

SASA



# Monitoring potato pests and disease vectors in Scotland

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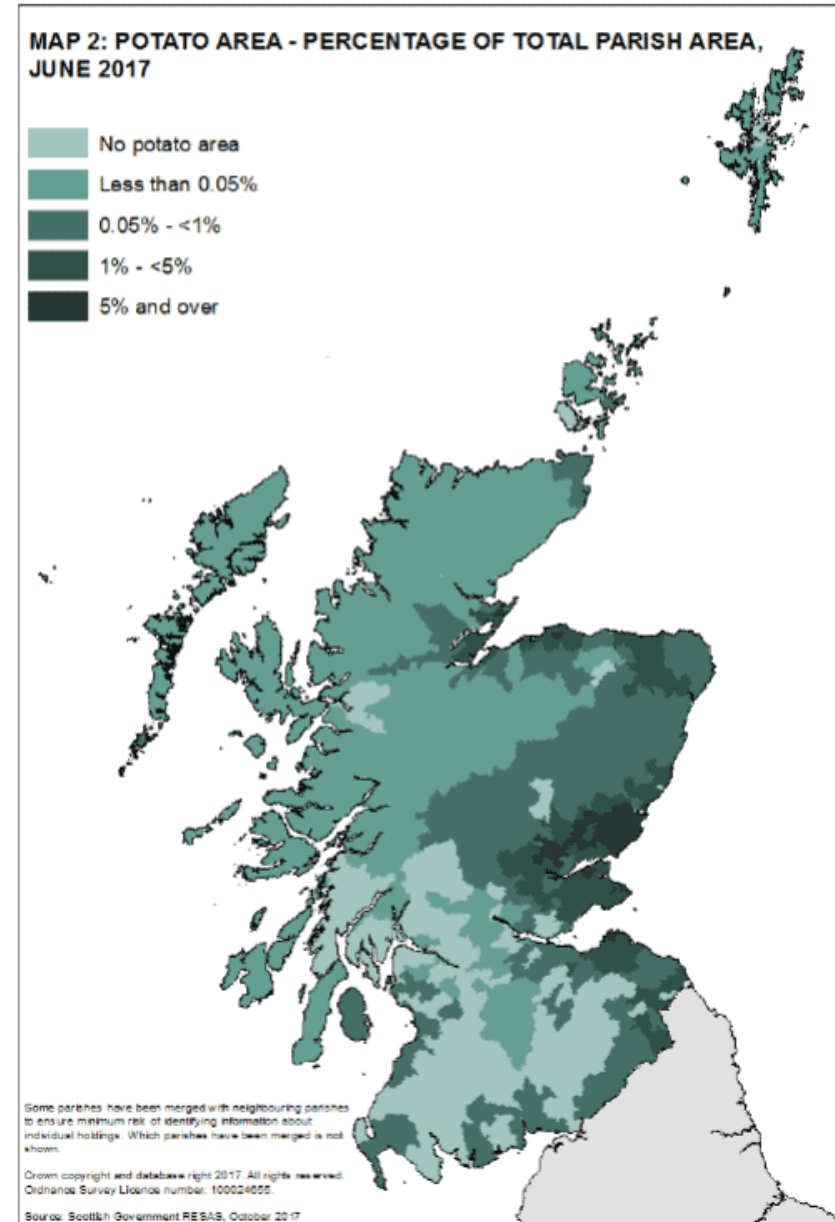
Senior Entomologist

and Head of Virology and Zoology

SASA, Scottish Government

# Potato production in Scotland

- ❖ 23% of GB potato production is in Scotland
- ❖ 77% of GB seed potato production is Scottish
- ❖ 27,400ha in 2018
- ❖ A key industry for Scotland



