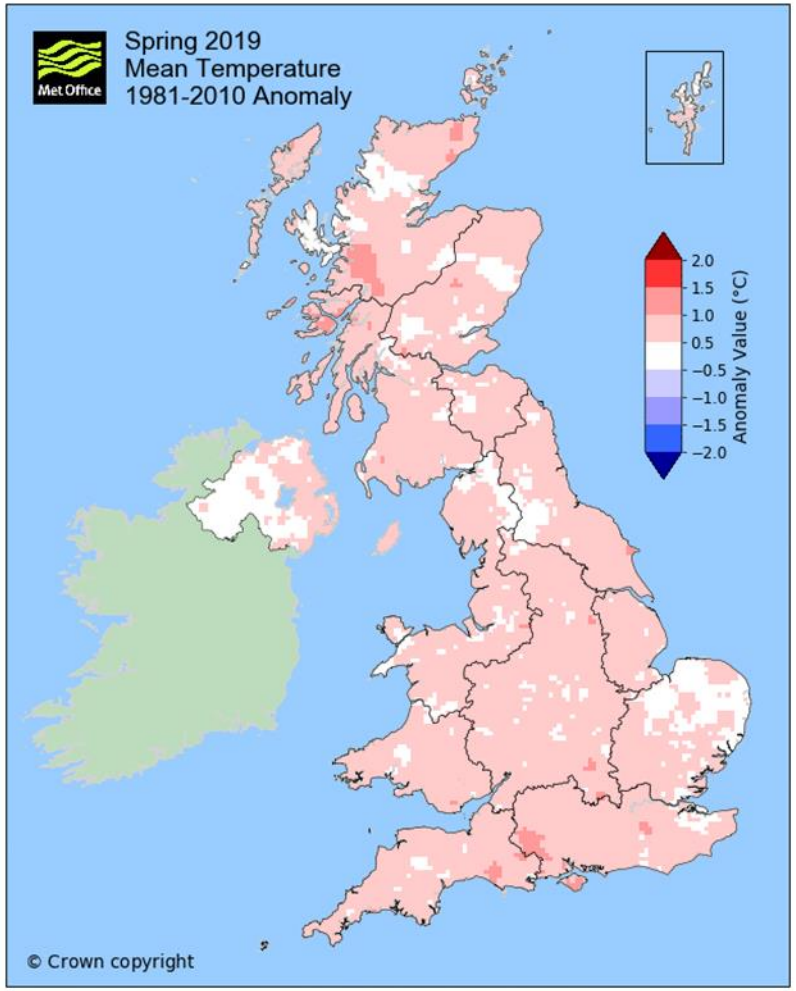
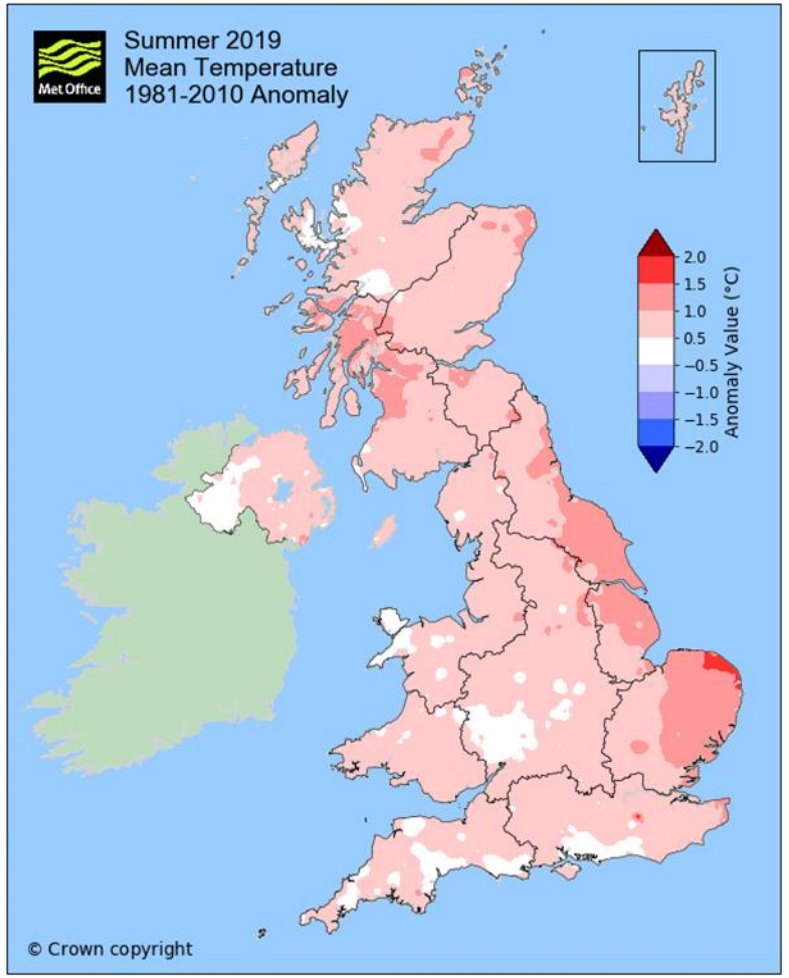
IPM Update/Fungicide resistance

