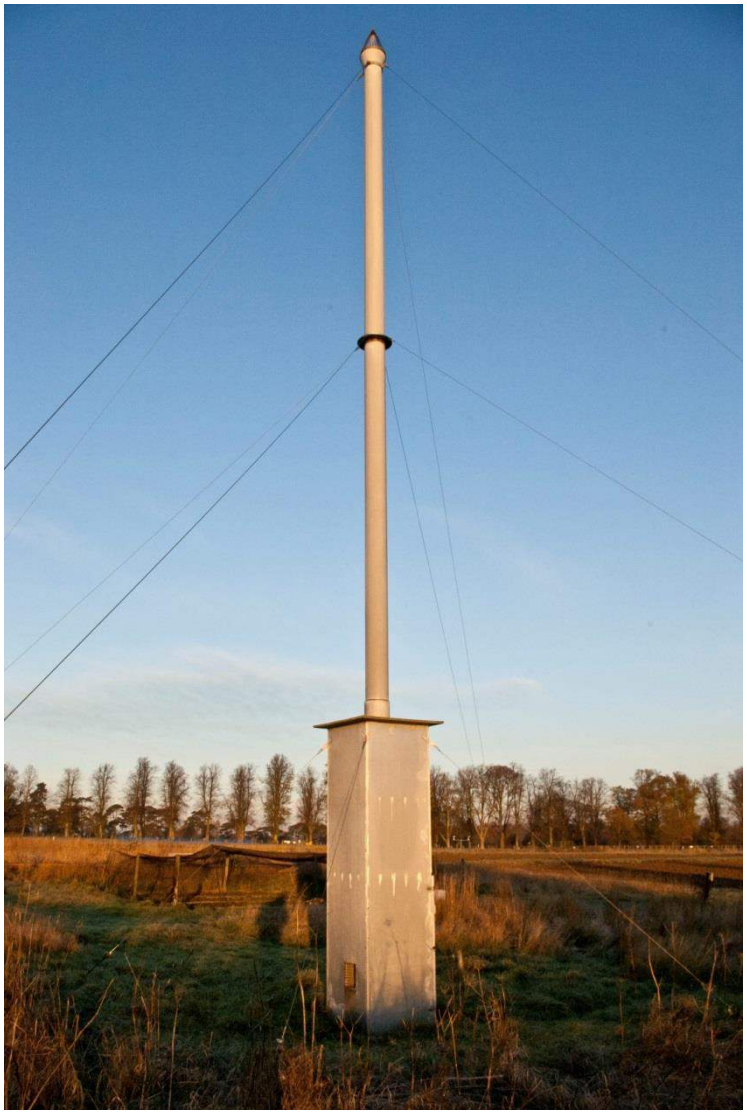
Rothamsted Research
where knowledge grows



