Fungicide Performance Results (2015)

Note: These slides contain curves up to 100% label dose.

Therefore, curves are different to those which are shown at the AHDB Cereals & Oilseeds Agronomists' Conference (8 December 2015), which showed results up to 200% label dose, but the data used to produce the curves is the same.

Wheat: Start Slide = 3

Barley: Start Slide = 29

Oilseed rape: Start Slide 44

Using fungicides effectively in wheat

Results of AHDB Fungicide Performance 2015

Product choice, timings and frequency

…depend on:

- The likely impact of the disease on:
  - Yield
  - Quality
- Varietal resistance and other agronomic effects
- Product efficacy
- Maximising the effective life of active ingredients
  - Sustainable product use
  - Early detection and/or prediction

Wheat – the main causes of yield loss

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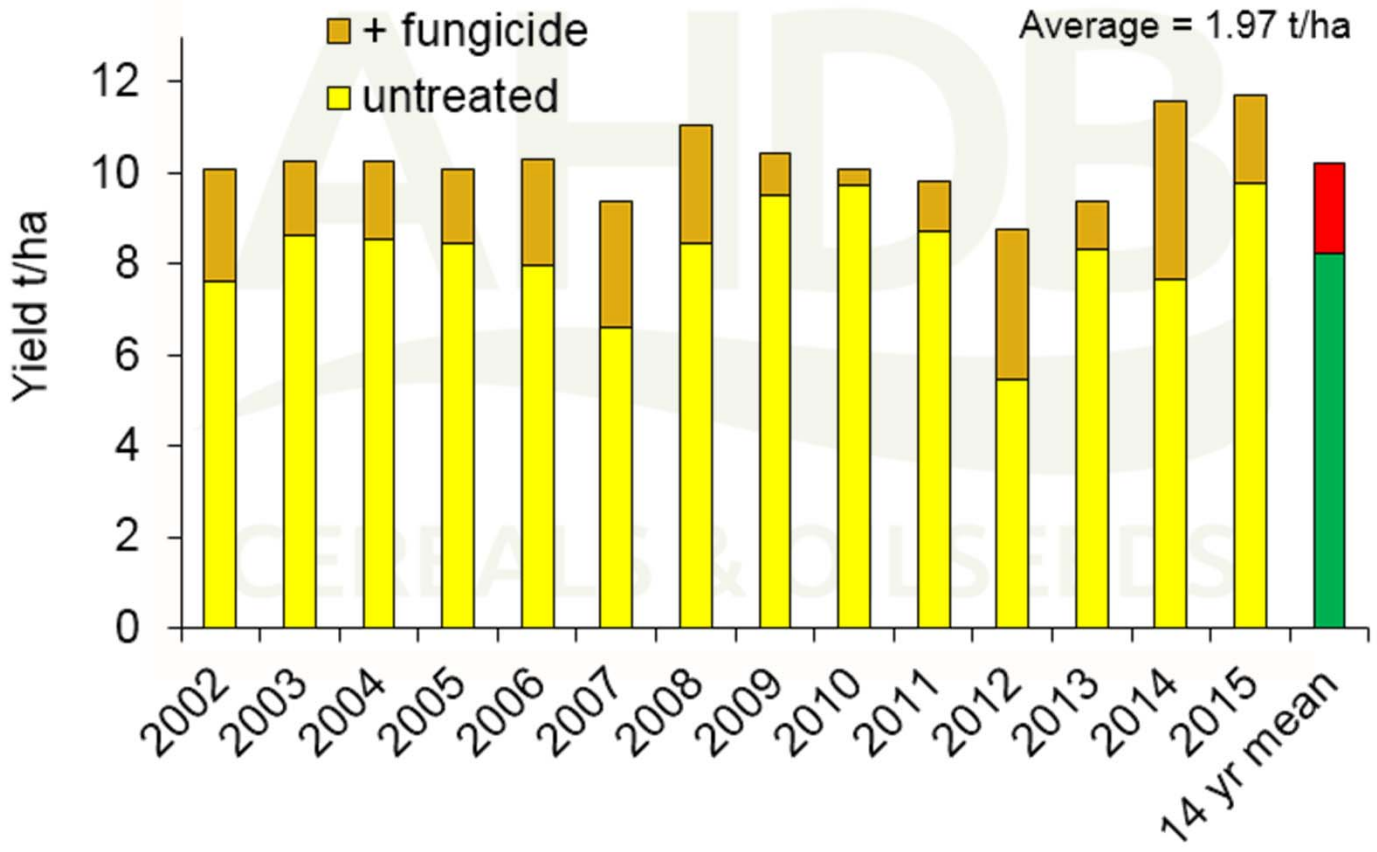
UK Wheat – response to disease control
(2002–2015)



Data extracted from the AHDB Recommended List trials

Wheat trials: summary 2015

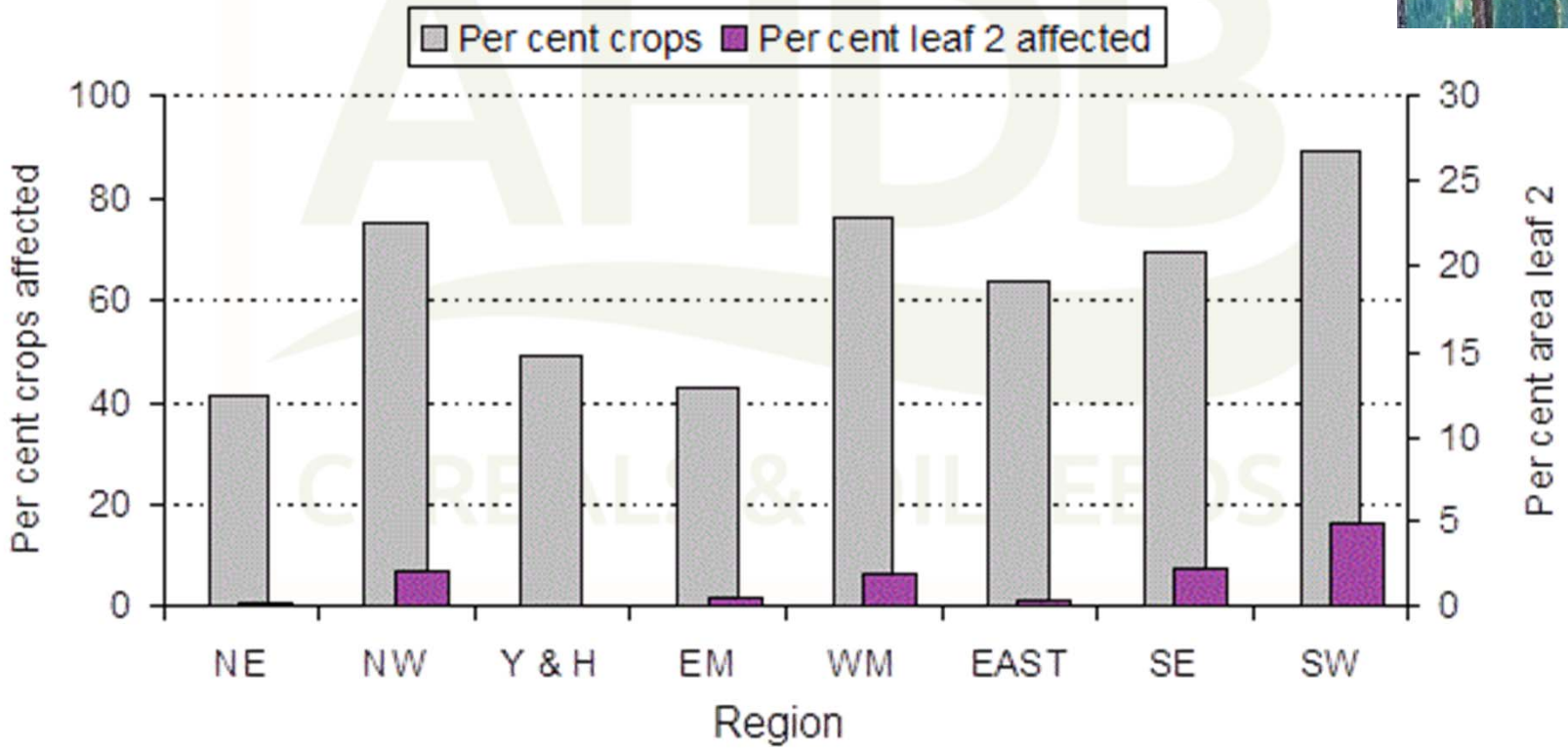
Target Disease	Site (Variety)	Organisation	Disease data
Septoria tritici (T1 and T2 trials)	Fife, Scotland (Consort)	SRUC	*Septoria tritici*
Septoria tritici (T1 and T2 trials)	Sutton Scotney, Hants (KWS Cashel)	NIAB	*Septoria tritici*
Septoria tritici (Leaf 2, timing trial)	Rosemaund, Hereford (Consort)	ADAS	*Septoria tritici*
Septoria tritici (Leaf 2 trial)	Carlow, Ireland (KWS Lumos)	TEAGASC	*Septoria tritici*
Yellow rust (T1 trial)	Kings Lynn, Norfolk (Oakley)	ADAS	Yellow rust
Brown rust (T2 trial, inoculated)	Cambridge (Crusoe)	NIAB	Brown rust

Wheat septoria: trial treatments

Product	Active(s)	Full Dose (l/ha)	S Scotney and Fife	Rosemaund	Carlow*
Untreated			+	+	+
Ignite / Opus Max*	epoxiconazole	1.5	+	+	+
Proline 275 / 250*	prothioconazole	0.72 / 0.8*	+		+
Bravo	chlorothalonil	1.0 l/ha (half dose) only	+	+	+
Imtrex	fluxapyroxad	2.0	+	+	+
Vertisan	penthiopyrad	1.5	+	+	+
Aviator 235 / 225* Xpro	bixafen + prothioconazole	1.25	+	+	+
Adexar	epoxiconazole + fluxapyroxad	2.0	+	+	+
Librax	Fluxapyroxad + metconazole	2.0	+	+	+
Vertisan + Ignite	penthiopyrad + epoxiconazole	1.5 + 1.5	+	+	

Septoria tritici (2015)

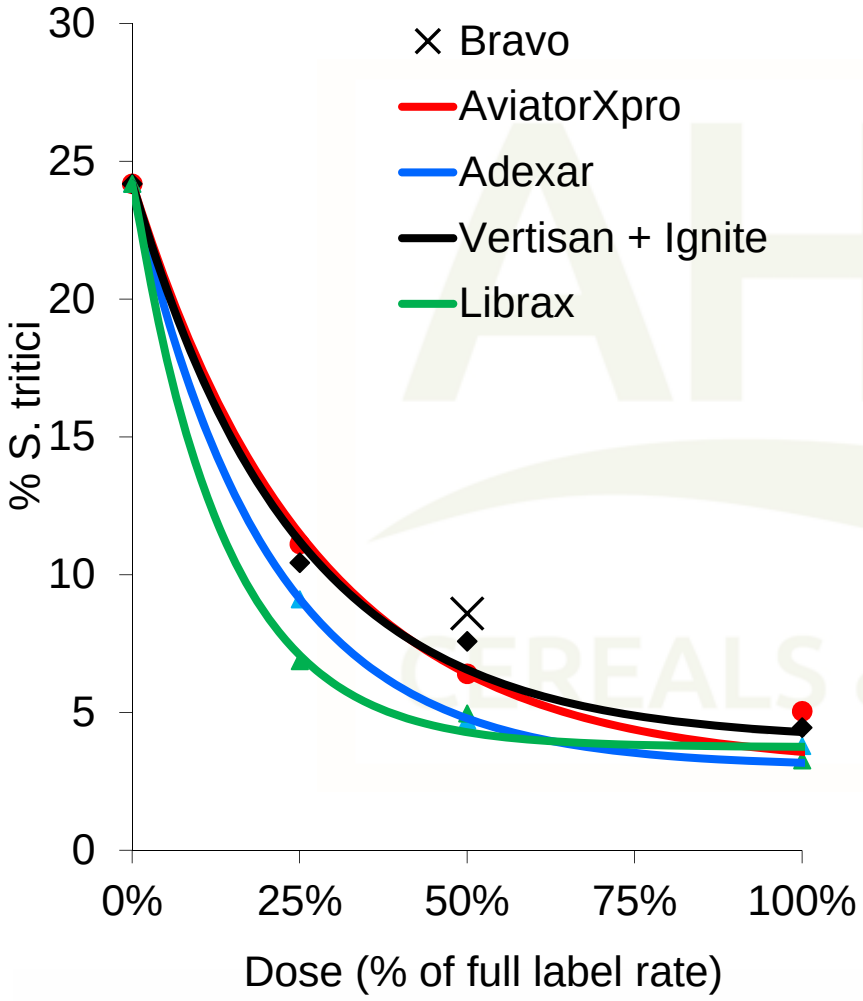
- The main cause of yield loss in wheat
- Still not fully controlled on farm in 2015



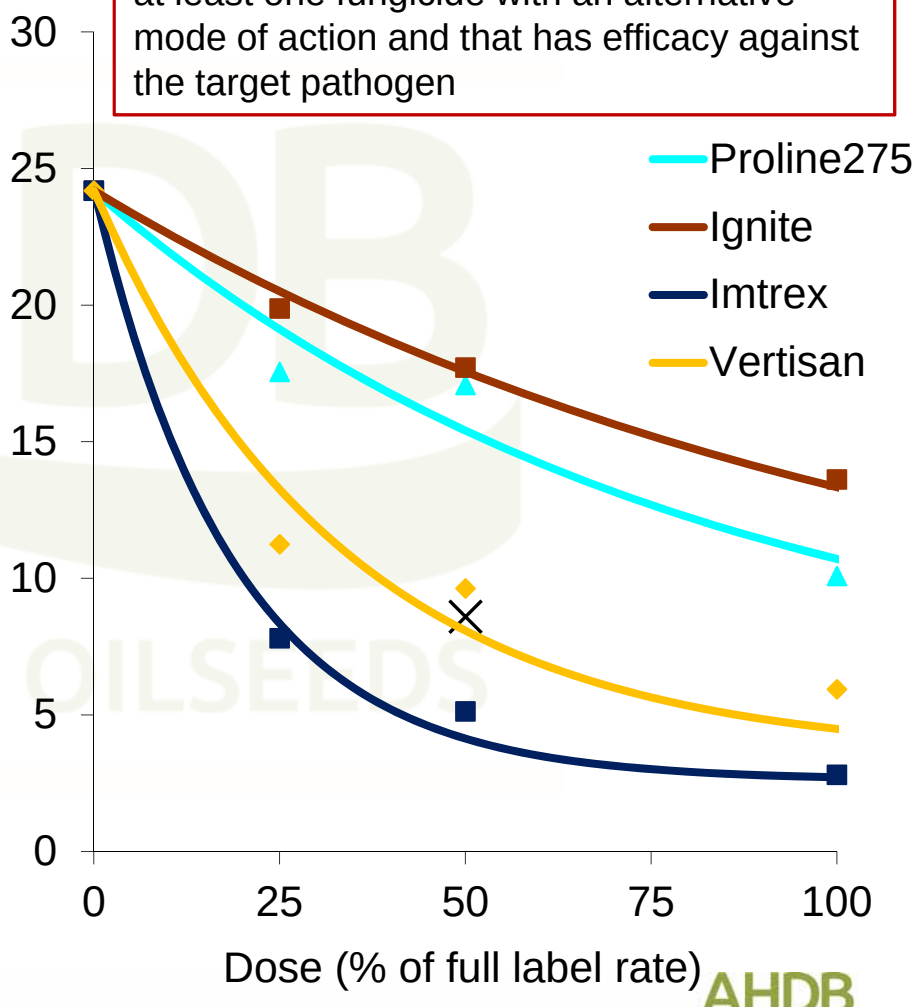
Defra: Cereal Disease Survey 2015

Septoria 2015: Protectant activity

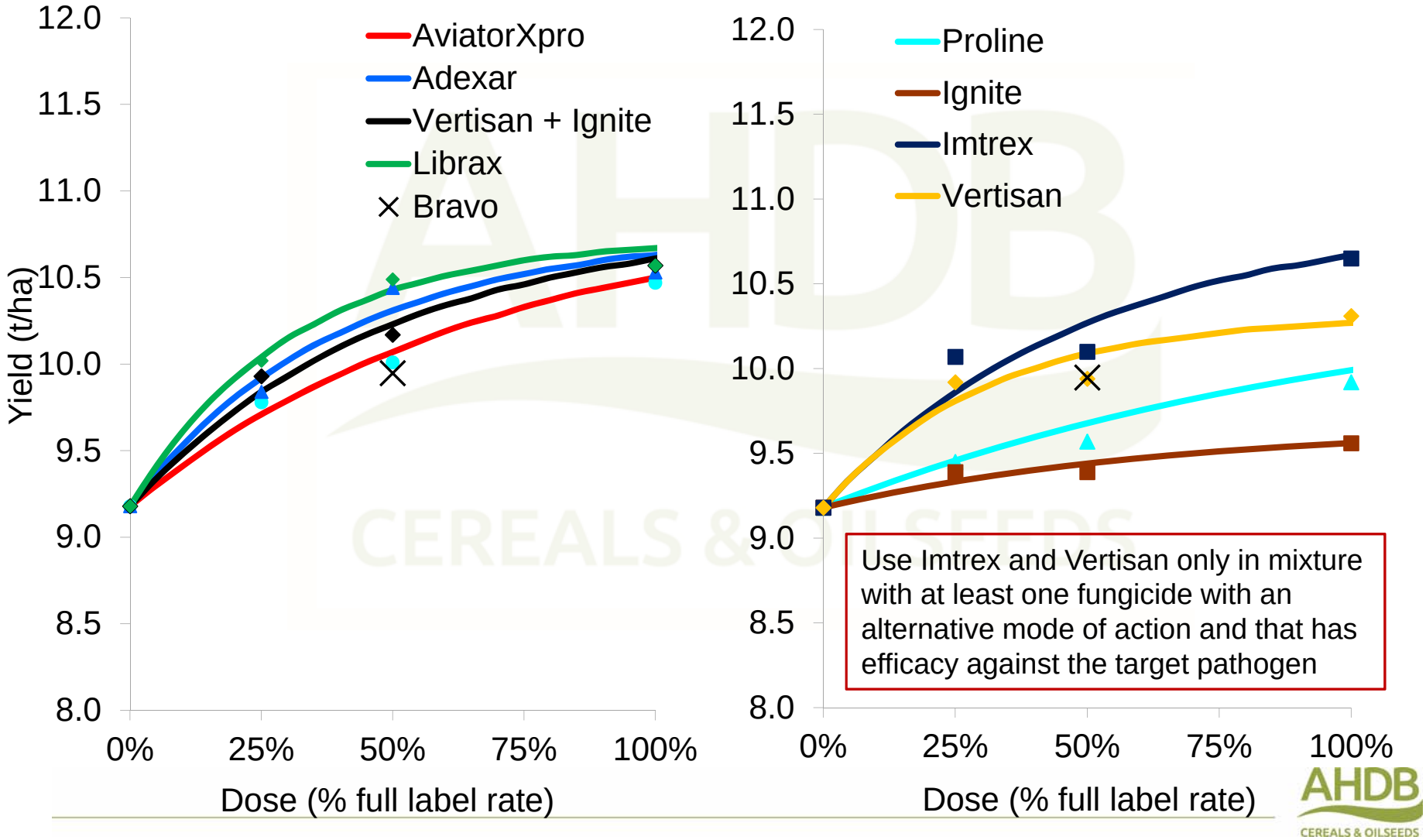
(6 trials)



