Fungicide performance update for wheat, barley and oilseed rape 2019

CEREALS & OILSEEDS

Note:

The graphs in these slides show dose-response curves up to 100% label dose.

The graphs at the AHDB Agronomists' Conference (3 December 2019) showed dose-response curves up to 200% label dose.

Fungicides are tested at double rate to improve the 'fit' of the dose-response curves.

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

Background information

Protection and curative

- ‘Protectant’ curves show the activity of fungicides when they are applied soon after the emergence of a leaf layer, before much infection has occurred
- ‘Curative’ curves indicate fungicidal activity after infection has occurred but before symptoms become visible
- Performance of products on each leaf layer and at each site was classified as protectant or curative based on timing of leaf emergence relative to spray application
- Performance of individual active ingredients can be assessed by comparing dose-response graphs. These show average performance measured across a range of sites, seasons and leaf layers

Trial methods

In order to provide a good test of the fungicides:

- Trials are located in areas that are at high risk from the target disease in most years
- Trials are carried out on varieties that are very susceptible to the target disease and not too susceptible to other diseases
- If necessary, over-sprays that are not active against the target disease are used to reduce the effect of other diseases on the trial
- Fusarium trial inoculated with fusarium species and mist-irrigated before and after inoculation to establish infection

Fungicide performance 2019 update for wheat

Septoria tritici efficacy data 2019

Site (Organisation)	Protectant	Curative	Mixed	Growth stage of application	Variety
Herefordshire (ADAS)	✓		✓	GS37	KWS Kielder
Hampshire (NIAB)	✓		✓	GS32	Dickens
East Lothian (SRUC)	✓	✓	✓	GS39	Viscount
Carlow, Ireland (Teagasc)	✓			GS37	KWS Lumos
Cardigan (ADAS)	✓	✓		GS39	KWS Santiago
Shropshire (NIAB)			✓	GS39	Dickens

Revystar XE

New fungicide product for 2020

- Contains a new triazole (Revysol) and an SDHI (Xemium)
    - 100 g/L mefentrifluconazole + 47.5 g/L fluxapyroxad
- Maximum individual dose 1.5 L/ha
- Maximum of two applications
- To be applied before GS69
- Approved for wheat, barley, oats, rye, triticale, spelt and durum wheat

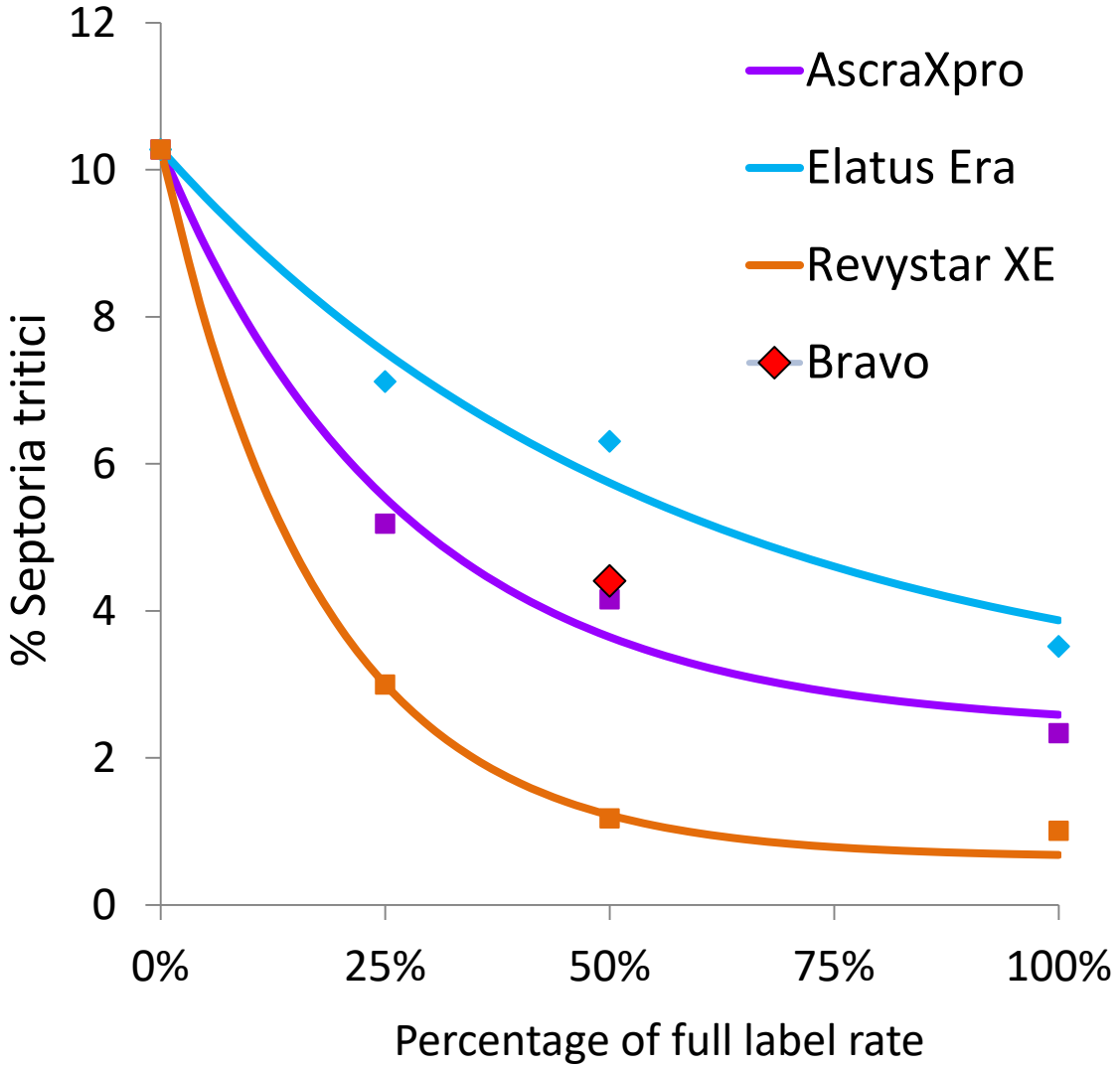
Wheat products 2019

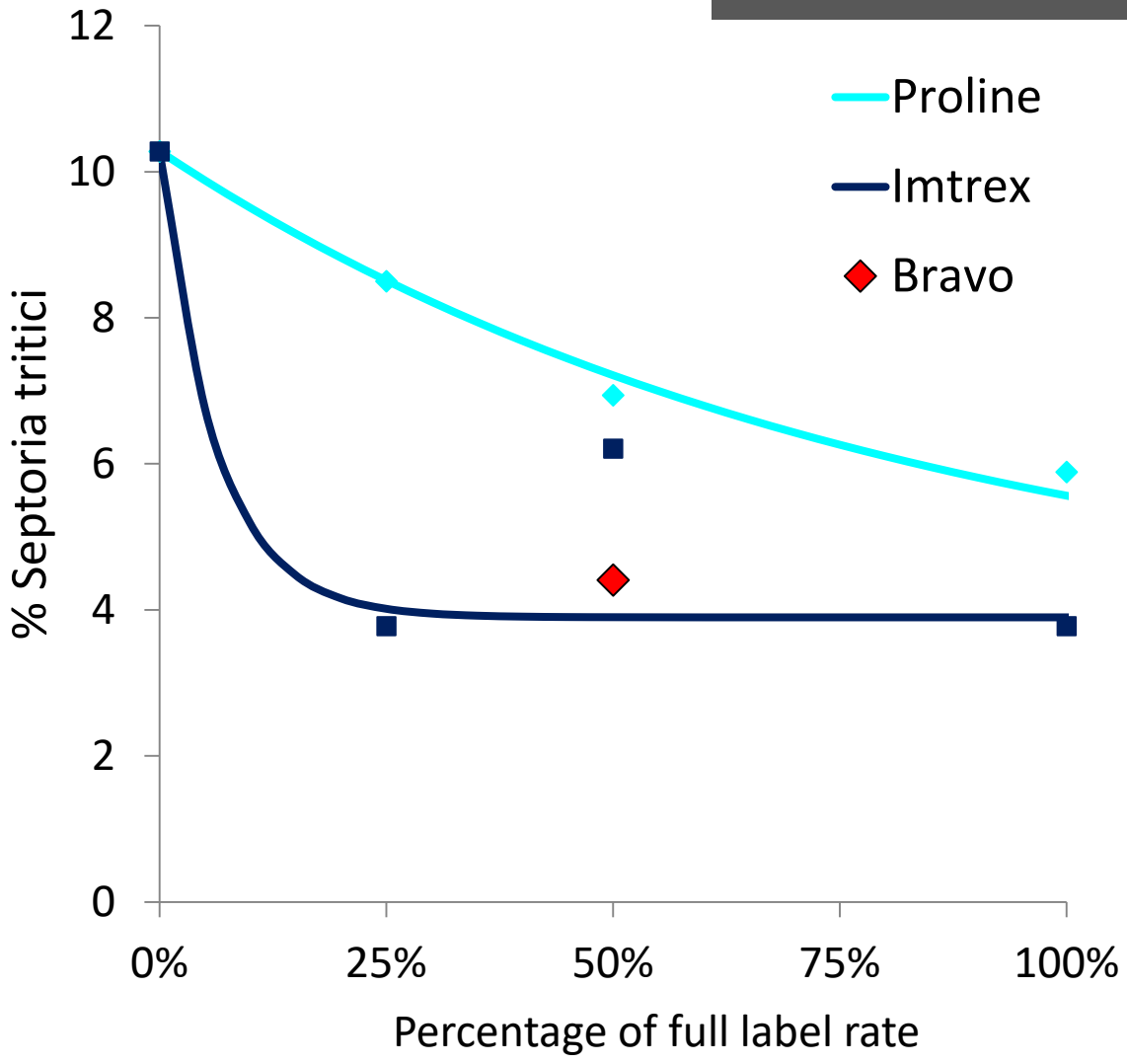
Product	Active(s)	Septoria	Brown rust	Yellow rust
Bravo	chlorothalonil	✓*		
Proline	prothioconazole	✓	✓	✓
Bassoon	epoxiconazole			✓
Imtrex	fluxapyroxad	✓	✓	✓
Comet	pyraclostrobin		✓	✓
Amistar	azoxystrobin			✓
Ascra Xpro	bixafen + fluopyram + prothioconazole	✓	✓	✓
Librax	fluxapyroxad + metconazole		✓	
Elatus Era	solatenol + prothioconazole	✓	✓	✓
Revystar XE	mefentrifluconazole + fluxapyroxad	✓	✓	✓

*Bravo at 50% dose only

Septoria tritici protectant 2019 (5 trials)

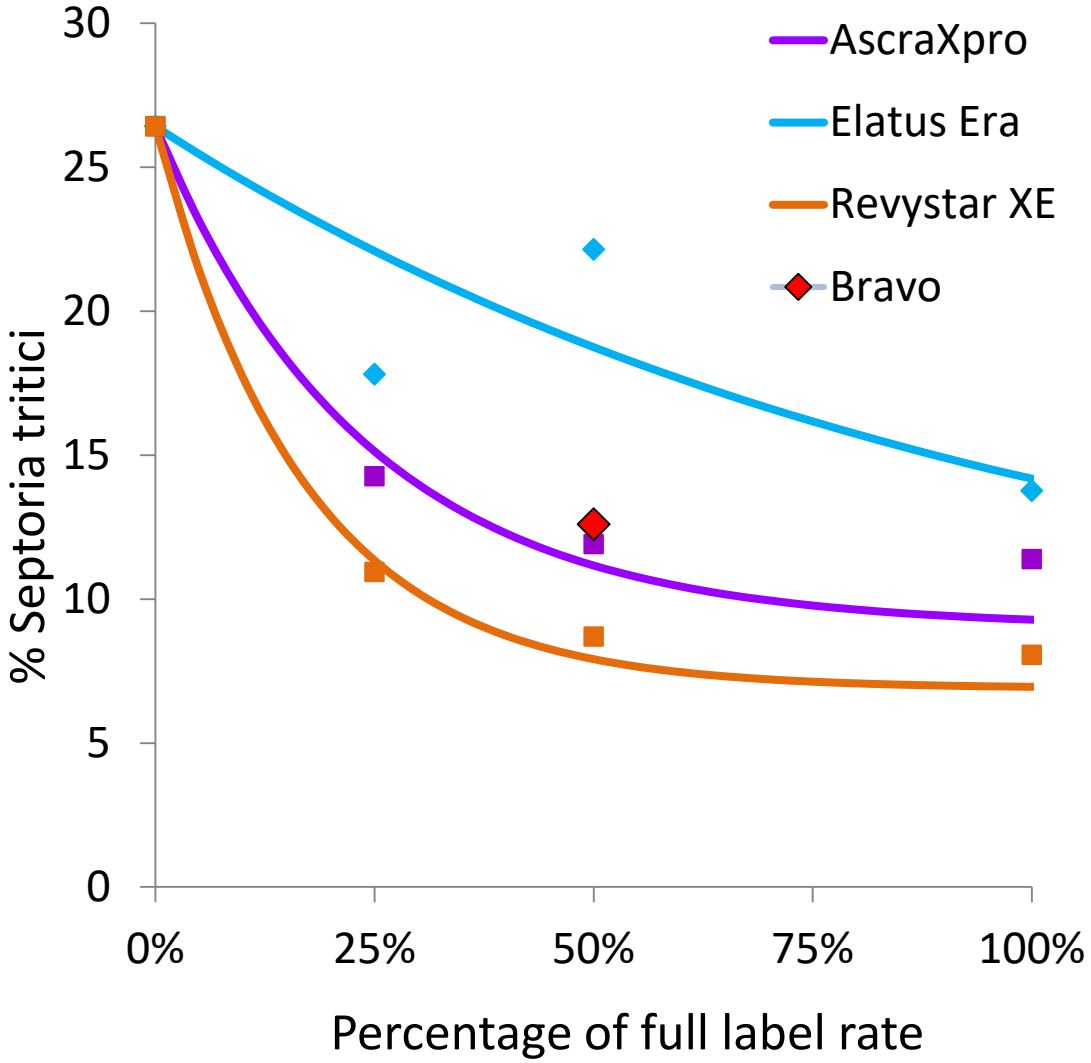
Use Imtrex only in mixture with at least one fungicide with an alternative mode of action that has efficacy against the target disease

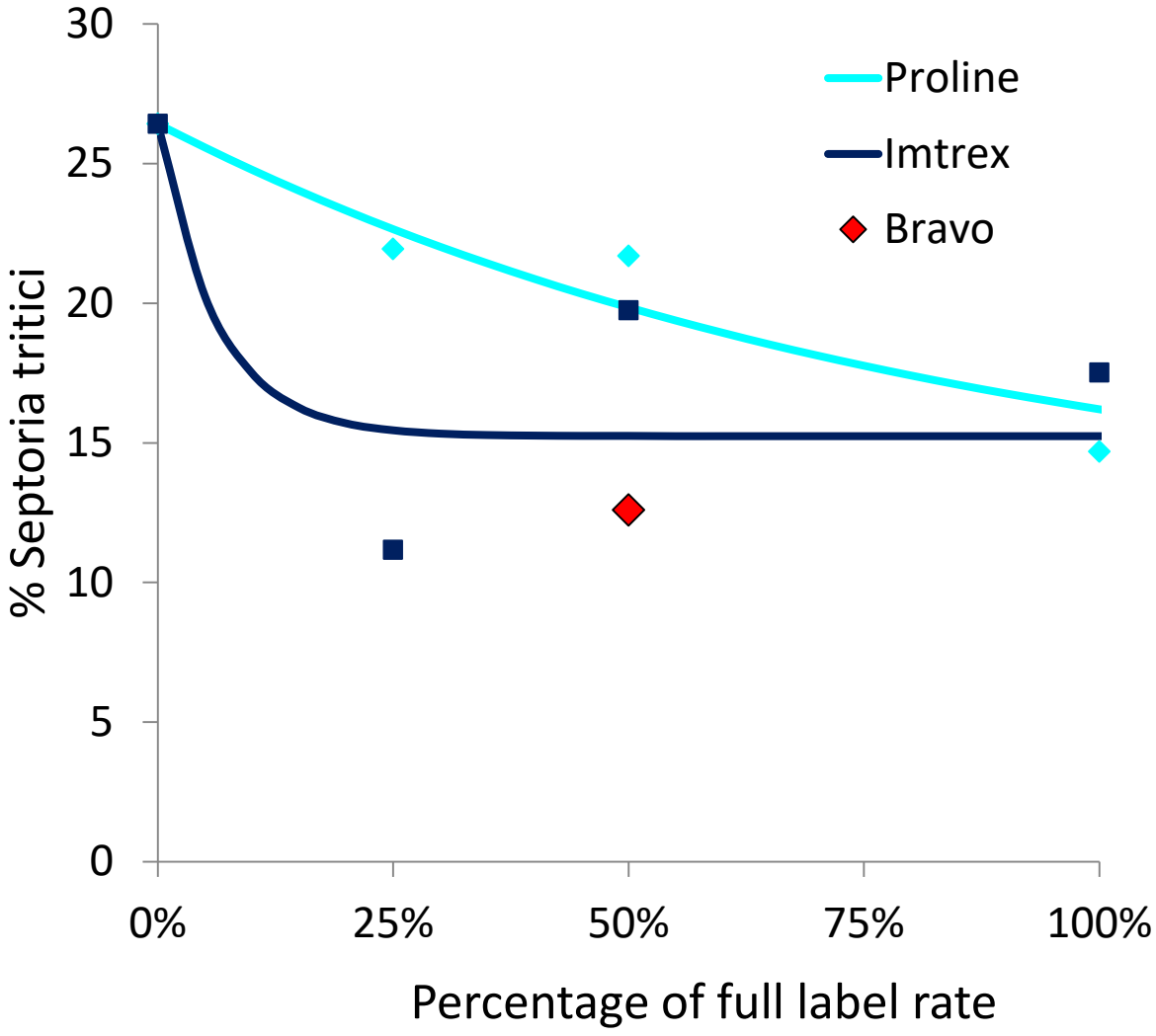




Septoria tritici mixed protectant and curative 2019 (4 trials)

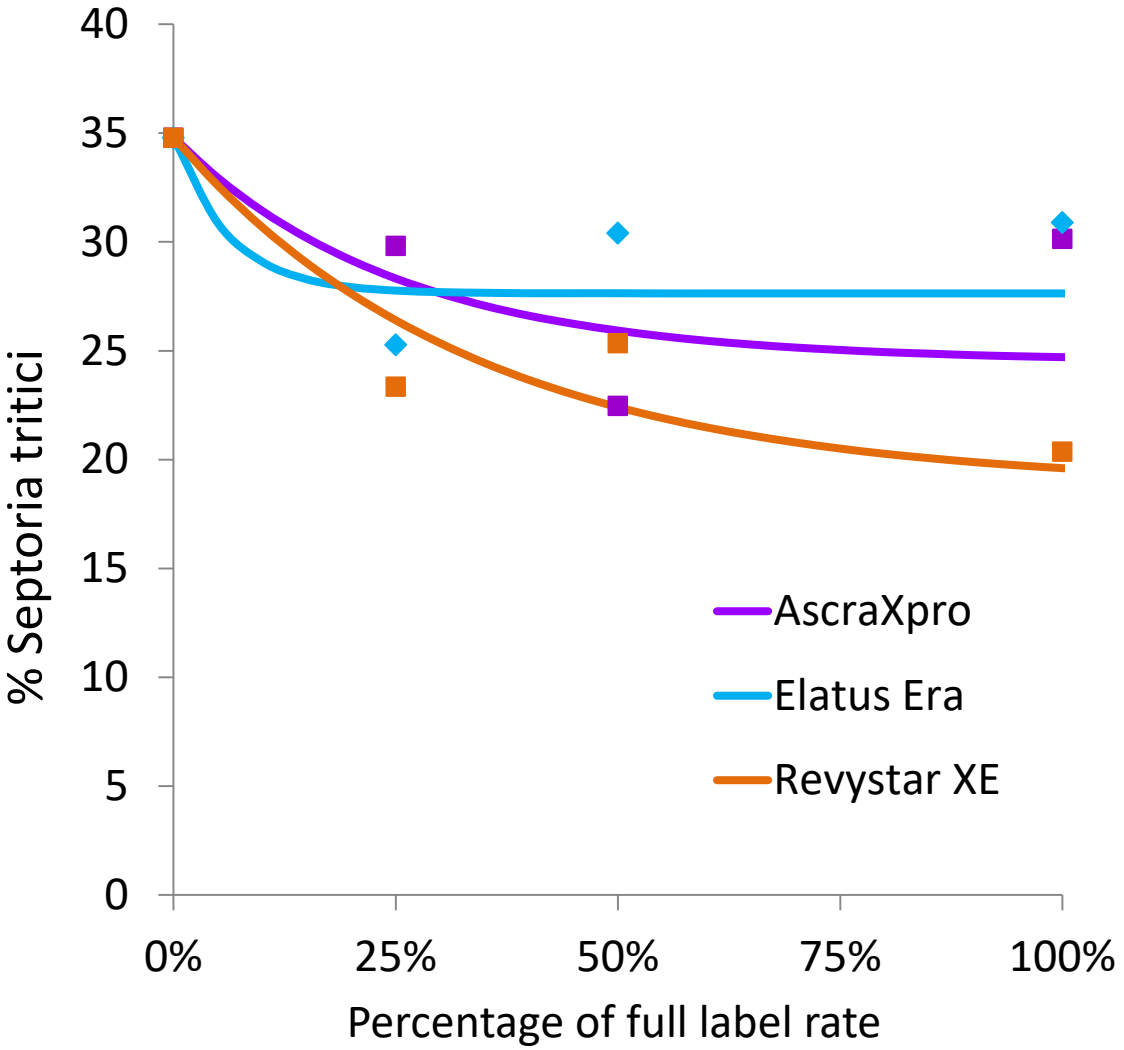
Use Imtrex only in mixture with at least one fungicide with an alternative mode of action that has efficacy against the target disease

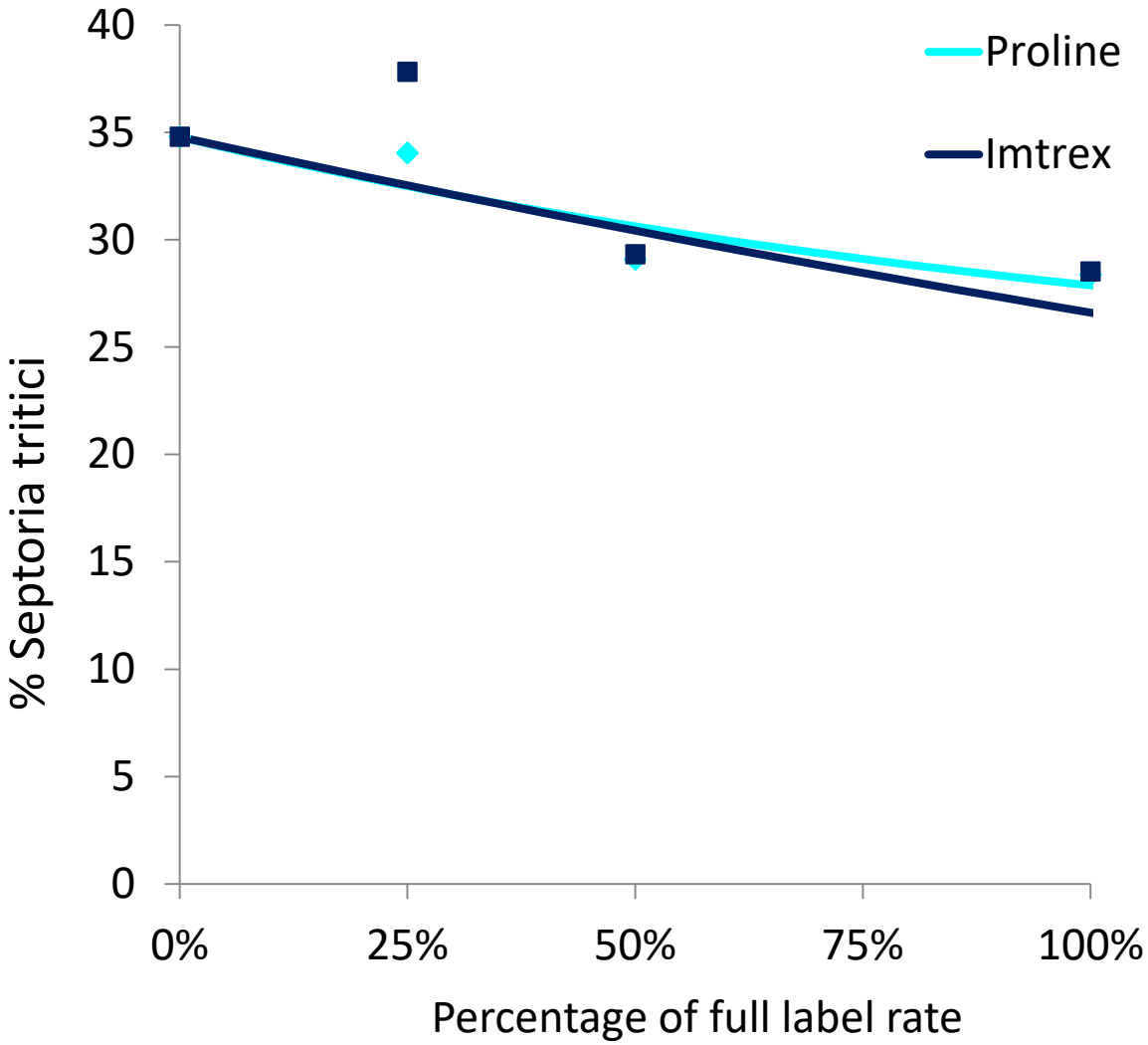




Septoria tritici curative 2019 (2 trials)

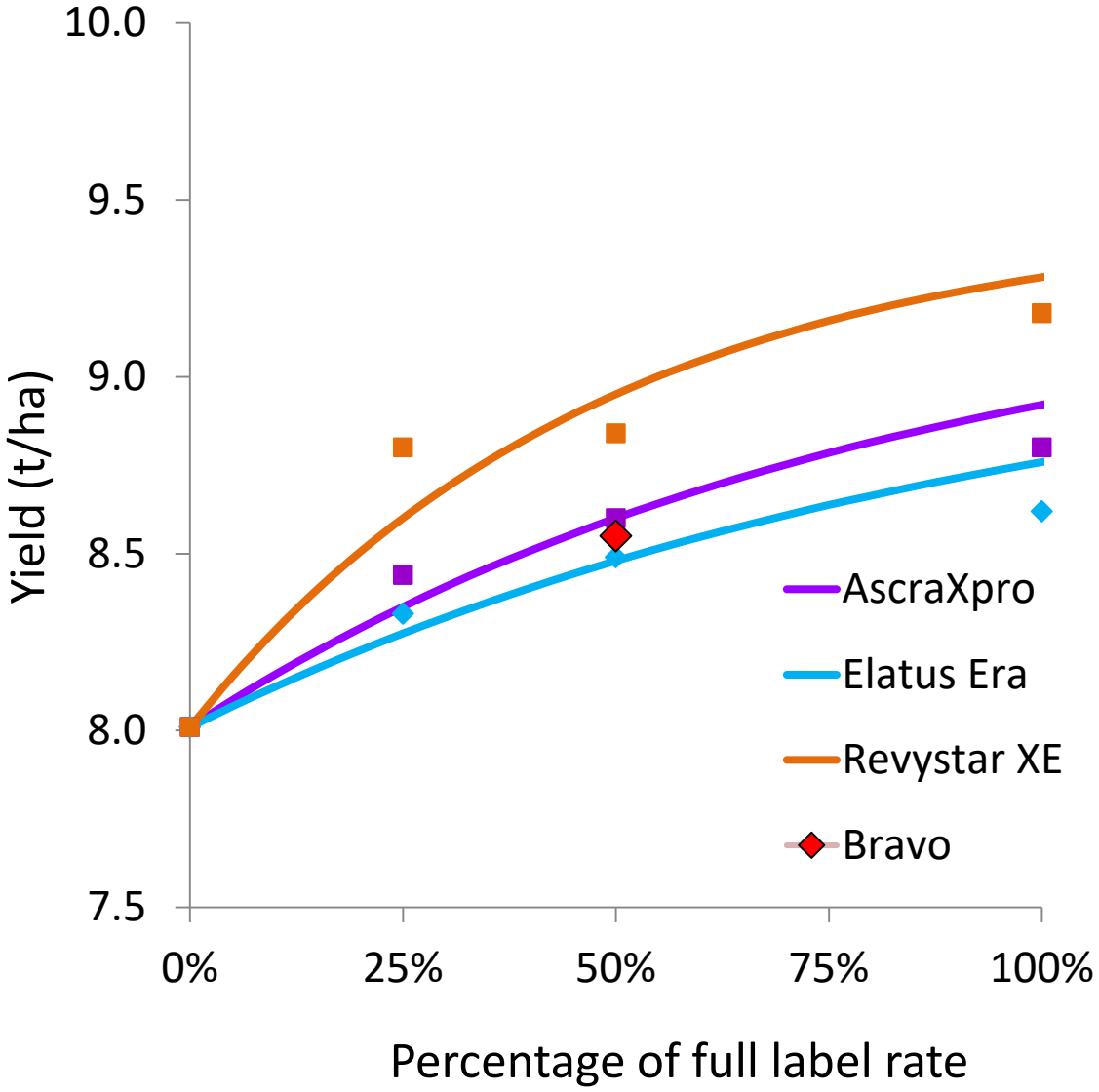
Use Imtrex only in mixture with at least one fungicide with an alternative mode of action that has efficacy against the target disease

