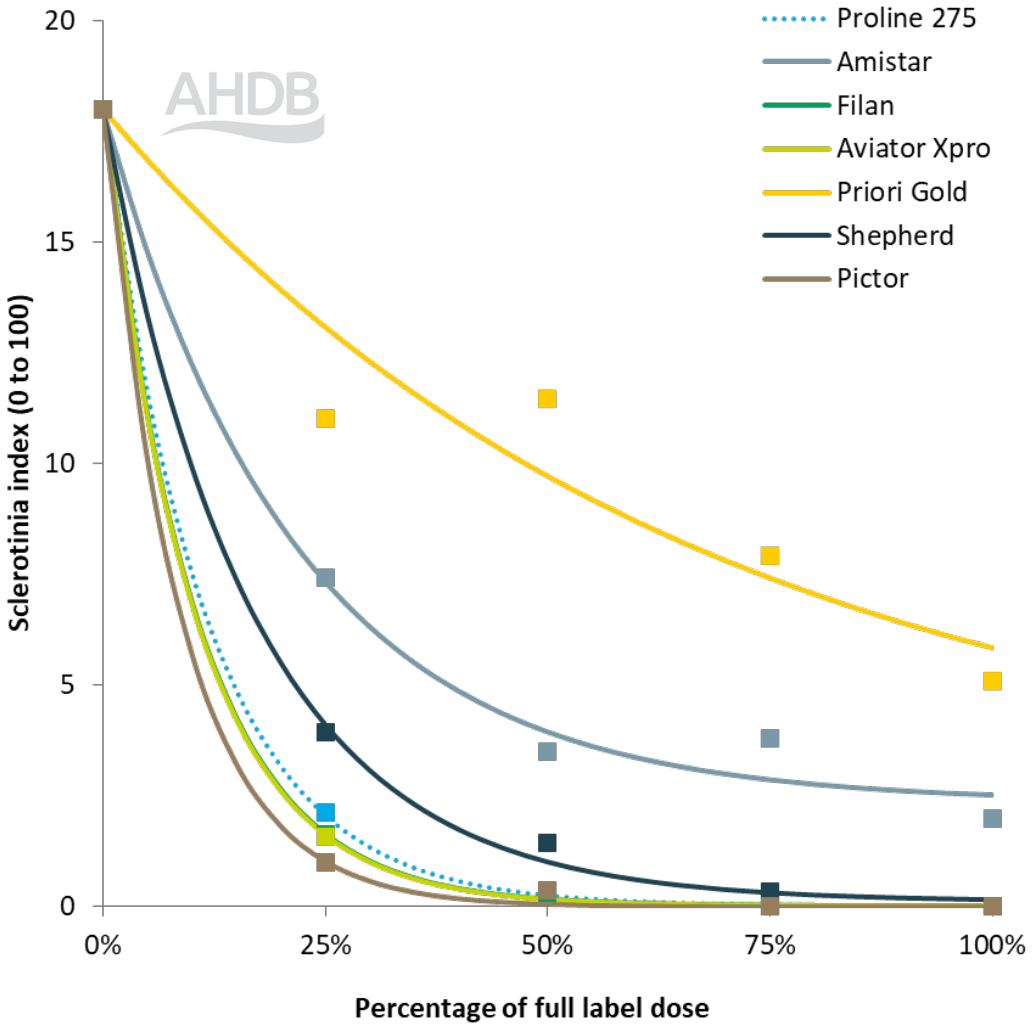
Treatment	Application Timing	Data (t/ha)
Untreated/Half Proline	T2 March 27	2.81
Untreated/Full Proline	T2 March 27	2.79
Half Proline/Untreated	T1 November 30	3.01
Full Proline/Untreated	T1 November 30	3.04