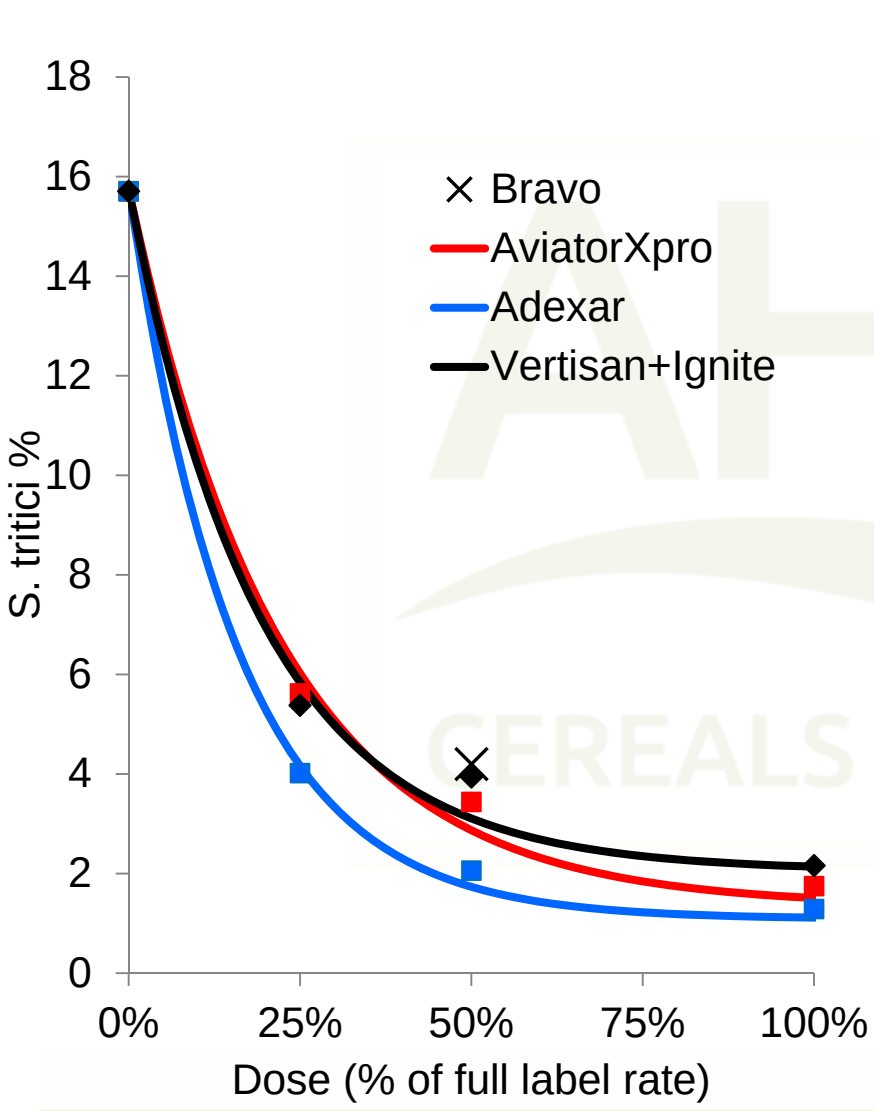
Use Imtrex and Vertisan only in mixture with at least one fungicide with an alternative mode of action and that has efficacy against the target pathogen



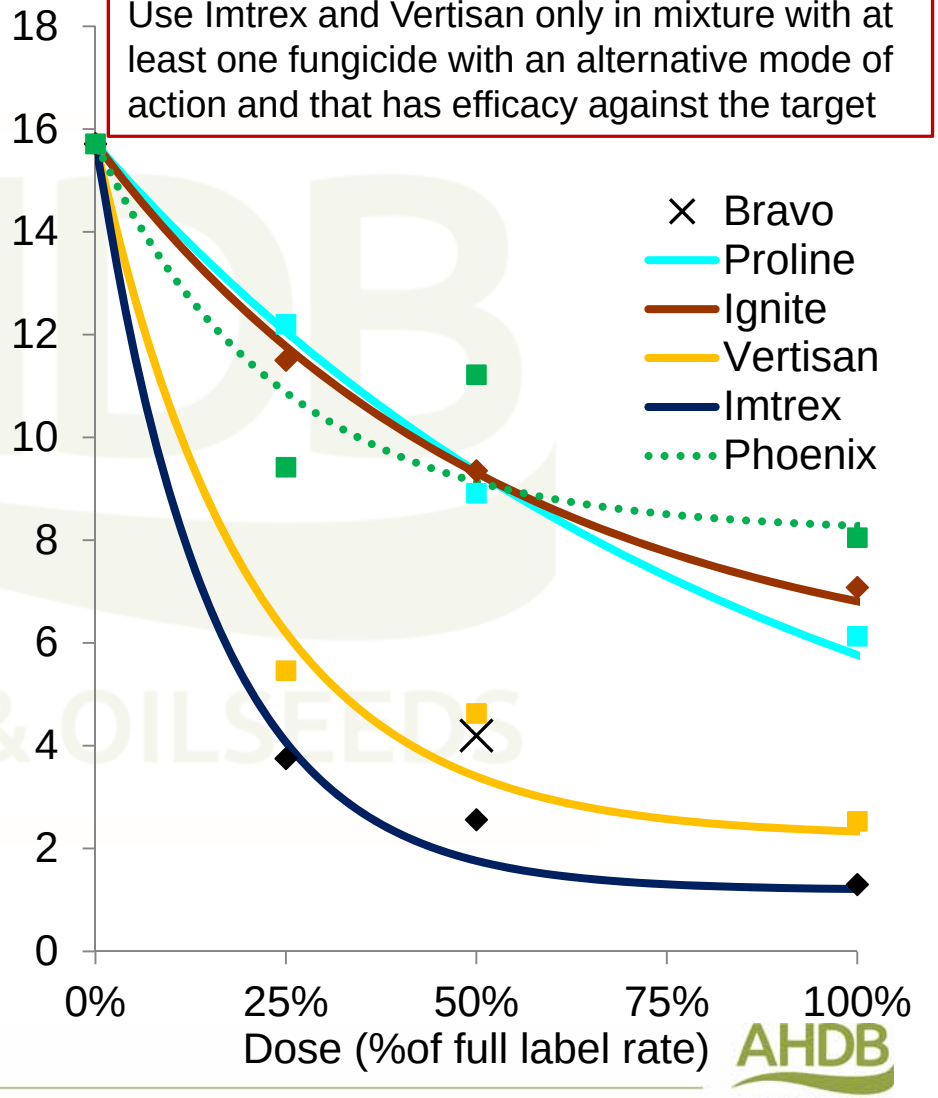
Septoria 2015: Yield
(6 trials)



Septoria 2013–15: Protectant activity



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



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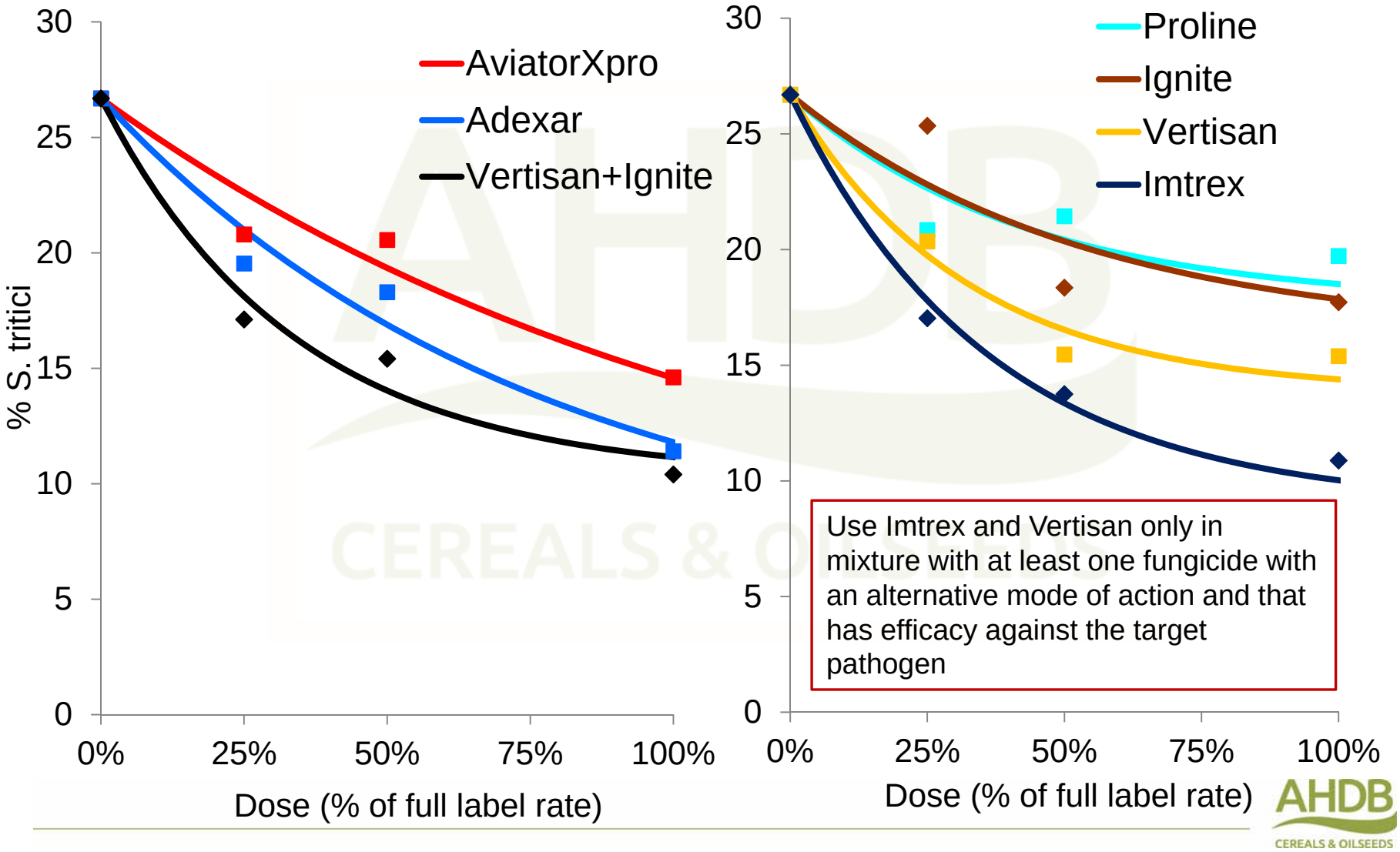
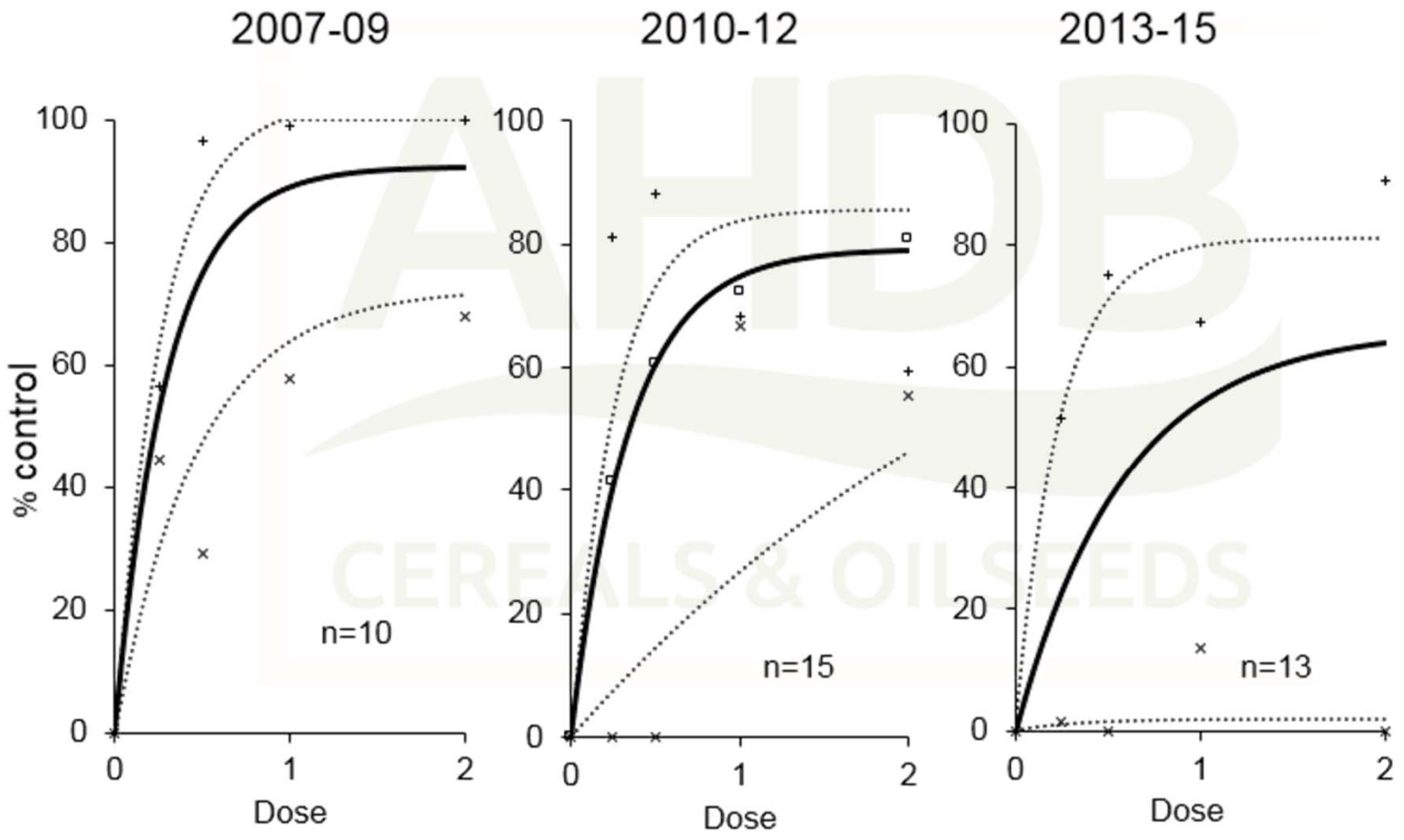
Septoria 2013–15: Eradicant activity

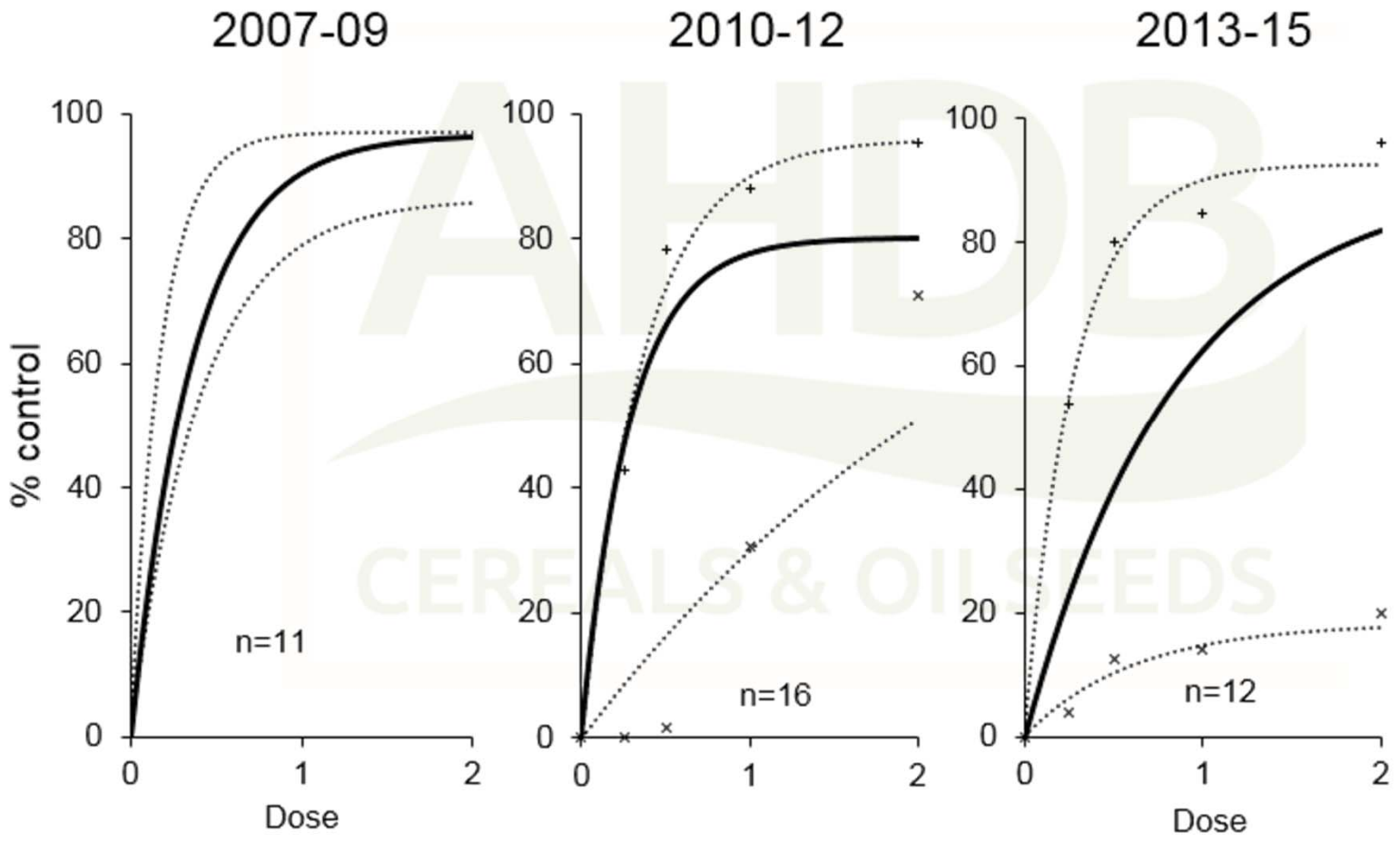


Changes in protectant activity (epoxiconazole)