OLD TRAPS, NEW TRICKS

Richard Harrington

BBSRC 20 Years of Pioneering Great British Bioscience

ROTHAMSTED RESEARCH

Rothamsted Research

where knowledge grows

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ROTHAMSTED RESEARCH

The UK suction-trap network today

Weather and climate change

New species, new problems

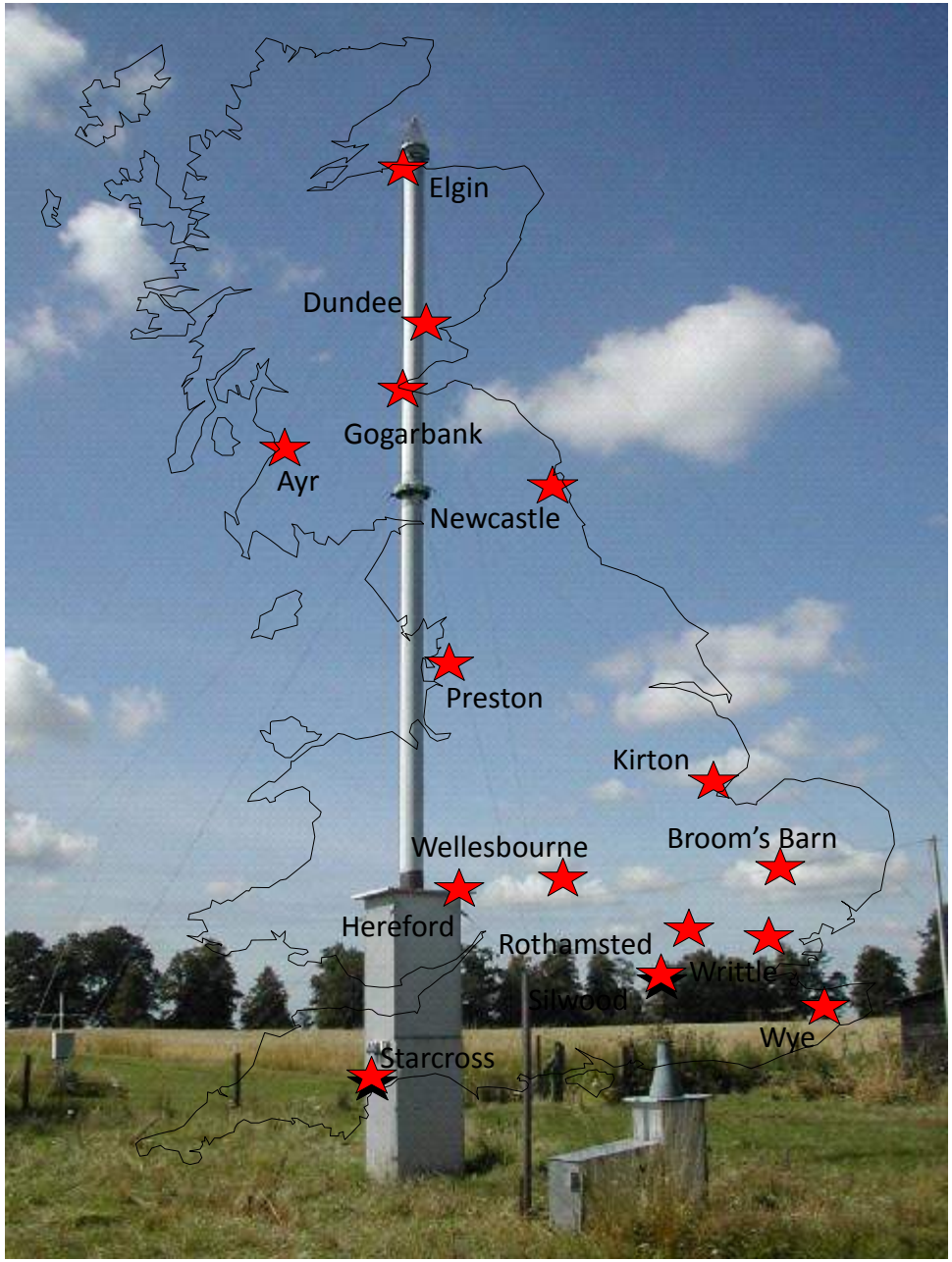
Below the species

The international dimension

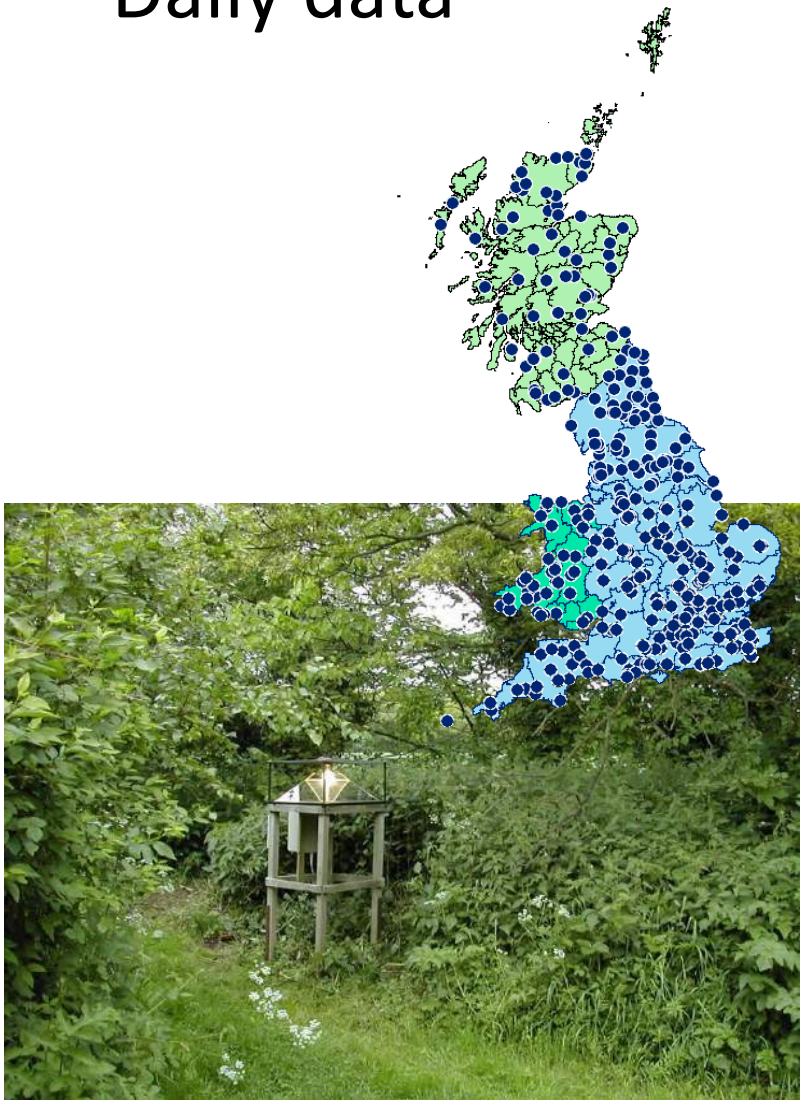
