Agronomists' Induction: Session 2

Emily Pope, Senior Knowledge Transfer Manager, AHDB

CEREALS & OILSEEDS

Harvest 2021

	East	West	Scotland
Integrated pest management	• Managed lower inputs • Benefits of flower strips on natural enemies and pests	• Managed lower fungicide inputs • Benefits of flower strips on natural enemies and pests • Autumn blackgrass control	• Plant health • Natural enemies and pollinators
Environment	• Cover crops & water quality	• Cultivation to improve soil health and crop roots	• Soil health • Crop nutrition
Business	• Marginal land		

Harvest 2022 trials

	East	Scotland	South
Integrated pest management	• Managed lower inputs • Benefits of flower strips on natural enemies and pests	• Crop nutrition • Improving direct drilled spring barley establishment	• Cover crops and water quality • Soil health under different management systems • Soil health at crop establishment • Soil health field assessments
Environment	• Cover crops & water quality	• Nitrogen application: Foliar vs Conventional • Cover crop ahead of spring barley	
Business	• Marginal land		

Strategic Farm Week

15-19 November 2021

ahdb.org.uk/SFweek2021

Agronomists' Induction: Session 2

Tools and services to support disease and weed control

Robert Saville, Crop Protection Scientist (Diseases), AHDB

Strategic Potato Farm results

Alex Wade, Arable Knowledge Exchange Manager (South East), AHDB

Agronomists' Induction 2021

Tools and services to support disease and weed control

Robert Saville, Crop Protection Scientist (Diseases), AHDB

CEREALS & OILSEEDS

Staff Covering Crop Protection Research for Diseases and Weeds

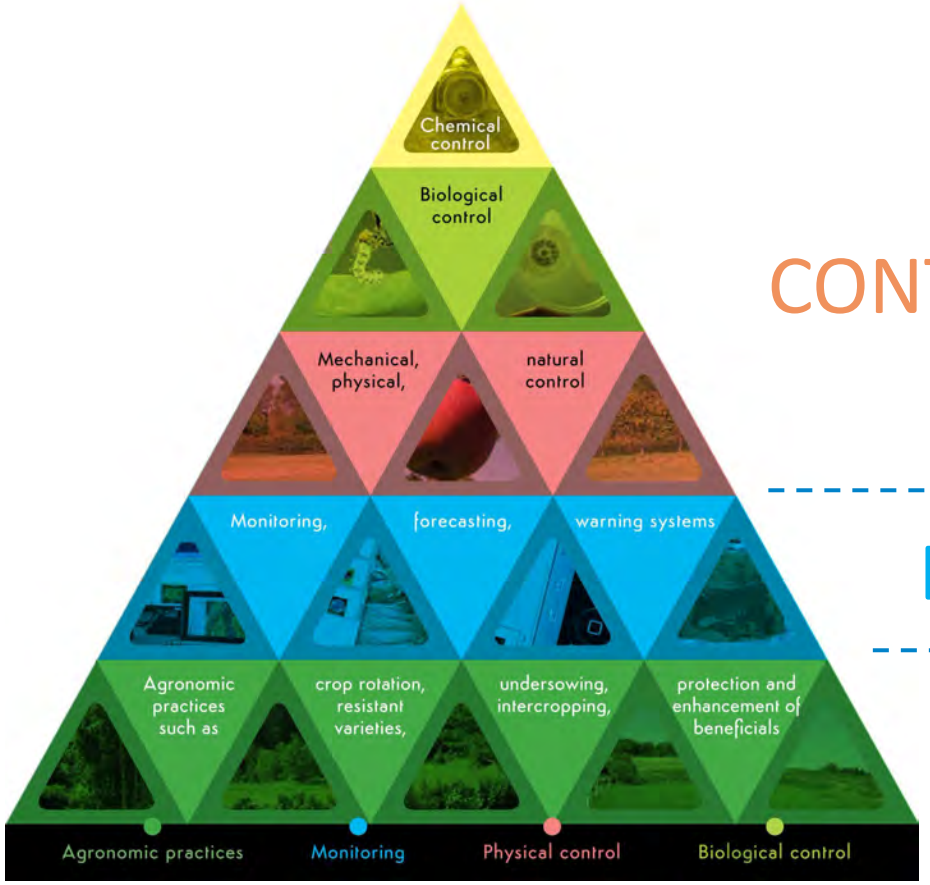
Robert Saville
Crop Protection Scientist
(Diseases and Weeds)

Catherine Harries
Crop Protection Scientist (Diseases)
Maternity Leave

Vacant
Crop Protection Scientist (Weeds)
Currently Recruiting

CEREALS & OILSEEDS

Integrated Pest Management



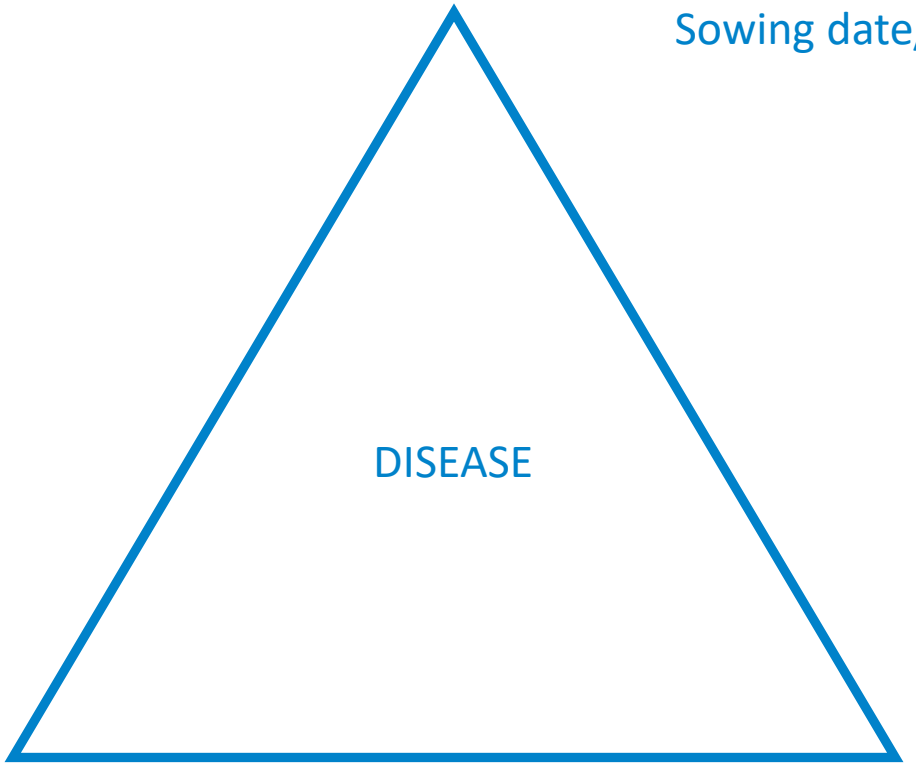
CONTROL

DETECT

PREVENT

Image credit: IBMA, IOBC and PAN Europe

Disease Triangle

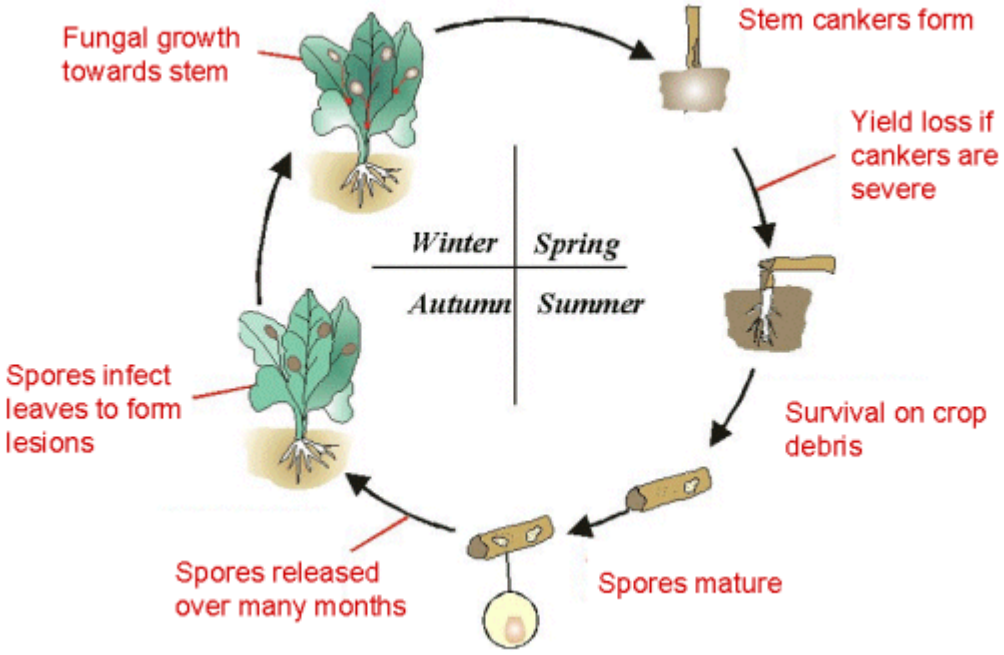


Host Resistance
Developmental stage of host plant
Sowing date/rate

Sporulation
Inoculum sources
Virulence

Temperature
Humidity
Rainfall

Phoma Leaf Spot (PLS)



Model Parameters:

Mean maximum daily temperature over the period 15 July to 26 September

Rainfall** (mm) over the period 15 July to 26 September

**New for 2021 = daily rainfall capped to 10mm and total rainfall is only measured up to 200mm

https://ahdb.org.uk/phoma-leaf-spot-forecast

CEREALS & OILSEEDS

Predicted wk of 10% Phoma Leaf Spot incidence in 2021, 2020 and 2019

Click button to change page

Predicted infection status

Select year and week to filter map

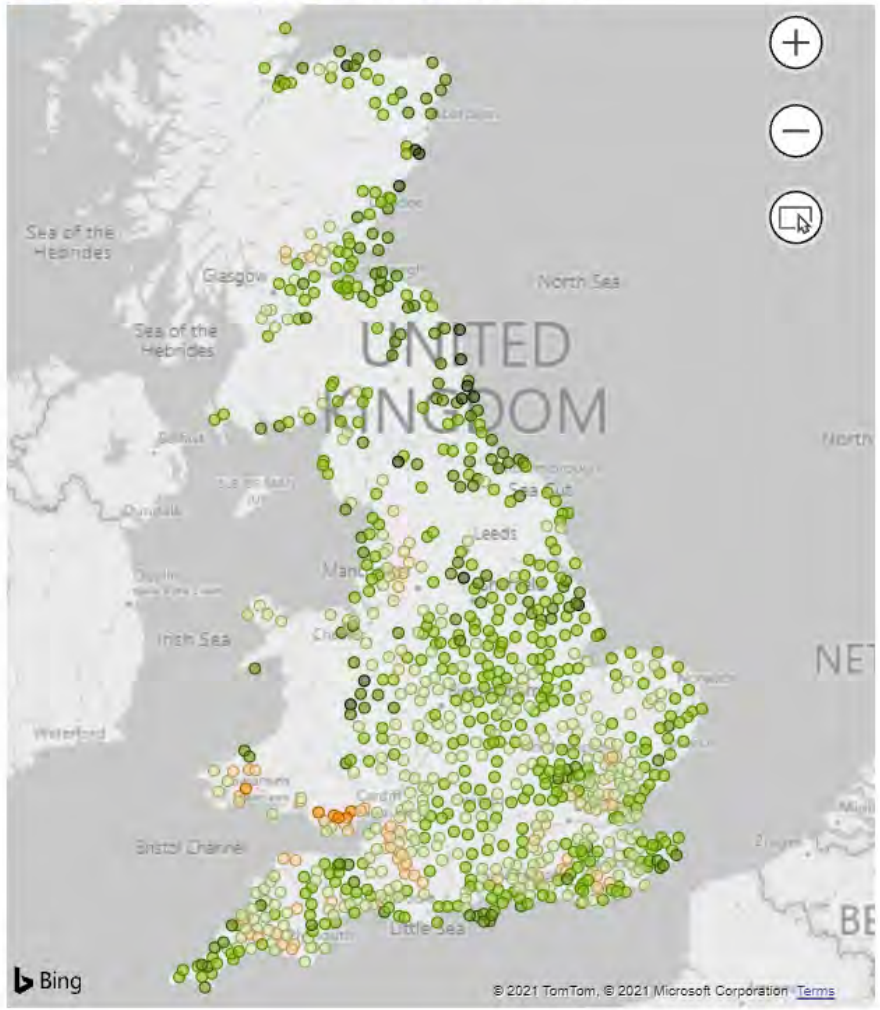
Year

- (•) 2021
- ( ) 2020
- ( ) 2019

Predicted week of 10% incidence

3 Oct | 10 Oct | 17 Oct | 24 Oct | 31 Oct | 7 Nov

●3 Oct ●10 Oct ●17 Oct ●24 Oct ●31 Oct ●7 Nov

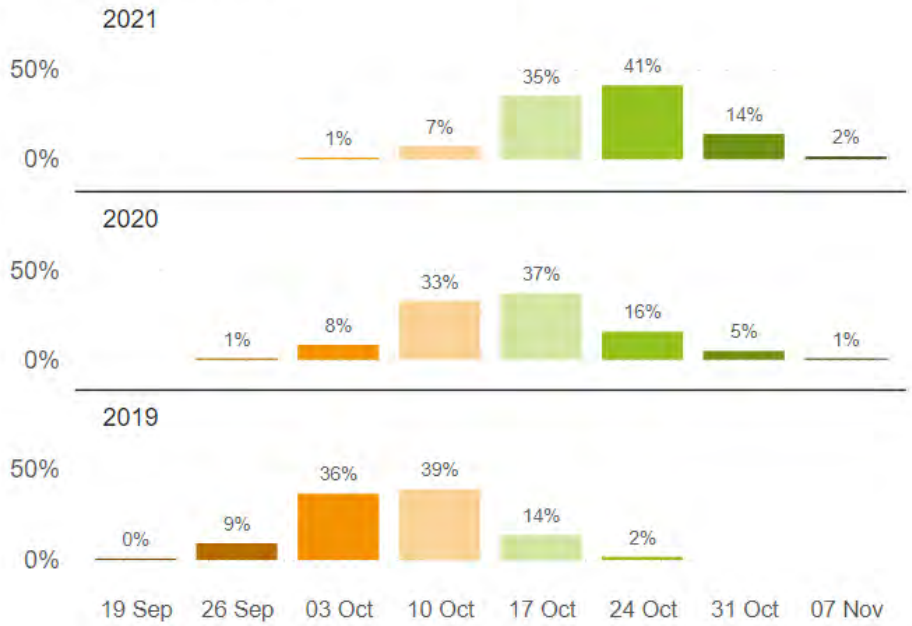


Select country / region to filter rest of dashboard

- [ ] England
  - [ ] East Midlands
  - [ ] East of England
  - [ ] London & South East Eng…
  - [ ] North East England
  - [ ] North West England
  - [ ] South West England
  - [ ] West Midlands
  - [ ] Yorkshire & Humber
- [ ] Scotland
  - [ ] Central Tayside & Fife
  - [ ] Dumfries, Galloway, Lothi…
  - [ ] Grampian
  - [ ] Highland & Eilean Siar
  - [ ] Strathclyde
- [ ] Wales
  - [ ] Wales

Data courtesy of Environment Agency, SEPA, Natural Resources Wales and Met Office

Annual distribution



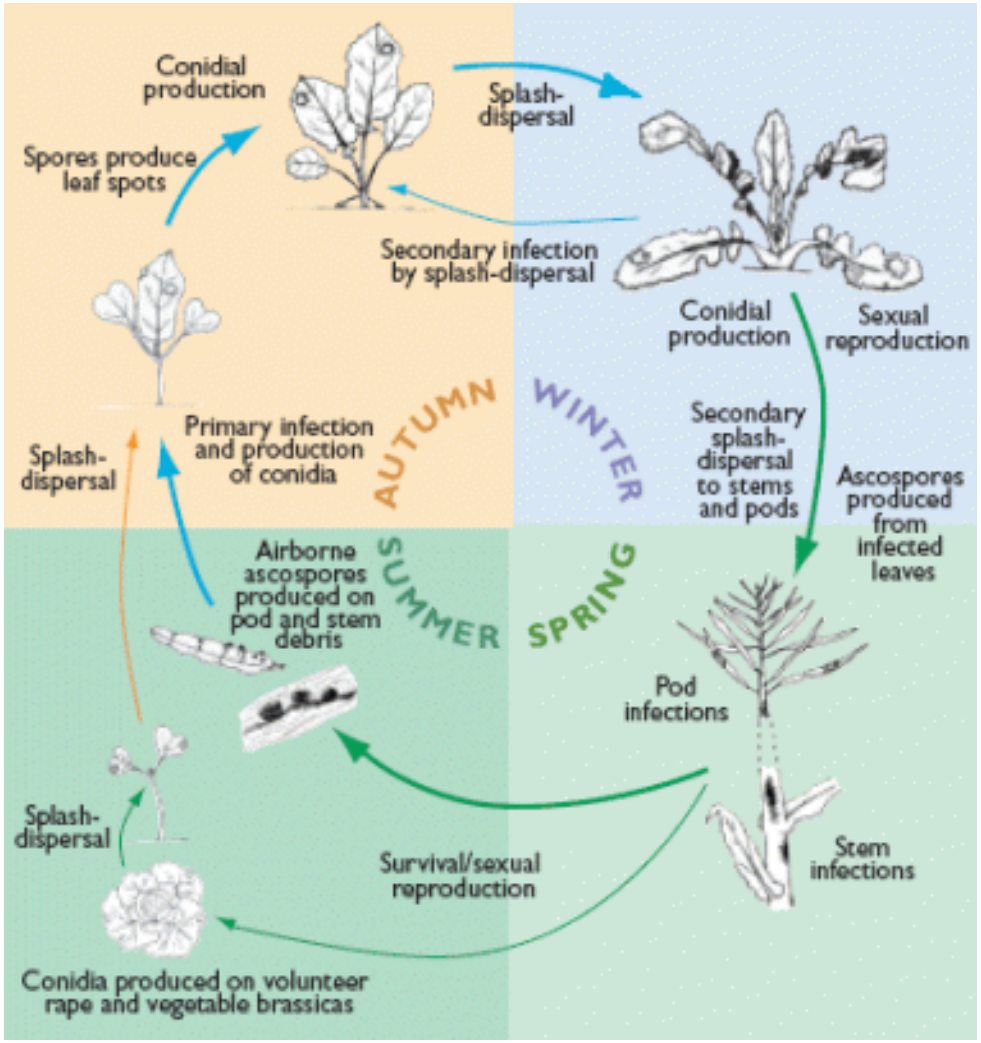
Individual locations

Location ID	2021	2020	2019
000008	24 Oct	17 Oct	3 Oct
000075TP	10 Oct	17 Oct	26 Sep
000076TP	24 Oct	10 Oct	10 Oct
000180TP	10 Oct	17 Oct	10 Oct
000181TP	17 Oct	10 Oct	10 Oct
000182TP	24 Oct	10 Oct	10 Oct
000900	31 Oct	24 Oct	10 Oct
000997	7 Nov	31 Oct	
003232	31 Oct	24 Oct	10 Oct
004942	7 Nov	24 Oct	

PLS forecast for decision support

- Guide crop monitoring
- Supporting field level data and monitoring
- A proxy for spore traps indicating when an epidemic is underway
- Help time fungicide sprays in the autumn
  - Spray thresholds
    - 10-20% RL phoma rating 7 or below
    - 20% RL phoma rating of 8 or 9

Light Leaf Spot (LLS)



Model Parameters:

Disease incidence in previous crop, mean summer temperature and winter rainfall

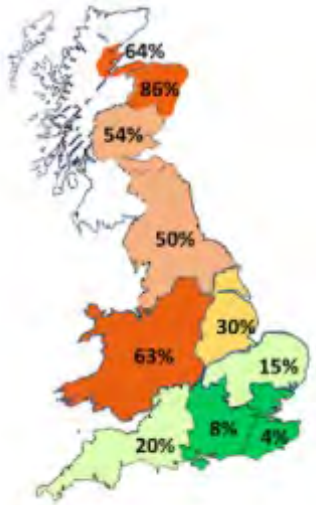
Predicts proportion of fields that will have over 25% LLS incidence