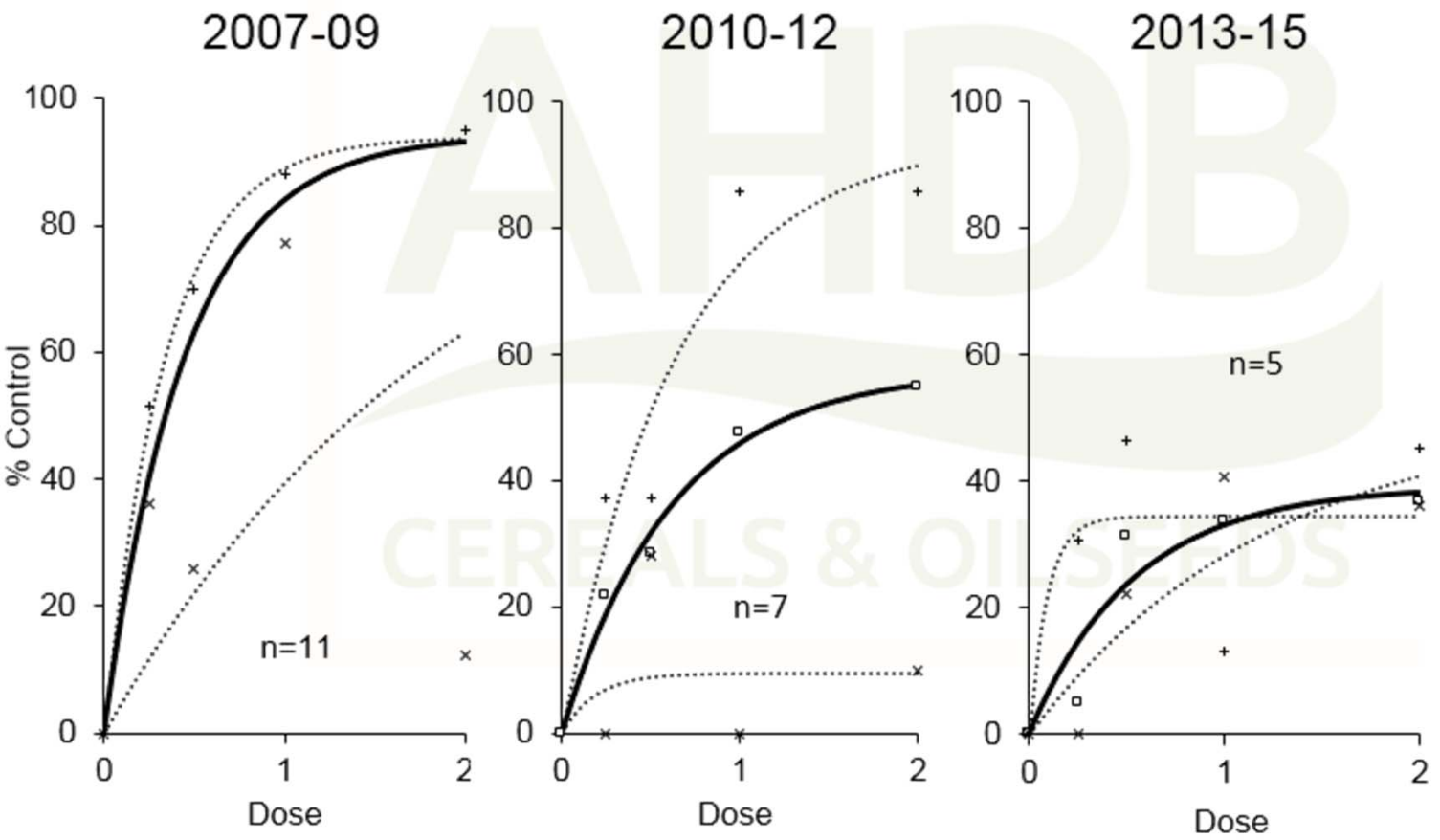
Solid line = mean response, Dotted lines = highest and lowest responses observed

Changes in protectant activity (prothioconazole)



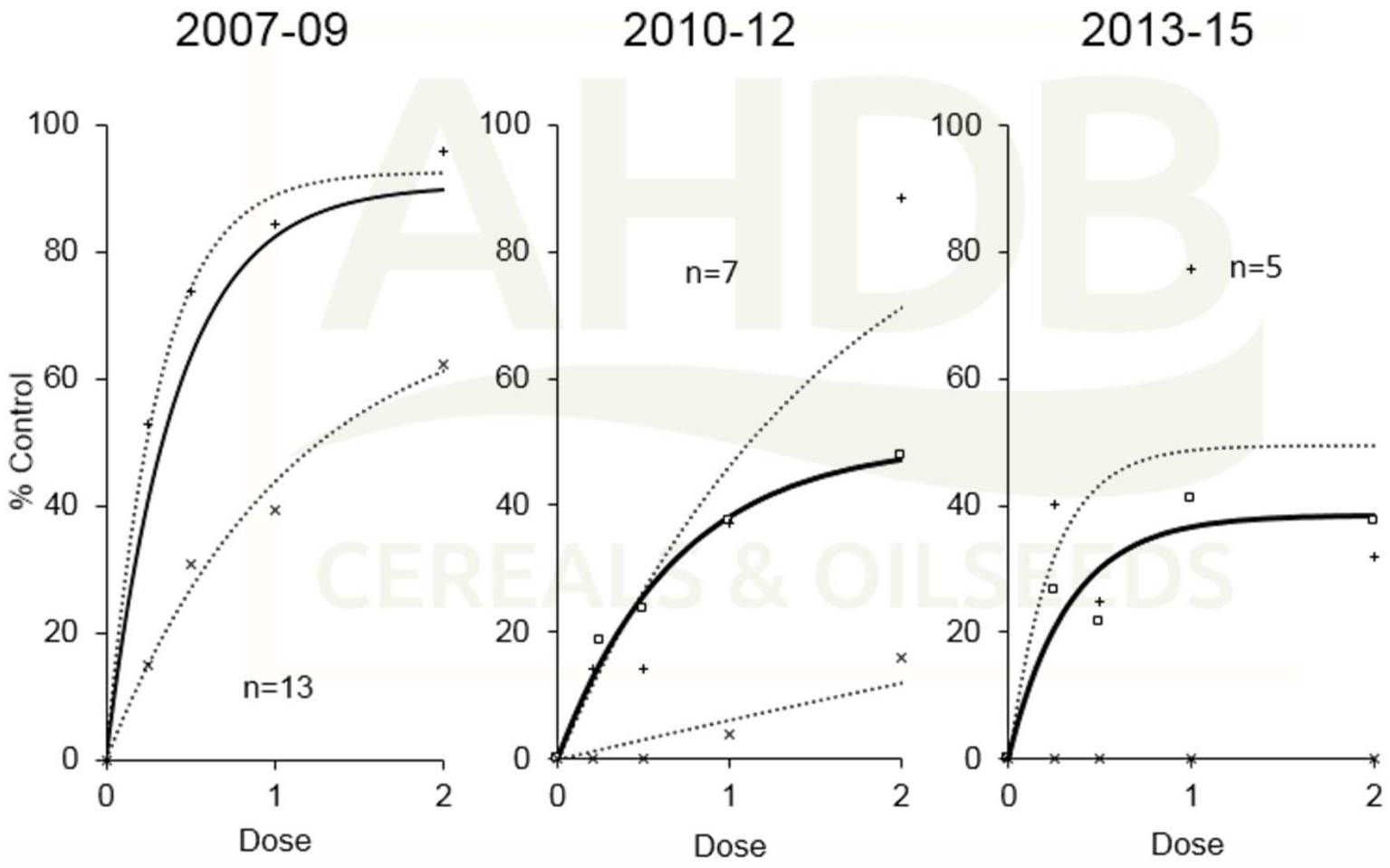
Solid line = mean response, Dotted lines = highest and lowest responses observed

Changes in eradicant activity (epoxiconazole)



Solid line = mean response, Dotted lines = highest and lowest responses observed

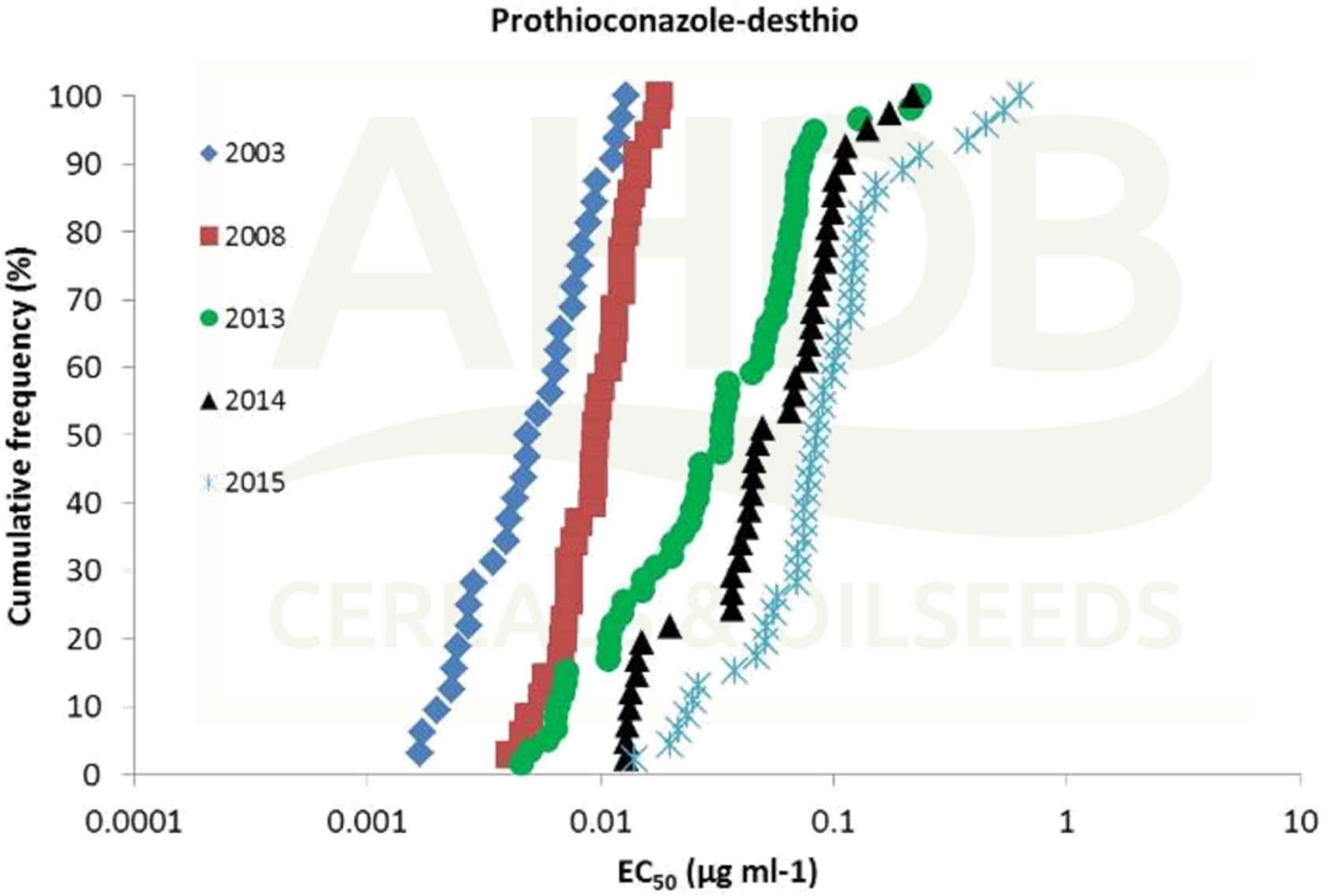
Changes in eradicant activity (prothioconazole)



Solid line = mean response, Dotted lines = highest and lowest responses observed

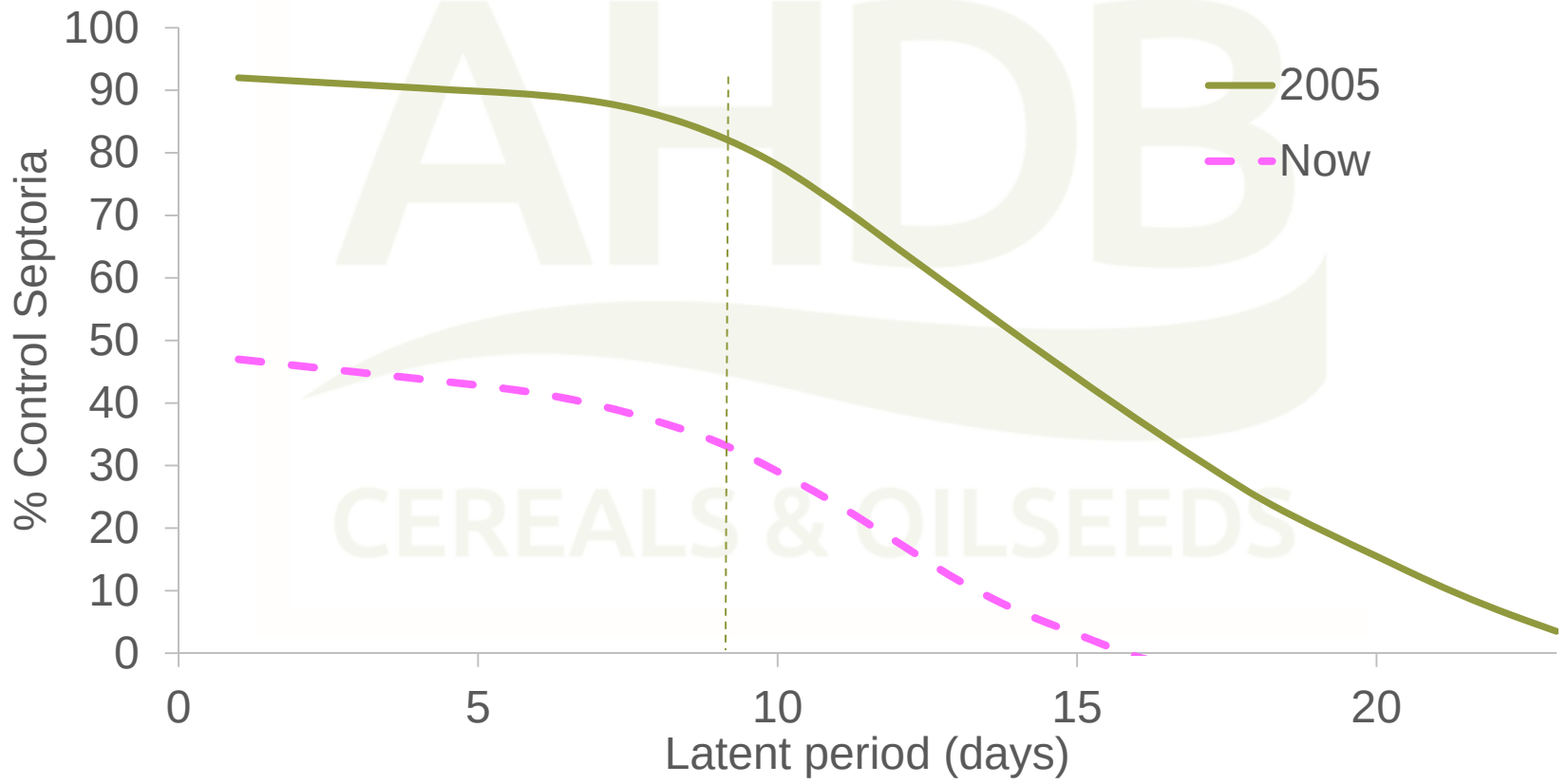
Fungicide sensitivity monitoring

Rothamsted populations



FRG group

The effect of latent period on % control



Preliminary information:

Reduced sensitivity to SDHIs found in septoria

- Isolates detected in Ireland 2015 (Teagasc)
  - Some have C-H152R mutation
  - Insensitivity outside the normal range
  - Cross resistance for SDHIs expected
  - Currently at low frequency in Ireland
  - Fitness unknown