Not just aphids

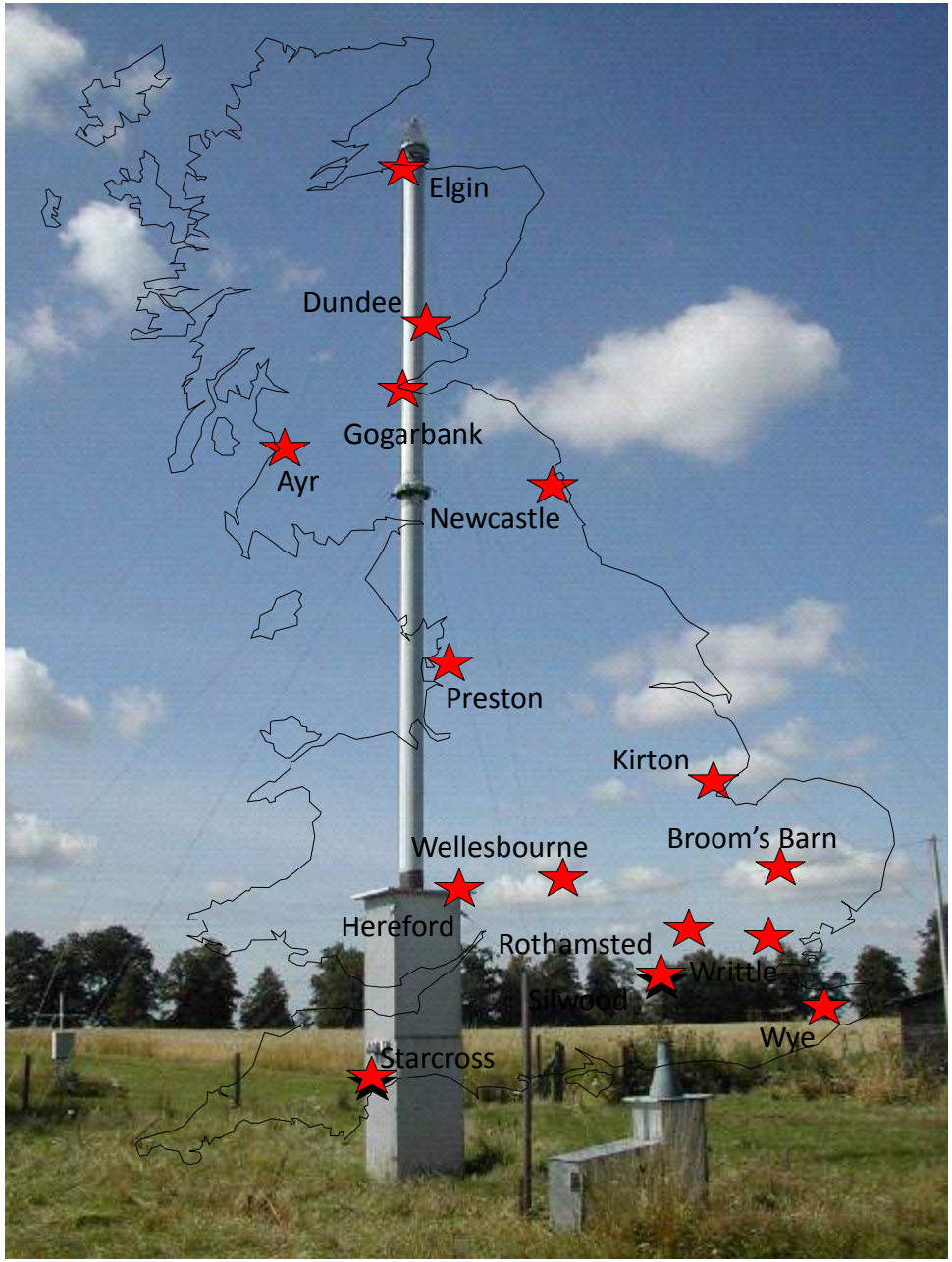
The double whammy

THE SUCTION-TRAP NETWORK TODAY

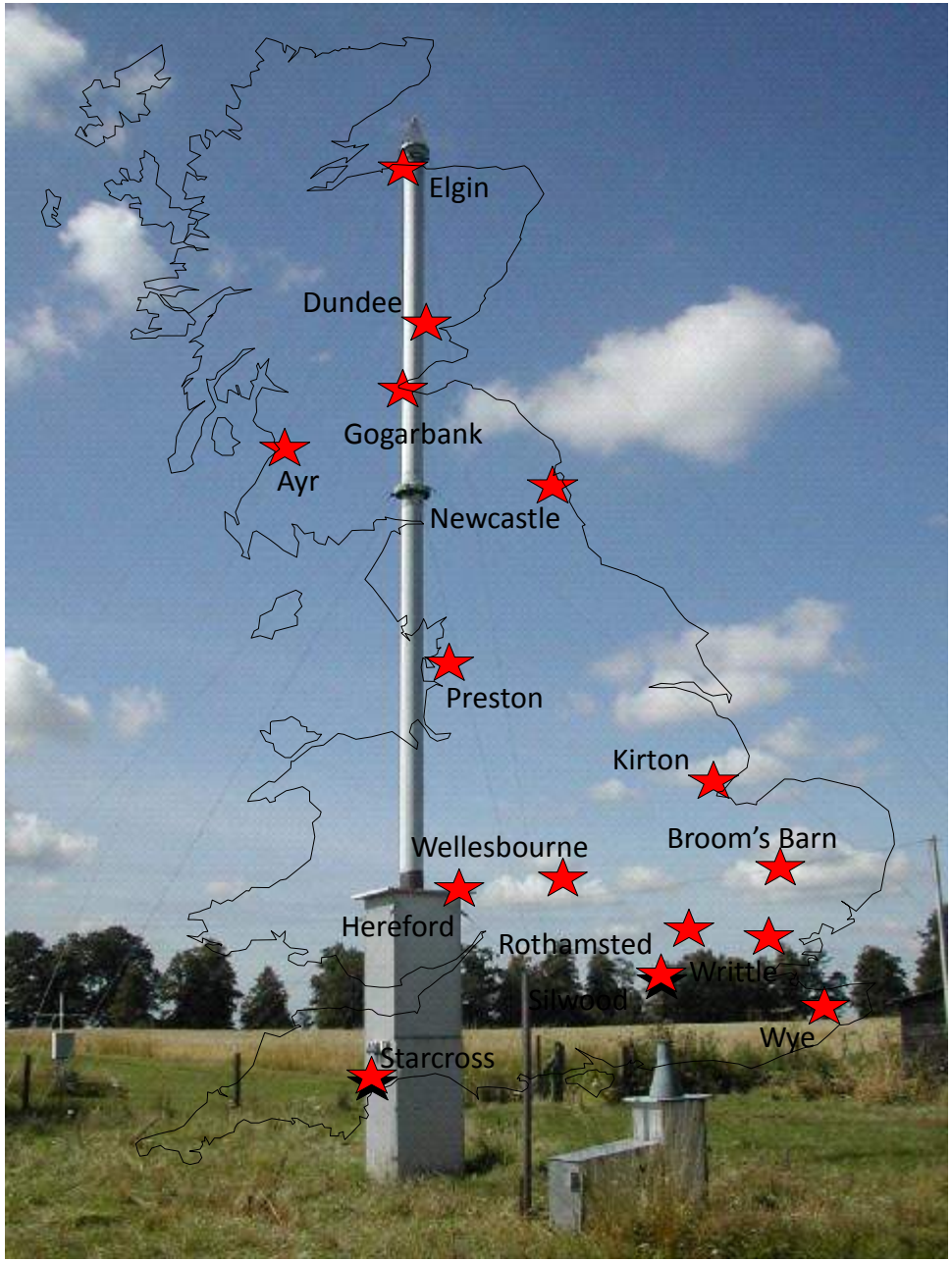


1964 – 2014+
Daily data

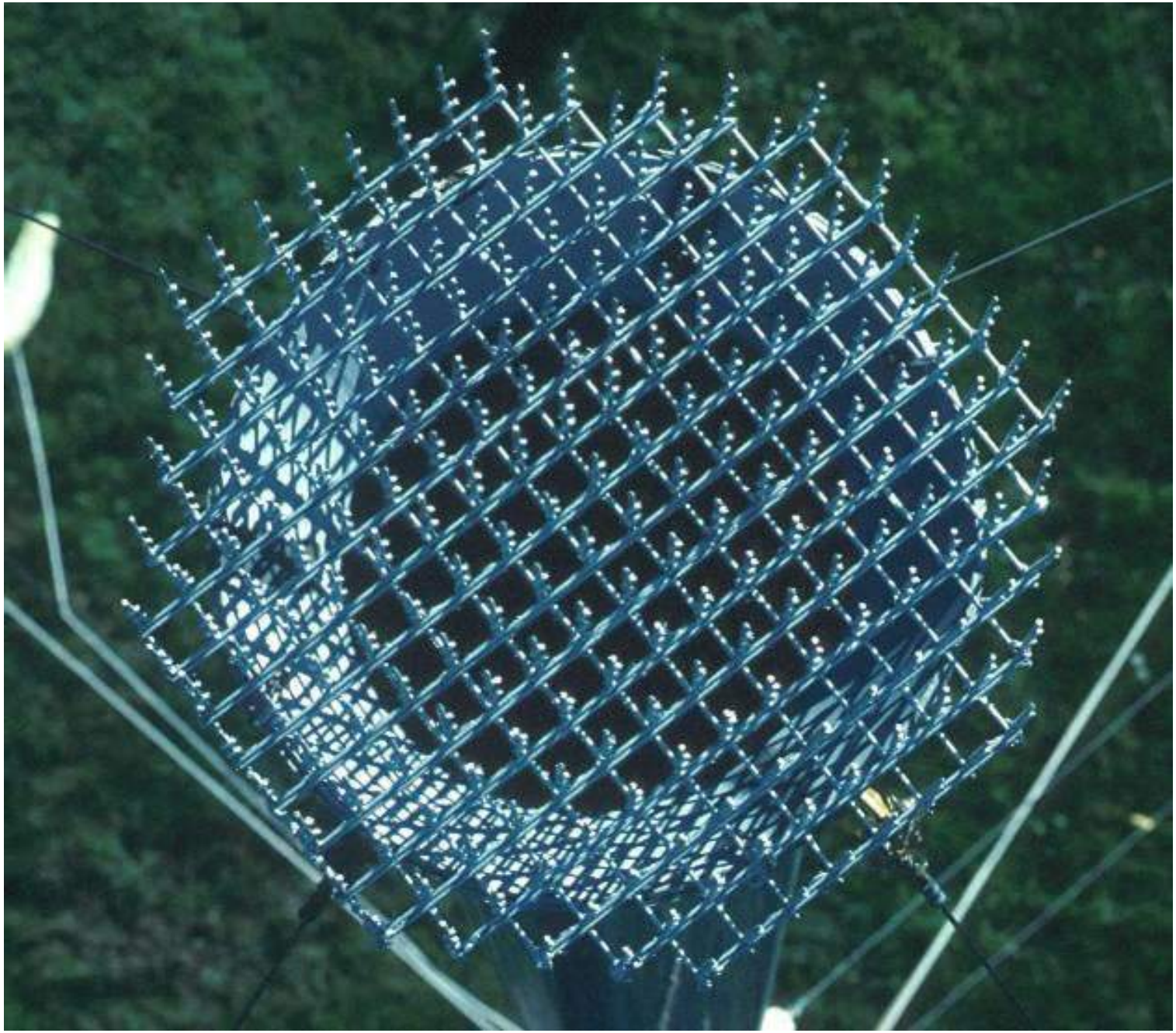




Unchanged since 1964



Unchanged since 1964



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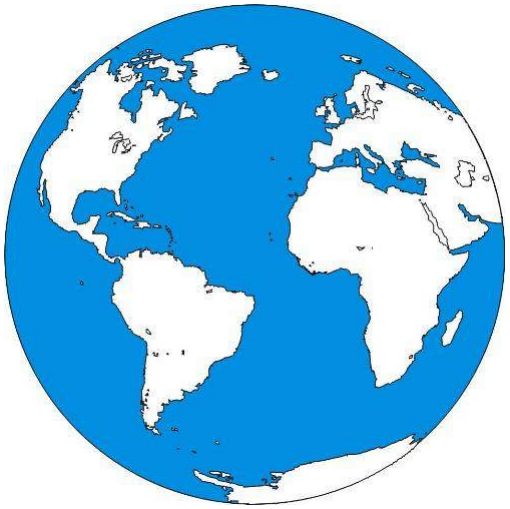
4700 Species



600 Species


Myzus ascalonicus
Myzus cymbalariellus
(1)
(2)
Myzus ligustri