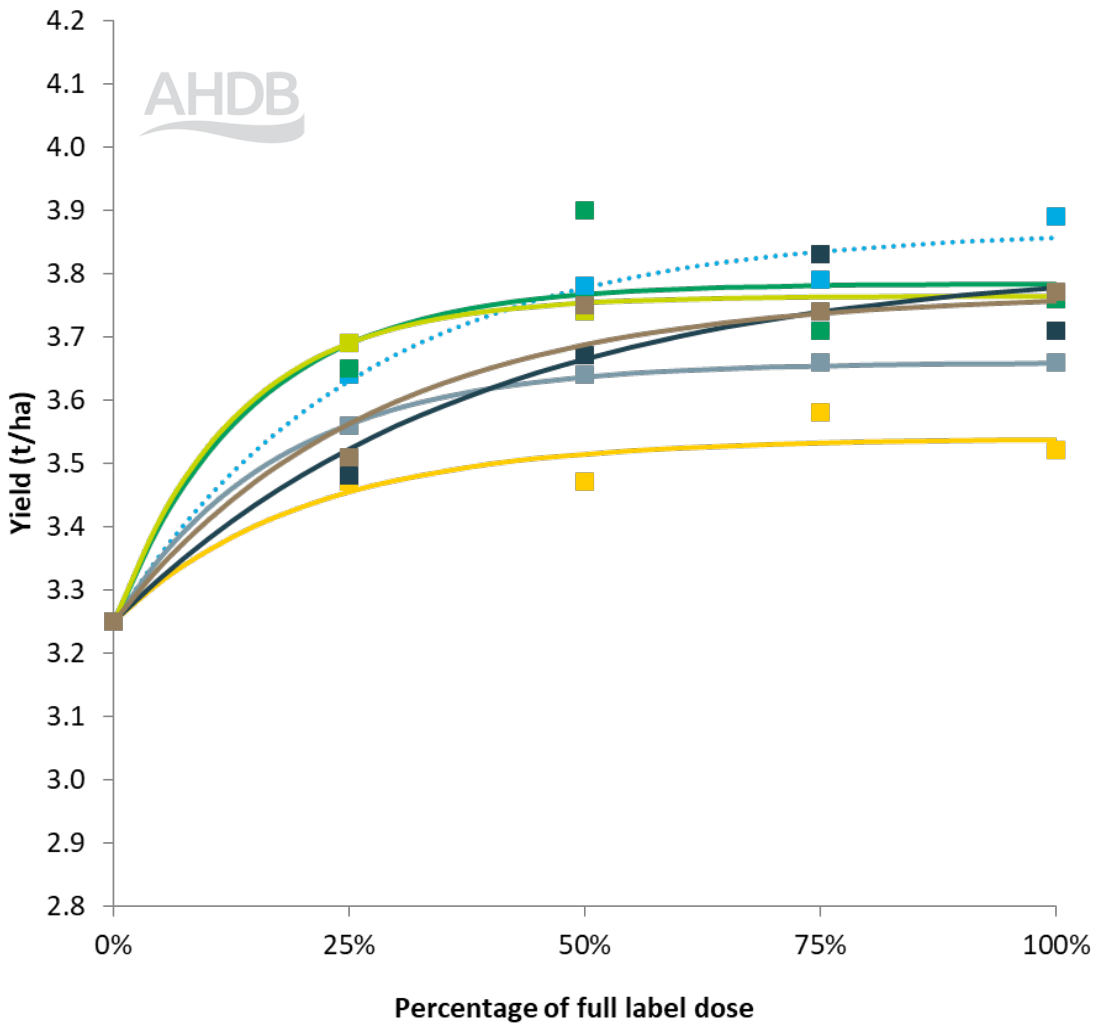
Light leaf spot disease and yield 2019–21 (5 trials)





Sclerotinia stem rot and yield 2015–17 (5 trials)





Oilseed rape summary

Phoma stem canker

- Effective azole and non-azole options for phoma stem canker control
- Yield responses ranged from 0.3 to 1.0 t/ha in 2023, with little benefit from applying >50% of full label rate (as part of a two-spray programme)
- Product differences in canker control and yields more evident when disease pressure was high

Light leaf spot

- Azoles and non-azoles both effective and providing similar control of disease and yield
- Both azole and non-azole chemistry available for use in the autumn
- Timing of application important to achieve control and yield protection

Sclerotinia stem rot

- All modes of action available for sclerotinia control can now be used elsewhere in the fungicide programme
- Consider what active ingredients have been used previously within the fungicide programme and use alternation and mixtures for resistance management

Acknowledgements

Rachel McGauley, Kristina Grenz, Catherine Harries and Jason Pole, AHDB

Jonathan Blake, Faye Ritchie, Philip Walker and Rebecca Joynt, ADAS

Stuart Knight and Nichola Hawkins, NIAB

Fiona Burnett, SRUC

Simon Edwards, Harper Adams University

Stephen Kildea, Teagasc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