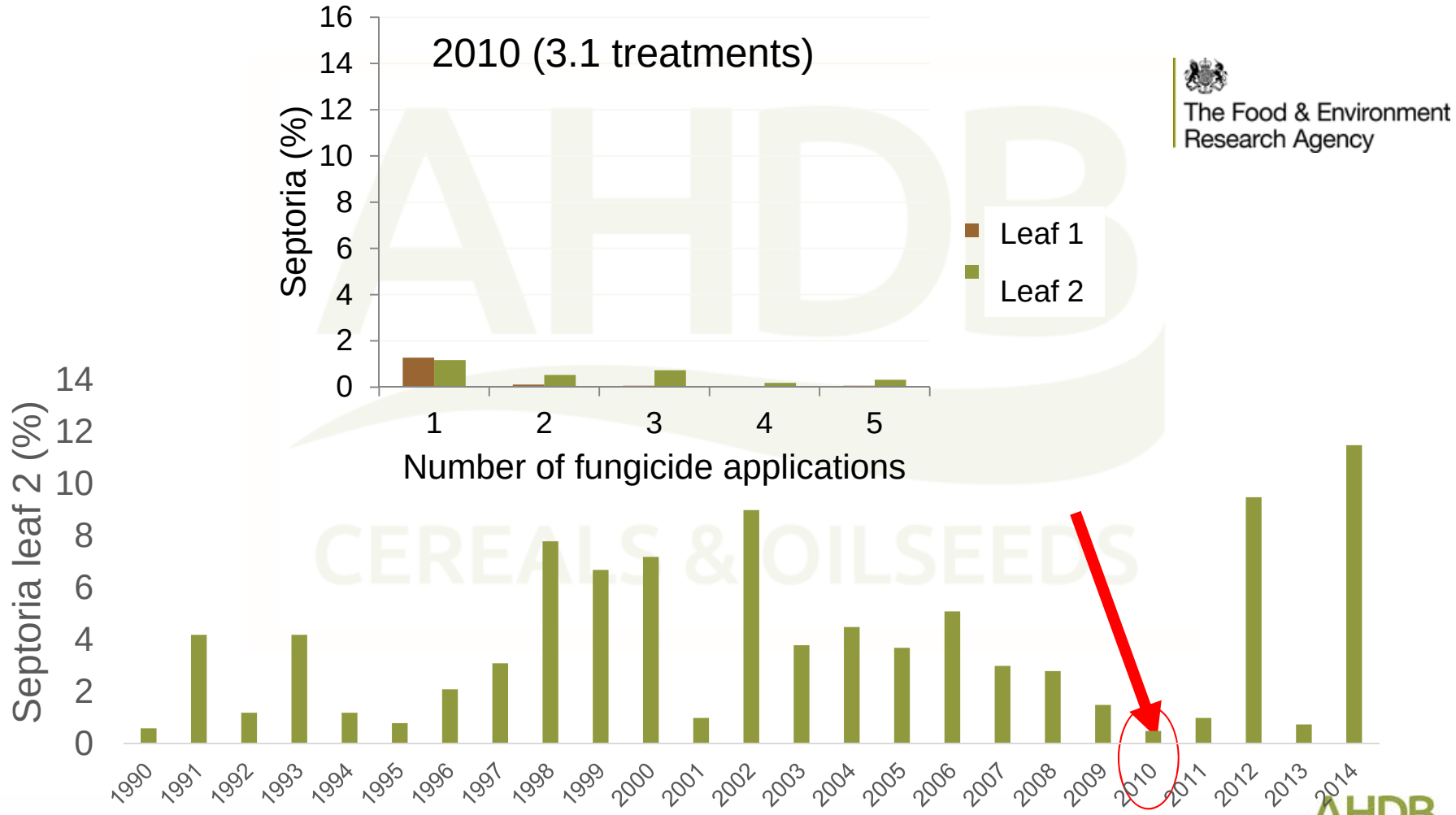
- SDHI stewardship paramount

Septoria control: Maximise use of other methods

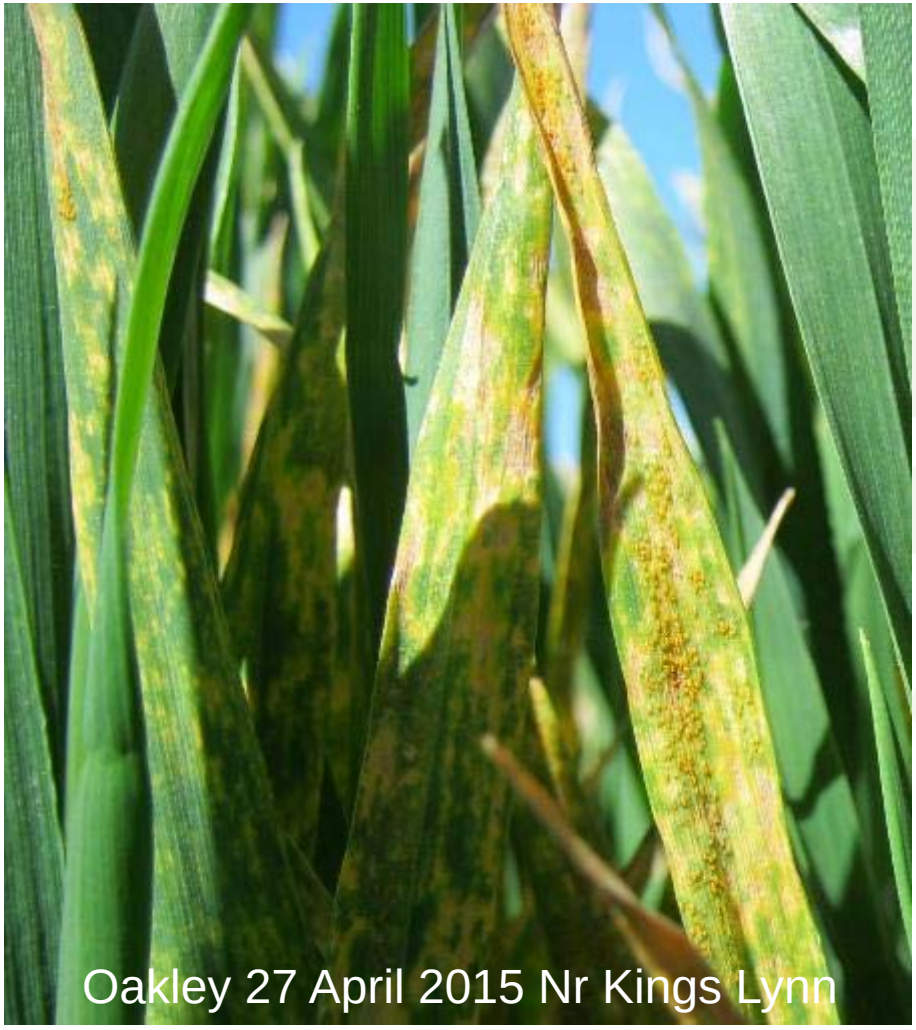
- Use different Modes of Actions in programmes
  - Multisites, azoles, (strobilurins)
- Use varietal differences in disease resistance

+

Septoria control: Minimise use of SDHIs to slow evolution



Yellow rust (2015)


Oakley 27 April 2015 Nr Kings Lynn

- 2015 epidemics delayed compared to 2014
- Most susceptible varieties: KWS Kielder, Solstice, Gallant, Cordiale and Horatio
- High levels in AHDB fungicide performance trial

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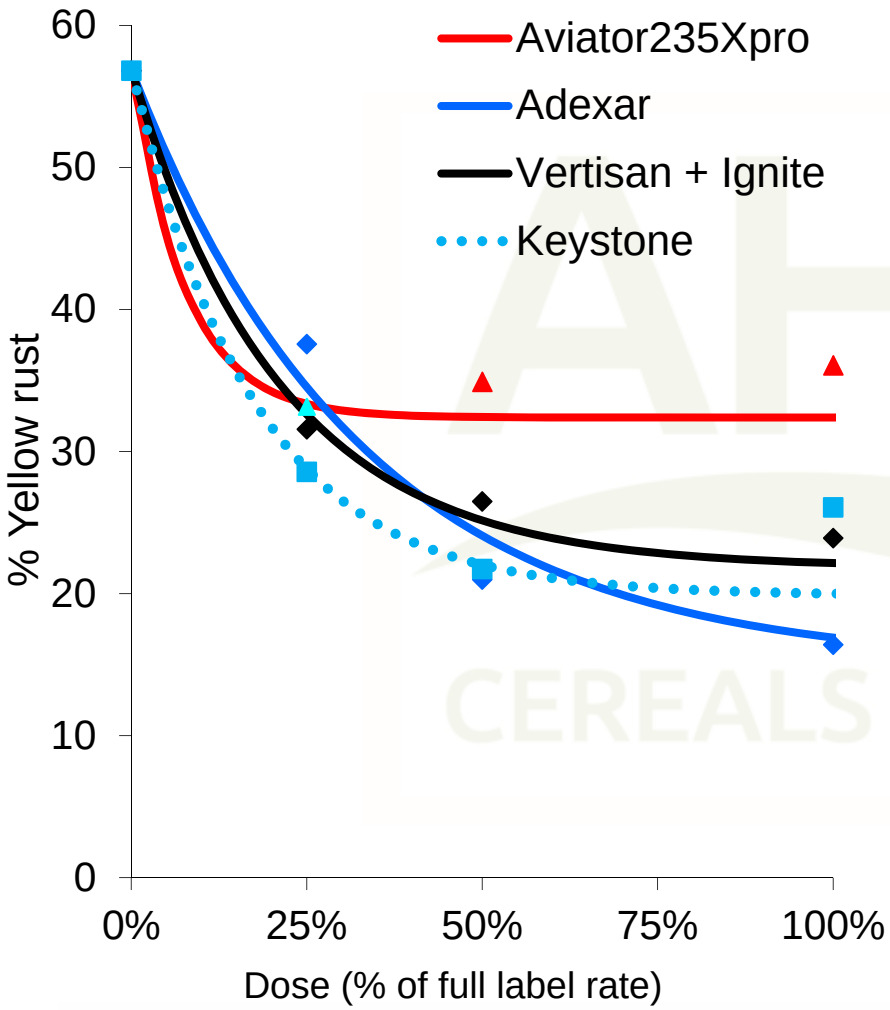
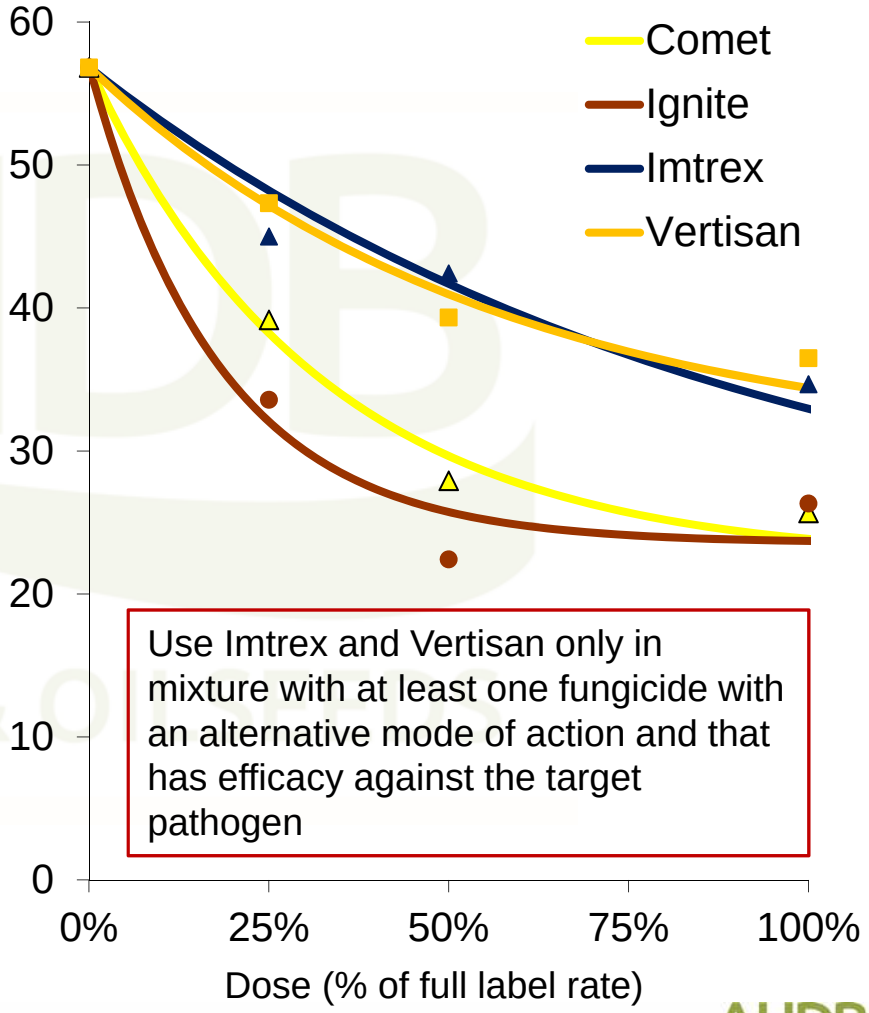
Yellow rust (2015)





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

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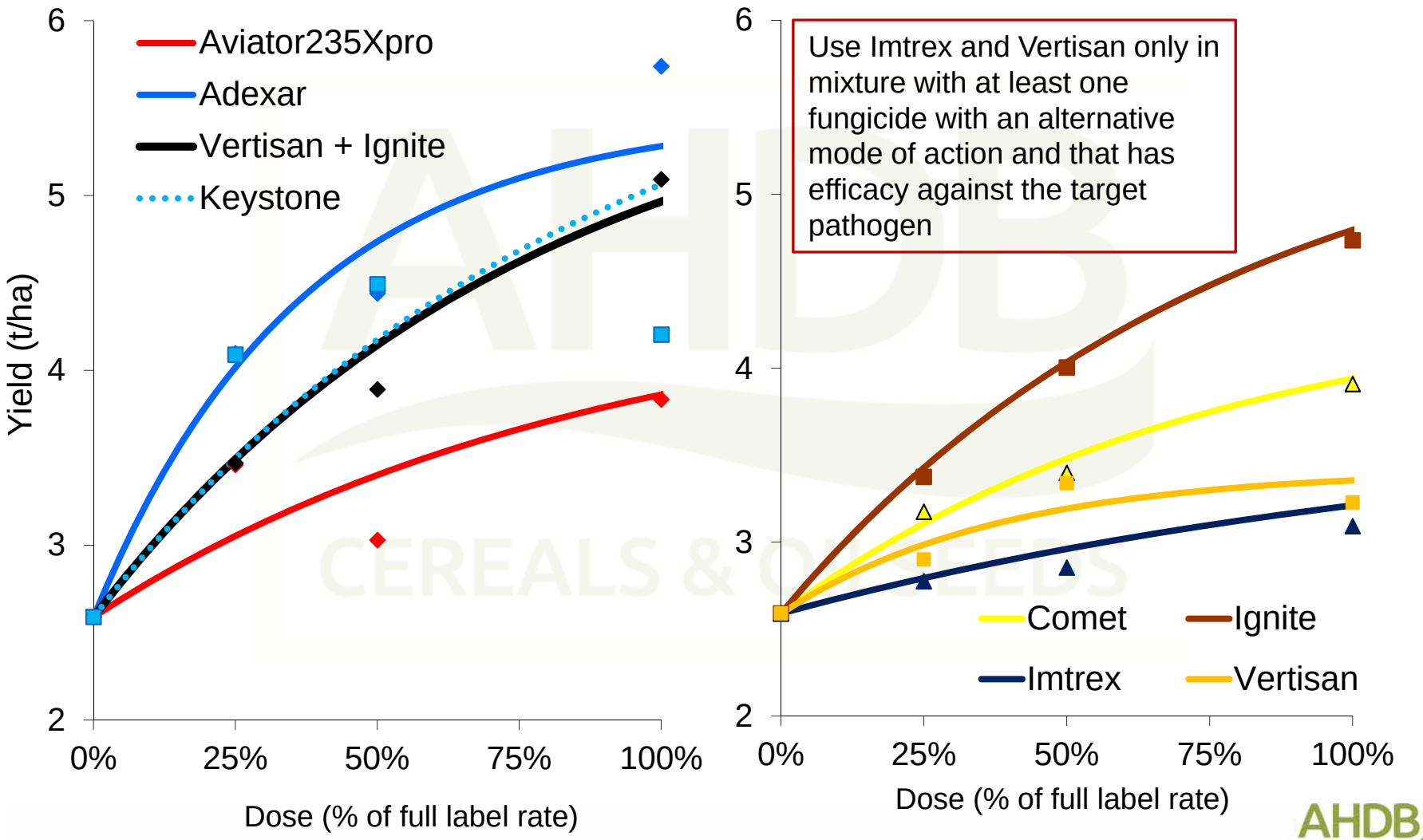
Yellow rust (2015) – Yield



Brown rust (2015)

- Epidemics on susceptible varieties at the end of the season in 2015
- Gator, Grafton and Crusoe particularly susceptible
- Inoculated fungicide performance trials in 2015 provided a good test

2016?

Above average winter temperatures may trigger early epidemics

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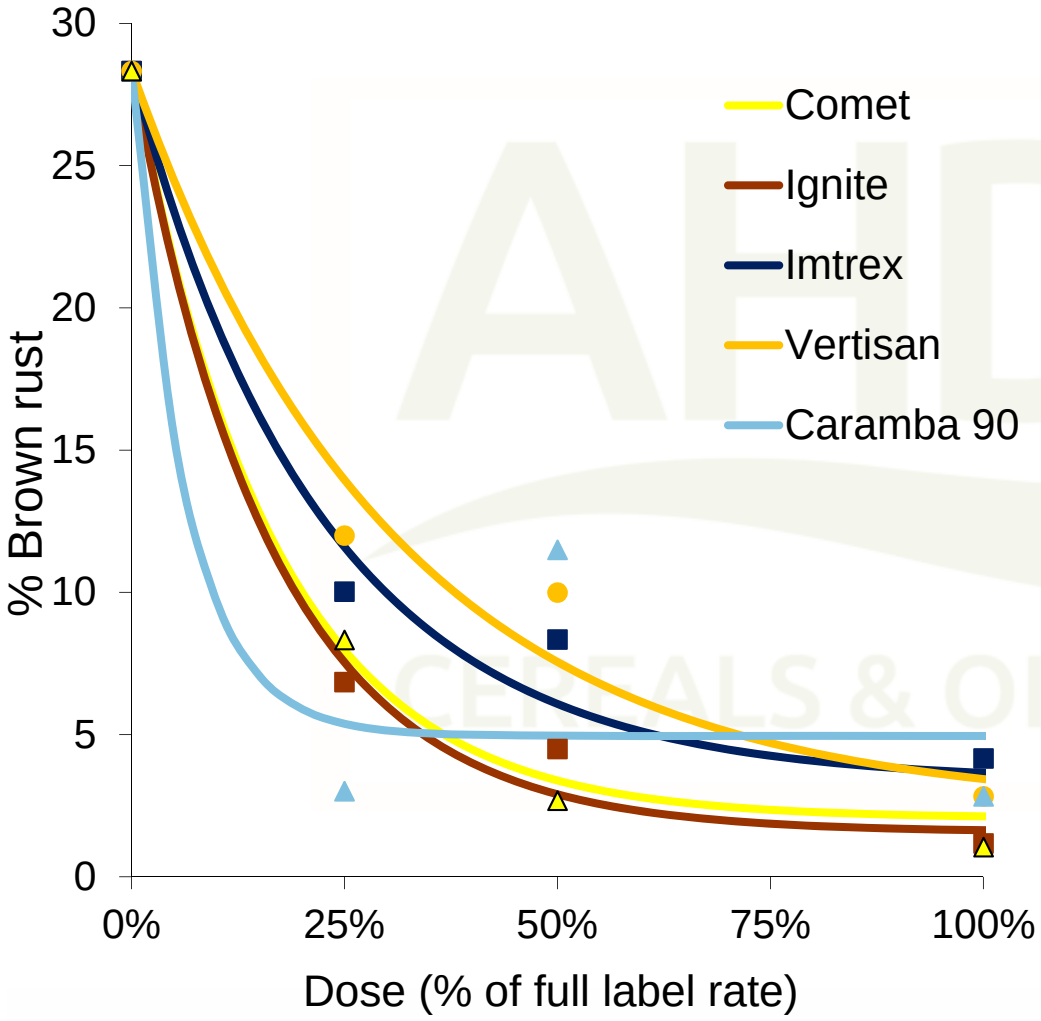
Brown rust (2015)



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

Wheat summary

- Septoria tritici
  - SDHIs are the most active chemistry
  - Librax at least as effective as other SDHI / azoles (only 1 year in trials)
  - Activity of azoles has declined but they still support SDHIs in curative situations
  - Multi-sites add valuable protectant activity to programmes
  - Both azoles and multisite actives are required to protect SDHIs
- Rusts
  - Epoxiconazole highly effective in curative situations
  - Strobilurins more active than SDHIs (esp on yellow rust)