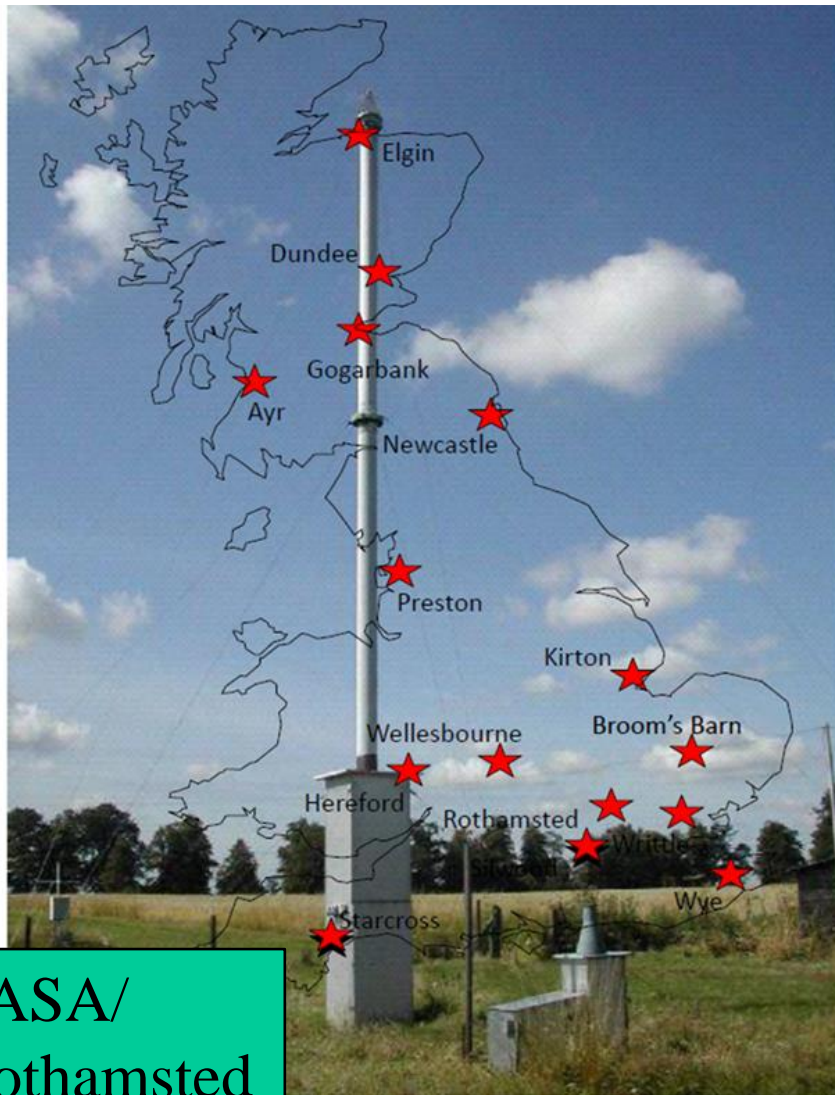


# (invertebrate) Zoology at SASA





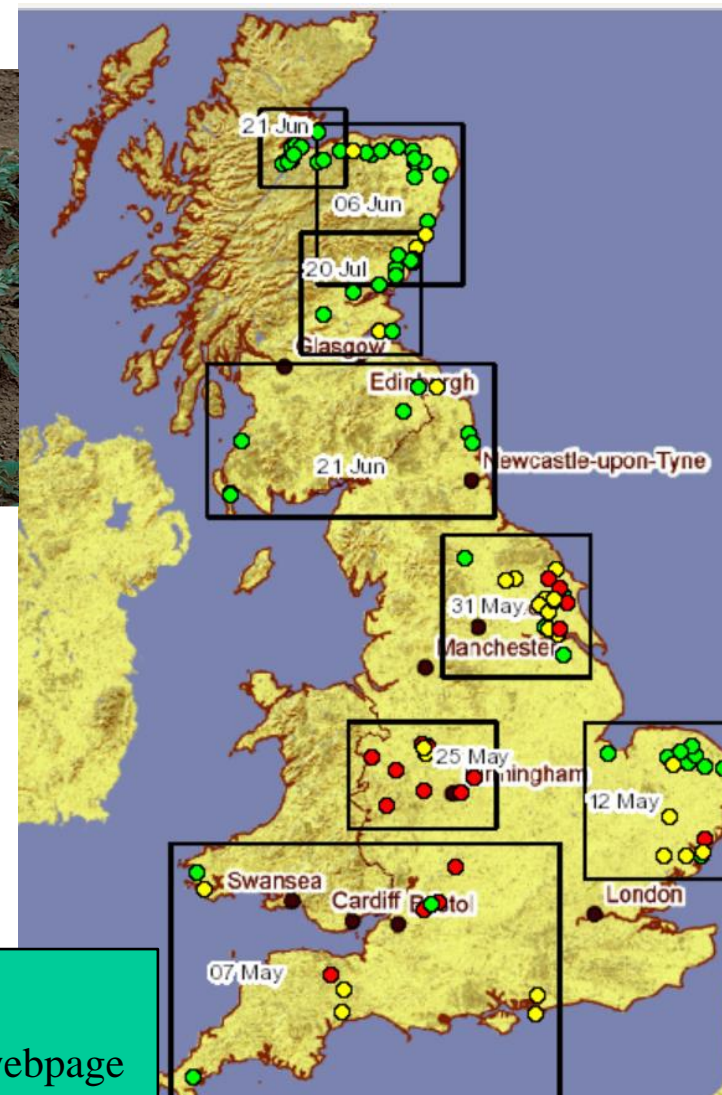
# Aphid monitoring in Scotland (and GB)



SASA/  
Rothamsted



Crop  
inspectors



FERA  
\*AHDB webpage



# Ideally we use all three



12.2m high  
Migrations  
80km range



Yellow pan trap  
'Trivial flight' –  
local movement



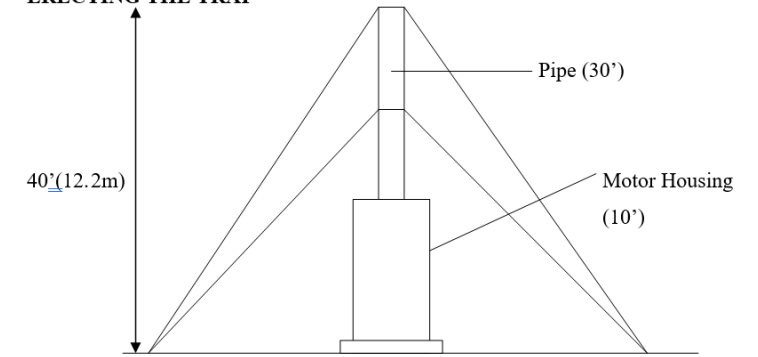
Field inspection  
Expanding populations  
Inform control