Myzus persicae
Myzus certus

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ROTHAMSTED RESEARCH

APHID BULLETIN 2013

BBSRC bioscience for the future

Bulletin No: 8 Date: 10 June - 16 June

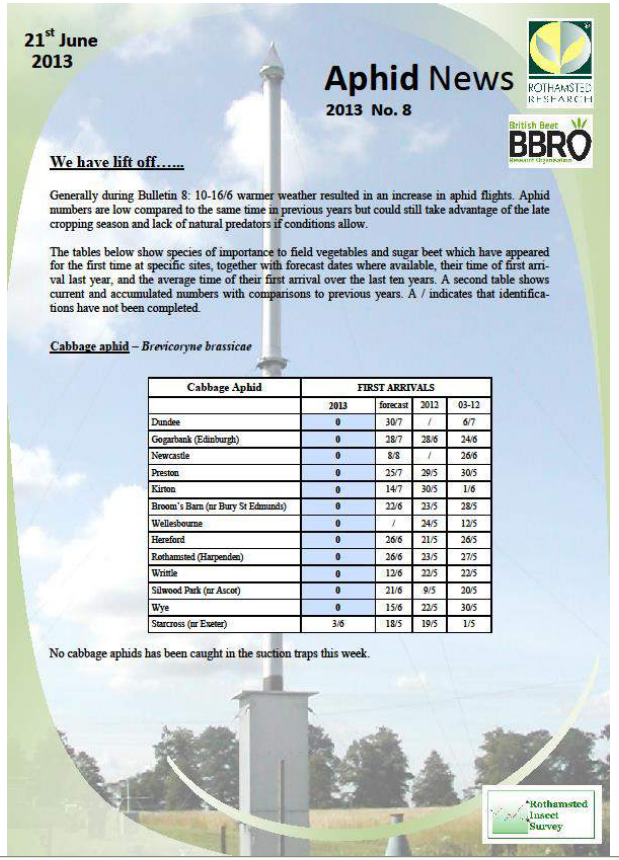
Rothamsted Insect Survey, Department of AgroEcology, Rothamsted Research,
Harpenden, Hertfordshire, AL5 2JQ, United Kingdom

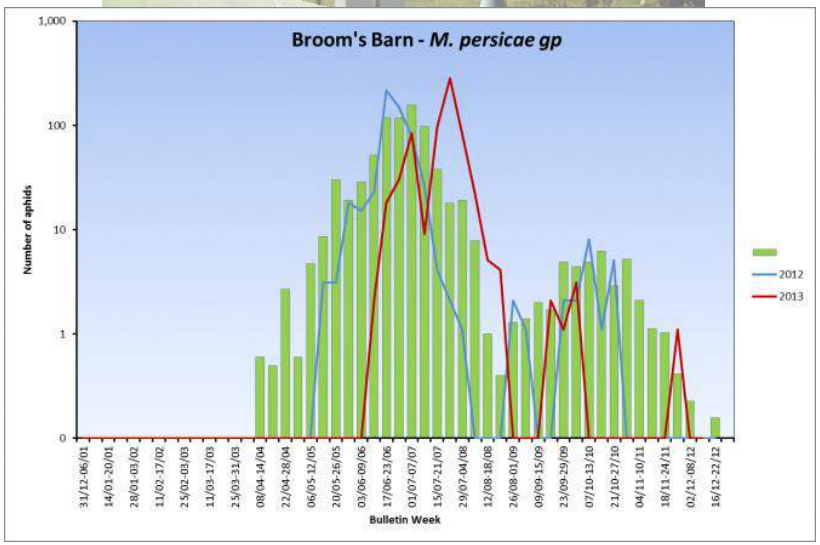
Askham Bryan is not operating at present.