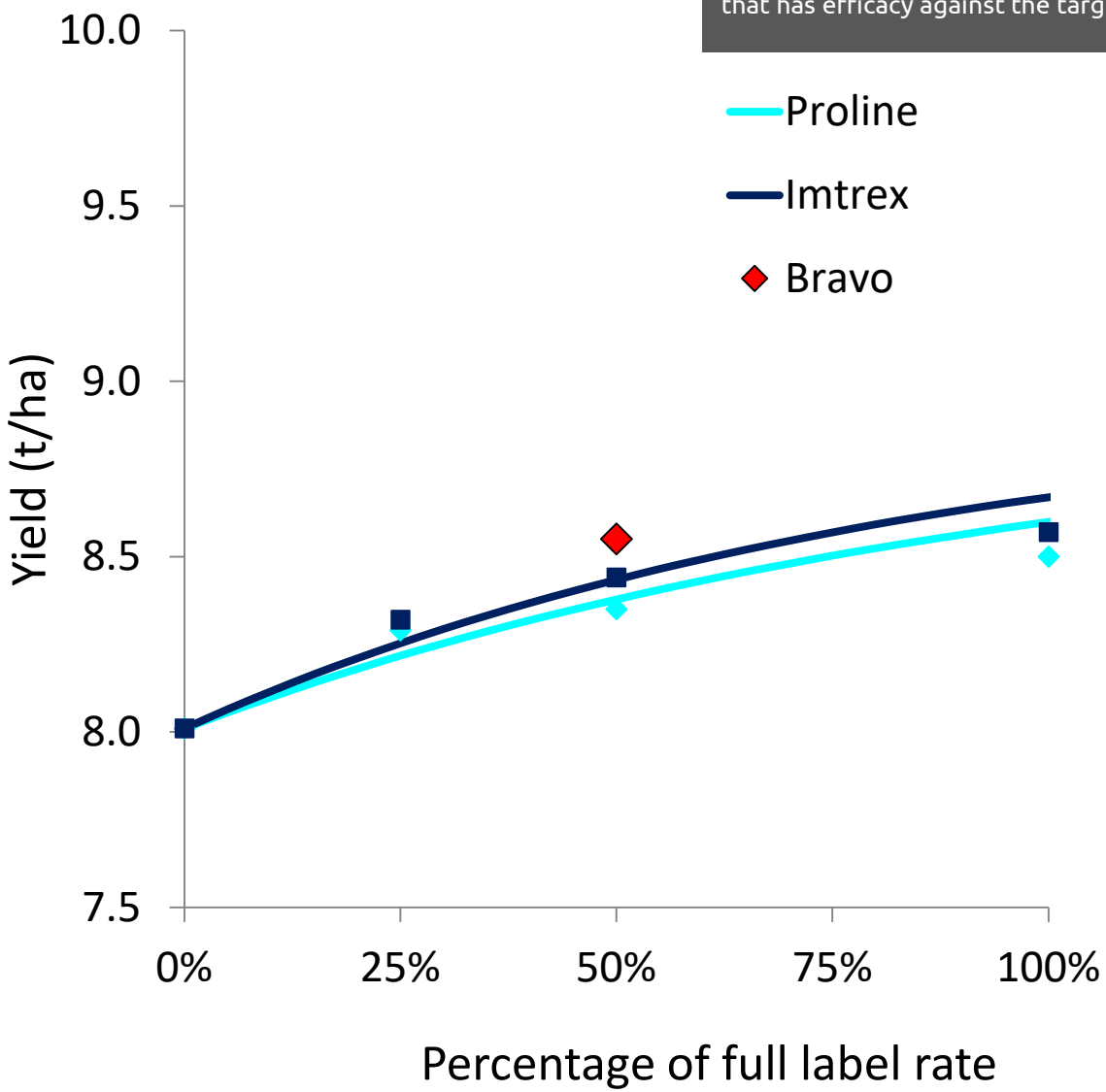




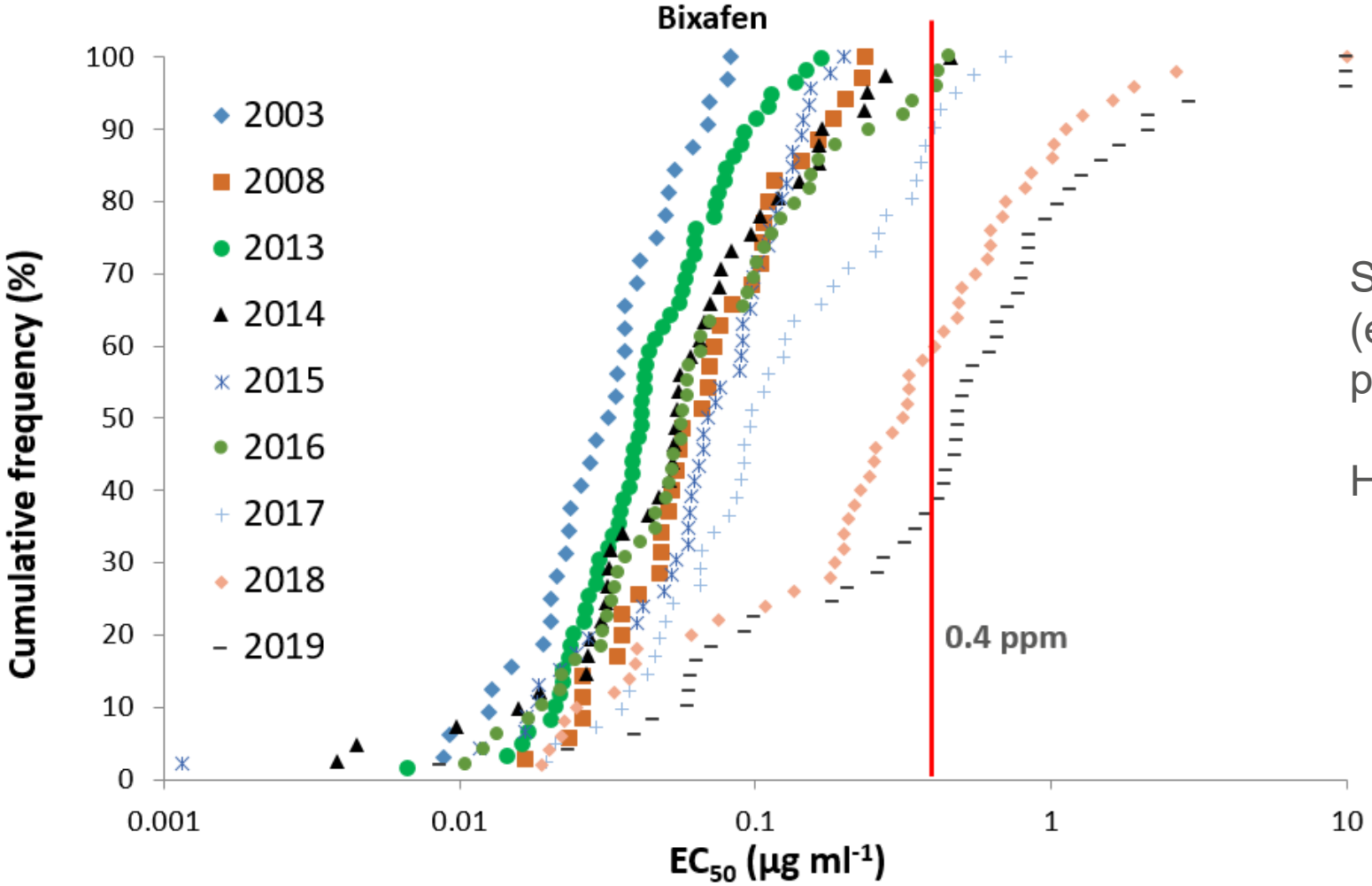
Septoria tritici trial yields 2019 (7 trials)

Use Imtrex only in mixture with at least one fungicide with an alternative mode of action that has efficacy against the target disease





Rothamsted early season monitoring 2019 SDHIs (n=49)

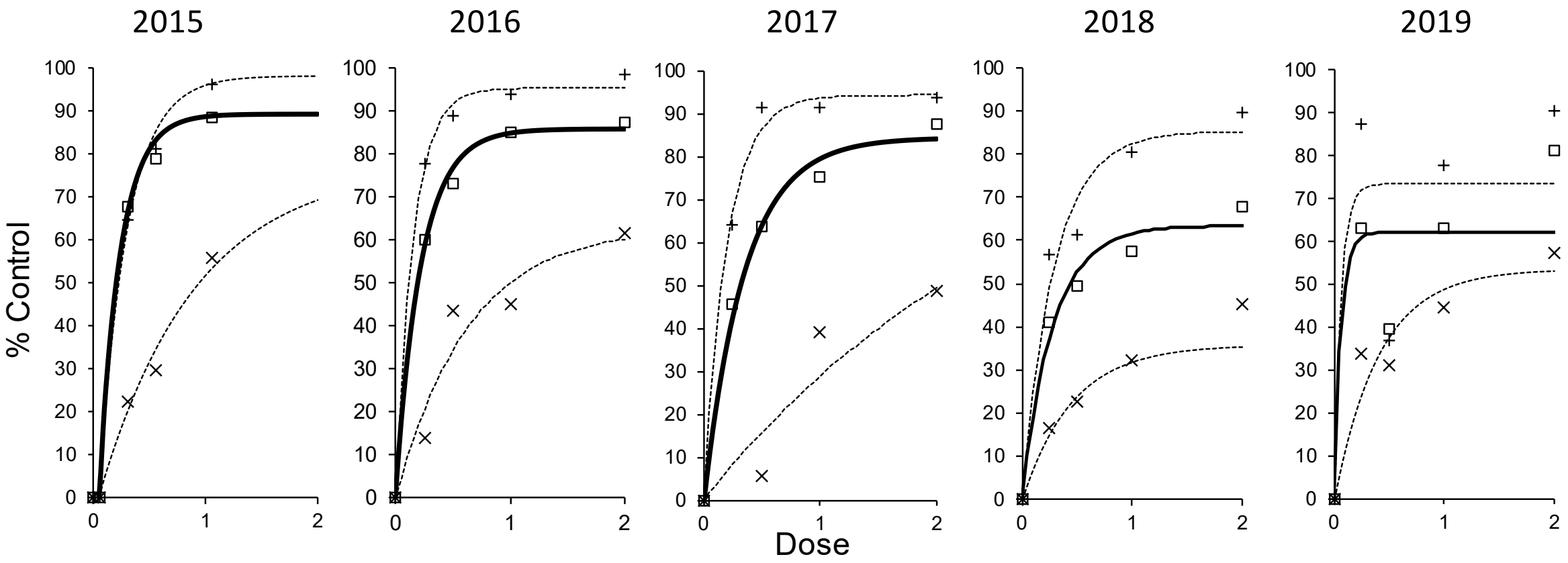


Strains less sensitive to SDHIs (e.g. T79N and N86S) now widely present in populations

H152R overwintered at this site

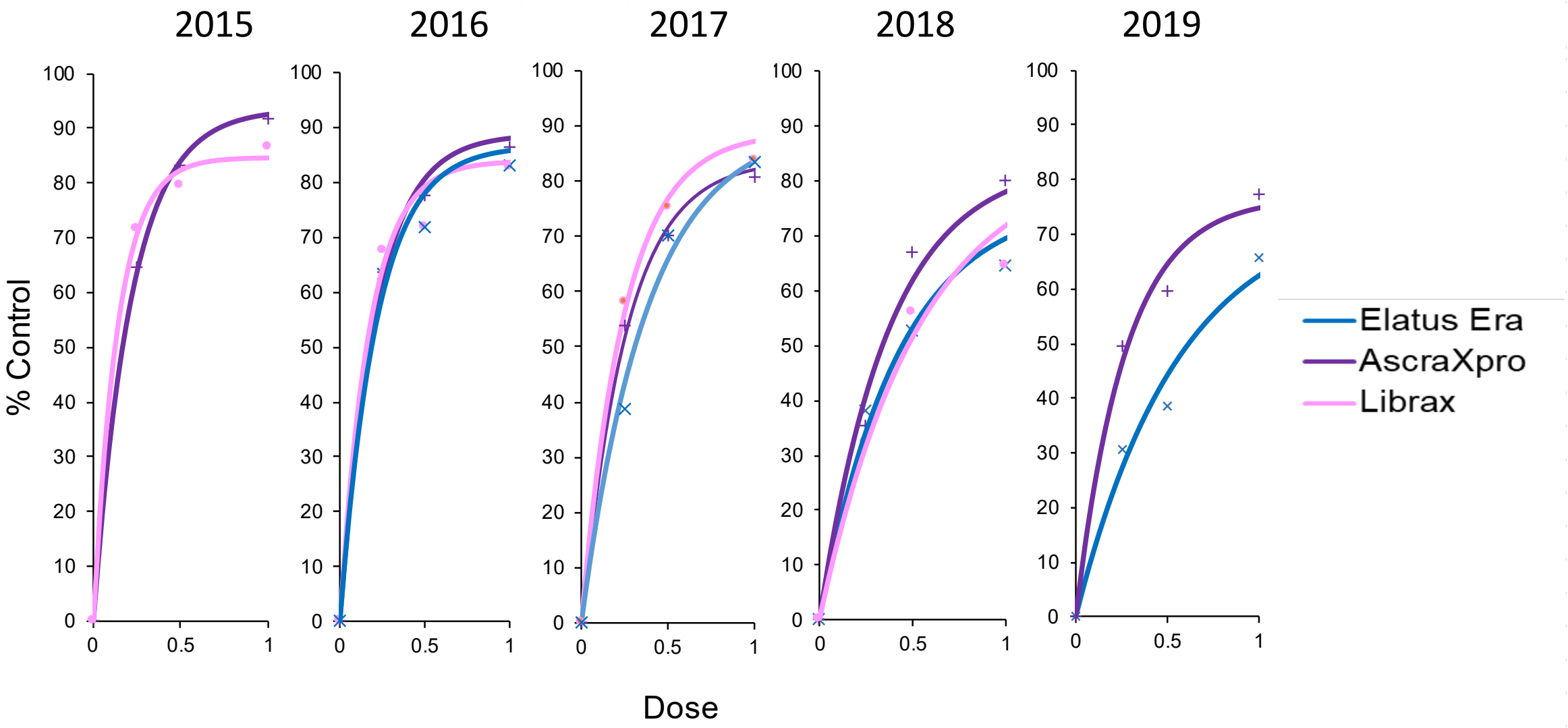
SDHI decline and stabilisation?

fluxapyroxad



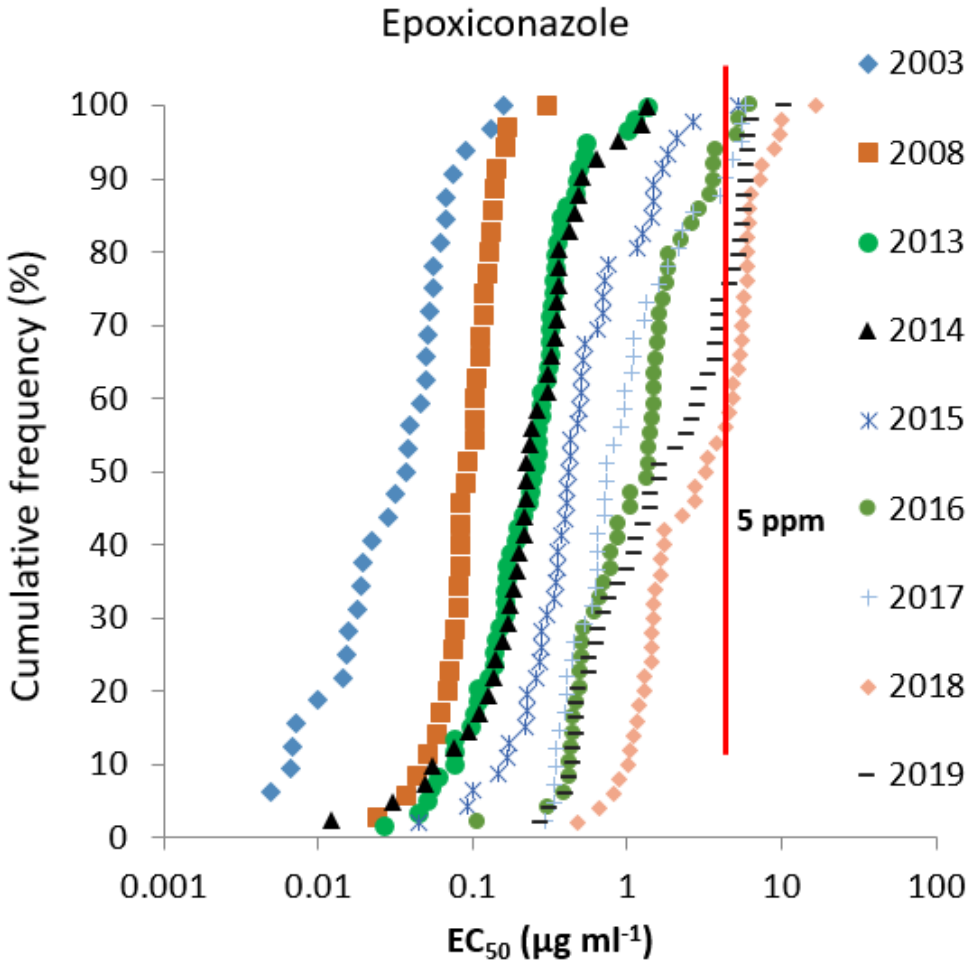
Data extracted from AHDB Fungicide Performance trials