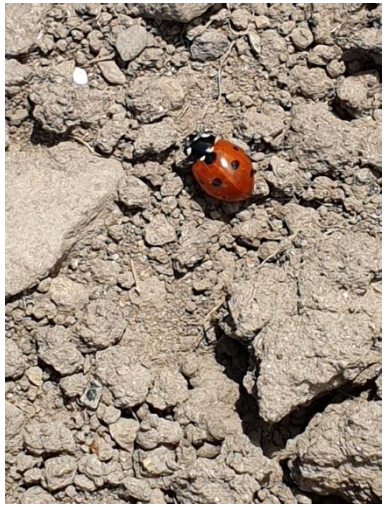
Neil Havis, Crop Protection Lead, SRUC

Introduction

2019 – temperature up on the 30 year average

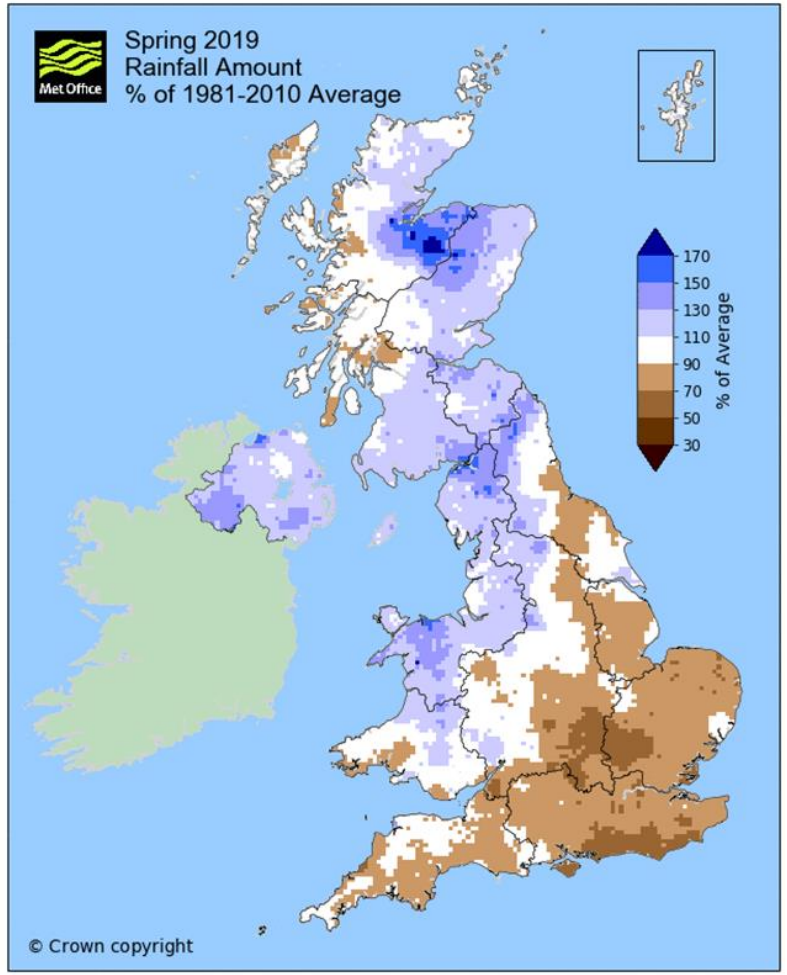


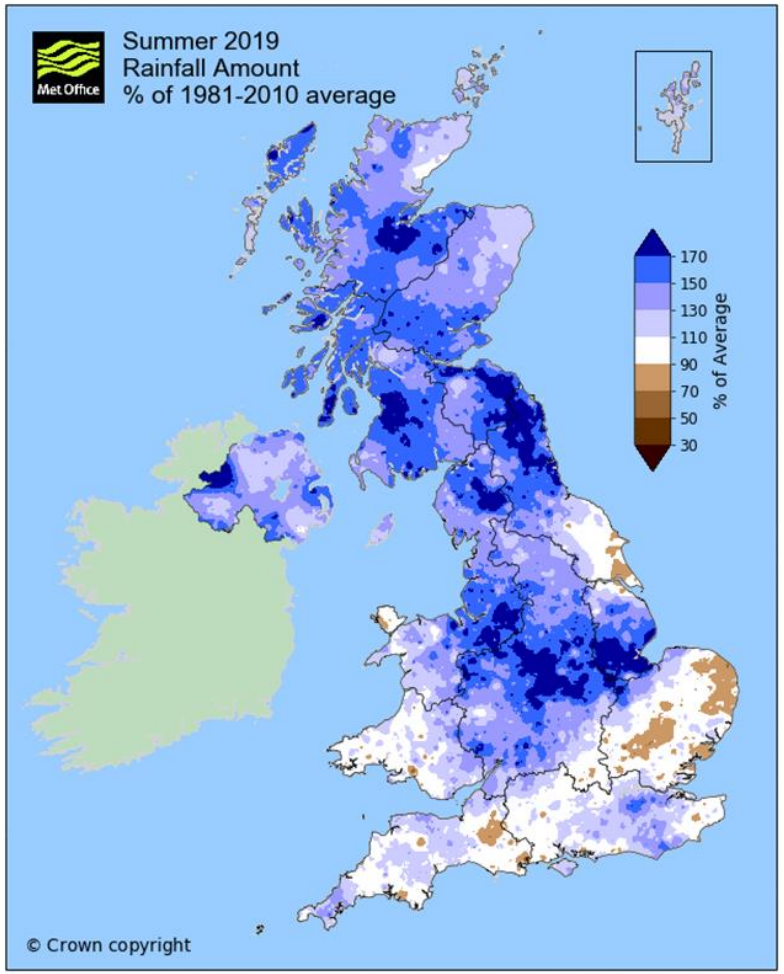


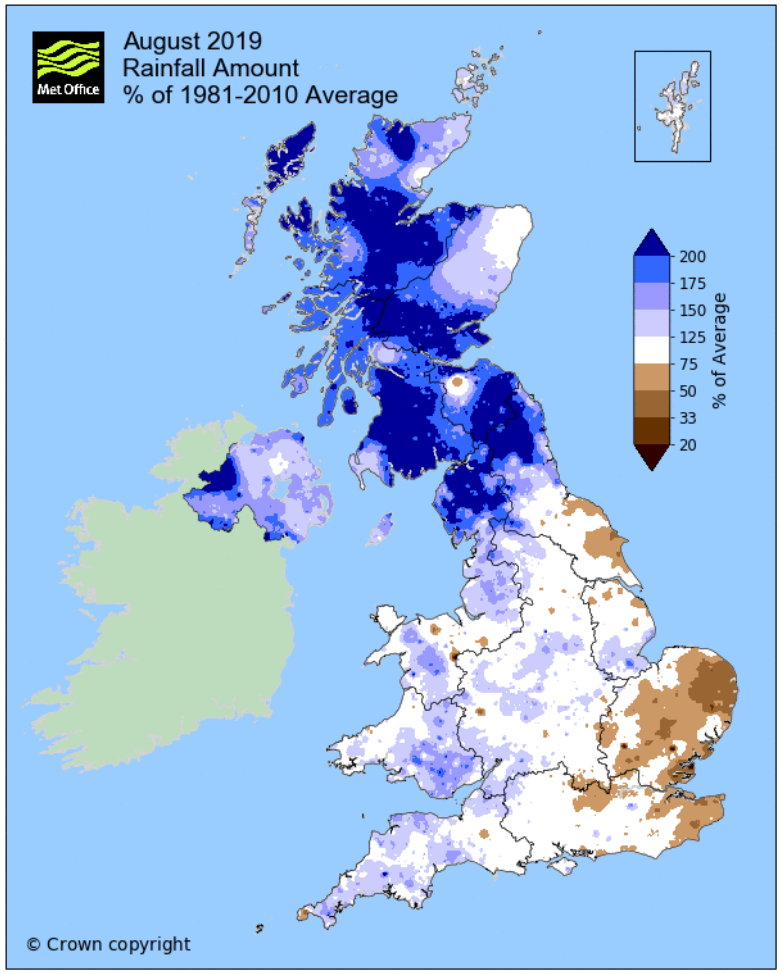


Introduction

2019 rainfall – wet summer (esp May and August) following a near average spring (march figures were higher than average)







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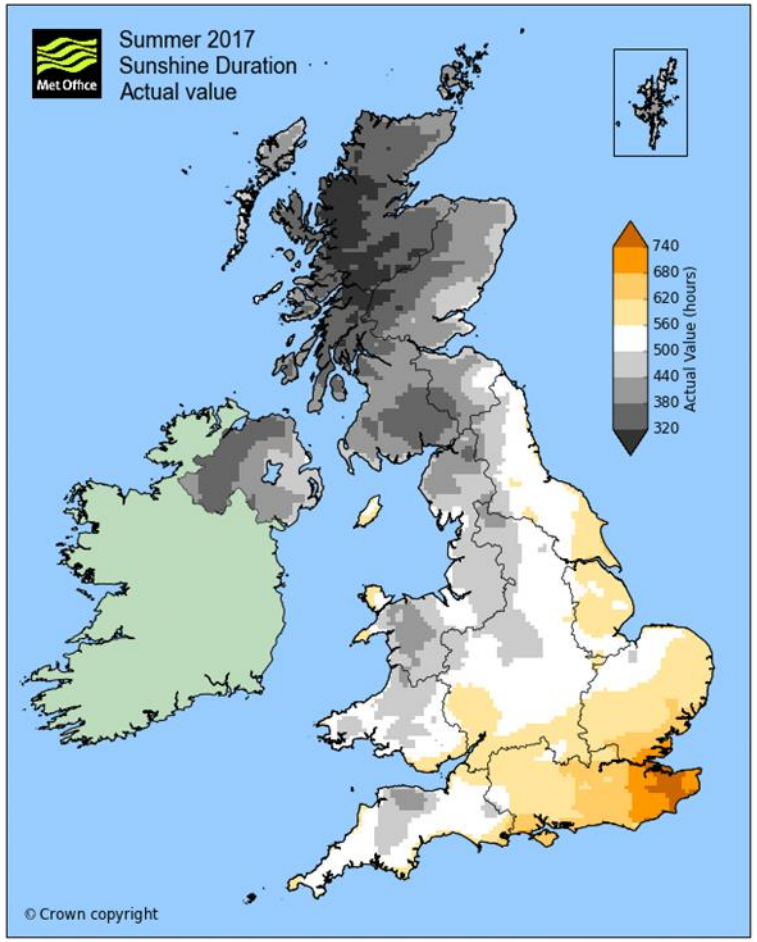
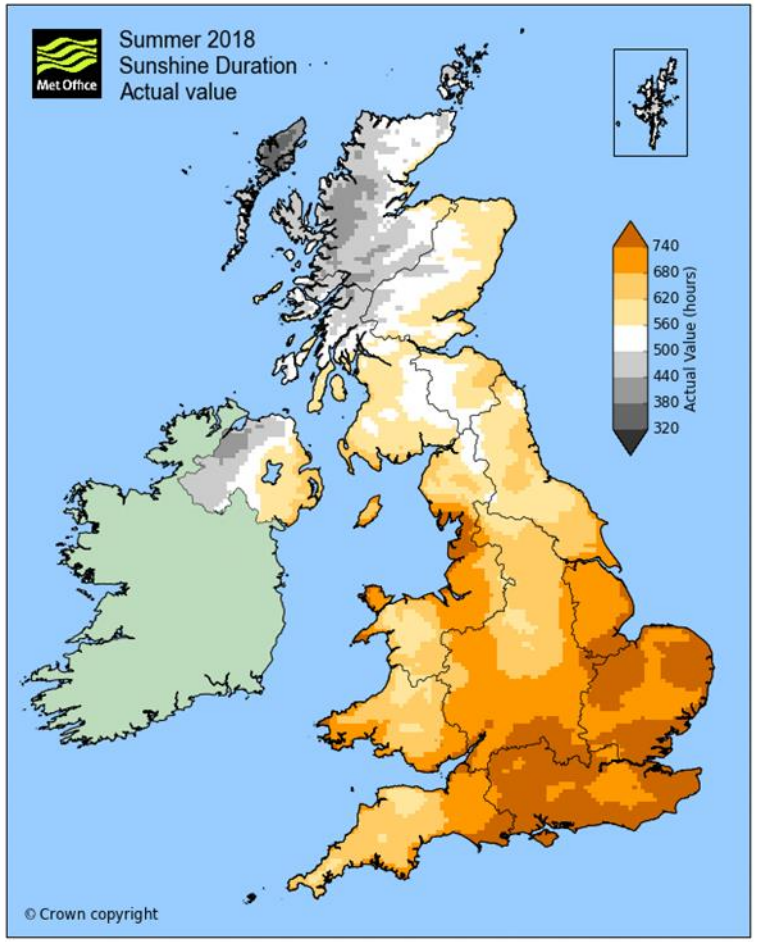
Introduction