Preliminary forecast issued in Autumn using historic average winter rainfall

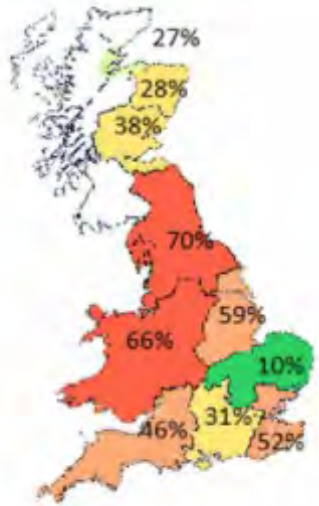
Updated in spring with actual rainfall

https://ahdb.org.uk/light-leaf-spot-forecast

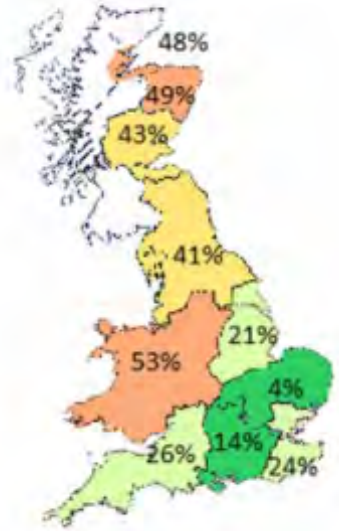
2020/21



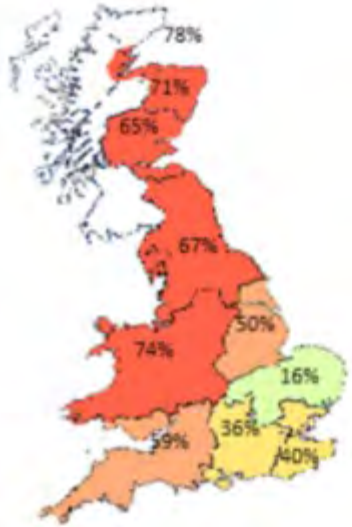
2019/20



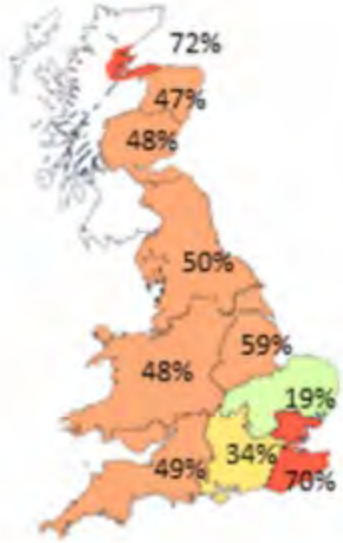
2018/19



2017/18



2016/17



2015/16

AHDB

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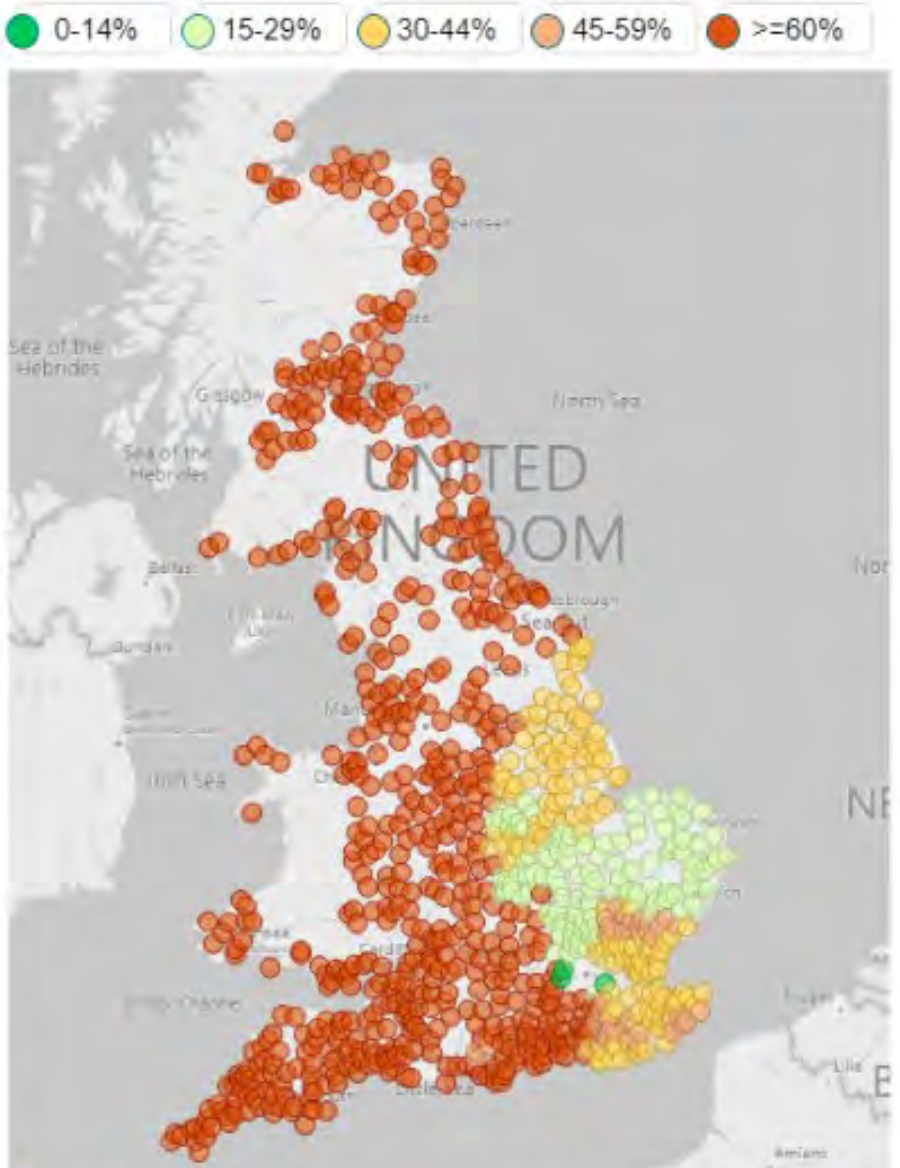
Preliminary Light Leaf Spot forecast for 2022

Select rainfall scenario for winter 21/22

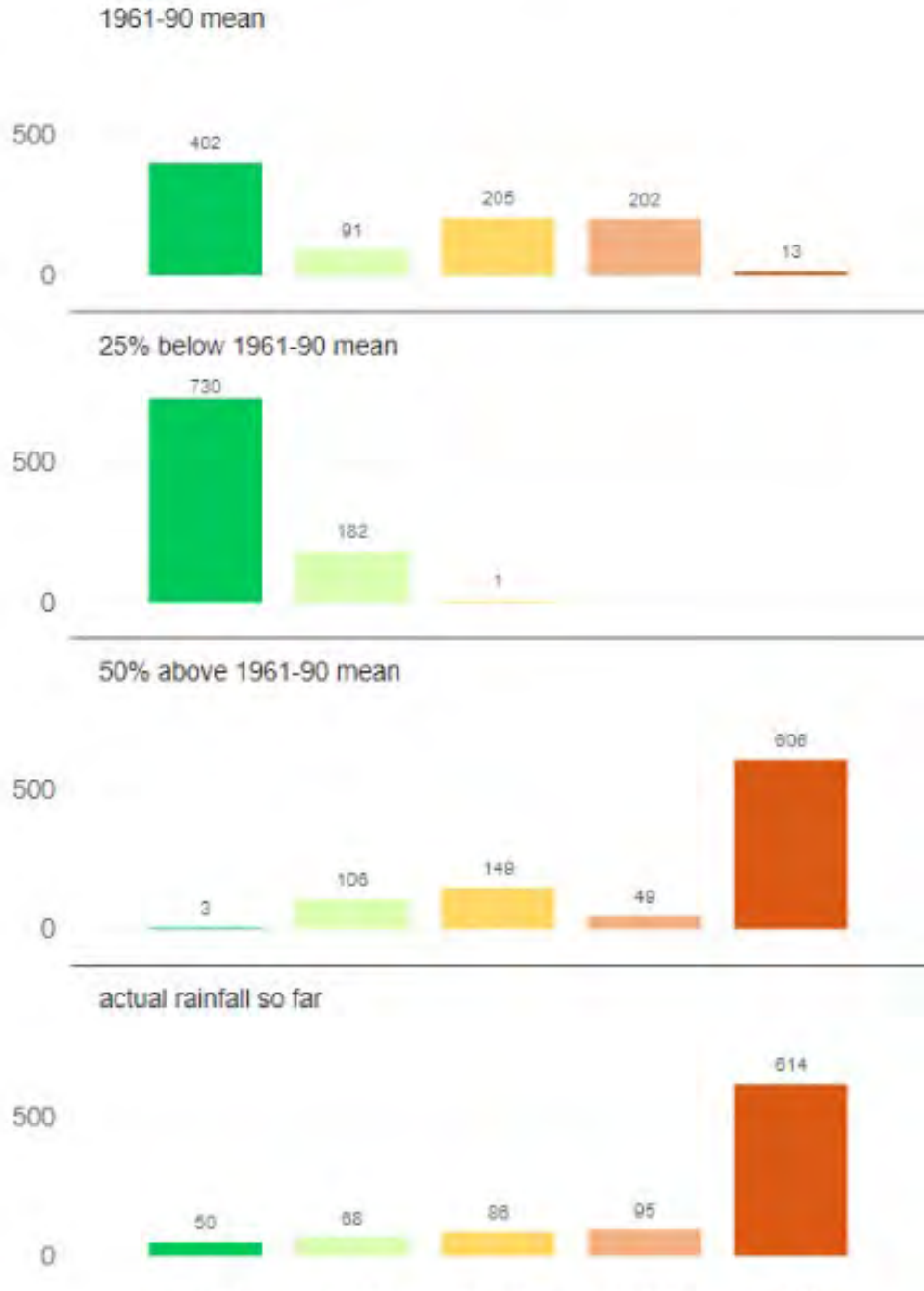
- ○ 1961-90 mean
- ○ 25% below 1961-90 mean
- ◉ 50% above 1961-90 mean
- ○ actual rainfall so far

Select LLS region to filter rest of dashboard

- ☐ Sc2
- ☐ Sc1
- ☐ North
- ☐ West
- ☐ East
- ☐ East Anglia
- ☐ South-East
- ☐ South
- ☐ South-West



Distribution of predicted disease incidence per rainfall scenario



Weather data courtesy of Environment Agency, SEPA, Natural Resources Wales and Met Office. Disease incidence data