Using fungicides effectively in barley

Results of AHDB Fungicide Performance 2015

Barley – the main causes of yield loss

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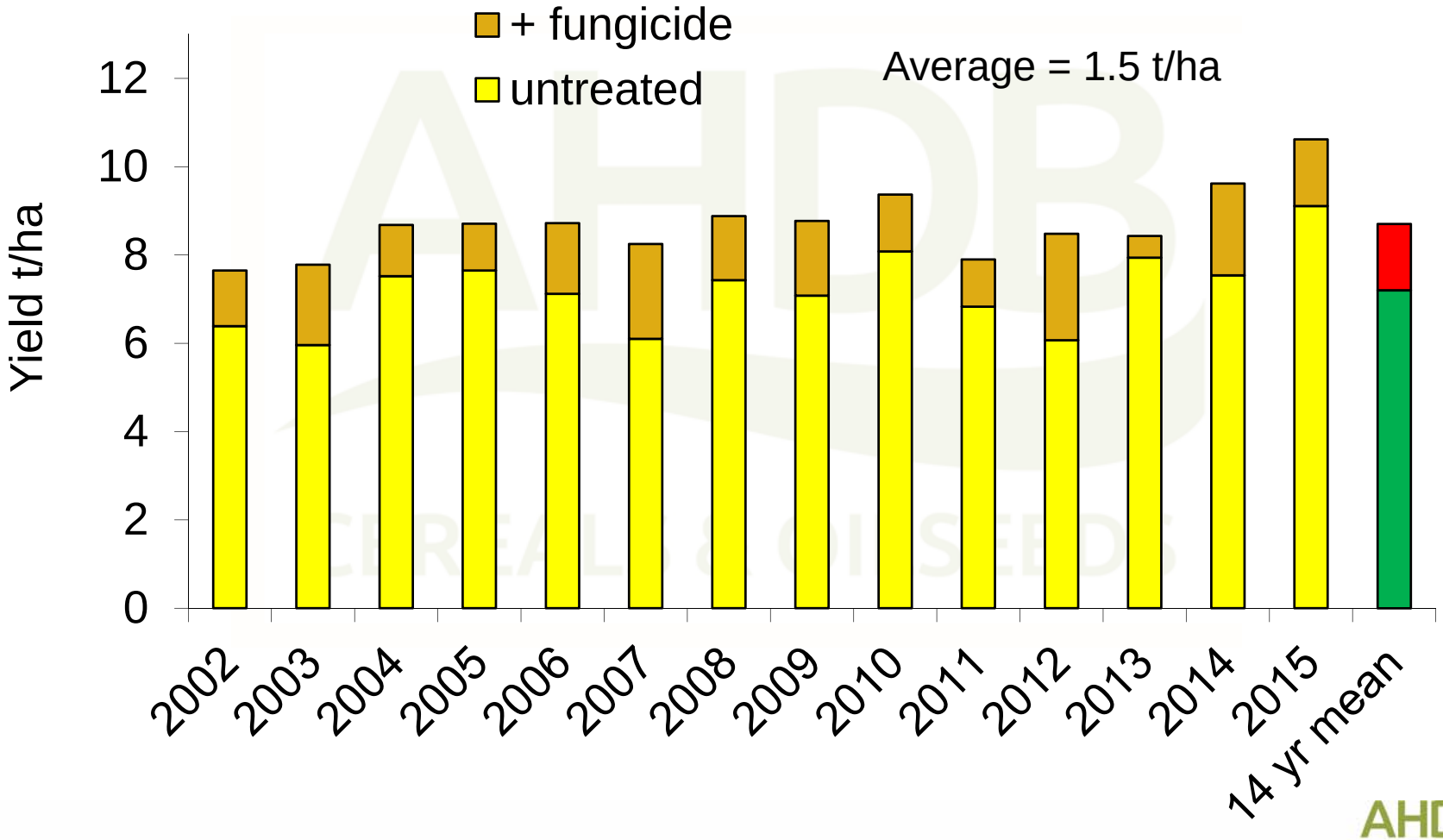
UK Winter barley – Yield and benefits of disease control



Data extracted from the AHDB Recommended List trials

Barley: Trials Summary 2015

Target Disease	Site (Variety)	Organisation	Disease data
Rhynchosporium (Winter Barley)	Lanark, Scotland (Saffron)	SRUC	Rhynchosporium + Mildew
Rhynchosporium (Winter Barley)	Cardigan, Wales (Saffron)	ADAS	Rhynchosporium
Rhynchosporium (Winter Barley)	Carlow, Ireland (Saffron)	TEAGASC	Mildew
Net Blotch (Winter Barley)	High Mowthorpe, N Yorks (Cassata)	ADAS	No disease
Net Blotch (Winter Barley)	Morley, Norfolk (Cassata)	NIAB	Net blotch
Powdery mildew (Winter Barley)	Midlothian, Scotland (Cassia)	SRUC	Rhynchosporium
Ramularia (Spring Barley)	Midlothian, Scotland (Prestige)	SRUC	Ramularia

Barley Trial: Treatments 2015

Product	Active(s)	Full Dose (l/ha)	Rhyncho Trials	Net Blotch Trials	Ramularia Trial
Untreated			+	+	+
Proline 275/250*	prothioconazole	0.72/0.80	+	+	+
Comet 200	pyraclostrobin	1.25		+	+
Kayak	cyprodinil	1.5		+	
Imtrex	fluxapyroxad	2.0	+	+	+
Zulu	isopyrazam	1.0	+	+	+
Vertisan	penthiopyrad	1.5		+	
Siltra Xpro	bixafen + prothioconazole	1.0	+	+	+
Adexar	epoxiconazole + fluxapyroxad	2.0	+		+
Bravo 500	chlorothalonil	2.0			+
Treoris	Penthiopyrad + Chlorothalinil	2.5			+

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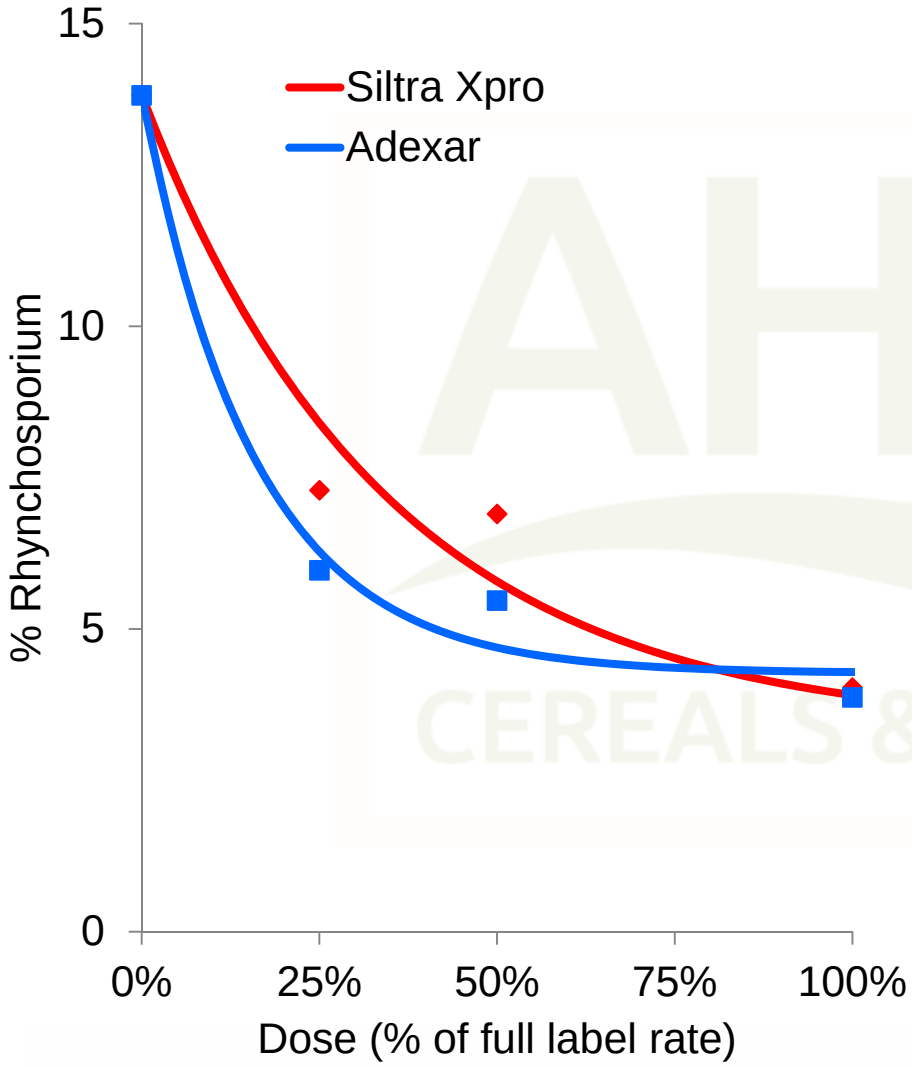
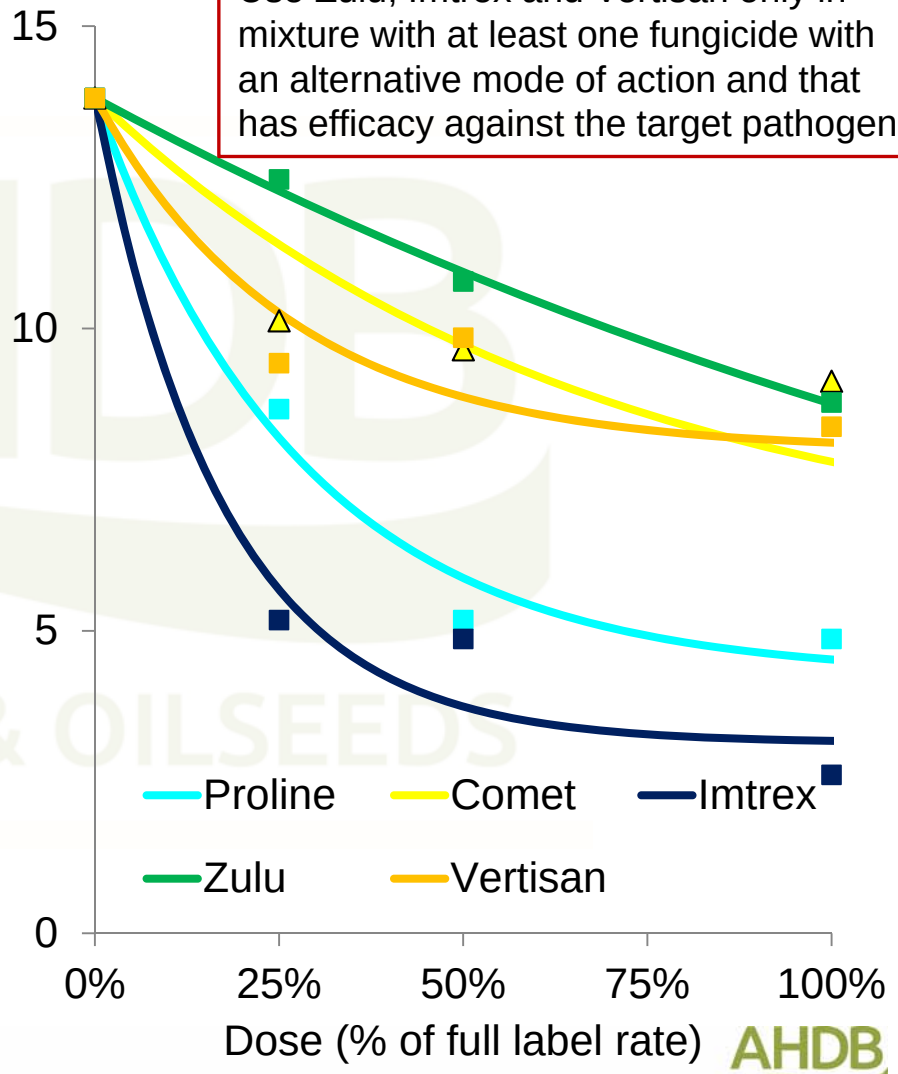
* Teagasc trial

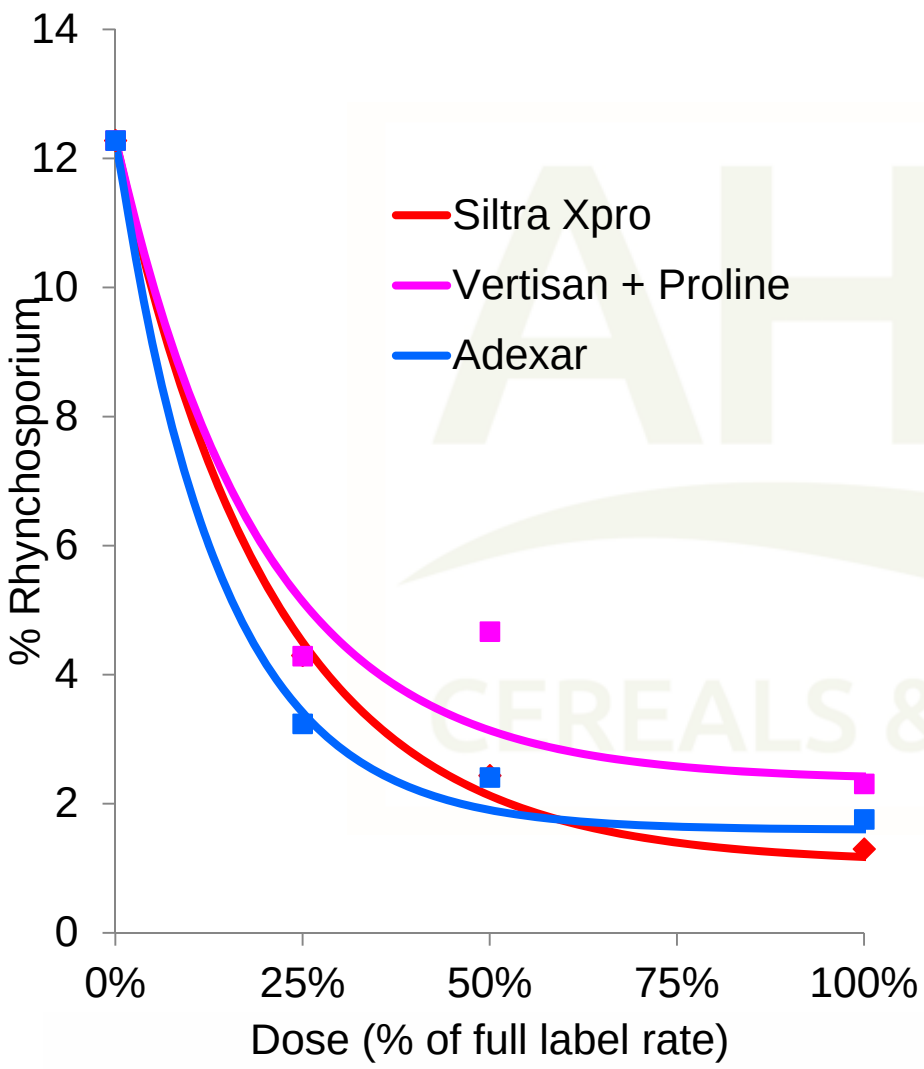
Rhynchosporium 2015
Protectant activity

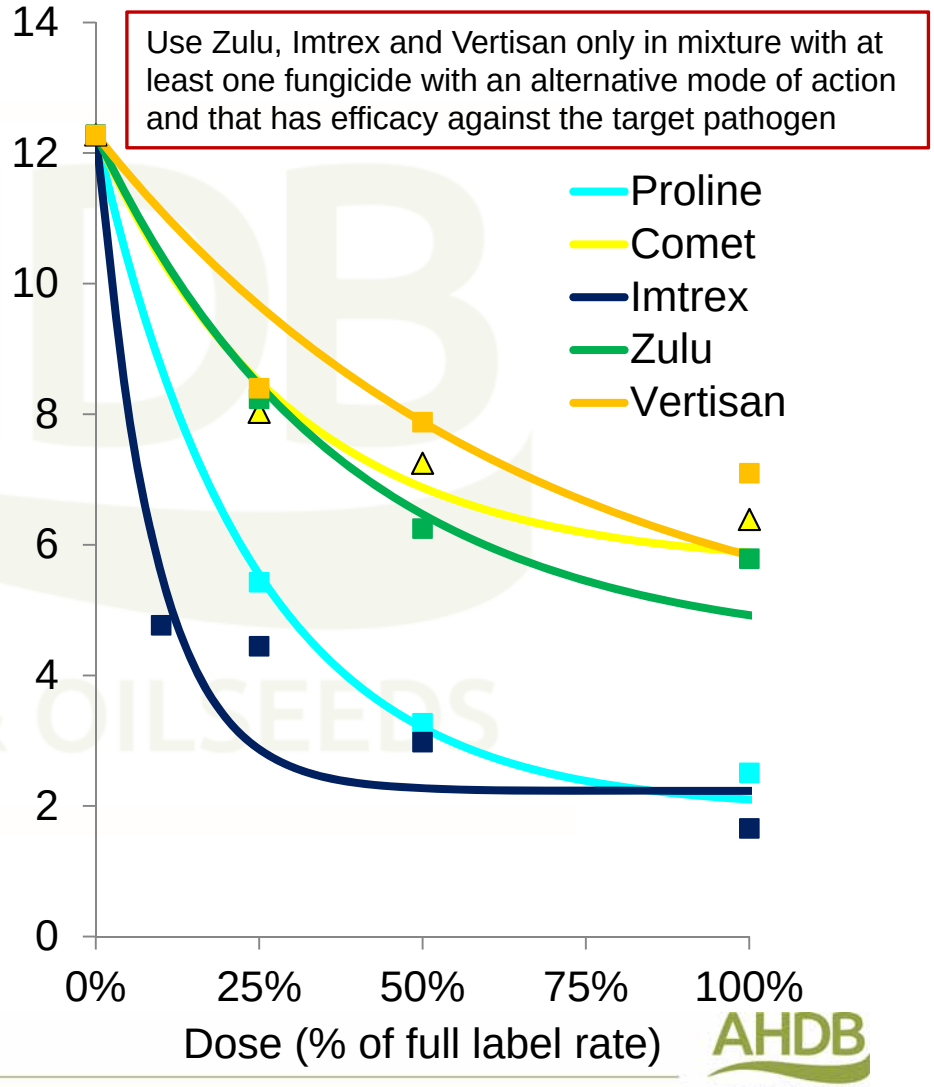




Use Zulu, Imtrex and Vertisan only in mixture with at least one fungicide with an alternative mode of action and that has efficacy against the target pathogen

Rhynchosporium 2013–15
Protectant activity





Use Zulu, Imtrex and Vertisan only in mixture with at least one fungicide with an alternative mode of action and that has efficacy against the target pathogen