# 12.2M 'Rothamsted traps' (Macauley et al, 1998)



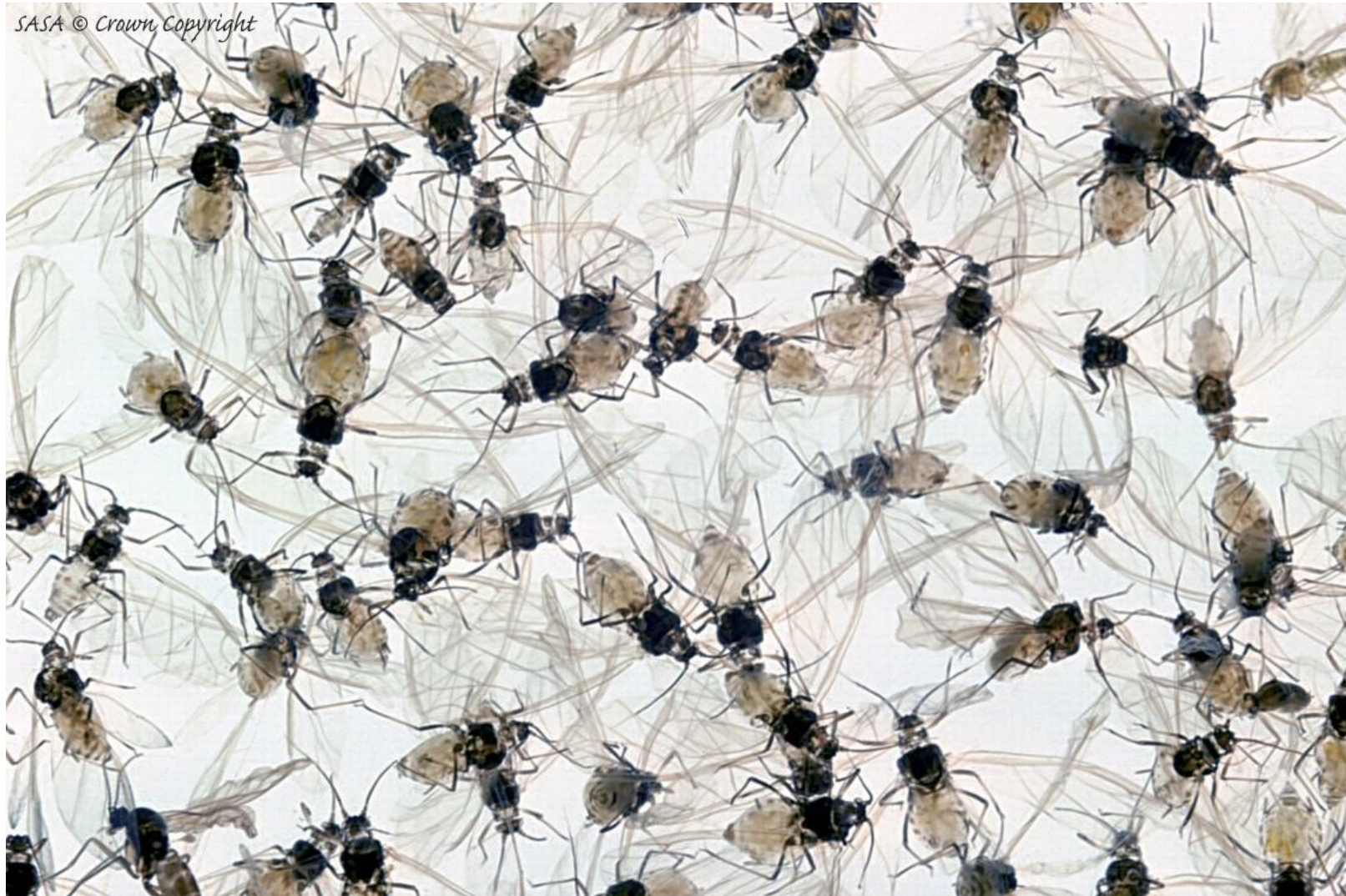
ERECTING THE TRAP



Pipe diameter 244mm  
45-55m<sup>3</sup> flow down pipe



# Suction trap catches





# Aphid Identification



- ❖ 4700 species worldwide
- ❖ 600 species in UK
- ❖ Often 30+ species in one catch





Entomology Aphid Identification Sheets

ENT R 002  
Version 4

BULLETIN NO \_\_\_\_\_  
SITE Dundee  
SITE CODE 907

DATE Wed 18/19 July  
DAY CODE \_\_\_\_\_  
CATCH FLAG Normal

IDENTIFIER HE+HG

**APHID RECORD SHEET 2018**

SPECIES	NO.	COMMENTS
<del>Rhopalosiphum padi</del>	<del>3235</del>	3235 (1)
Rhopalosiphum polycephalum	401	
Metopolophium dirhodum	2285	
<del>Sitobion avenae</del>	554	
Sitobion fragariae	159	
Sitobion cleopatrae	12	
Sitobion sp.	80	
<del>Myzus persicae</del>	20	
Cavariella pastinacae	9	
Cavariella thabaldi	65	
Cephalosiphum hypophaeae	72	
Acyrtosiphon pisum	40	
Metatubus bifinis	11	
Pemphigus sp.	23	
Lipaphis erysimi	17	
Brachycaudus helichrysi	87	
Aphis fabae	1	
Aphis sp.	1	
Metopolophium festucae	1	
Hyperomyzella thimanthi	1	
Uromyza humboldti	1	
Cryptomyza geleopadi	1	
Myzus persicae	1	
Halimolobos atriplicis	1	
Schizolobos pineti	1	
Ernara sp.	3	
Melanaphis elizabethae	3	
Uroleucon sp.	3	
<del>Macrosiphum euphorbiae</del>	2	
Nasonovia ribisnigri	1	
Nasonovia pilosella	2	
Eucerania punctipennis	25	
Pterocomma alii	1	
Brevicoryne brassicae	2	
Triposiphia producta	10	
Hyalopteris pruni	4	
Hyperomyzus lampyris	1	
Myzocallis castanea	1	
Macrosiphum rosae	3	
Hyperomyzus lactucae	3	
<b>Total</b>		

Plate checked: ✓ JW

Entomology Aphid Identification Sheets

ENT R 002  
Version 4

BULLETIN NO \_\_\_\_\_  
SITE Dundee  
SITE CODE \_\_\_\_\_

DATE 18/19 July continued  
DAY CODE \_\_\_\_\_  
CATCH FLAG \_\_\_\_\_

IDENTIFIER W

**APHID RECORD SHEET 2018**

SPECIES	NO.	COMMENTS	CHECK
Acyrtosiphon malvae	1		
Uroleuconia sp.	1		
Tuberculatus borealis	1		
<del>Cephalosiphum cedrorum</del>	2		
Aphis roseae	1		
Adelgidae	1		
Phyllaphis togii	1		
Cavariella acedipalis	1		
Macrosiphum sp.	4		
Aulacorthum solani	1		
Macrosiphum viciae	1		
Lipaphis acletothymum	1		
Schizaphis stripi	2		
Unidentifiable	7		

2 x Psyllids






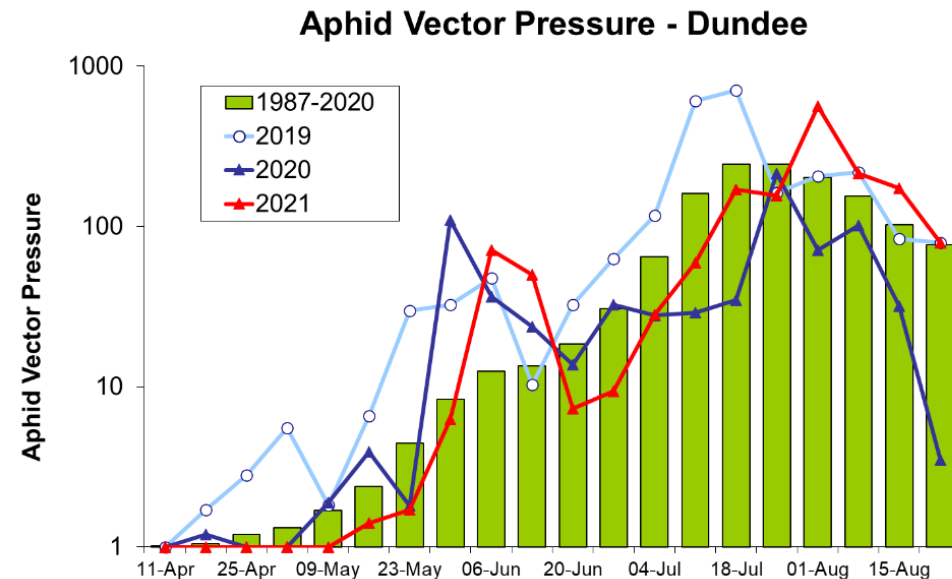
Plate checked: ✓ JW

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# Analysis and reporting – SASA website