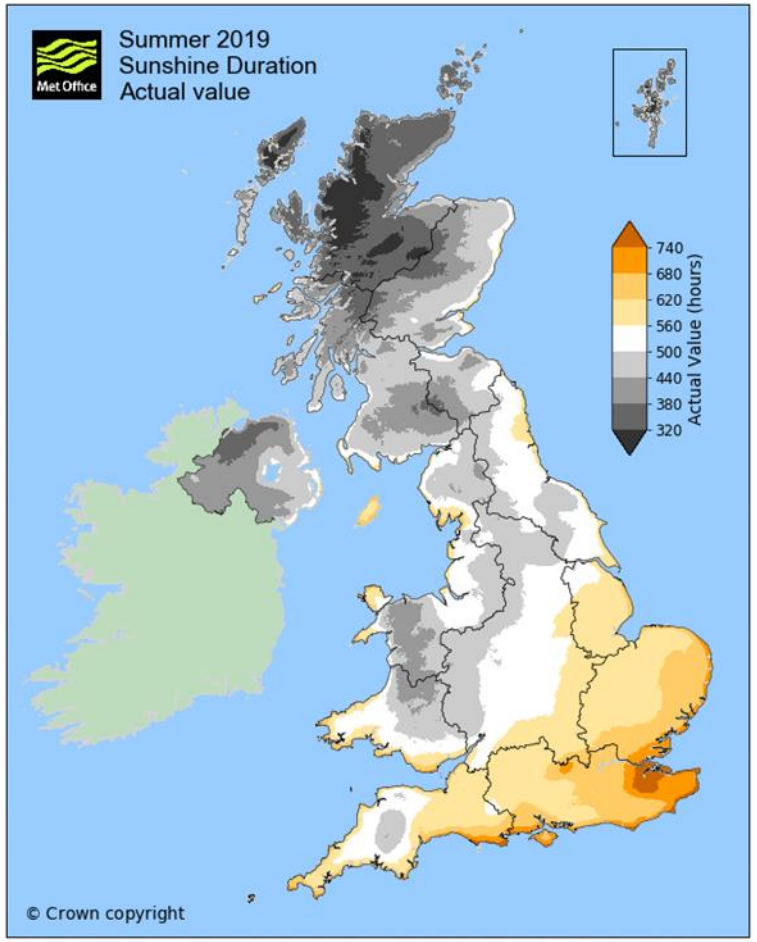
2019 rainfall – wet summer- late attack from splash borne diseases

Introduction

2019 sunshine – normal service resumed

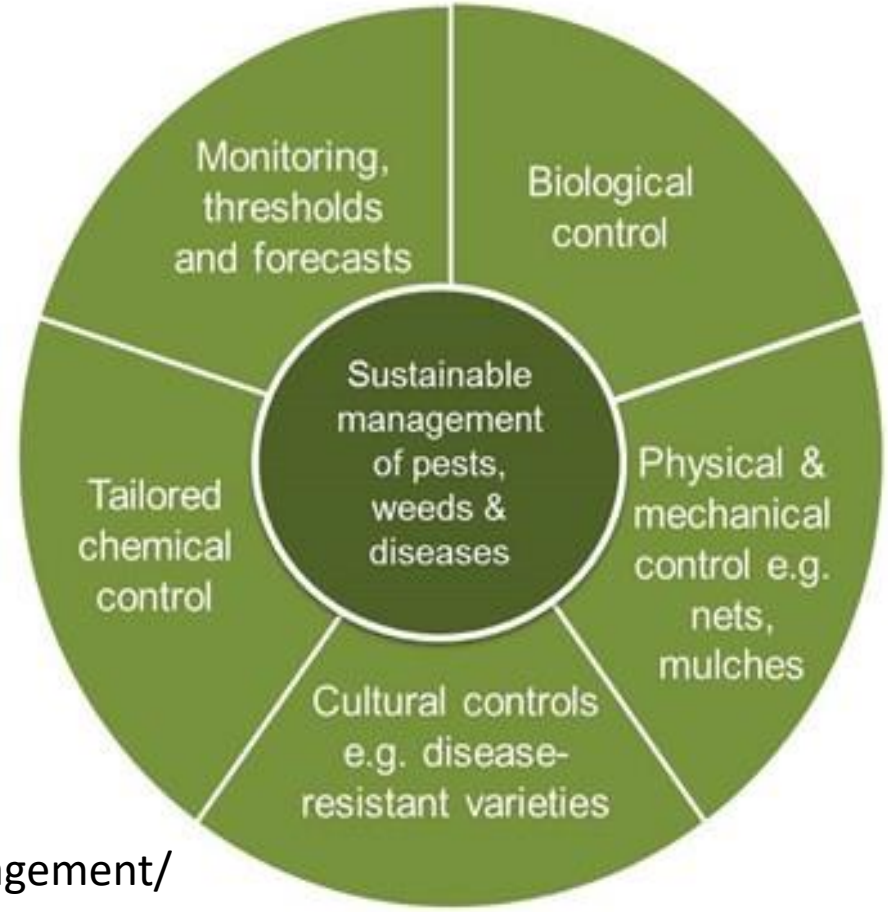






IPM

- Work is ongoing to develop effective, sustainable and profitable IPM programmes in barley
- Various projects funded by RESAS, AHDB Mains of Loirston and commercial sponsors



