

# Fungicide performance update for wheat, barley and oilseed rape (2022)

Wheat: slides 7–30

Barley: slides 31–46

Oilseed rape: slides 47–58



**The graphs in this document show  
dose-response curves up to 100% label dose.**

The AHDB Agronomists' Conference presentation (6 December 2022) showed dose-response curves up to 200% label dose.

In these trials, most fungicides are tested at double rate to improve the 'fit' of the dose-response curves.

In commercial situations, do not exceed the recommended label dose (i.e. 100%).

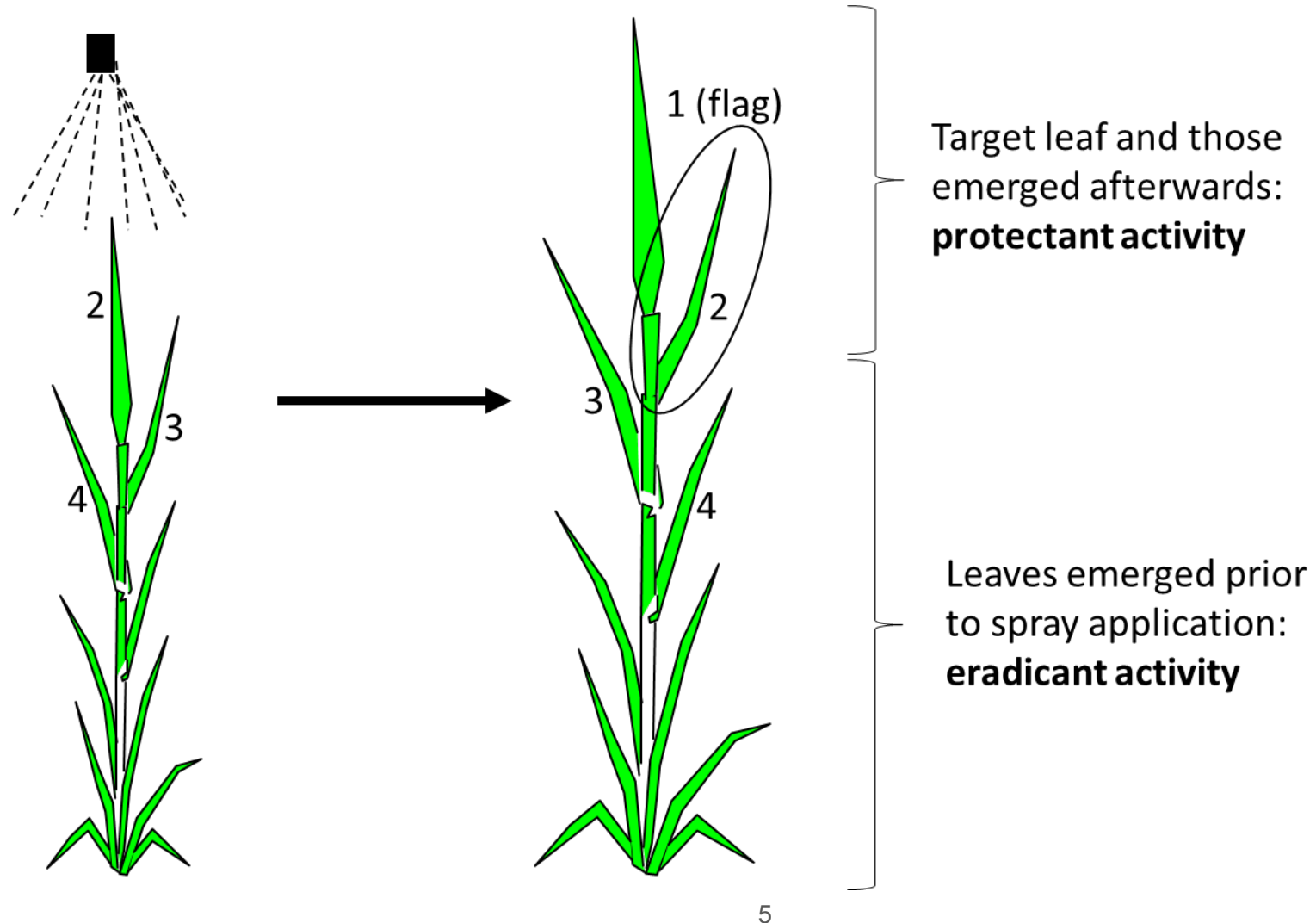
[ahdb.org.uk/fungicide-performance](https://ahdb.org.uk/fungicide-performance)

## 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](http://ahdb.org.uk/frag)

- 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



# Wheat and barley – registered products

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

A further seven unregistered products were tested in 2022 (data will be released upon registration).

\*Arizona tested at full-dose (100%) only

\*\*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

# Fungicide performance update for wheat (2022)

# Wheat trial sites (harvest year 2022)

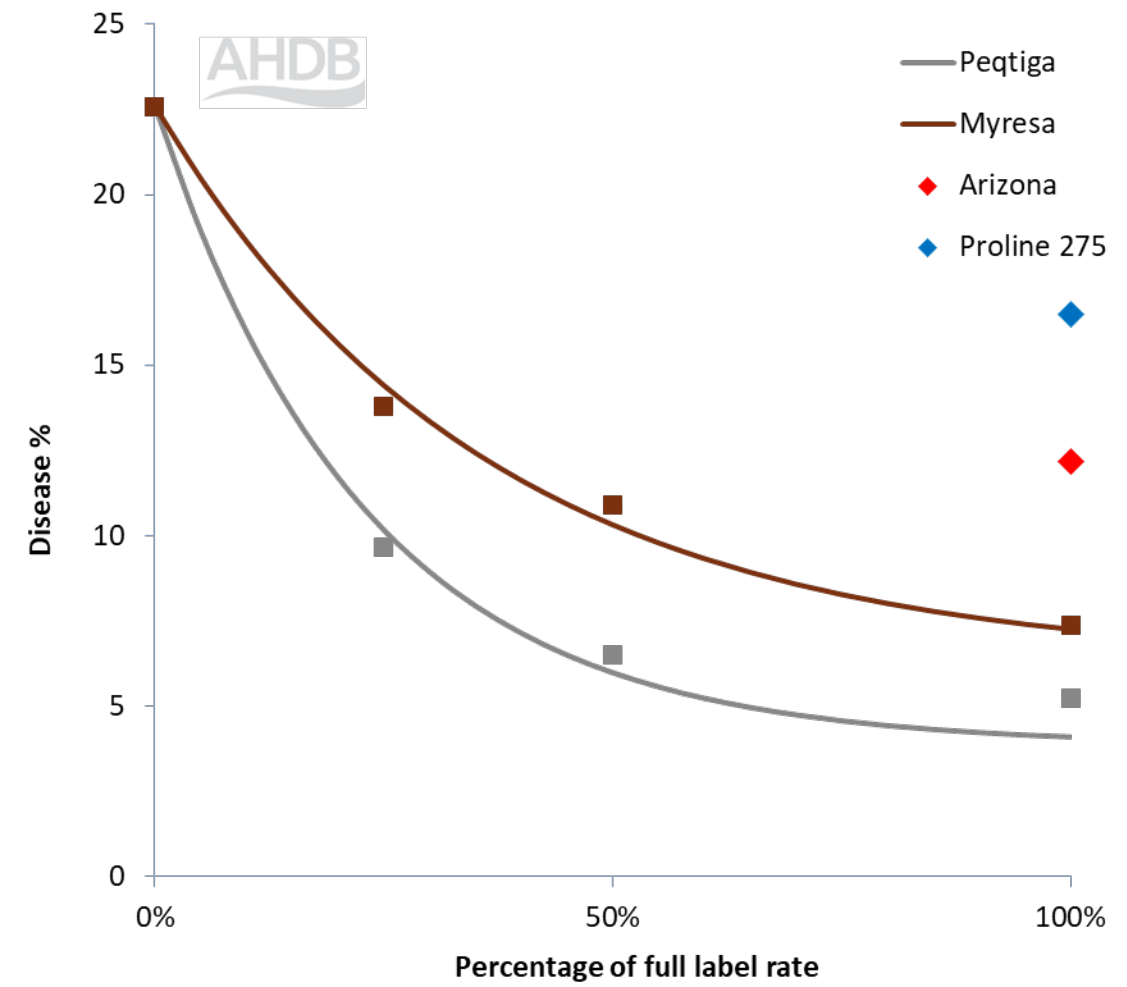
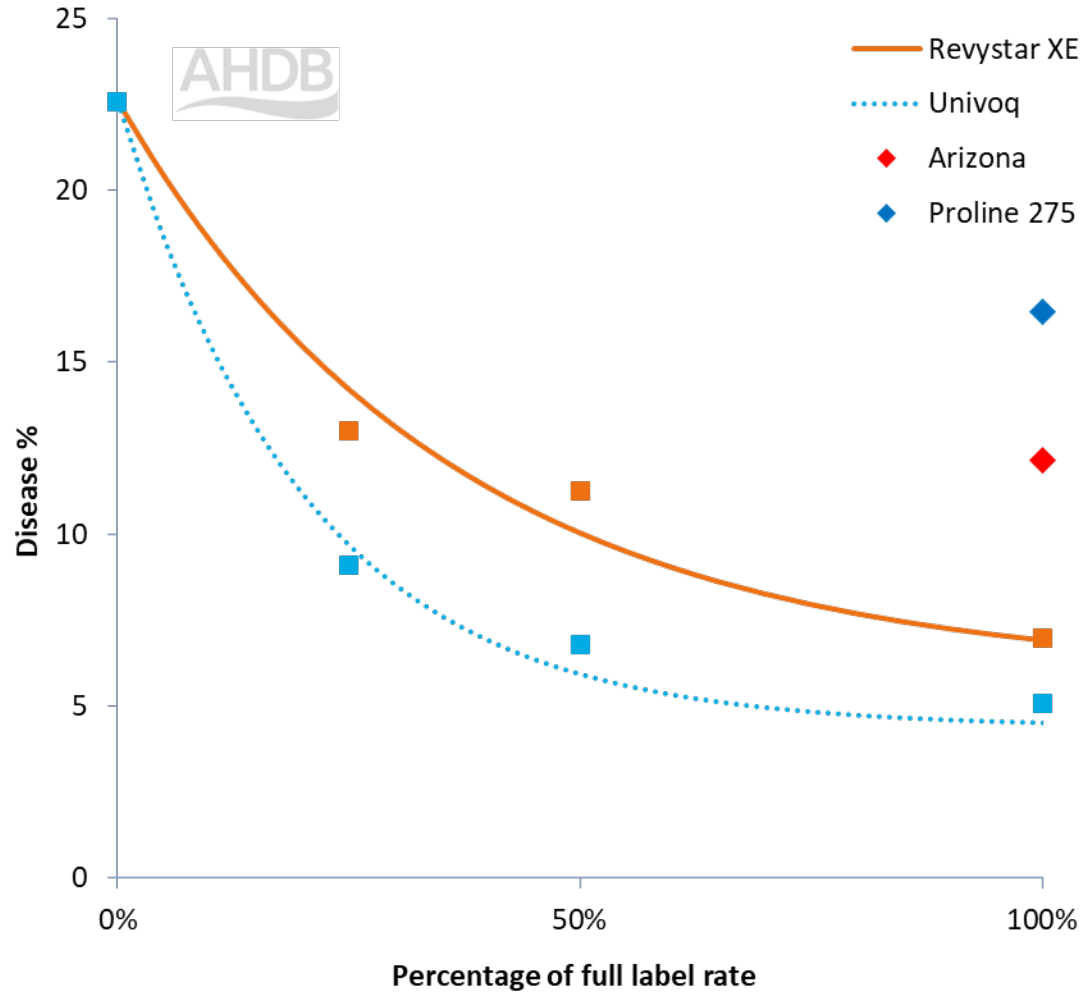
	Site	Target disease	Variety
1	Rosemaund T2	Septoria tritici	KWS Barrel
2	Sutton Scotney T1.5	Septoria tritici	Elation
3	East Lothian T2	Septoria tritici	KWS Barrel
4	Terrington T1	Yellow rust	Kinetic
5	Cambridge T2	Brown rust	Crusoe
6	Gleadthorpe T3	Fusarium	RGT Illustrious
7	Carlow T2	Septoria tritici	Costello
8	Cardigan T2	Septoria tritici	RGT Gravity
9	Telford T2	Septoria tritici	Elation
10	Dundee T1	Septoria tritici	KWS Barrel



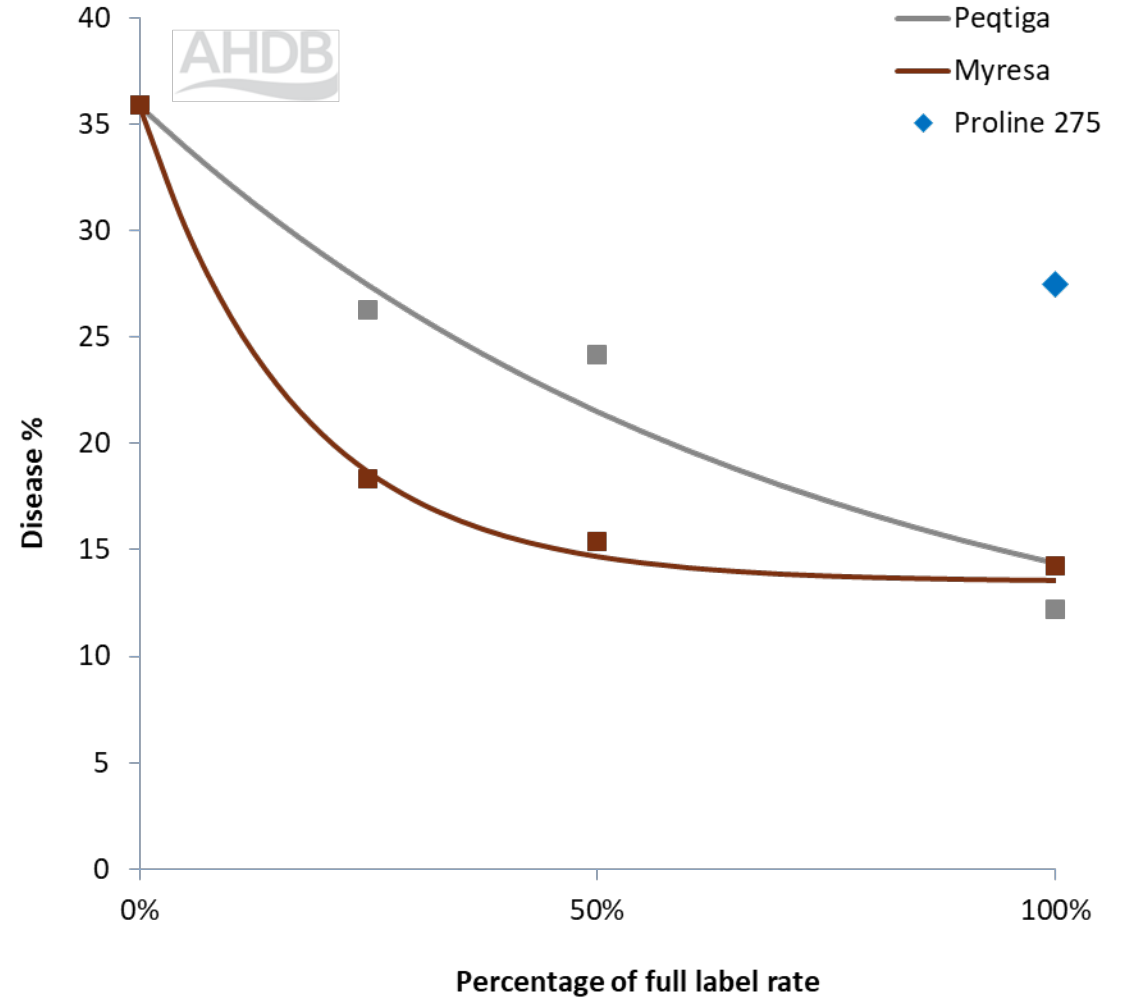
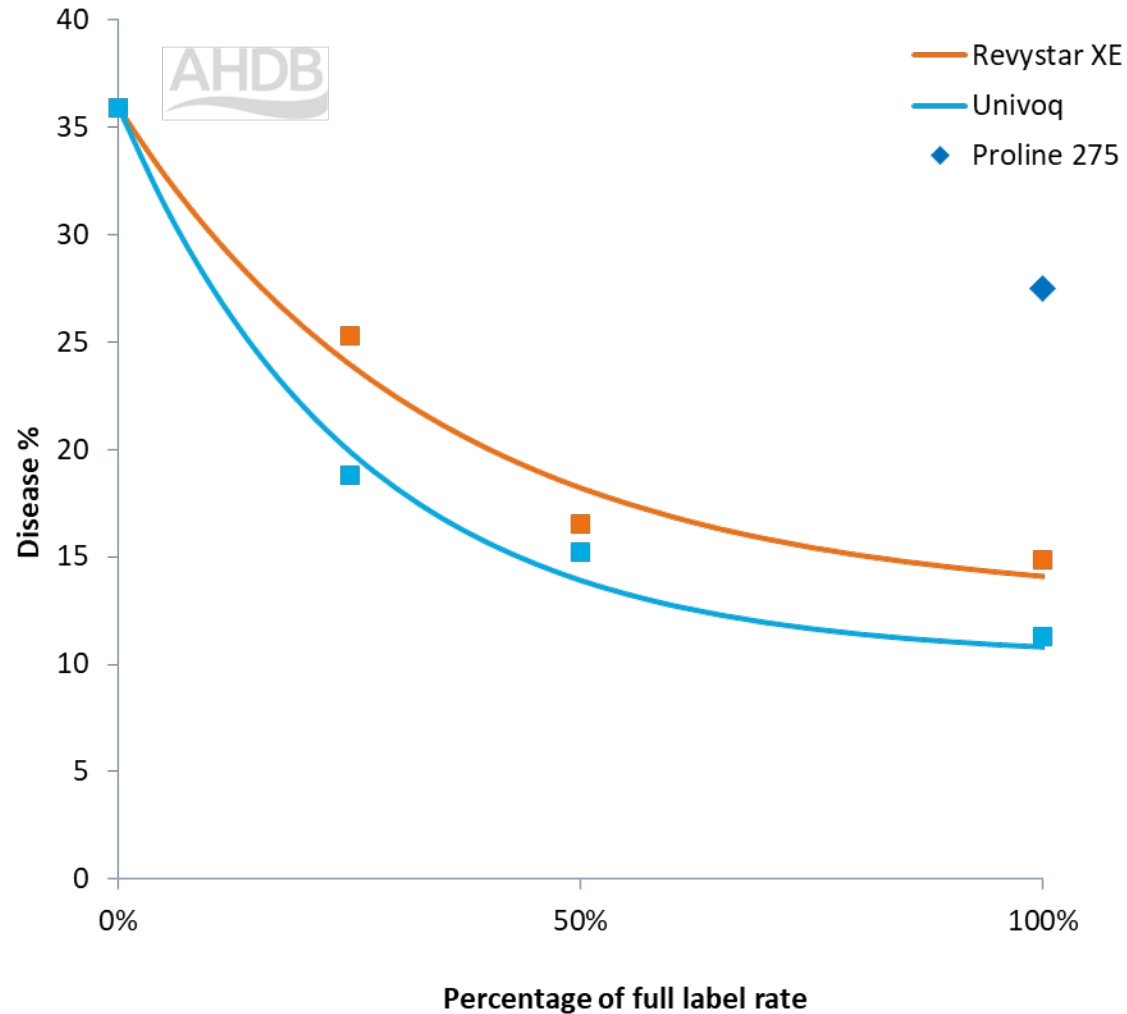
# Wheat septoria tritici efficacy data (2022)

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

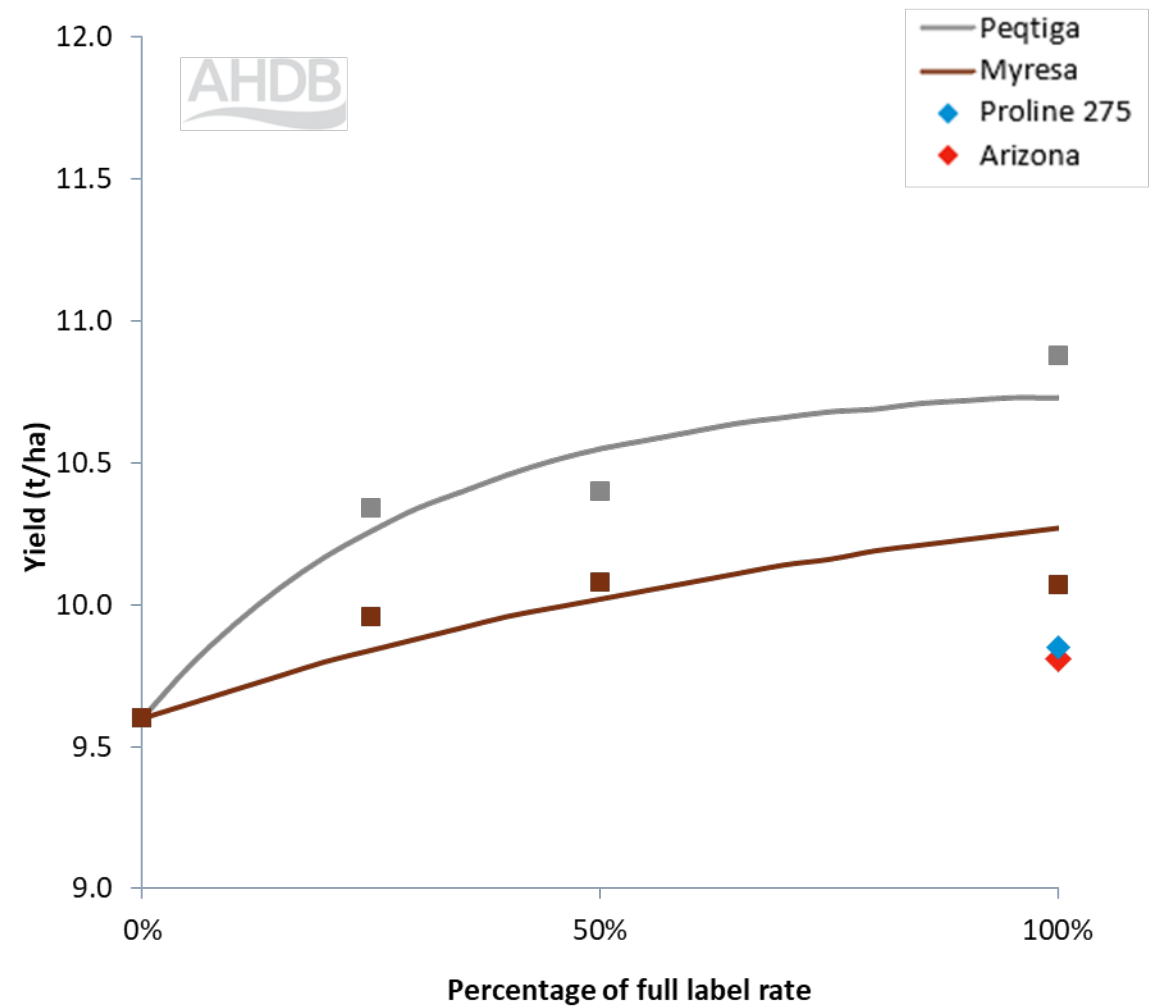
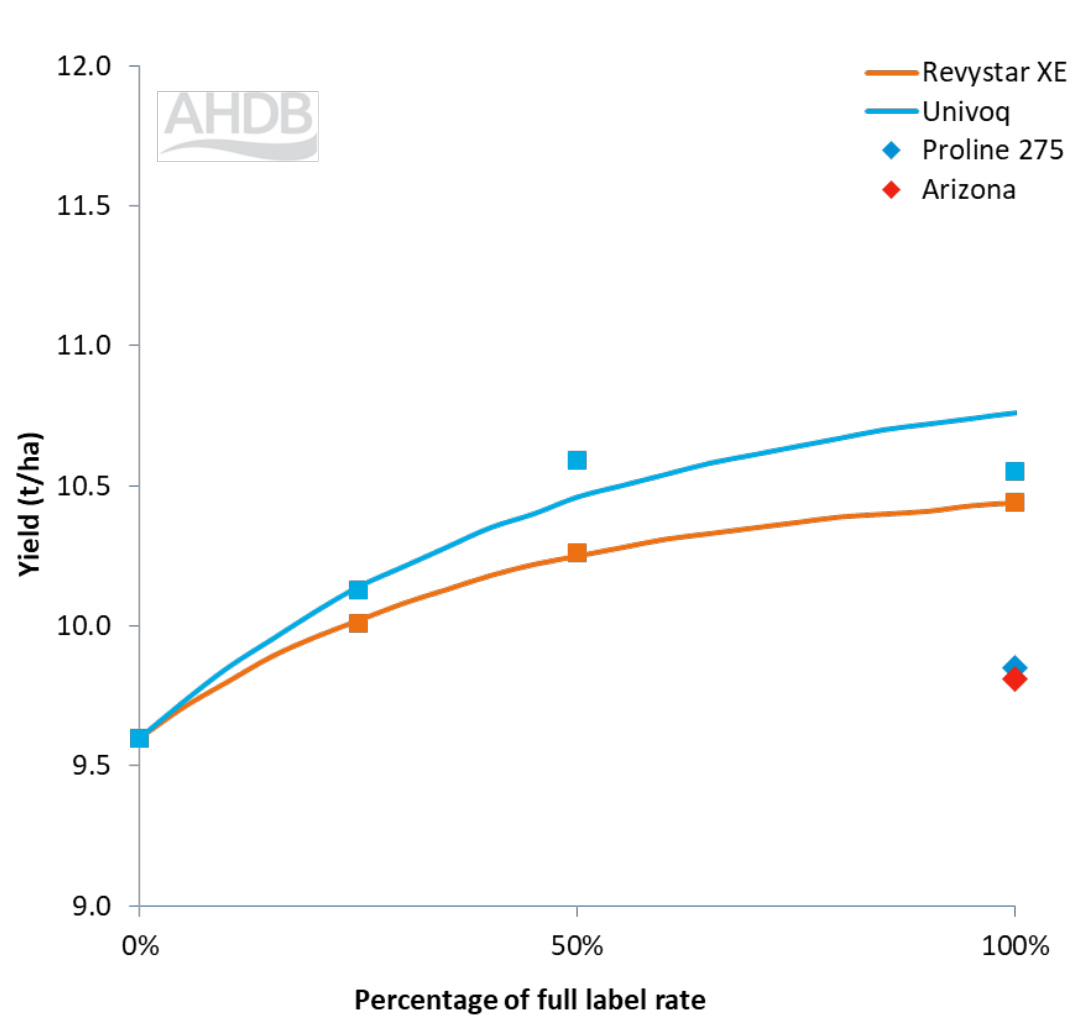
# Septoria protectant 2022 (7 trials)



# Septoria eradicant 2022 (2 trials)



# Septoria yield 2022 (6 trials)





# Field photos

Herefordshire, June 2022

Untreated



Proline 0.72 l/ha



Arizona 1.5 l/ha





# A dose response: Revystar XE

Herefordshire, June 2022

0.375 l/ha (25%)



0.75 l/ha (50%)