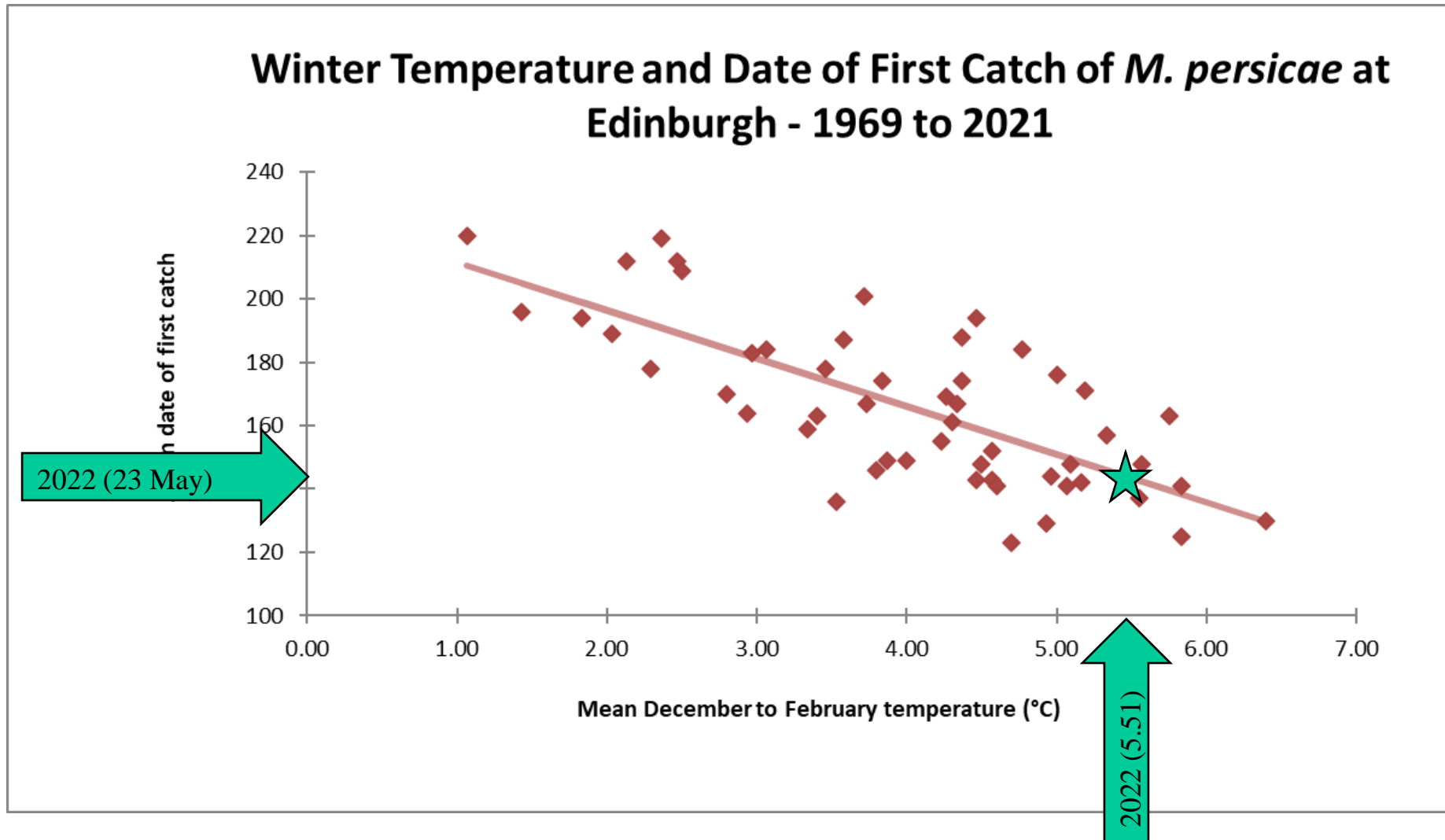
- ❖ Key species and vector pressure
- ❖ Winter day-degrees allow ‘first flight’ predictions
- ❖ Compare to previous 30+ years to predict timing and abundance of peaks
- ❖ Pan traps identify ‘local hotspots’

<i>M. persicae</i>	Dundee	Edinburgh
First catch in 2021	24-26 May	27 June
1st catch prediction 2021	26 June	23 June
Mean date of first Catch	13 June	14 June
Total catch to 31 July 2021	14	4
Predicted catch to 31 July 2021	12	11
Mean catch to 31 July	44	35