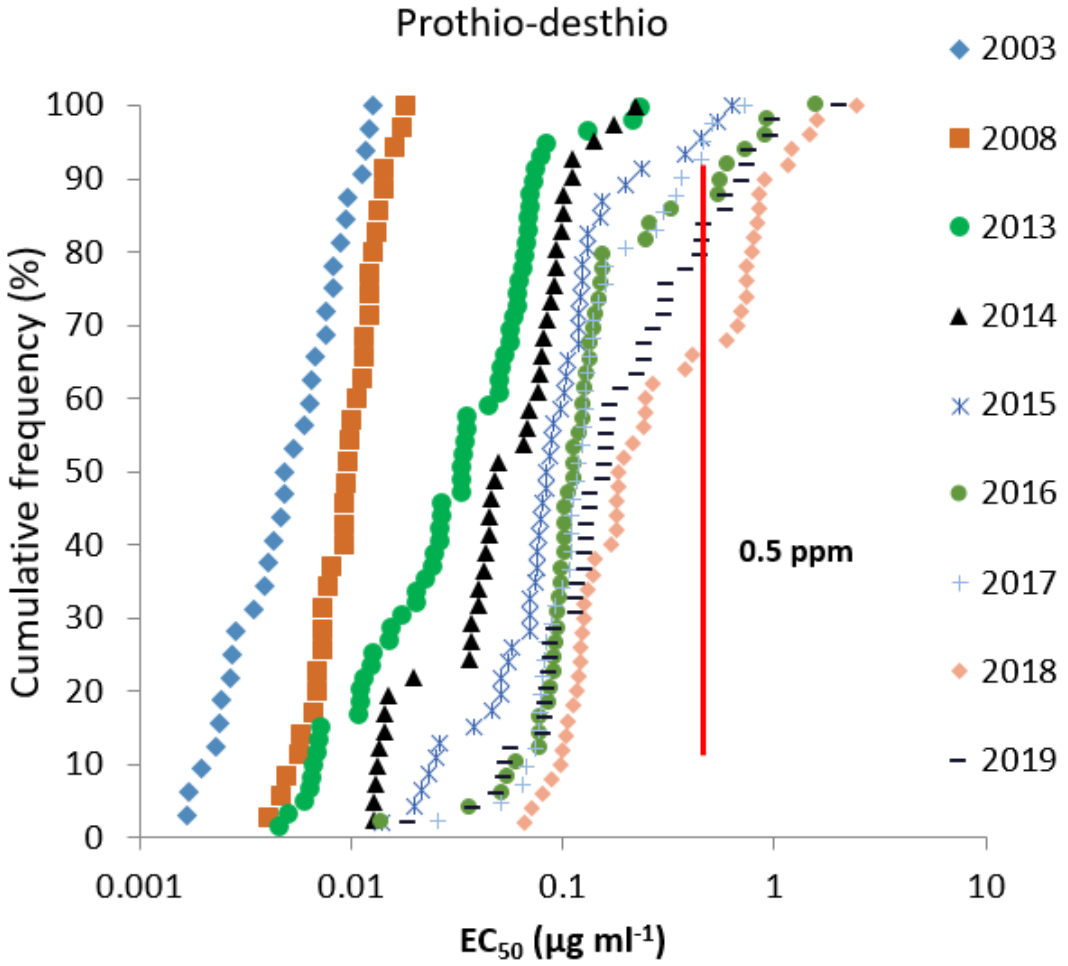
SDHI/azole efficacy on septoria tritici



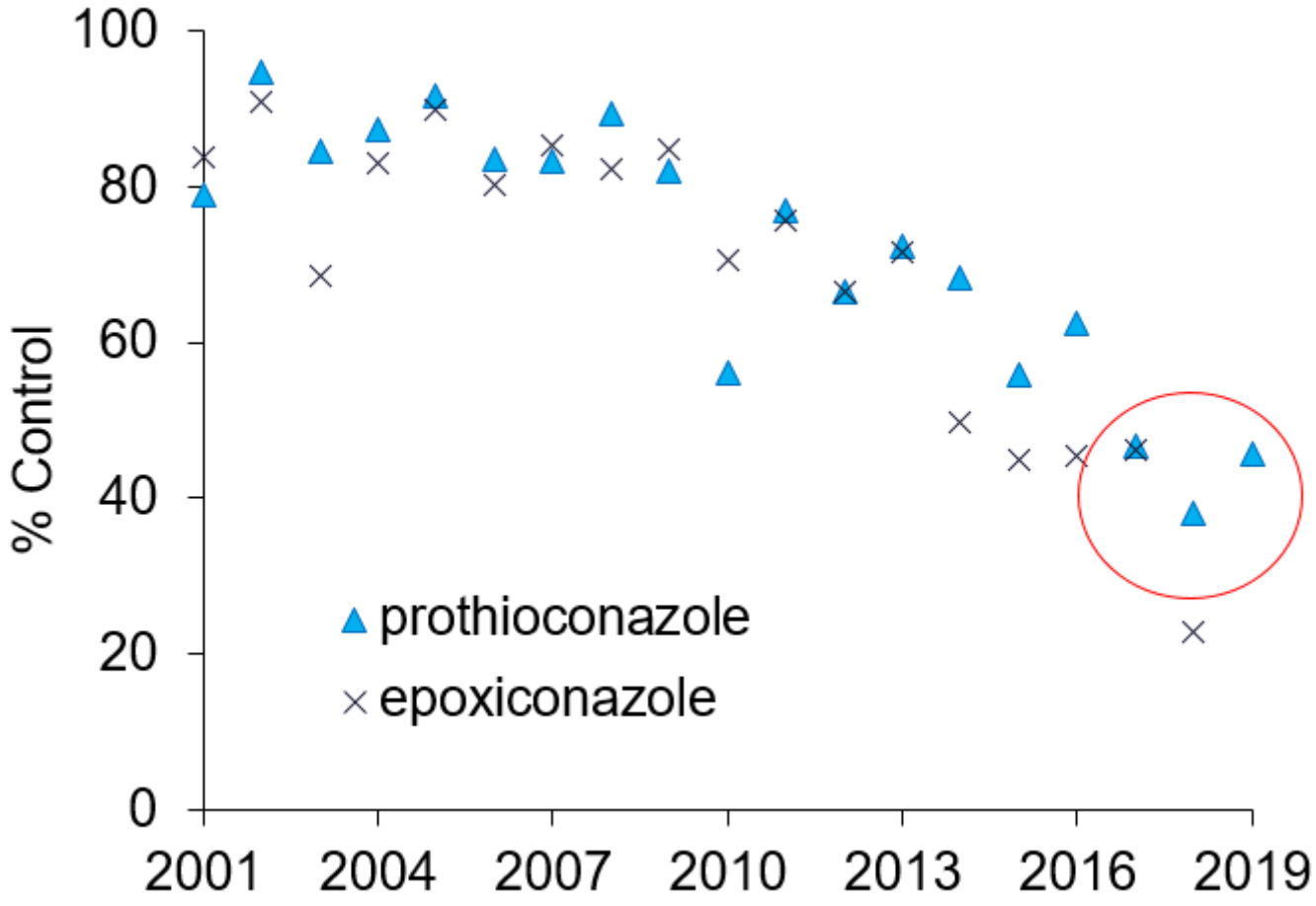
Rothamsted early season monitoring 2019

Azoles



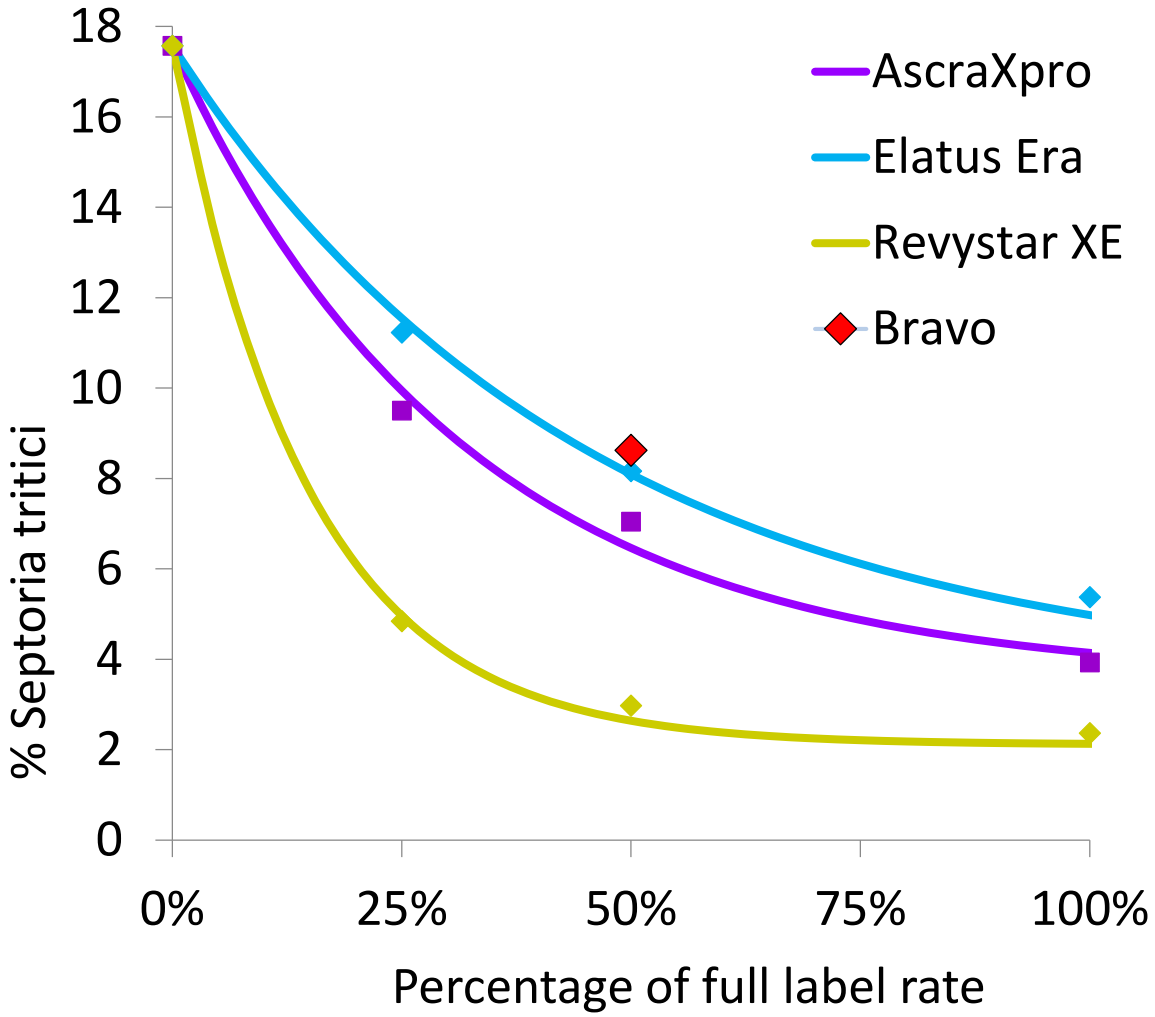


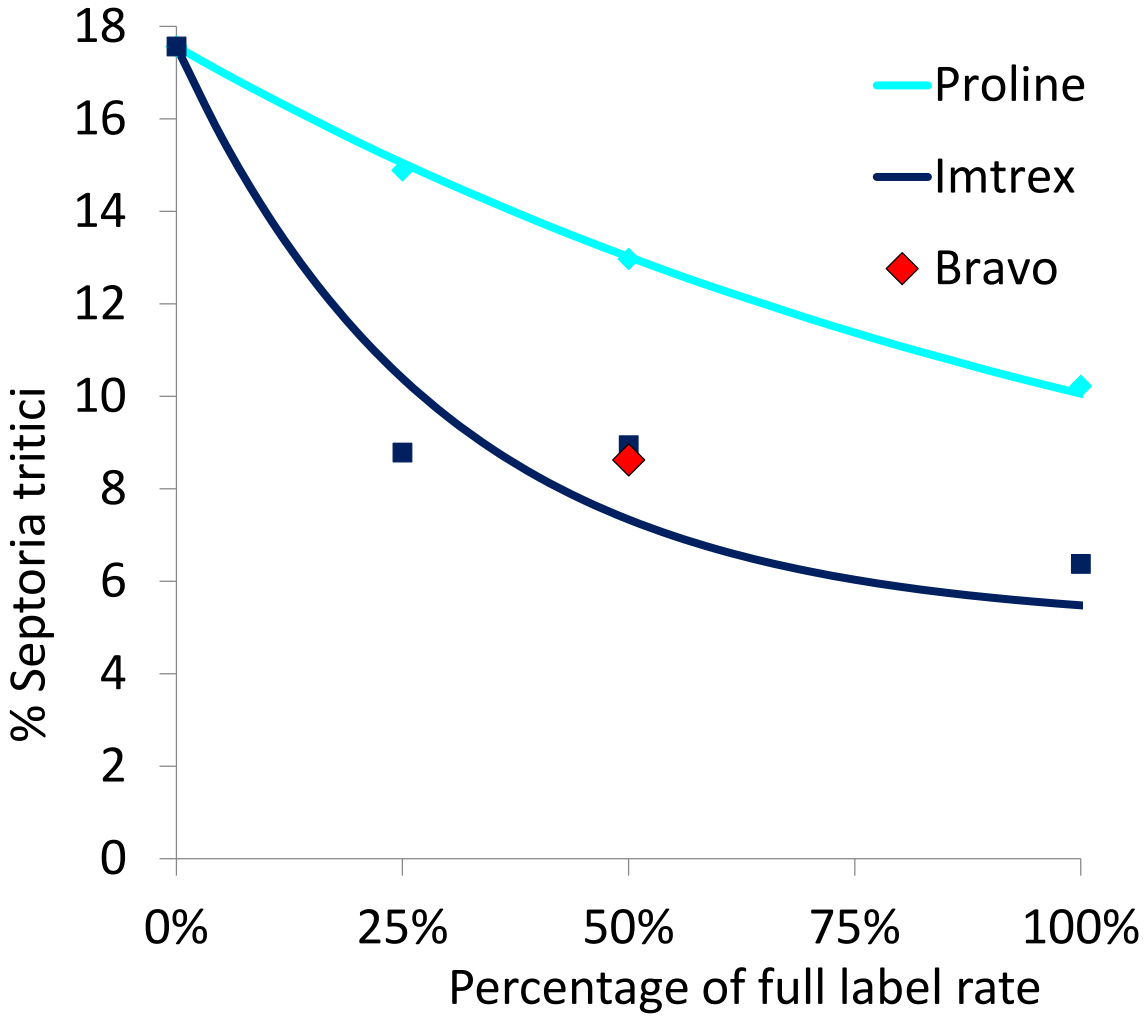
Azole efficacy on septoria tritici (2001–19)
Protectant activity at full rate



Septoria tritici protectant 2017–19 (15 trials)

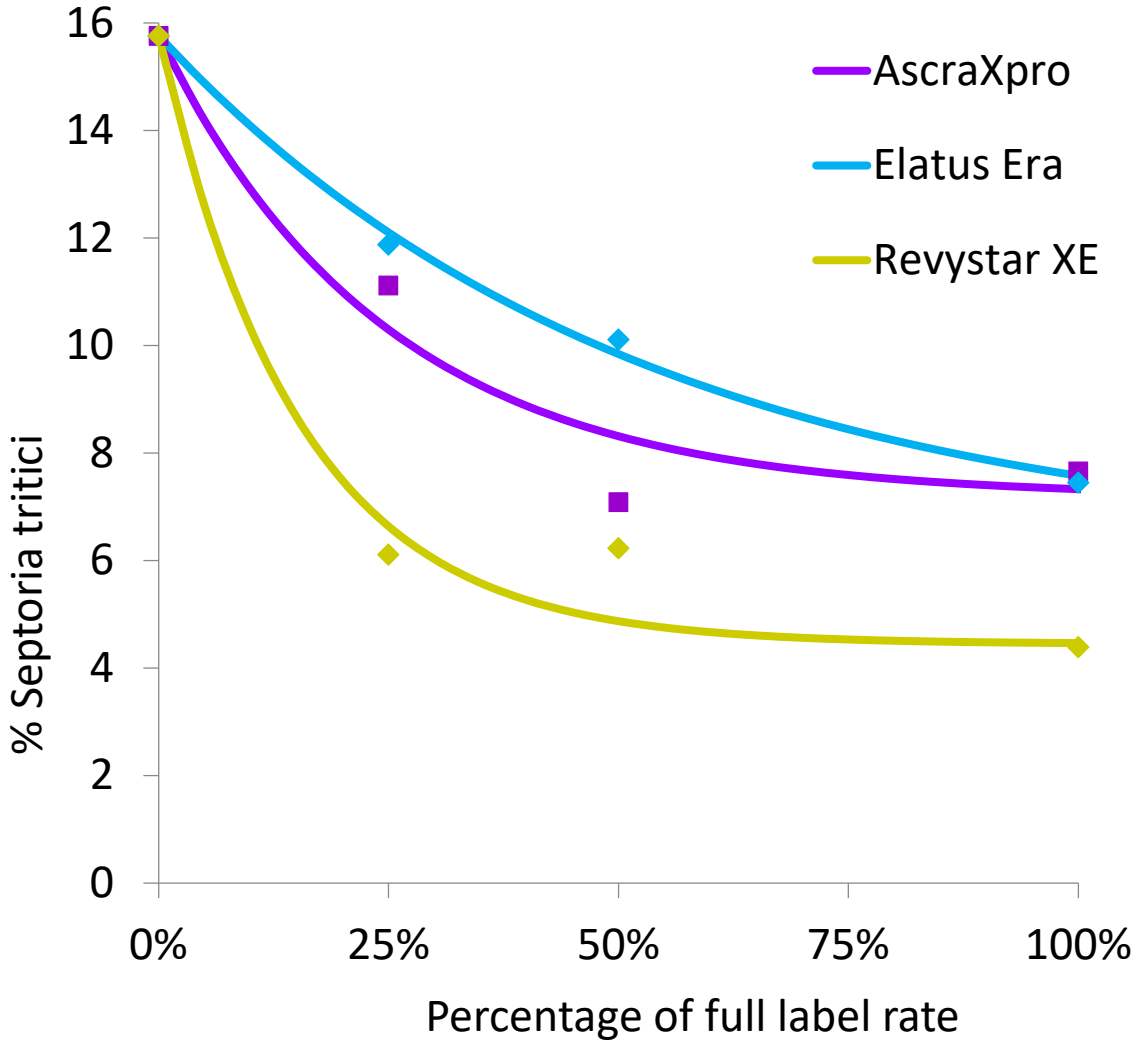
Use Imtrex only in mixture with at least one fungicide with an alternative mode of action that has efficacy against the target disease

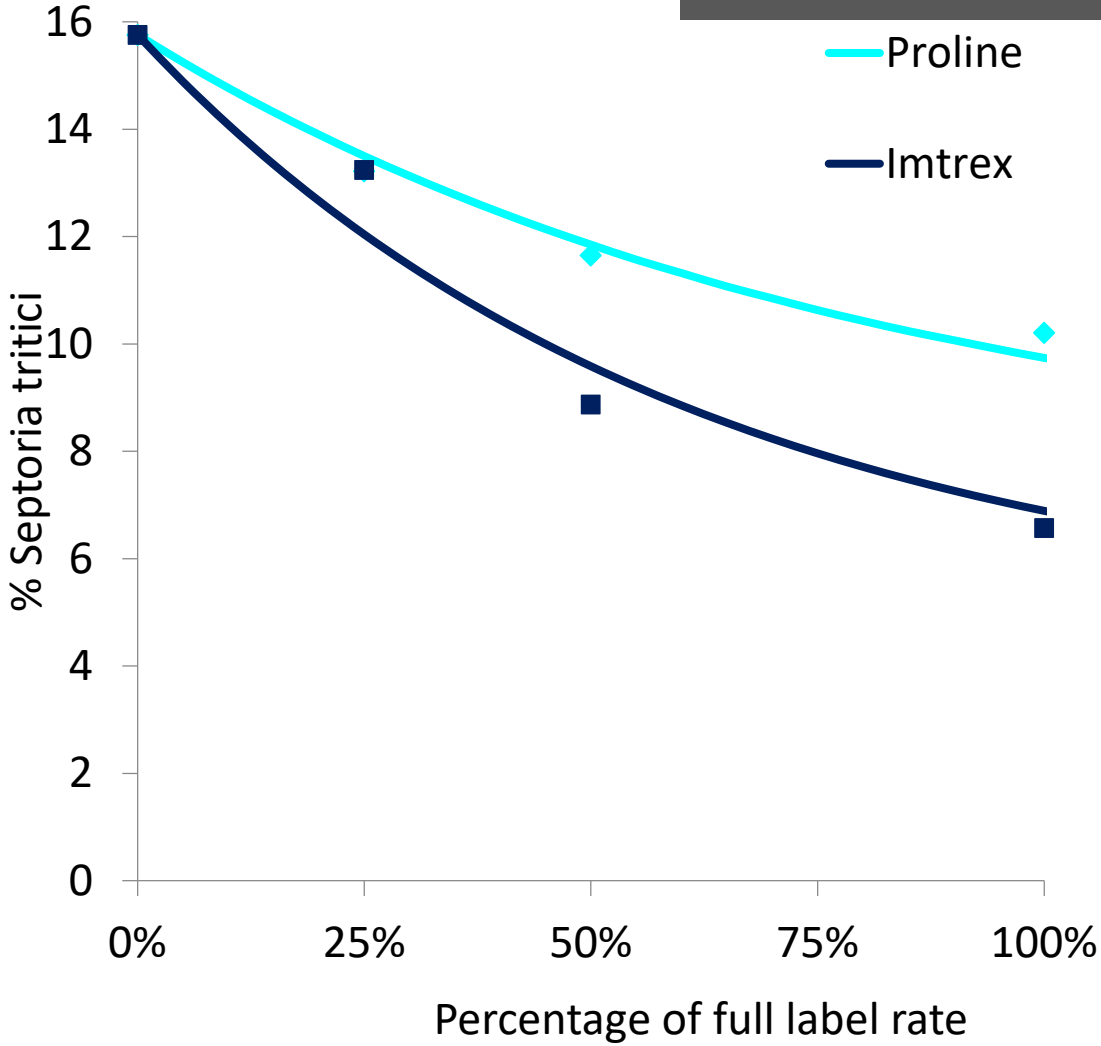




Septoria tritici curative 2017–19 (6 trials)

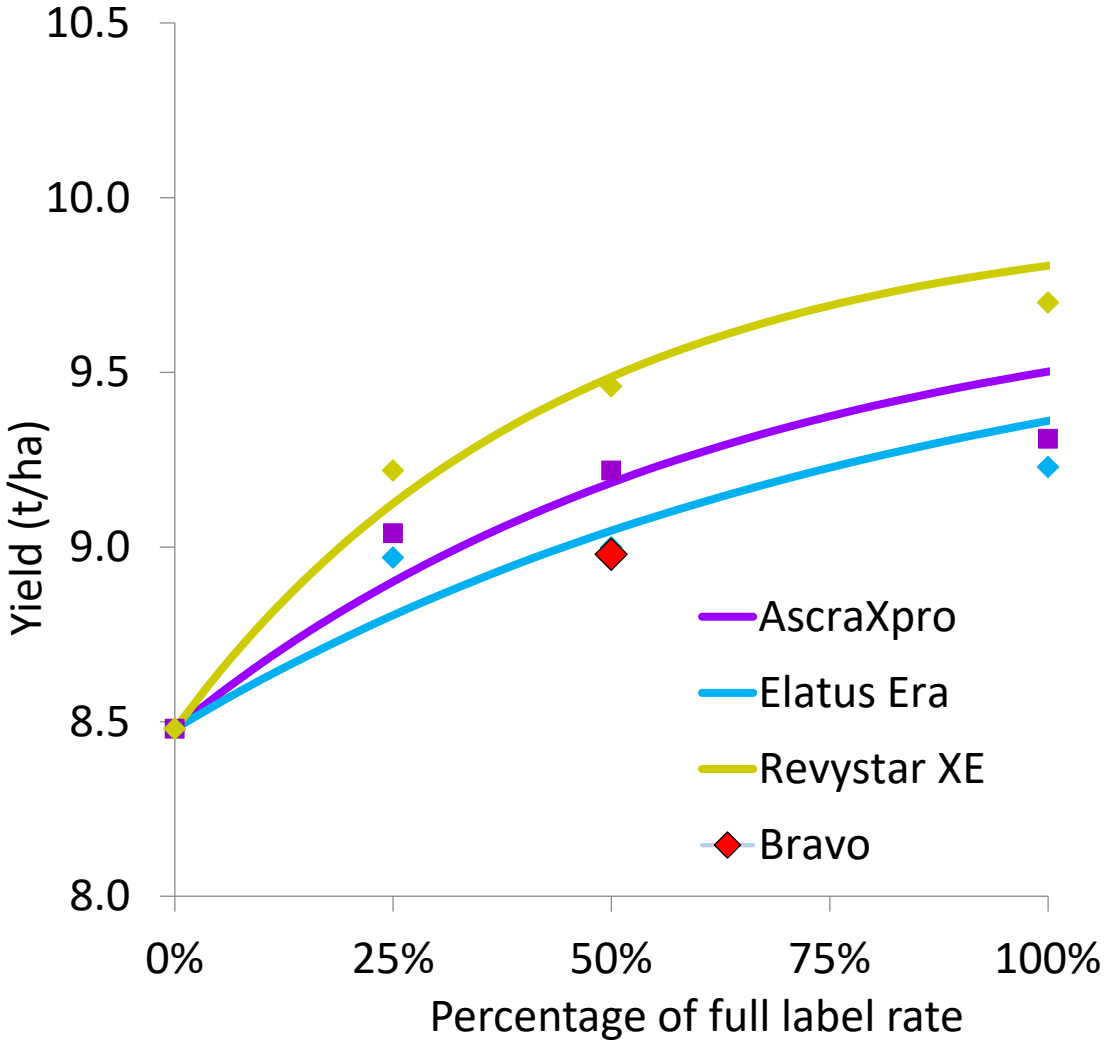
Use Imtrex only in mixture with at least one fungicide with an alternative mode of action that has efficacy against the target disease

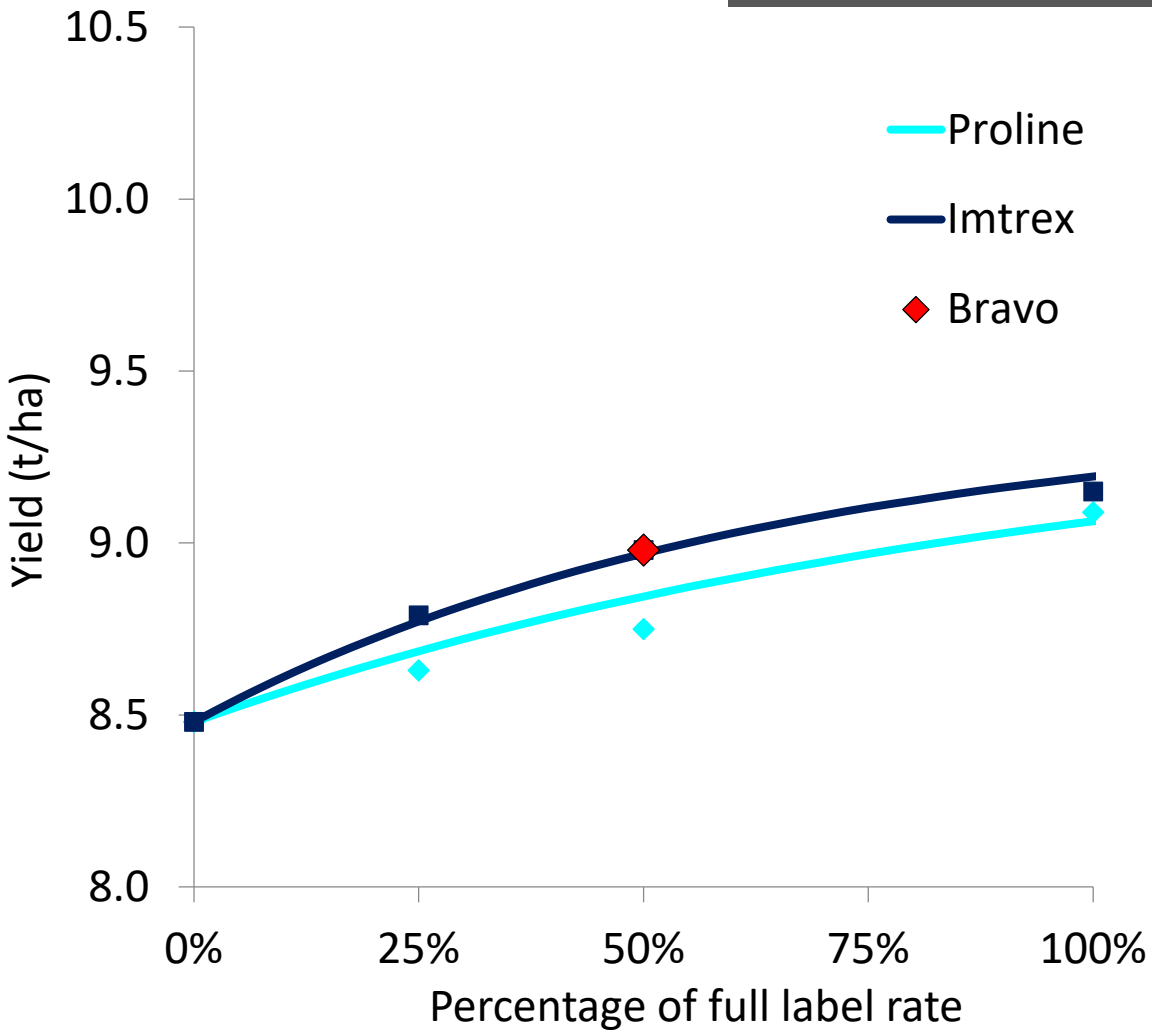




Septoria tritici trial yields 2017–19 (20 trials)

Use Imtrex only in mixture with at least one fungicide with an alternative mode of action that has efficacy against the target disease





Yellow rust 2019

Reflection (near Kings Lynn)

Yellow rust – widespread in 2019

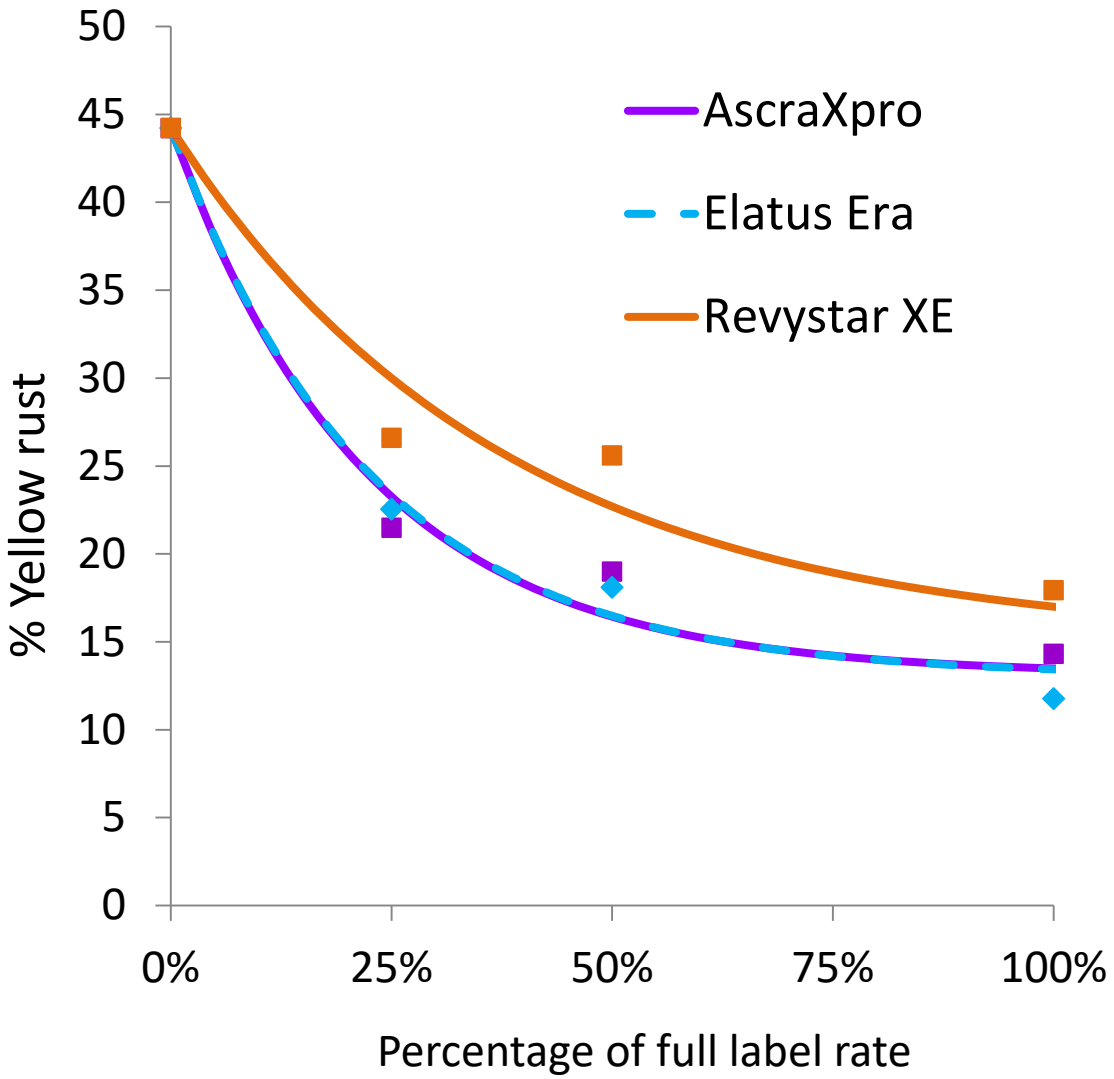
RL ratings changes

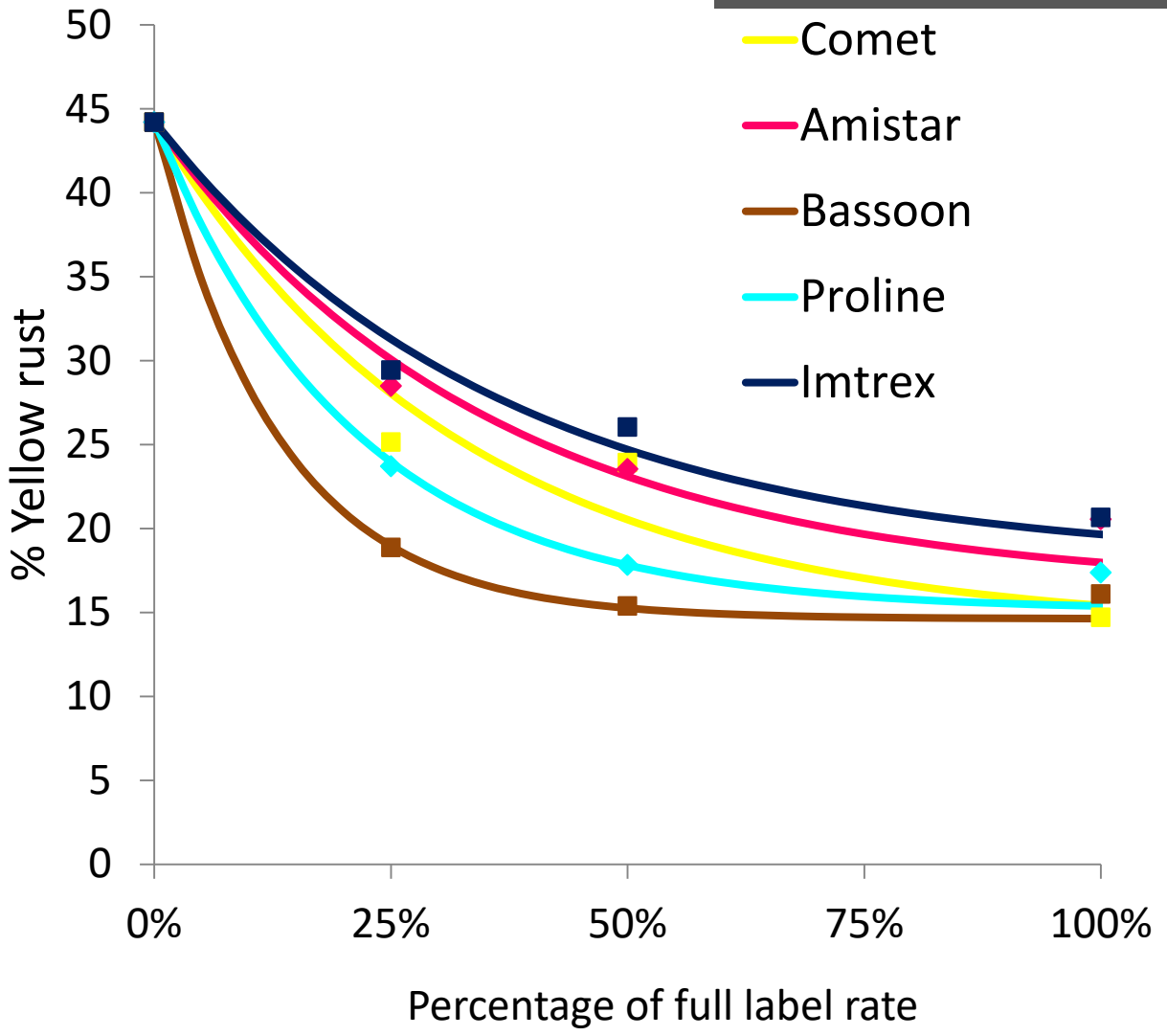
- Zyatt 8 to 7
- Bennington 6 to 5
- Viscount 7 to 6