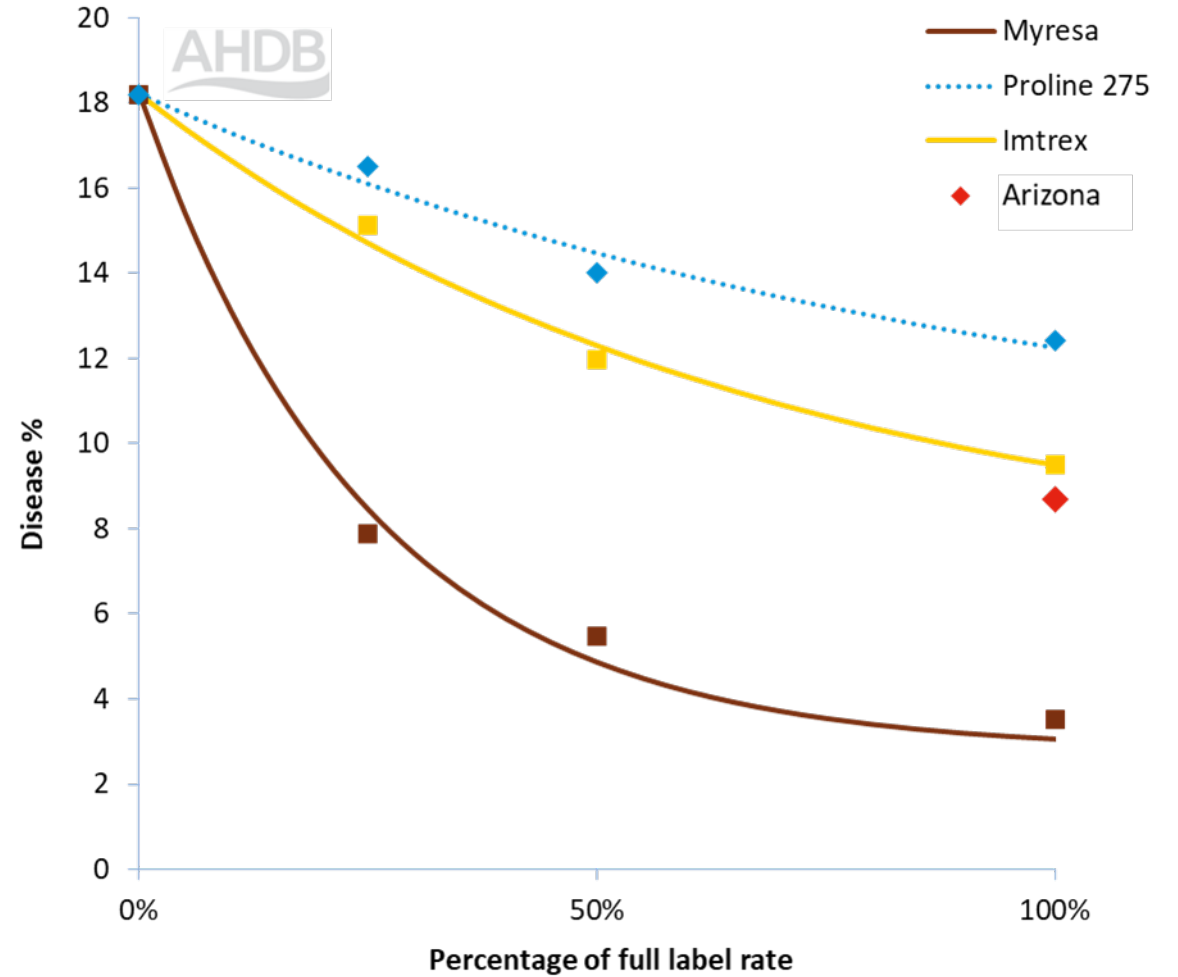
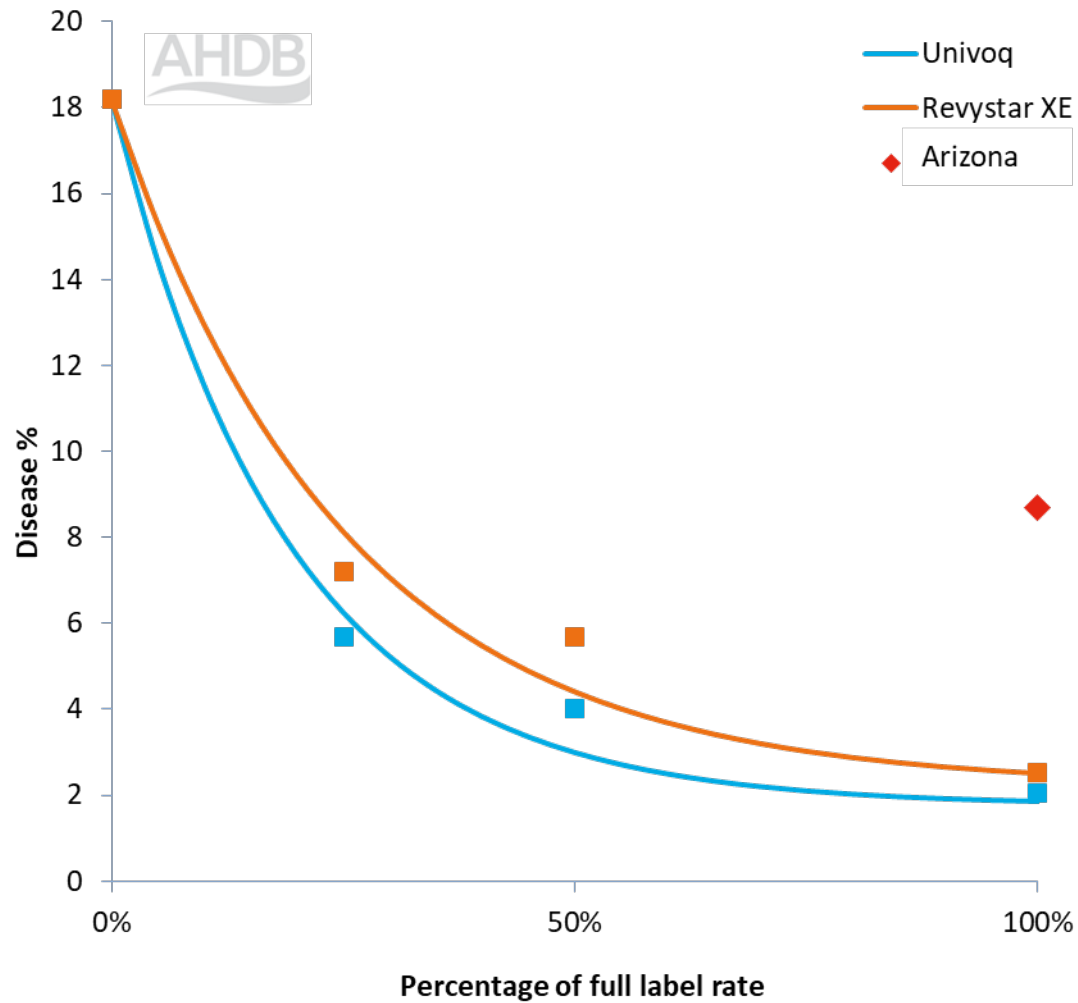


1.5 l/ha (100%)

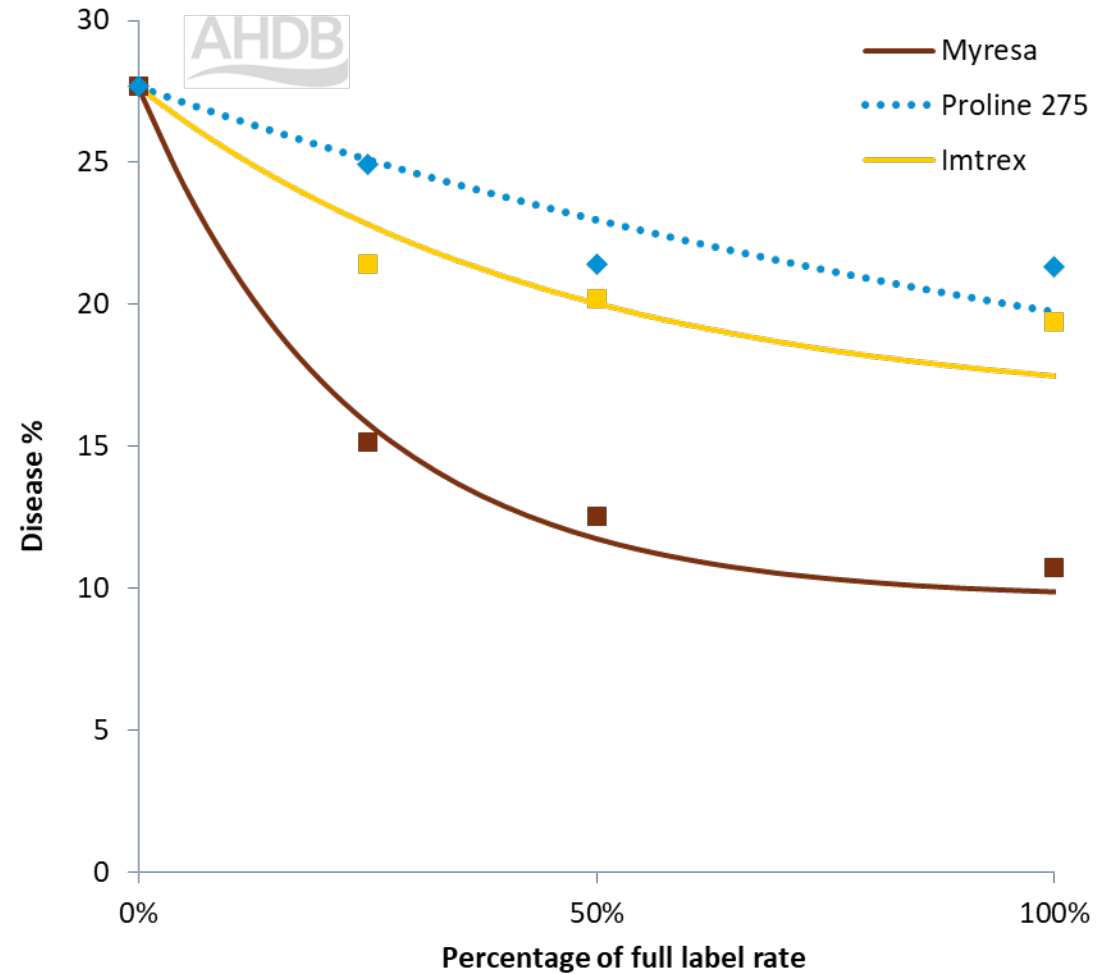
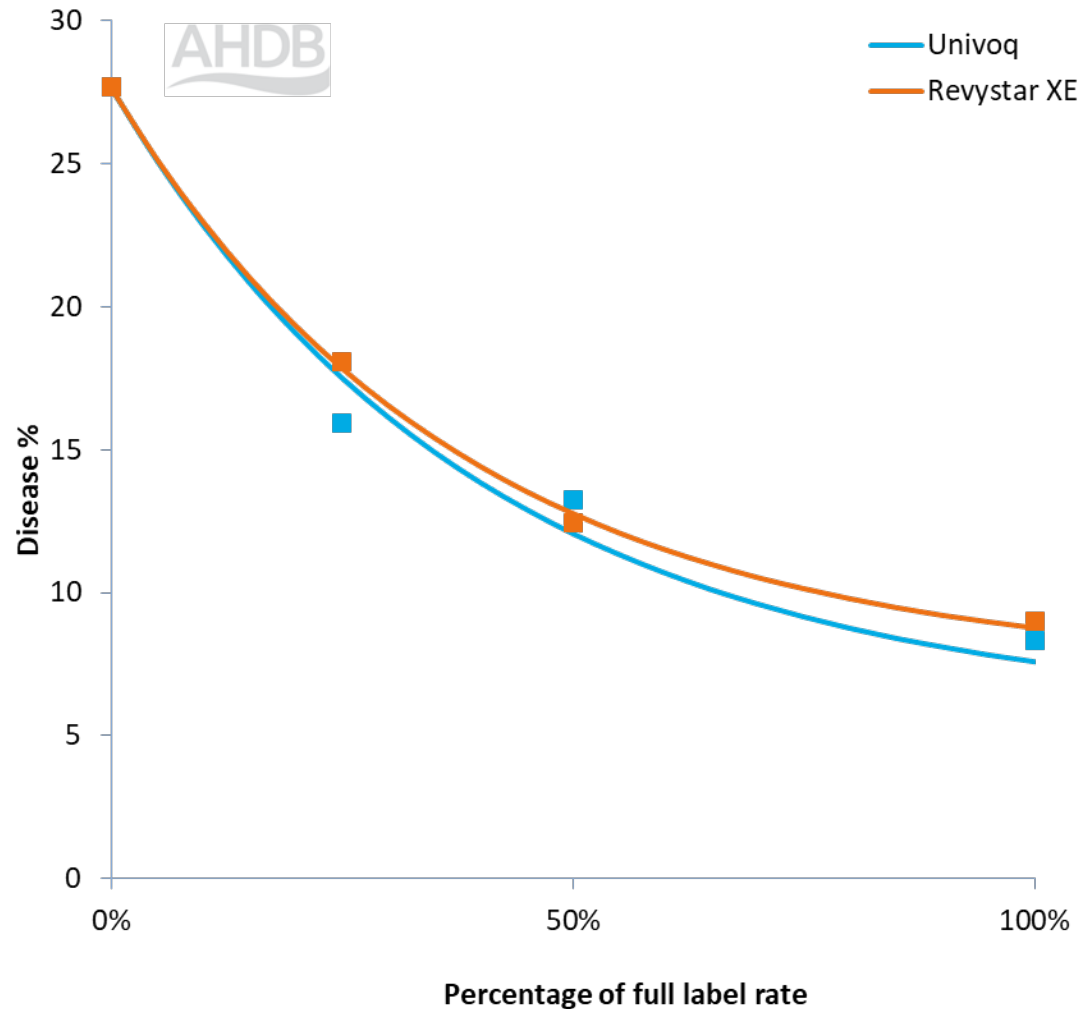




# Septoria protectant 2020–22 (17 trials)

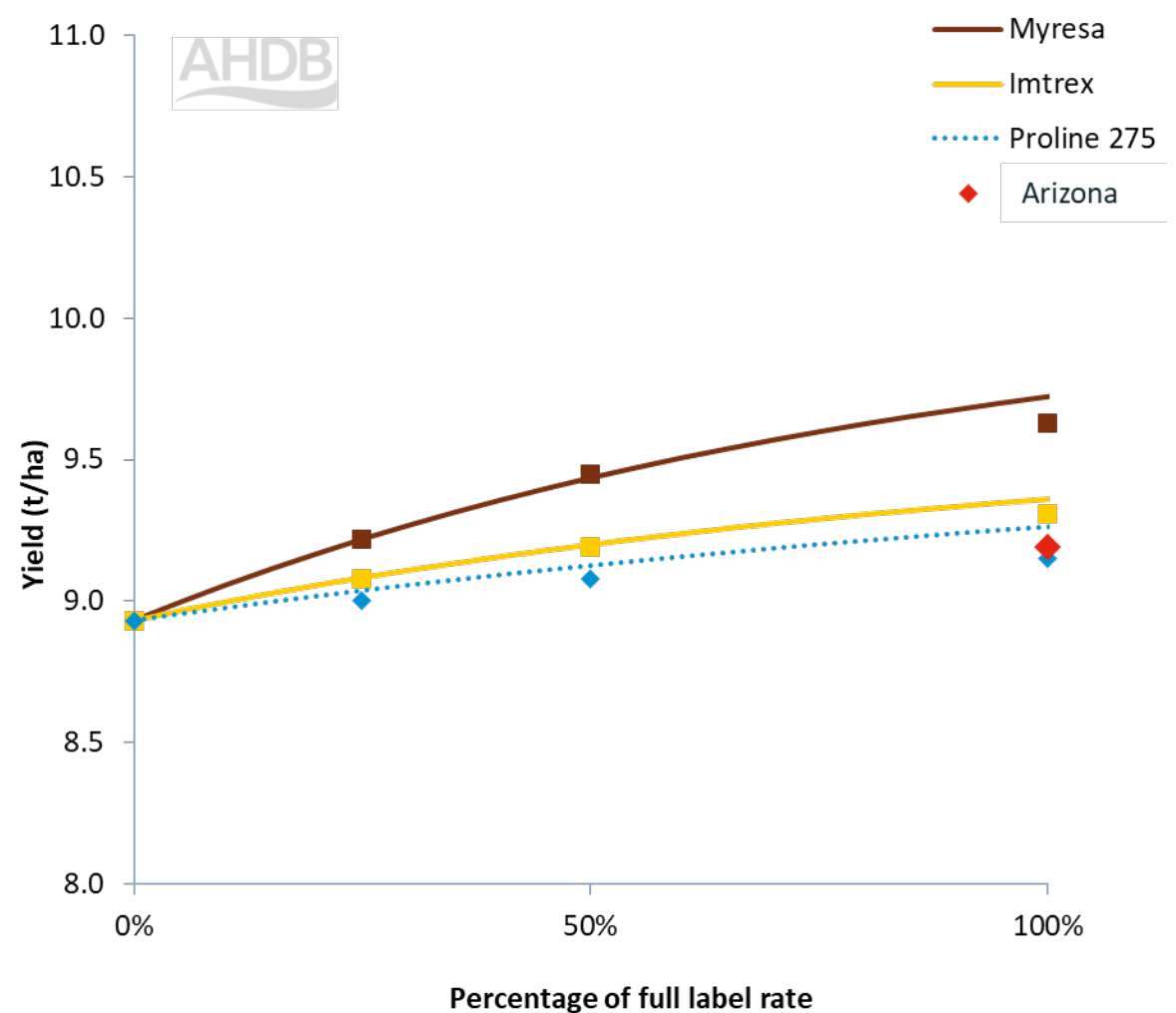
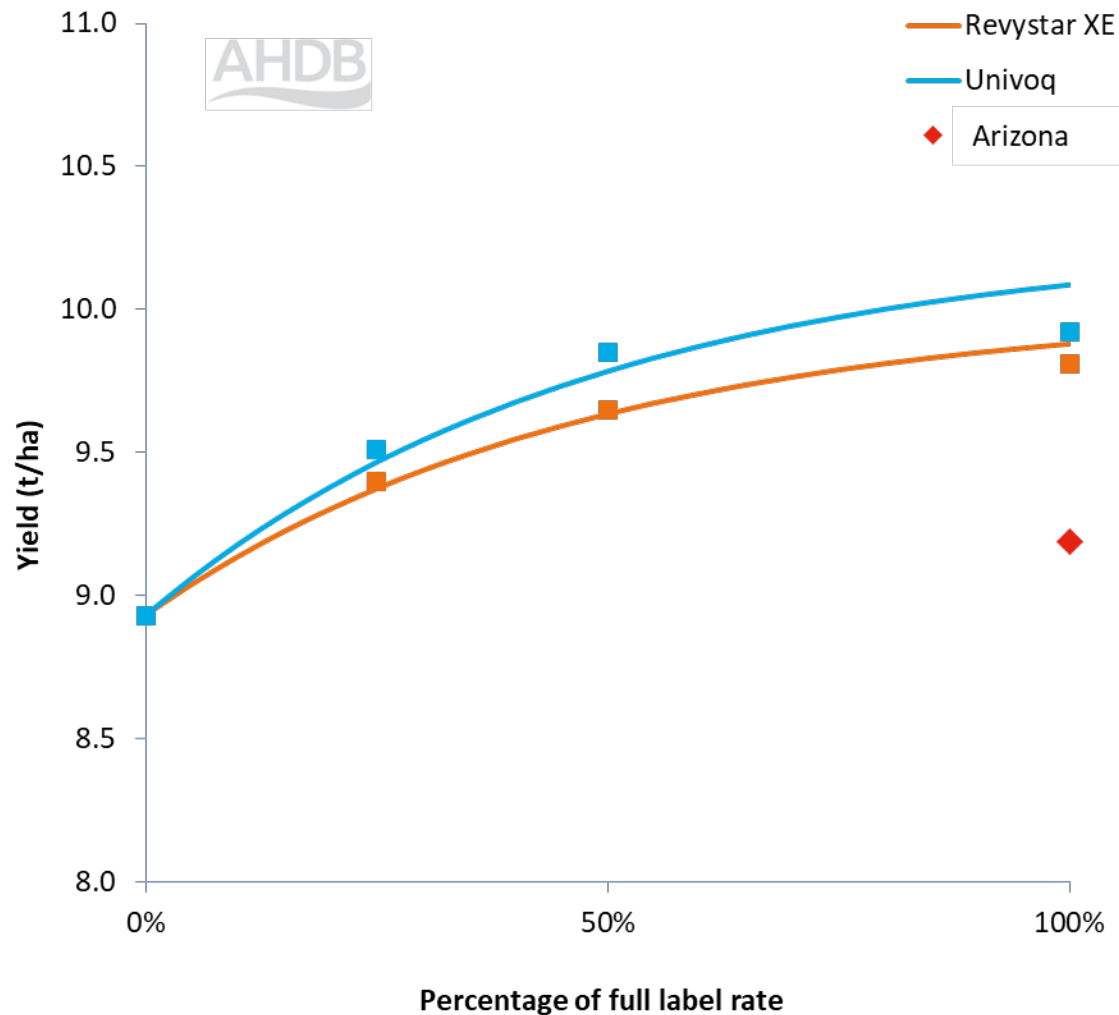


# Septoria eradicant 2020–22 (10 trials)



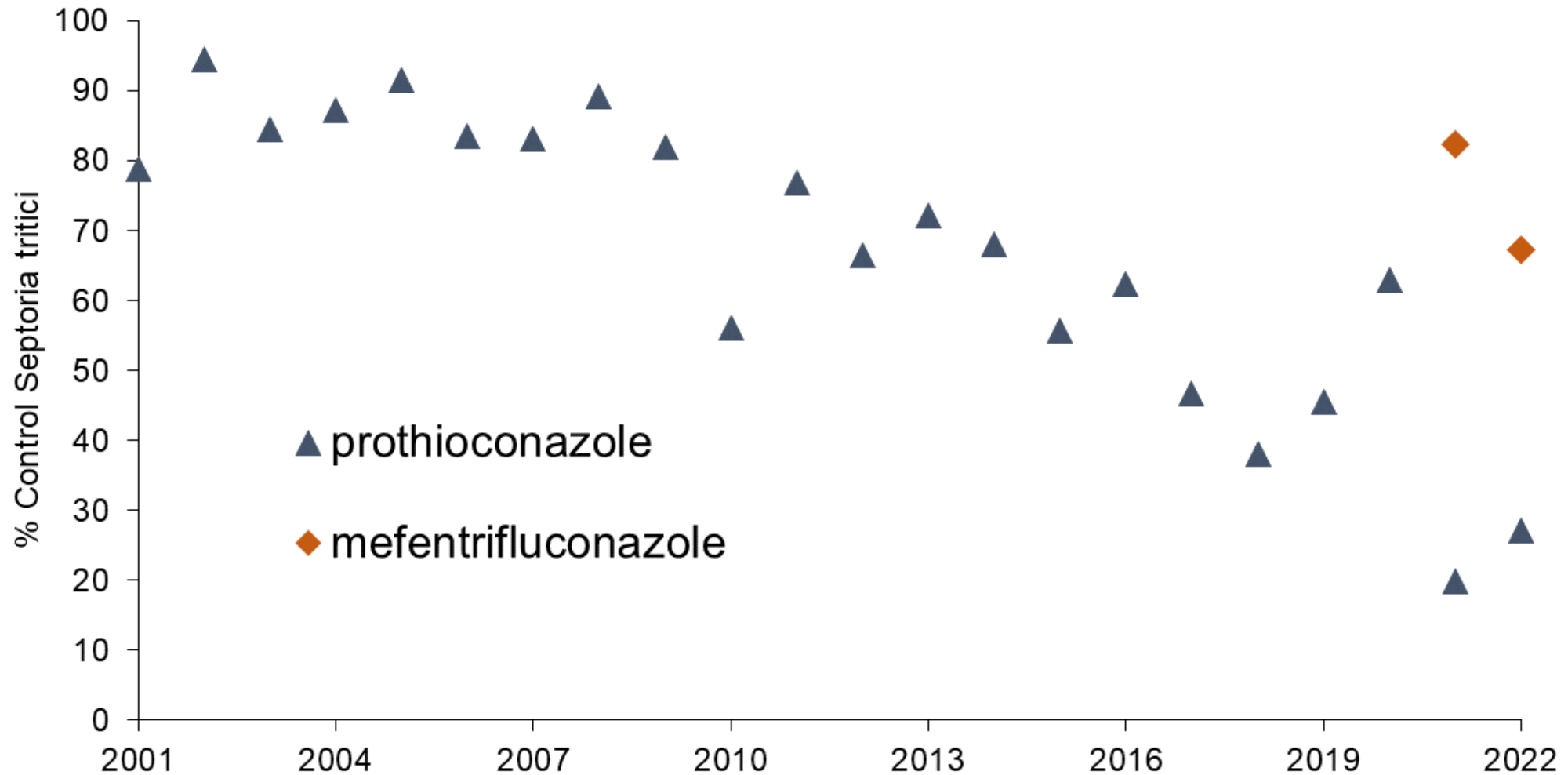


# Septoria yield 2020–22 (19 trials)

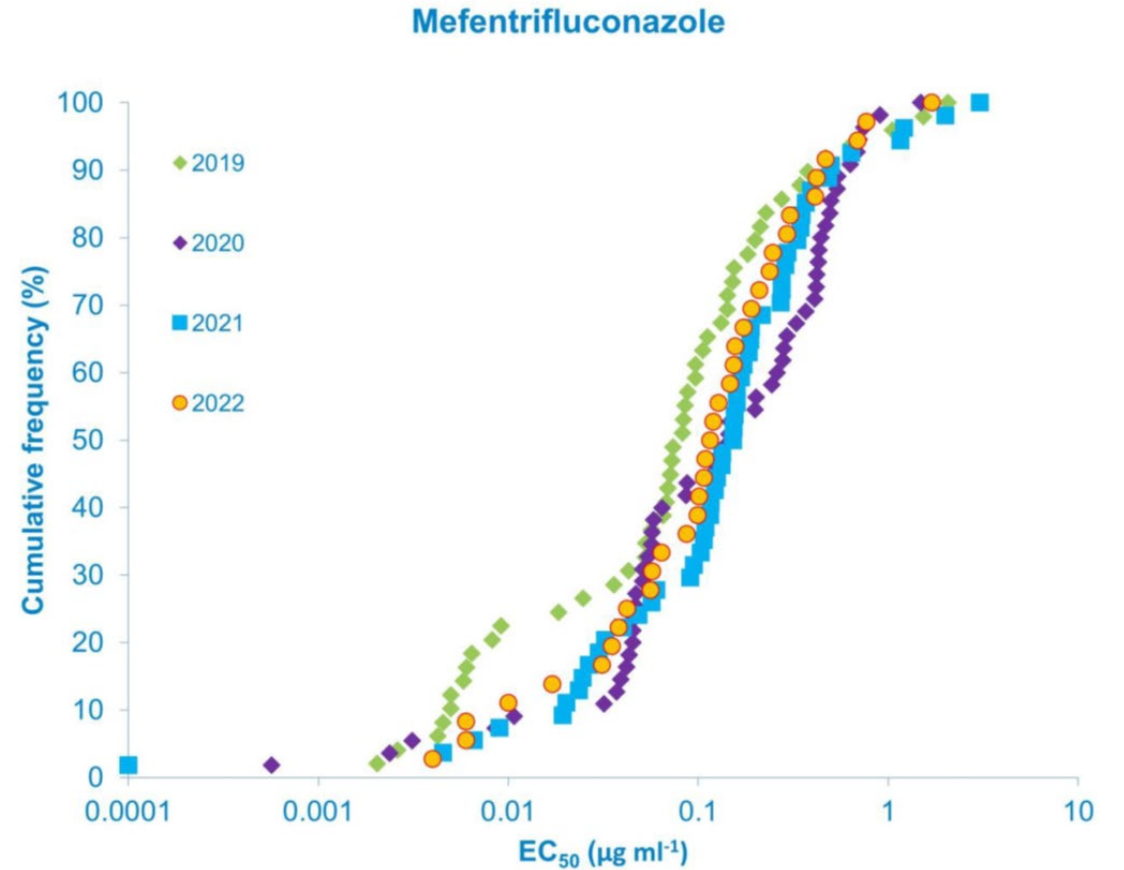
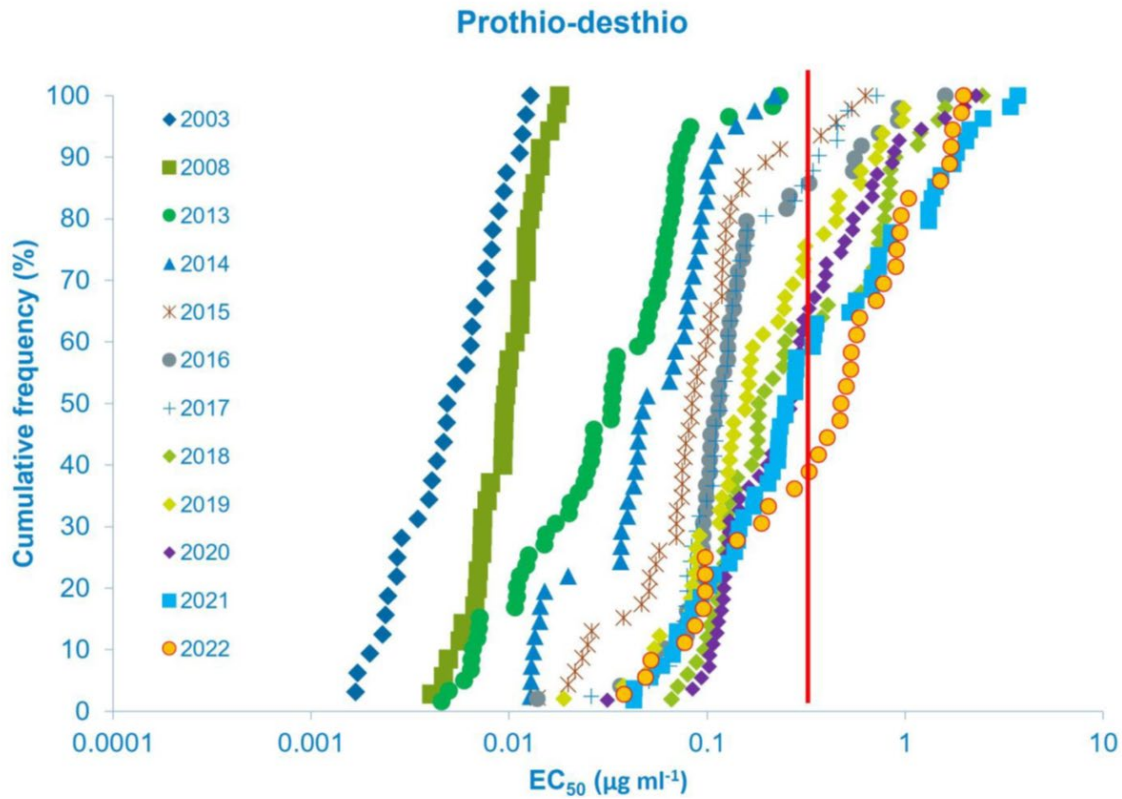