# Aphid predictions - 2-3 weeks early in 2022



# Rothamsted website – crop specific

← → ↻ 🏠 🔒 https://insectsurvey.com/aphid-bulletin

ROTHAMSTED RESEARCH Insect Survey

Welcome Aphid Data Moth Data Get Data Impact About Contact

## Aphid Bulletin: Crop

Select your crop

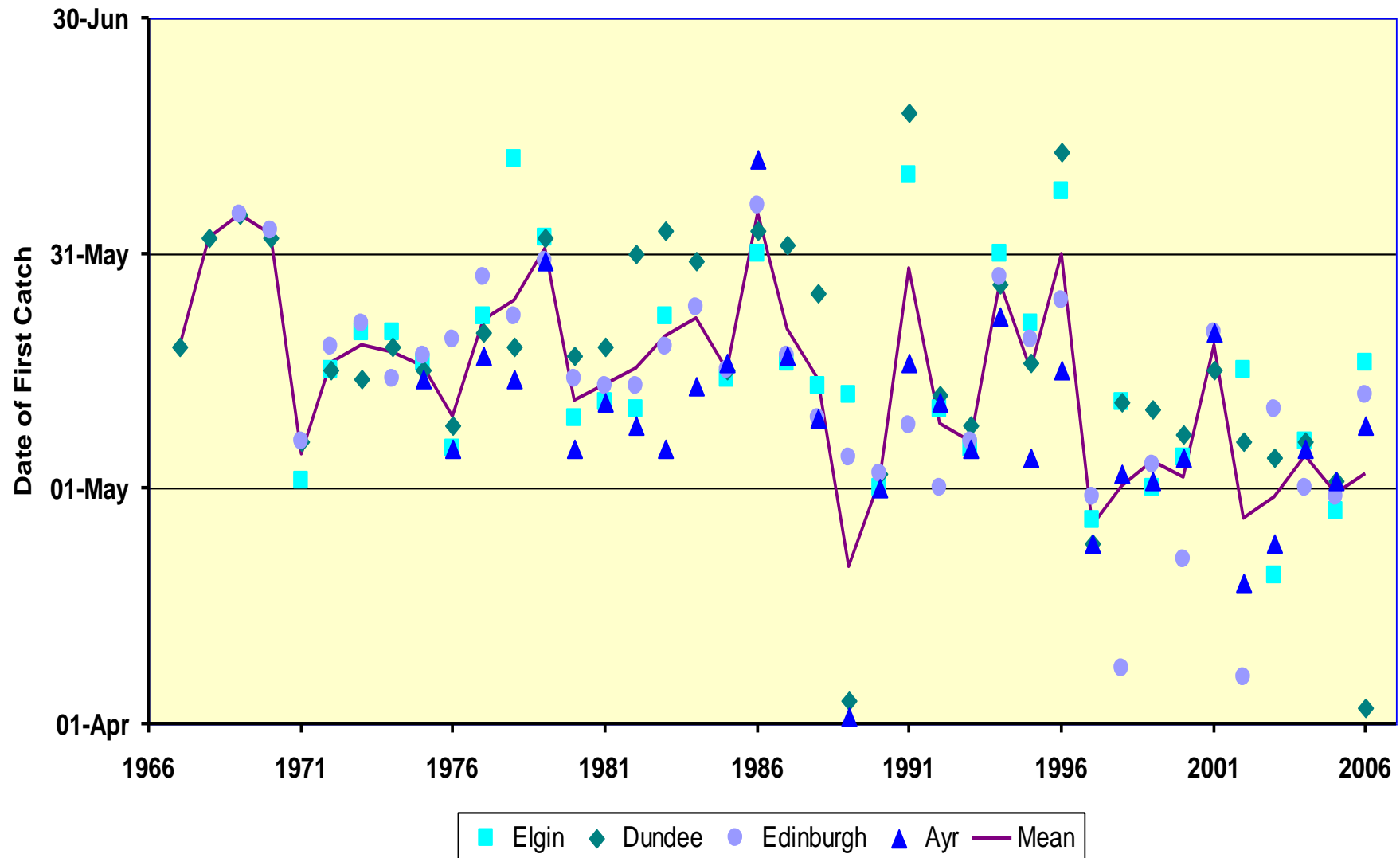
Scotland

1  
2  
3  
4

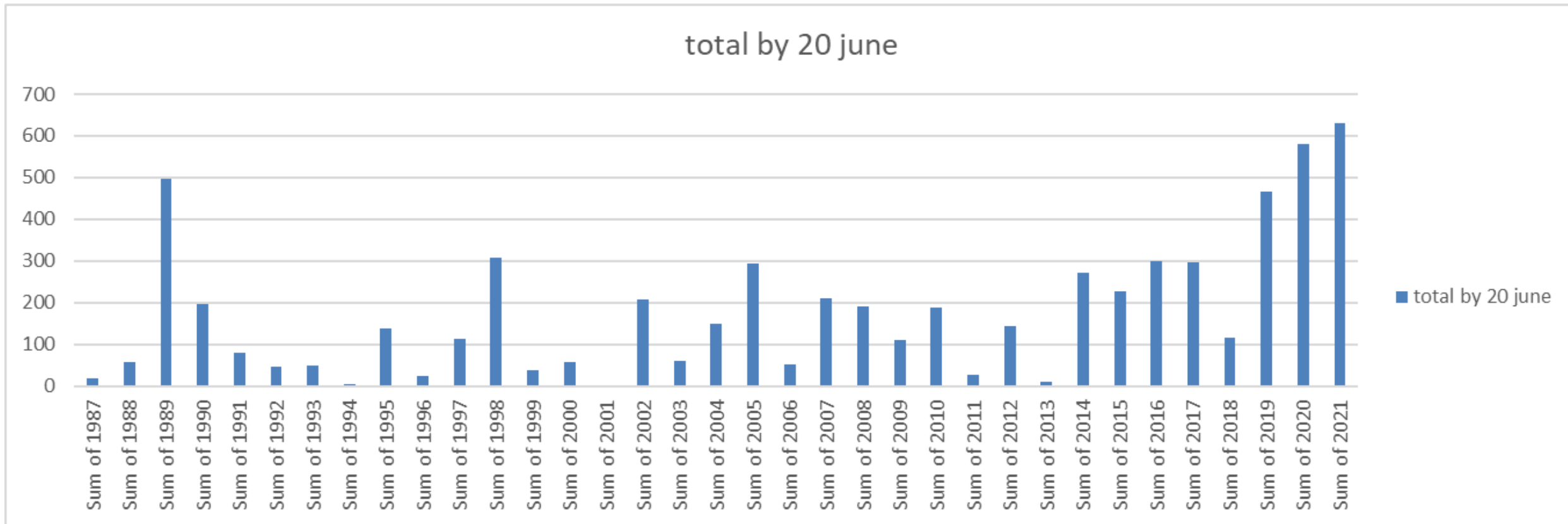
- Cereals
- OSR / other brassicas
- Potato
- Sugar beet
- Carrots
- Peas / beans
- Lettuce



# Green spruce aphid, *Elatobium abietinum*



# Willow-Carrot aphid *Cavariella aegopodii*





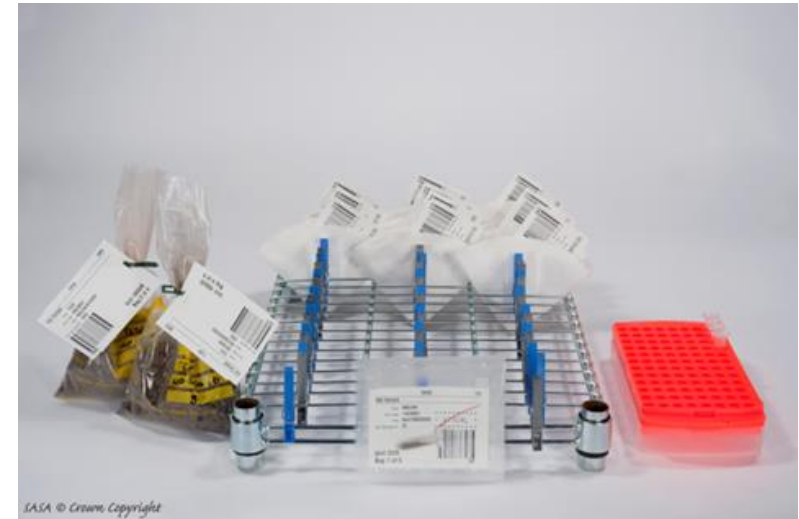
# Potato cyst nematode (PCN)