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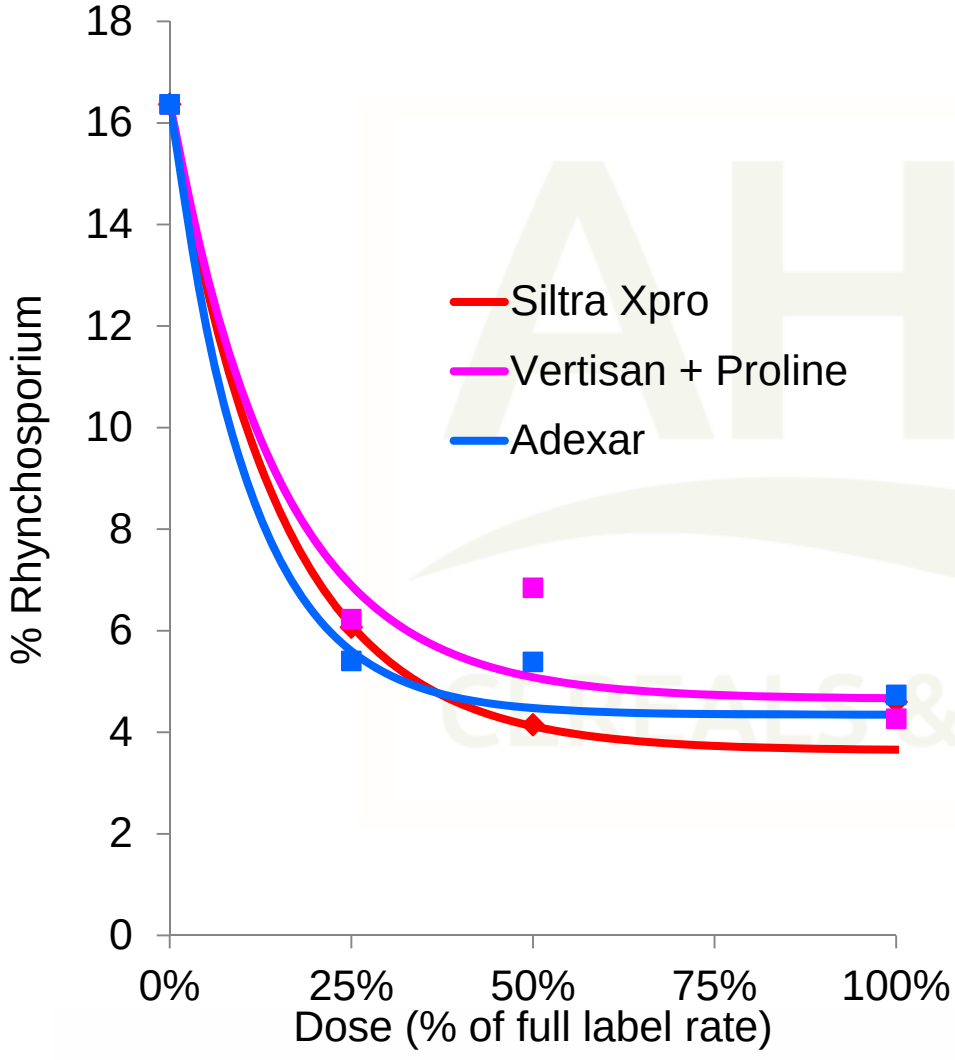
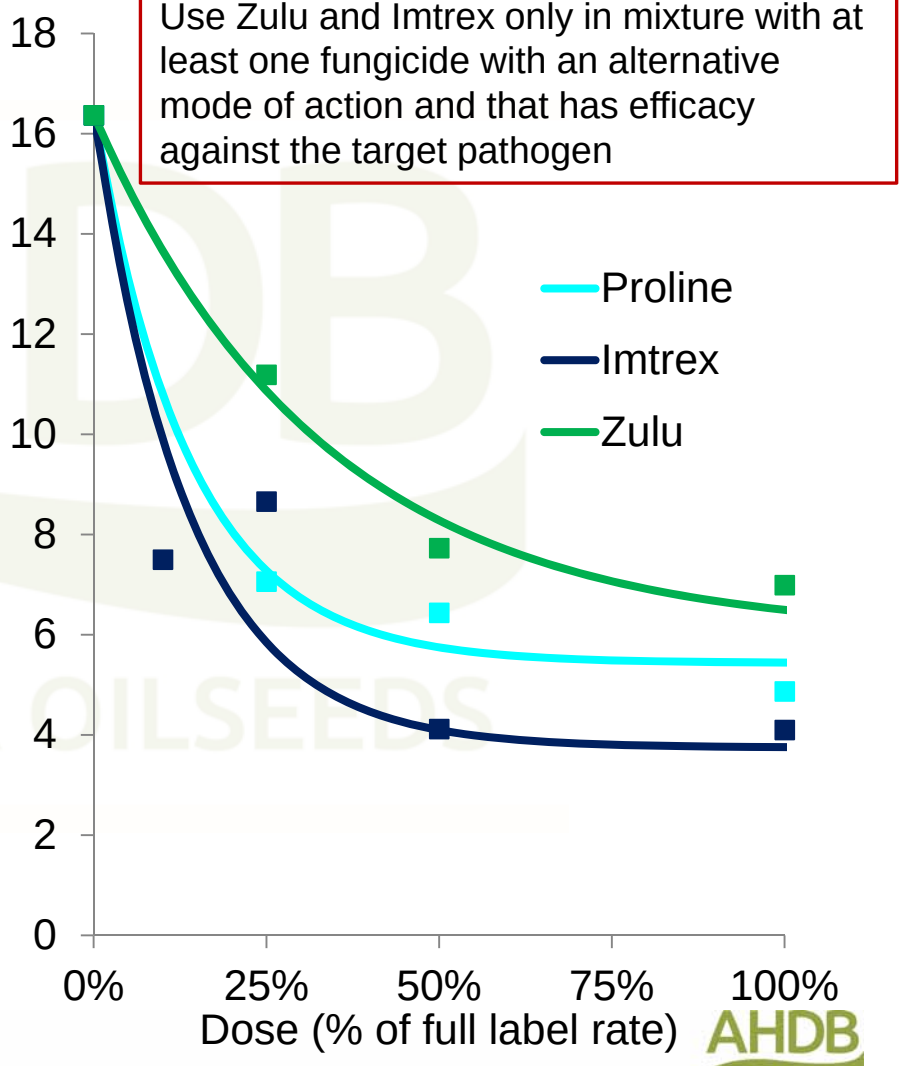
Rhynchosporium 2013–15
Eradicant activity





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

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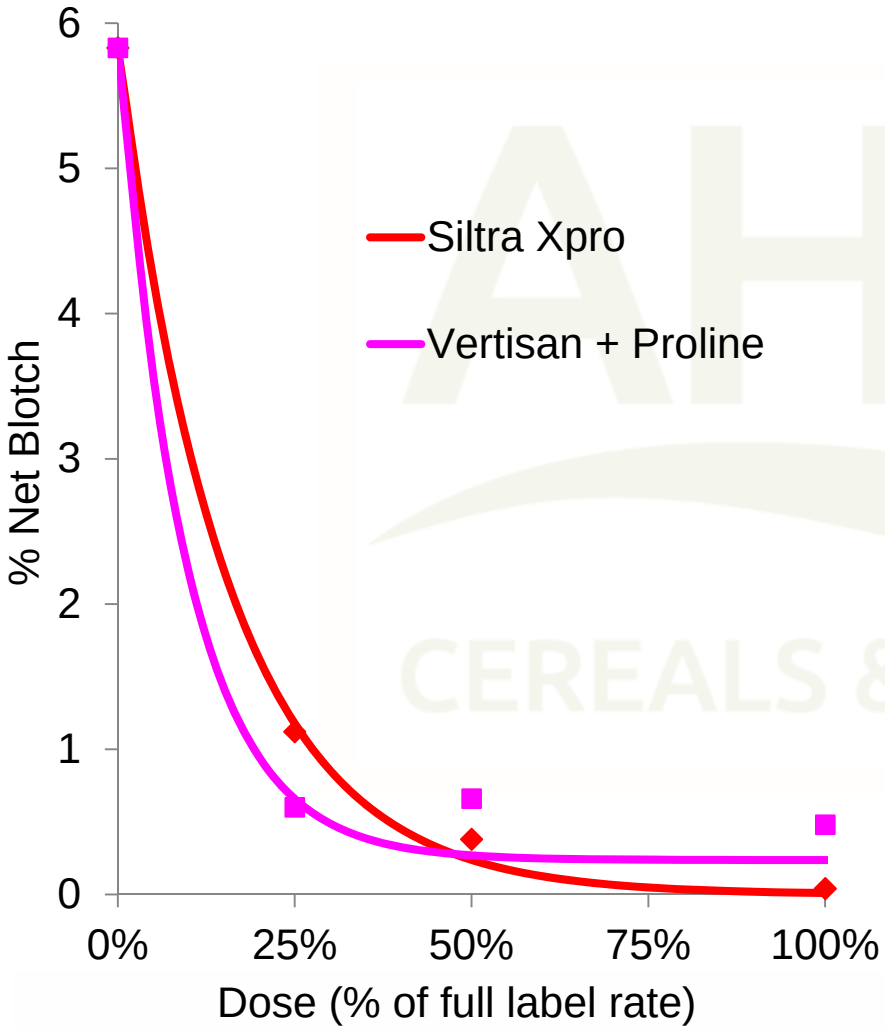
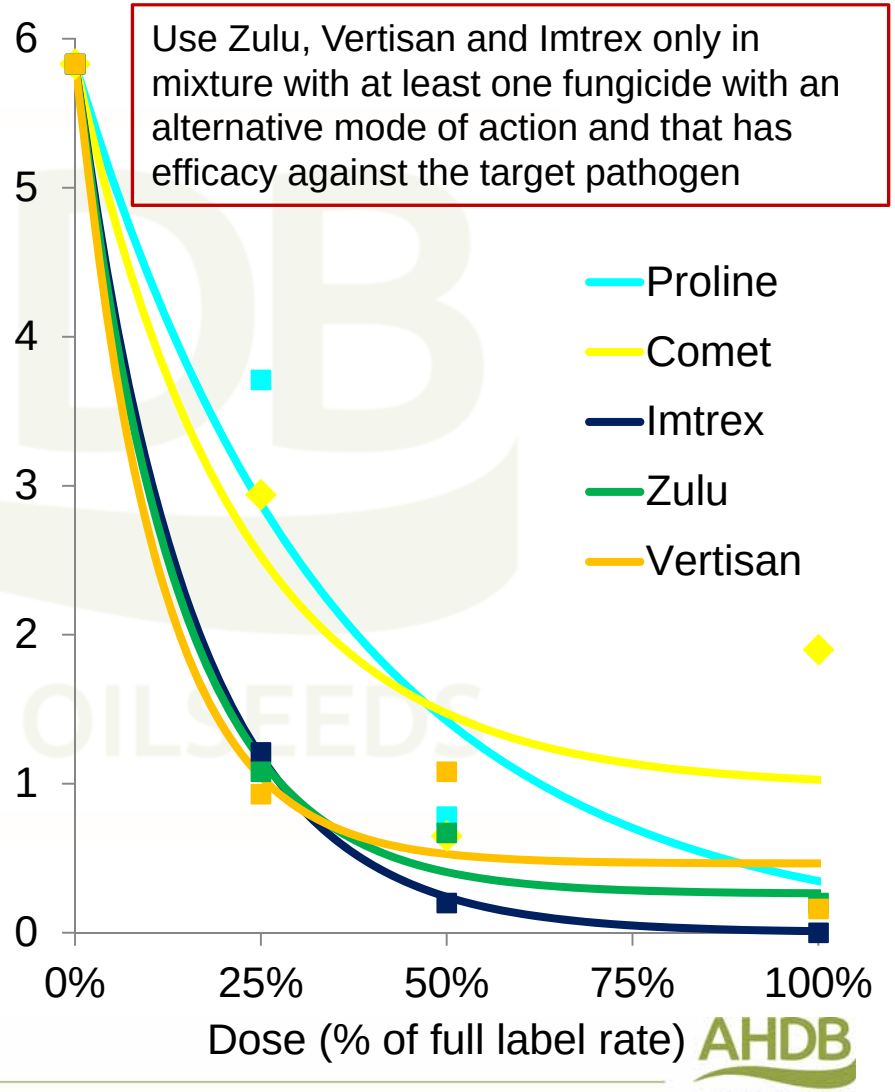
Net blotch 2012–15
Protectant activity



Use Zulu, Vertisan and Imtrex only in mixture with at least one fungicide with an alternative mode of action and that has efficacy against the target pathogen



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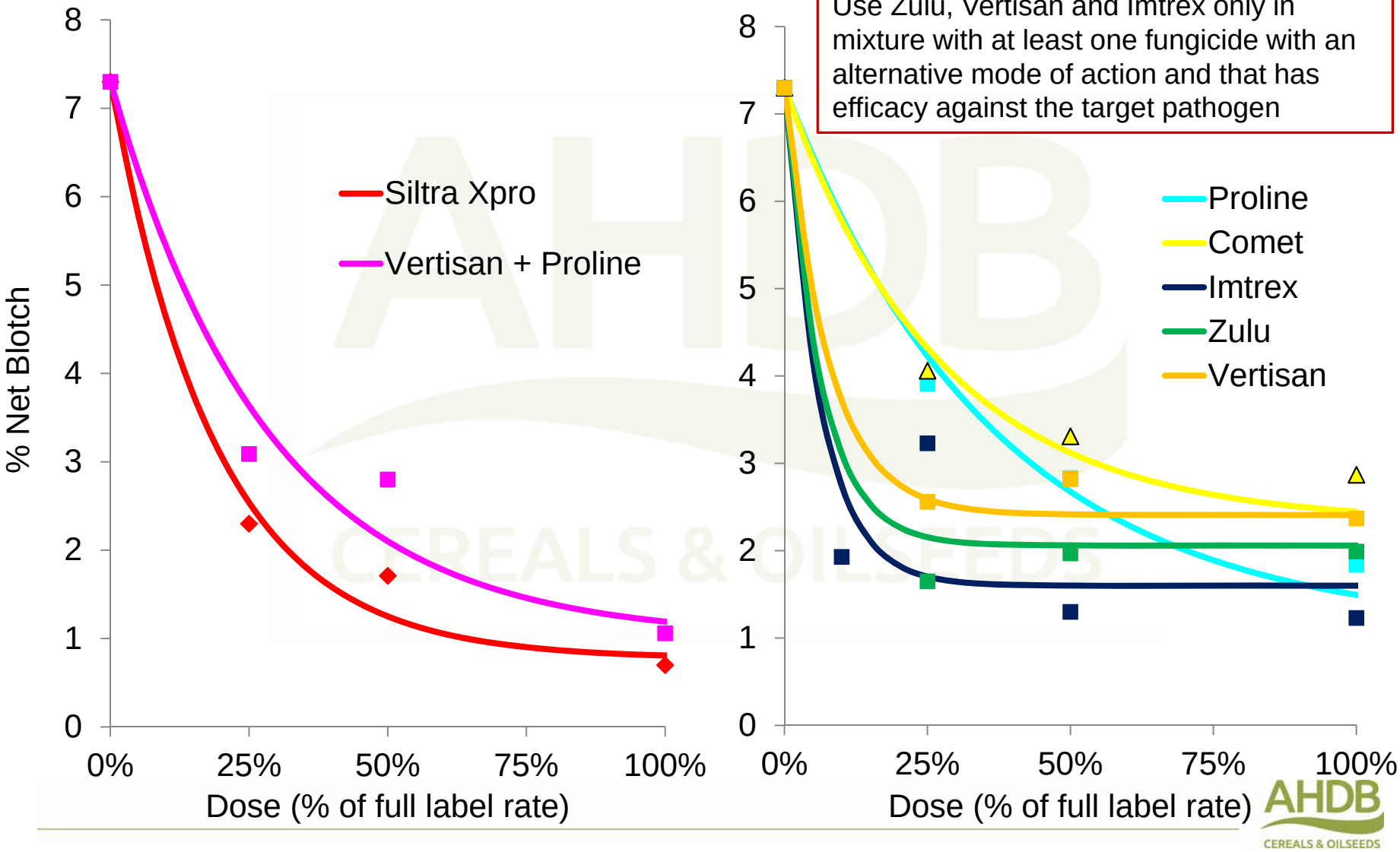
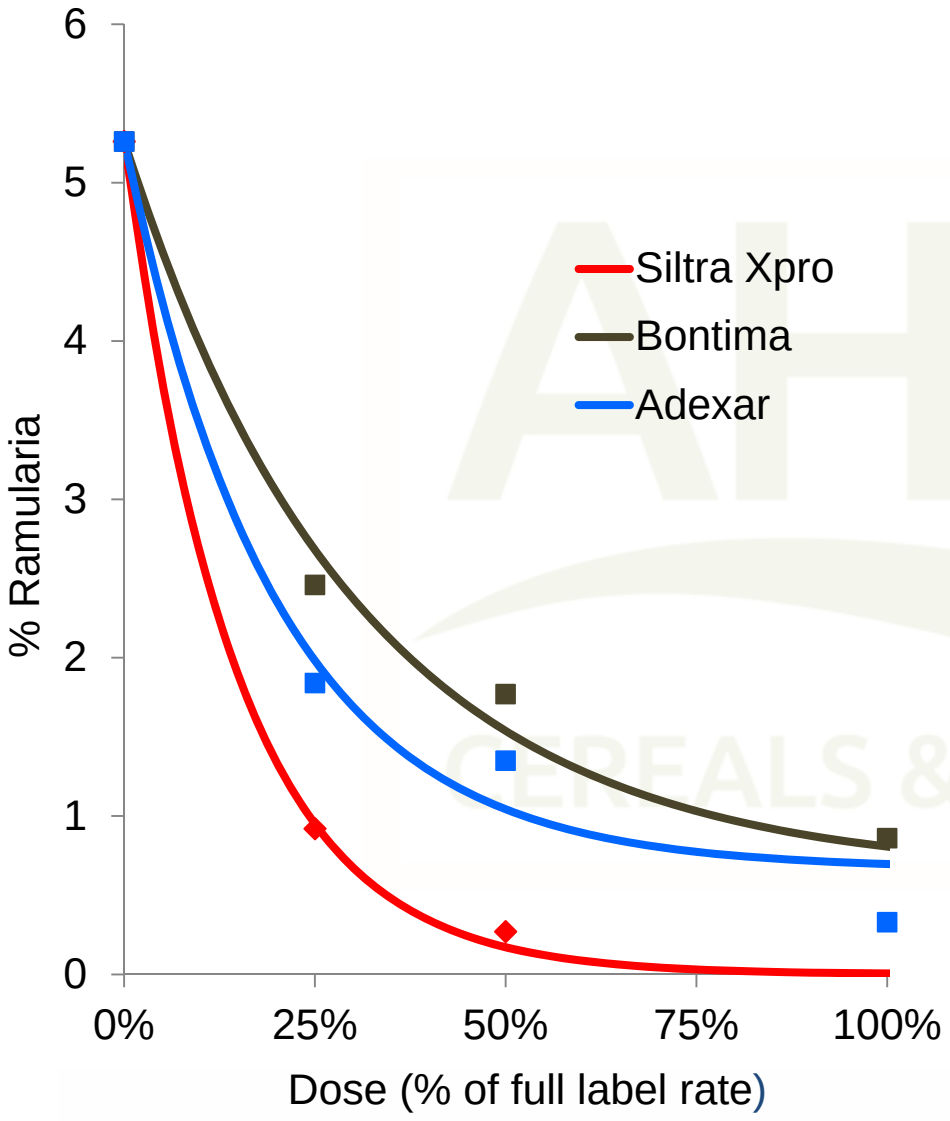
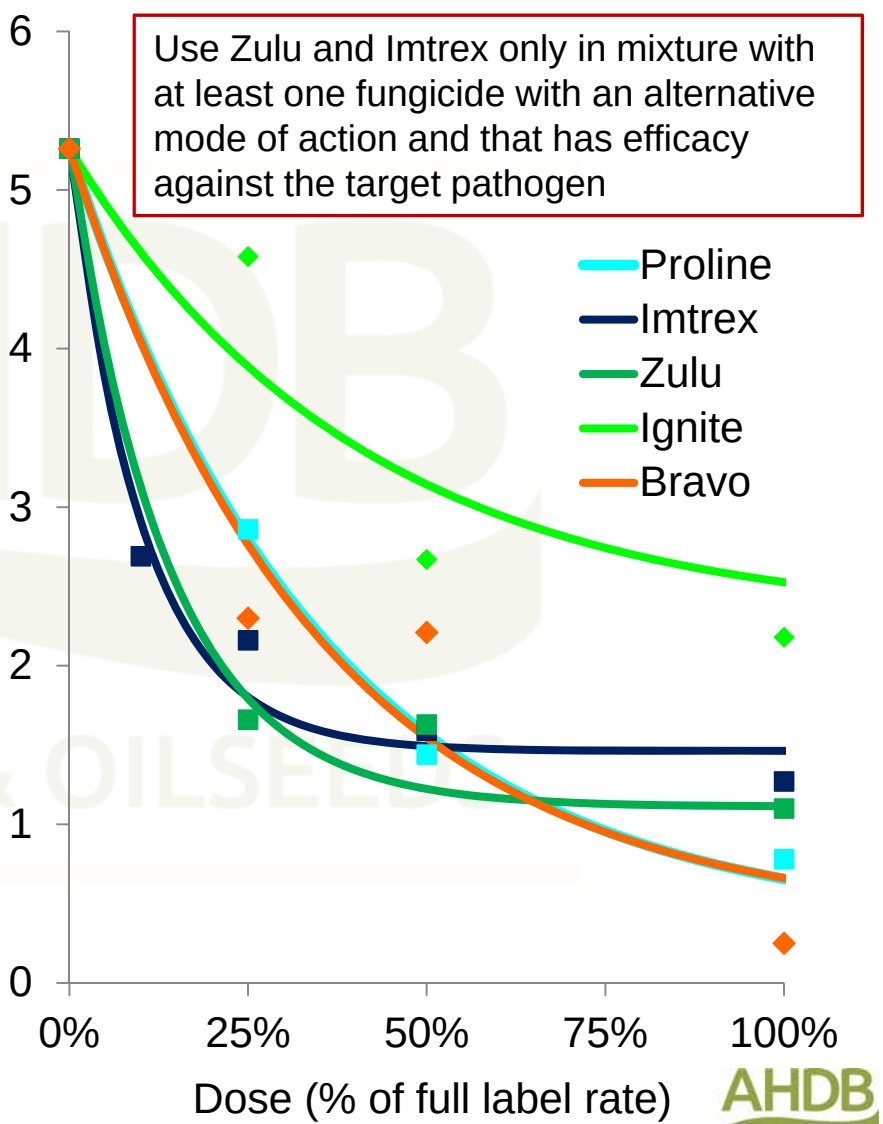
Net blotch 2012–15
Eradicant activity