# Azole changes in efficacy on septoria (2001–22)

Protectant situations – full label rate

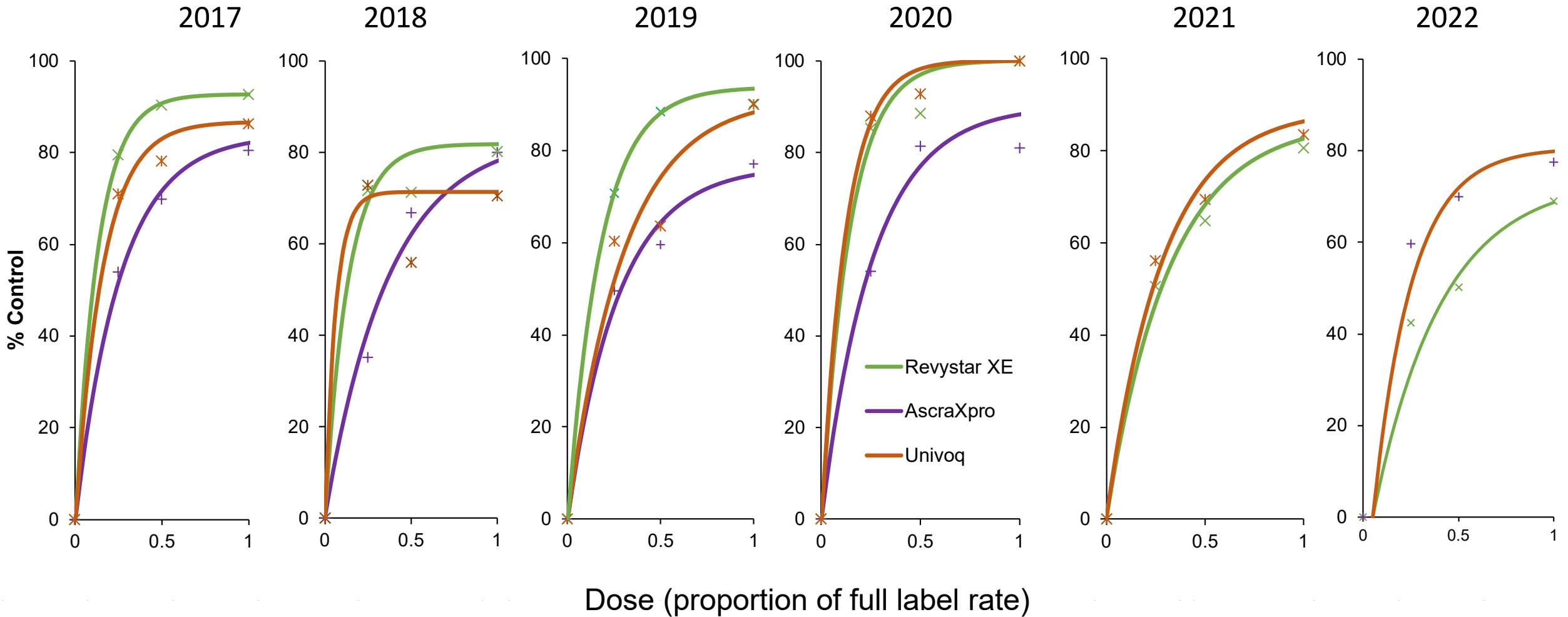


# Azole sensitivity over time (Rothamsted)



# Mixtures changes in efficacy on septoria (2017–2022)

Protectant situations



# Septoria sensitivity update

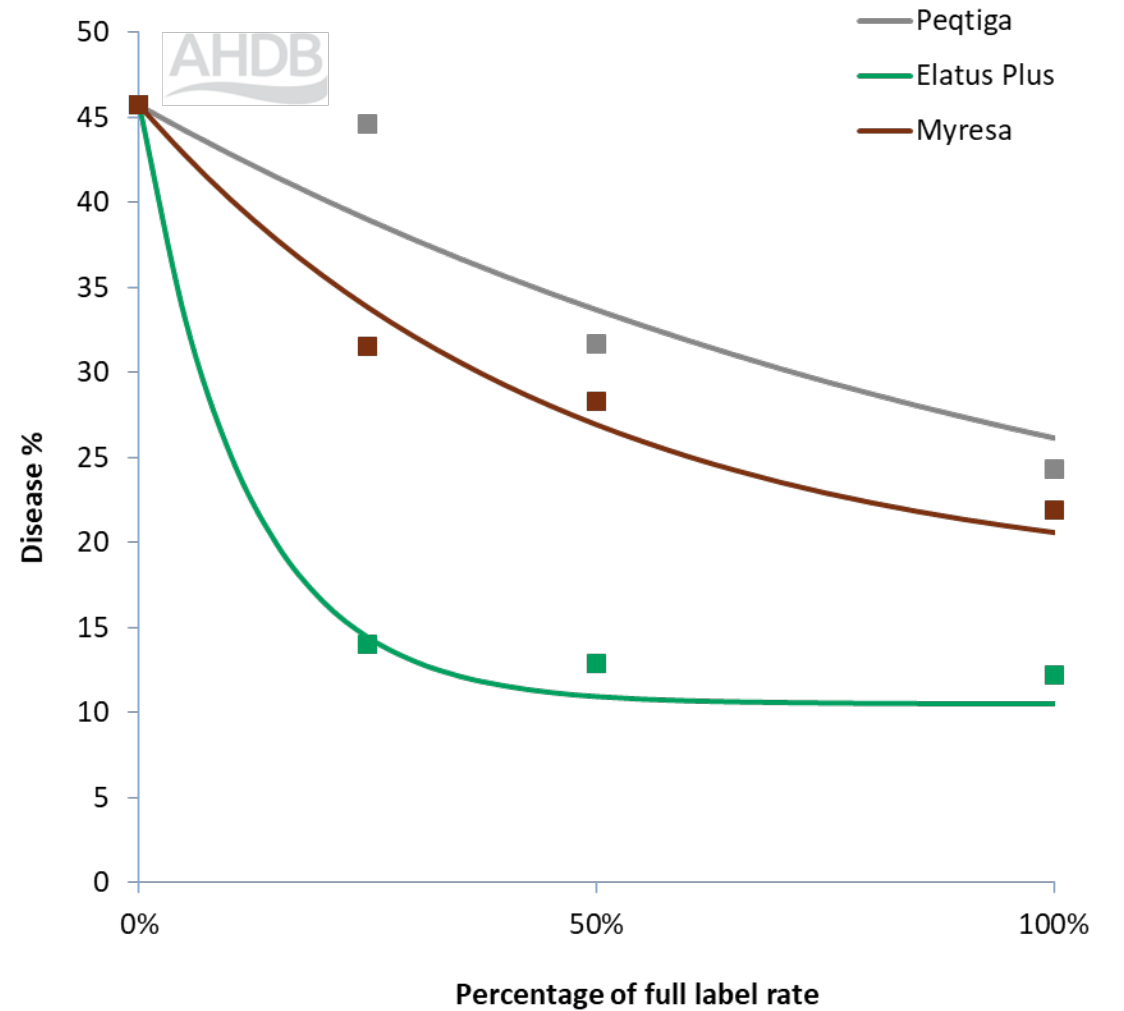
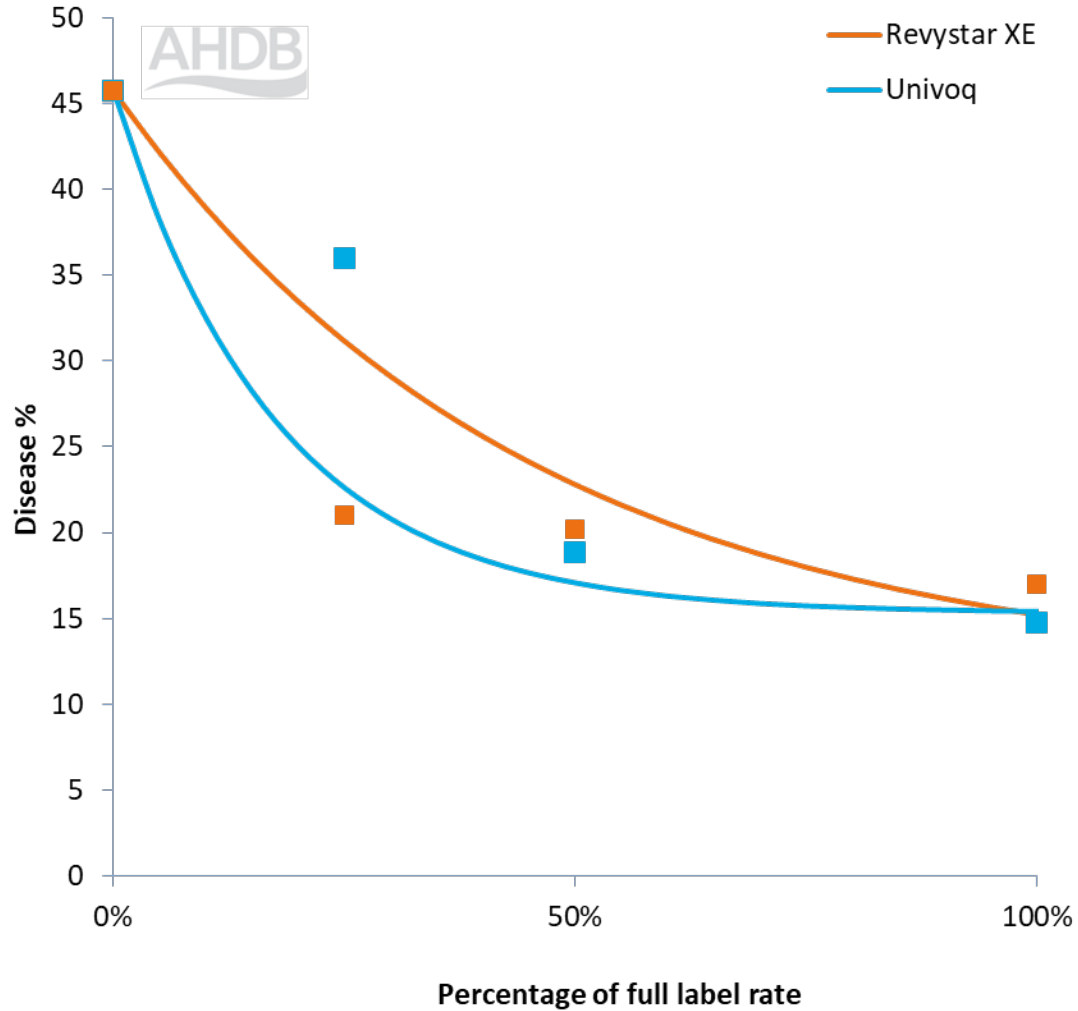
- 2022 sensitivity monitoring data shows no significant shifts, and all isolates tested were within previous ranges
- Septoria populations are heterogenous and individual samples vary considerably by site and season
- SDHI and azole isolates with reduced sensitivity are slowly accounting for an increasing proportion of the population
- These less sensitive isolates are becoming more complex, carrying an increasing number of mutations
- Pre- and post-application monitoring shows a single fungicide application is sufficient to drive changes in the septoria population
- **It remains critical that resistance management measures are built into programmes: mixtures, alternation and multisites are key components**



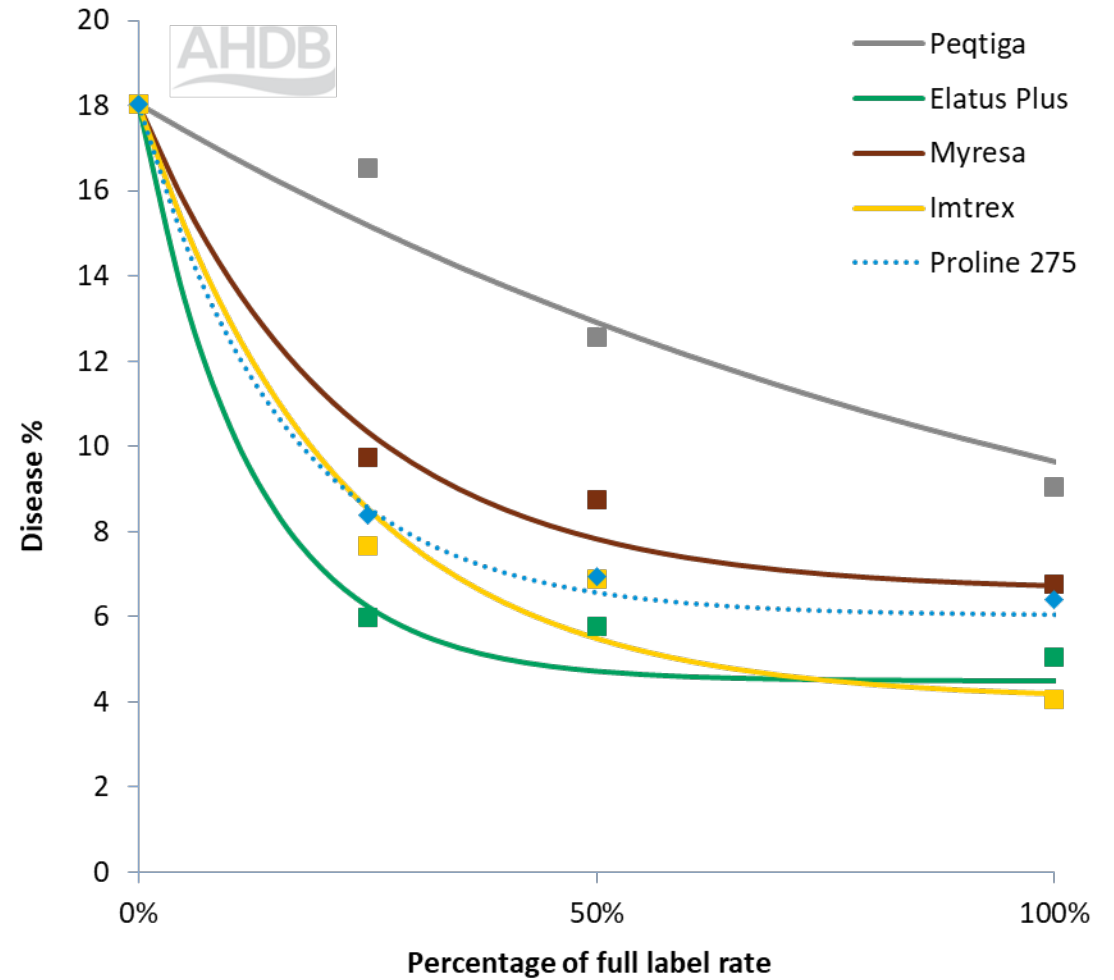
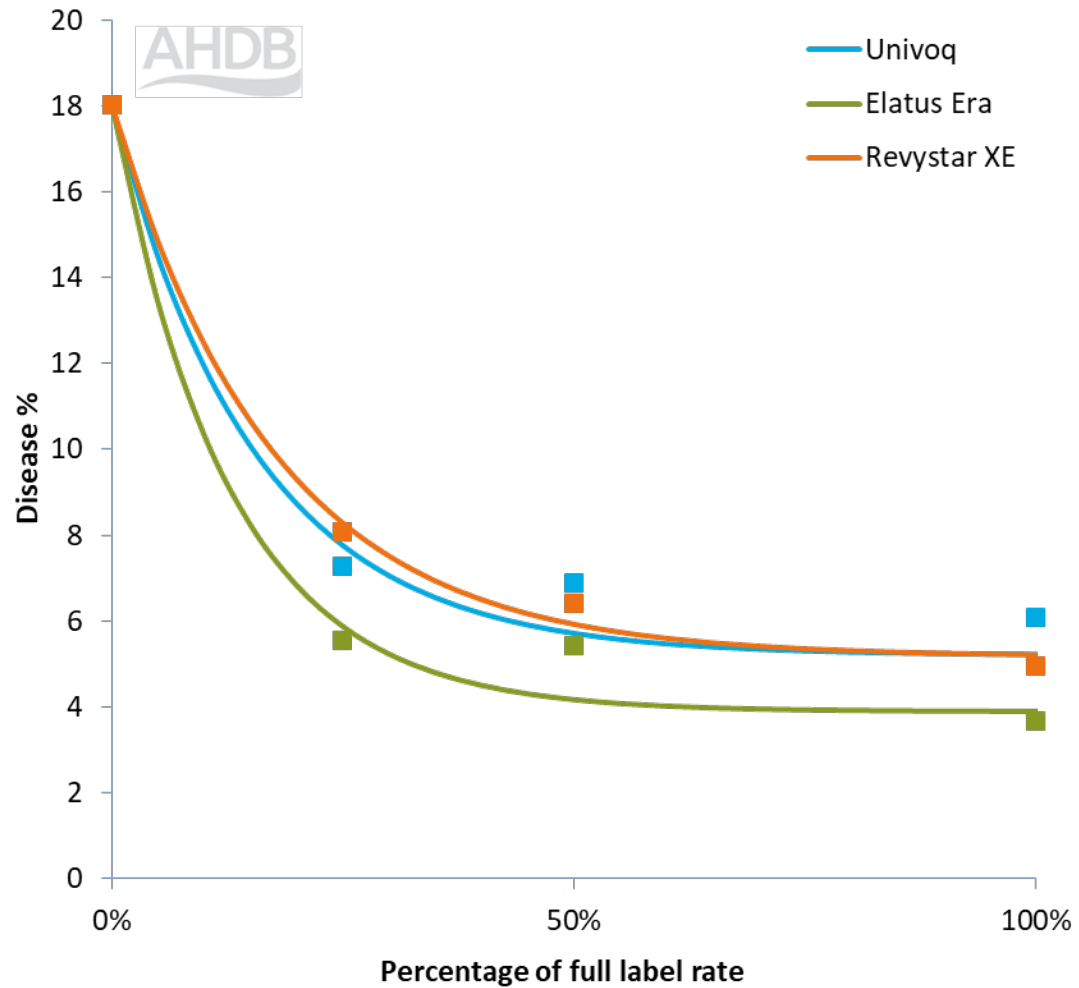
# Yellow rust (2022)



# Yellow rust 2022 (1 trial)

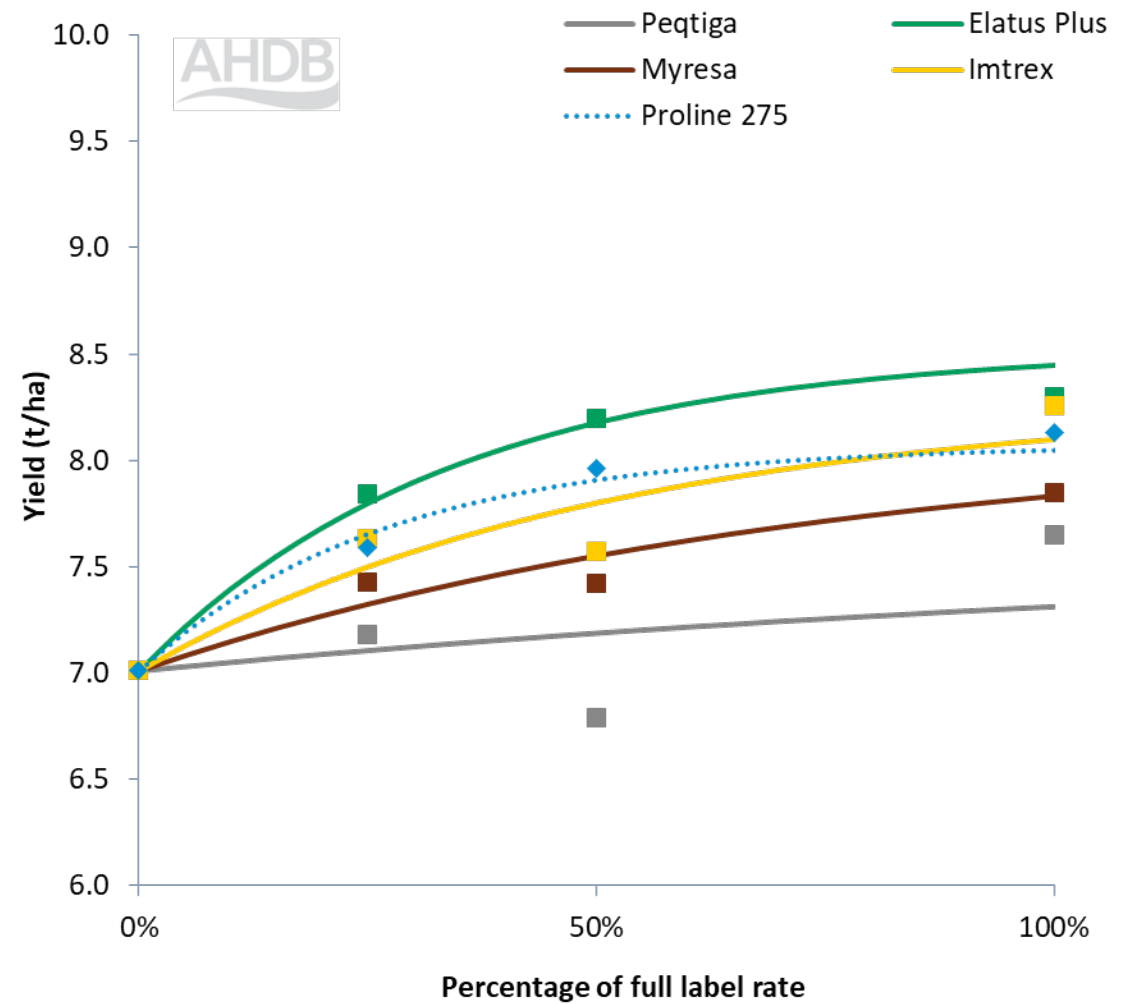
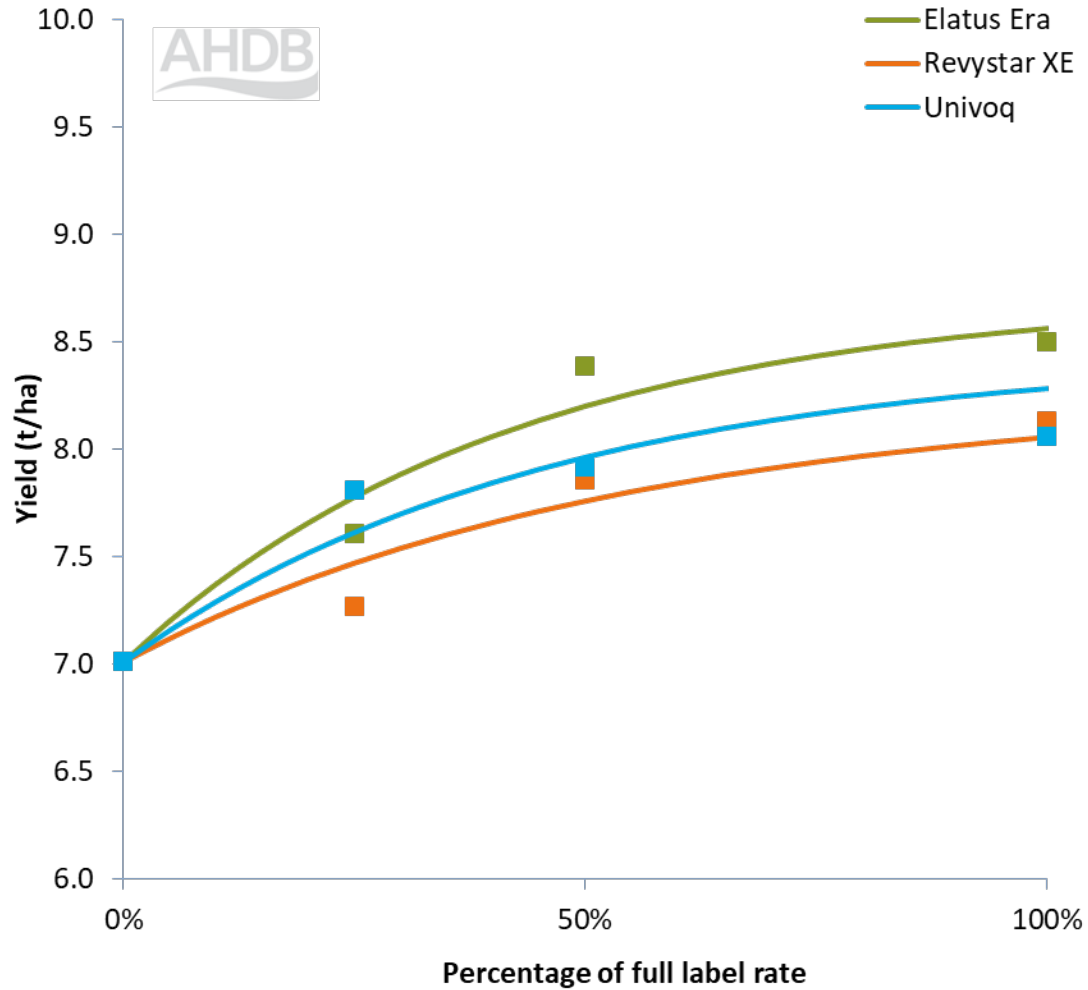