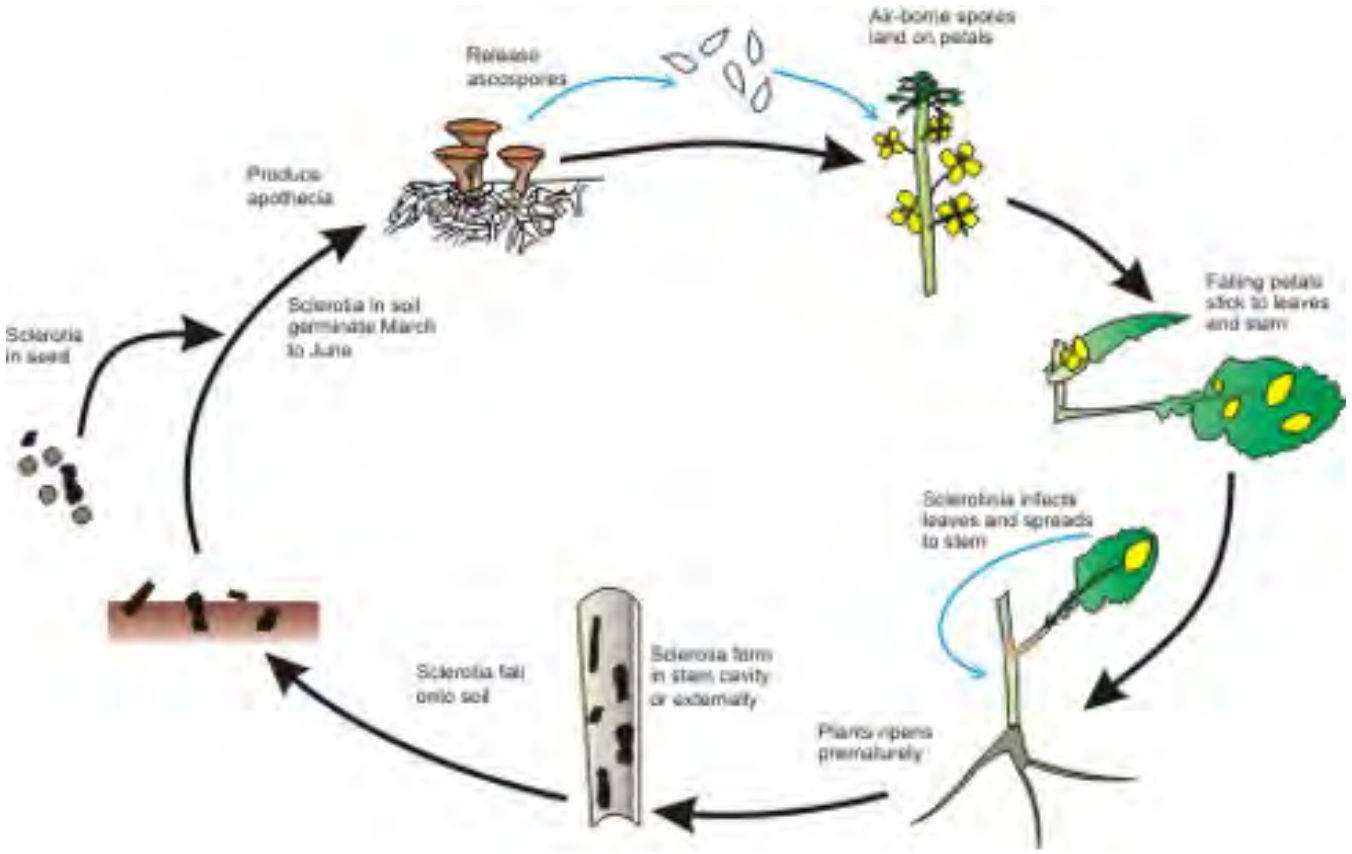
LLS forecast for decision support

- Target crop monitoring and SpotCheck sampling
- Long symptomless phase – initial infection can remain unnoticed
- Better targeted spray timing
  - A well-timed autumn fungicide has large impact in moderate to high disease years
  - Potential to reduce fungicide dose or omit spays altogether in low disease years

<u>Future improvements</u>

- Incorporate monitoring component
- Reinstate crop specific forecast
- Spore trap network

Sclerotinia Risk Alerts



Model Parameters:

Relative humidity > 80%
Air temperatures ≥ 7°C
} > 23 hours

~150 weather-based forecast locations

Presence of spores

Flowering stage

CEREALS & OILSEEDS

Weather-based forecast

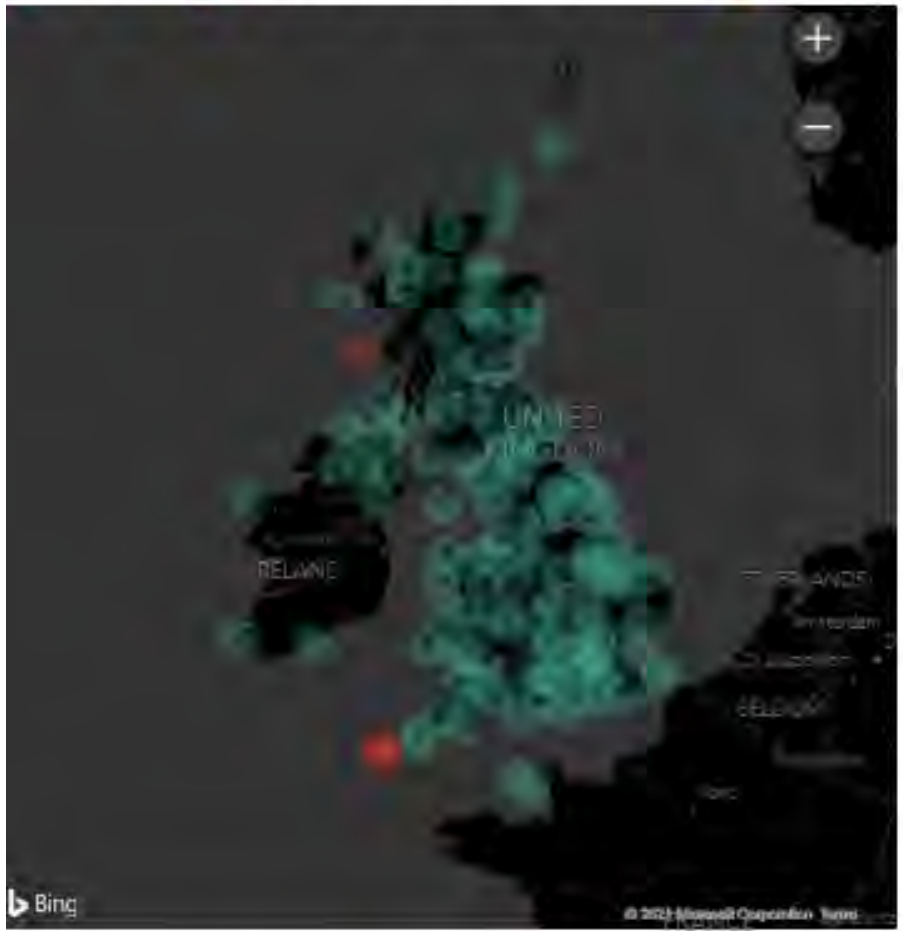
Low Risk
Near Miss
High Risk

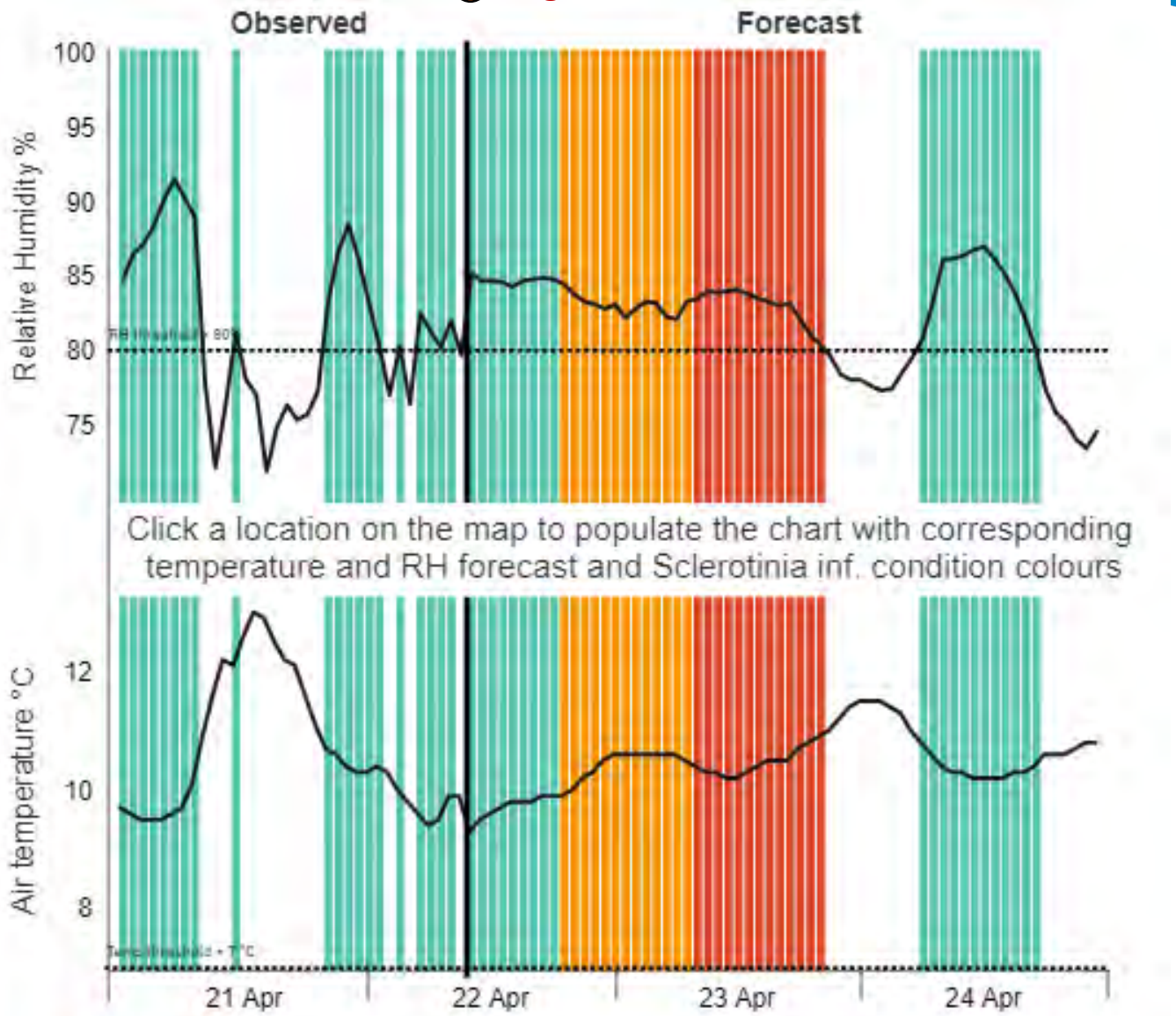
Main page | Spore data

Region: All

Sclerotinia infection conditions over today and next 48 hrs

< 21 hrs | 21-22 hrs or >=23 with 'near miss' | >= 23 hrs

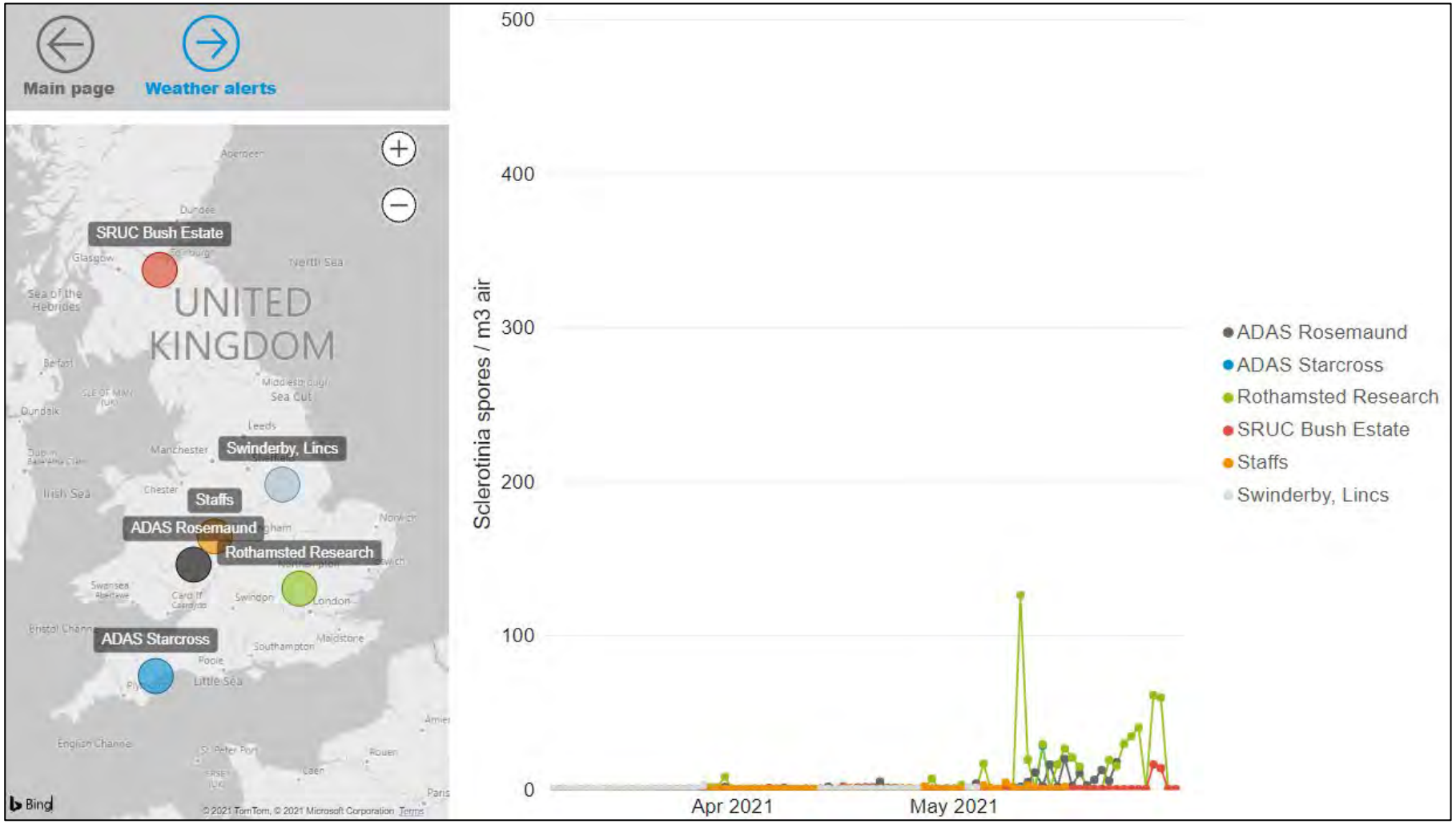




AHDB

This tool is powered by AHDB WeatherHub and uses current and historic weather data from the MetOffice and forecast data from MET Norway

Spore Trap data



CEREALS & OILSEEDS

Sclerotinia risk alerts for decision support

- Optimise spray timing
  - Usually preventative spray before mid-flower
  - May need second spray if flowering is protracted

- Delay spray so don’t need second one, or omit spray completely

<u>Future improvements</u>

- Automatic spore traps
- Trialling on monitor farm network

United Kingdom Cereal Pathogen Virulence Survey

UKCPVS

NIAB

AHDB

Animal & Plant Health Agency

UKCPVS

Please complete this form and send with each sample for virulence analysis to FREEPOST UKCPVS

It is not compulsory to include contact information. However, it would be useful for NIAB to be able to contact you after a sample has been received in case we have any further questions. All personal data supplied will be kept confidential to the UKCPVS project, and will be deleted after two years of the sample submissions. Full details of the NIAB privacy policy can be found on www.niab.com.

Crop: ..... Disease: .....

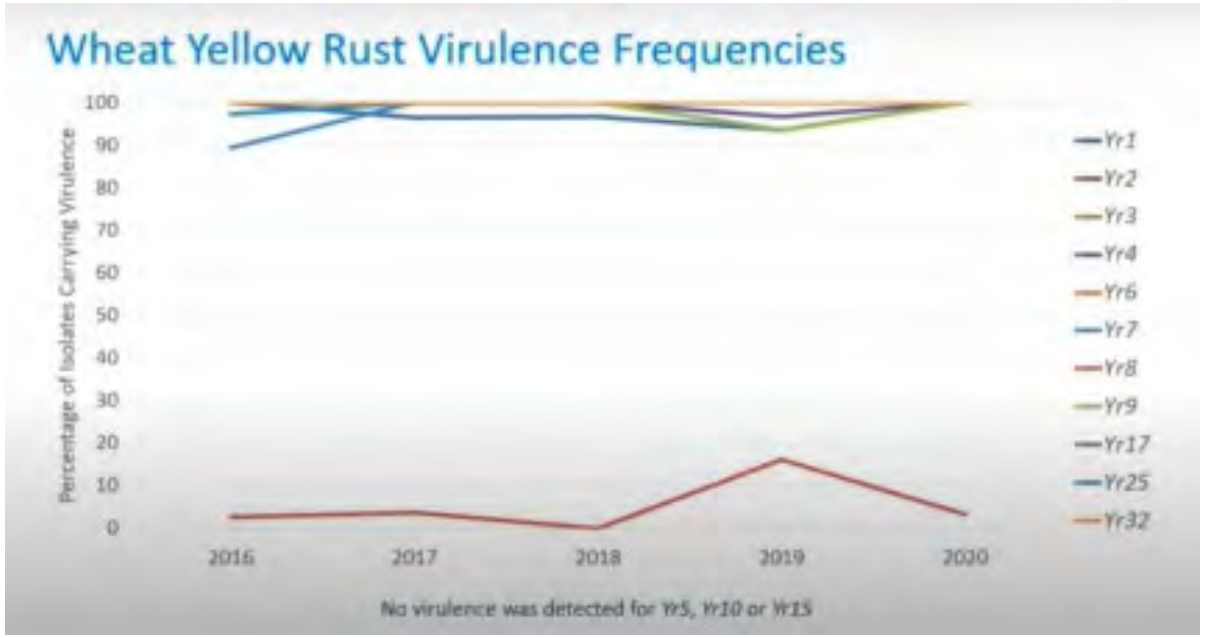
Sample no FOR OFFICE USE ONLY	Variety	Date	Location (include county & postcode if known) (AHDB trials operators - include trial ID)	Severity of attack * (% leaf area infection)	Crop GS	Notes (e.g. fungicide treatment)

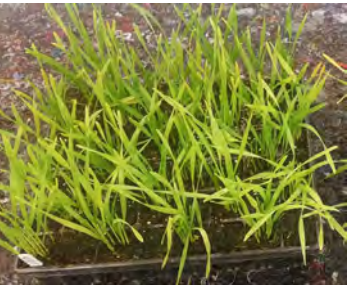
* If foci present, give assessment for foci and also plot (or field) as a whole.

Name: ..... Tel: .....

Address: ..... Mobile: .....

..... Email: .....