Ramularia 2012-2015



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



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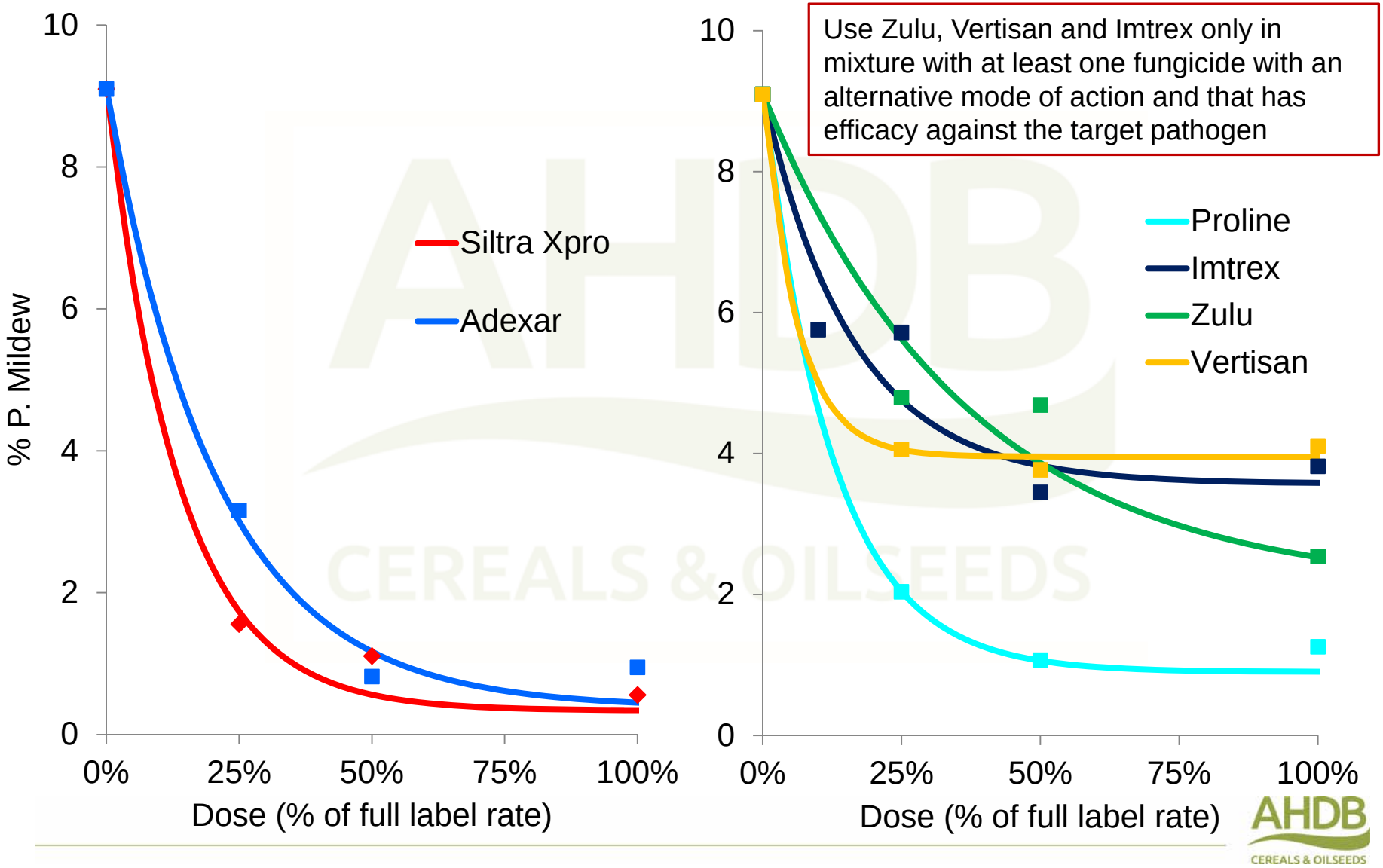
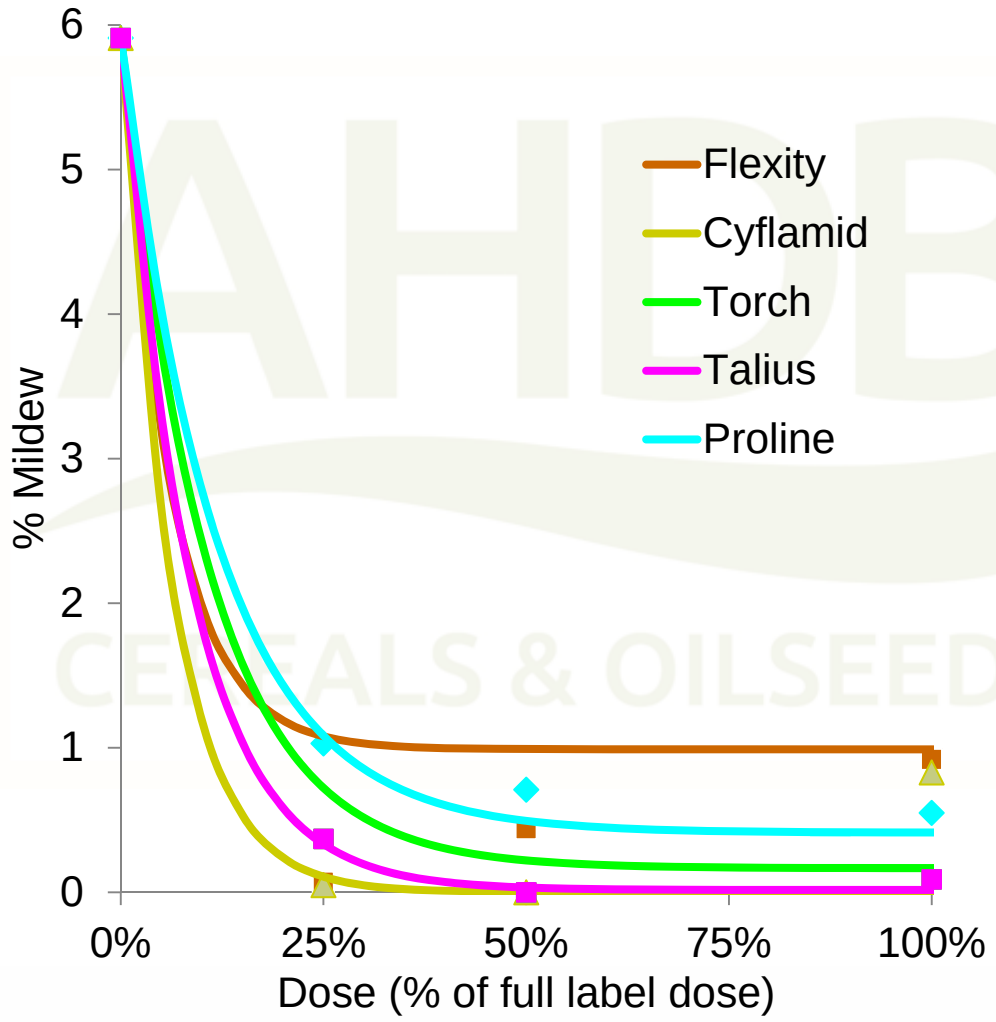
Powdery mildew 2013–15



Powdery mildew 2011-2014
Mildewicides + Proline



Barley summary

- Siltra Xpro – good broad spectrum activity
- Adexar/Imtrex or Vertisan + Proline similar on rhyncho and net blotch
- Proline consistent efficacy (as seen previously)

- SDHIs showed good net blotch activity
- Ramularia was controlled by the SDHIs, Proline or Bravo
- Avoid over-reliance on SDHI + azole – other mixtures are available

Using fungicides effectively in Oilseed rape

Results of AHDB Fungicide Performance 2015

Causes of yield loss in oilseed rape

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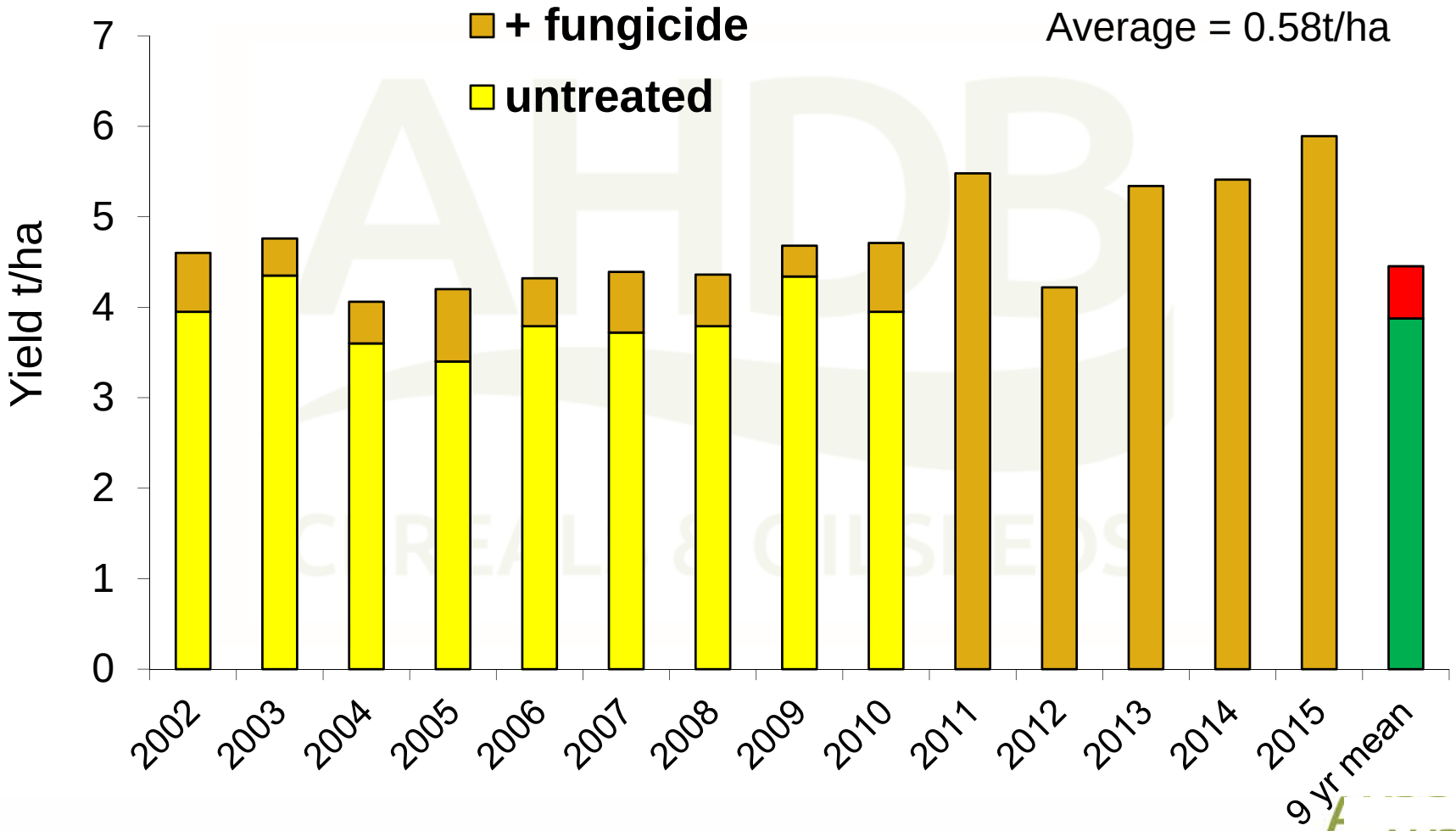
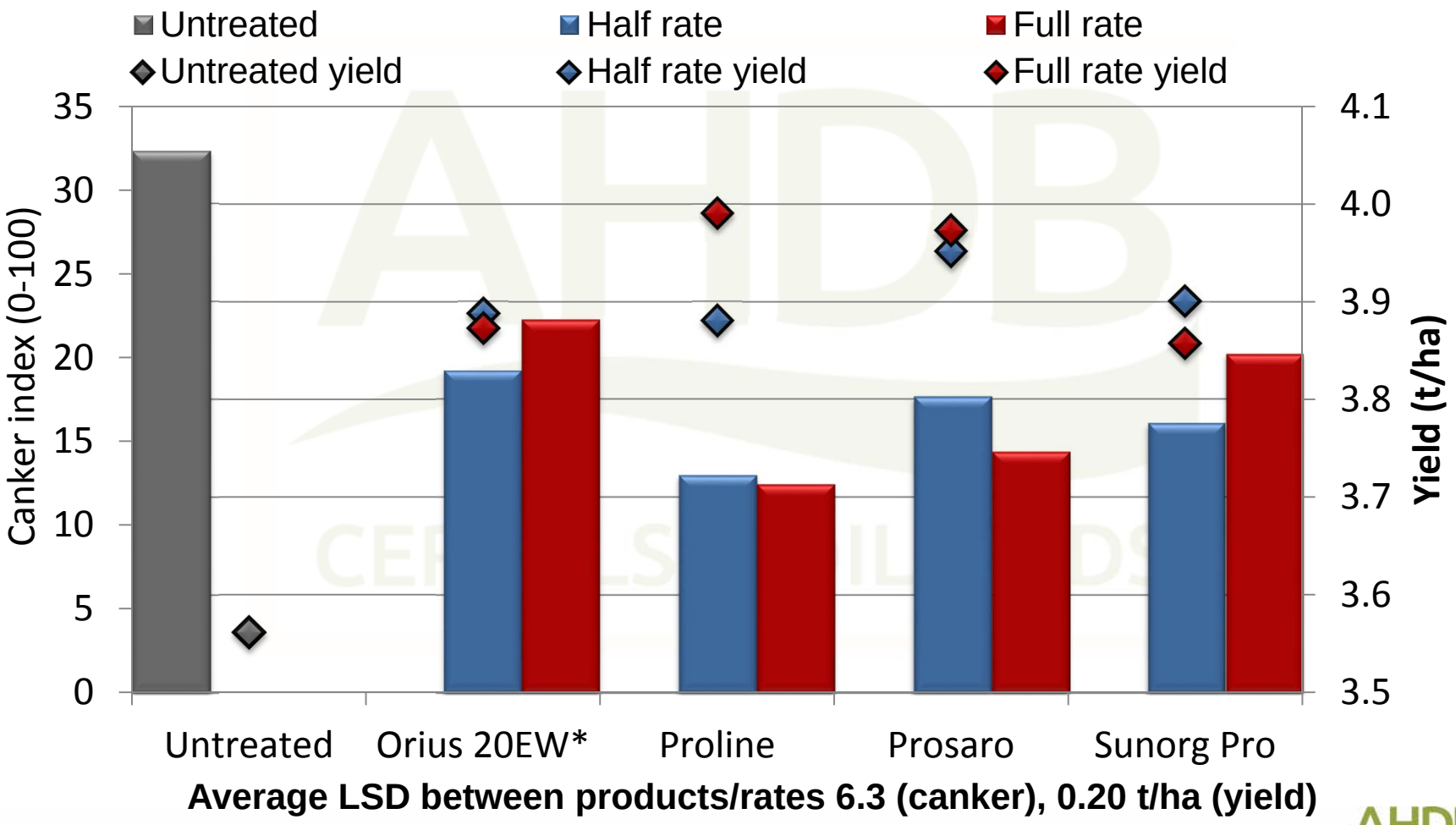
UK oilseed rape – yields and benefits of disease control