Late sowings can be higher risk

Yellow rust 2019 (1 trial)

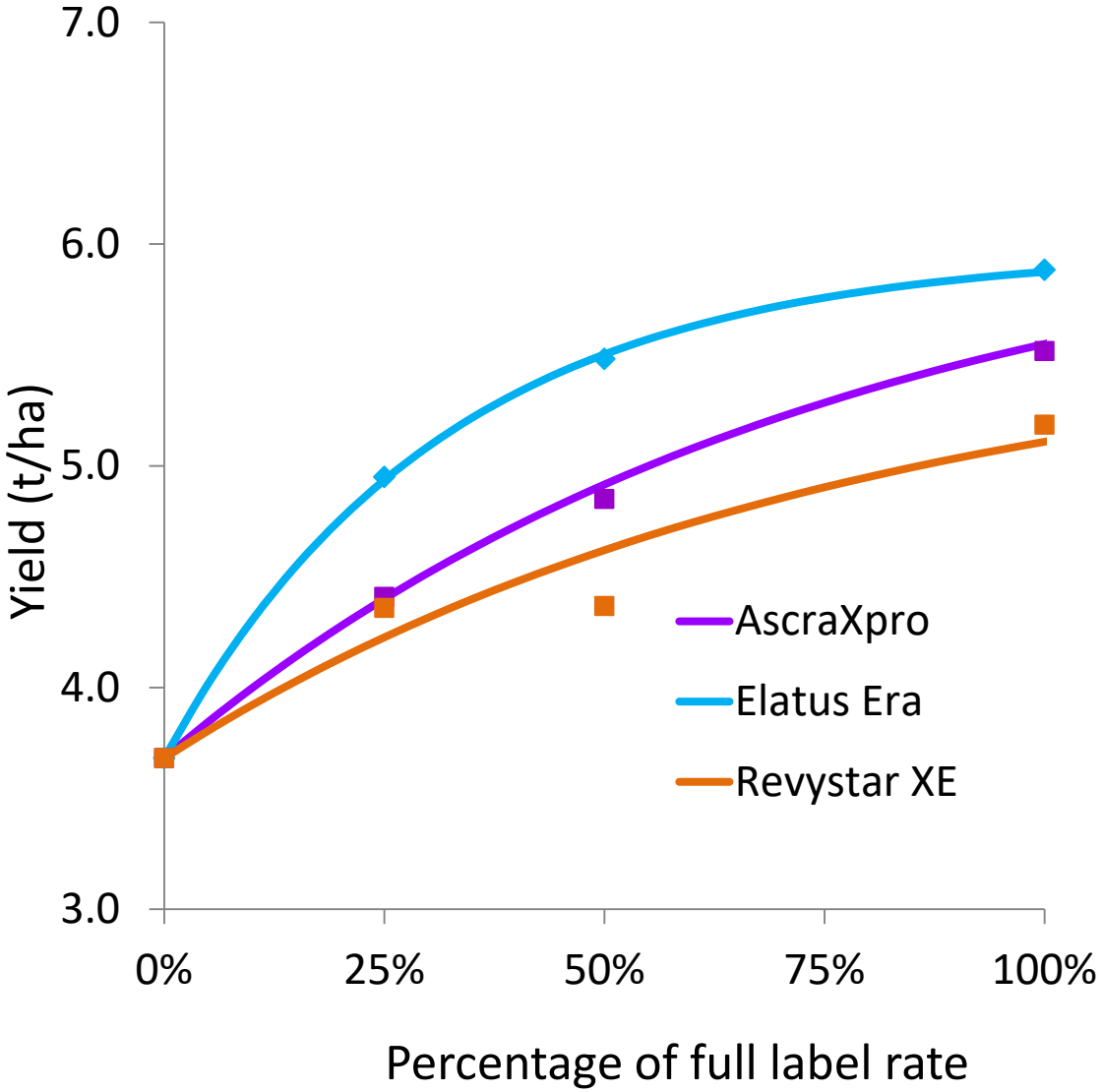
Use Imtrex only in mixture with at least one fungicide with an alternative mode of action that has efficacy against the target disease

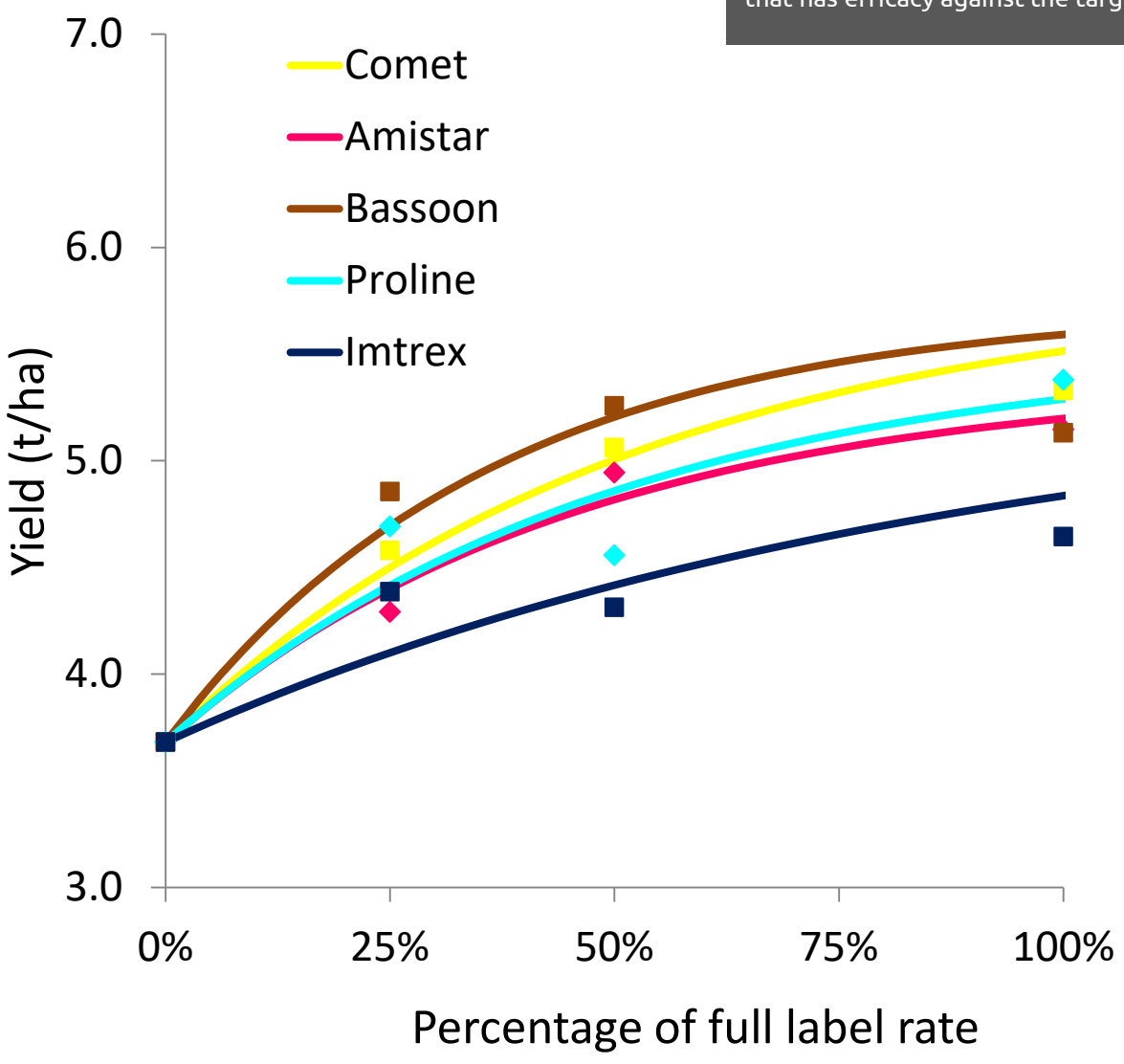




Yellow rust trial yields 2019 (1 trial)

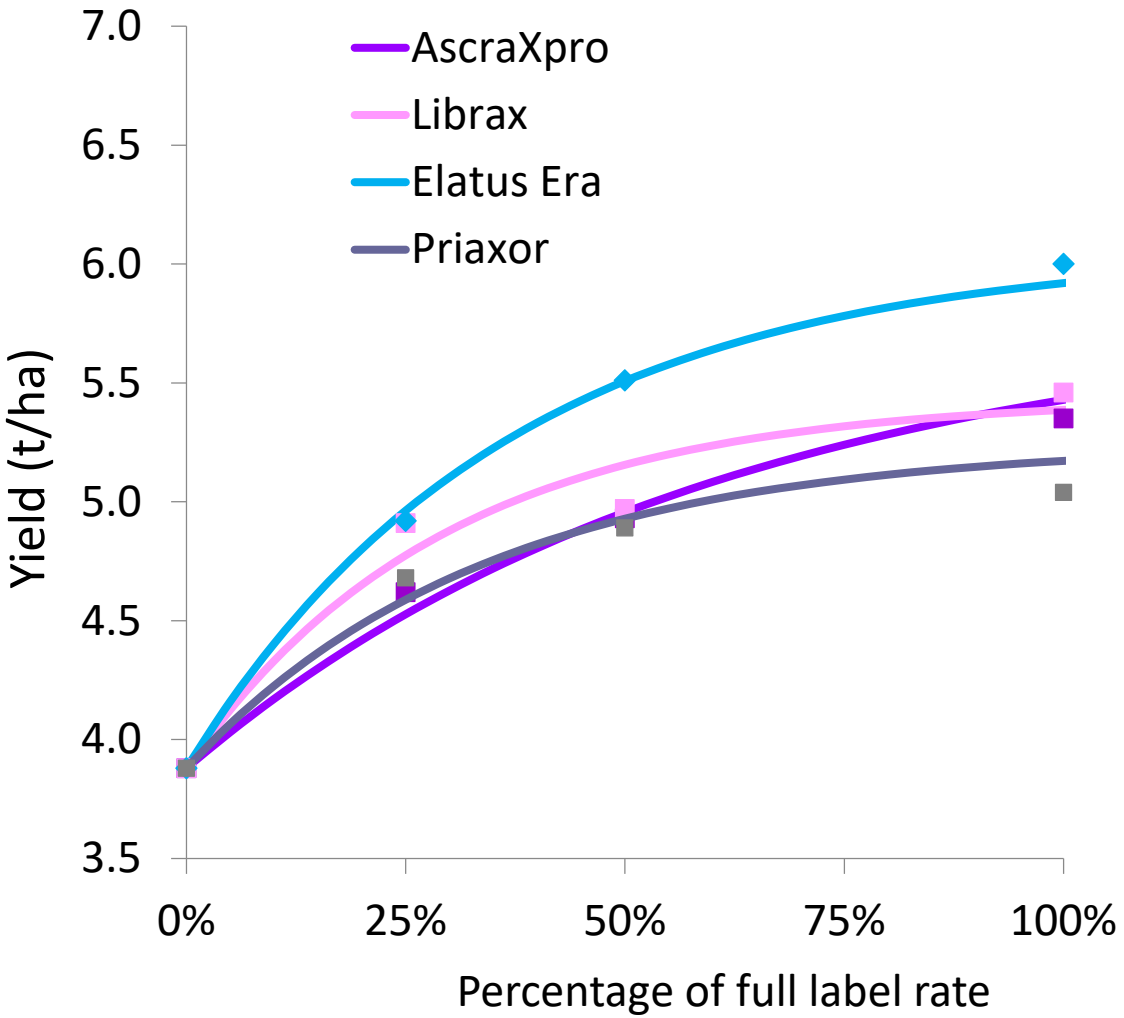
Use Imtrex only in mixture with at least one fungicide with an alternative mode of action that has efficacy against the target disease

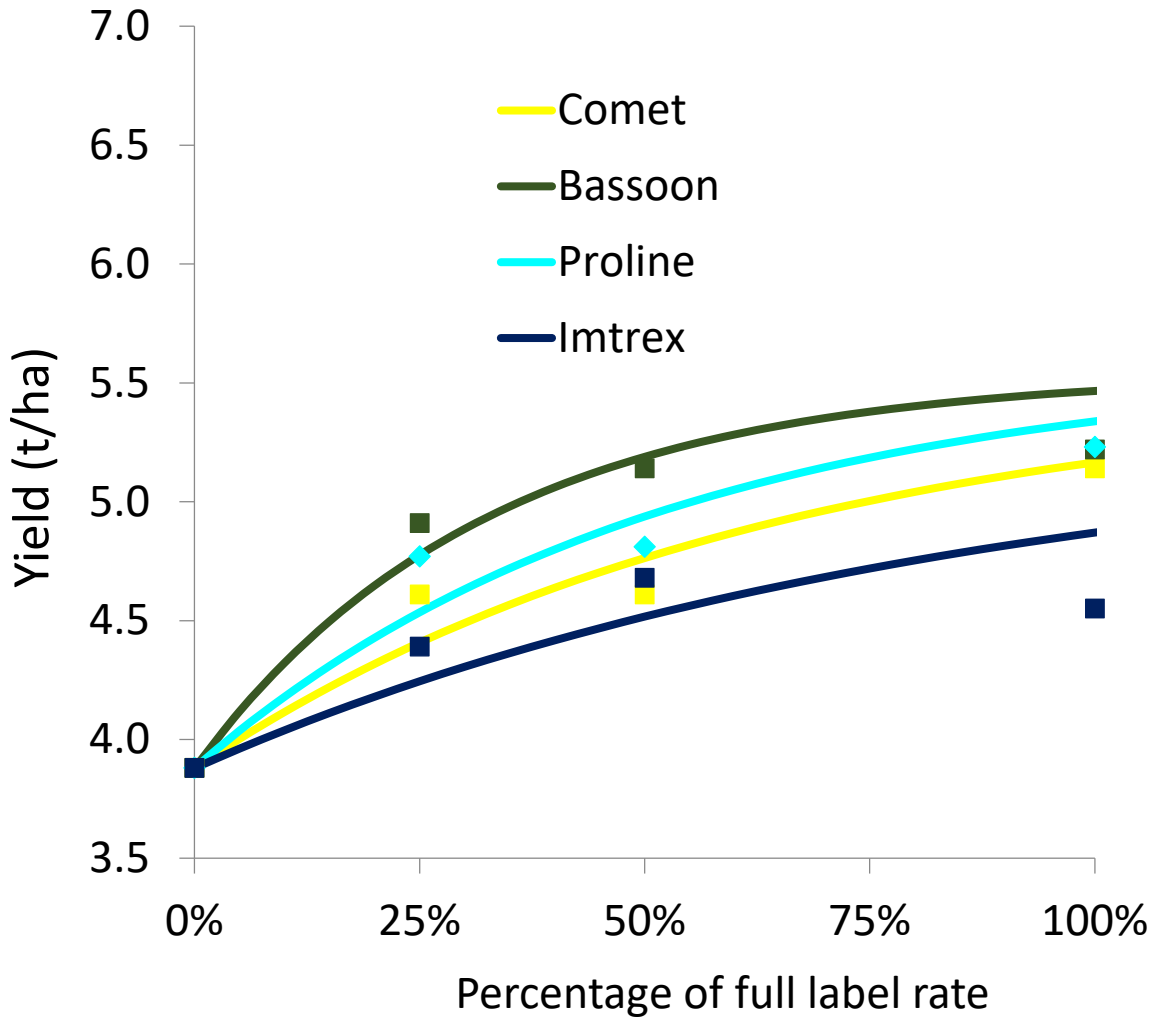




Yellow rust yield 2017–19 (3 trials)

Use Imtrex only in mixture with at least one fungicide with an alternative mode of action that has efficacy against the target disease





Priaxor = fluxapyroxad + pyraclostrobin

Brown rust 2019

Crusoe (Cambridge)

Slow to develop in 2019 following cool spring weather

RL ratings changes

Firefly 8 to 6

Viscount 9 to 8

Skyscraper 5 to 6

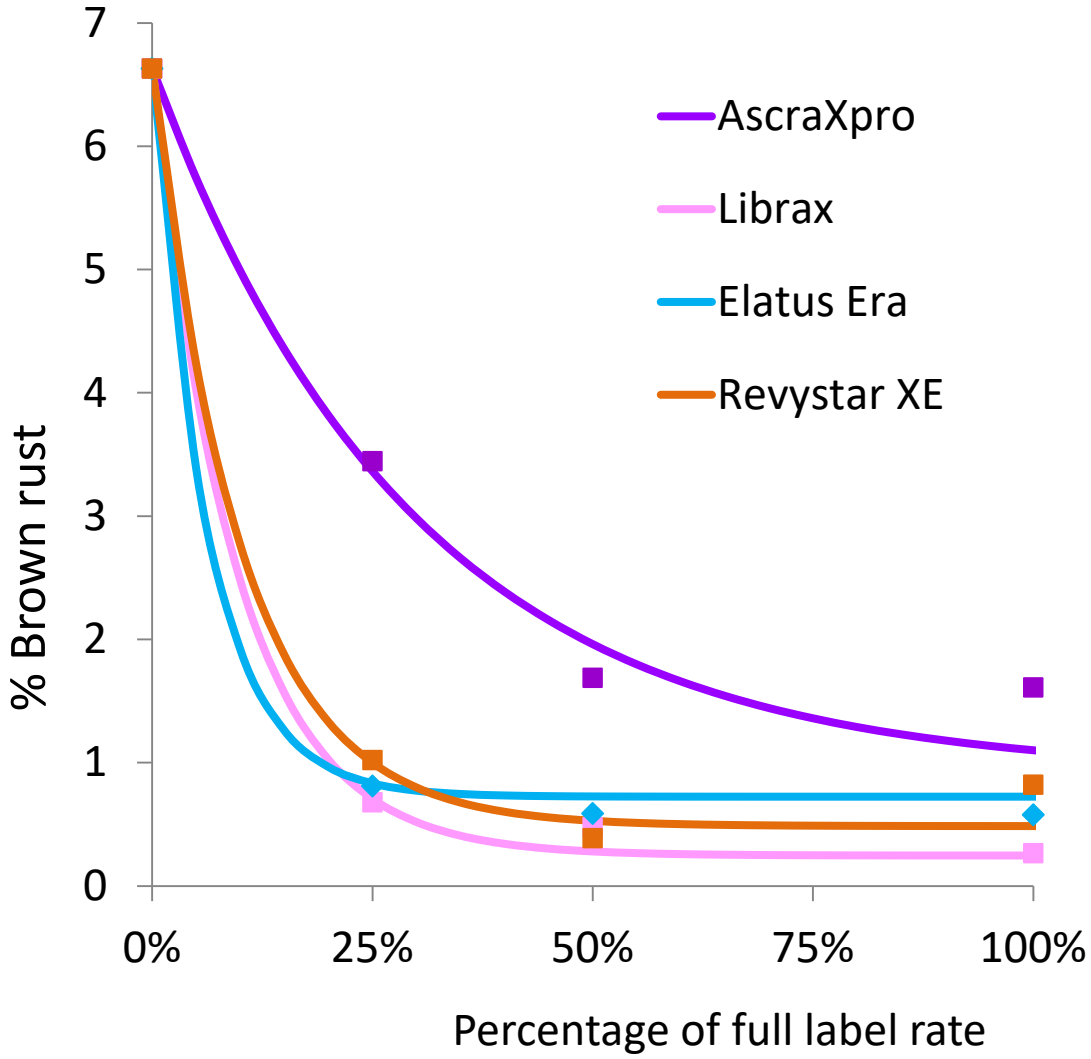
Spotlight 6 to 7

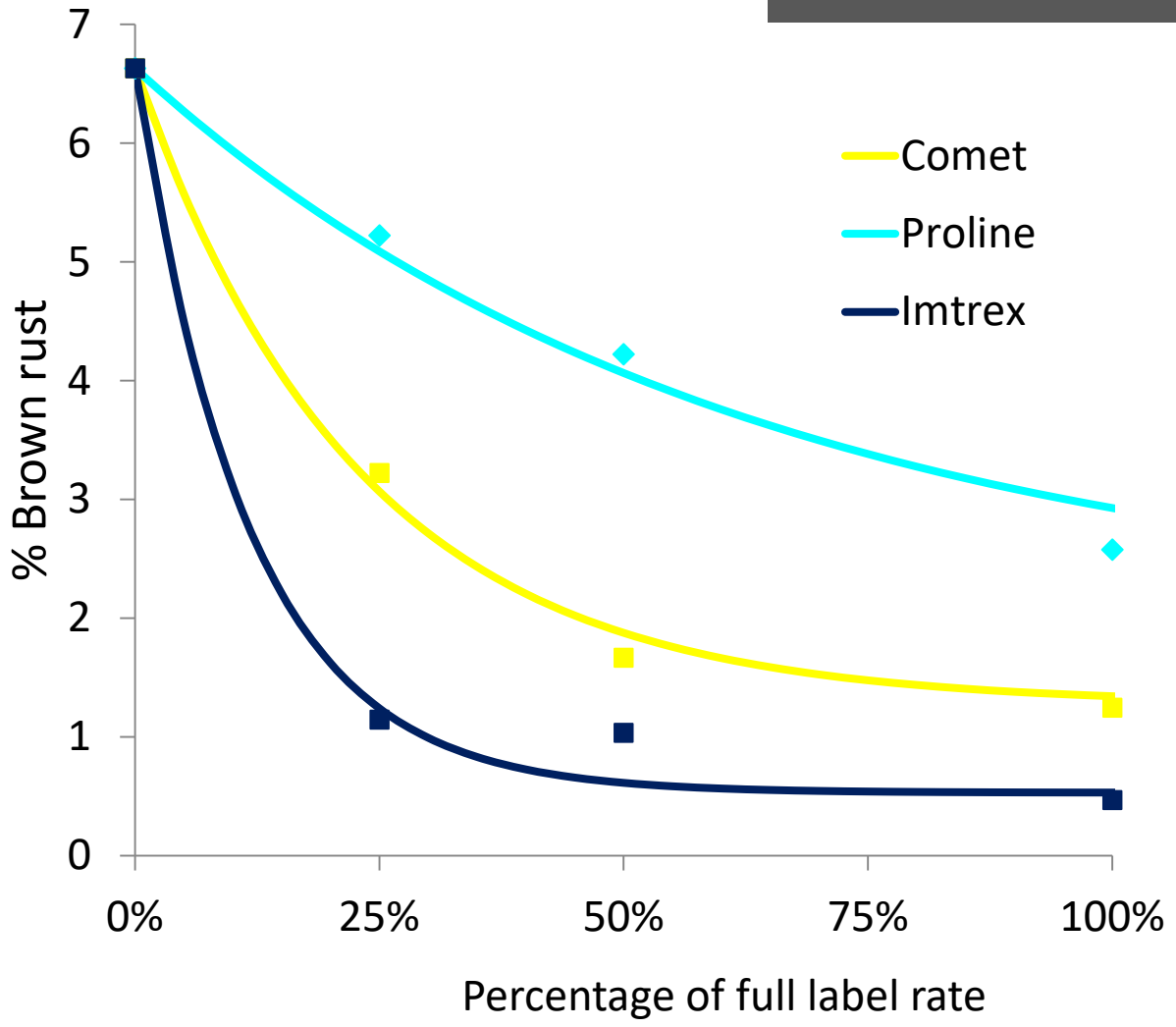
Fungicide performance trial (Cambridge)

- Crusoe
- GS 39 application

Brown rust 2019 (1 trial)

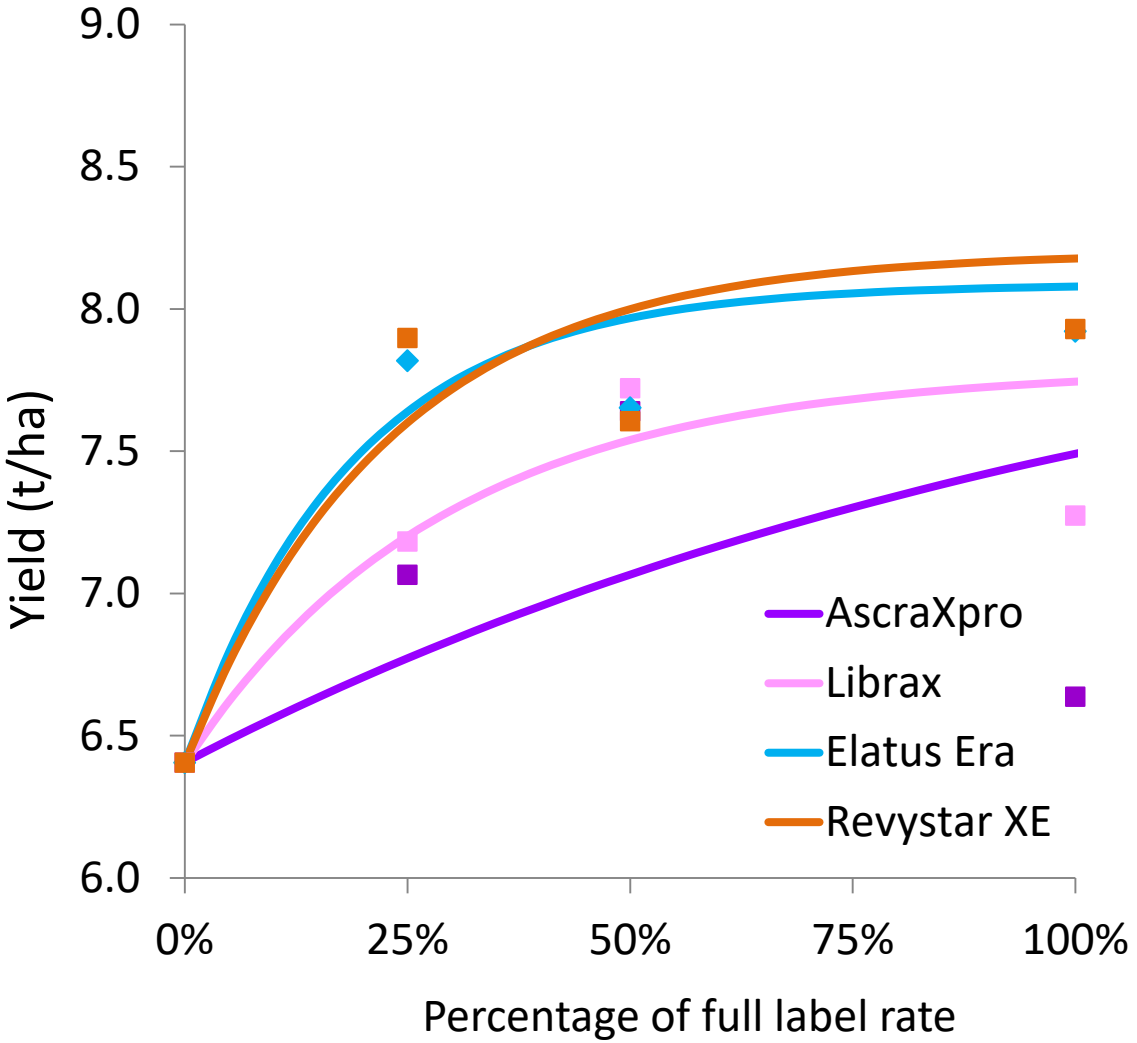
Use Imtrex only in mixture with at least one fungicide with an alternative mode of action that has efficacy against the target disease