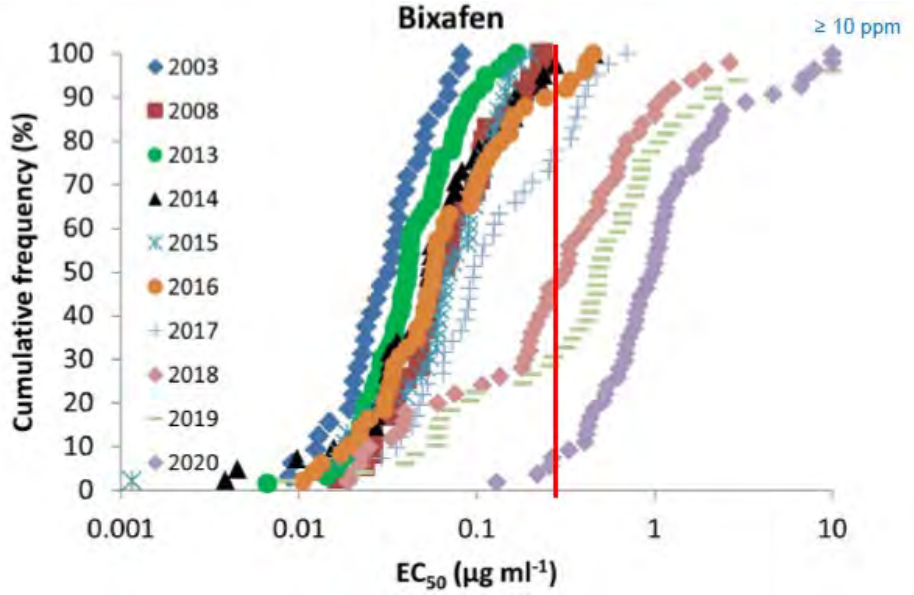


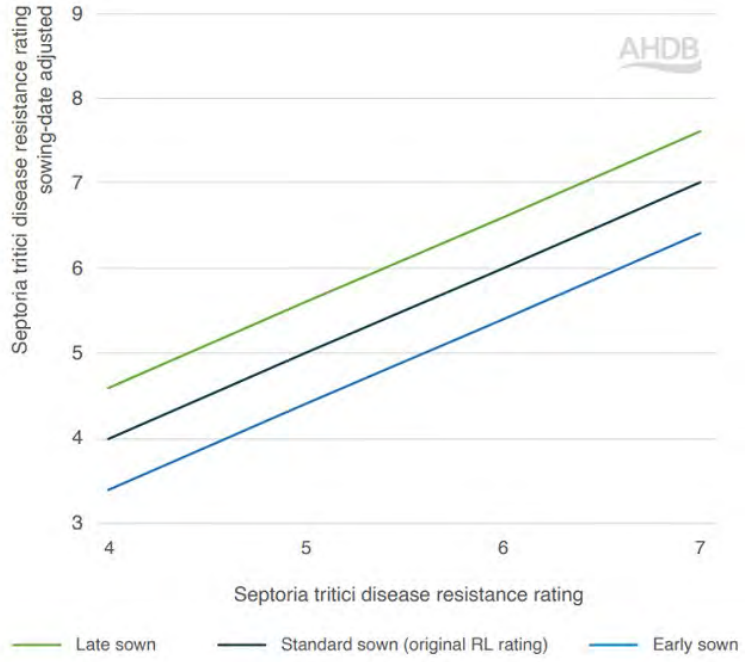


2022 UKCPVS STAKEHOLDER EVENT
2nd March 2022
NIAB, Cambridge

Septoria tritici

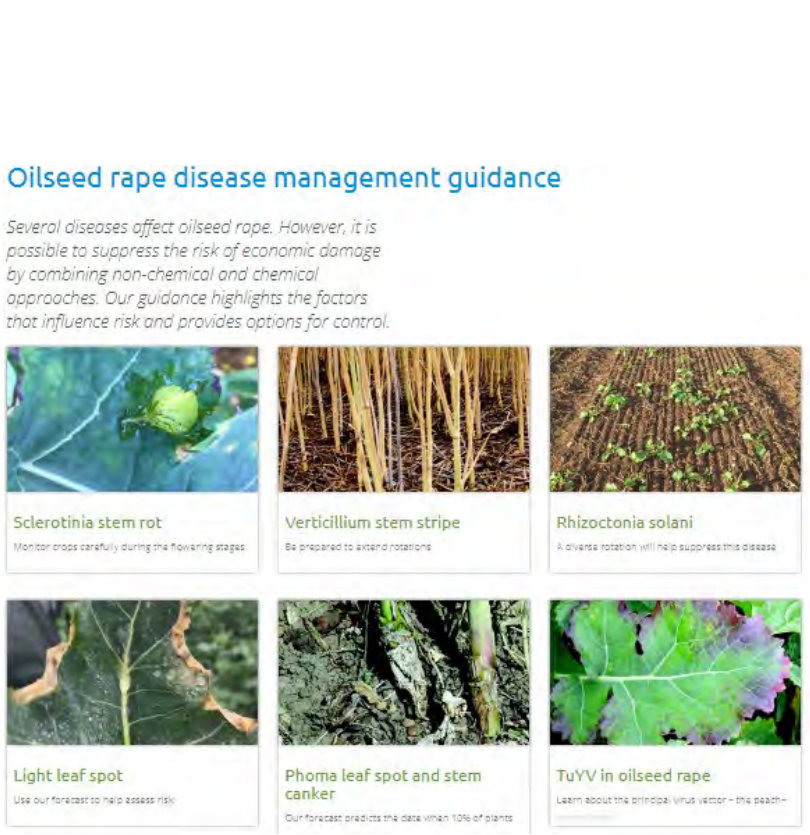
- Monitoring Fungicide Resistance
- Host Resistance RECOMMENDEDLISTS
- Fungicide Performance Trials
- Fungicide Challenge – manage in season risk
- Agronomic approaches

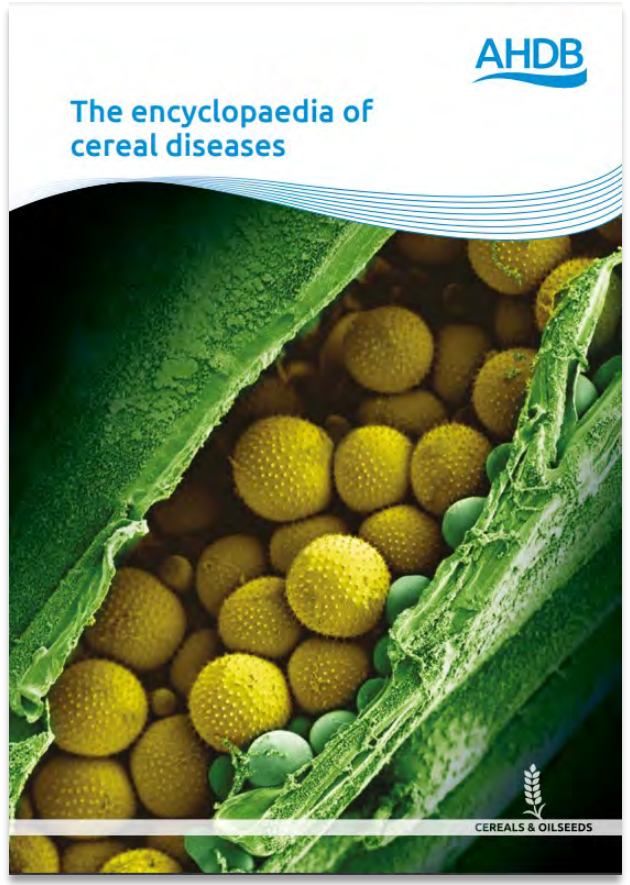




2021 AGRONOMIST'S CONFERENCE
7th December 2021
Peterbrough

Key Disease Resources





https://ahdb.org.uk/tools

Key Weeds Resources

- Weed management in arable rotations*
- The encyclopaedia of arable weeds*
- Pocket weed identification guide

*NEW! These guides are now also available as HTML

Agronomists' Induction 2021

SPot Farm Update 2021 Season

Alex Wade, Arable Knowledge Exchange Manager (South East), AHDB

POTATOES

SPot Scotland

Milton of Mathers Farm Montrose

Milton of Mathers farm hosts Strategic Potato (SPot) Farm Scotland, extending the SPot farm network to the North East of Scotland. The business spans 80 hectares of seed potatoes, with the rest of the arable land dedicated to barley and oilseed rape.

SPot North

RJ and AE Godfrey
Scunthorpe

Located on the Lincolnshire and Yorkshire border, RJ and AE Godfrey spans 440 hectares of main-crop potatoes for the packing market. The farm grows peas, sugar beet, wheat, oilseed rape and linseed.

SPot East

James Foskett Farms Ltd
Suffolk

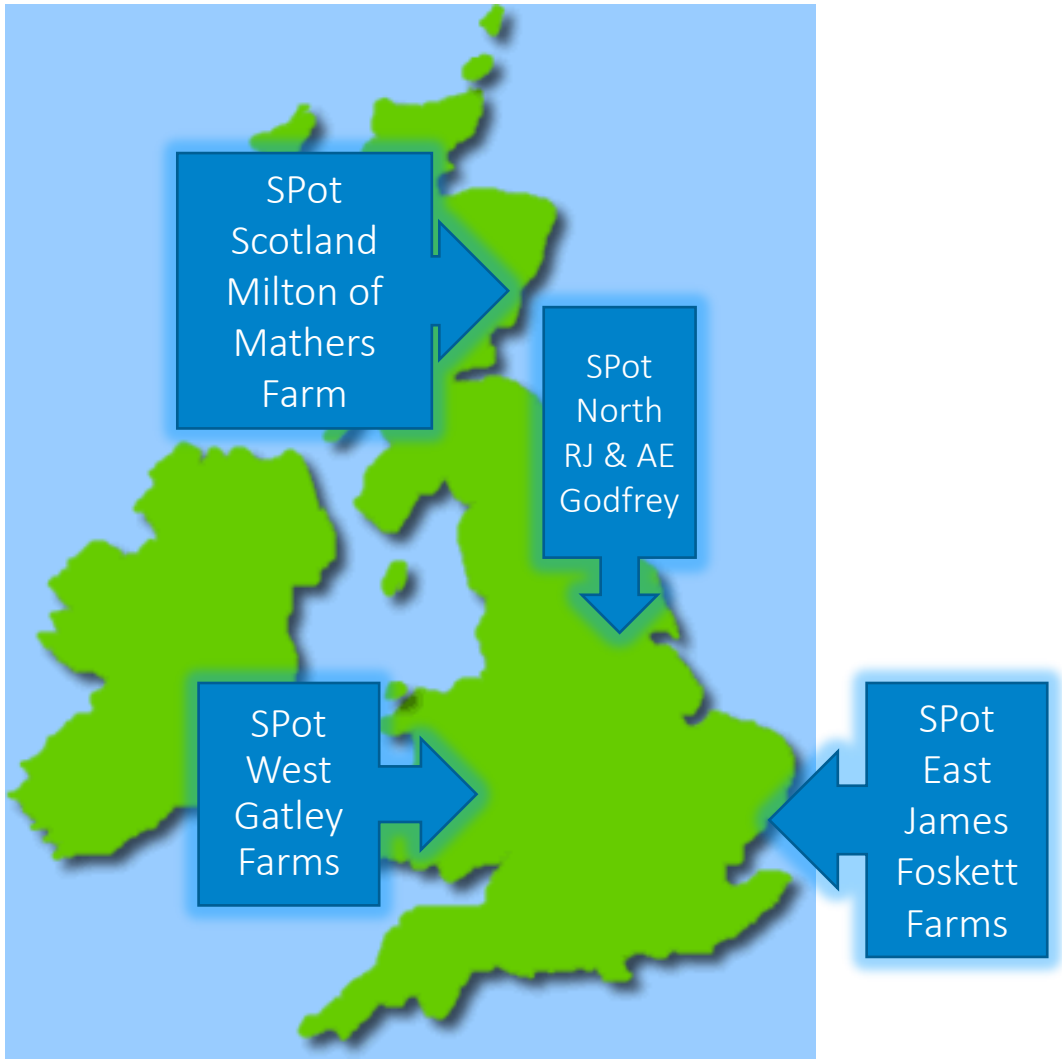
James Foskett Farms Ltd was appointed Strategic Potato (SPot) Farm East in September 2019. It features 230 hectares of organic cropping and a 5,150 tonne capacity storage unit.

SPot West

Gatley Farms
Herefordshire

Gatley Farms was appointed Strategic Potato (SPot) Farm West in November 2020. The business grows 140 hectares of ware potatoes. The business is interested in improving productivity over production and looking into new ways of best practice moving forward.