# EU directive 2007/33/EC

**Applies to seed potatoes – thus reducing the risk associated with the main means of spread of PCN**

- Came into force 1 July 2010
- All land to be used for seed production must test free from PCN
- Unified sampling rates for seed stipulated across EU
- Sampling rate has increased by over 2-fold (114% increase)
- Annual ware survey also undertaken
- Measures to control spread of PCN





# Sampling is low-tech



(mock samples from SASA farm)

Soil Test ID: 3355

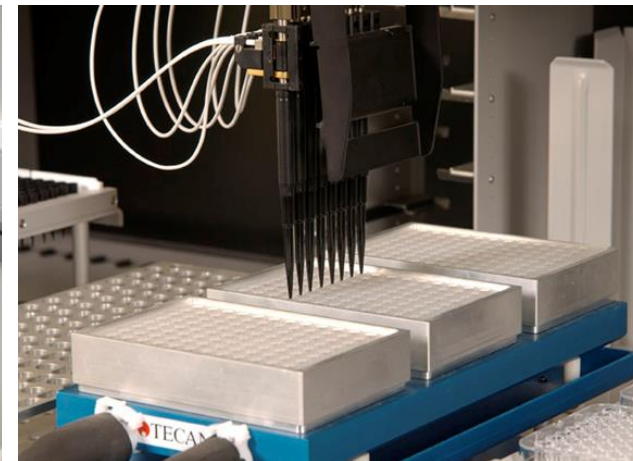
Applicant:	WSSF Potato Co Ltd	Occupier:	WSSF Potato Co Ltd
Address:	Roddinglaw Estate Edinburgh EH12 9FJ	Address:	Roddinglaw Estate Edinburgh EH12 9FJ
Work Phone:	0131 244 6348	Work Phone:	0131 244 6348
Work Phone:	0131 244 6349	Work Phone:	0131 244 6349
Farm Name:	RODDINGLAW ESTATE	Farm Code:	560/0009
FID:	NT/16466/70888	Field Area:	8.866ha
Last Cropped:	2001	Present Crop:	Grass
Year of Planting:	2014	Destination(s):	



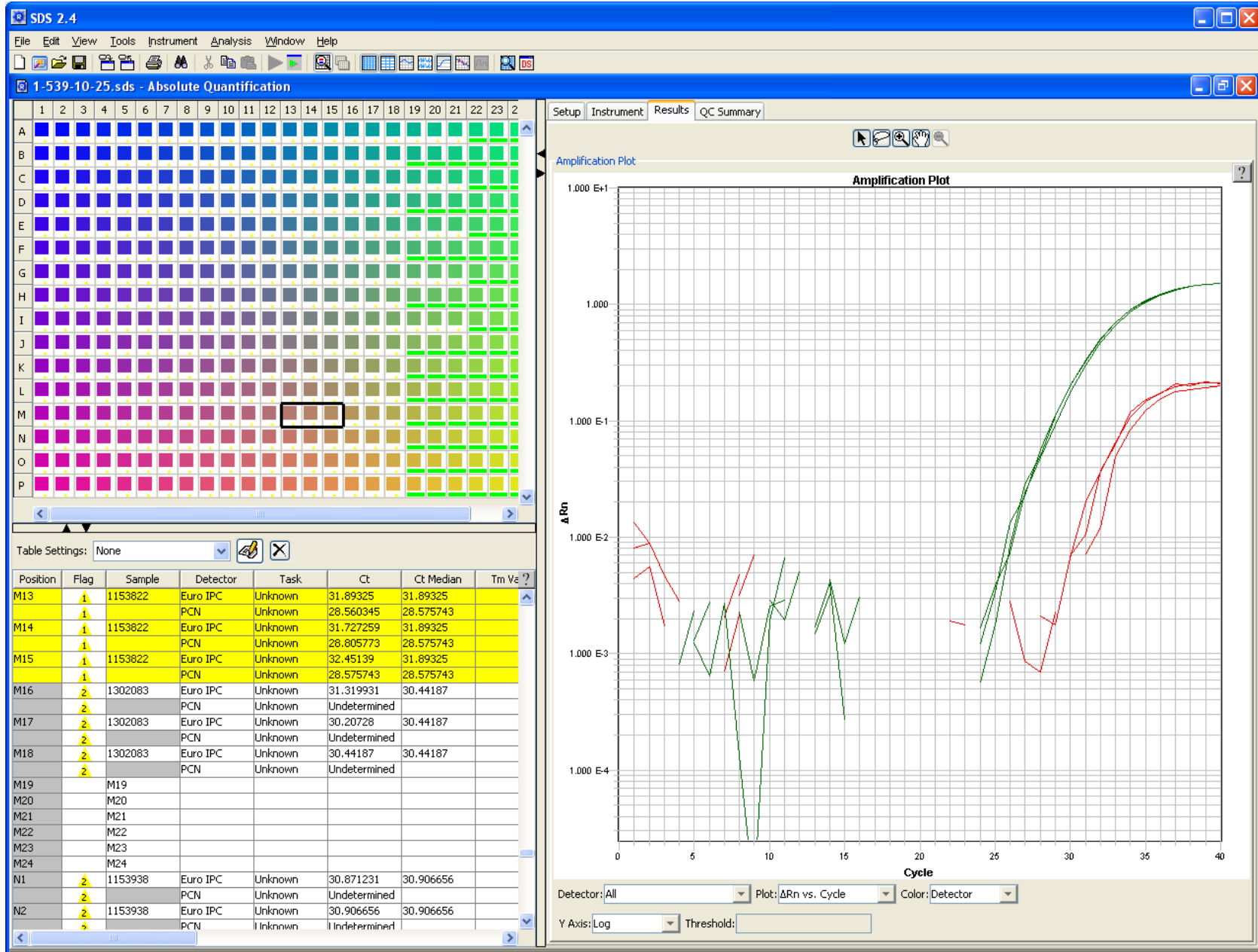
Sample Unit ID	Area	Rate Type	Analysis Type	Area Per Bag	No. of Bags	Corer
3355/A	4ha	Lower	PCR	1ha	4	Small
3355/B	4.9ha	Lower	PCR	0.98ha	5	Small