https://voluntaryinitiative.org.uk/schemes/integrated-pest-management/

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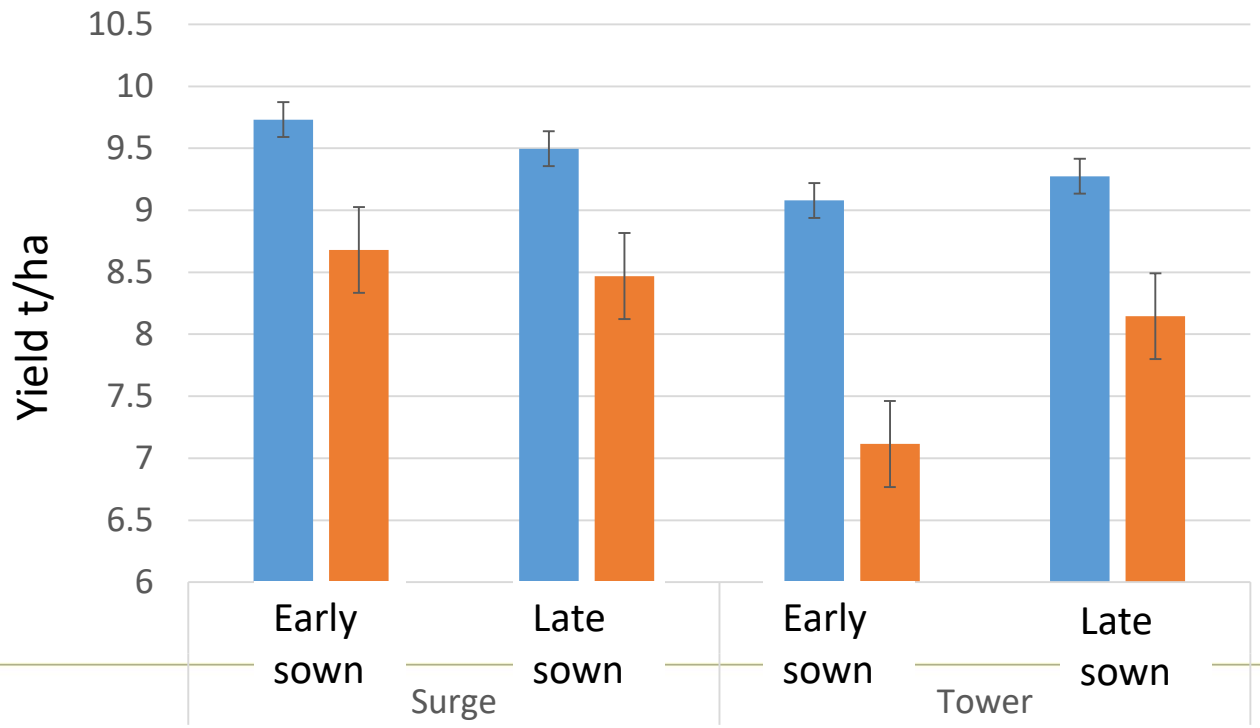
Winter barley IPM: Sow date*Cv*Fungicide

- Late sown crops sown 3-4 weeks later than early sown.
- 2 Varieties: Surge (res), Tower (sus)
- 4 fungicide programmes: 0/1/2/3 sprays



- Greater fungicide requirement in early sown + susceptible crops

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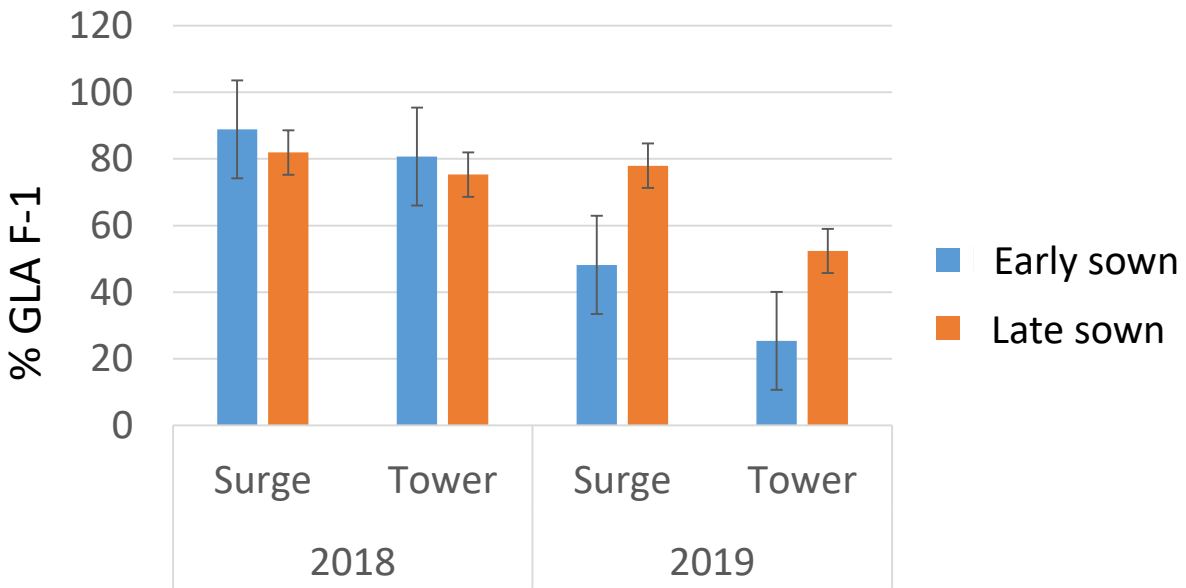
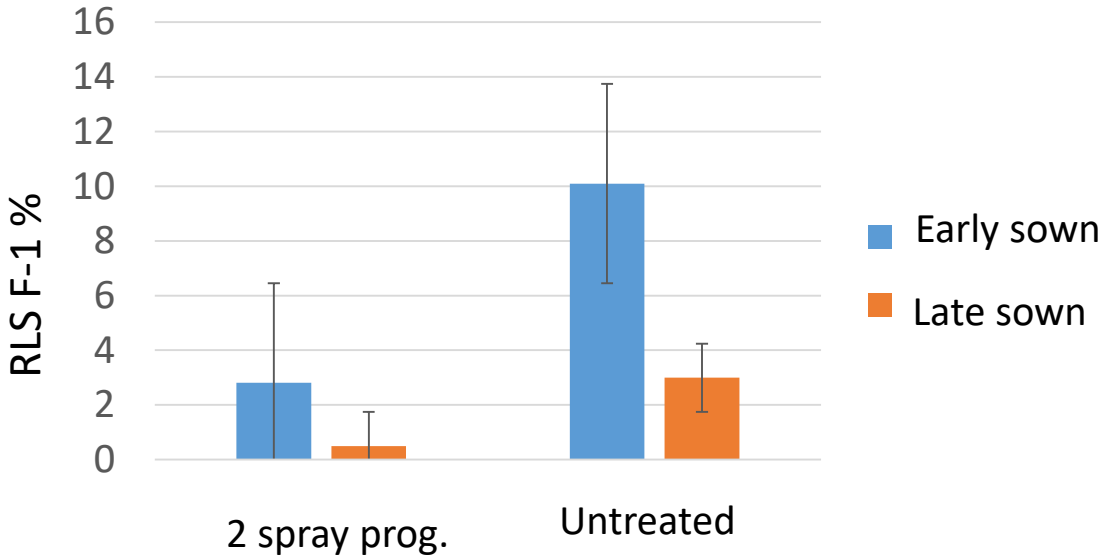
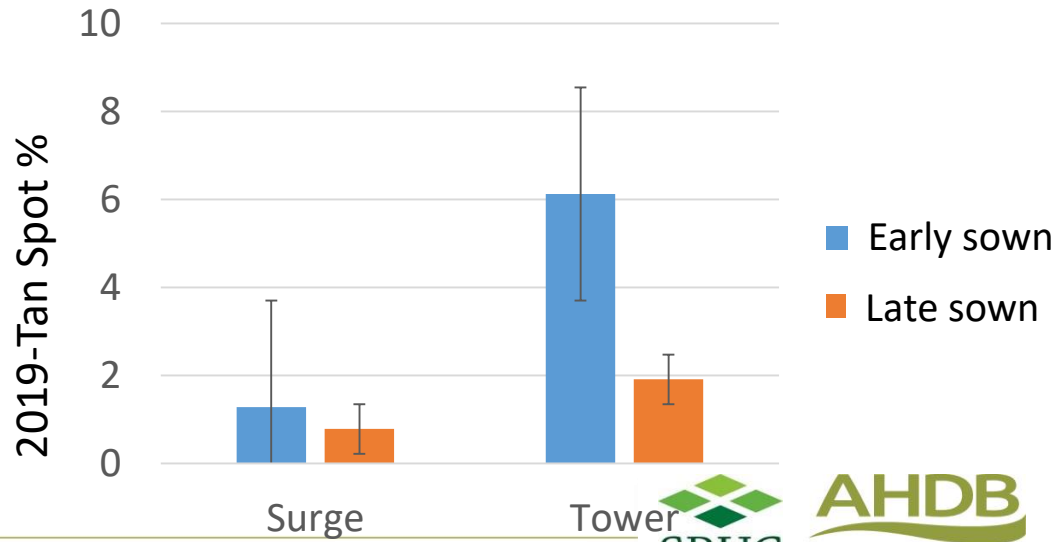
Winter barley IPM: Sow date*Cv*Fungicide