# Yellow rust 2020–22 (4 trials)

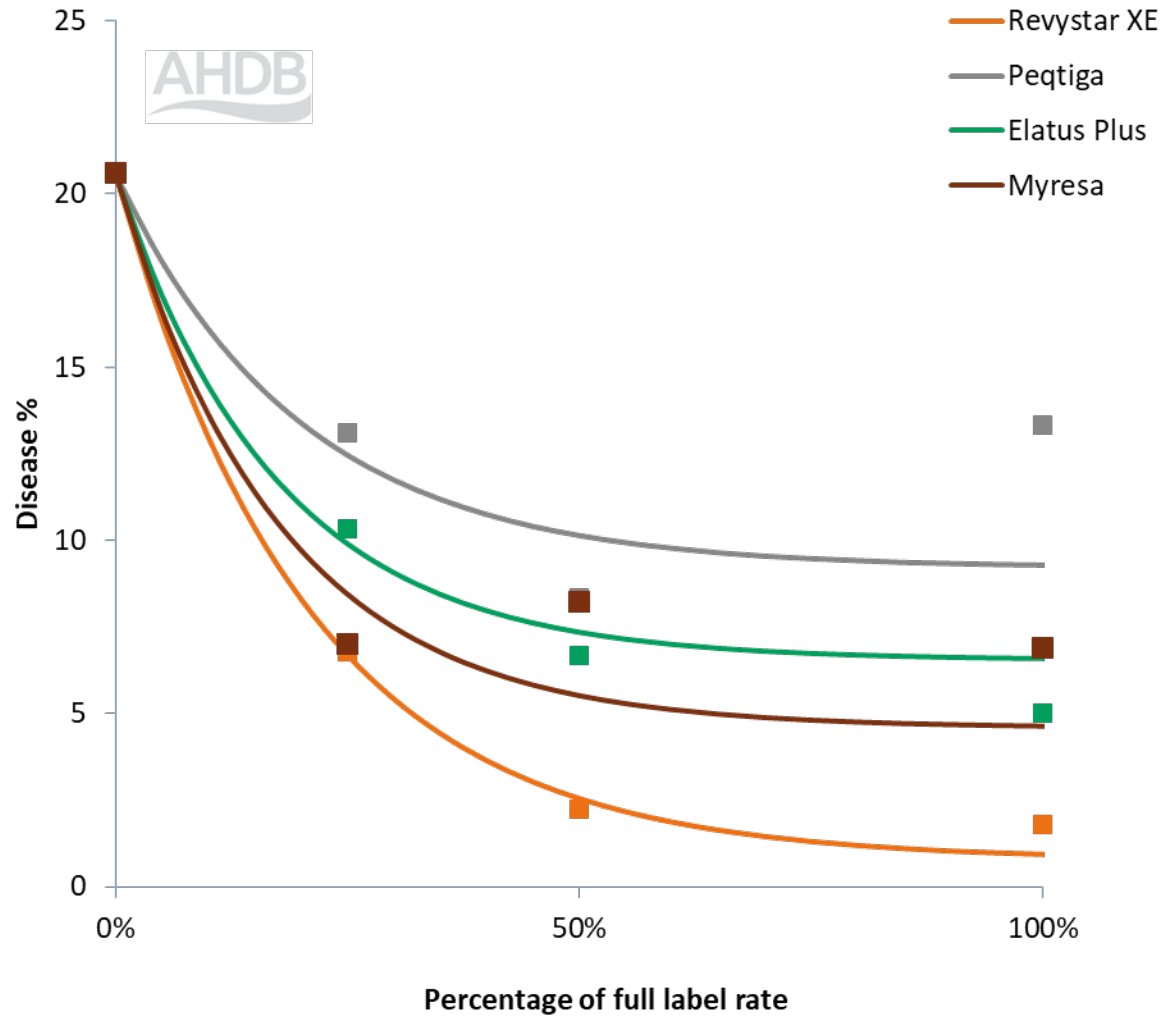




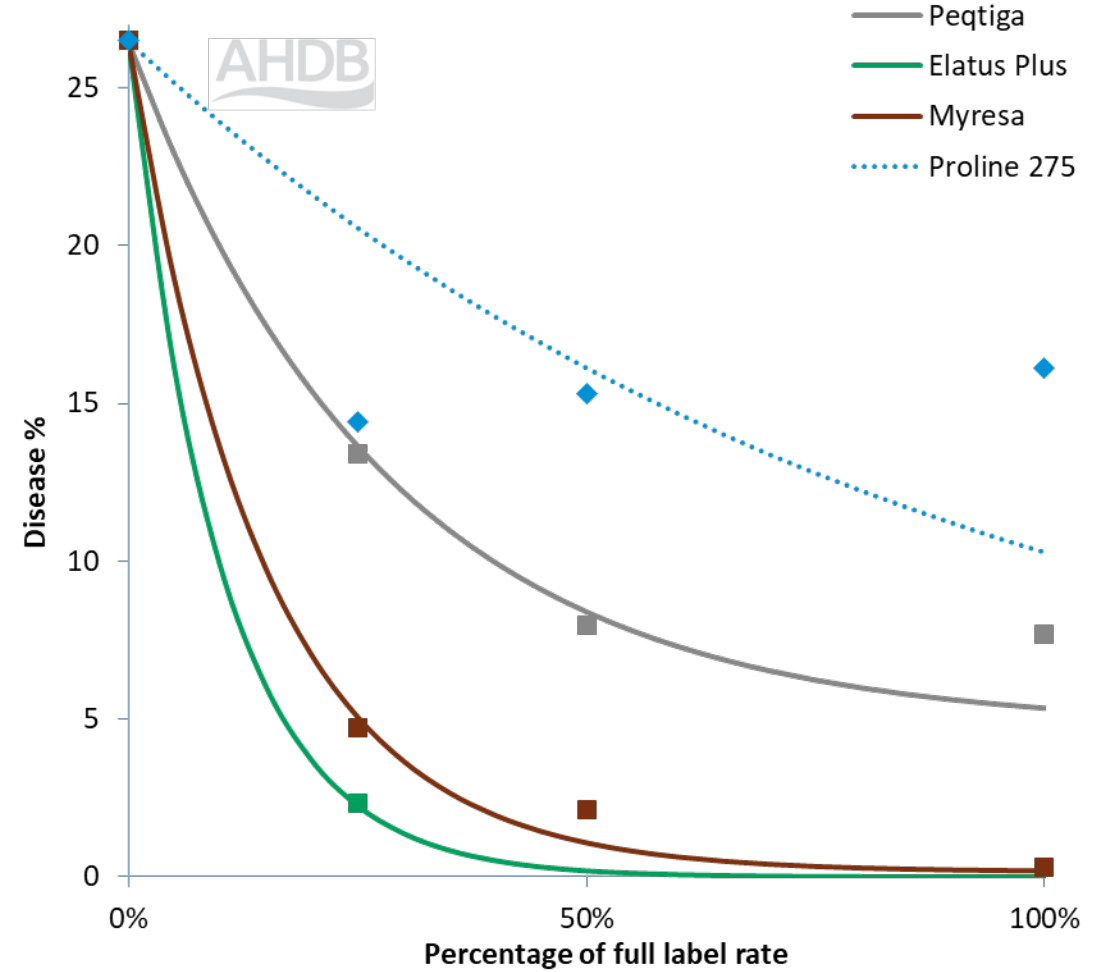
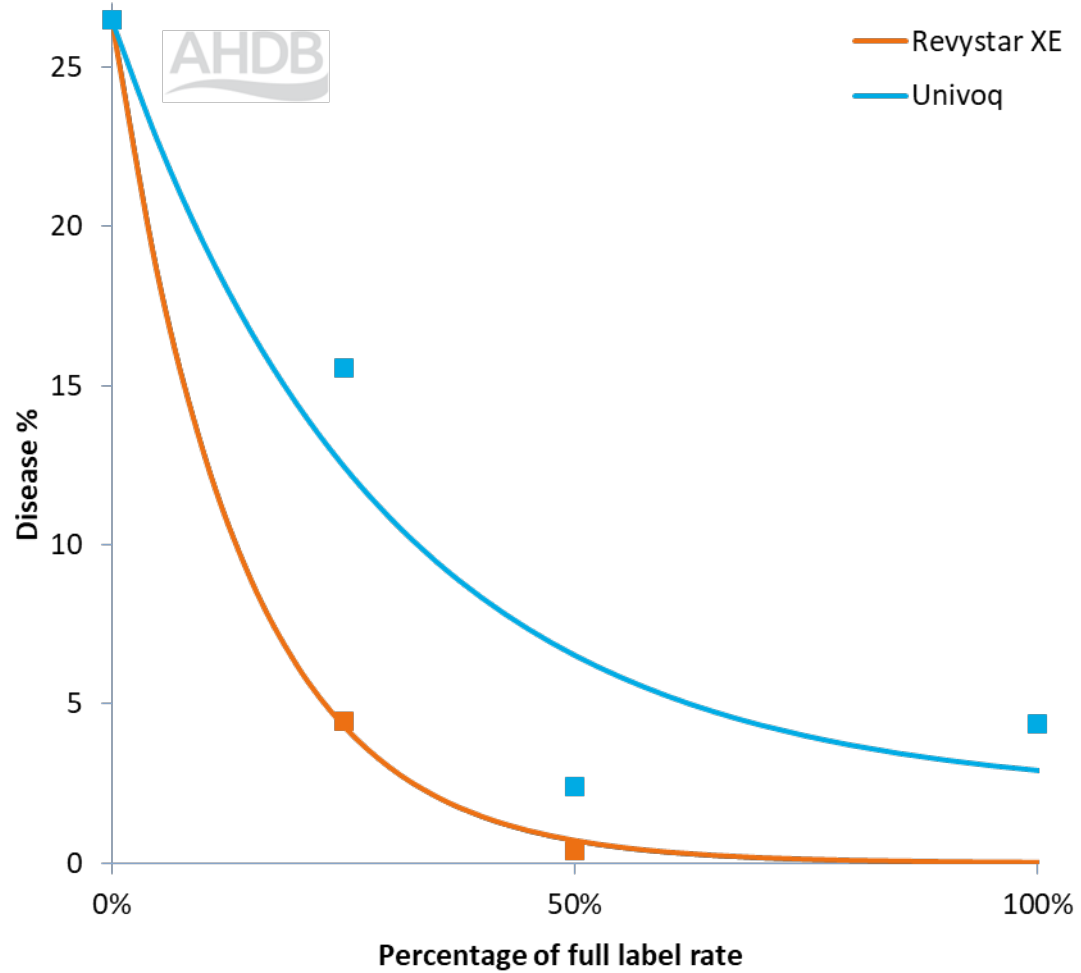
# Yellow rust yield 2020–22 (3 trials)



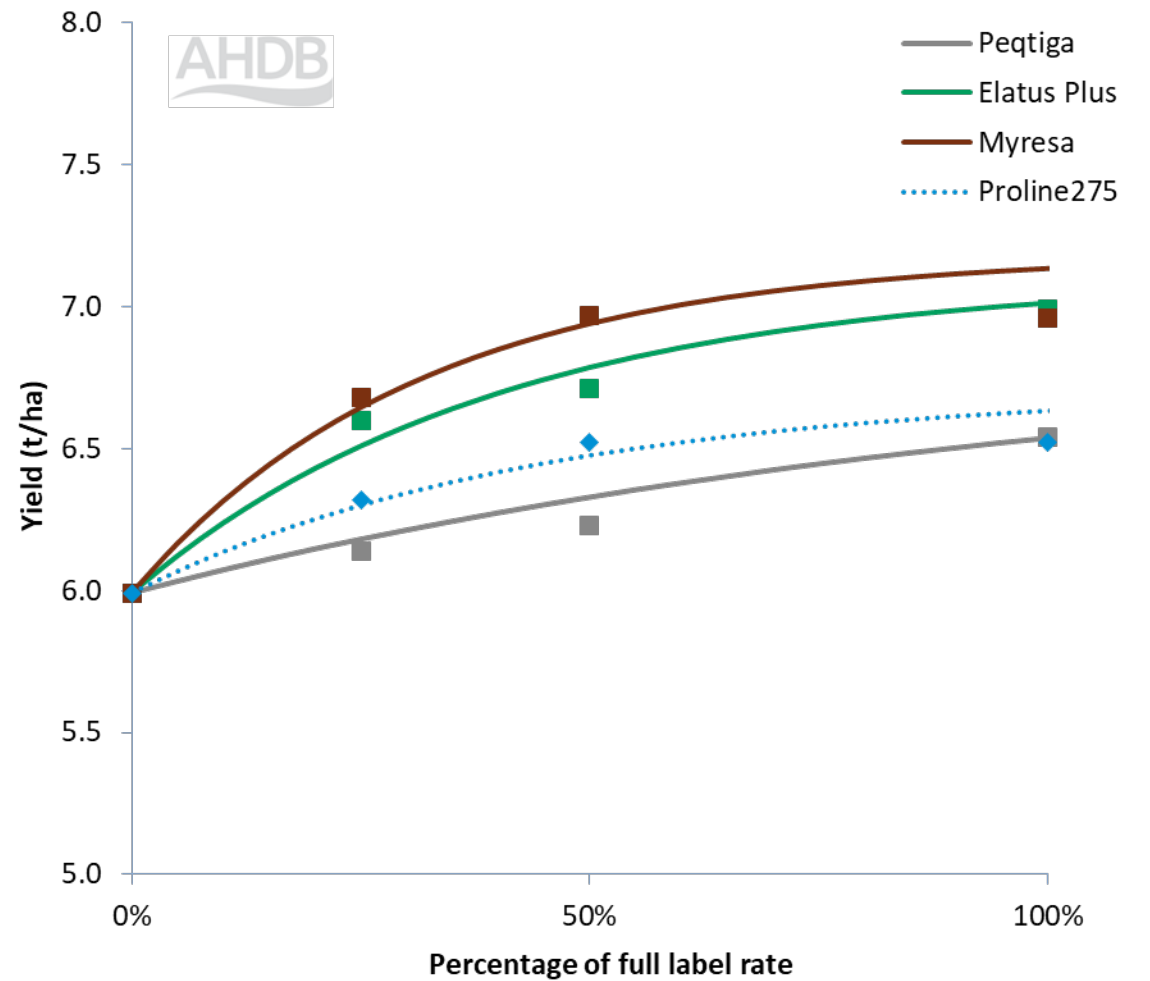
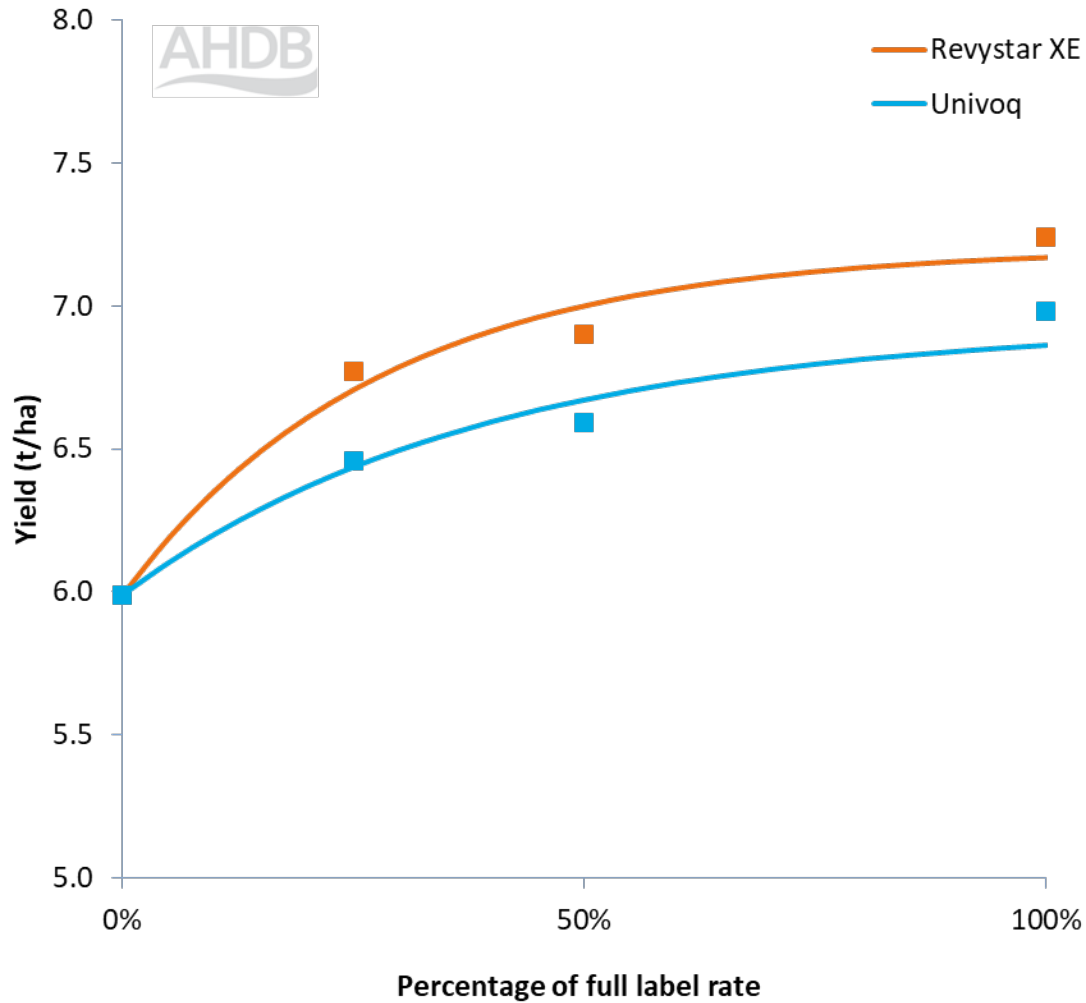
# Brown rust 2022 (1 trial)



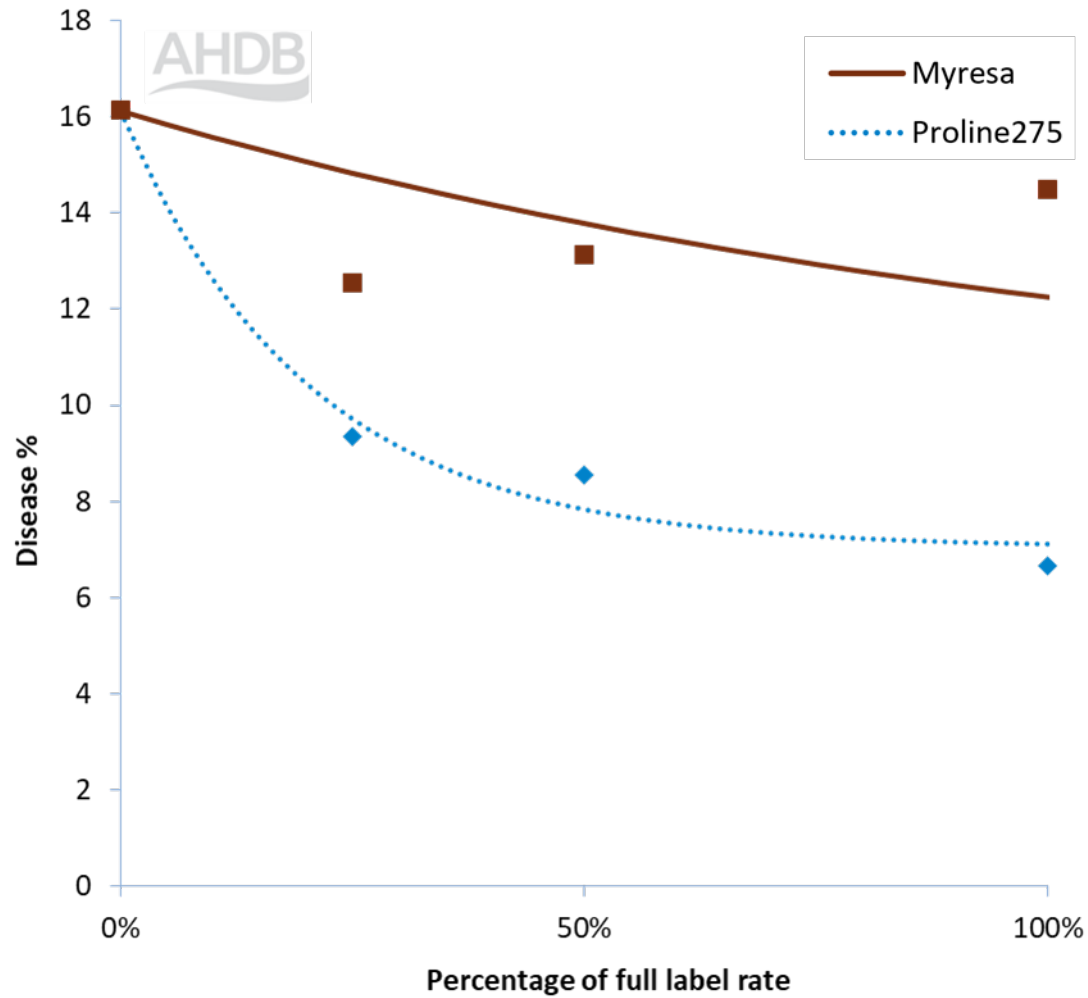
# Brown rust 2020–22 (3 trials)



# Brown rust yield 2020–22 (3 trials)



# Fusarium 2022 (1 trial)



# Wheat summary

- On septoria, mefentrifluconazole and fenpicoxamid are leading actives
  - Mixtures containing these actives give highest levels of activity
- On yellow rust, Elatus Era was particularly effective but all mixtures performed well
- Mefentrifluconazole and SDHIs tested were highly active on brown rust, fenpicoxamid and prothioconazole showed useful activity

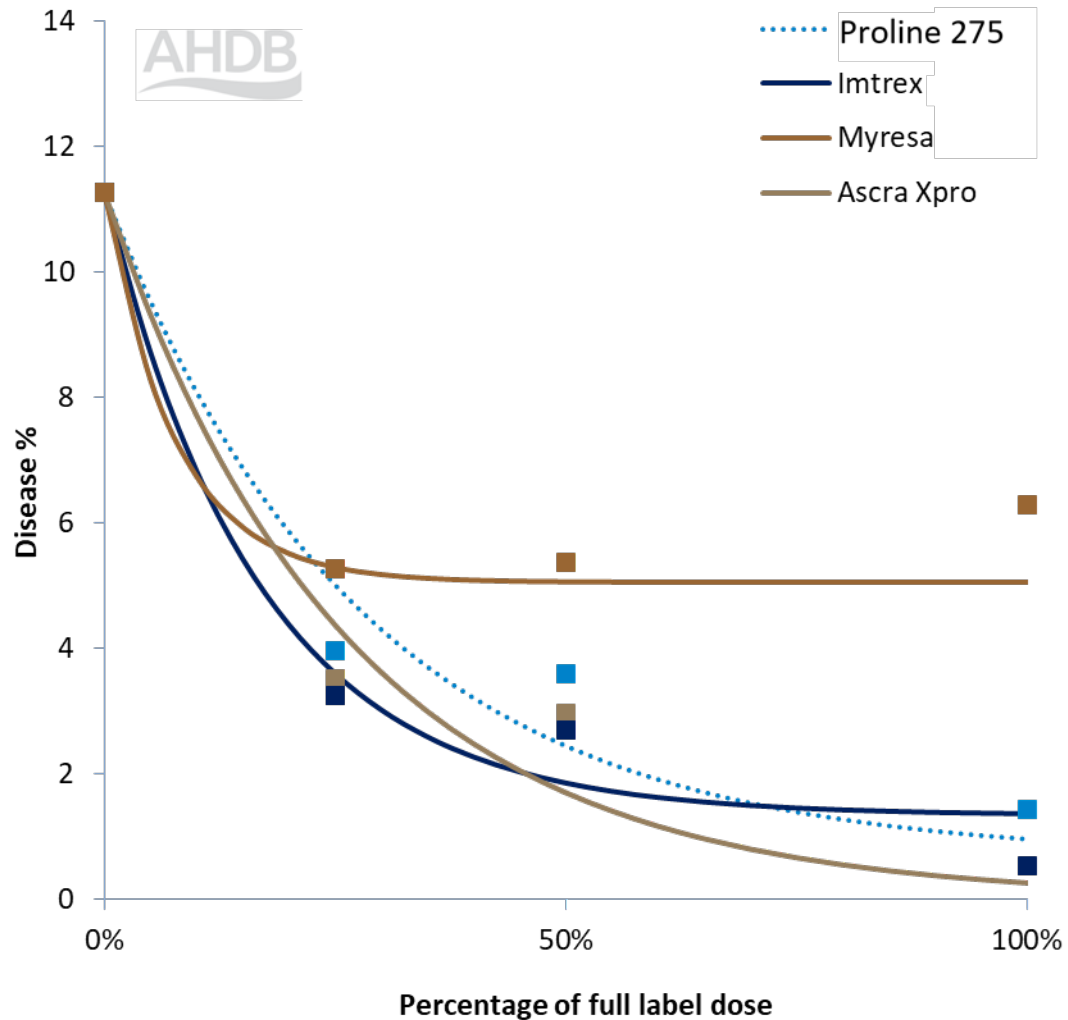
# Fungicide performance update for barley (2022)

# Barley trial sites (2022)

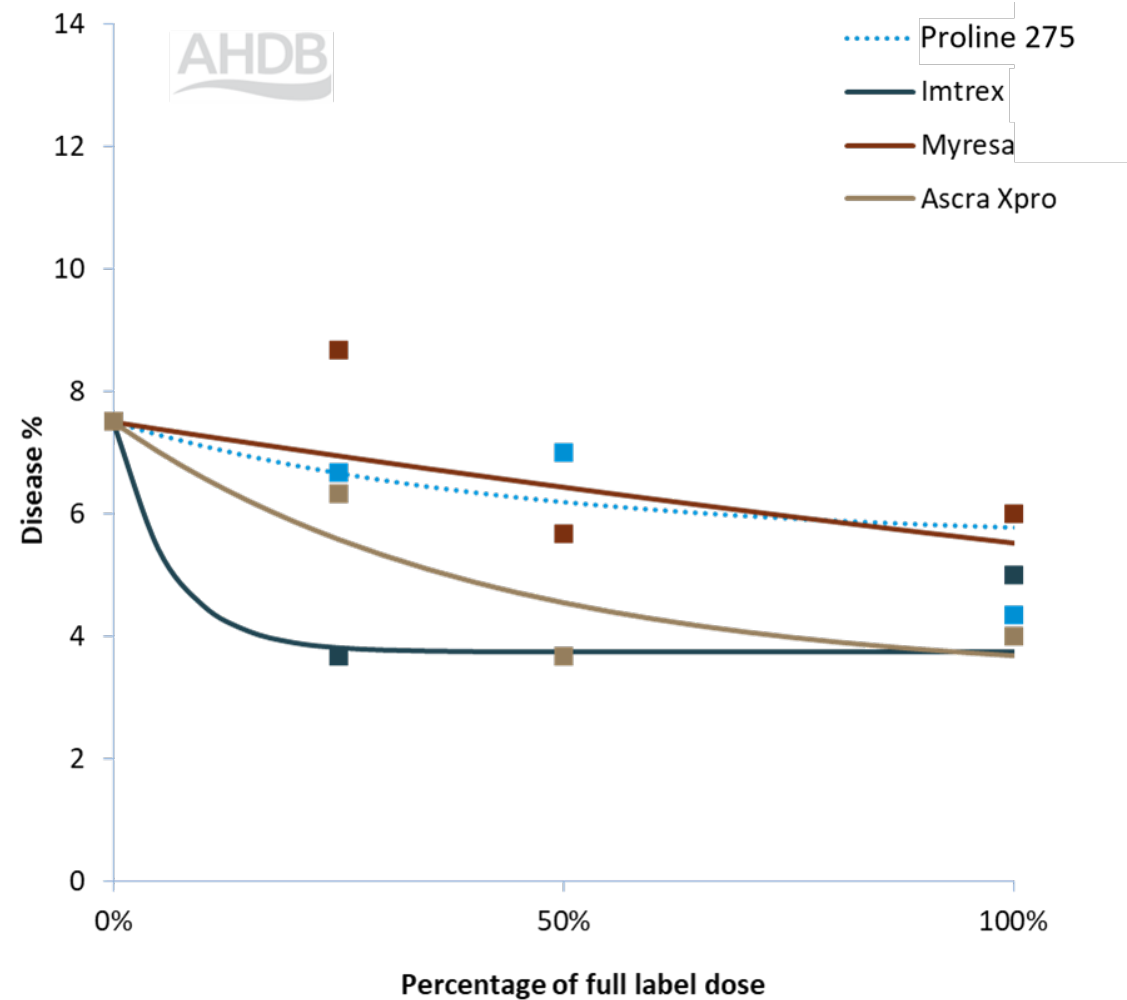
Trial site		Target disease
1	Lanark T1	Rhynchosporium
3	Cardigan T1	Rhynchosporium
4	High Mowthorpe T2	Net blotch
5	Morley T2	Net blotch
6	Midlothian T2	Ramularia
7	Carlow T1.5	Rhynchosporium
8	Carlow T2	Ramularia
9	Powys T1.5	Rhynchosporium