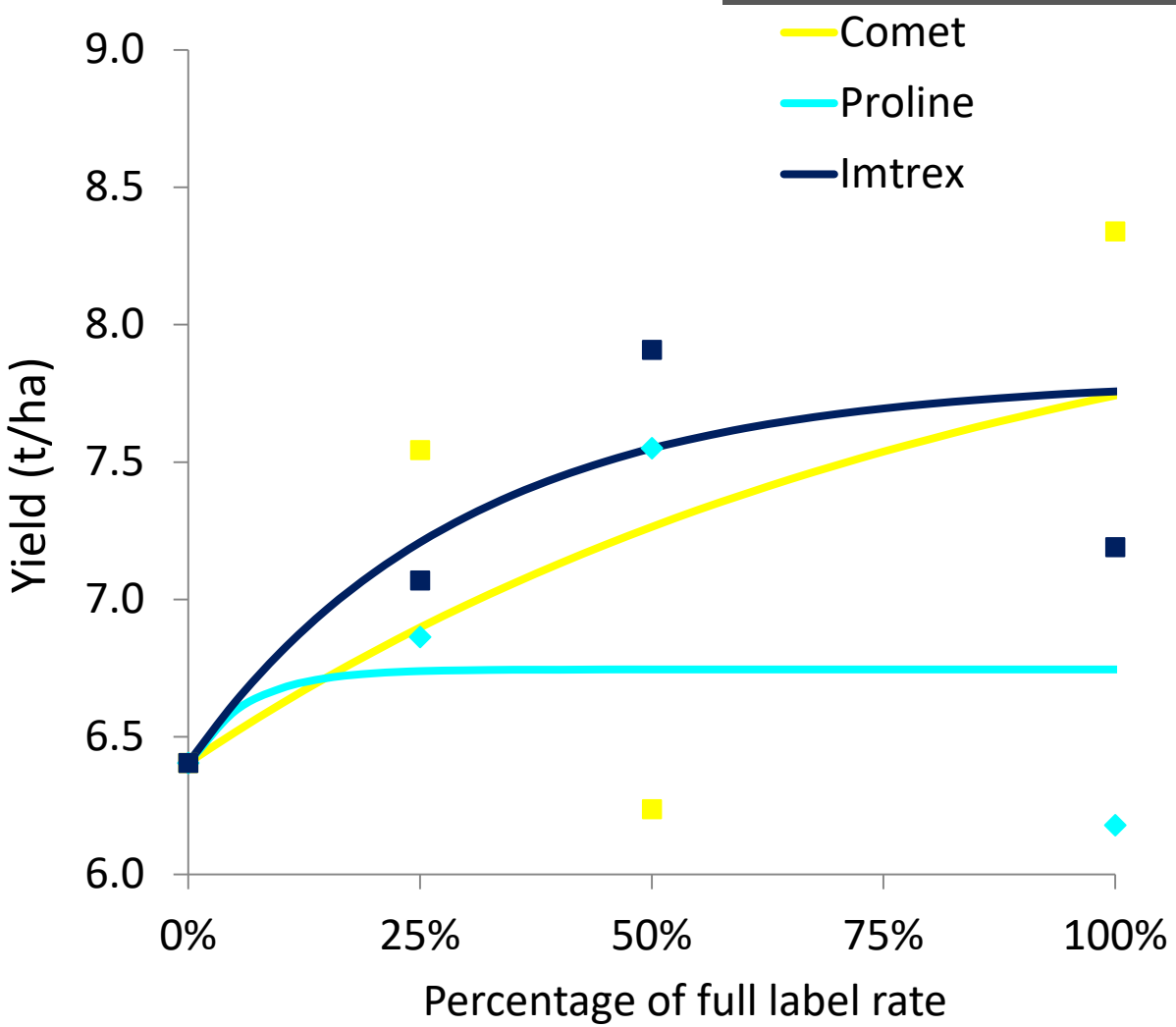




Brown rust yield 2019 (1 trial)

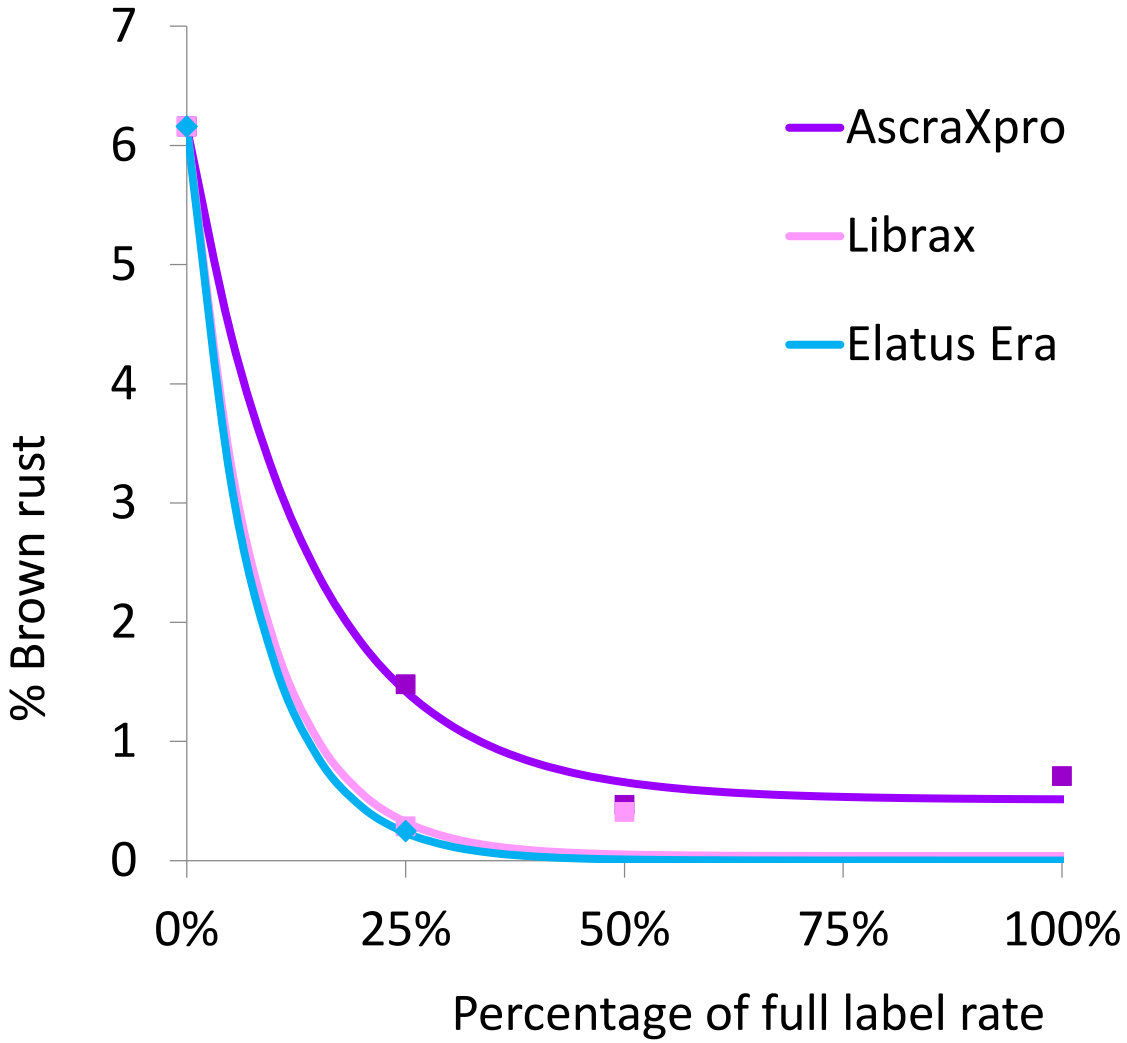
Use Imtrex only in mixture with at least one fungicide with an alternative mode of action that has efficacy against the target disease

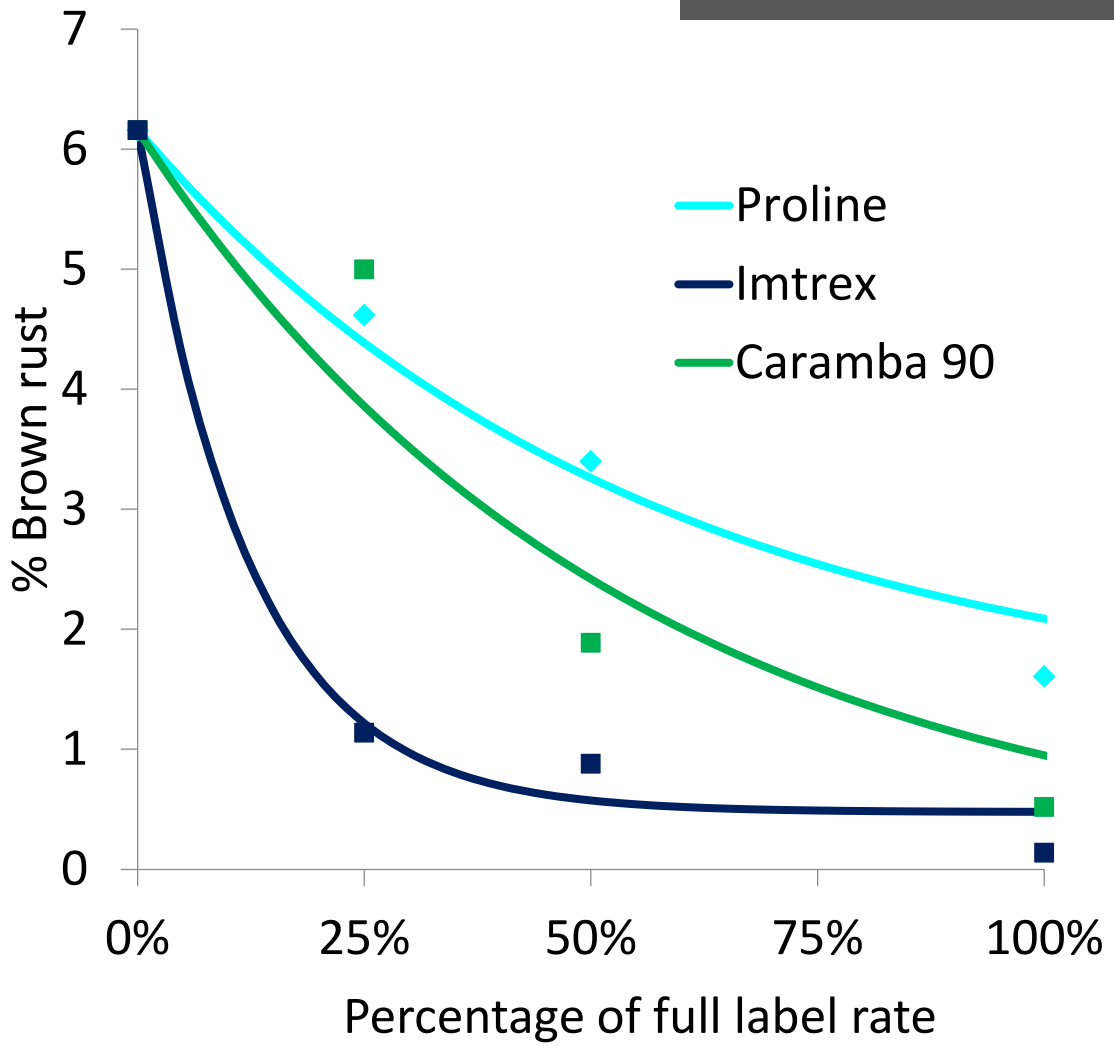




Brown rust 2017–19 (3 trials)

Use Imtrex only in mixture with at least one fungicide with an alternative mode of action that has efficacy against the target disease

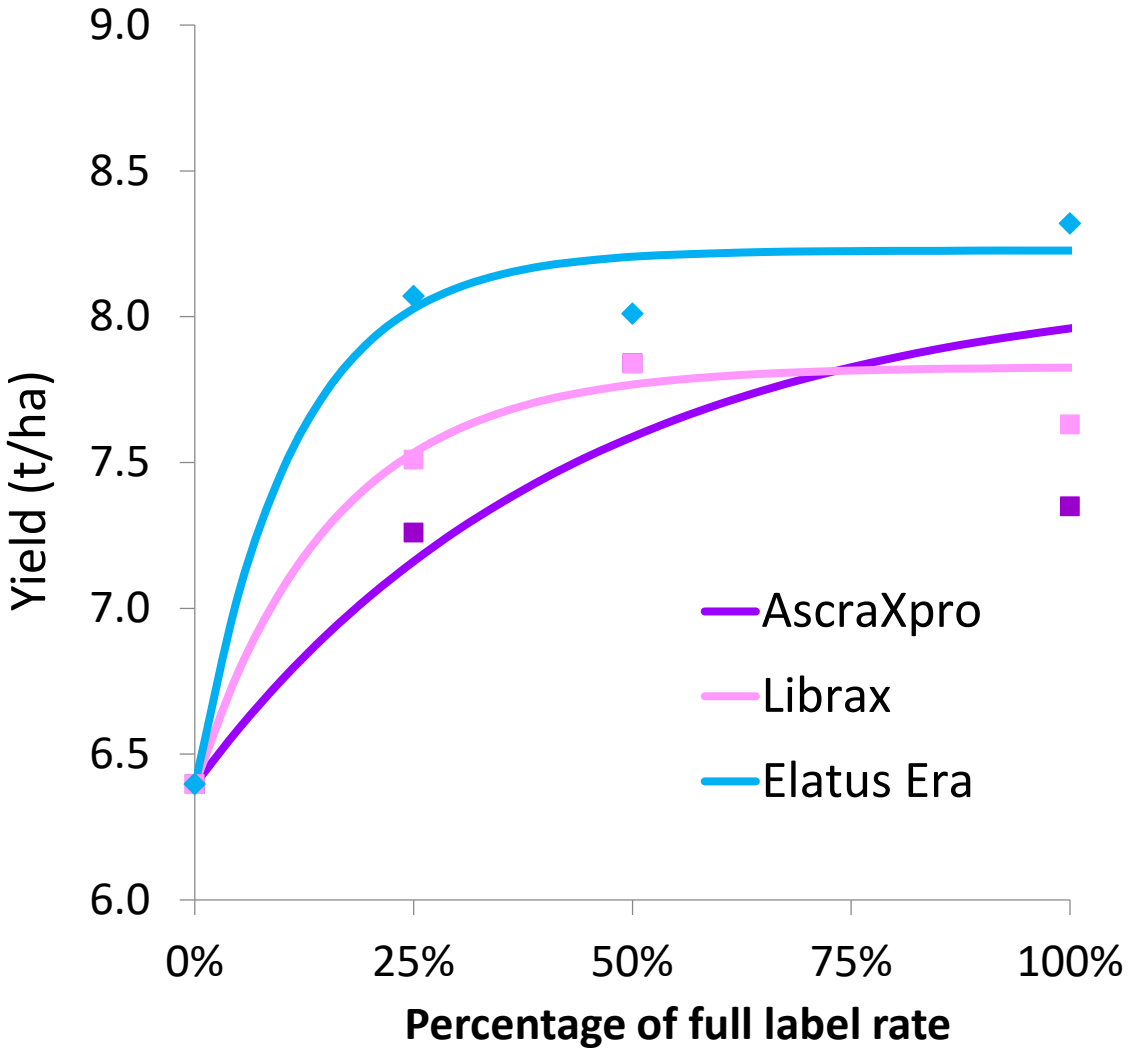


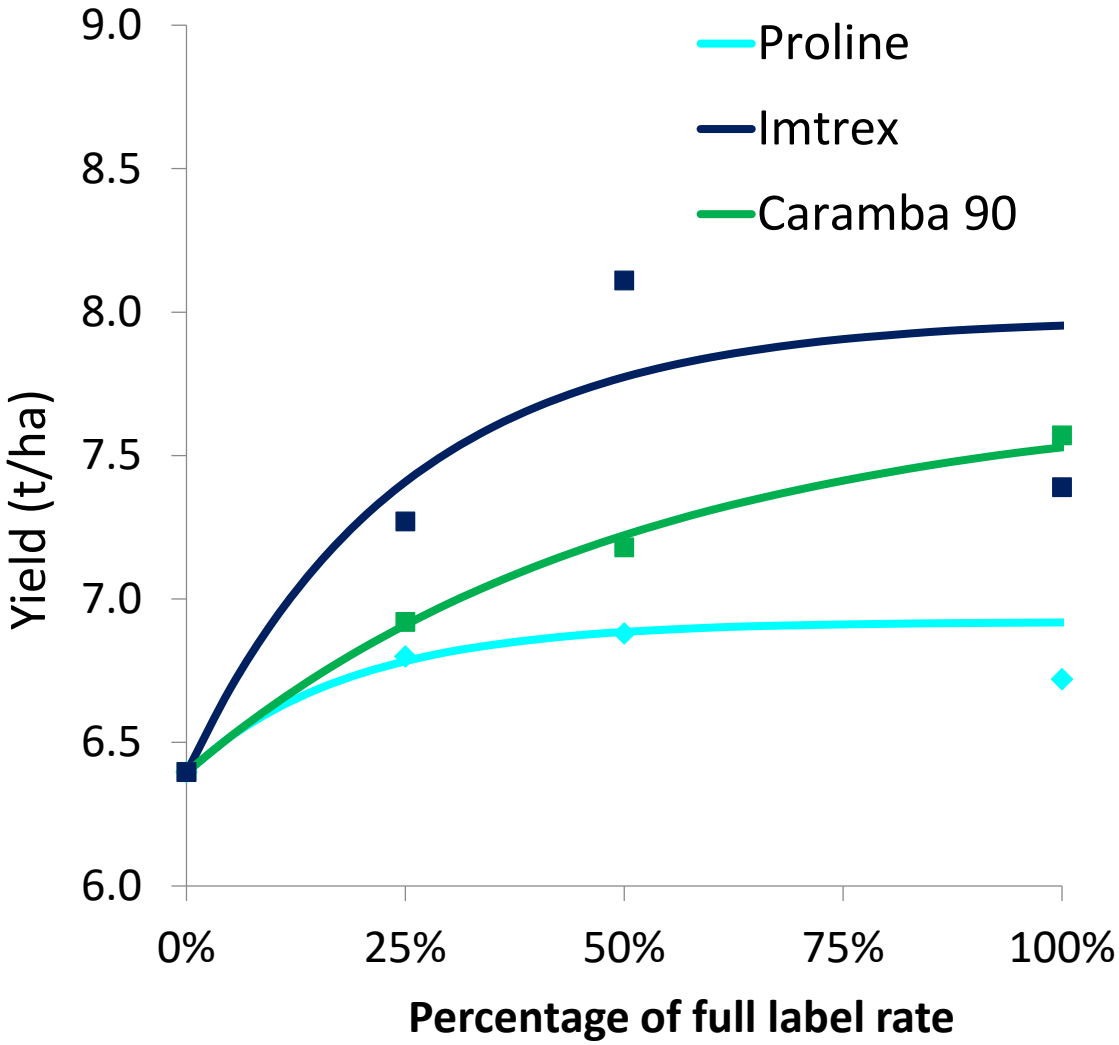


Caramba 90 = metconazole

Brown rust yields 2017–19 (3 trials)

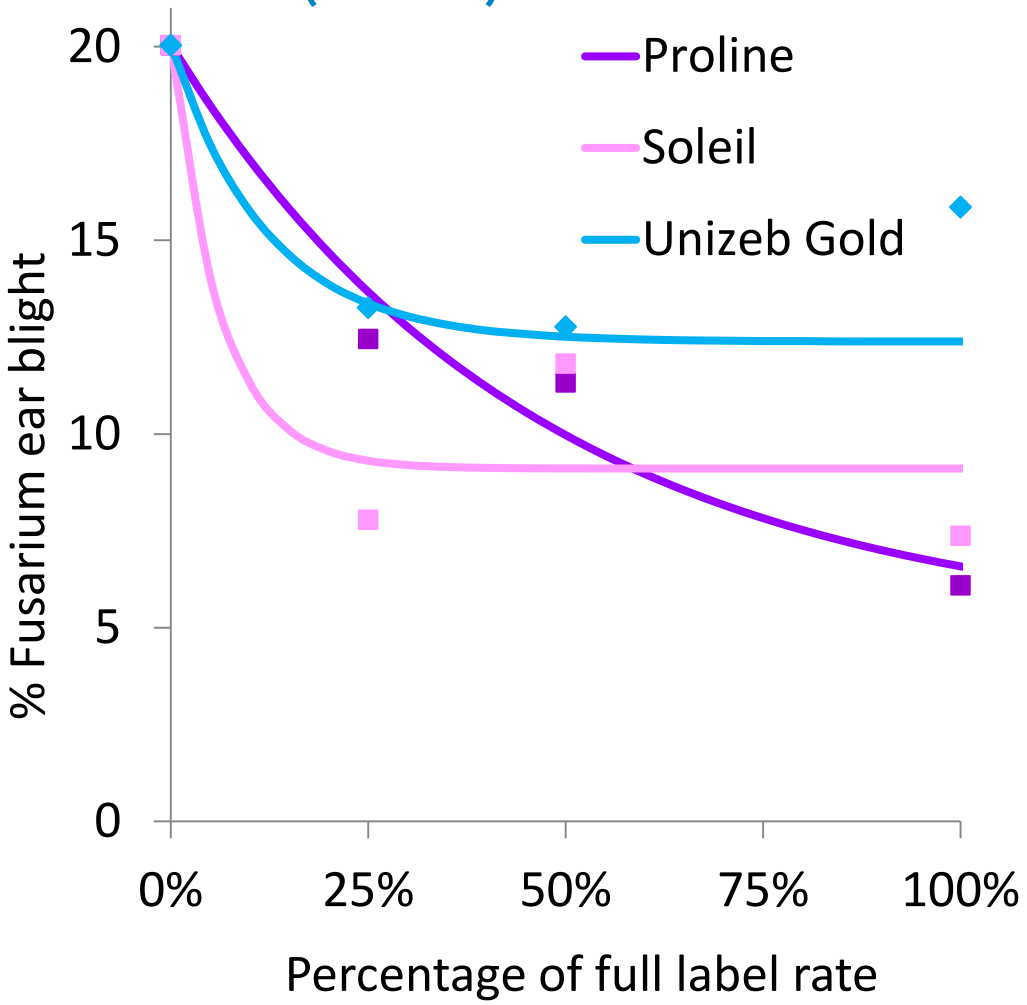
Use Imtrex only in mixture with at least one fungicide with an alternative mode of action that has efficacy against the target disease



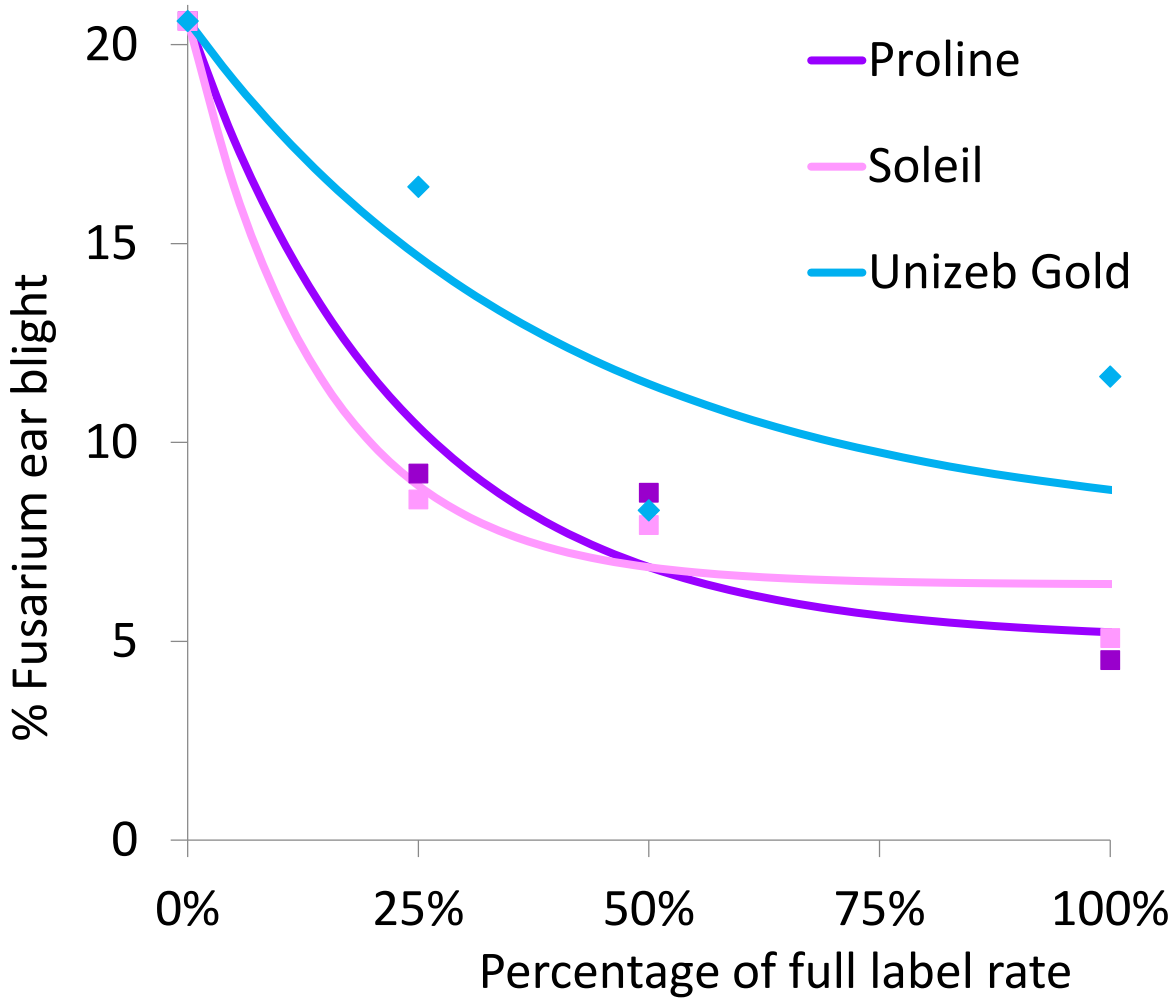


Fusarium trial (inoculated)
Zyatt (near Mansfield, Nottinghamshire)

2019 (1 trial)