- Early sowing decreases GLA in disease years.
- Due to RLS (both years) and also tan spot 2019.
- Susceptible variety= less GLA, more disease.







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Fungicide treatments for all trials

Trt	T0 (>GS30)	T1 (GS31)	T2 (GS39-45)
1	Untreated	Untreated	Untreated
2	Untreated	Siltra XPro (0.6L/ha)	Untreated
3	Untreated	Siltra XPro (0.6L/ha)	Siltra XPro (0.4L/ha)
4	Cyflamid (0.3L/ha) + Comet (0.4L/ha)	Siltra XPro (0.6L/ha)	Siltra XPro (0.4L/ha)

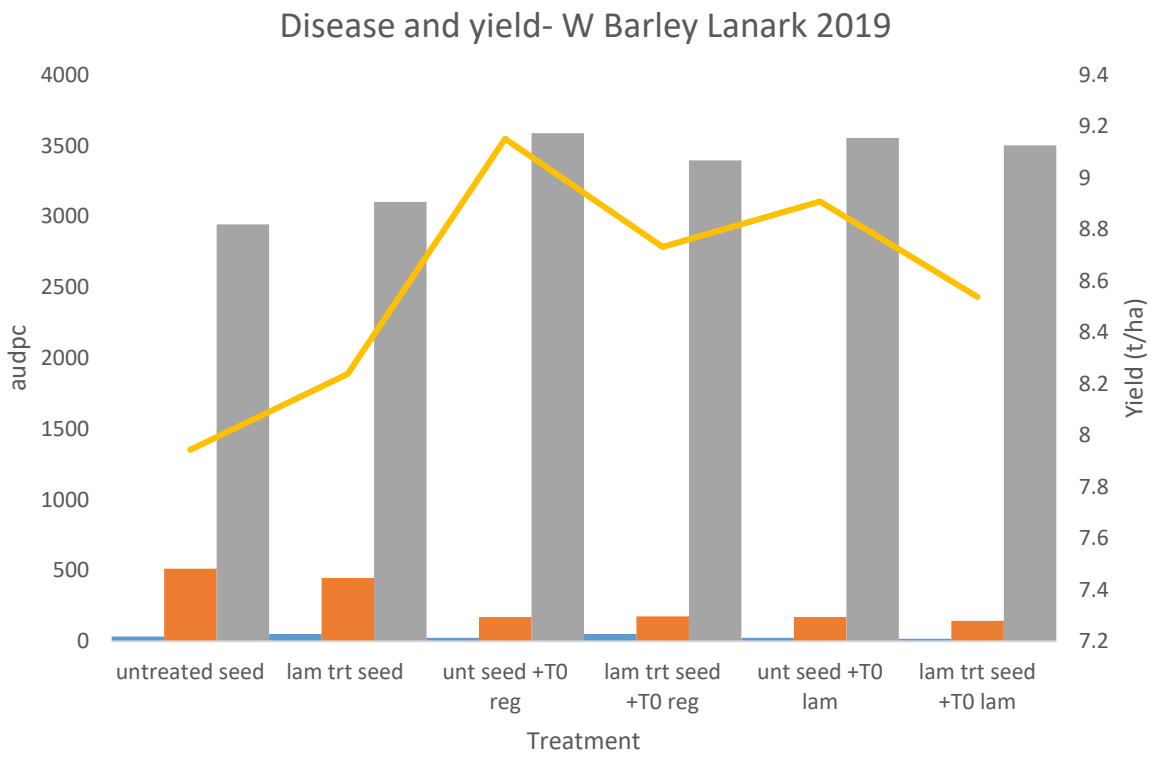
IPM trials 2019

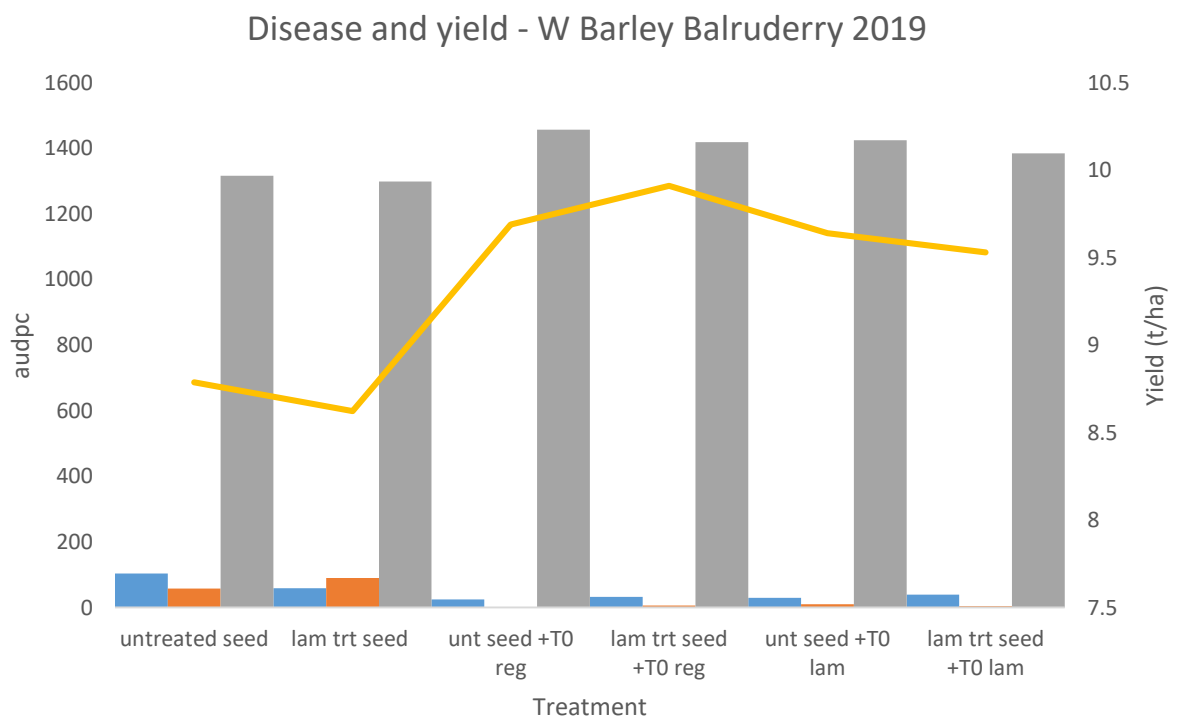
- Determining scope for omitting T1 spray in spring barley
- Comparing different variety mixes to monocultures for disease control and yield stability
- Effect of tillage regime on agronomy and yield in winter barley varieties