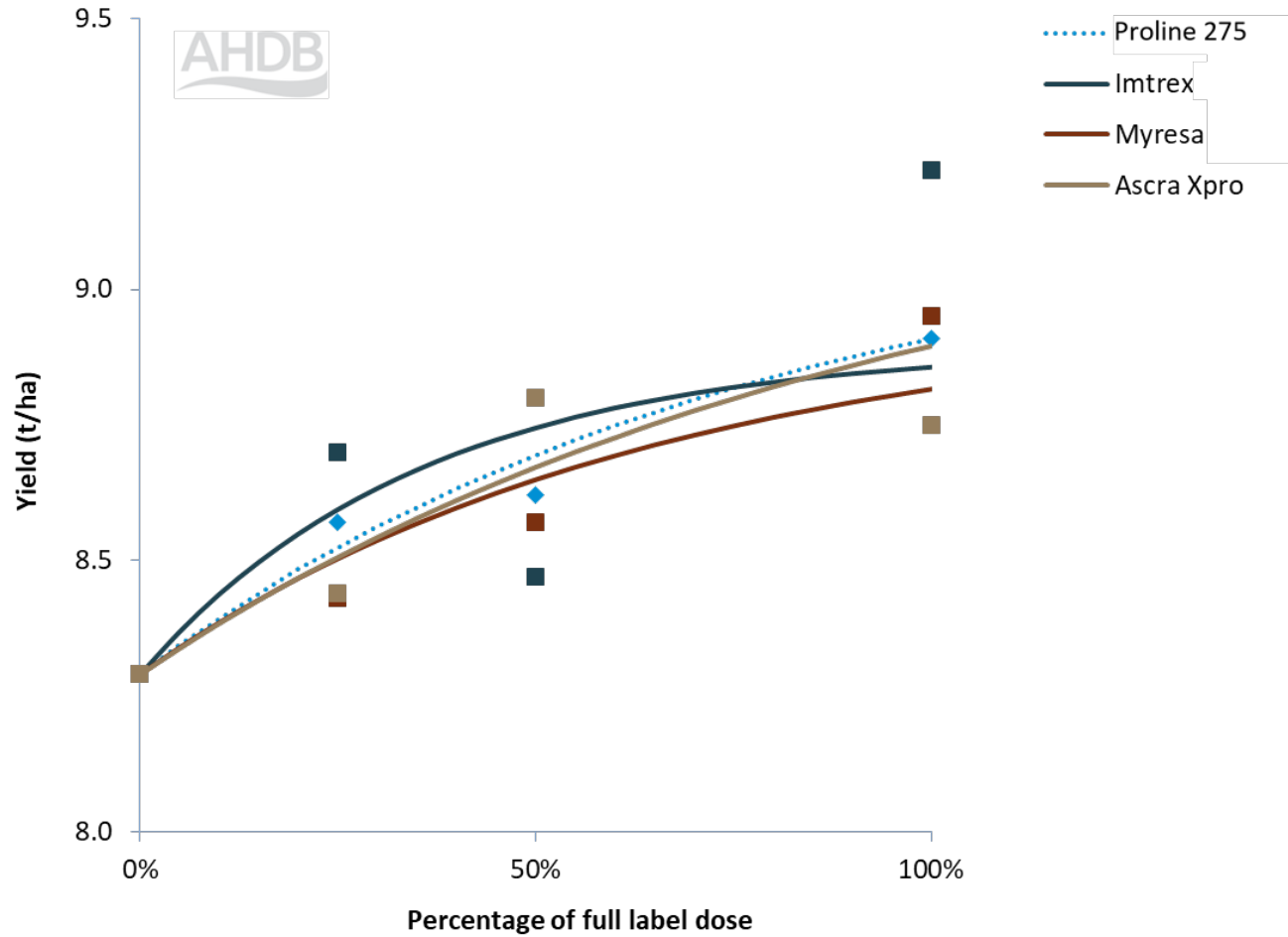
# Rhynchosporium protectant 2022 (2 trials)



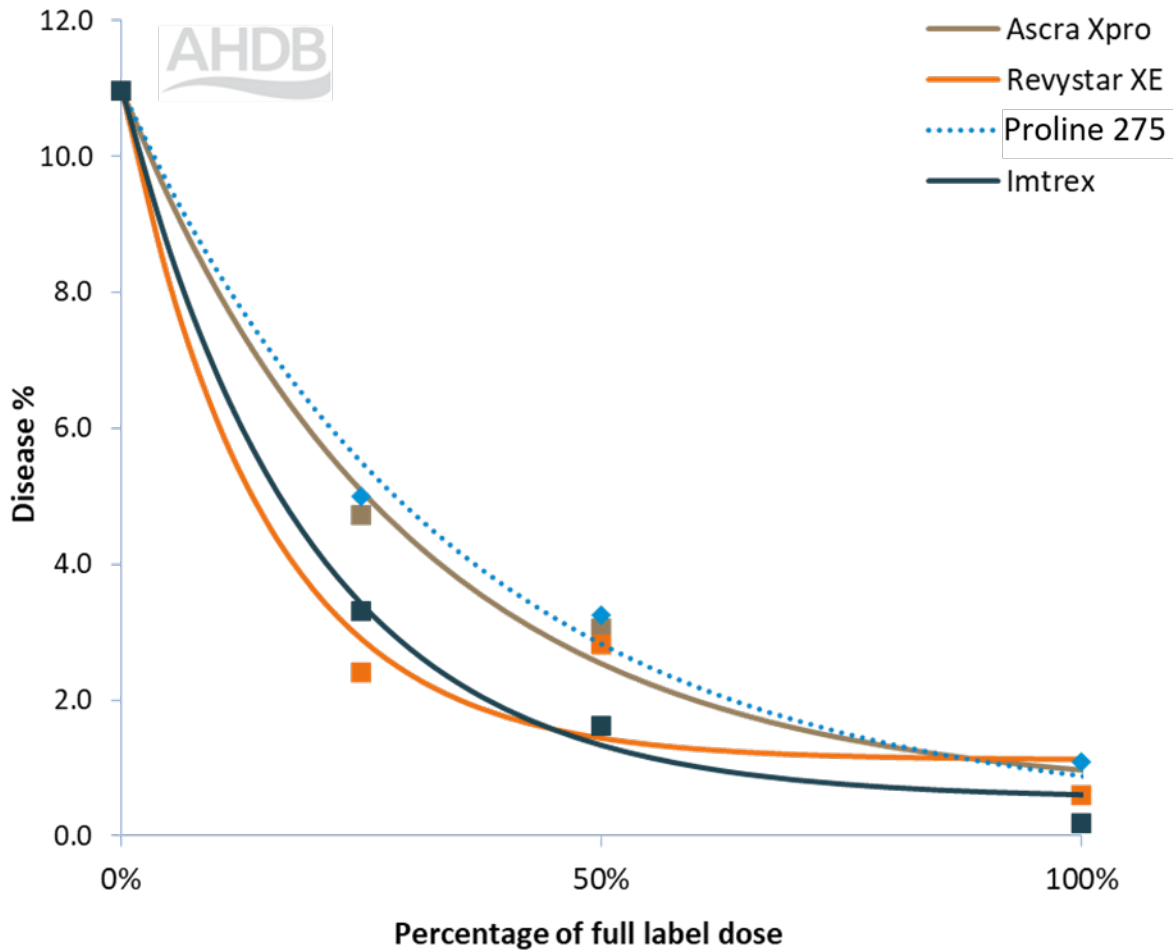
# Rhynchosporium eradicator 2022 (1 trial)



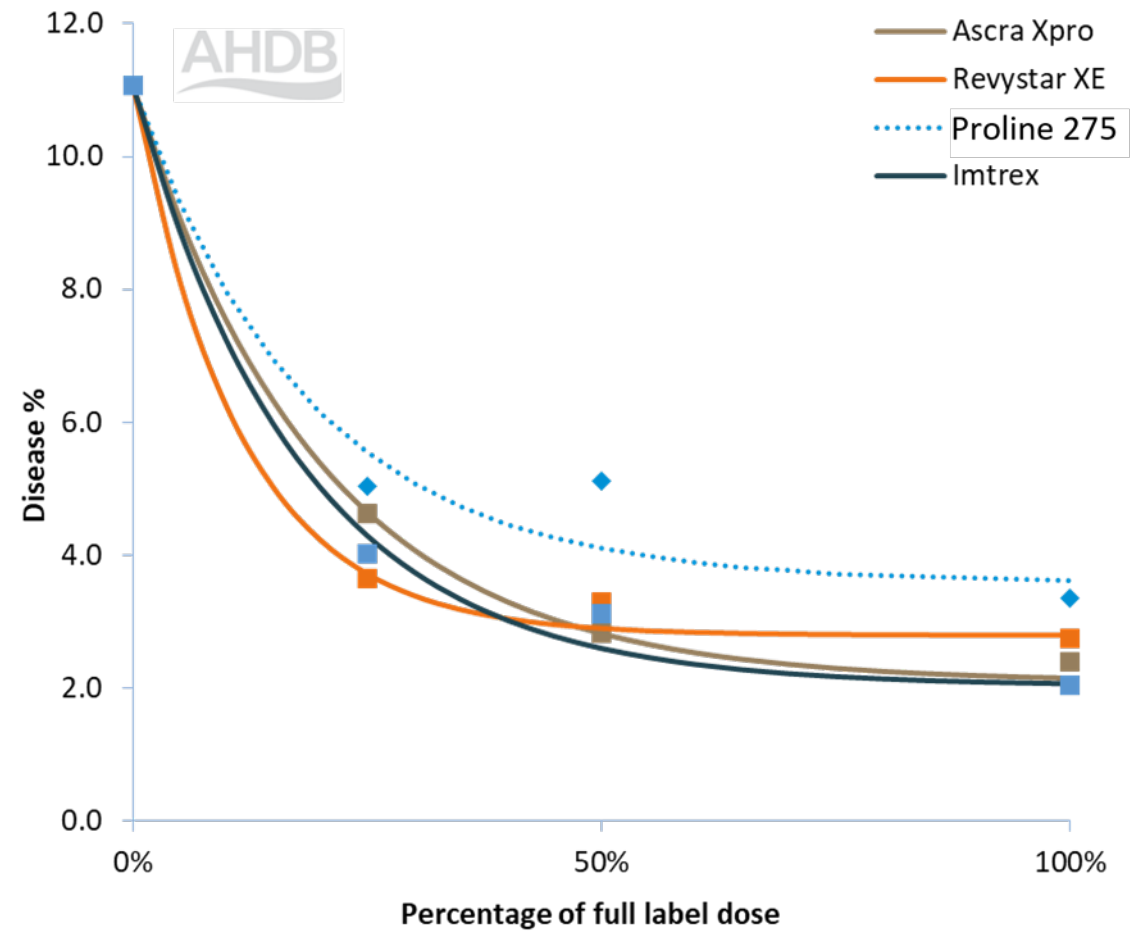
# Rhynchosporium yield 2022 (2 trials)



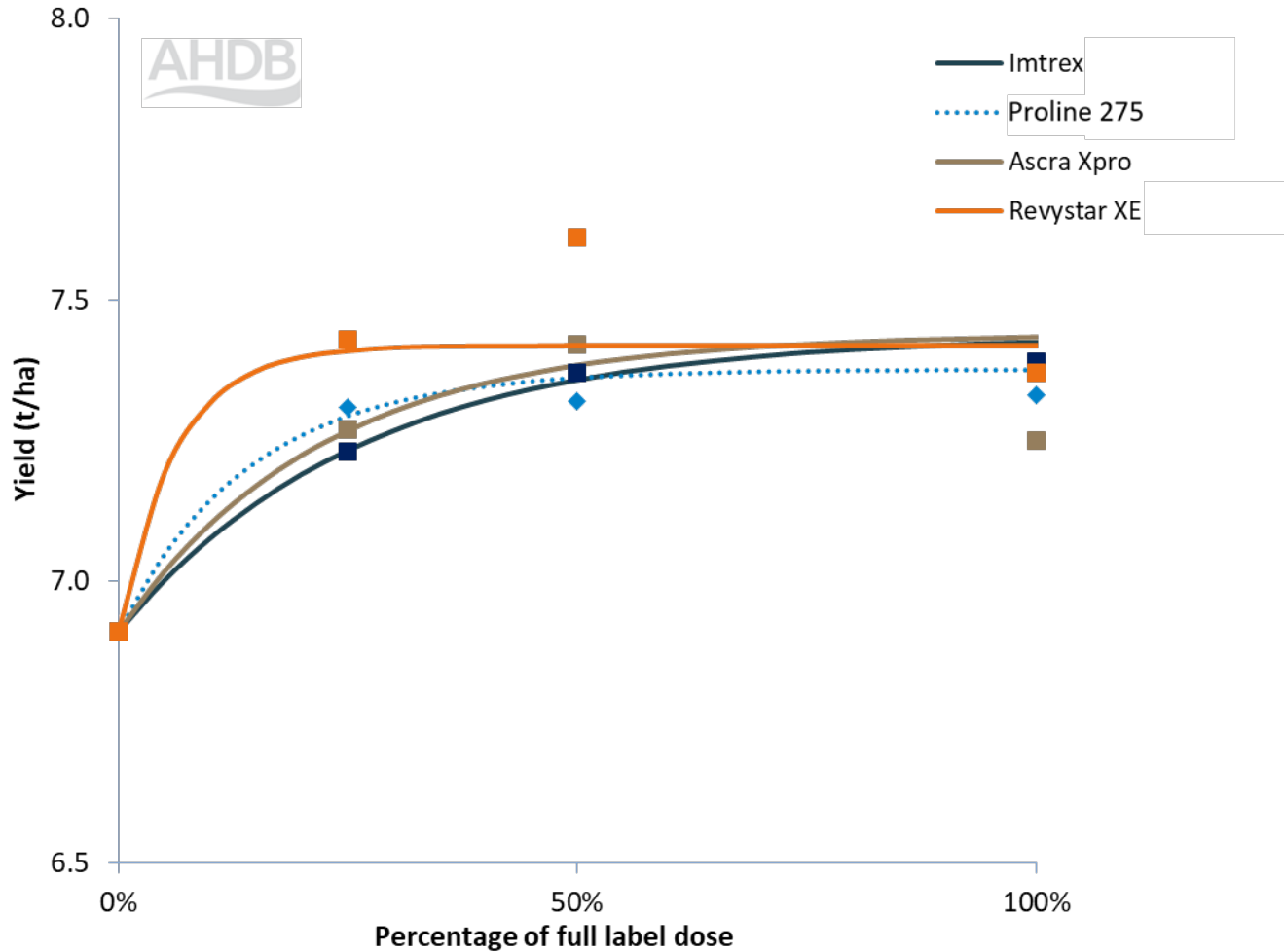
# Rhynchosporium protectant 2021–22 (4 trials)



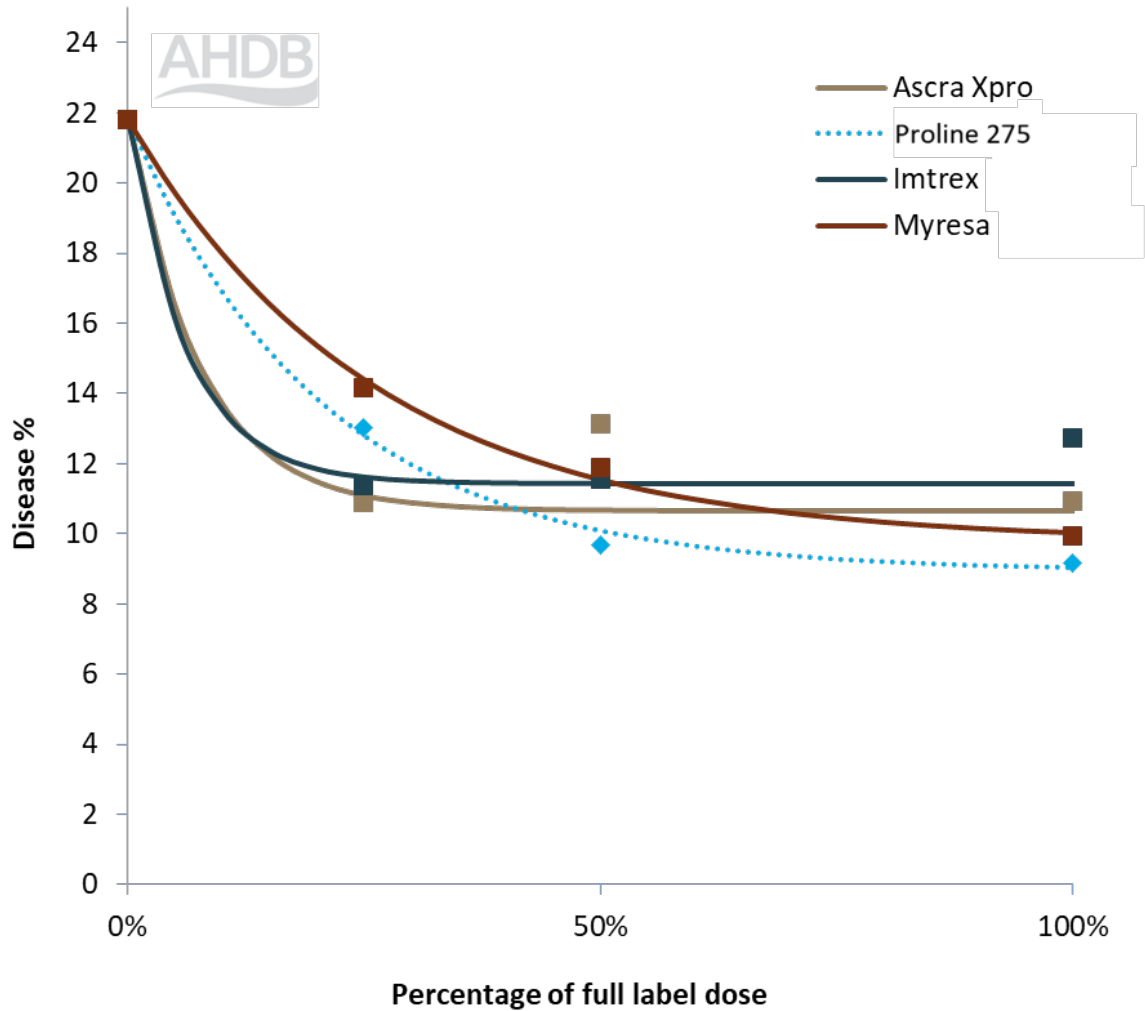
# Rhynchosporium eradicator 2020–22 (6 trials)



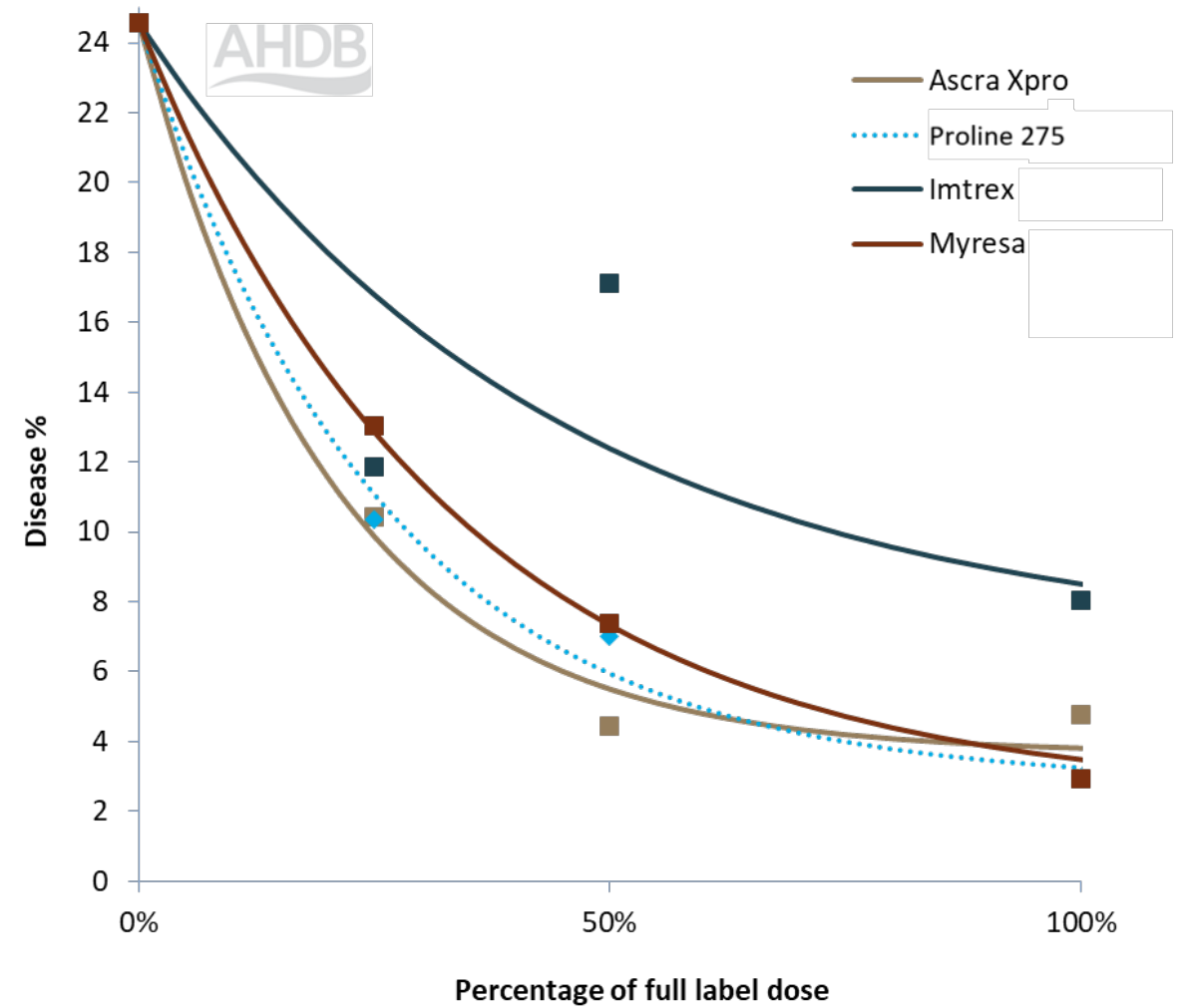
# Rhynchosporium yield 2020–22 (8 trials)



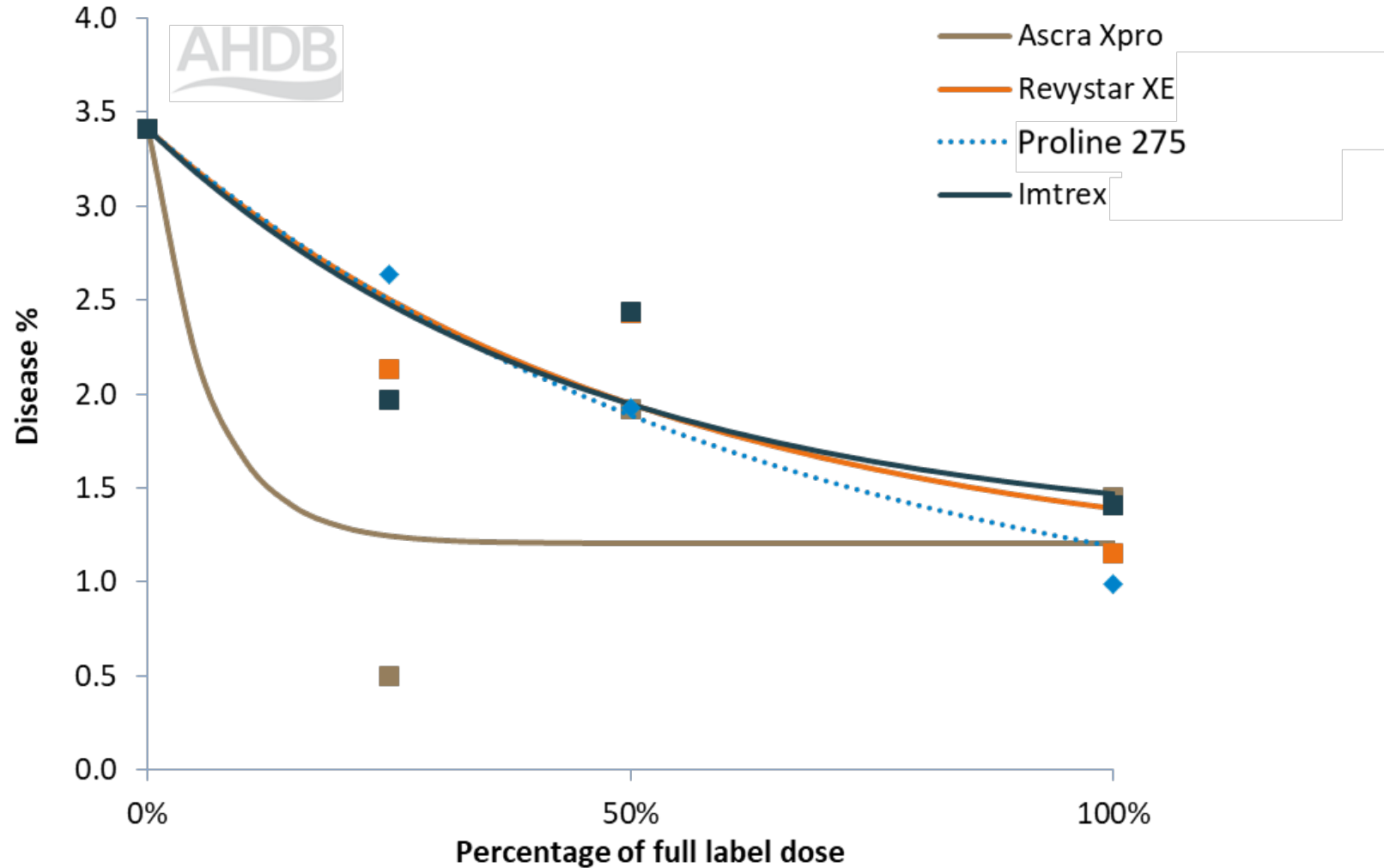
# Net blotch protectant 2022 (1 trial)



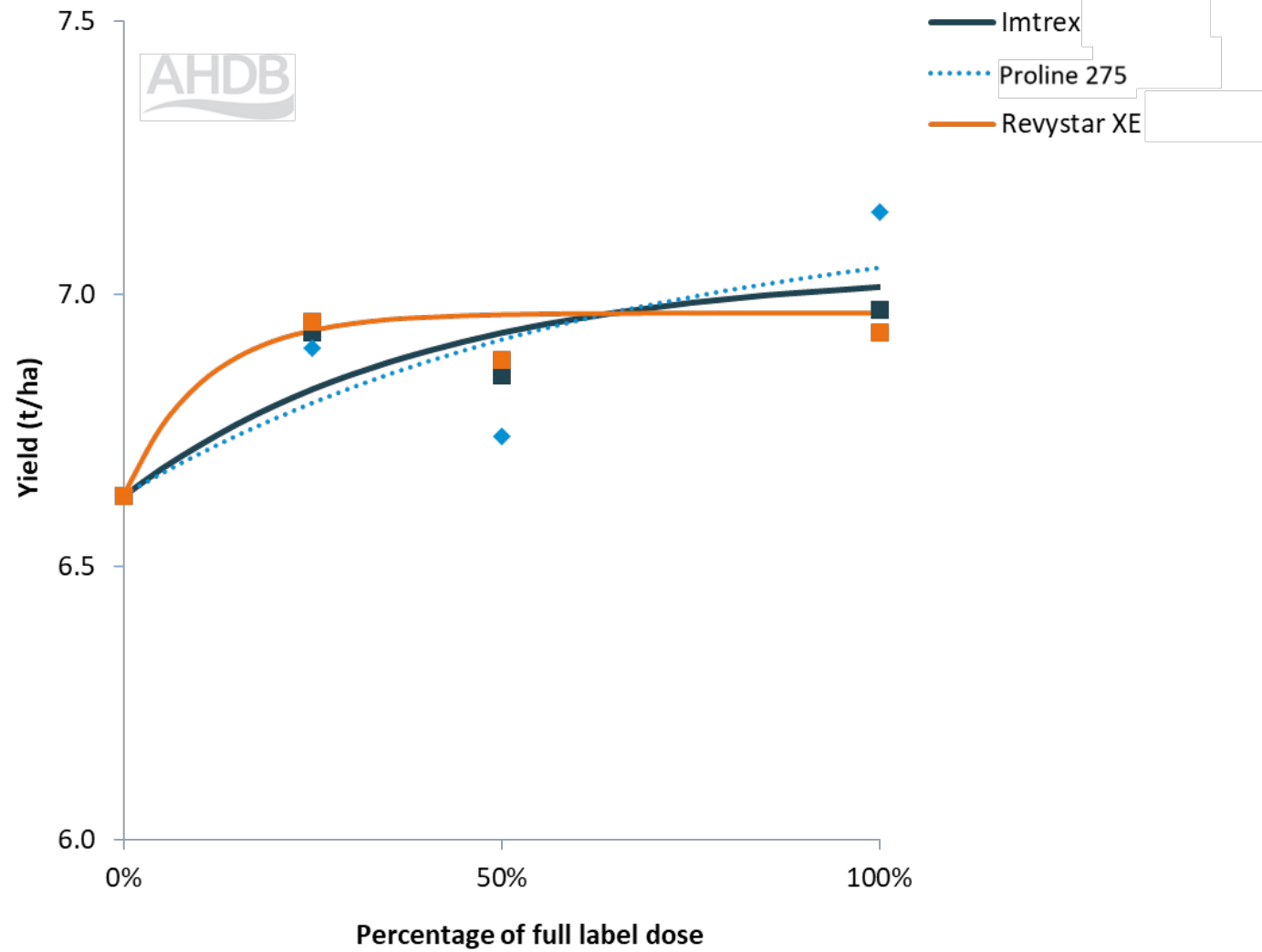
# Net blotch eradicant 2022 (1 trial)