# Analysis is higher tech

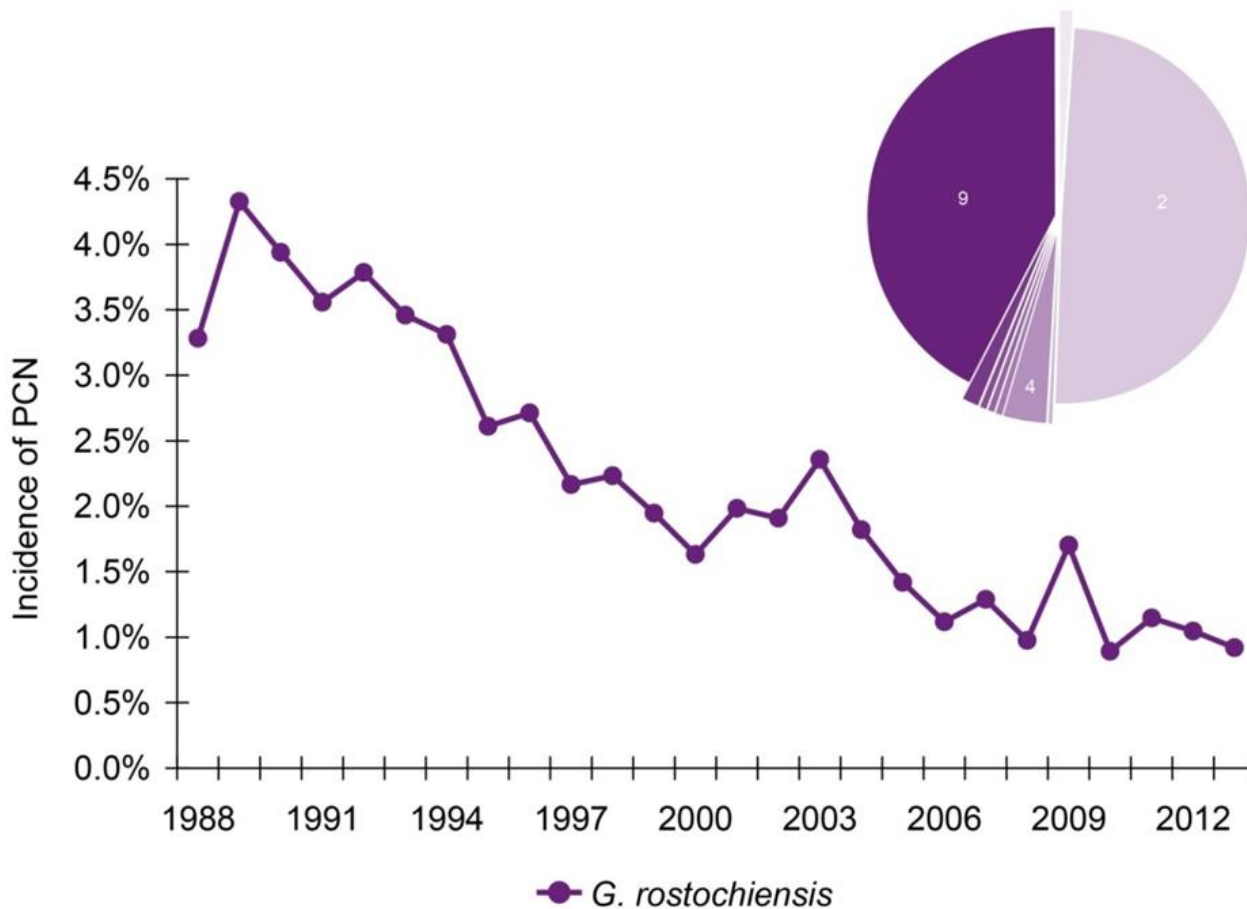






# *G. rostochiensis*: incidence and resistant varieties

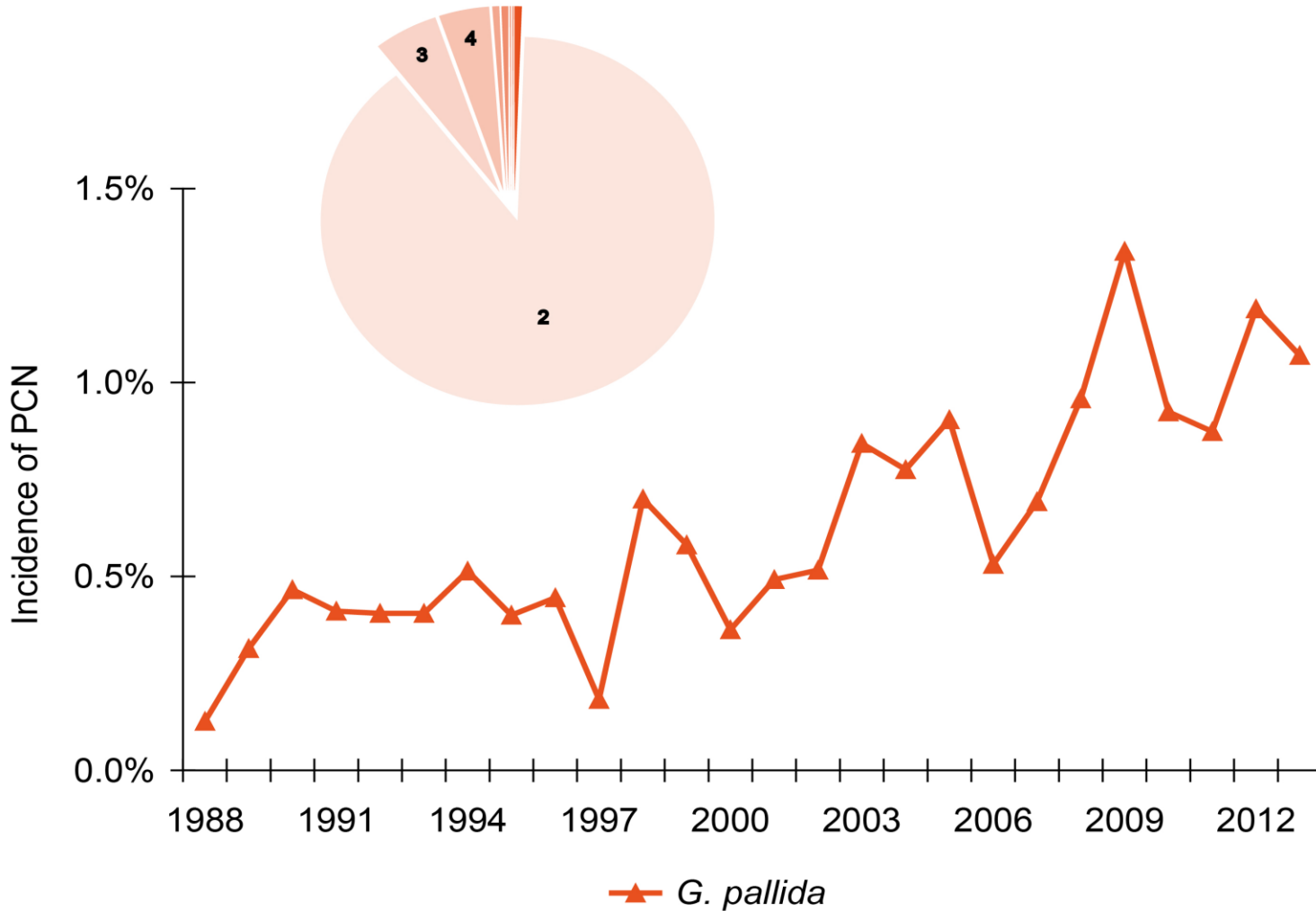
43% of crops have no resistance to *G. rostochiensis*