Untreated

2 x Laminarin + red rate fungicide

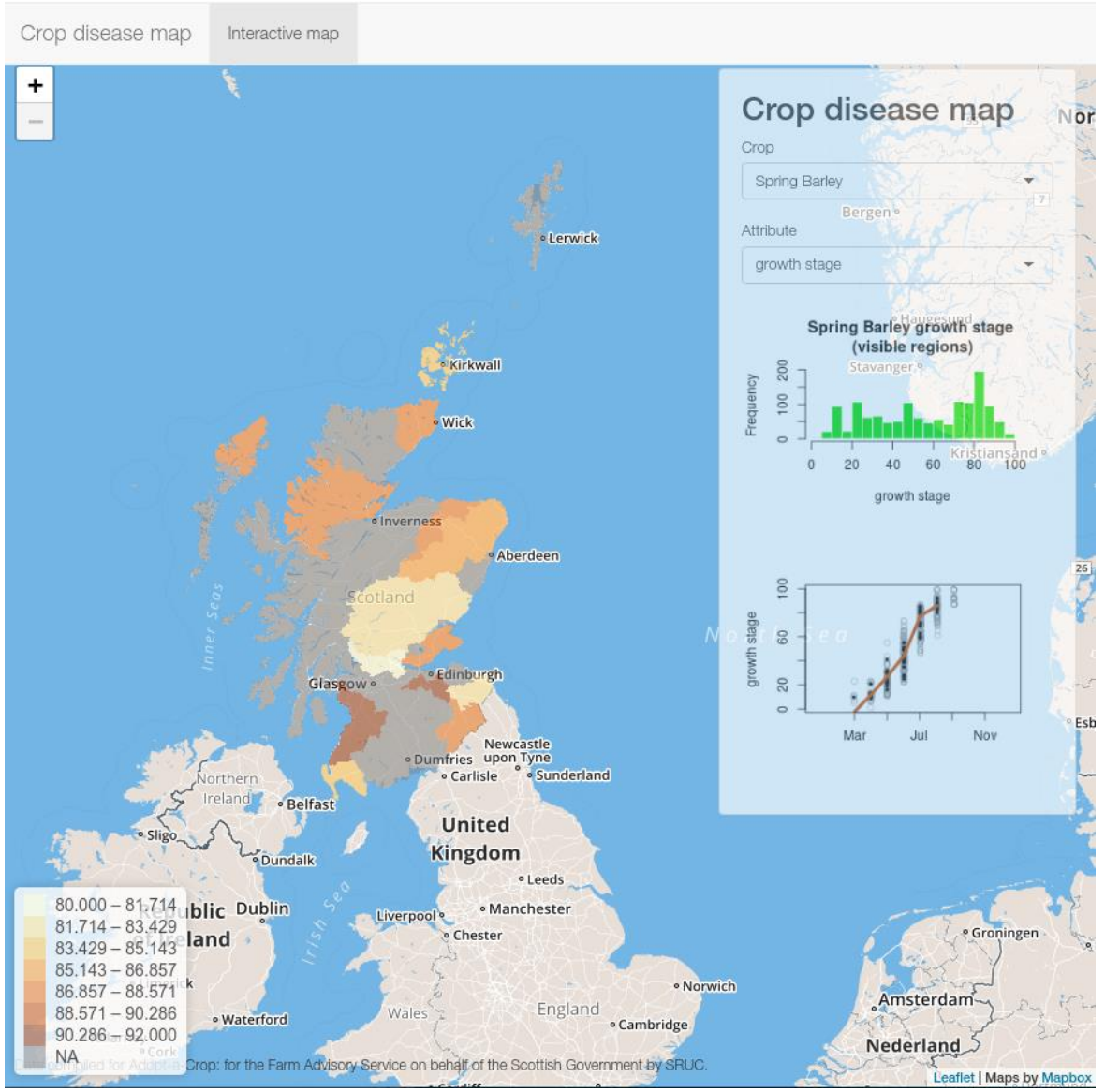
IPM Disease control programmes





IPM – Monitoring of Scottish crops

Provide information from adopt a crop sites in a real time format to inform growers of crop growth/disease/pest issues



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Resistance challenges continue to build

Fungicide Group	Diseases affected
Strobilurins	mildew (wheat and barley), septoria, net blotch, tan spot, ramularia, rhynchosporium, M. nivale
Azoles	mildews, septoria, ramularia, rhynchosporium, tan spot
SDHIs	net blotch, septoria, ramularia, tan spot
MBCs (no longer used)	eyespot, septoria, M. nivale, ramularia
Quinoxyfen	wheat mildew, barley mildew
Metrafenone	wheat mildew, barley mildew
Chlorothalonil	None
Folpet	None
Mancozeb	None

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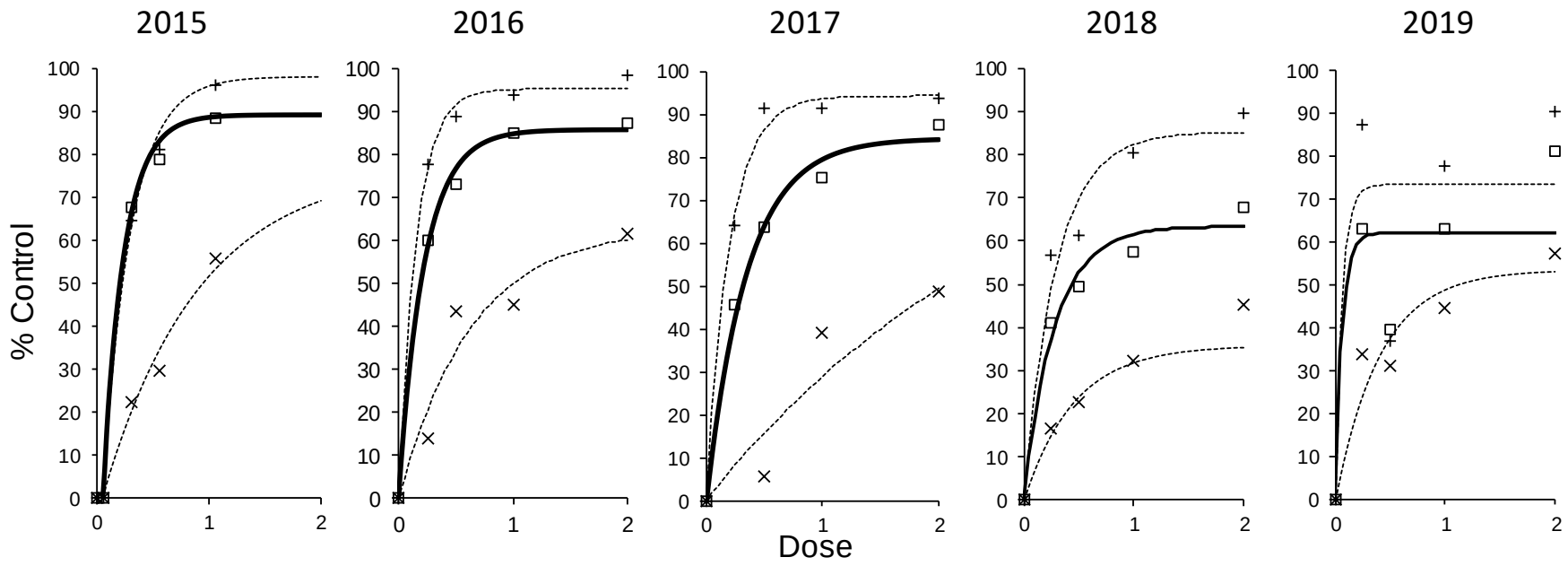
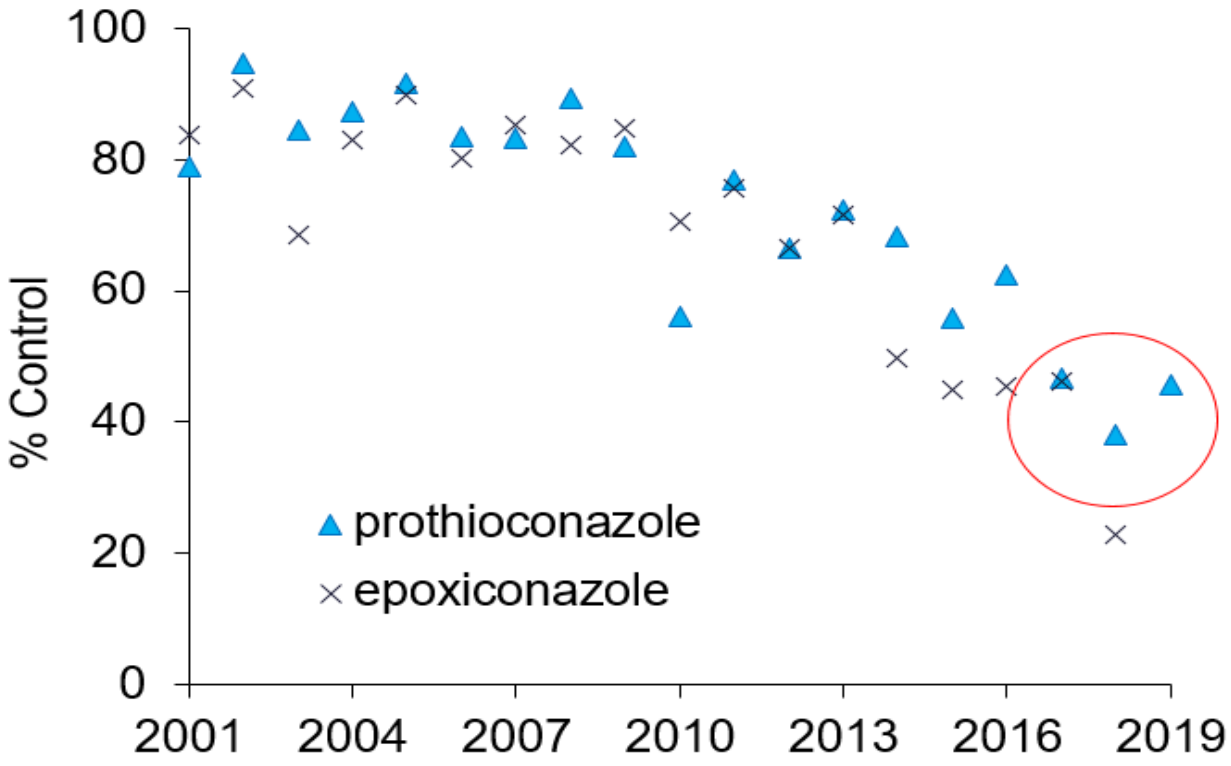
SDHI emerging issues