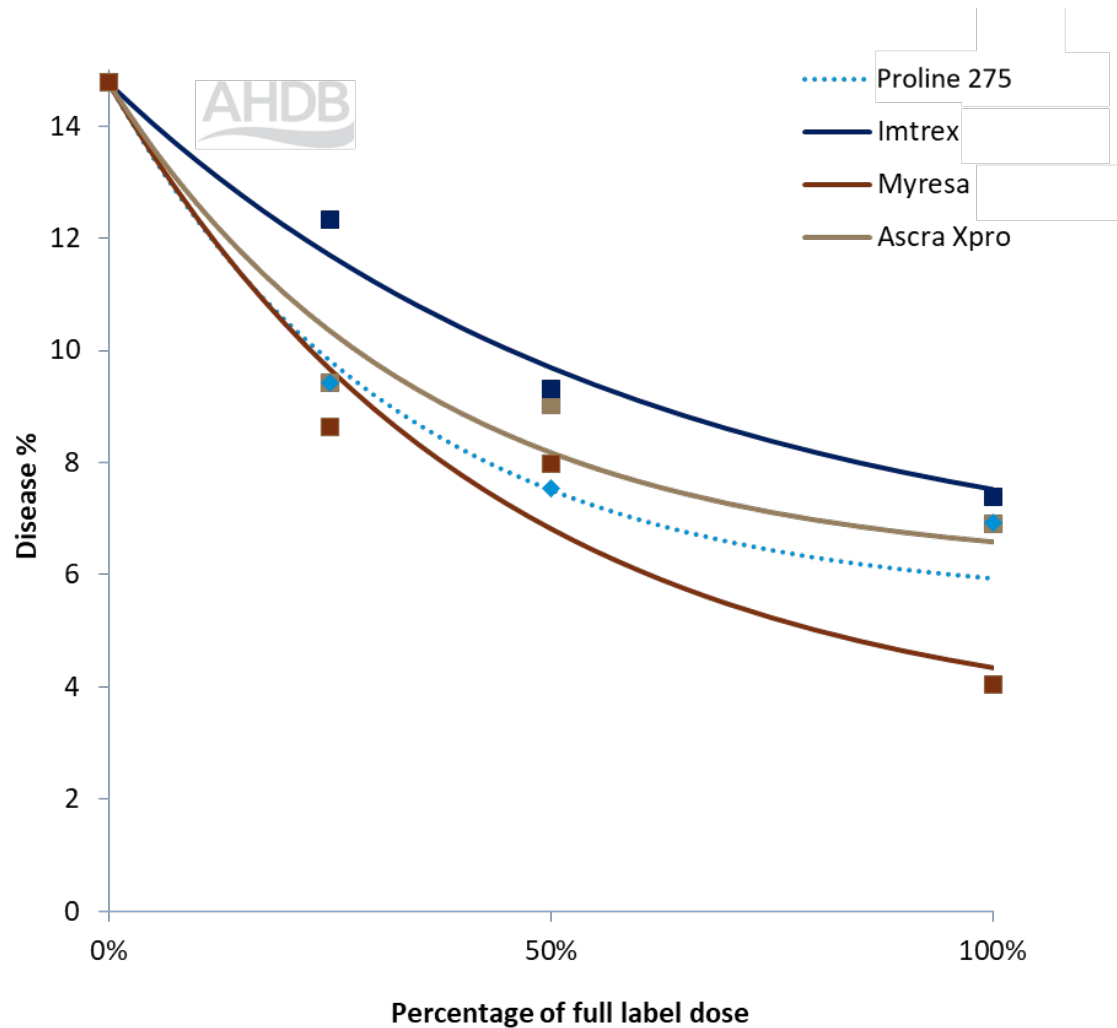
# Net blotch eradicator 2020–22 (3 trials)



# Net blotch yield (winter barley) 2020–22 (2 trials)

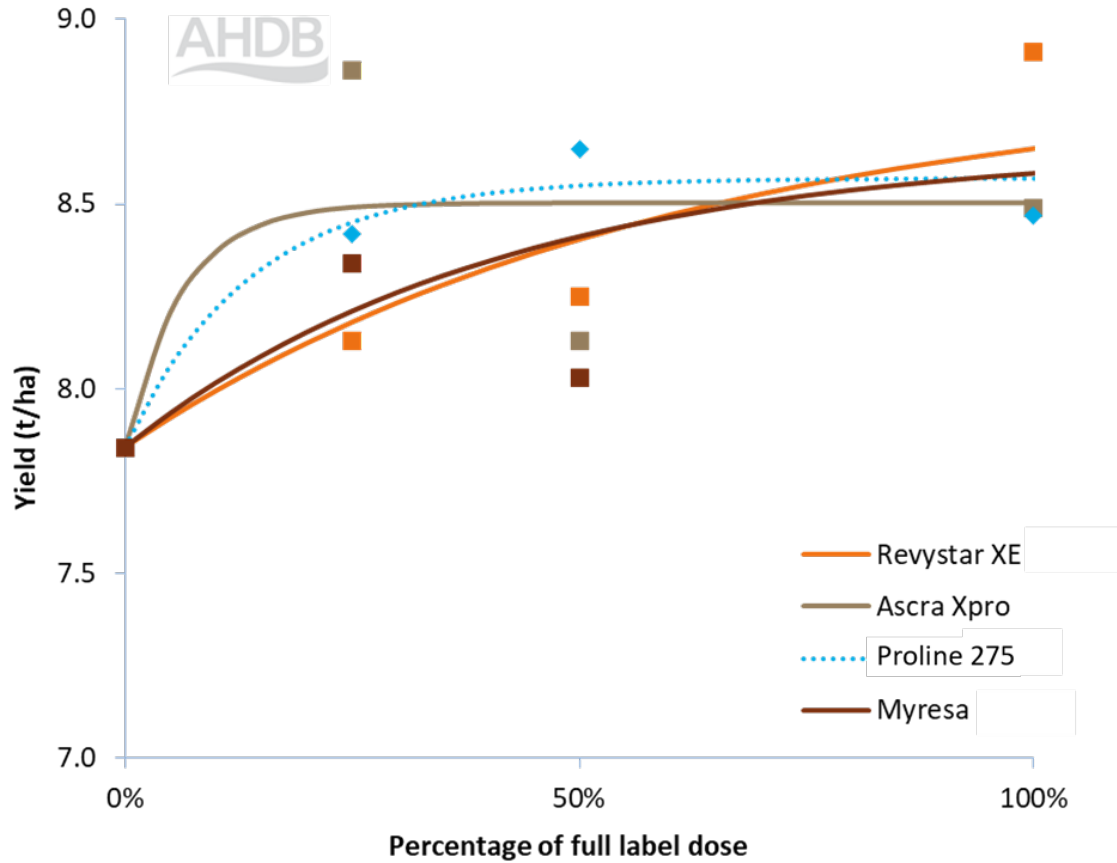


# Ramularia protectant 2022 (4 trials)

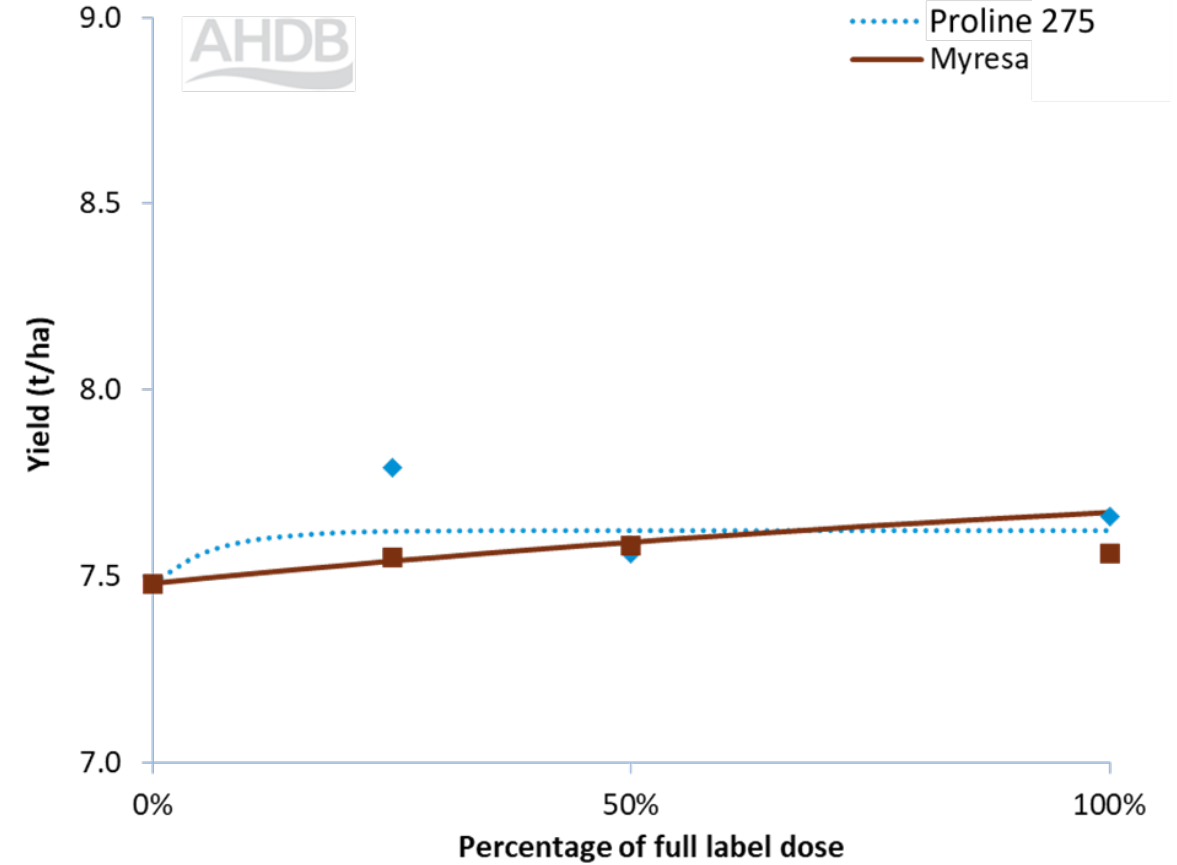




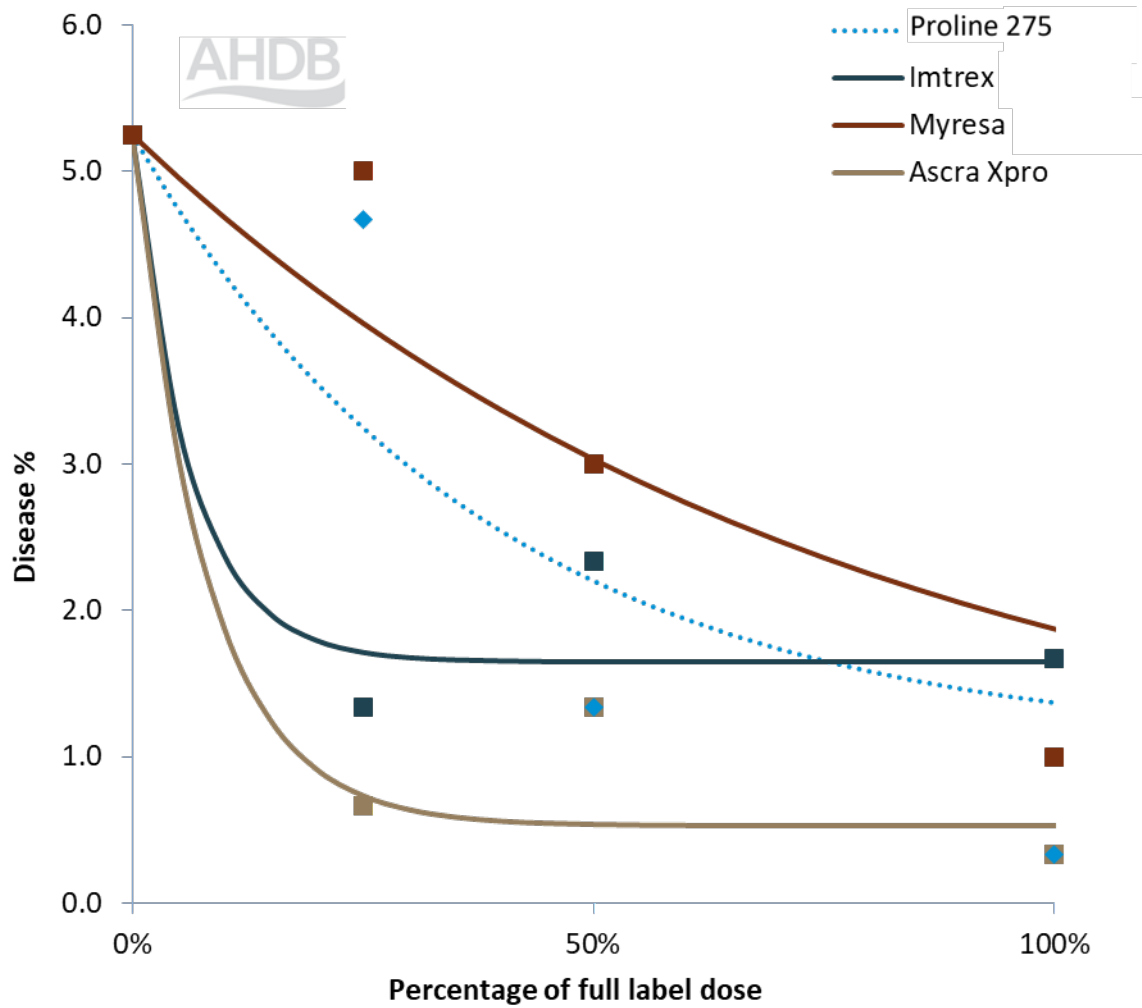
# Winter barley ramularia yield 2020–22 (4 trials)



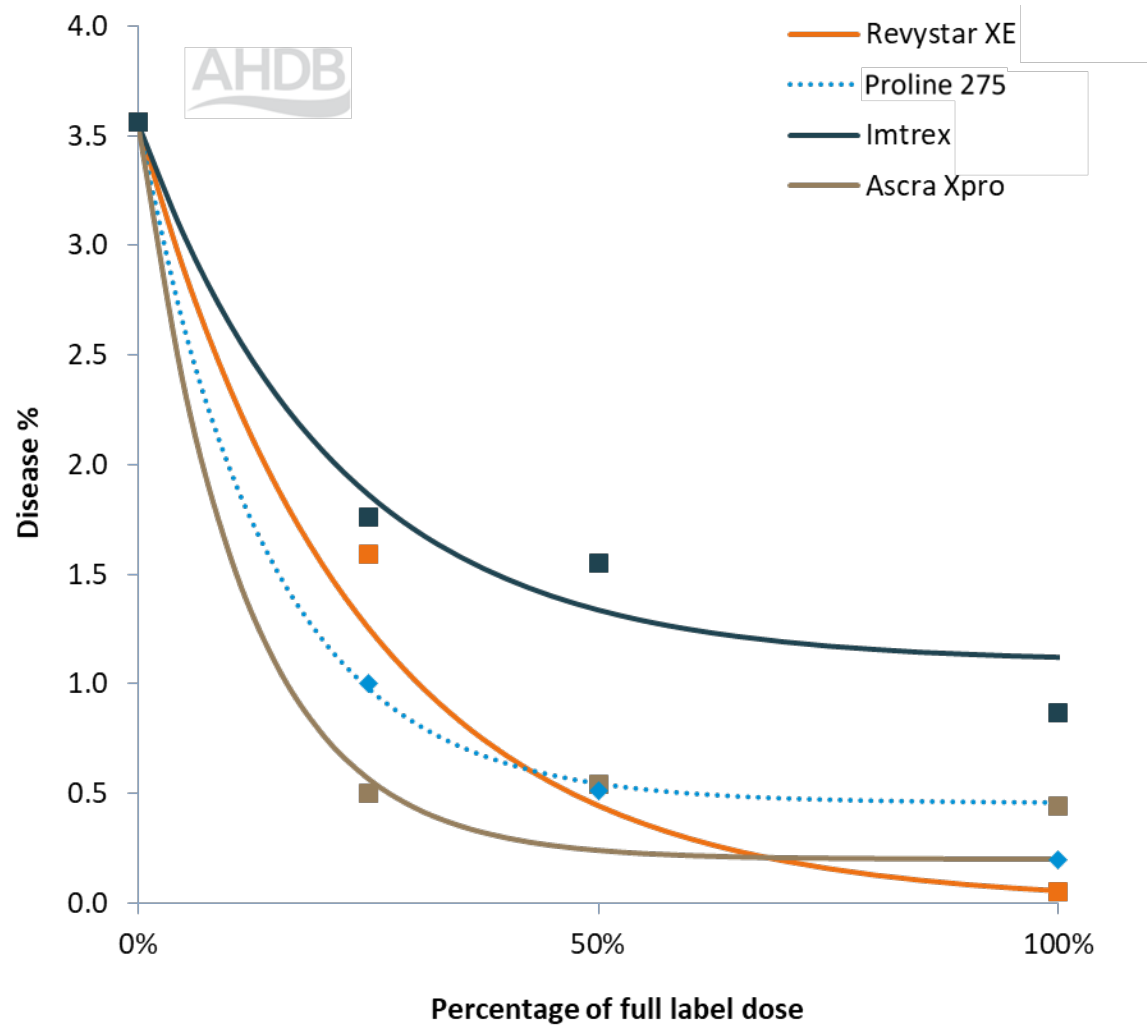
# Spring barley ramularia yield 2021–22 (2 trials)



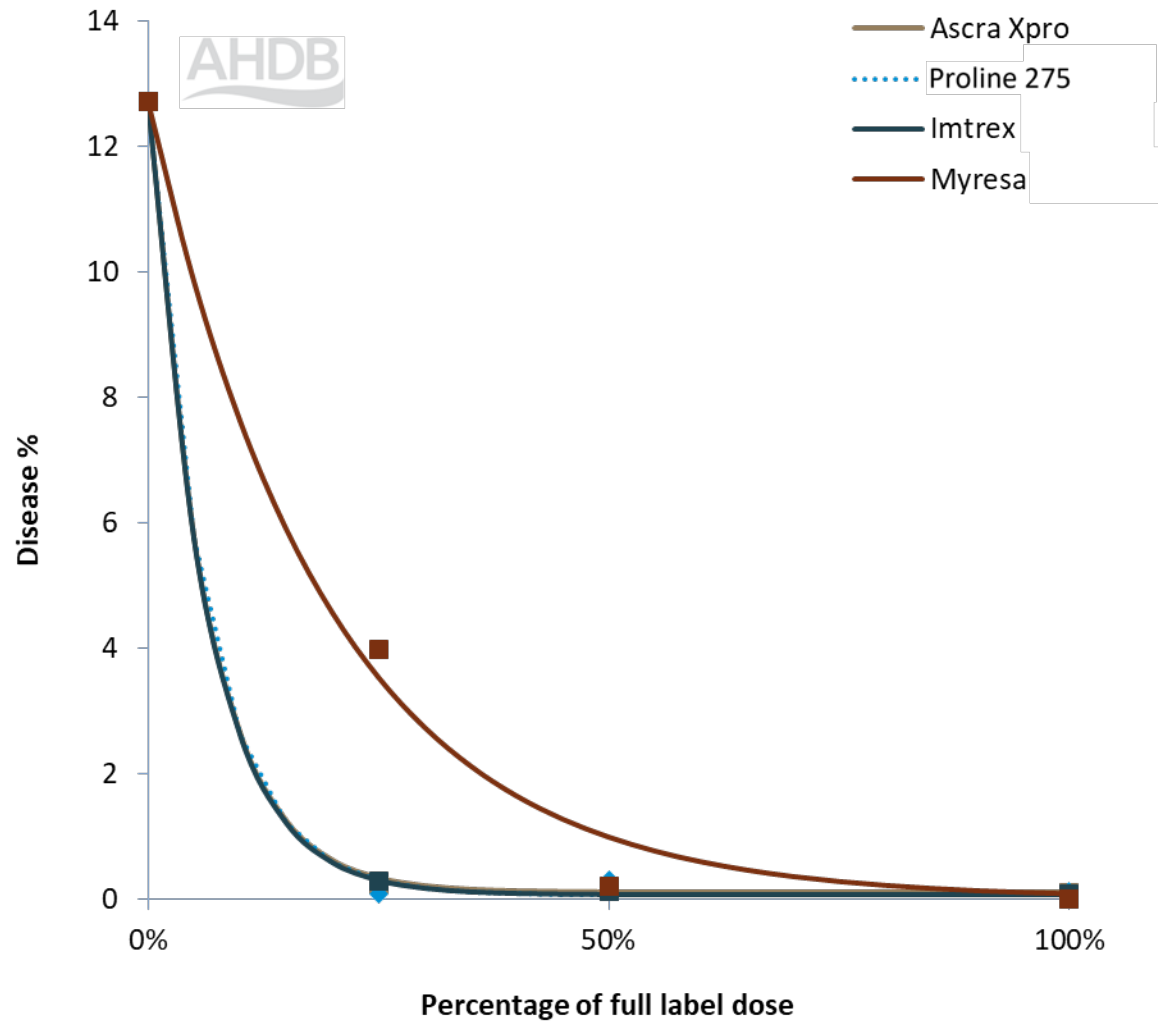
# Mildew 2022 (1 trial)



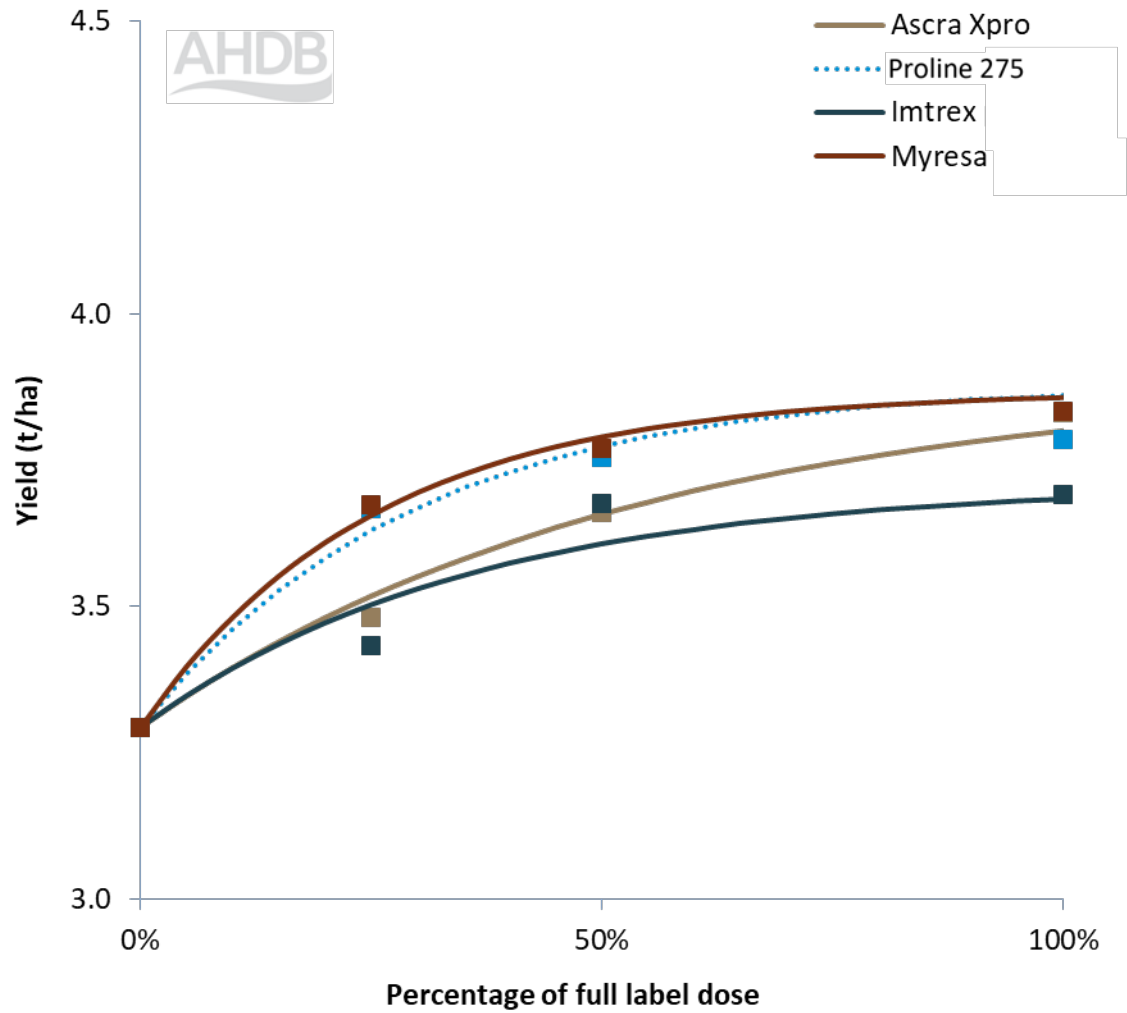
# Mildew 2020–22 (4 trials)



# Brust rust 2022 (1 trial)



# Brown rust yield 2022 (1 trial)



# Barley summary

- Prothioconazole, fluxapyroxad and mefentrifluconazole gave effective rhynchosporium control, particularly when used in a protectant situation
- A mix of actives (as in Ascra Xpro and Revystar XE) was more effective than straight products and is also an effective anti-resistance strategy
- Prothioconazole and mefentrifluconazole gave reductions in ramularia. Fluxapyroxad was less effective than the azoles tested
- Brown rust was well controlled by all fungicides tested
- For mildew, SDHIs, fluopyram, and bixafen add useful protectant activity (in Ascra Xpro). Good control also from Revystar XE
- For net blotch, azoles add useful activity to SDHIs



# Fungicide performance update for oilseed rape (2022)

# Fungicide performance in oilseed rape

Trial site	Target disease	Variety
Herefordshire (ADAS)	Phoma stem canker	Flamingo
Norfolk (ADAS)	Phoma stem canker	Flamingo
North Yorkshire (ADAS)	Light leaf spot	DK Expedient
Midlothian (SRUC)	Light leaf spot	Campus