	EI	D	G	Ay	N	AB	P	K	BB	We	H	RT	Wr	SP	W	SX
Days	7	4	7	7	7		7	7	7	7	7	7	7	7	7	7
Part Catches																
A. pisum												1	1			2
A. fabae gp.													1	1		1
A. solani							7								1	2
B. helichrysi		1	2	5	5		20	81	313	142	90	54	80	17	43	31
B. brassicae																
C. aegopodii		2	1	2	2		138	25	183	18	56	26	35	9	8	19
D. platanoidis				21			477	152	56	37	7	92	71	28	17	14
E. abietinum	3	4	9		36		118	1			3	1			1	3
H. pruni													1			1
H. lactucae							2								1	2
M. euphorbiae					1		3		1			2	1			3
M. dirhodum	1		7	1			14		3	3	7	3	3		4	10
M. ascalonicus	1		1	2	2		4		1		1		1	1	2	
M. persicae gp								2	2				2		7	
N. ribisnigri												2				
P. humuli							1	7	15	22	102	3	36	1	5	16
R. insertum	1	2	1	4	7		13			7	7	1				3
R. maidis																
R. padi	1	1					2	4	1		3	6		1	2	10
S. avenae							2	5		1			1	1	2	1
S. fragariae			1	1			1	5	14	6	9	7	16	6	10	37

The Rothamsted Insect Survey is a BBSRC supported National Capability
with additional support from the Lawes Agricultural Trust, the BBRO, AHDB-HGCA and others.
Any enquiries should be directed to Dr Richard Harrington
(richard.harrington@rothamsted.ac.uk; 01582 763133 ext. 2452)

Rothamsted Insect Survey





www.rothamsted.ac.uk/insect-survey

Rothamsted Research

where knowledge grows

WEATHER AND CLIMATE CHANGE

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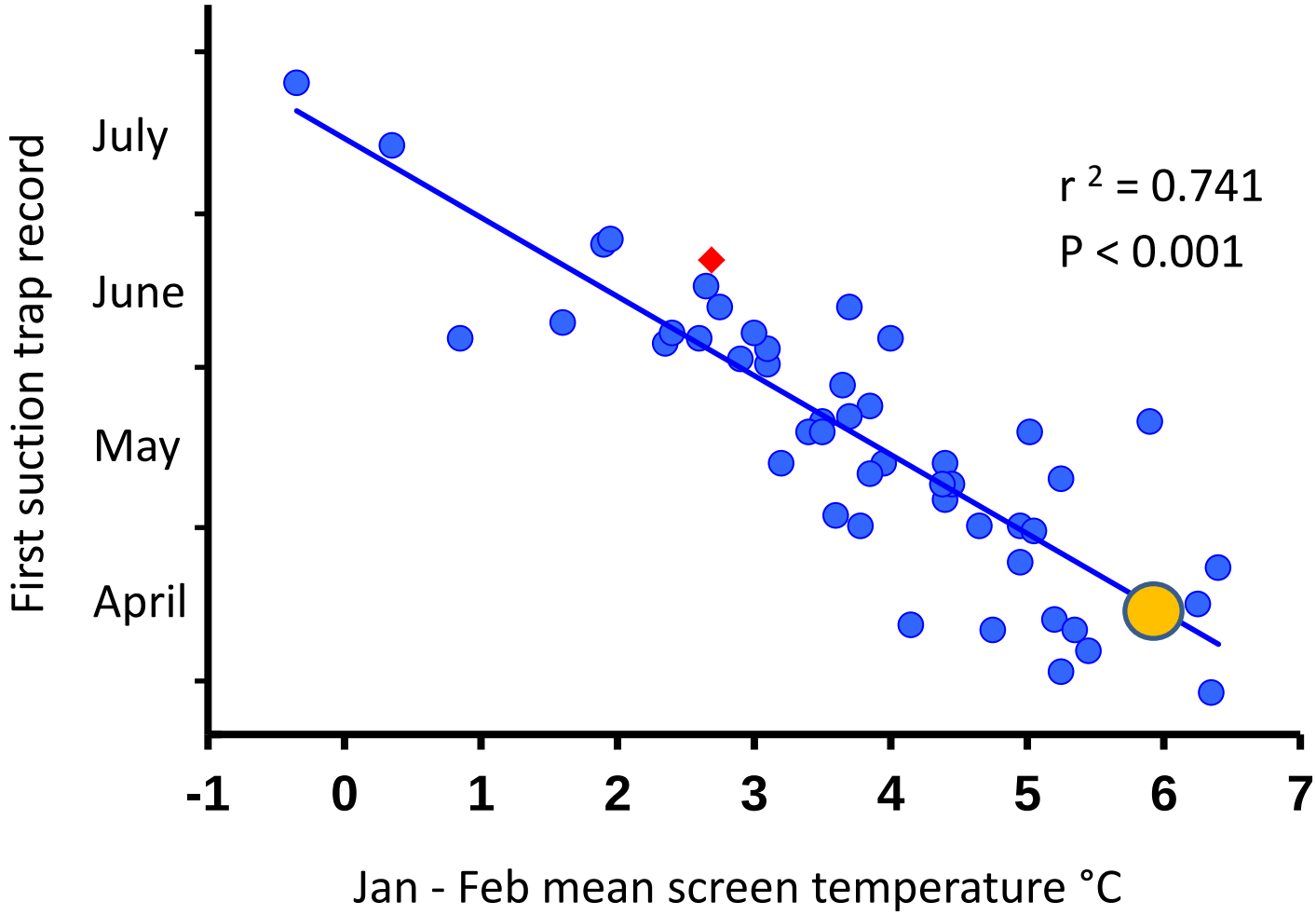
ROTHAMSTED RESEARCH

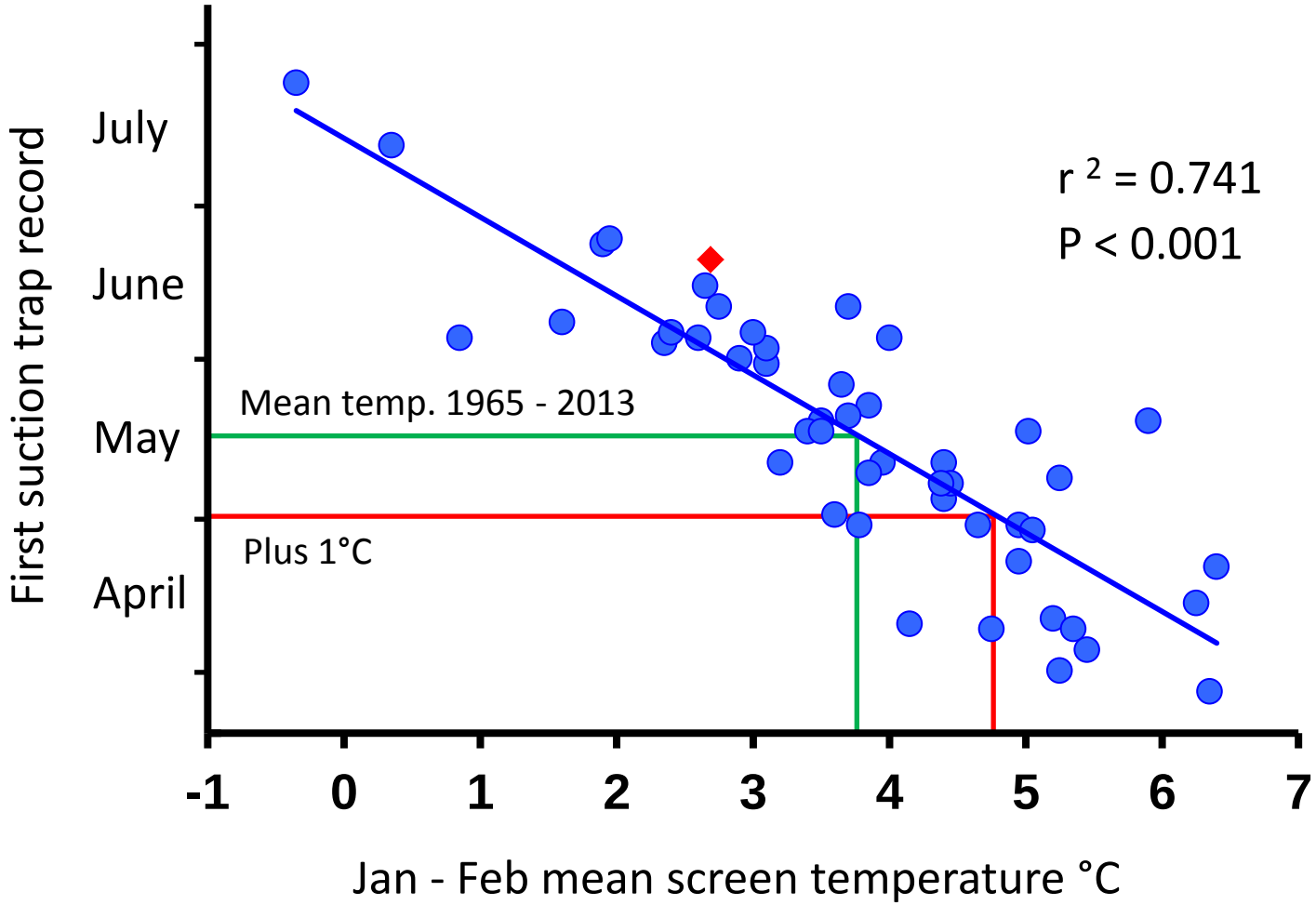
Peach–potato aphid at Rothamsted 1965 - 2013