SPot Farms for 2021



Topics

Scotland	East	North	West
(ADAS) Carbon Audit	(ADAS) Carbon Audit	(ADAS) Carbon Audit	(ADAS) Carbon Audit
Border/Flower strips work	Control of virus spread	MH - Achieving reliable tuber residues	MH - Achieving reliable tuber residues
Virus - Mineral Oils	Visual expression of virus	Dormancy of 40+ Varieties	Dormancy of 40+ Varieties
Mulch Project	New wireworm treatments	Storage and Agronomy (seed Handling)	Storage & Agronomy Trial (Seed Handling)
PCN management practices	Compaction alleviation	Determinacy Scoring	Determinacy Scoring
IPM strategies to minimise virus in seed	Spore Trapping (Blight) Trial	Irrigation - Best use of available water	Spore Trapping (Blight) Trial
	Tolerance of resistant varieties	Use of Haulm Puller as an alternative	Soil Erosion Trial
	Trap cropping	Comparison of Cultivation Depths	Soil health scorecard
		Variable seed rate & nutrition - Omnia	

Multi- site

Single site

Soil Erosion

Why did we do it?

From a lecture by Prof Jane Rickson of Cranfield Uni. “On average it is estimated one tonne of soil per hectare is lost each year.

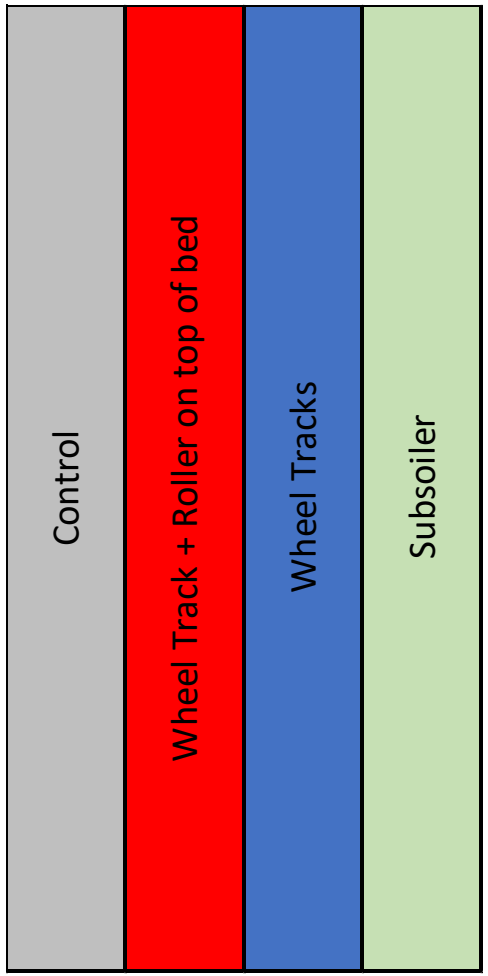
Treatments

The Aqua Agronomy machine has different components. The effect of each is different so forms a separate treatment.

1) Control – no treatment.
2) Three legged flat lift; penetrates approx. 50cm into the ground at the centre of each wheeling.
3) Aqua Agronomy Wheel Track Roller (A). Two angles tines behind each wheel, 25cm depth. Followed by a wheel making indents into the wheeling's which divert water to the sides of the beds.
4) Aqua Agronomy Wheel Track Roller (B). Rollers fit on a track along the top of the bed, making indents which stop water running into the wheeling's.

Machines

Trial Plan



4 beds per plot. 140m length

Terrastop Silt Fencing

Results

Group 4 Royal		Planted Royal	23/04/2021		
		50% Emergence	20/05/2021		
		50% GC	08/06/2021		
Soil Erosion SPot West	25/06/2021	15/09/2021			
	Weight 1	**Weight 2**	**Total**	**Per ha**	**Percentage reduction from control**
Subsoiler	0.95	0.62	1.57	31.4	41.85%
Aquagronomy Wheel track	1.48	0.63	2.11	42.2	21.85%
Aquagronomy Wheel track roller	1.04	0.79	1.83	36.6	32.22%
Control	1.78	0.92	2.7	54	

Blight Spore Trapping

1. What was the question?

2. What was the driver?

3. What was the aim?

Weather based warnings

AHDB BlightSpy

1. Select a region

- Scotland North East
- Scotland Central
- Scotland South
- Wales
- North West
- Yorks. & N. East
- West Midlands
- East Midlands
- East of England
- South East
- South West

2. Check Blight risk over 48 hrs. from start date

7 July | 8 July | 9 July | 10 July | 11 July | 12 July

No alert | 'Near miss' | Full Hutton period

Syngenta Blightcast

Hutton Criteria

Hours of the Day:	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
Wednesday 17/06	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Thursday 18/06	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Friday 19/06	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Saturday 20/06	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Sunday 21/06	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

Colours Legend

Night time	Day time	
		Low Risk (No Blight Period)
		Medium Risk (Near Miss)
		High Risk (Full Blight Period)

Blight Periods

B	Near Blight Period	X	Blight Period

Hutton Criteria :

This new criteria identifies a risk when there has been two consecutive days where:

- The minimum air temperature of 10ºC.
- There is a minimum of 6 hours with a relative humidity of at least 90%.

Spray Window Opportunity

Hours of the Day:	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
Wednesday 17/06													R	R			R							
Thursday 18/06										R		R	R	R	R				R					
Friday 19/06																								
Saturday 20/06																								
Sunday 21/06	R	W	X	X	W	W			R		W	W	W	W	W	W	W	W	X	W	W			

Traps

James Hutton Institute (JHI) supplied spore traps and analysis.

1. GRIPPS-99M, from Aerobiology Research Laboratories.
2. Spornado Sampler

3. Blight Scouting - Potato plants are highly effective spore traps themselves, with unsprayed crops having the advantage of being receptive 24-7. At each farm the fields with spore traps and adjacent fields were intensively monitored for blight, in addition to the thorough scouting normally taking place

Results

The GRIPPS traps were fiddly and time consuming to set up and use.

SPot West spore trap results

- Detection of Phytophthora Infestans DNA took place from 31 May 2021 – Small quantities usually dismissed as background ‘noise’.
- It is not clear what threshold should be taken seriously, probably 1-2 spores.
- A reading of 1.85 spores was recorded from one of the traps samples on 5 July. This was ten days in advance of the first blight seen by scouting in nearby fields on 15 July. Such advance warning would be valuable, if it could reliably be achieved.

Results

SPot East spore trap results

- Late blight was observed first at SPot East in the field on 24 June on the north side of the field

- The GRIPPS trap did not detect more than a trivial ‘noise’ level of DNA until July 12th, by which time the field was severely infested.

- The Spornado never detected more than 0.36 spore equivalent, even when a blighted leaf was actually poking into the mouth of the sampler.