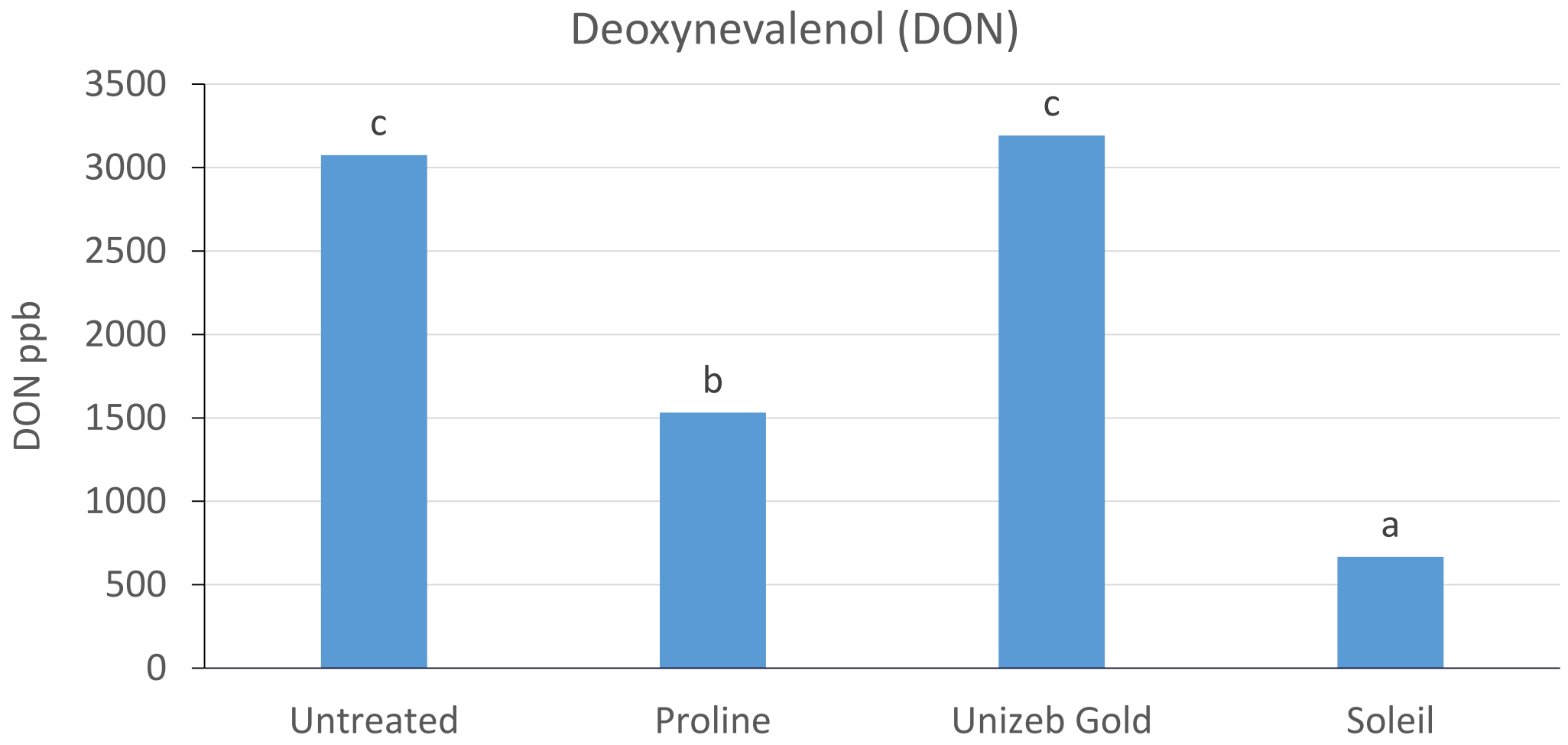


2018–19 (2 trials)



Soleil = tebuconazole + bromuconazole, Unizeb Gold = Mancozeb

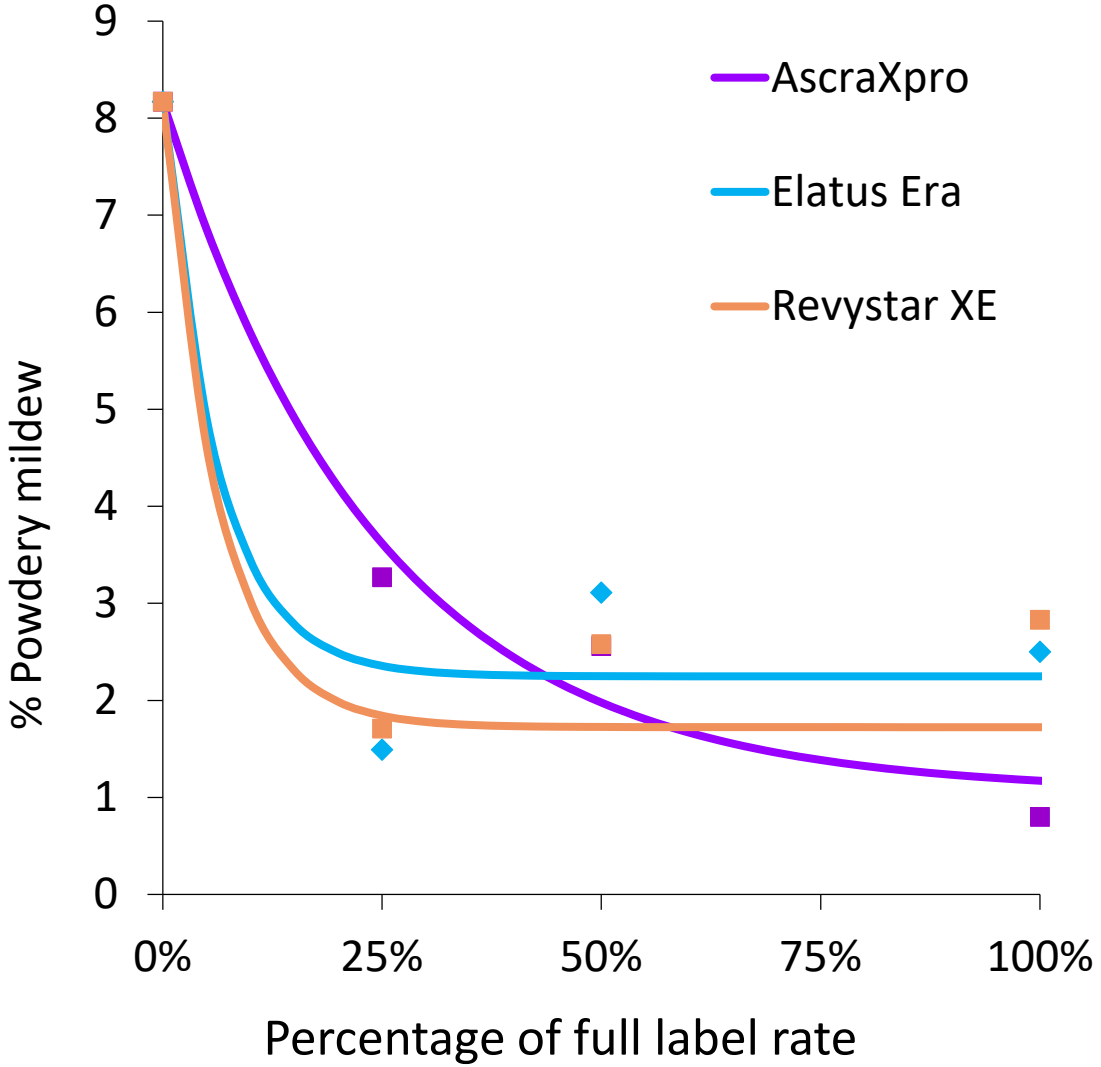
Mycotoxin control 2019

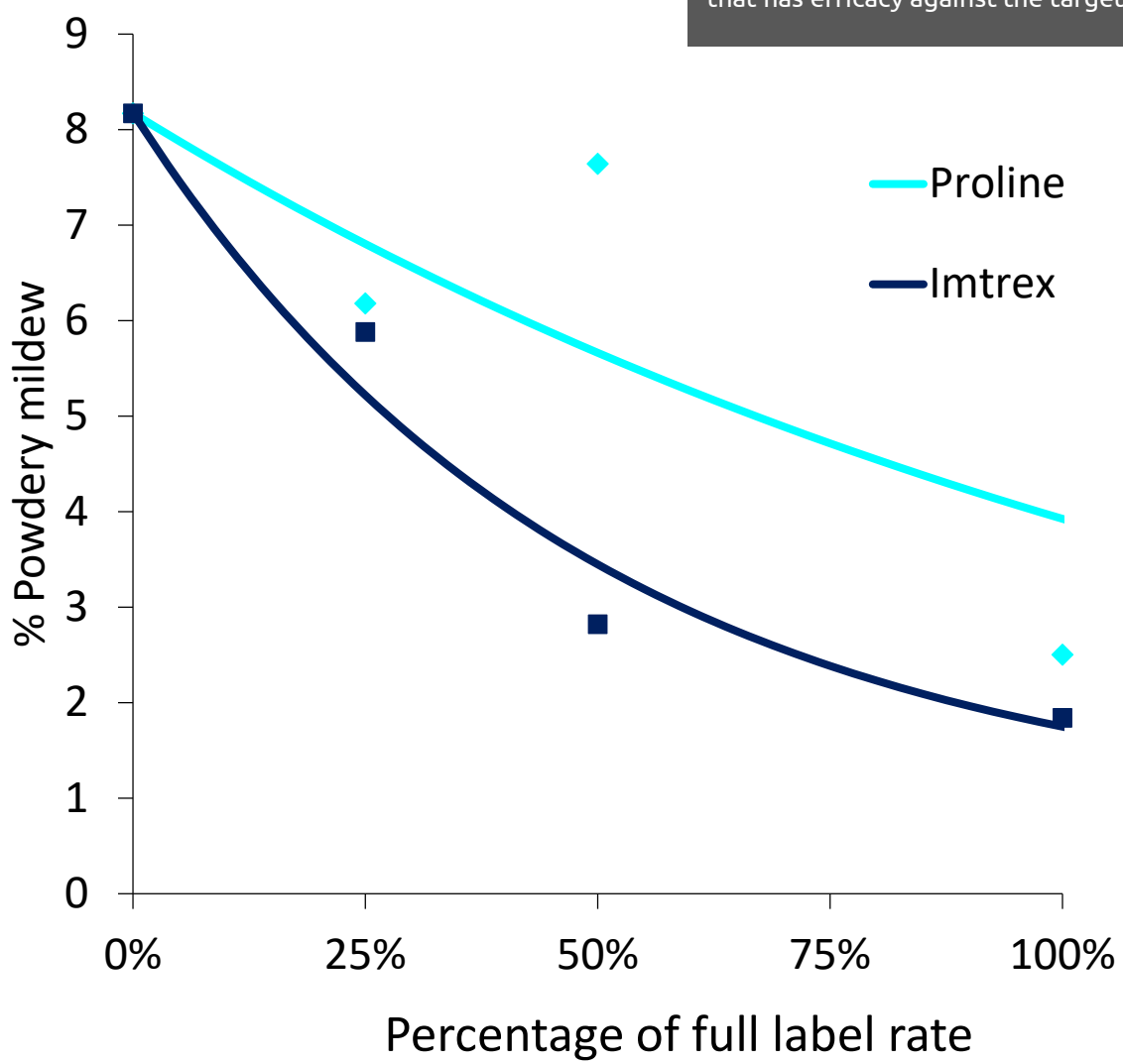


Maximum legal limit of DON in wheat for human consumption = 1250ppb

Wheat powdery mildew 2019 (2 trials)

Use Imtrex only in mixture with at least one fungicide with an alternative mode of action that has efficacy against the target disease





Wheat summary 2019

Septoria tritici

- Revystar XE very effective with a yield response up to full dose
- Ascra ahead of Elatus Era in 2019
- Solo SDHI Imtrex ~60% protectant control, prothioconazole ~ 45%

Rusts

- Elatus Era highest yield on yellow rust, matched by Revystar XE on brown rust

Fusarium

- Soleil and Proline effective, Soleil better DON reduction in 2019
- Unizeb Gold adding activity on visual head blight symptoms

Mildew

- All SDHI/azoles tested showed good levels of control

Fungicide performance 2019 update for barley

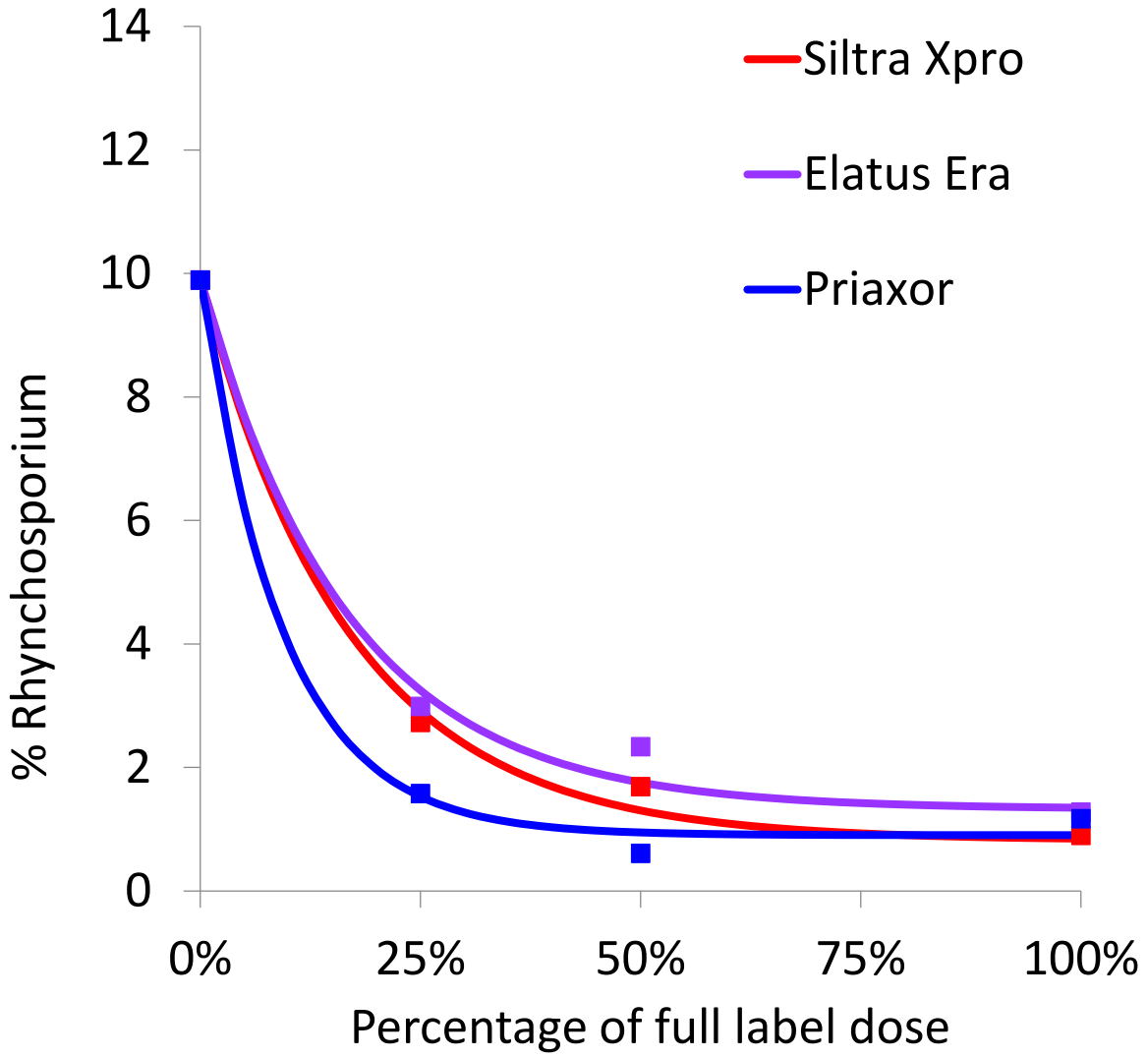
Barley disease data in harvest year 2019

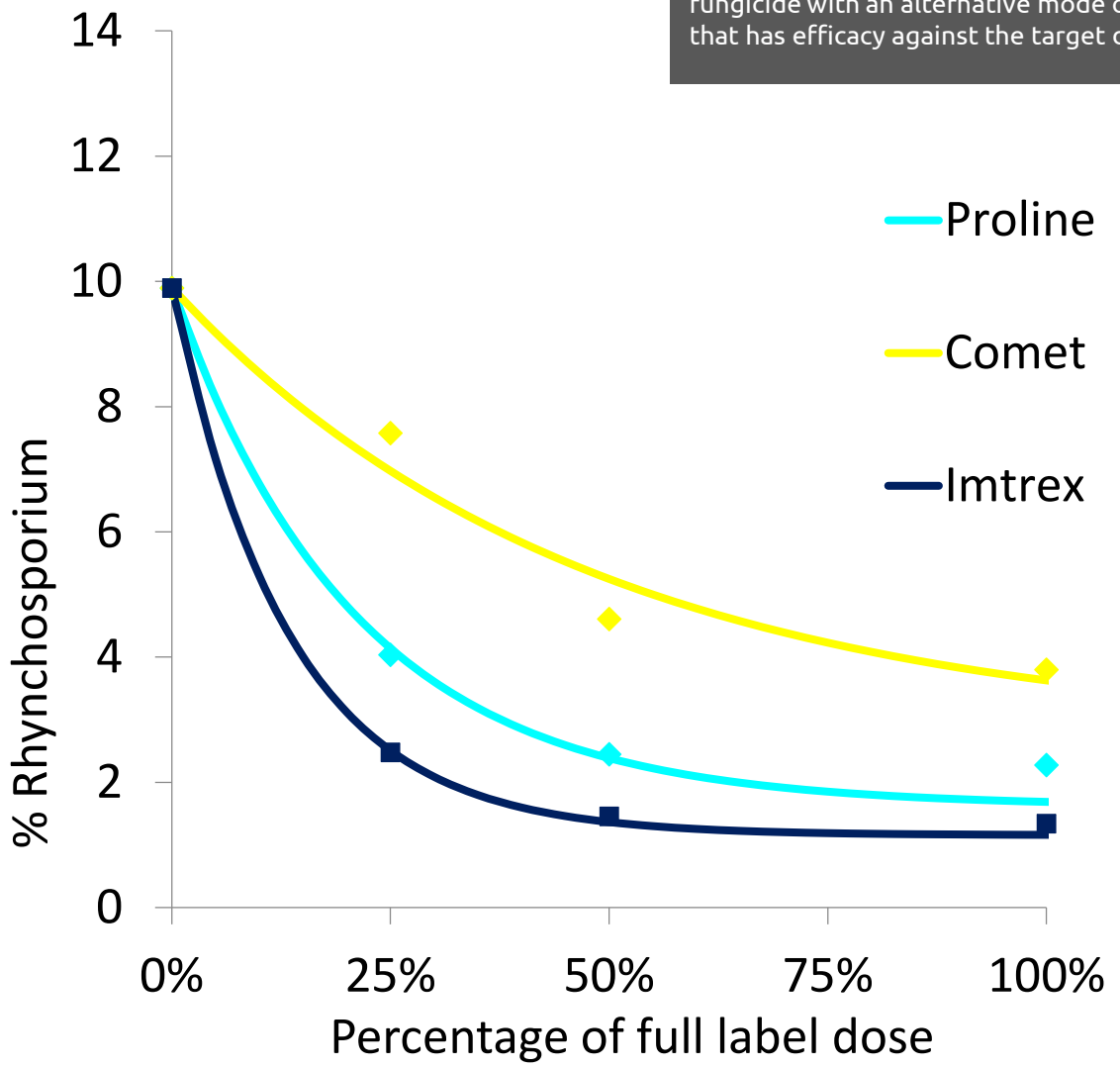
Site (Organisation)	Target disease	Variety	Rhyncho	Net Blotch	Ramularia	Mildew	Tan spot
Lanark (SRUC)	Rhyncho	KWS Tower	✓				✓
Cardigan (ADAS)	Rhyncho	KWS Cassia	✓			✓	
Carlow, Ireland (Teagasc)	Rhyncho	KWS Cassia	✓			✓	
Morley, Norfolk (NIAB)	Net blotch	Flagon		✓			
Midlothian (SRUC)	Ramularia	Laureate (SB)			✓		✓
Carlow, Ireland (Teagasc)	Ramularia	Pixel (WB)			✓		

Rhynchosporium 2017–19 (8 trials)

(protectant activity)

Use Imtrex only in mixture with at least one fungicide with an alternative mode of action that has efficacy against the target disease

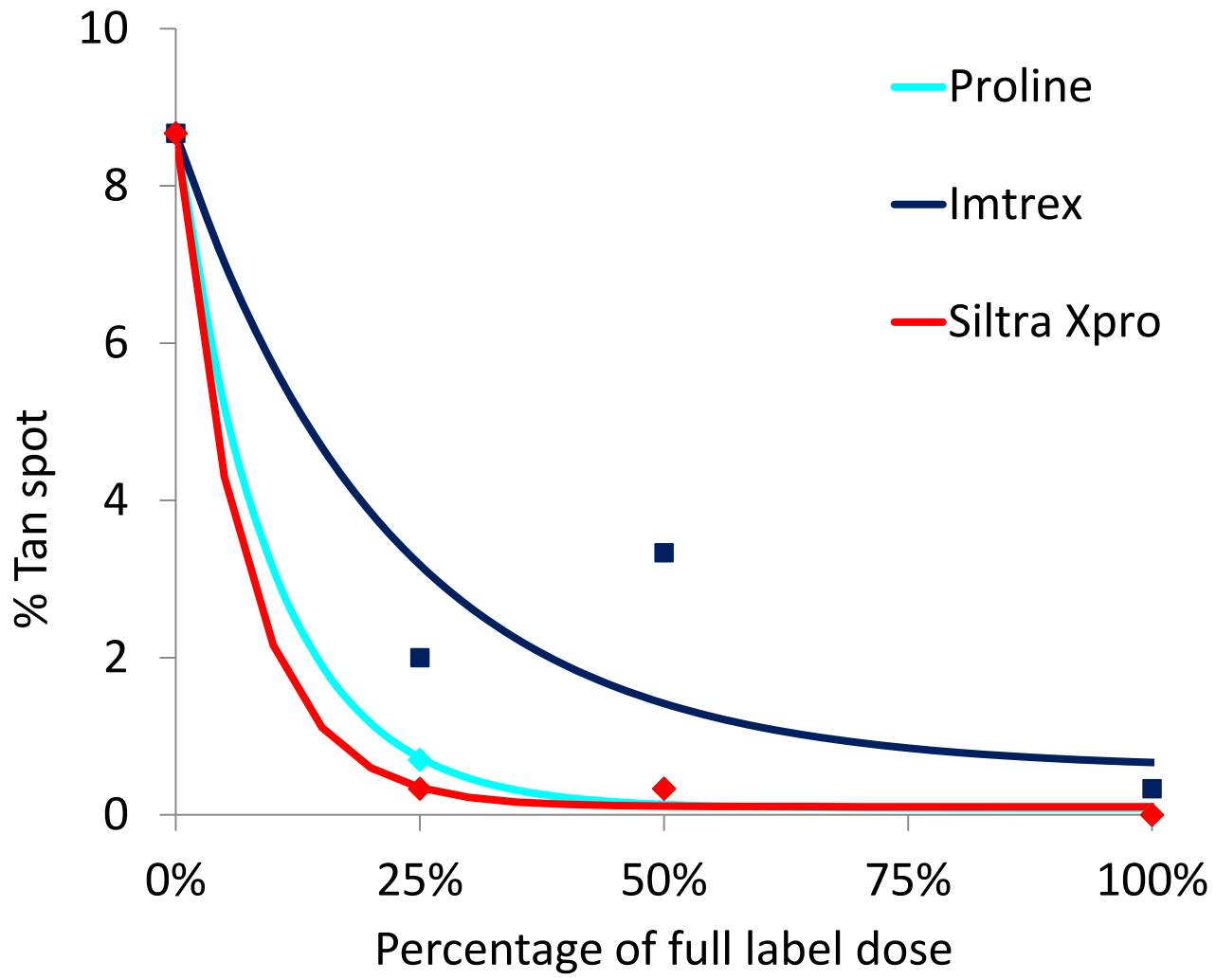




Priaxor = fluxapyroxad + pyraclostrobin

Winter barley tan spot 2019 (1 trial)

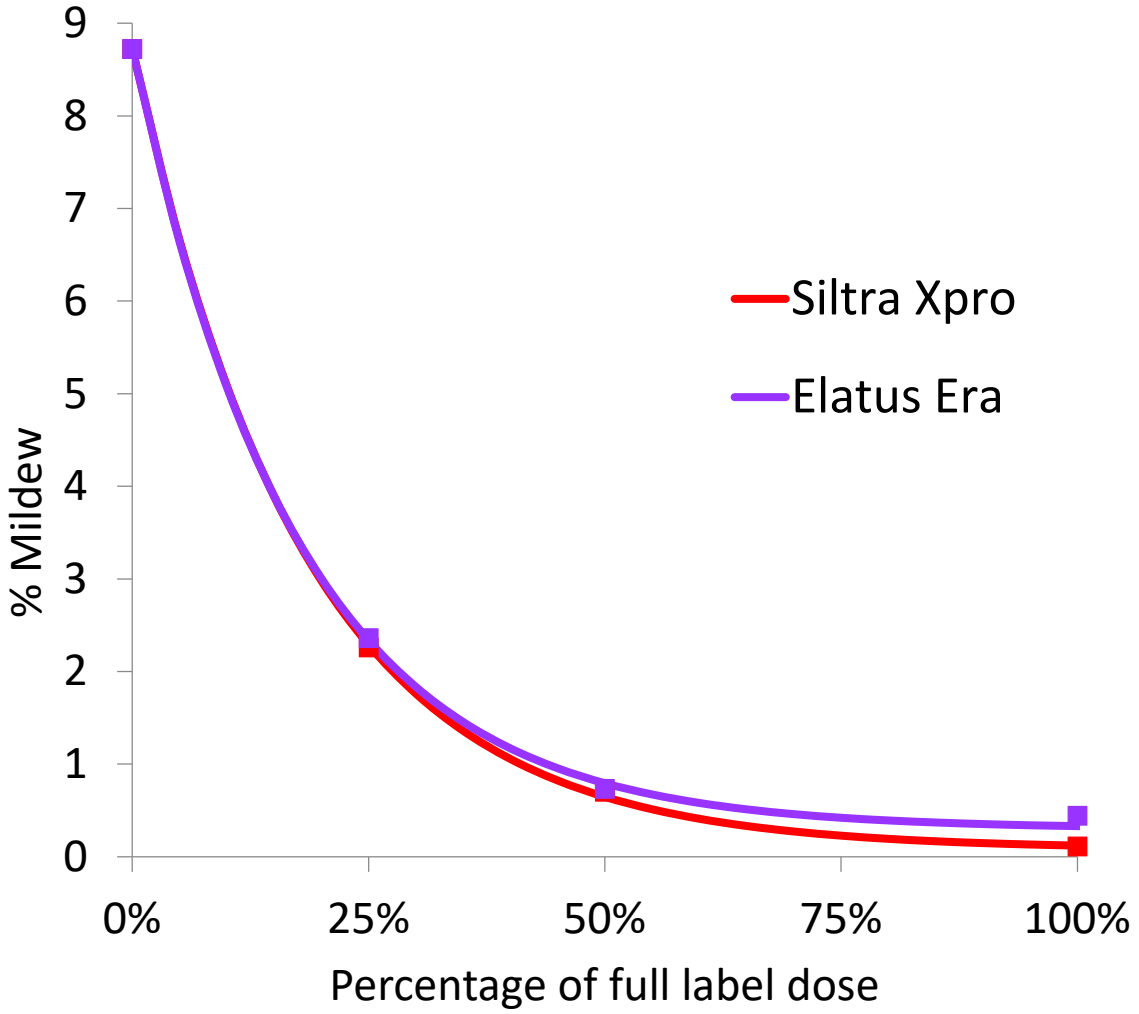
Use Imtrex only in mixture with at least one fungicide with an alternative mode of action that has efficacy against the target disease