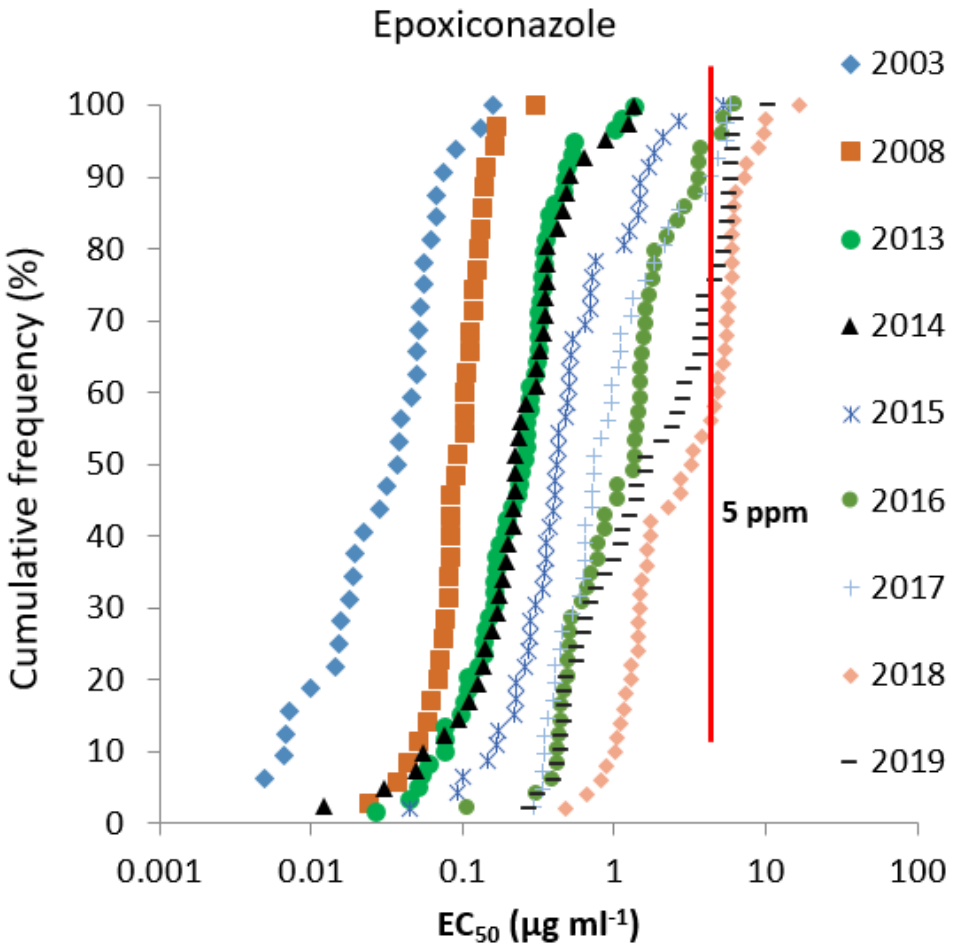
Strains less sensitive to SDHIs
(e.g. T79N and N86S) now widely present in populations

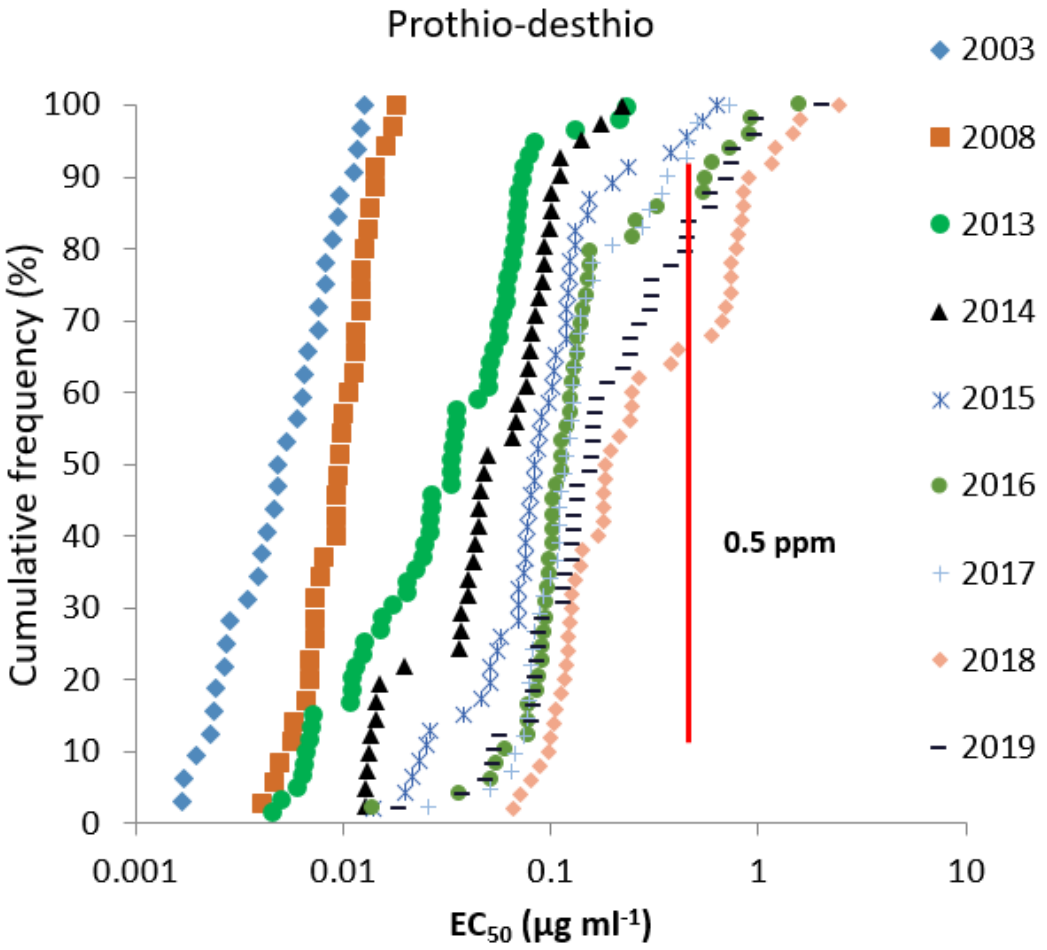
H152R overwintered at Rothamsted site

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



Rothamsted early season monitoring 2019





How will we retain efficacy in new and existing chemistry?