(2013 is shown in red)



Peach–potato aphid at Rothamsted 1965 - 2013

(2013 is shown in red)



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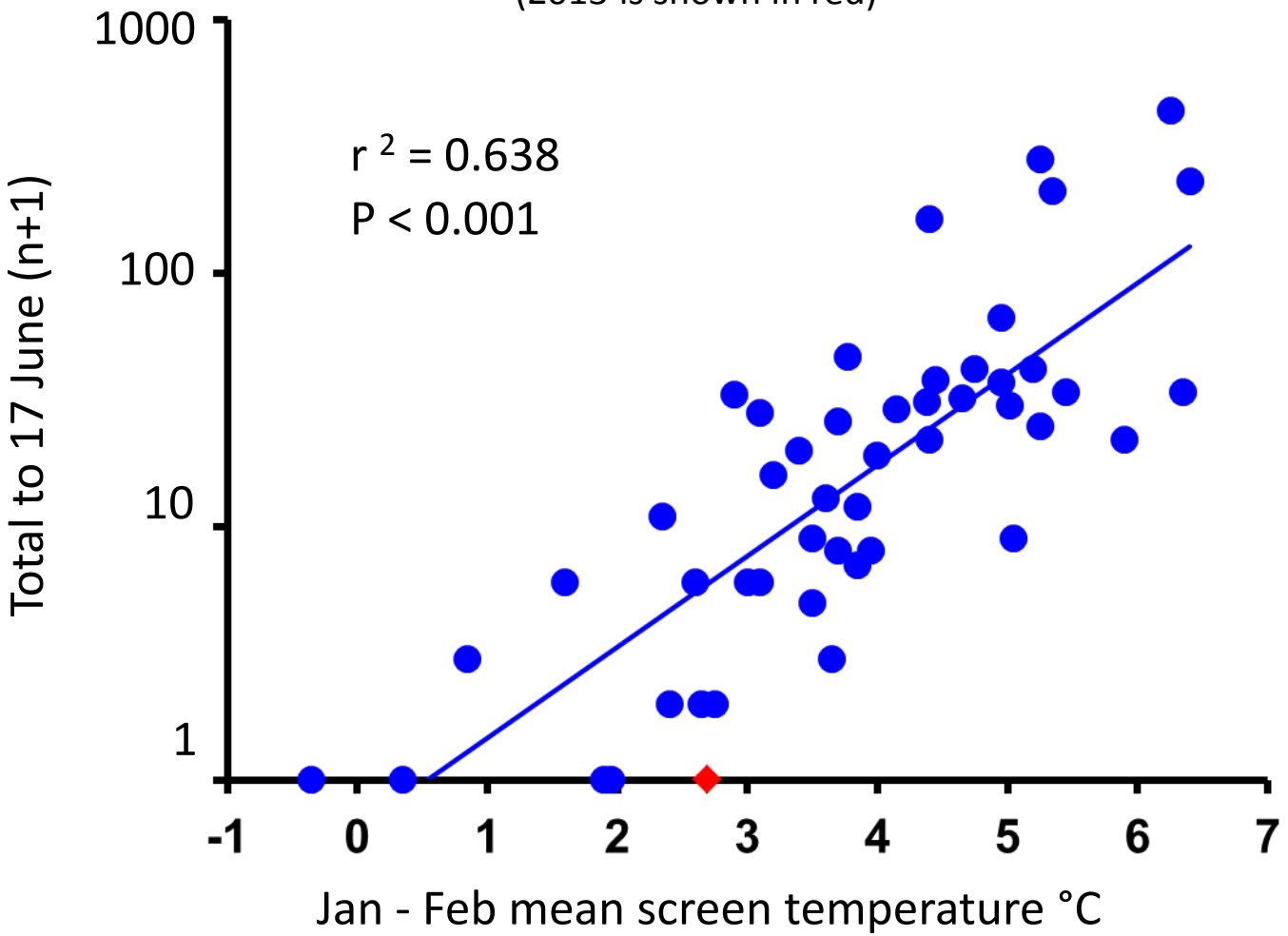
Peach–potato aphid at Rothamsted 1965 - 2013

(2013 is shown in red)