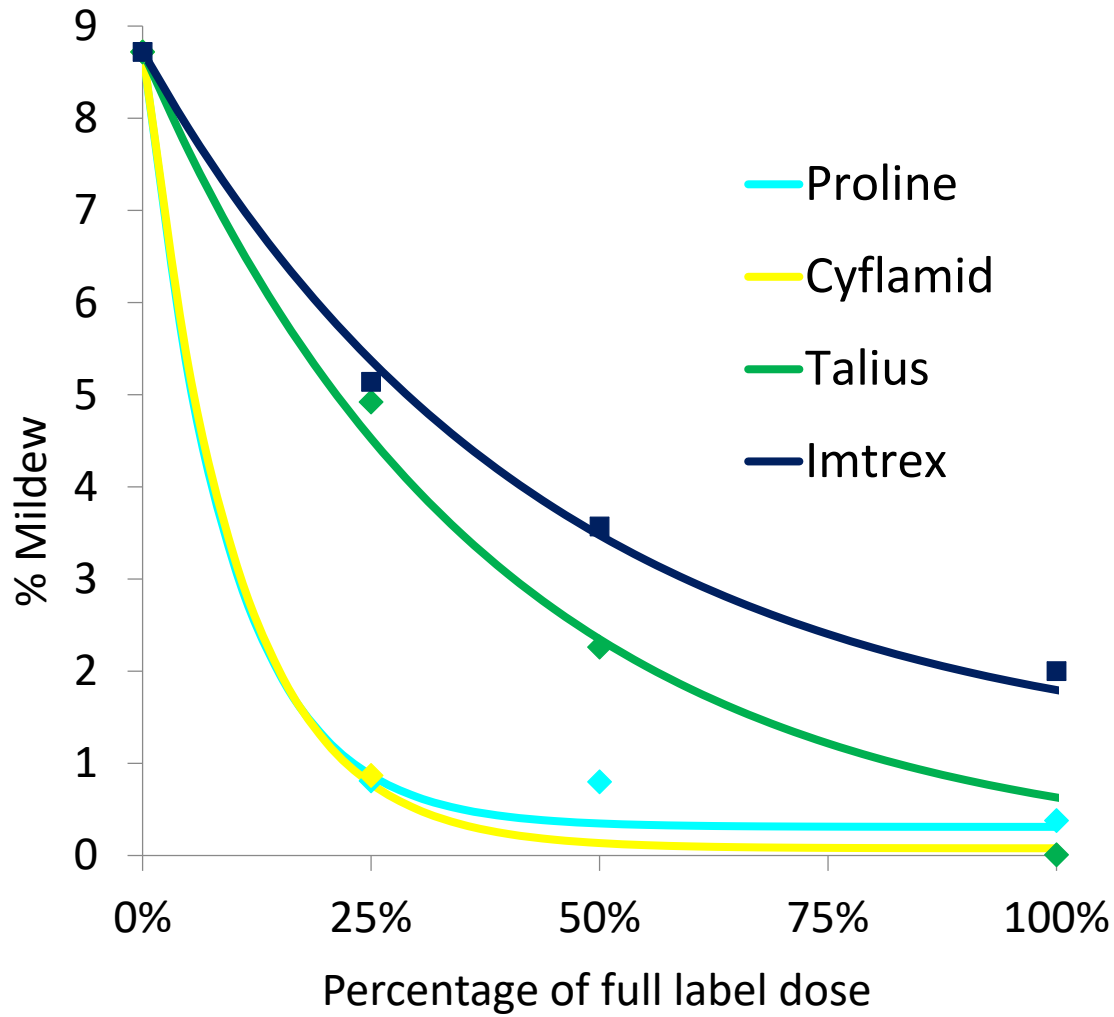


Barley powdery mildew 2017–19 (6 trials)

(protectant activity)

Use Imtrex only in mixture with at least one fungicide with an alternative mode of action that has efficacy against the target disease

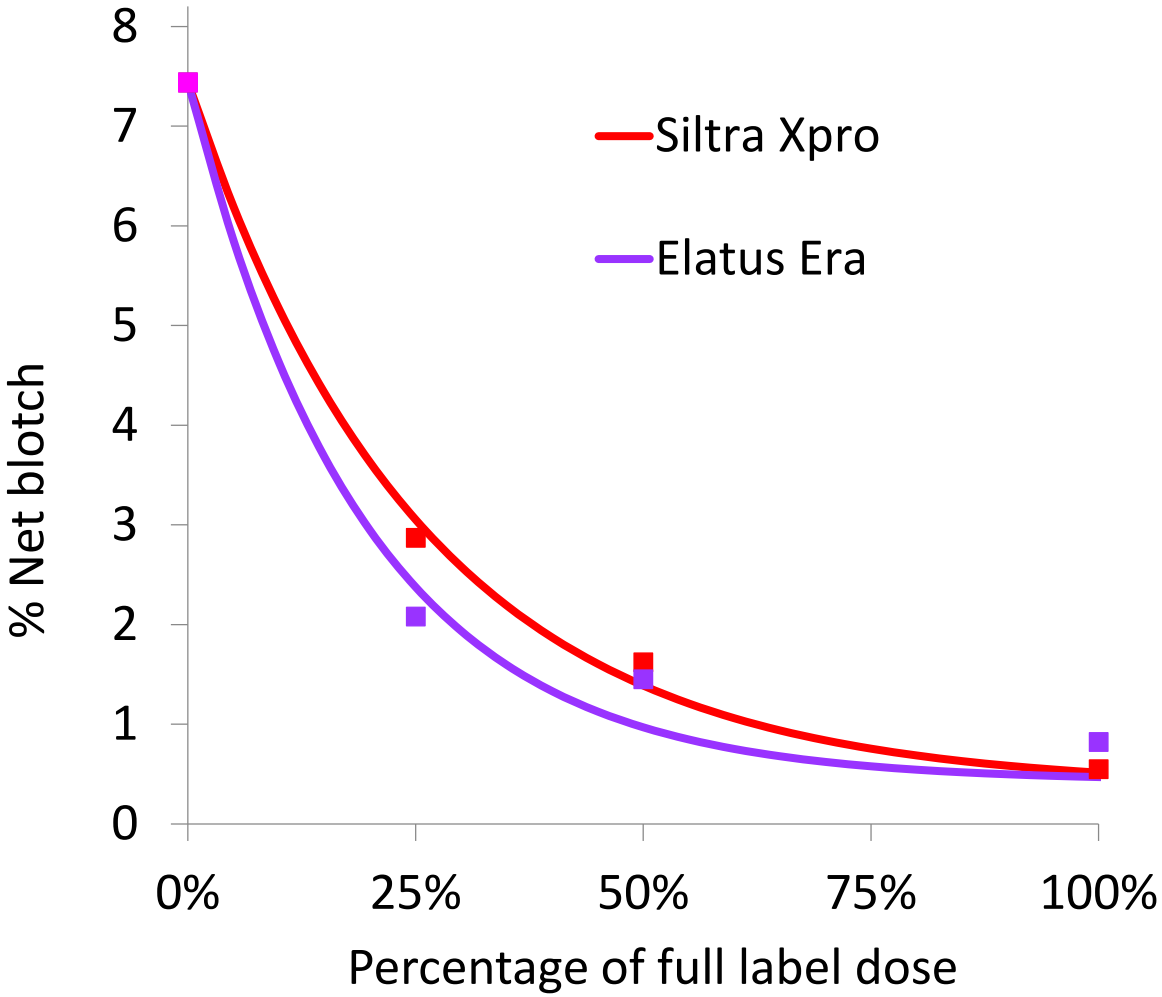


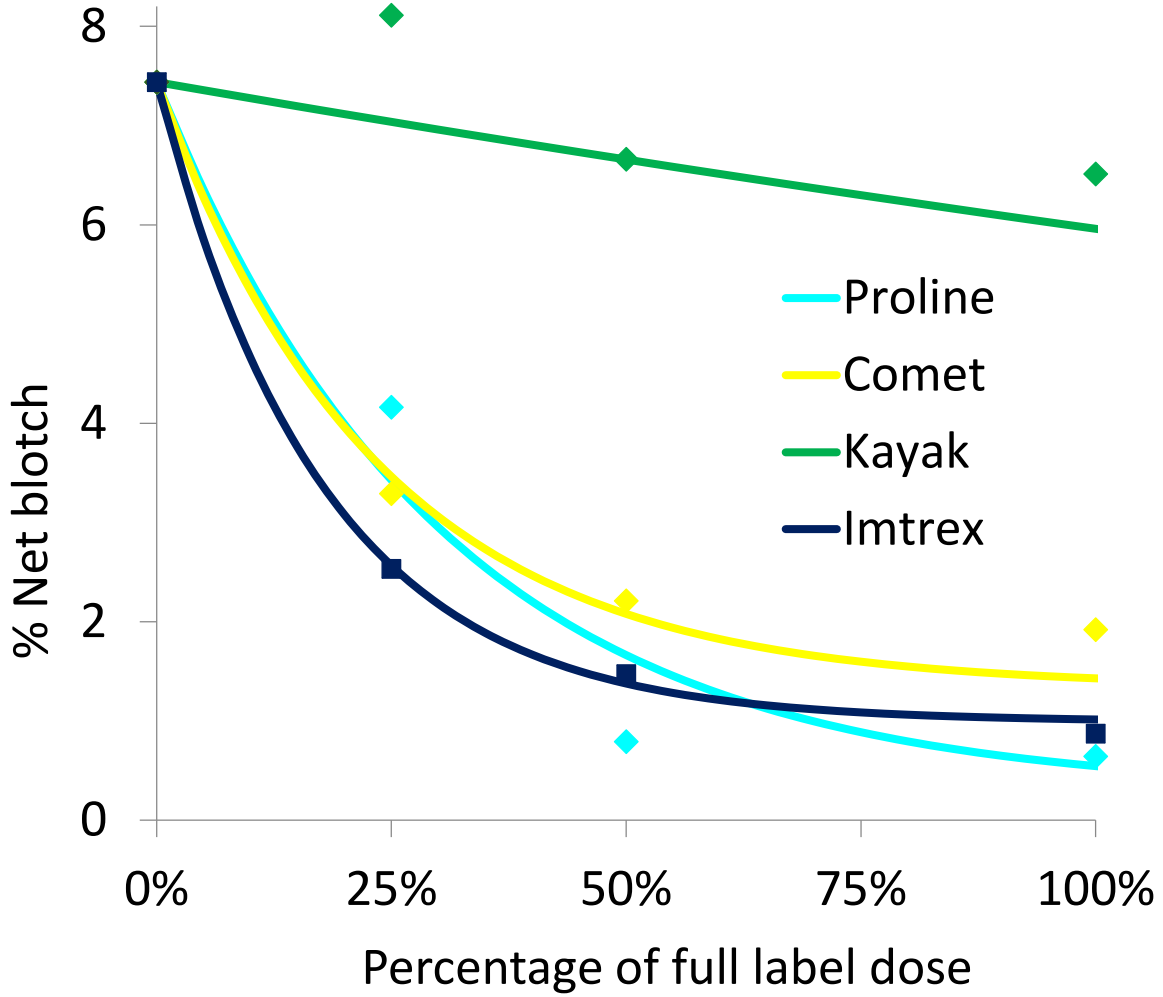


Net blotch 2017–19 (4 trials)

(protectant activity)

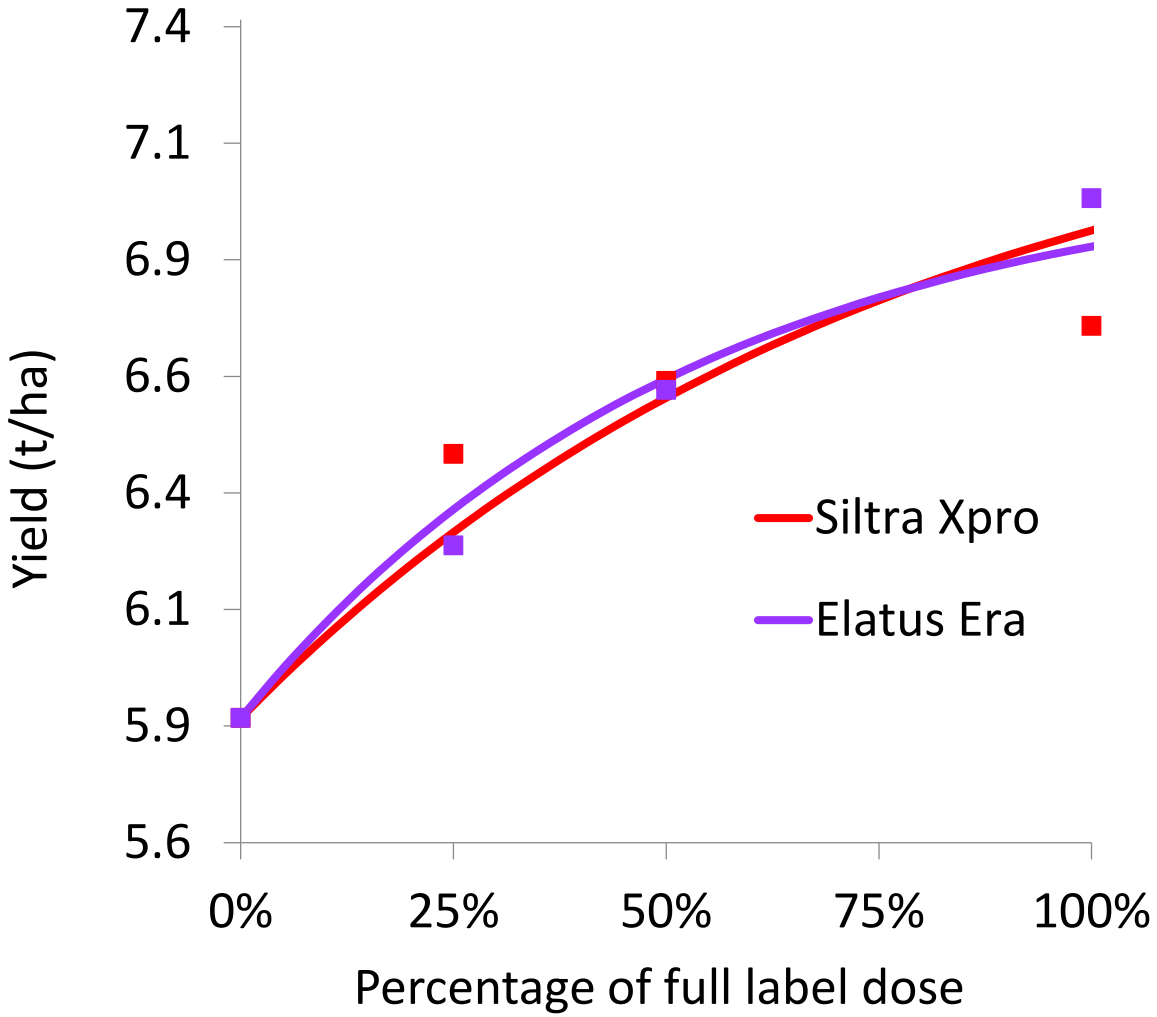
Use Imtrex only in mixture with at least one fungicide with an alternative mode of action that has efficacy against the target disease

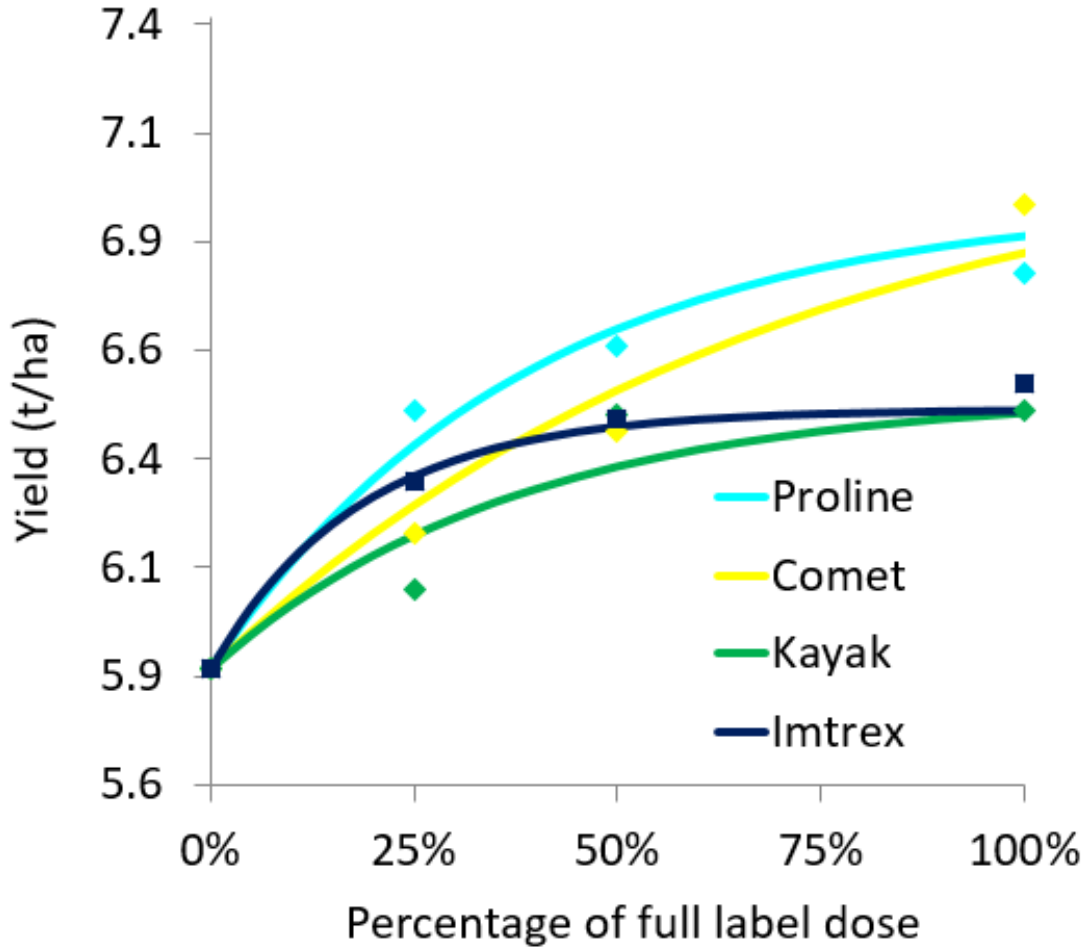




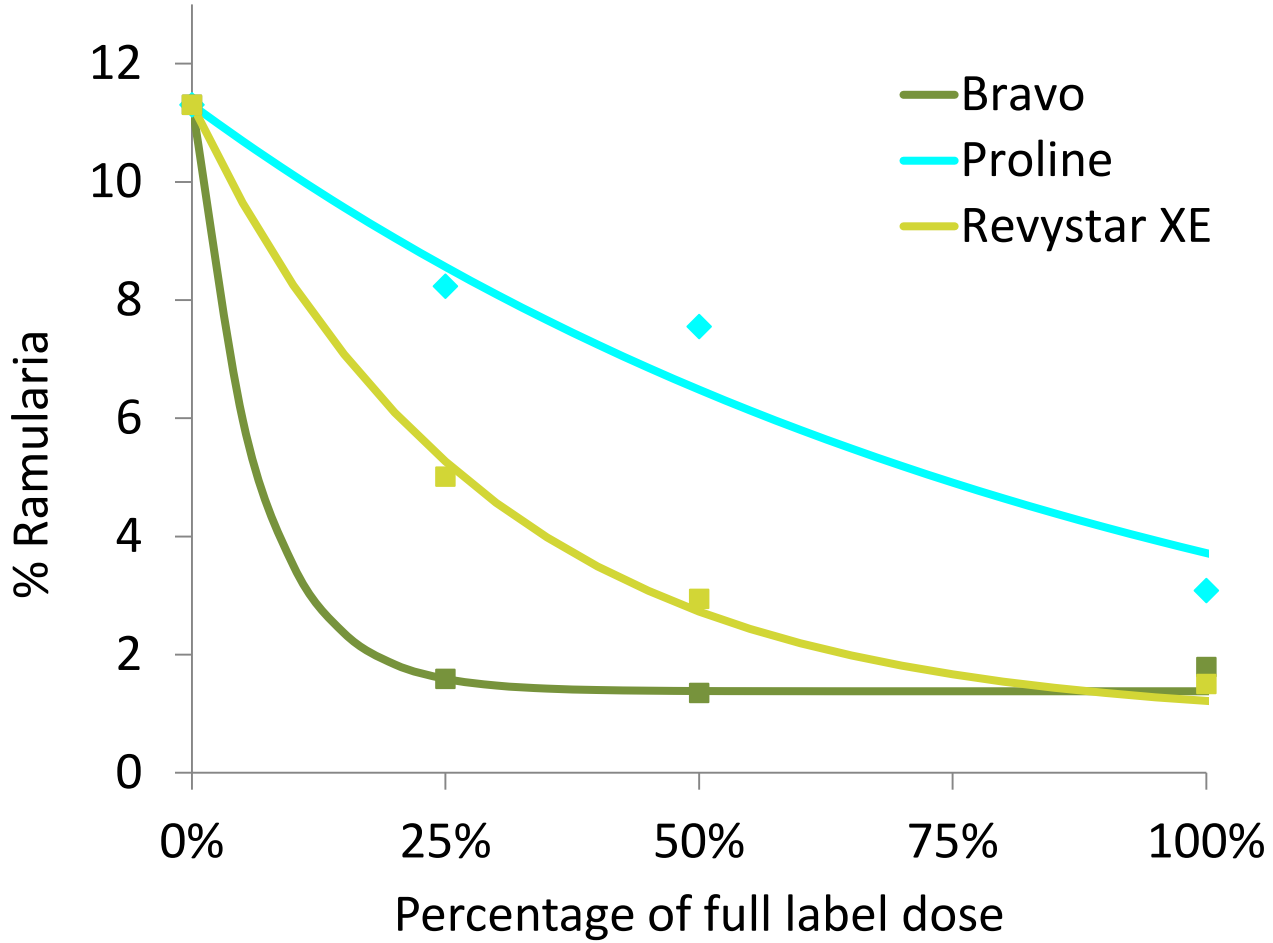
Net blotch yields 2017–19 (5 trials)

Use Imtrex only in mixture with at least one fungicide with an alternative mode of action that has efficacy against the target disease





Ramularia 2019 (2 sites)



Barley summary 2019

- Rhynchosporium and net blotch – fluxapyroxad- or prothioconazole-based products lead (higher doses required for net blotch control)
- Mildew – prothioconazole-based products and Cyflamid most effective
- Tan spot – very good efficacy Proline and Siltra at low rates (Imtrex useful activity)
- Ramularia:
    - Revystar XE promising.
    - Resistance appears patchy – some activity from prothioconazole
    - Loss of CTL in 2020 will impact

Fungicide performance 2019 update for oilseed rape

Two new products, with existing actives, for OSR

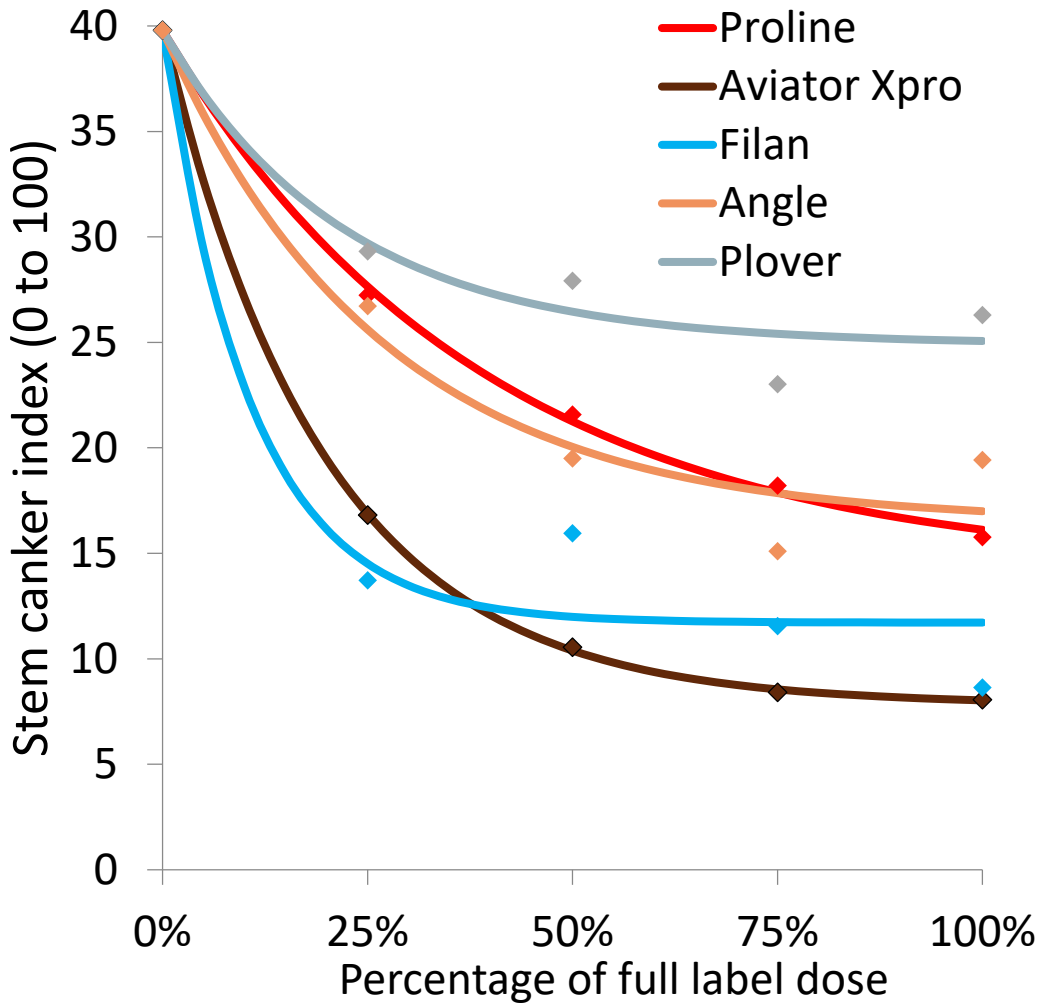
Aviator Xpro

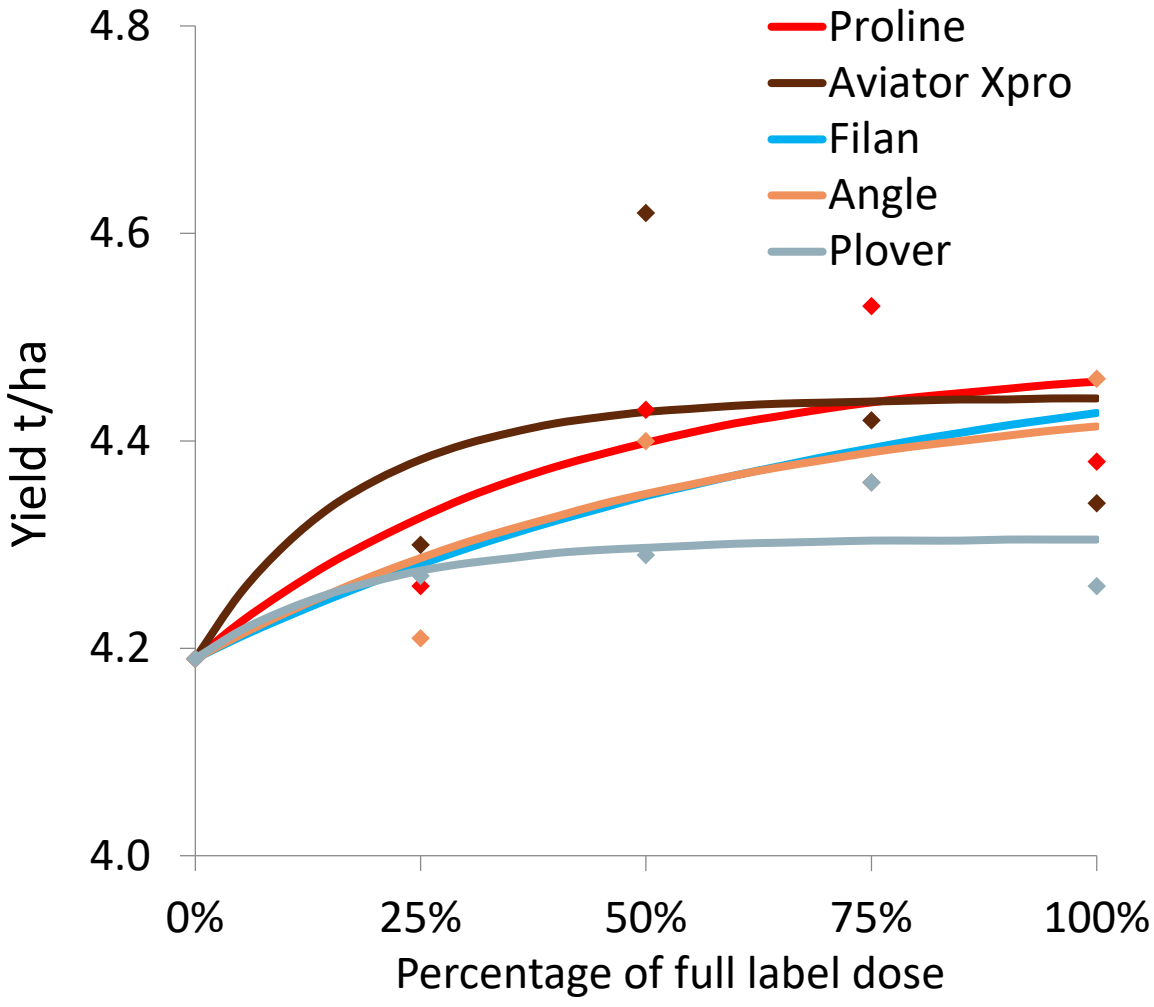
- 75g/l bixafen + 160g/l prothioconazole
- Maximum individual dose 1.0 l/ha
- Maximum of two applications per crop
- Can be applied up to 56 days before harvest
- Approved for control of:
    - Light leaf spot
    - Phoma stem canker
    - Sclerotinia control