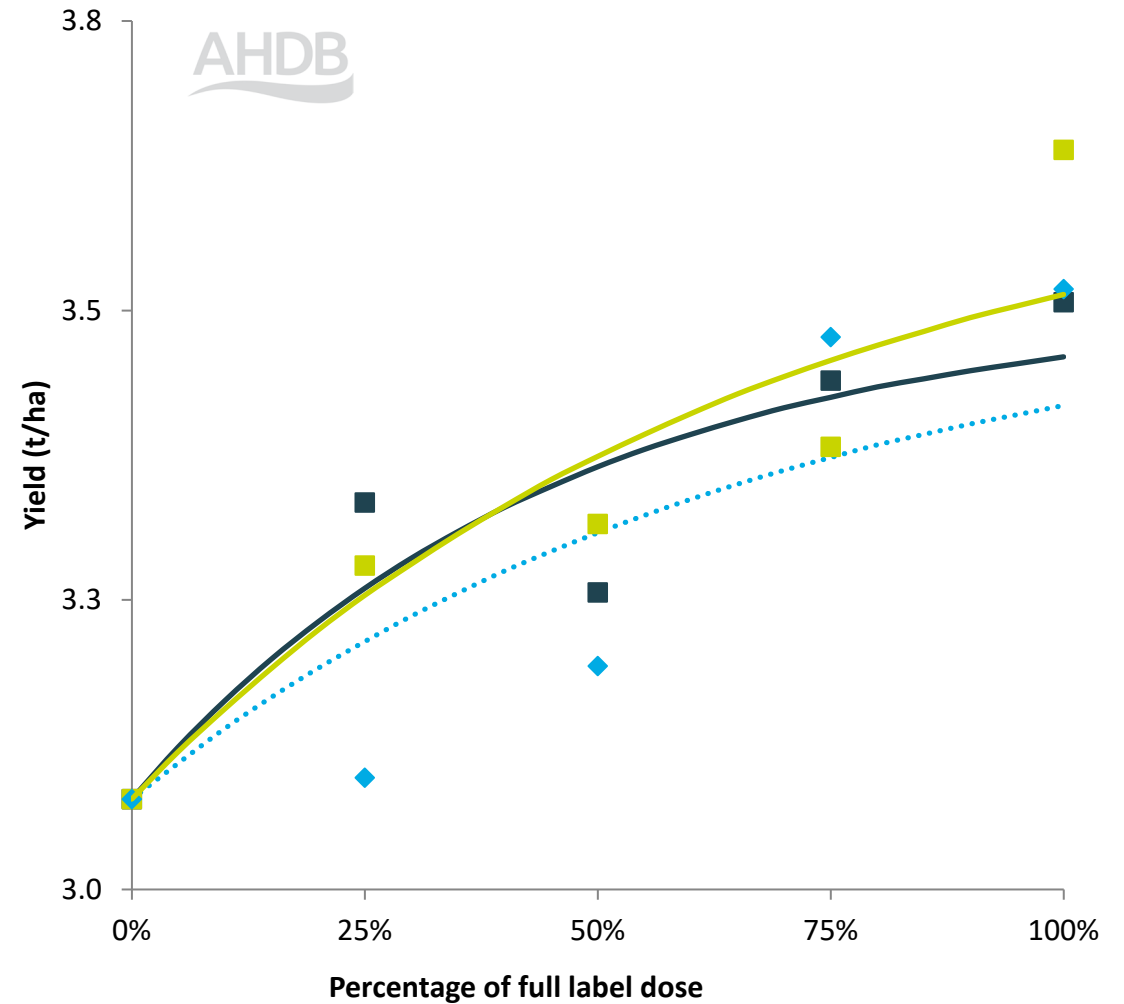
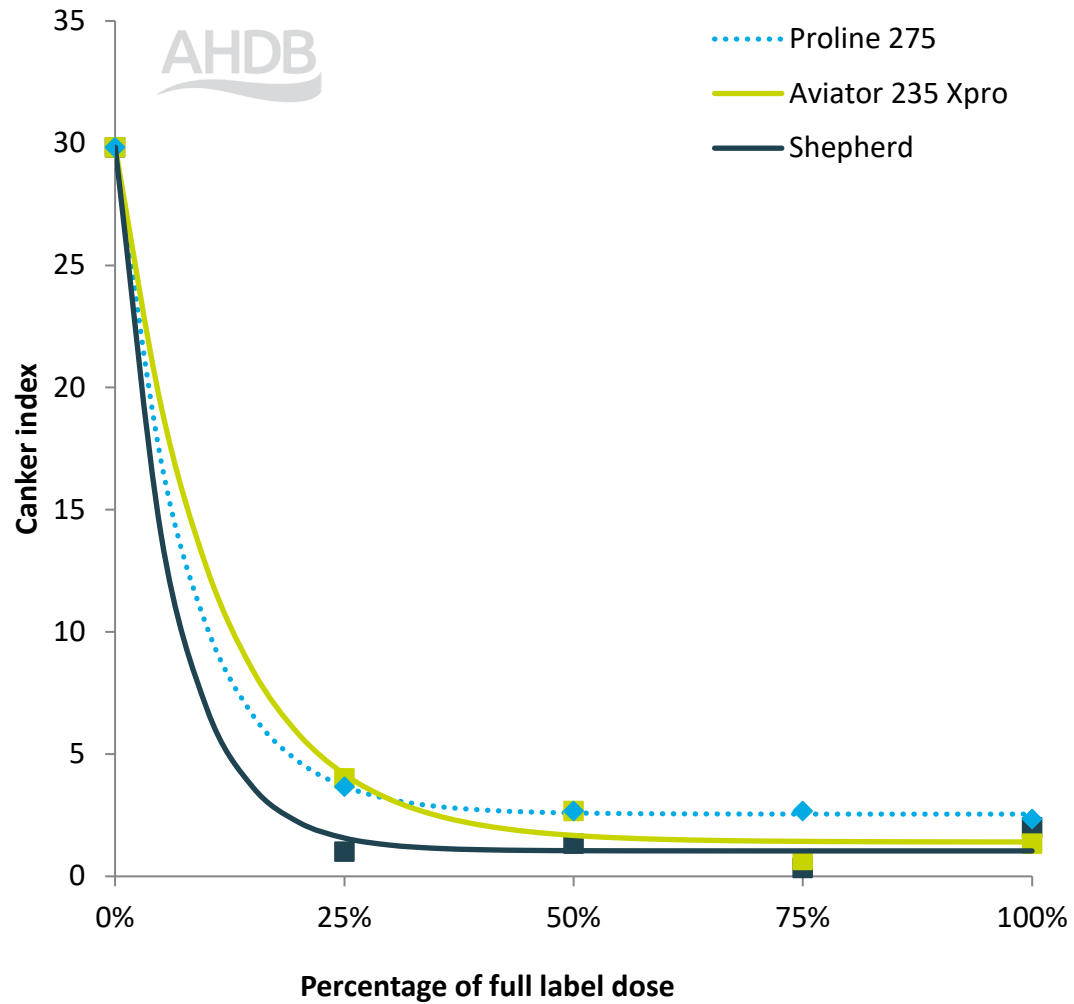
# Oilseed rape products

Product	Active(s)	Mode of action
Proline 275	prothioconazole	DMI
Priori Gold*	azoxystrobin + difenoconazole	QoI + DMI
Aviator 235 Xpro	bixafen + prothioconazole	SDHI + DMI
Filan*	boscalid	SDHI
Architect**	mepiquat chloride, prohexadione calcium + pyraclostrobin	QoI
Shepherd**	boscalid + pyraclostrobin	SDHI + QoI
Plover	difenoconazole	DMI
Amistar	azoxystrobin	QoI
Pictor	dimoxystrobin + boscalid	QoI + SDHI

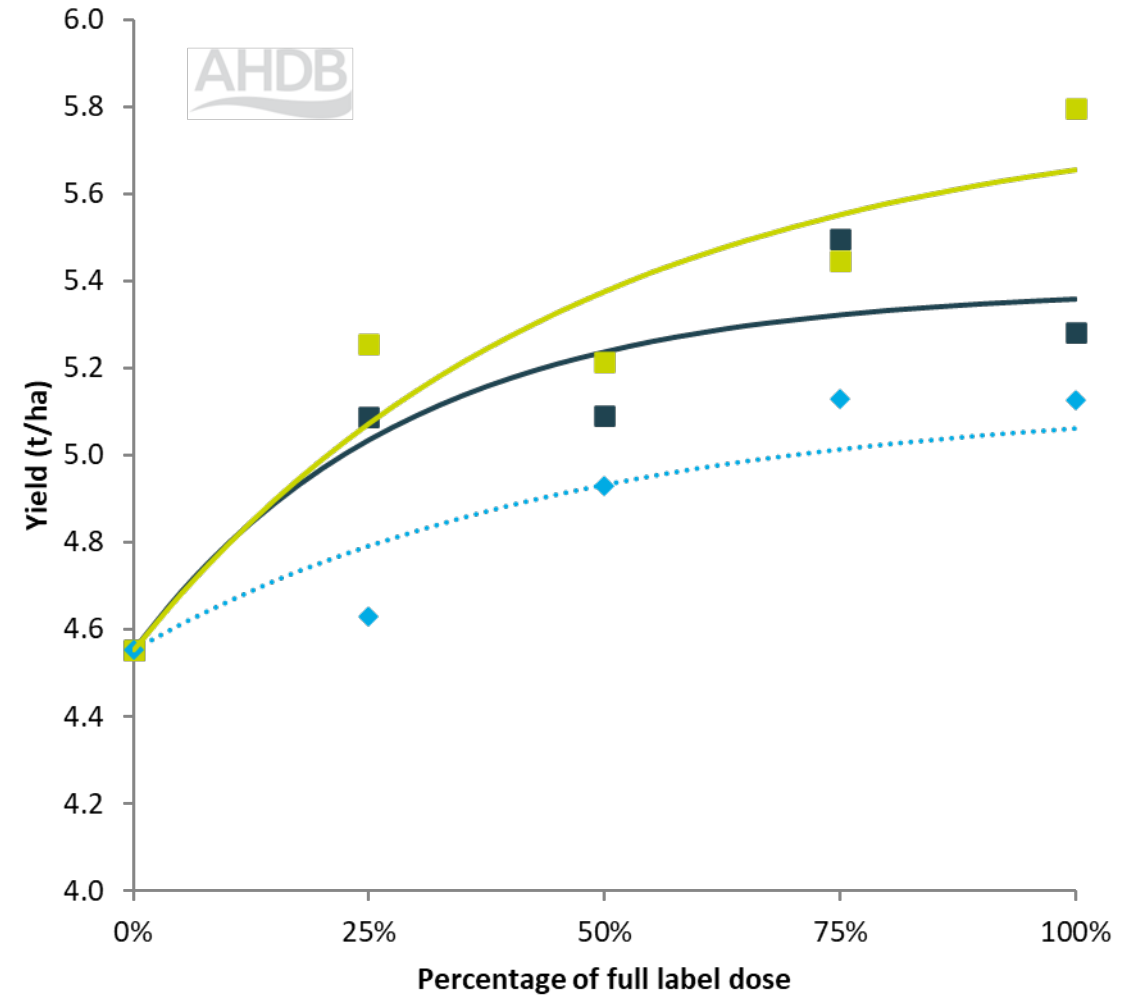
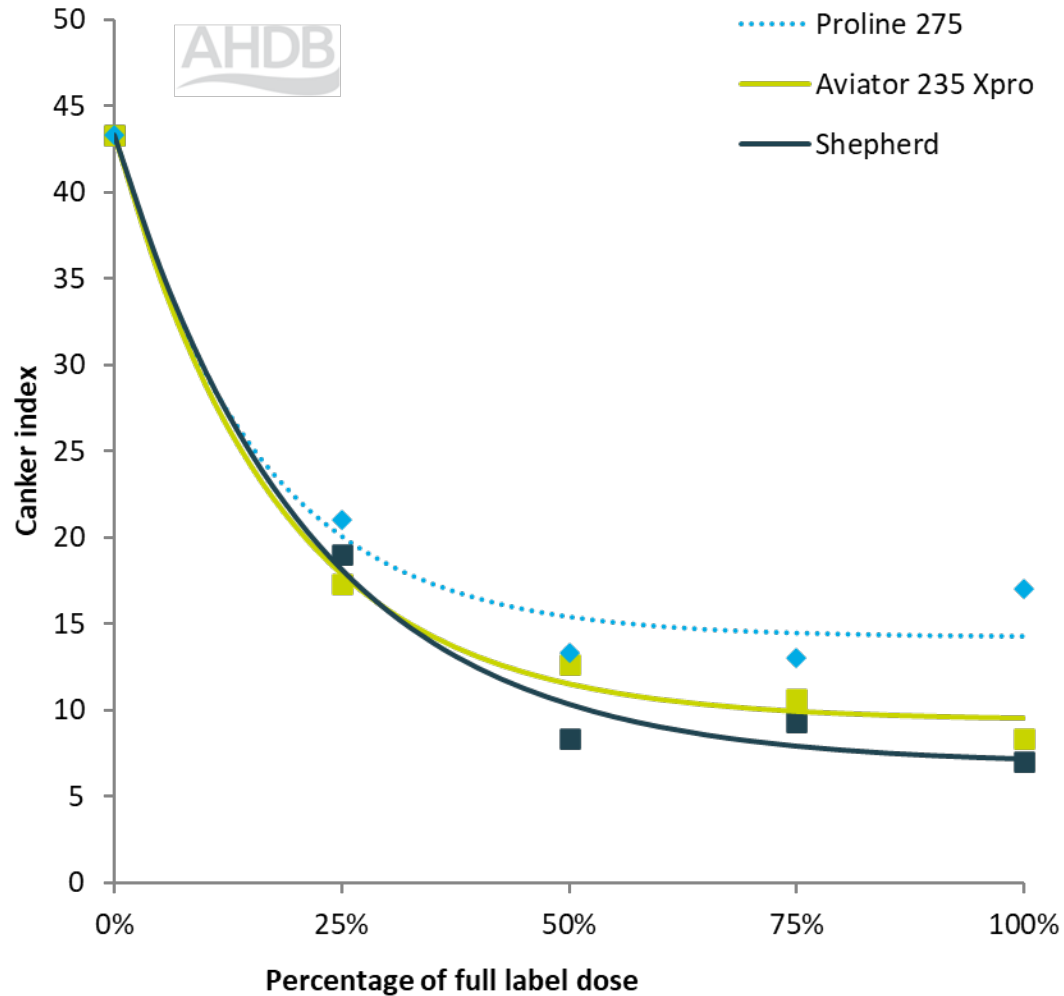
\*Products do not have a label recommendation for light leaf spot control but may be applied at the appropriate time, for the control of other diseases.

\*\*products registered in 2021.

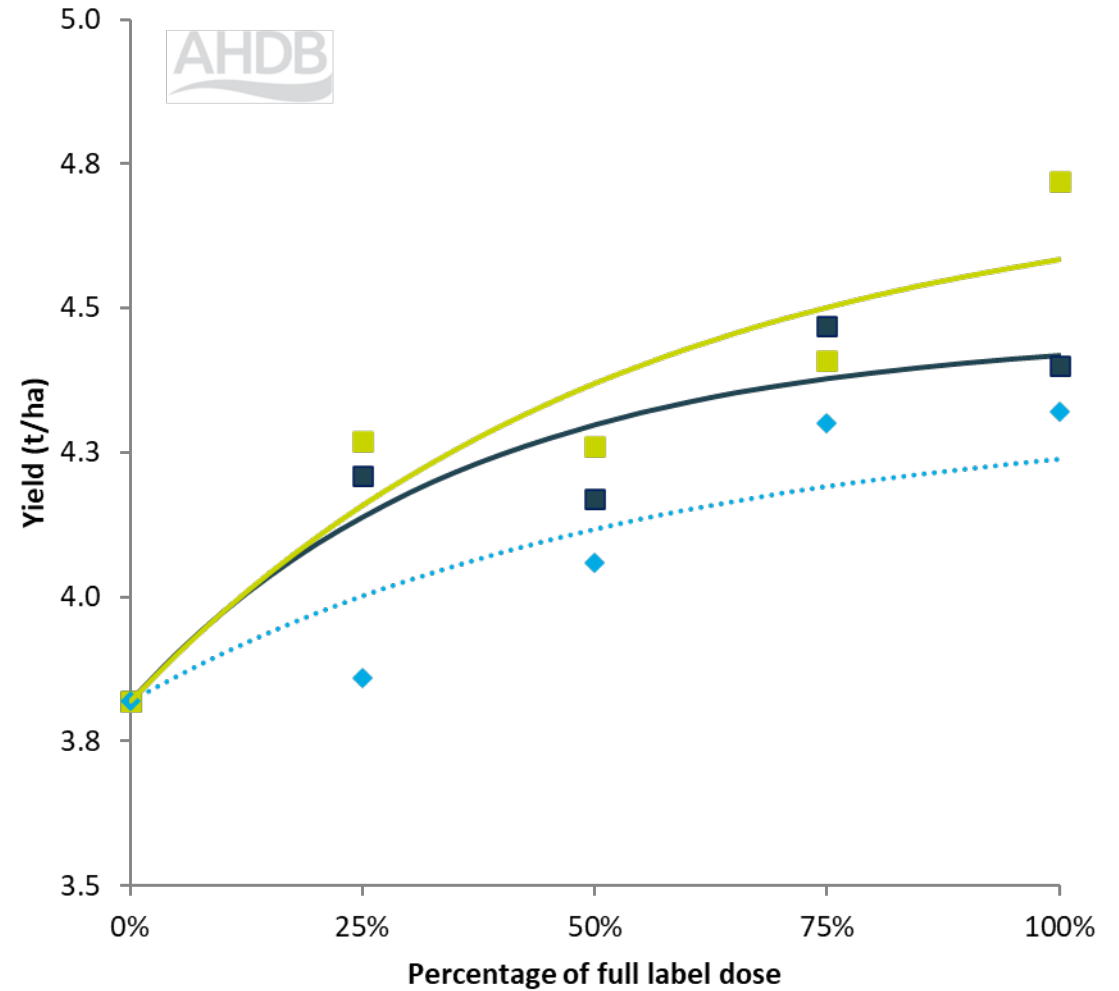
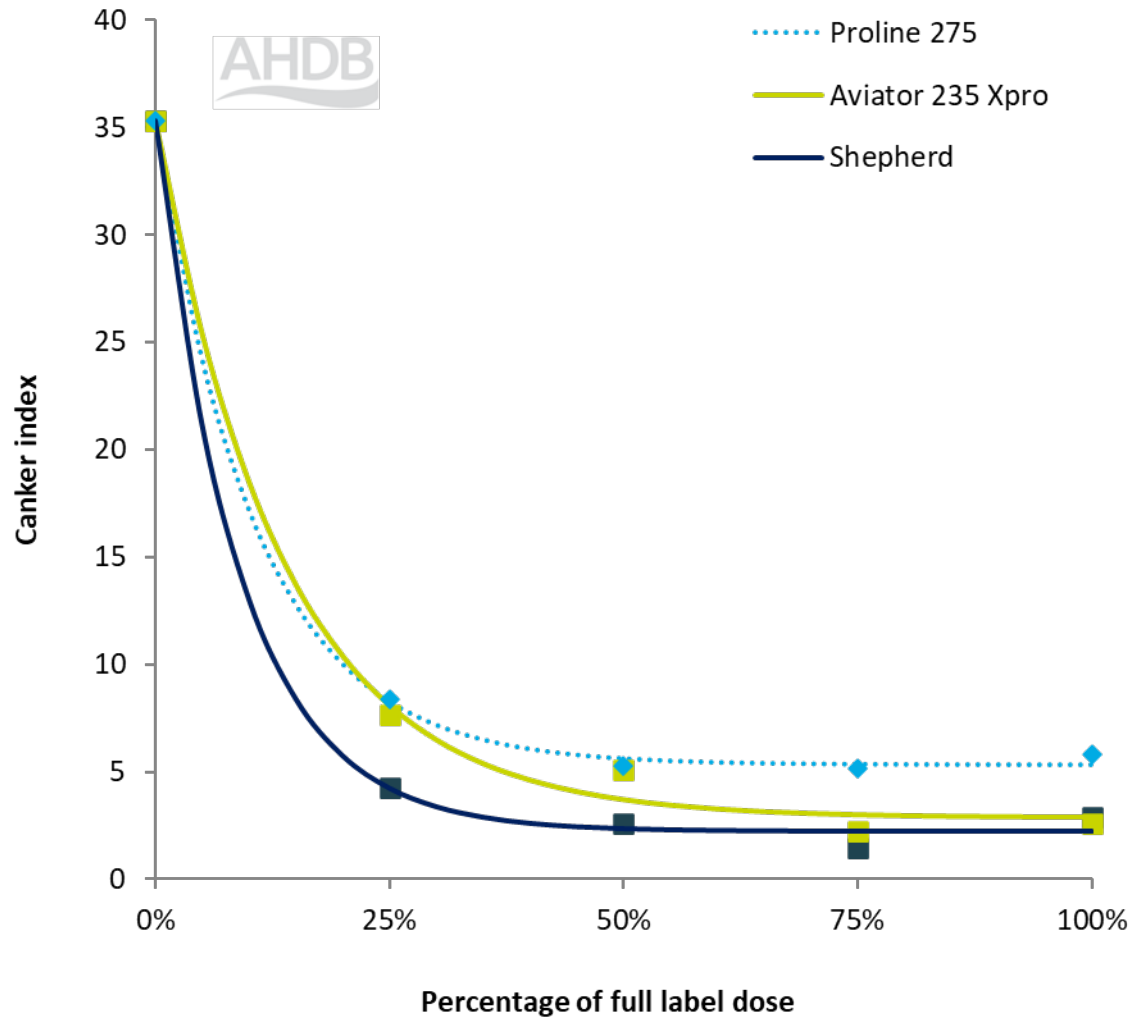
# Phoma stem canker and yield (Herefordshire, 2022)



# Phoma stem canker and yield (Norfolk, 2022)

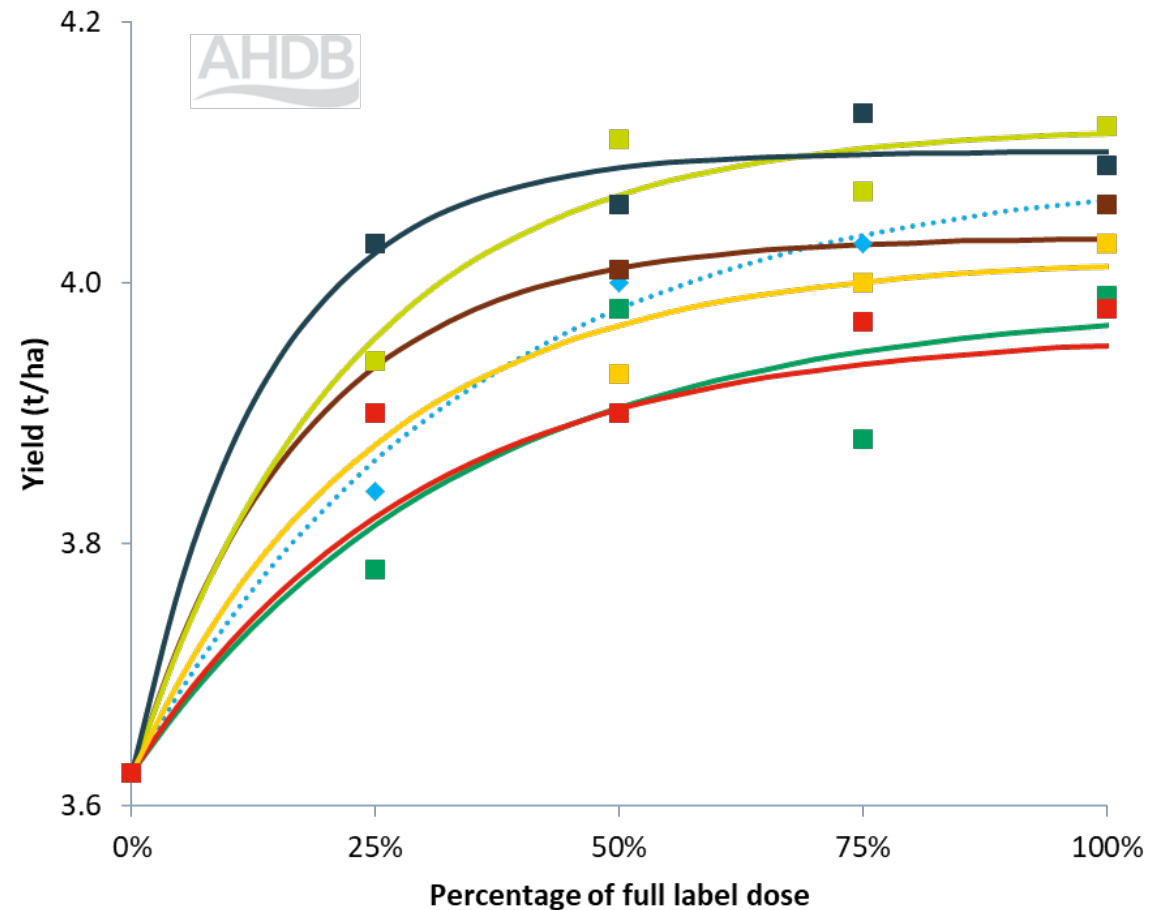
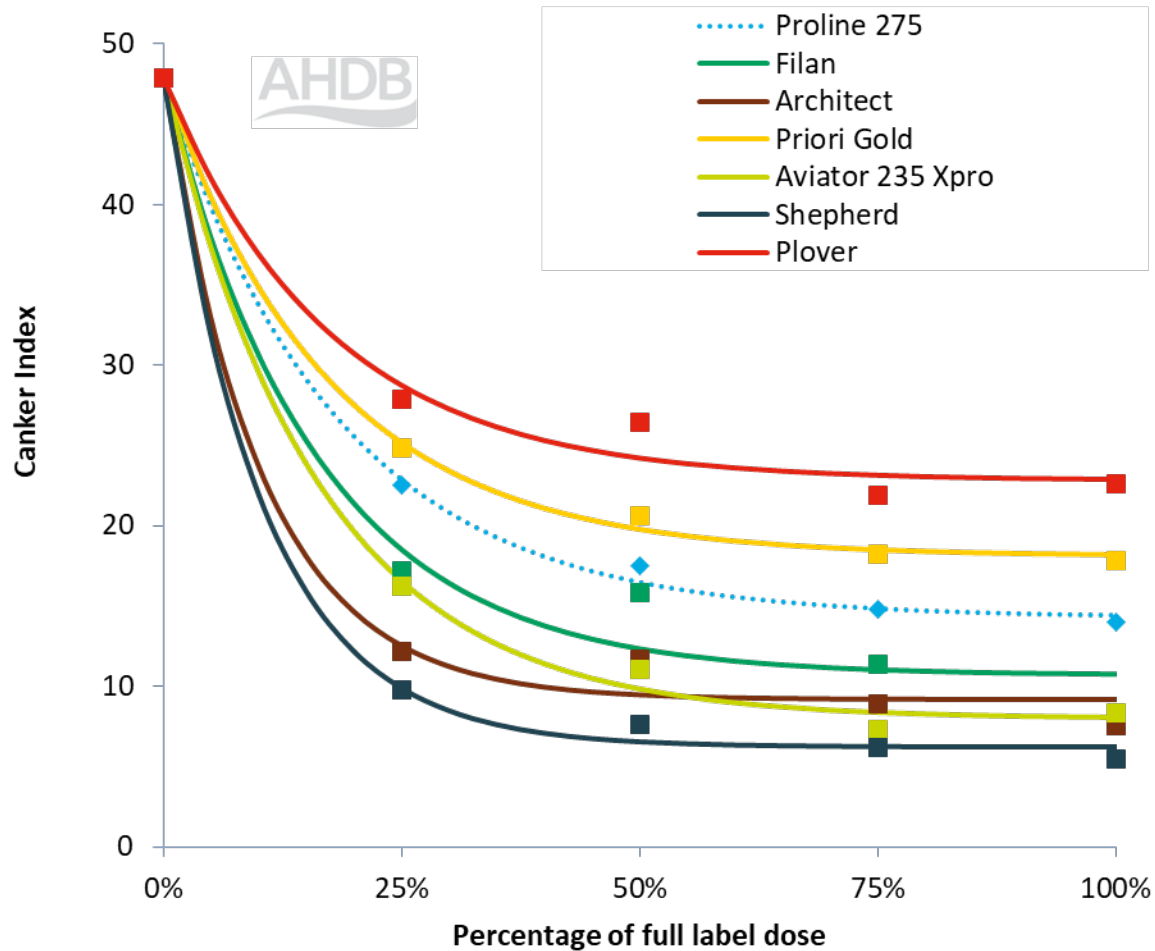