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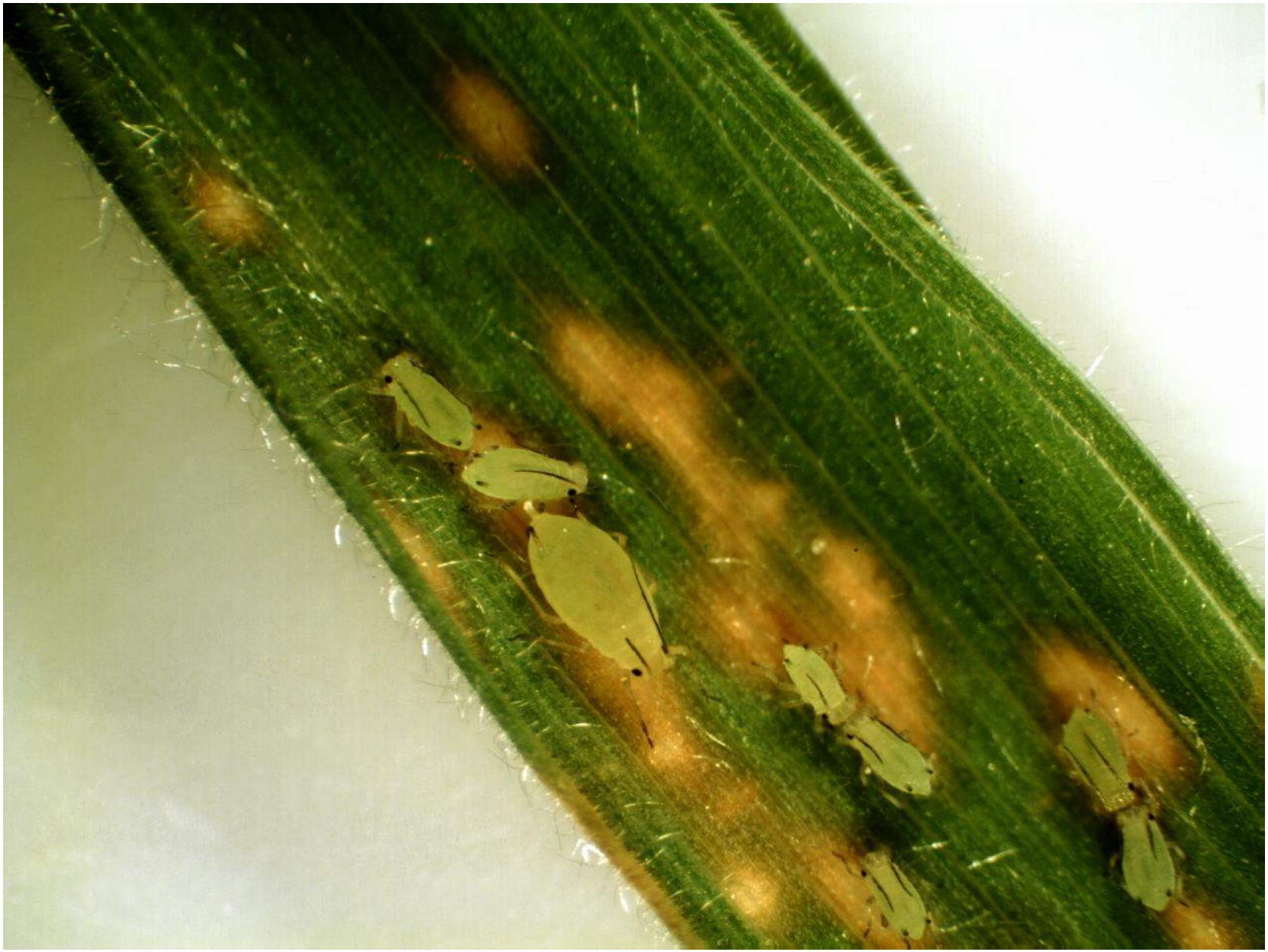
NEW SPECIES, NEW PROBLEMS



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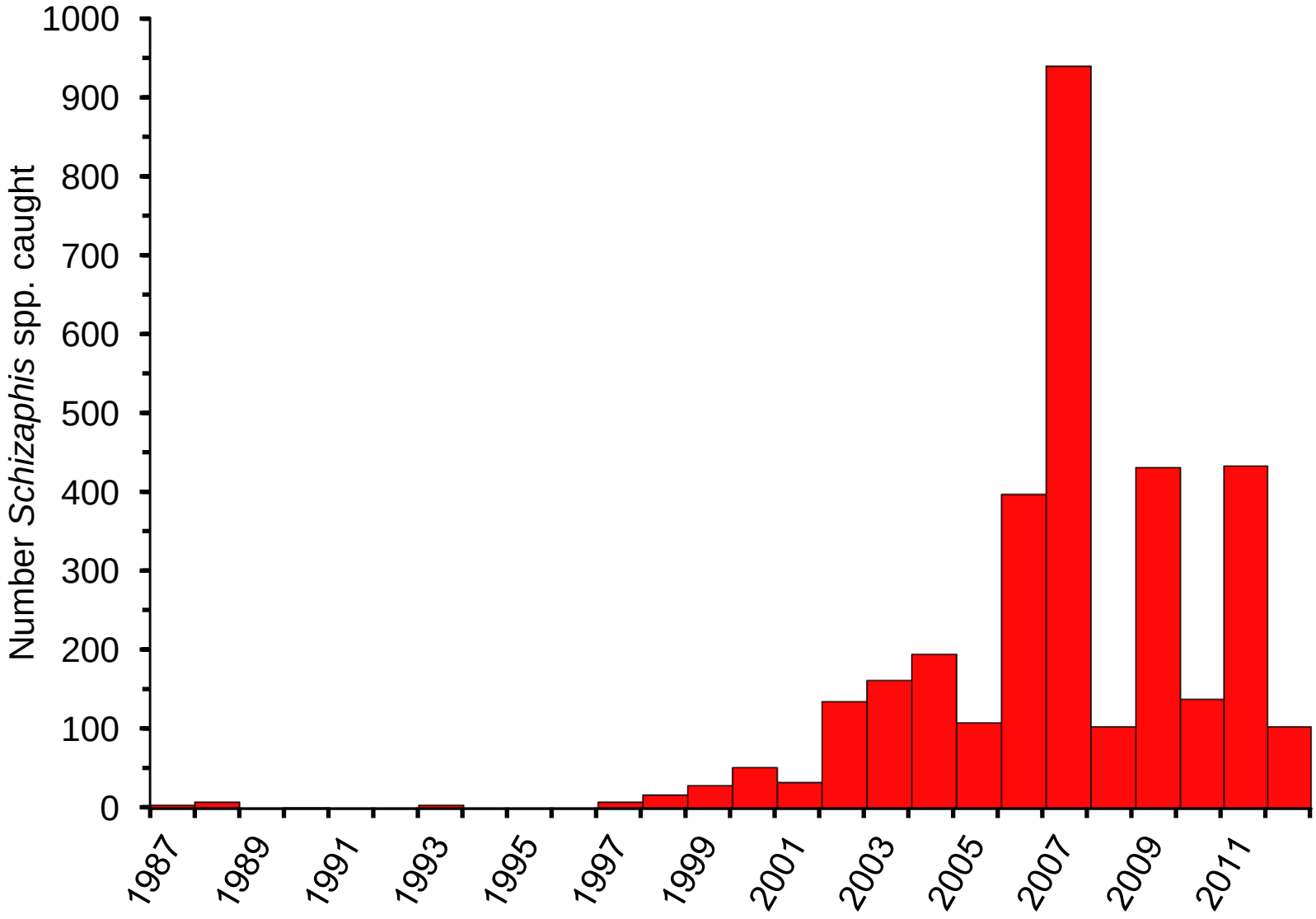
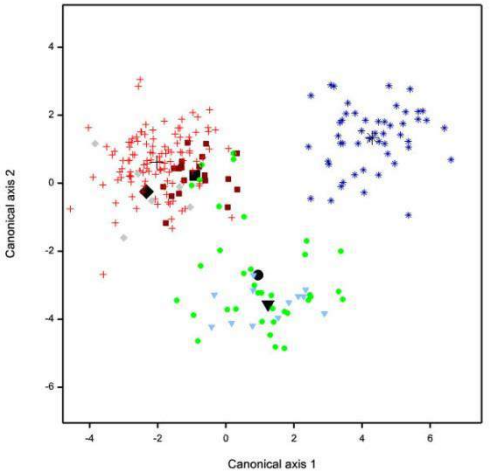
ROTHAMSTED RESEARCH