Data extracted from the AHDB Recommended List trials

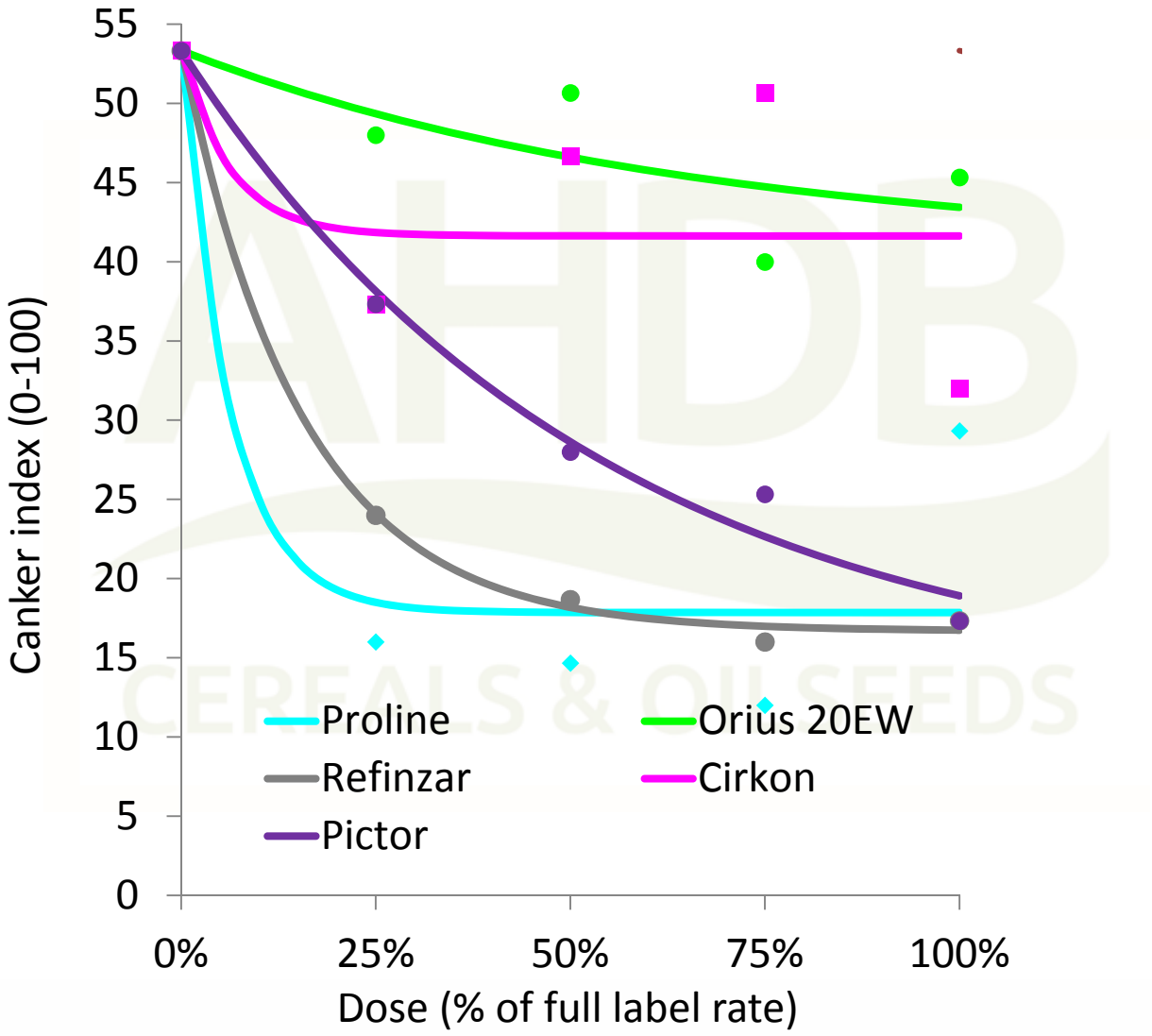
Phoma: canker index and yield

(average across 8 sites 2011–14)

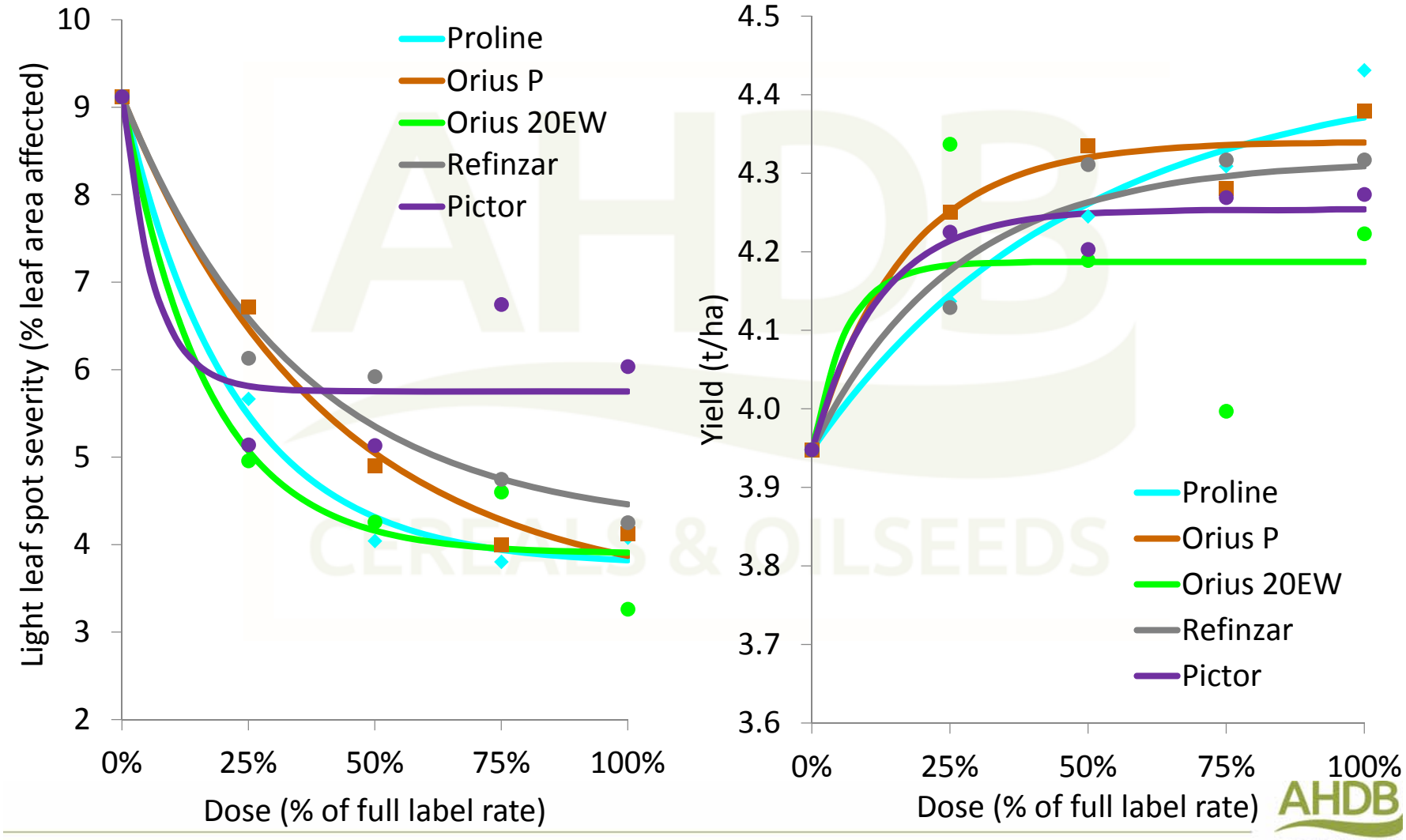


*Orius 20EW based on two years of data only

Phoma: canker index 2015 (curative situation)

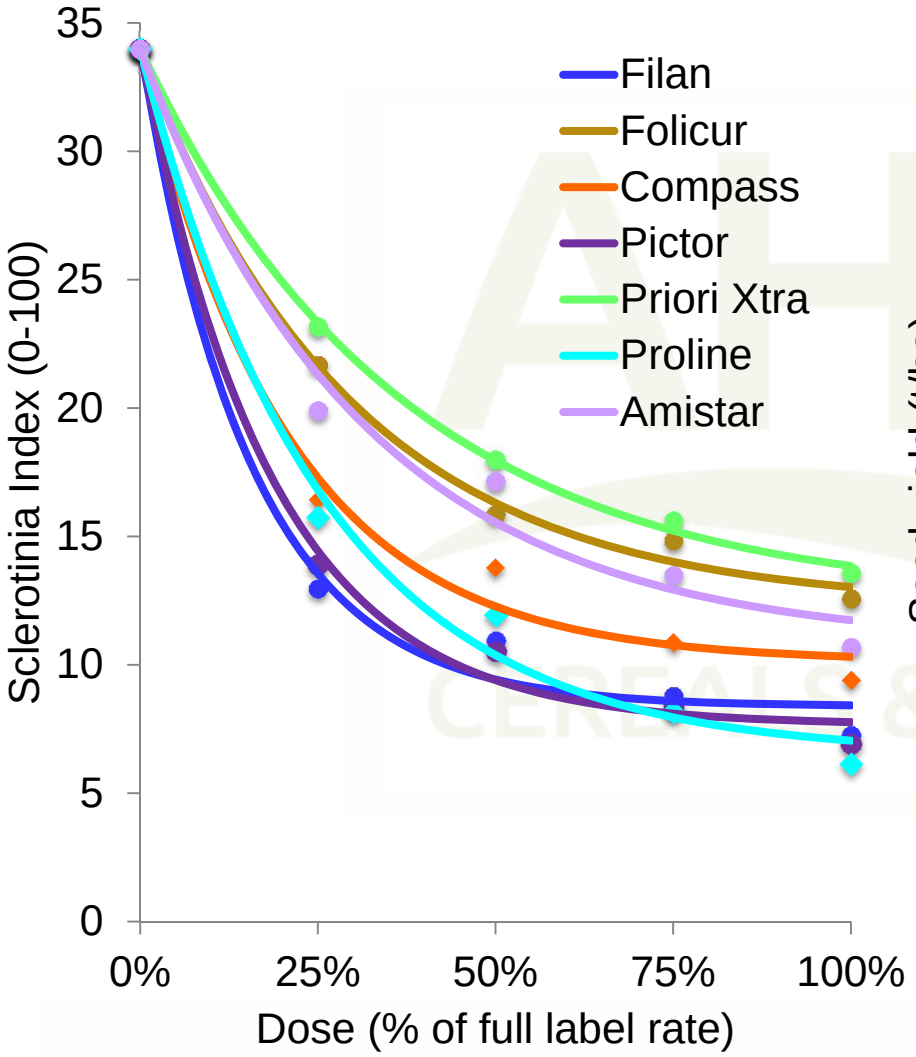


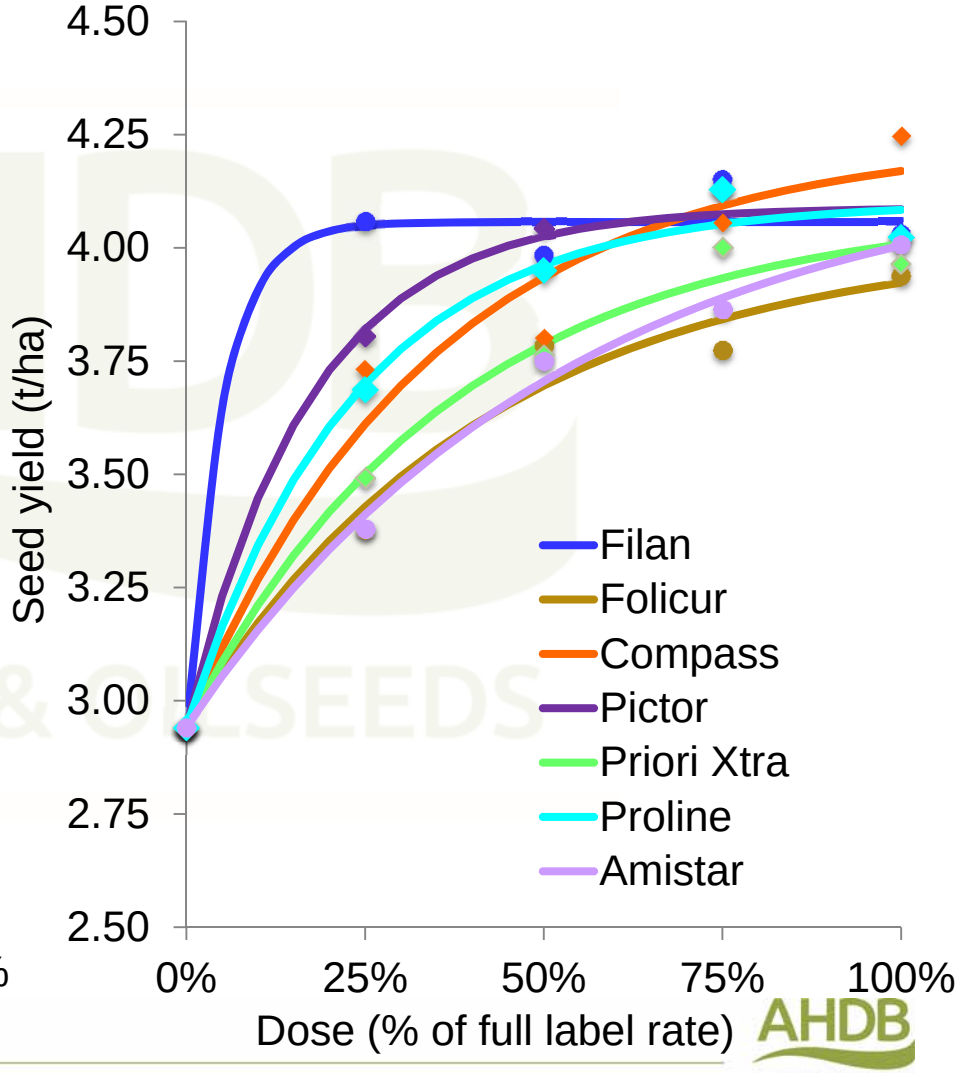
Light leaf spot: severity and yield (5 sites 2014–15)



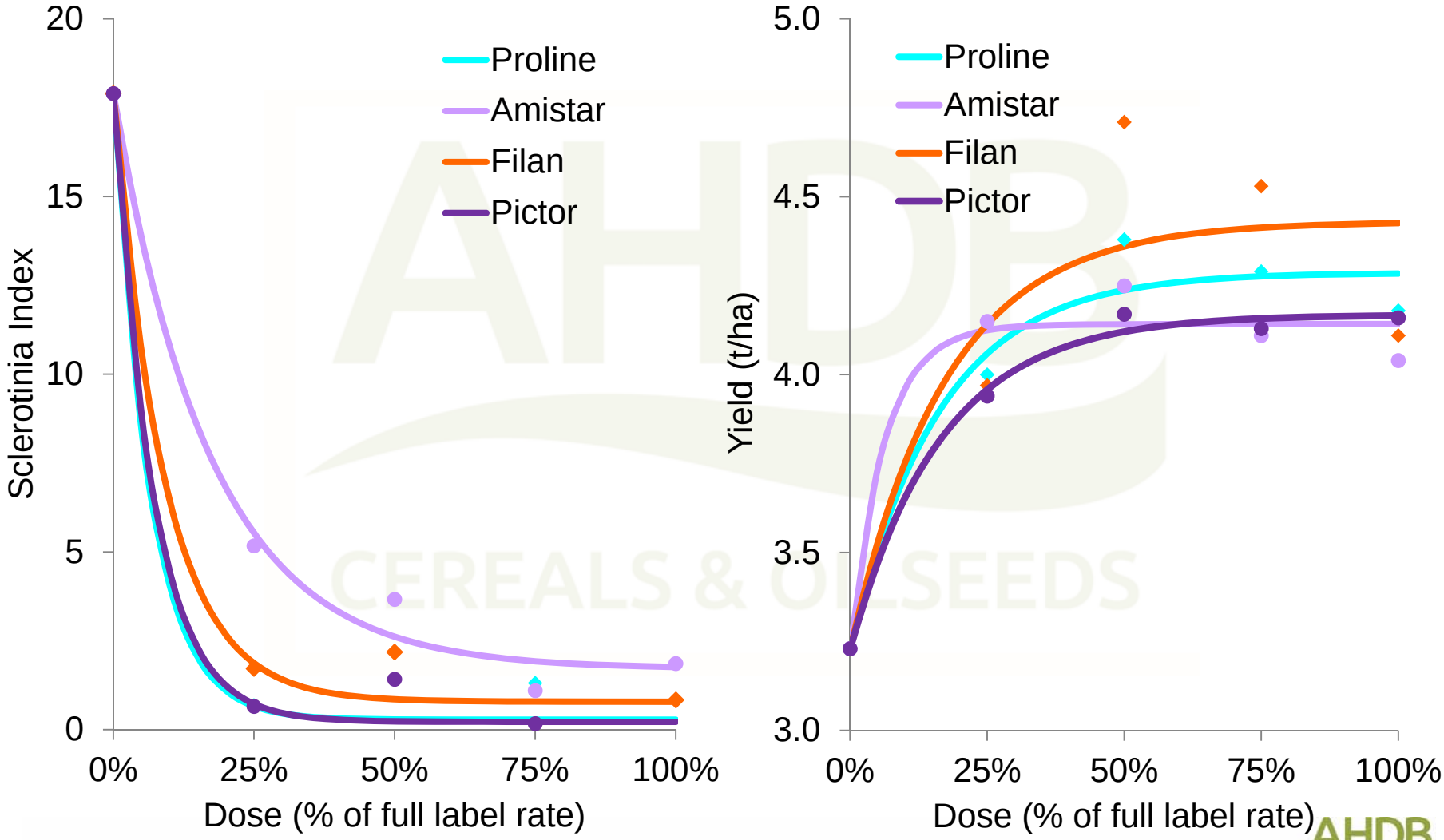
Note: label restrictions for Refinzar and Pictor

Sclerotinia: disease and yield
(Kent and Herefordshire 2006–08)





Sclerotinia: disease and yield 2015 (one site)



Sclerotinia incidence = 19%

OSR summary

- Phoma control can generally be achieved using half rates in a two spray programme
- Treatment timing is key for good light leaf spot control – monitor on field-by-field basis
- Spray timing critical for sclerotinia control – benefits from using higher doses
- Non-azole options available for phoma and light leaf spot control – note restrictions
- More information available on AHDB website

Developments for 2016

Year 1 of 3 for a new project

- (part-funded by AHDB)

Combines agronomy, variety and chemistry to maintain control of septoria tritici in wheat

- Variety
- Sowing date
- Seed rate
- Fungicide programmes

Thank you

Acknowledgements

AHDB CEREALS & OILSEEDS

Teagasc Agriculture and Food Development Authority

SRUC RESEARCH

NIAB TAG

ADAS

Harper Adams University