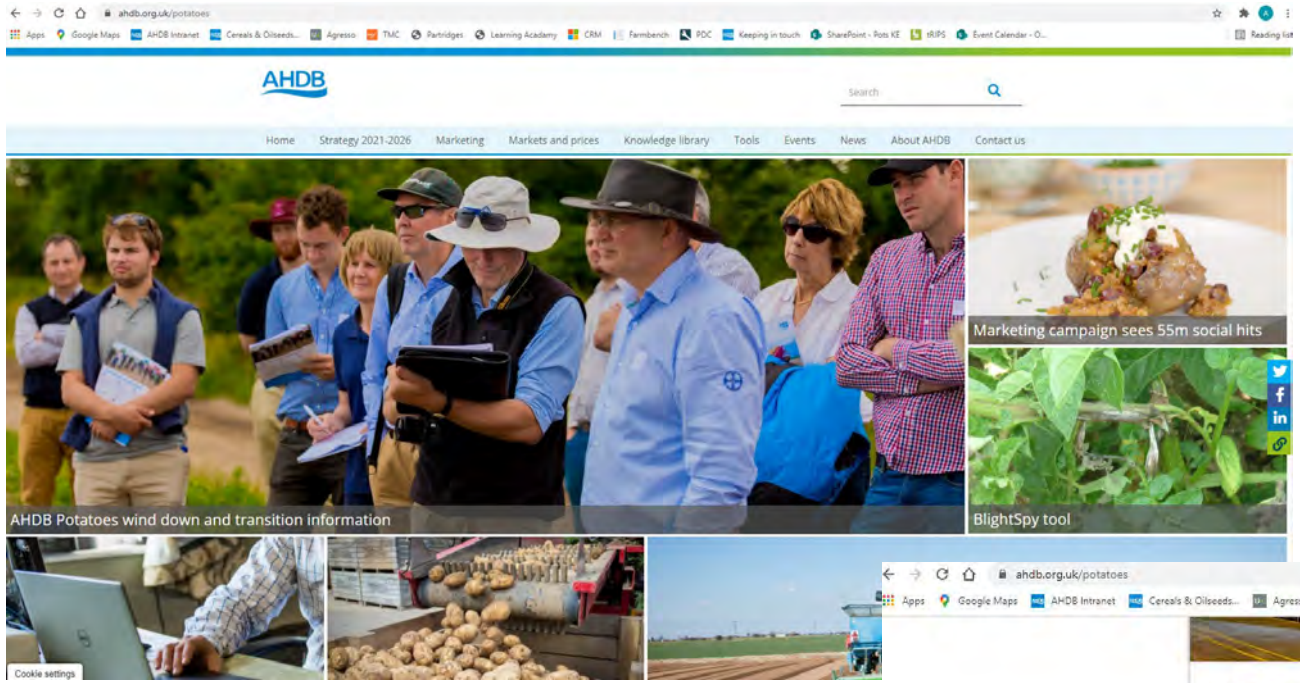
July 6th

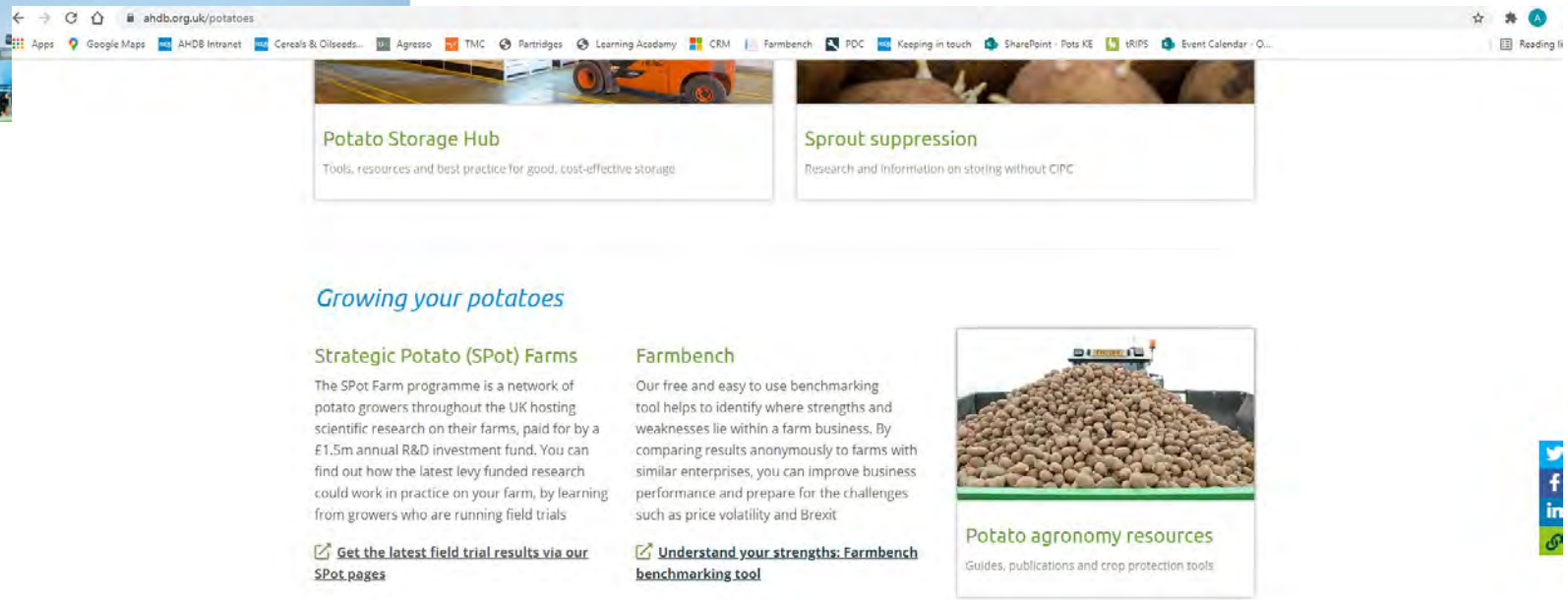
July 9th

Conclusion from the late blight control demonstration on SPot farms 2021

- Weather based warnings continue to be valuable. Those provided by BlightSpy are generally accurate but users should be aware of the weather data points used by any weather based warning, in relation to field location.
- Spore trapping for Phytophthora Infestans is not yet accurate enough to be relied on. There is an opportunity for development of spore detection equipment to enable growers to use fungicides with more precision.
- Varietal resistance can be a valuable contributor to IPM control.

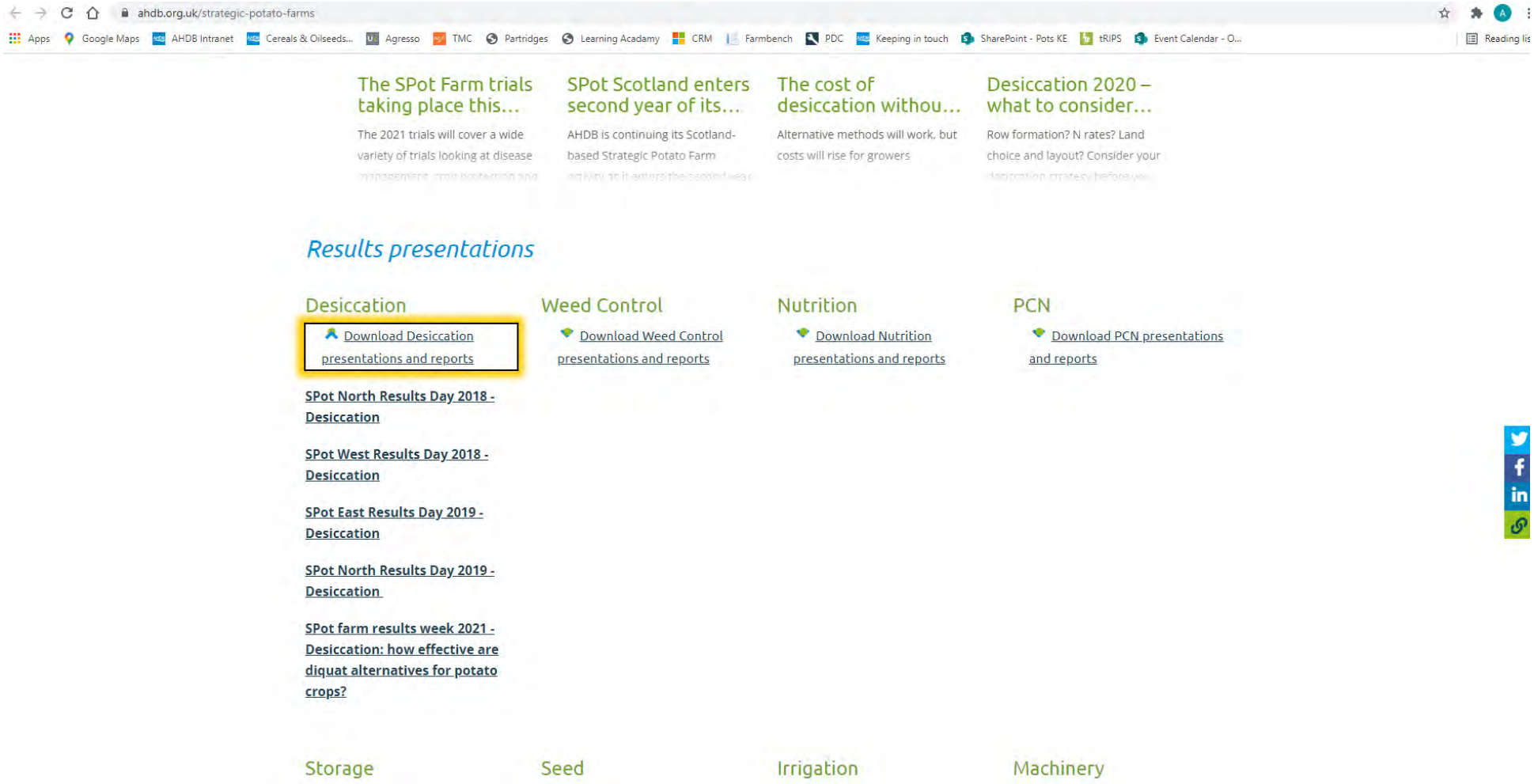
Where to find the results





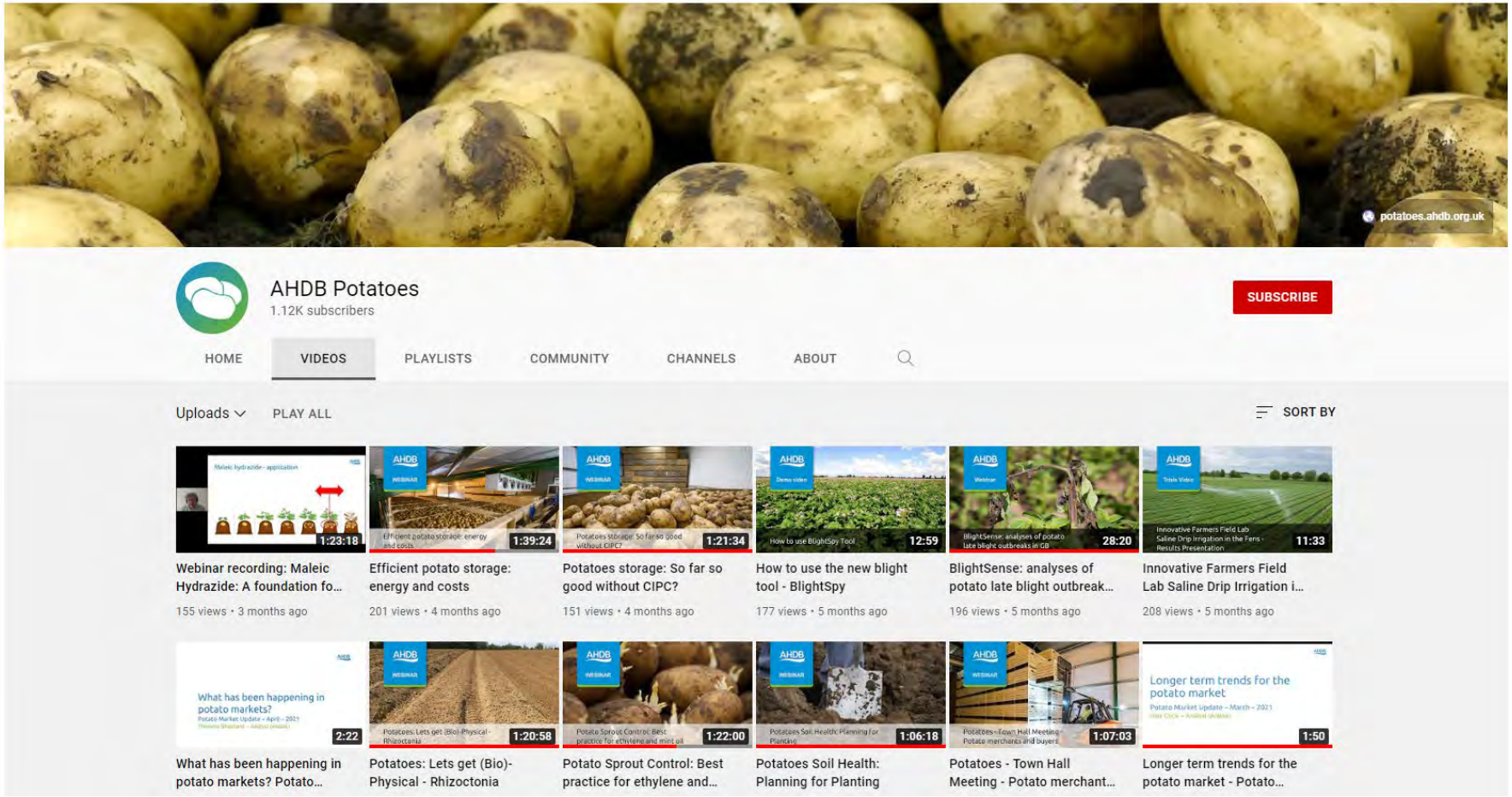
https://ahdb.org.uk/potatoes

Where to find the results



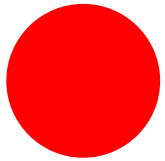
https://ahdb.org.uk/strategic-potato-farms

Where to find the results

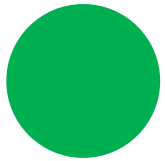


https://www.youtube.com/ahdbpotatoes

Day 1 Workshop – 15.15



Red Group – Seminar 1



Green Group – Seminar 2

Blue Group – Emperor Suite

Refreshments served in breakout rooms