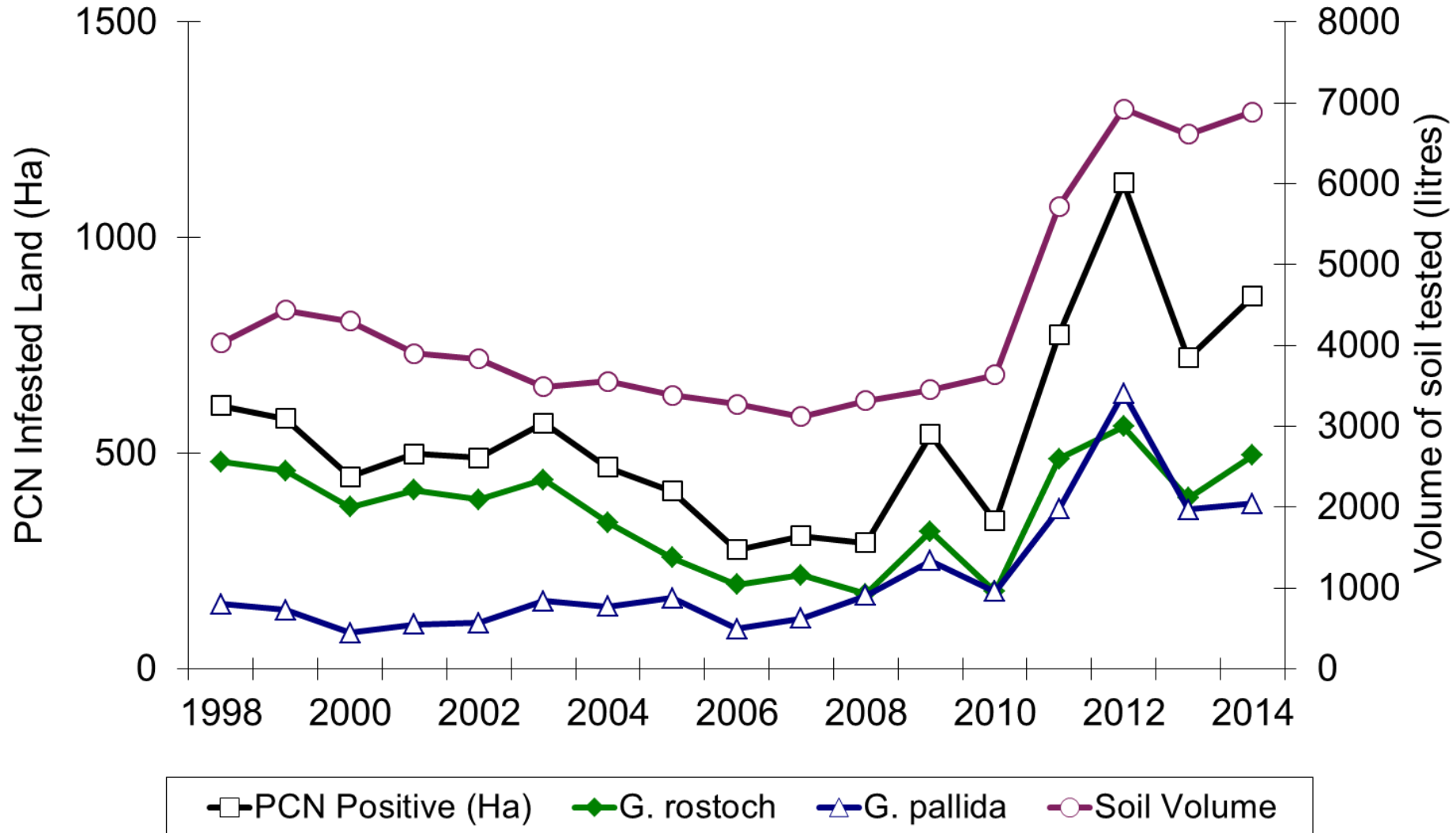


# *G. pallida*: incidence and resistant varieties

84% of crops have no resistance to *G. pallida*



# Impact: Seed Land testing positive for PCN





# PCN working group recommendations

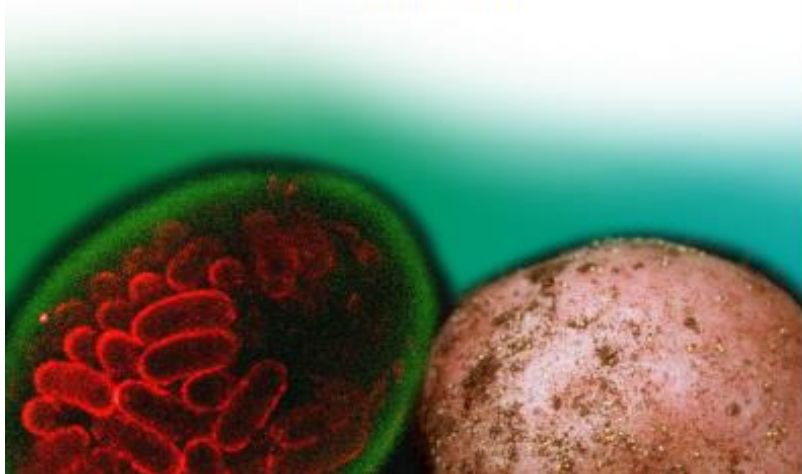


Scottish Government  
Riaghaltas na h-Alba  
gov.scot

## **Potato Cyst Nematode (PCN) and the future of potato production in Scotland**

Report of the Scottish PCN Working Group

November 2020



- Increase capability and motivation to implement change
- Preserve the land base for future generations
- Control the epidemic
- Recognise the investment needed to tackle the PCN problem

# Acknowledgements:

SASA Zoology team

Scottish Government Agricultural Inspectors

Rothamsted Insect Survey

Larissa Collins and FERA team

And thank you for inviting me!

**SASA**

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