# Phoma stem canker and yield (Norfolk and Herefordshire, 2022)

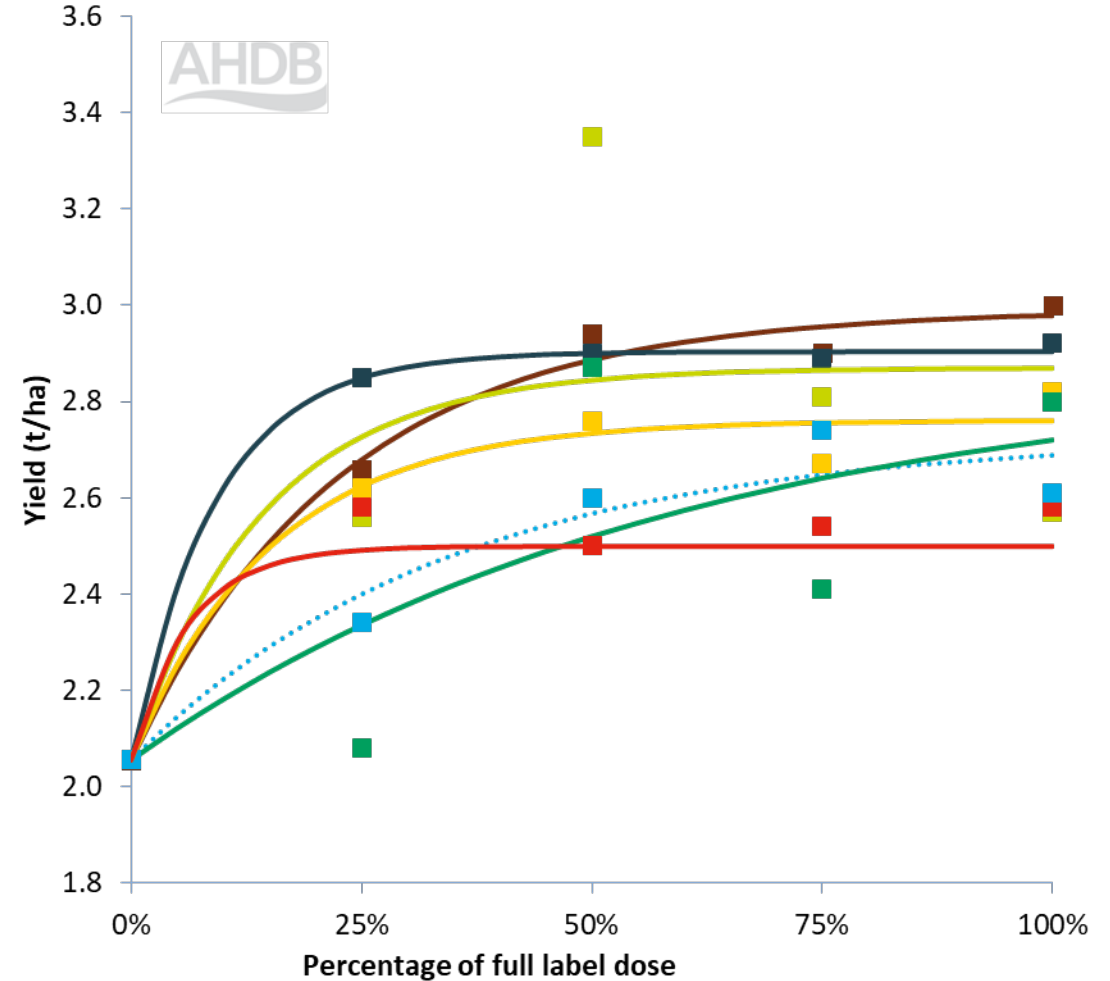
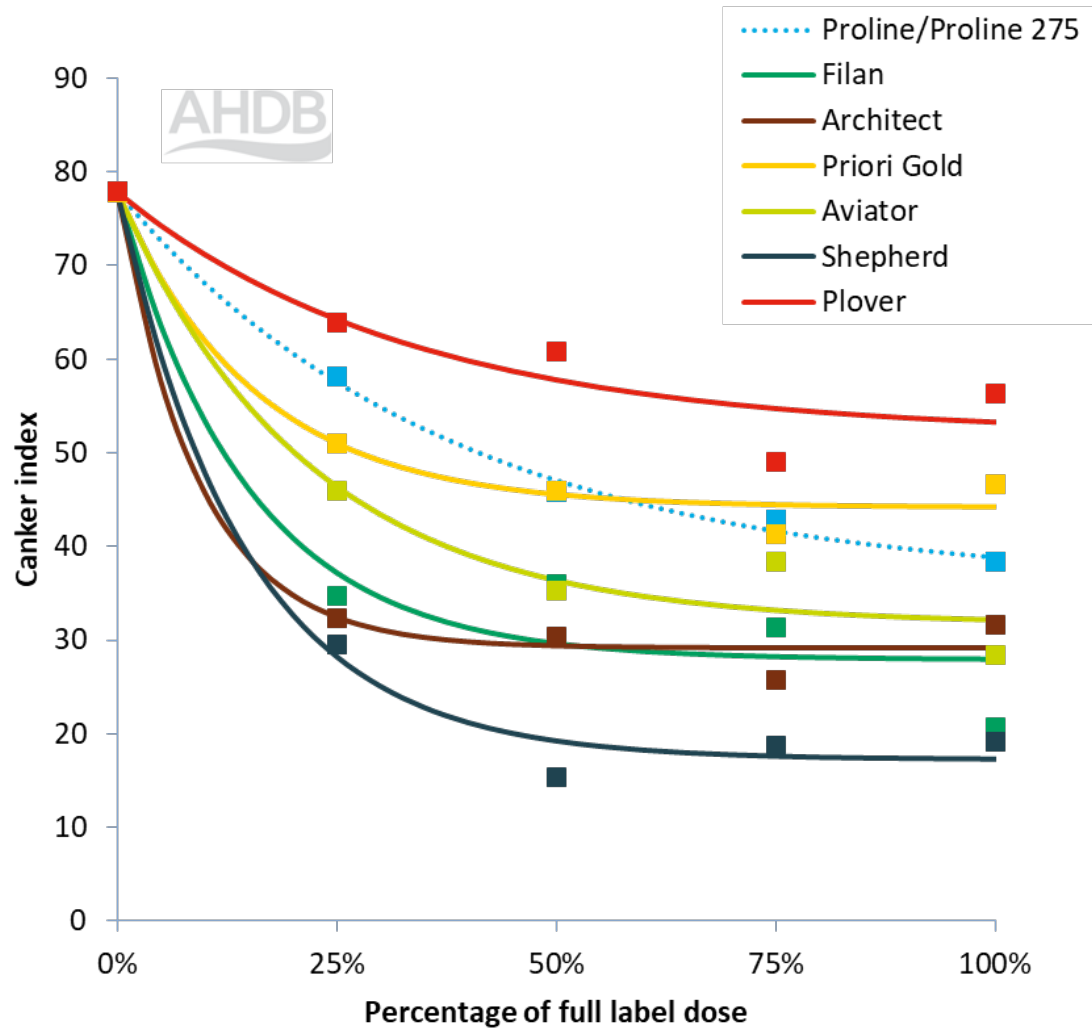




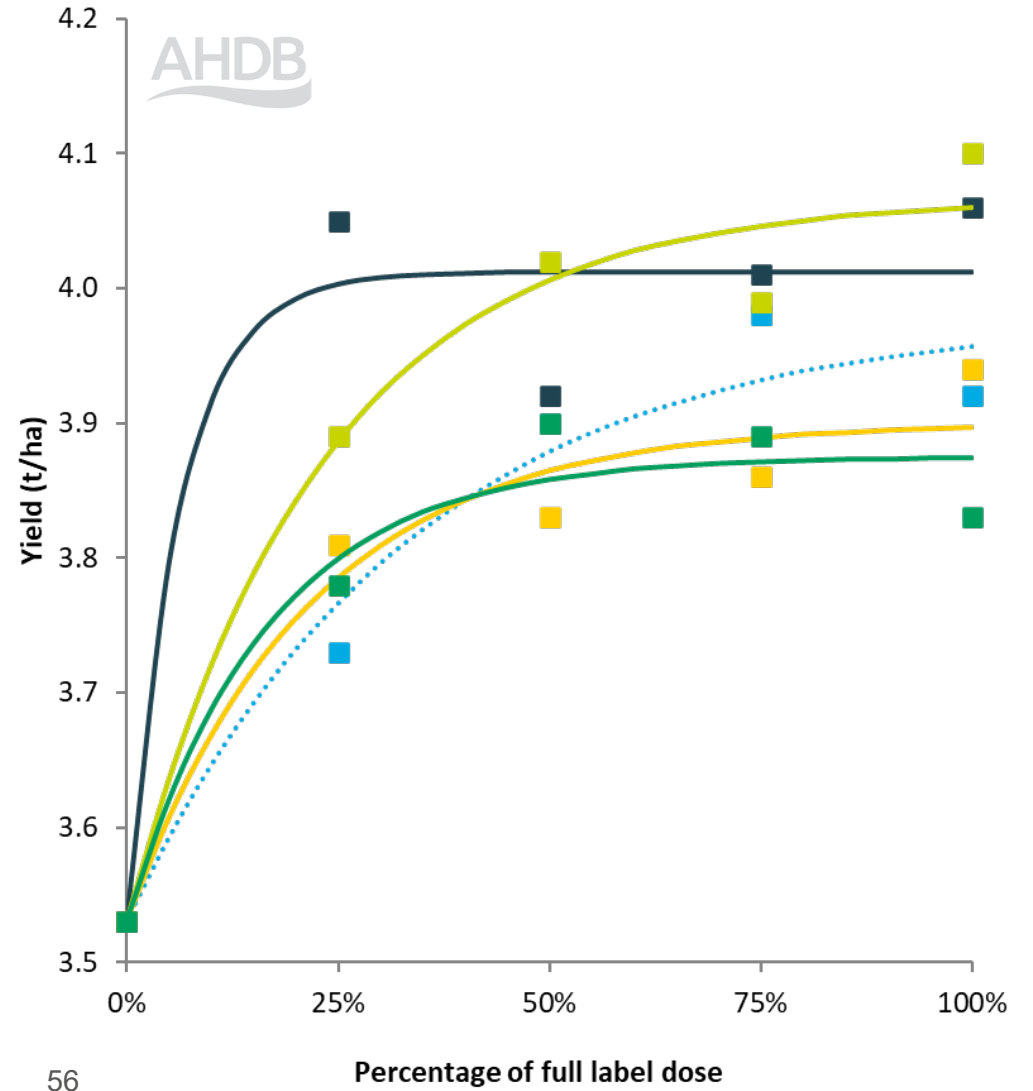
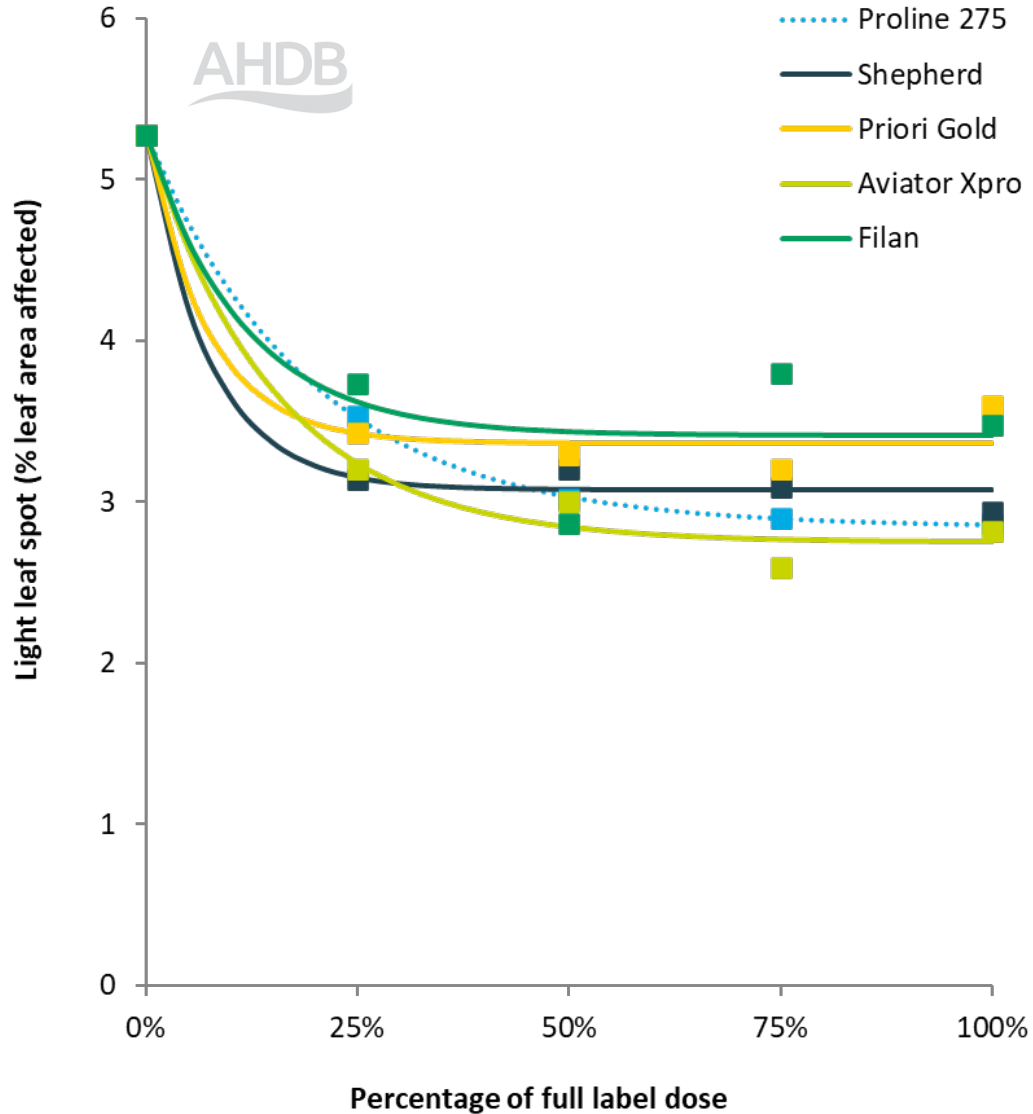
# Phoma stem canker and yield 2015–22 (12 trials)



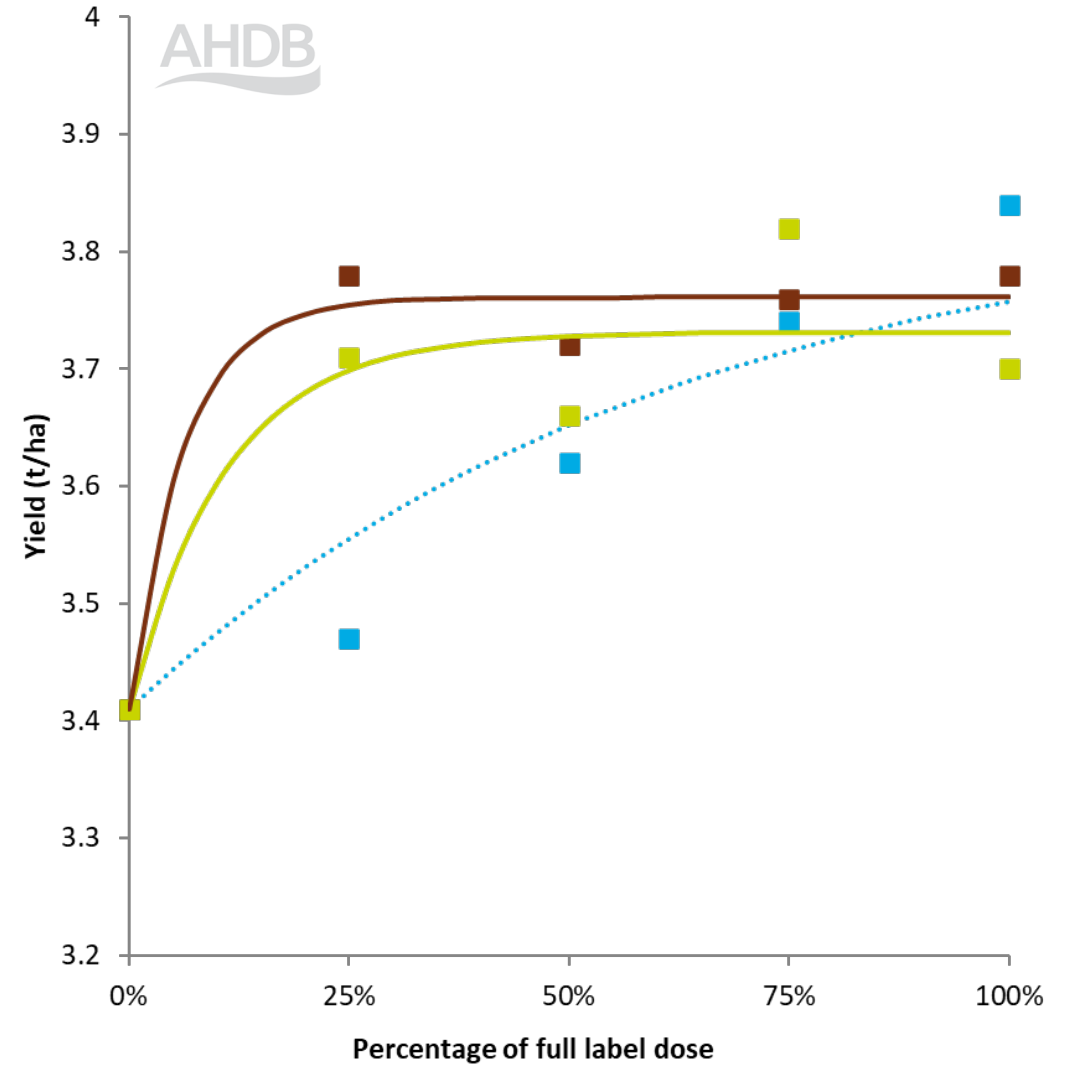
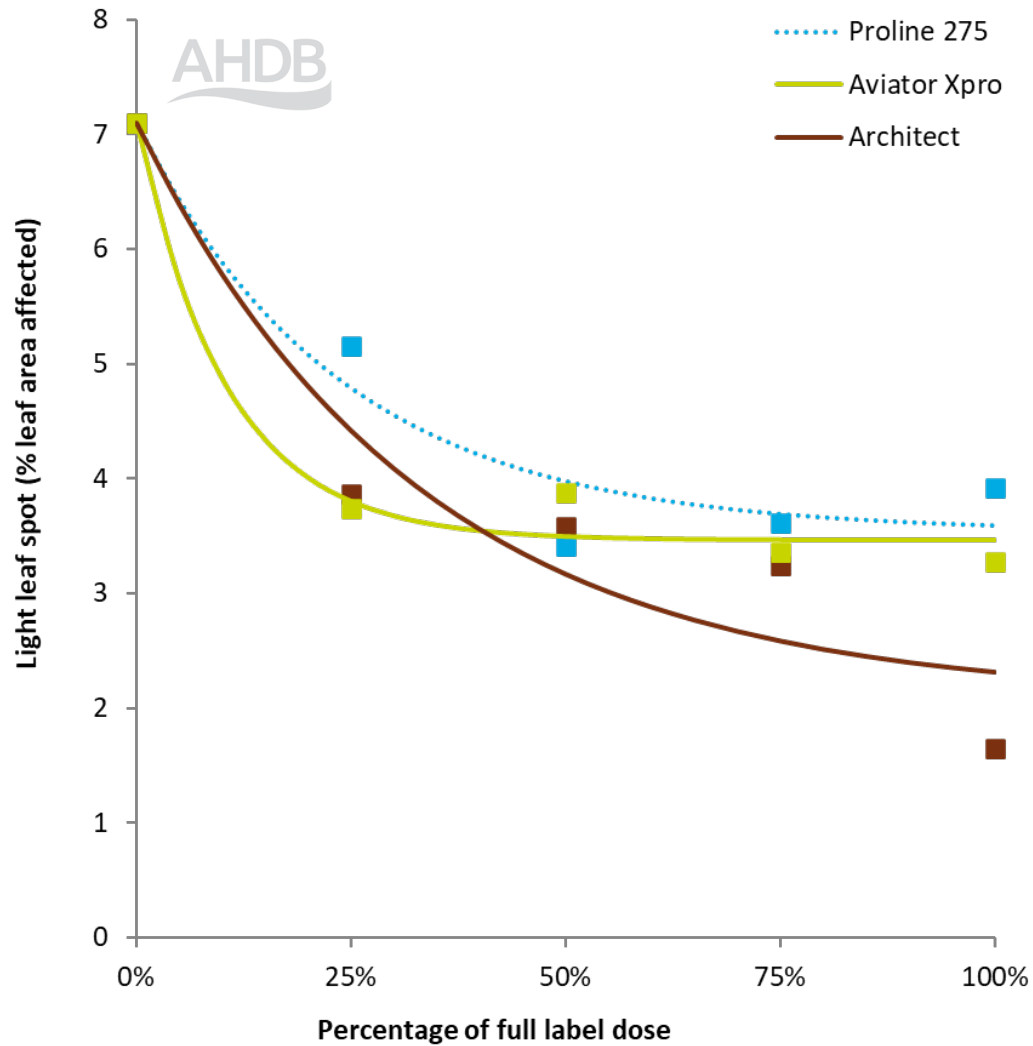
# Phoma stem canker control when disease pressure high (index >80, 2 sites)



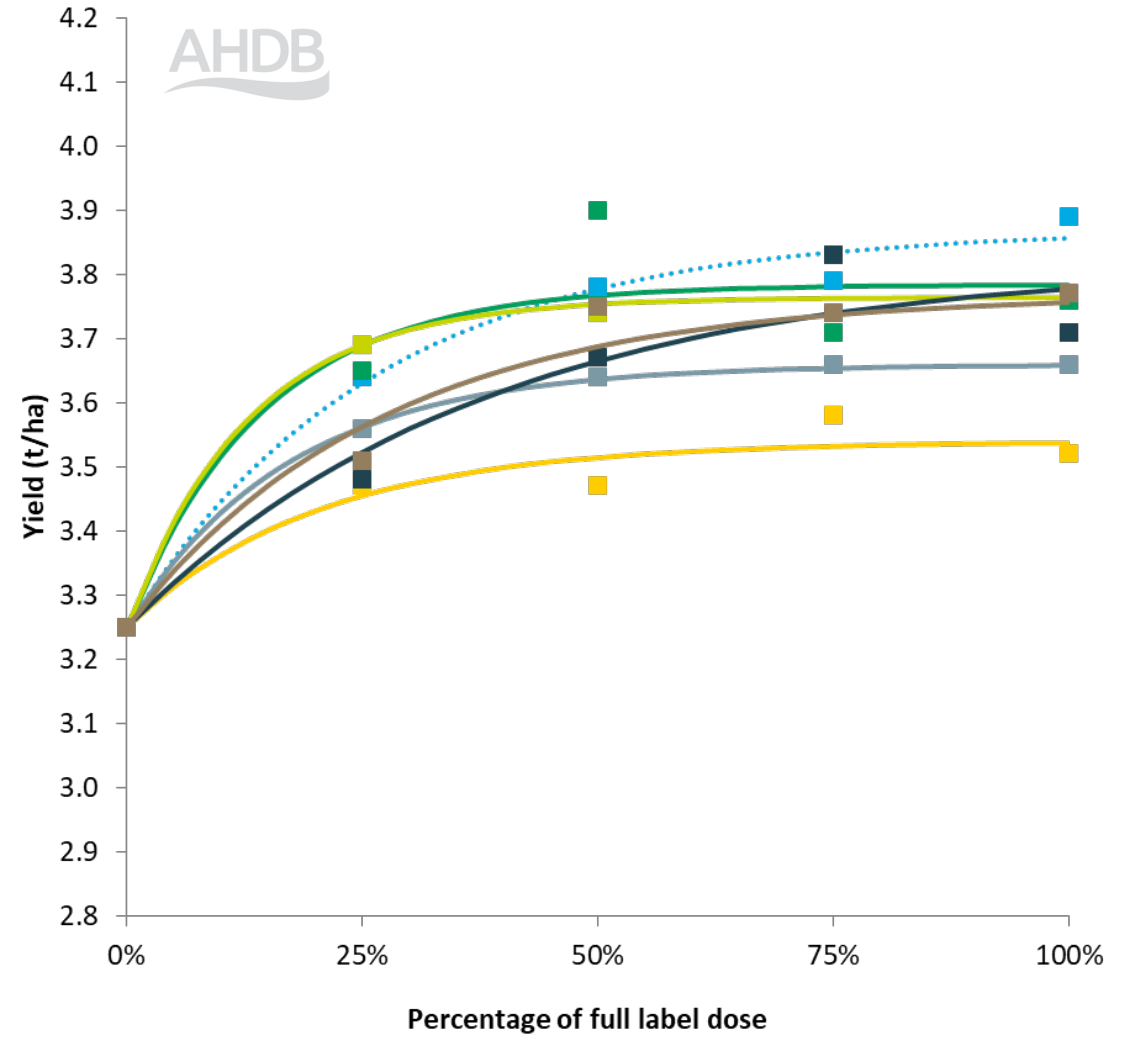
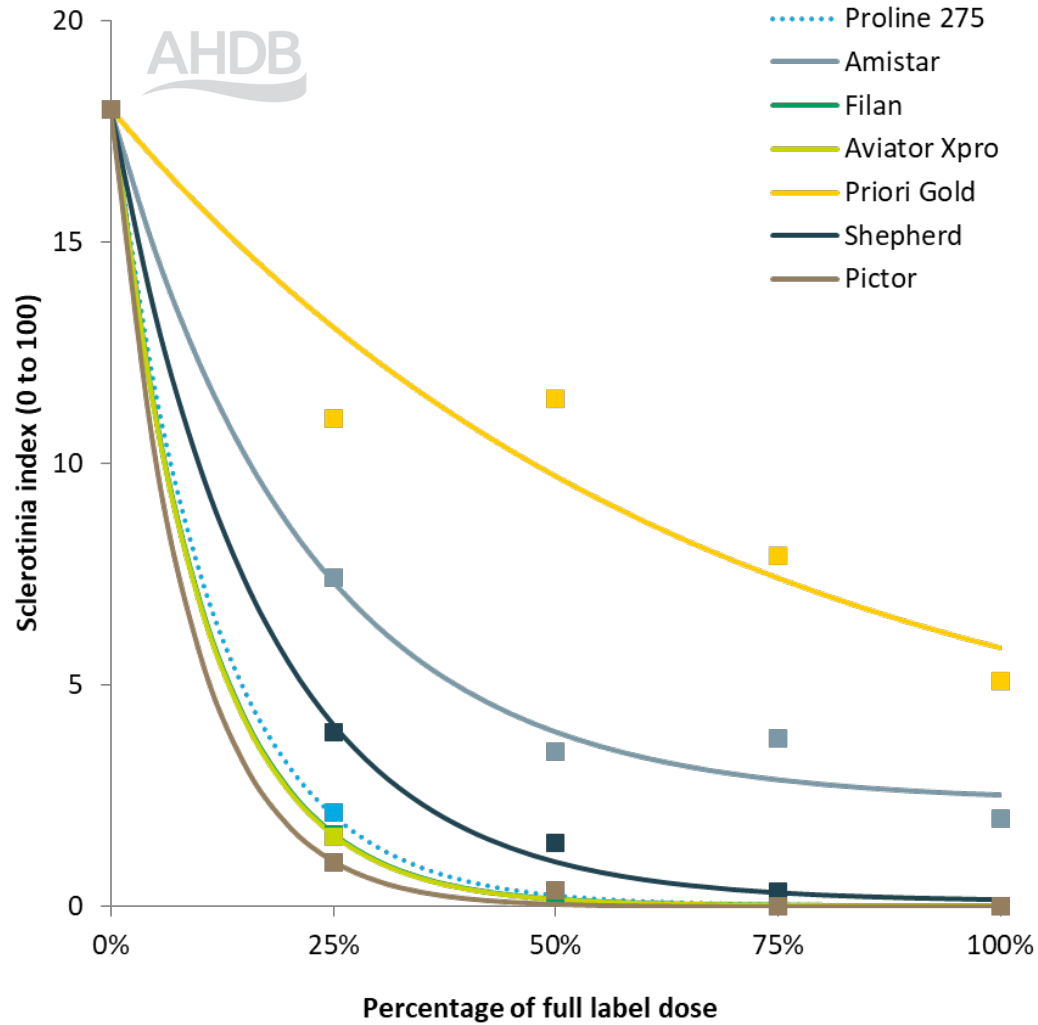
# Light leaf spot disease and yield 2019–21 (5 trials)



# Light leaf spot disease and yield 2015–16 (5 trials)



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



# Oilseed rape summary

- **Phoma stem canker**
- Effectiveazole and non-azole options for phoma stem canker control
- Yield responses ranged from 0.4 to 1.0 t/ha in 2022, 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
- Bothazole and non-azole chemistry available for use in the autumn

## 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

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A vibrant landscape of a green field at sunset. The sun is low on the horizon, casting a warm glow over the scene. The sky is filled with soft, colorful clouds in shades of orange, yellow, and blue. A path of tall green grass leads from the foreground towards the horizon. In the distance, there are rolling hills and a few buildings. The overall mood is peaceful and inspiring.

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