Angle

- 125g/l azoxystrobin + 125g/l difenoconazole
- Maximum individual dose 1.0 l/ha
- Maximum of two applications per crop
- Can be applied up to and including end of flowering
- Approved for:
    - Phoma stem canker reduction
    - Sclerotinia control (moderate control)

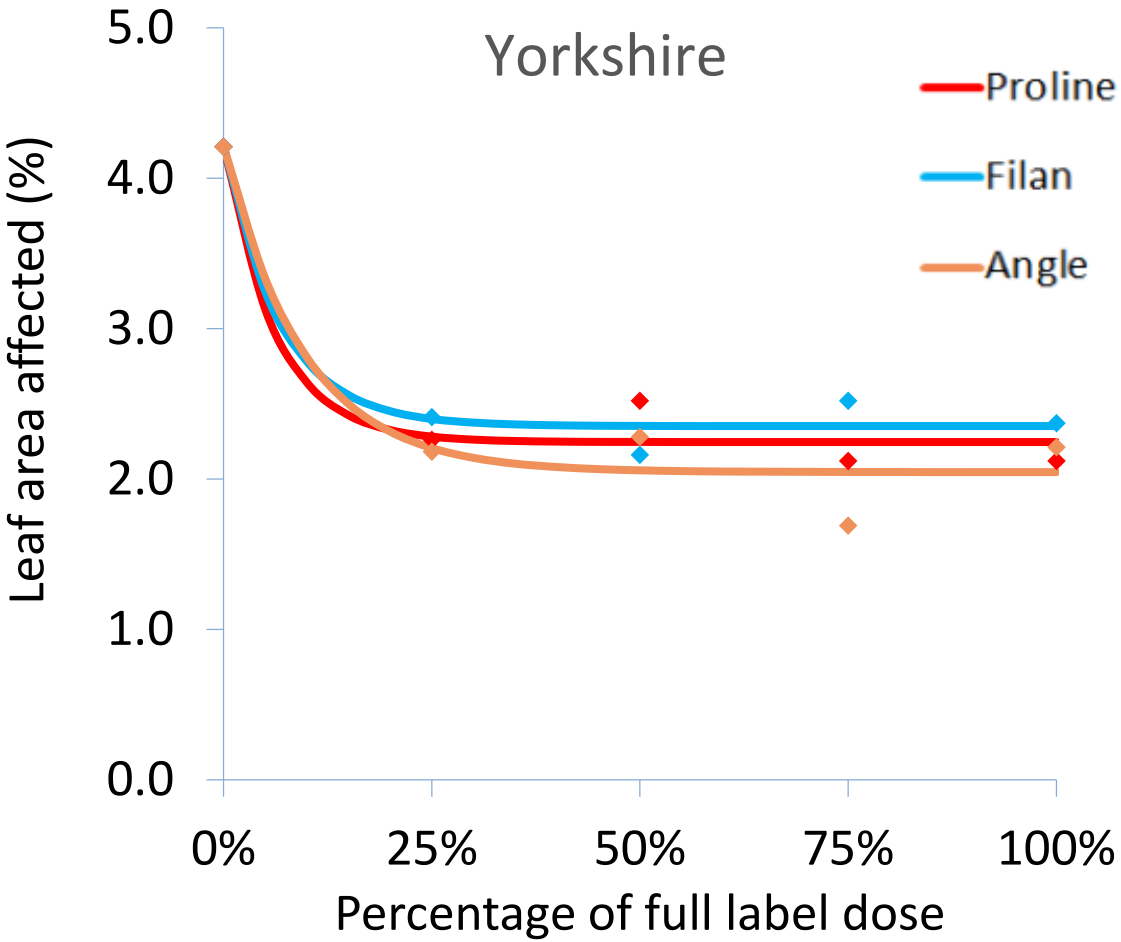
Phoma stem canker 2018–19 (4 trials)

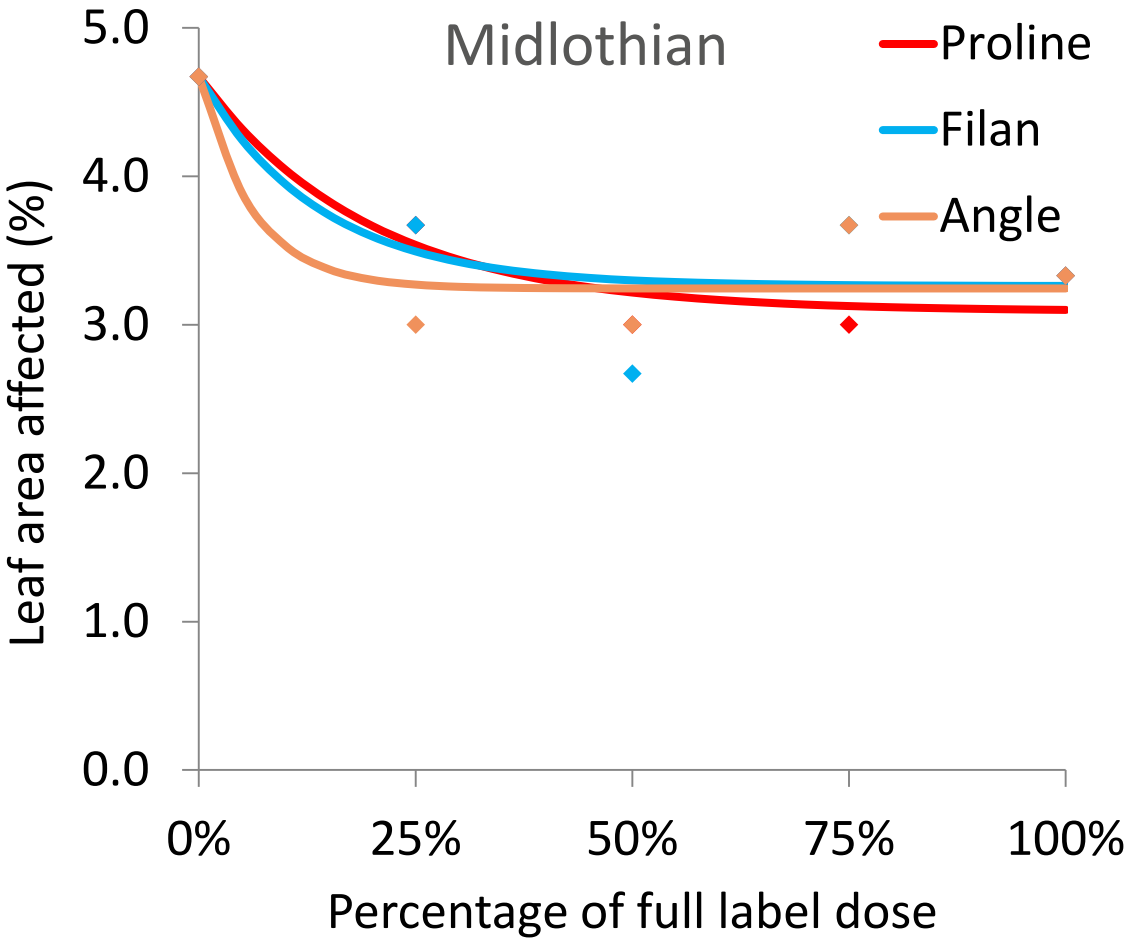




Four trials at Rosemaund, Herefordshire and Terrington, Norfolk.

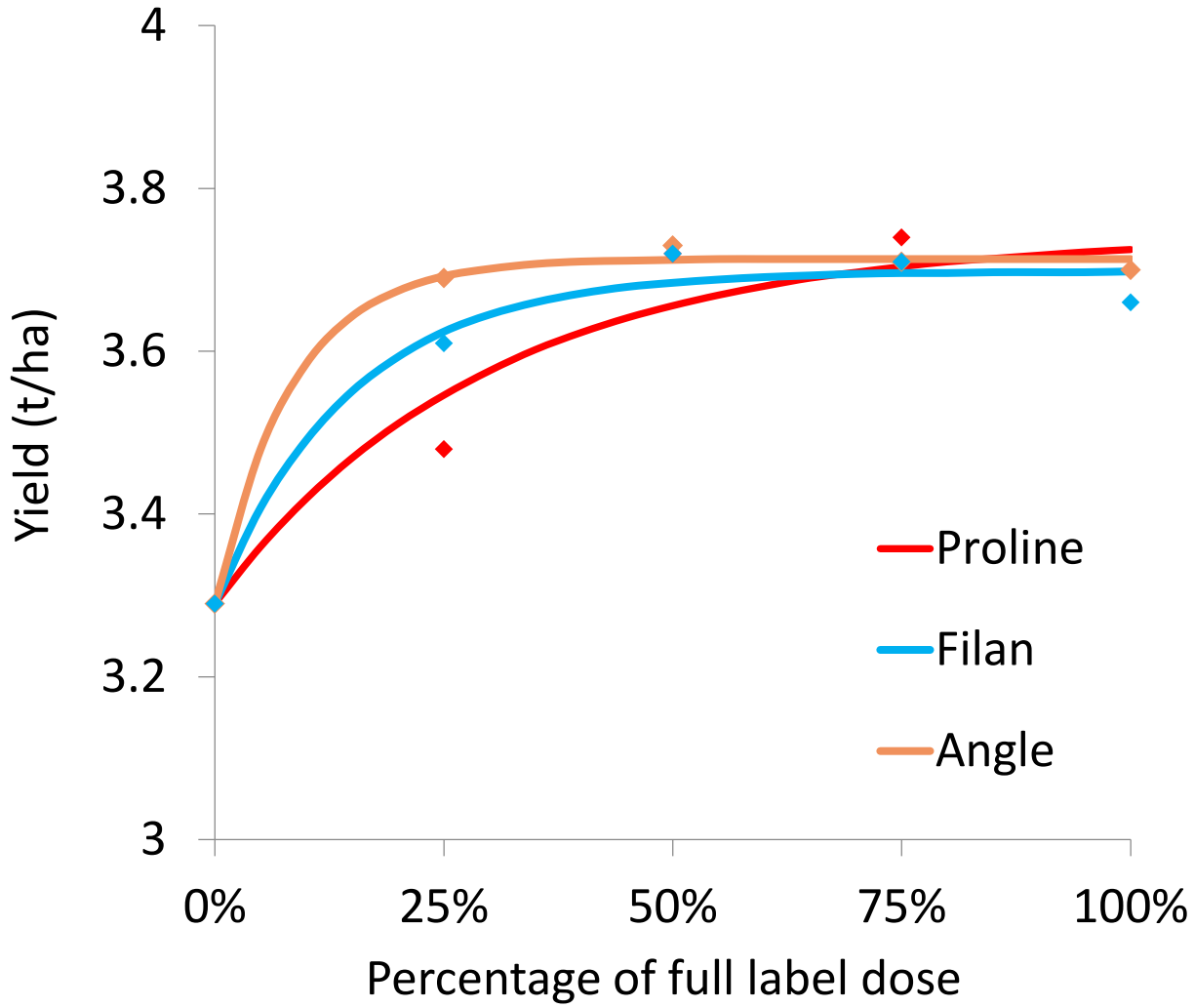
Light leaf spot control 2019
(March assessments)



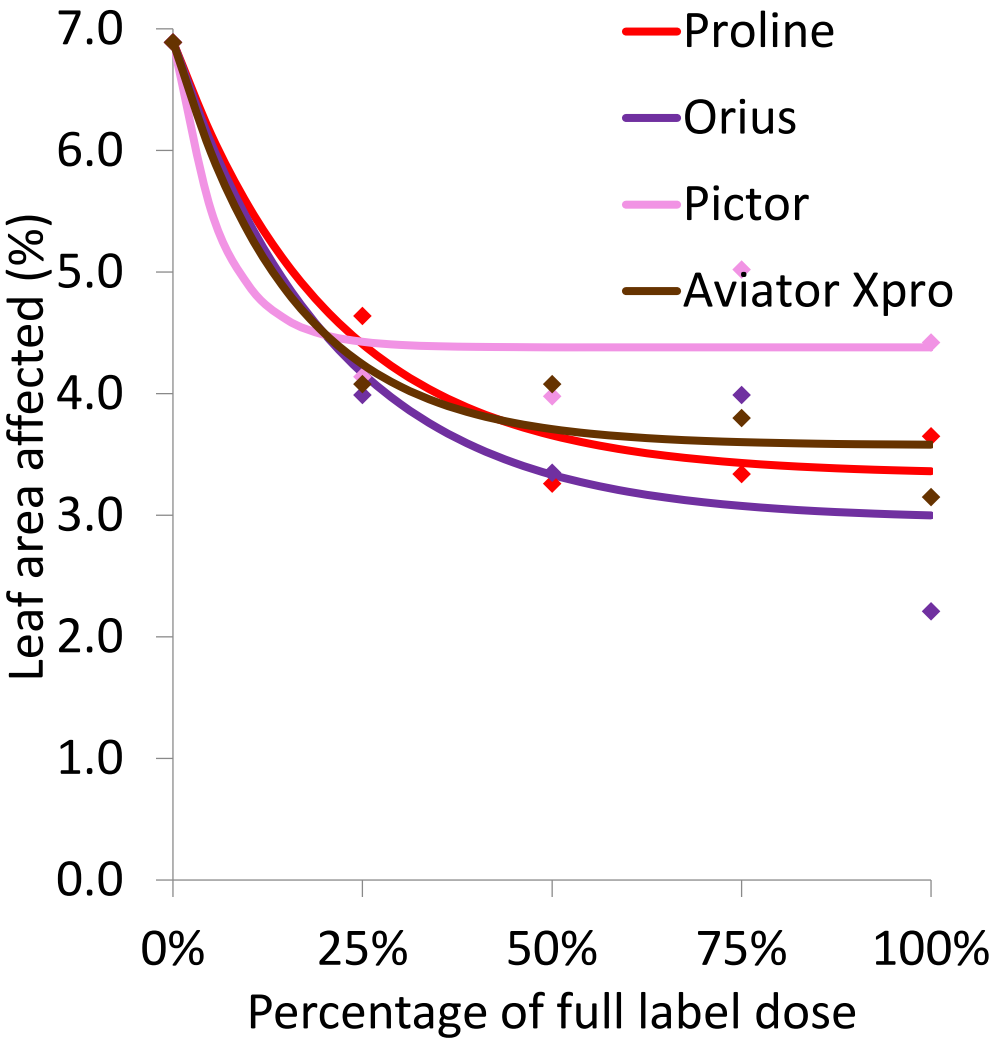


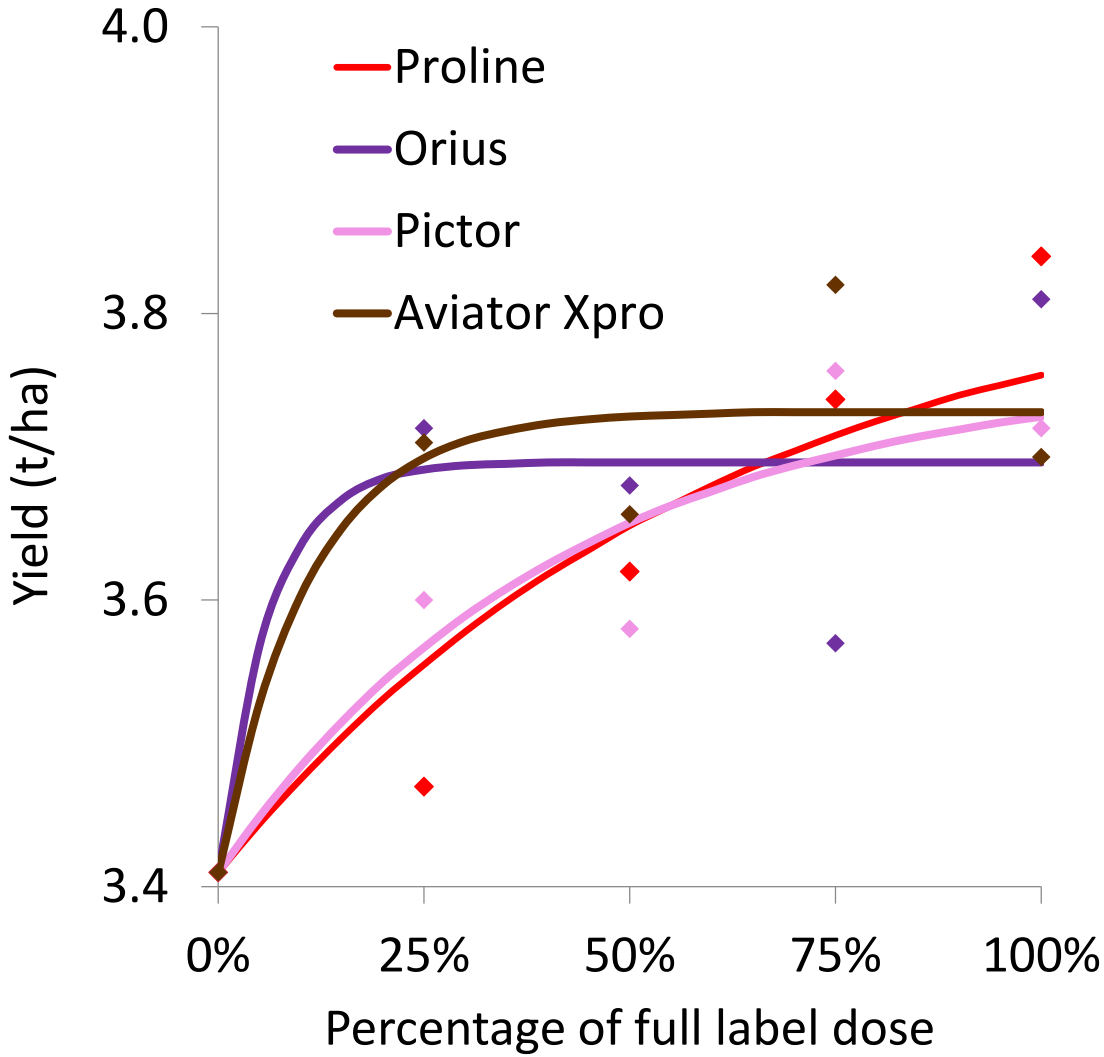
Note: Labels for Filan and Angle do not include control of light leaf spot

Light leaf spot yields 2019 (2 trials)



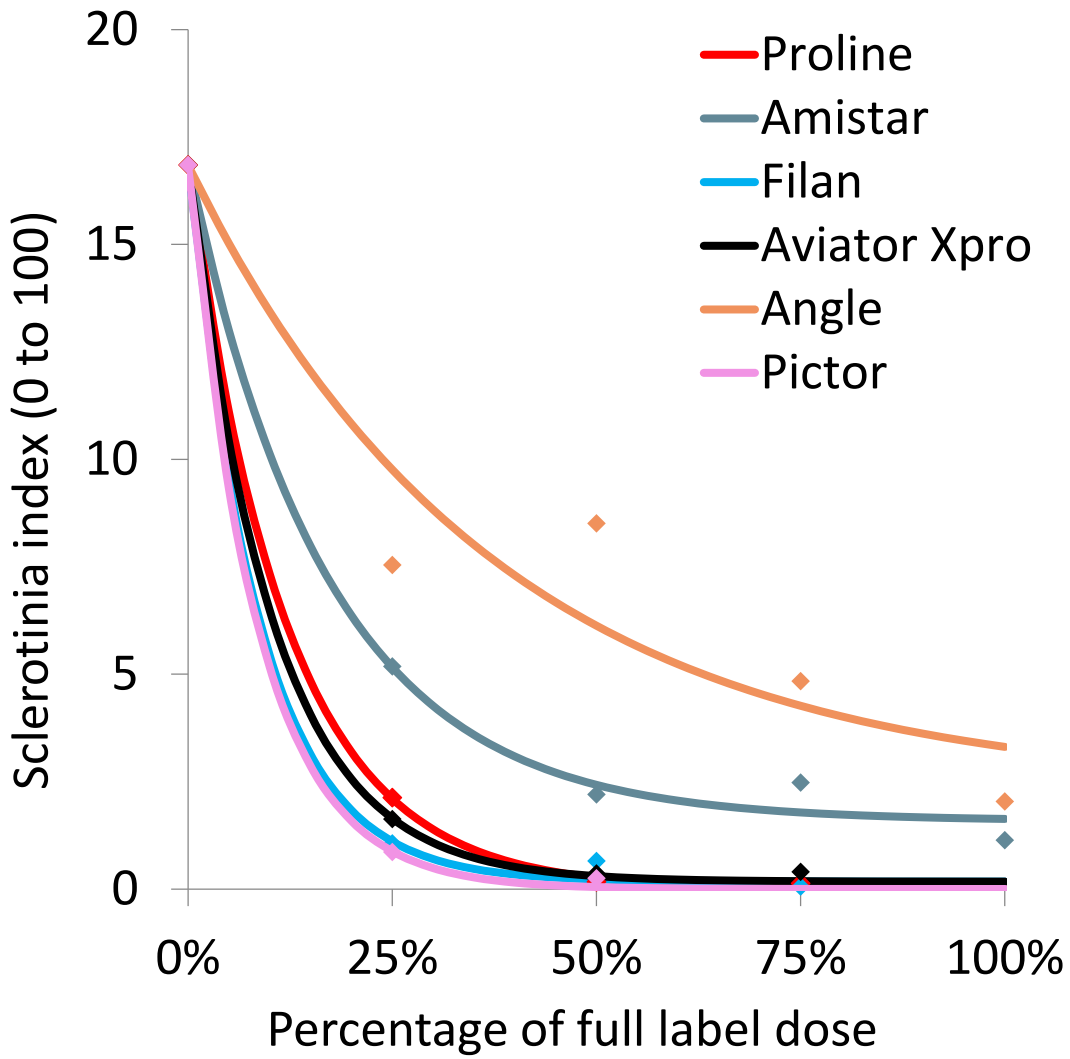
Light leaf spot: disease and yield 2015–16 (5 trials)

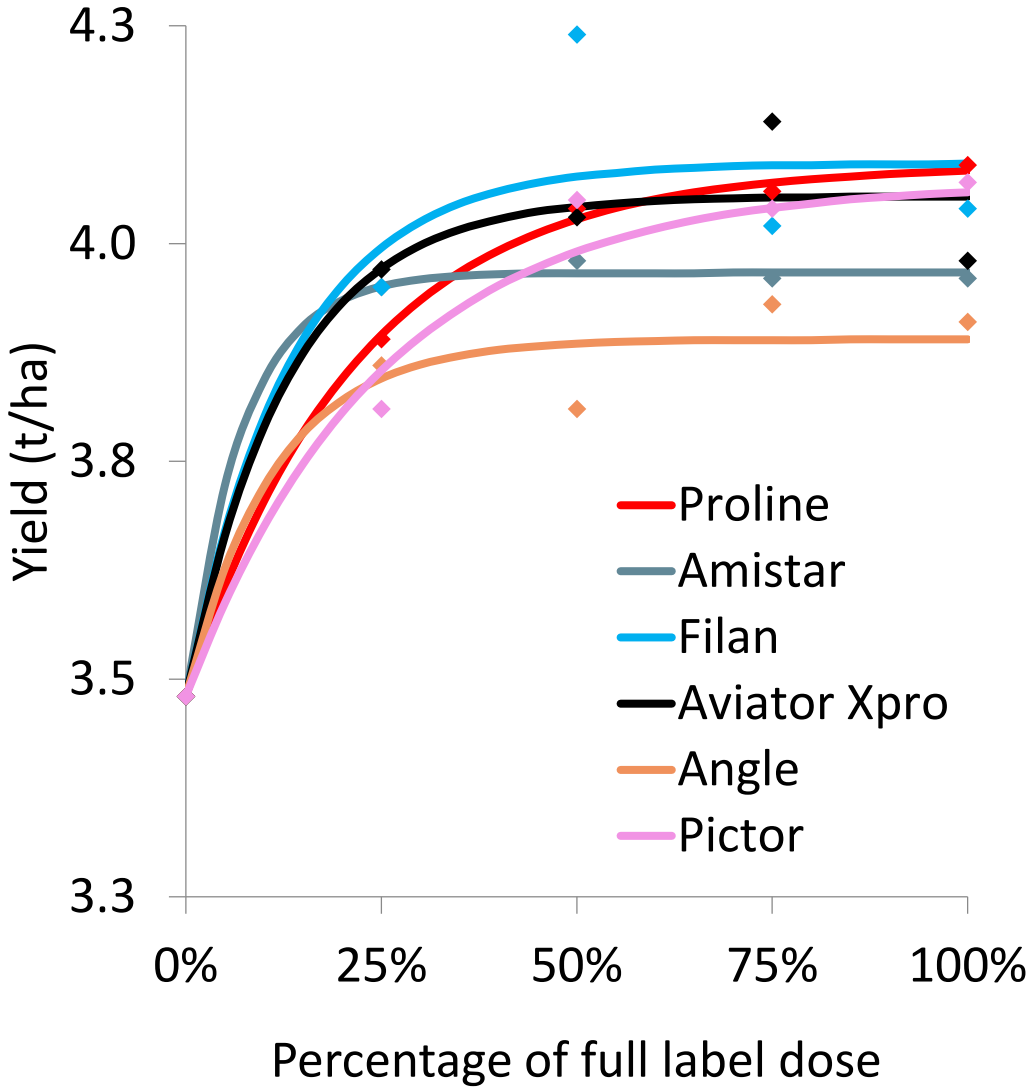




Trials based in Yorkshire and Midlothian

Sclerotinia stem rot 2015–17 (4 trials)





Trials in Ceredigion and Herefordshire, single applications

OSR summary 2019

Phoma stem canker

- Azoles, SDHIs and strobilurins all have efficacy
- Two applications providing effective control

Light leaf spot

- Early sown crops more at risk
- Significant yield benefits (~0.4t/ha) from control in 2019

Sclerotinia stem rot

- Products containing prothioconazole or boscalid lead
- Azoxystrobin also effective

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