- Do everything possible to reduce disease risk and reduce reliance on fungicides (resistant varieties, rotations, agronomy..)
- Maximise use of low risk (multisite) fungicides as mixture partners
- Use minimum effective doses and balanced mixtures
- Limit use and alternate where possible

- If multiple applications of single-site fungicides are needed:-

➢Limiting number of treatments of a MoA is a simple, practical message

➢But may be unnecessarily restrictive or counterproductive

➢Limiting by total dose may be effective and allow more flexibility

➢Experimental evidence being obtained

Managing with less and protecting what's left

- Do everything to reduce risk….rotation, variety, certified seed, sow date, monitoring, surveillance, crop walking, tailored sprays
- Use that information to make treatment decisions
- Value varietal resistance
- Don't play fast and loose with new fungicides
- Take the risk of resistance in all chemistry seriously
- Stick to guidelines and, obviously, to statutory limits

- Keep abreast of developments and follow the best technical advice
- Everyone wants new twists and clever pitches but this can leave individuals dangerously exposed and puts our whole industry at risk …. there are genuine win: wins.

Managing resistance too challenging?

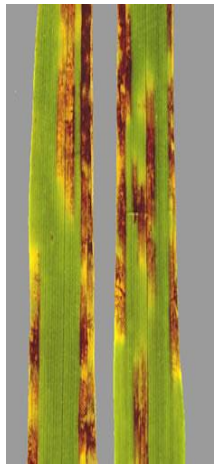
Perception	Acceptable options
Increased uptake of IPM too complex	Increased varietal resistance React to weather, tillage and sow date
Not economic to reduce inputs	Keep inputs high but use mixtures and alternations Reduce use of marginal T0, T1.5 and T4 sprays Reduce use of high risk fungicides Increase use of lower risk / multisites
Fungicide resistance not important / not my problem	Label guidance Label requirements Statutory measures Public good for public money

Barley –

- Multiple disease targets
- Greater number of active groups
- Lower inputs
- History of slow uptake of more disease resistant varieties
- Issues with net blotch, mildew and rhynchosporium

Ramularia – evolving picture

- QoI resistance since 2002
- MBC resistance (2 forms)
- Emerging issue with SDHIs 2014
- 2017 Fall off in field performance for SDHIs and azoles
- 2019 Mixed picture reported across UK and Europe



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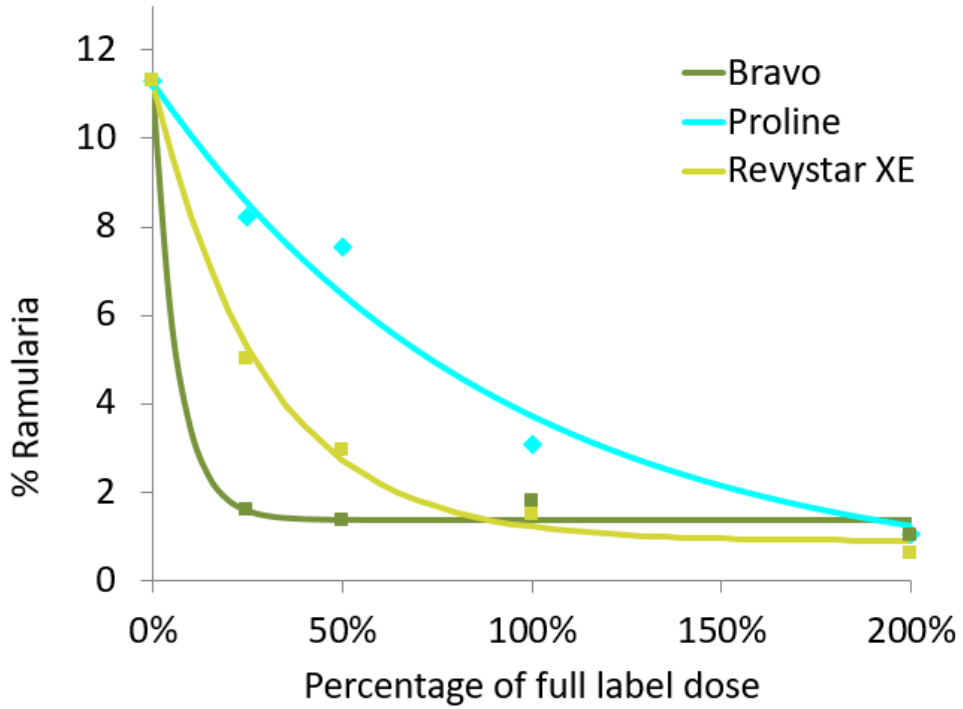
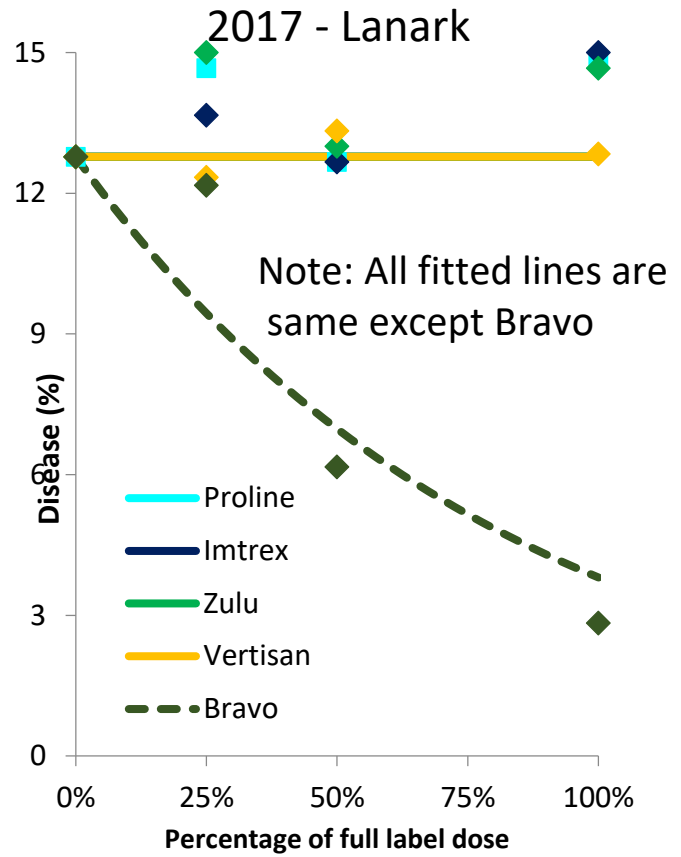
Ramularia 2019 (2 sites)





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)

OSR summary – IPM in practice

- Early sown crops more at risk of light leaf spot
- Spring timing at stem extension
- Current levels…
- Little between products in terms of efficacy

- For sclerotinia, products containing prothioconazole or boscalid lead
- Azoxystrobin also effective
- Base treatments and doses on risk
- Alternate and mix actives through programme where possible

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Europe investing in rural areas

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