Schizaphis spp. in UK suction-traps

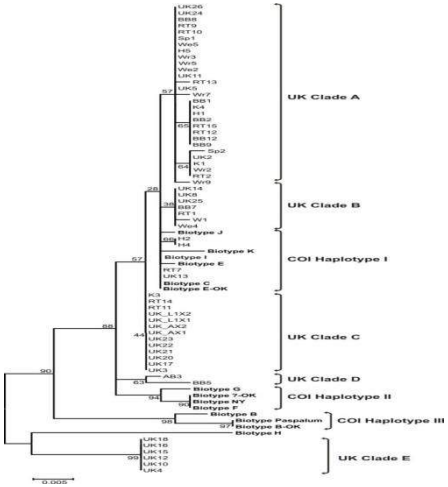


Lab experiments

Morphometrics



Molecular markers



Suggest *Schizaphis agrostis* and *Schizaphis holci*

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BELOW THE SPECIES

Grain aphid, some pyrethroid control failure noticed since Summer 2011

Photo: Alan Dewar

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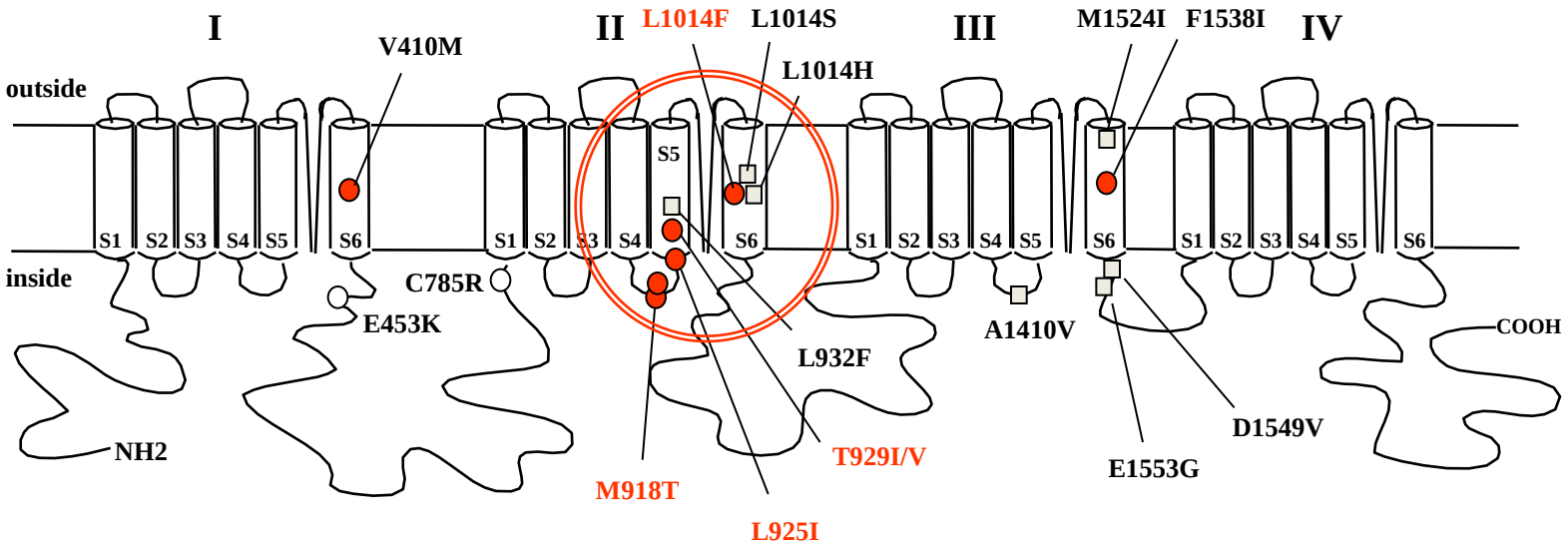
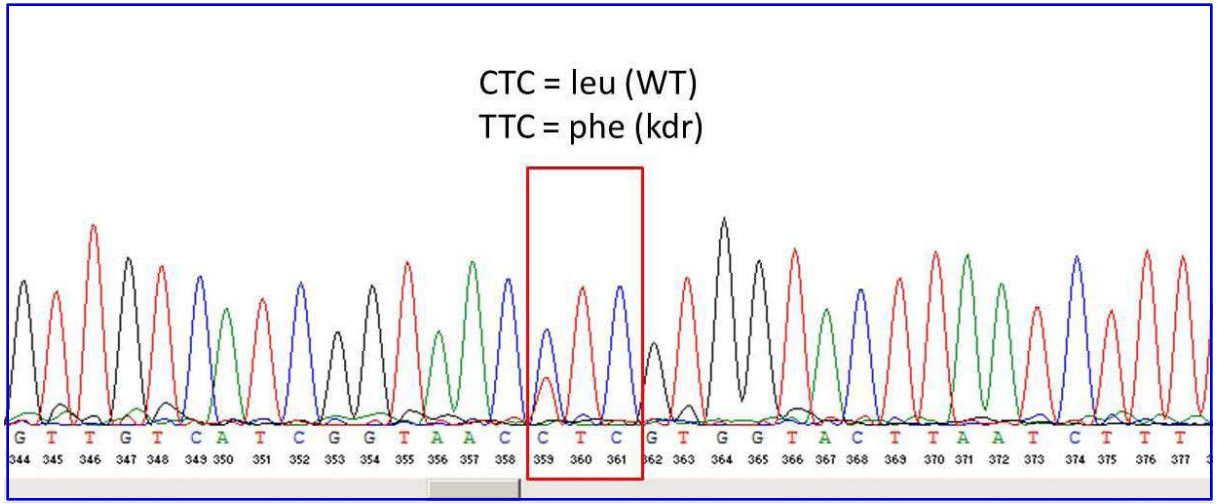
Sodium channel - mutations implicated in pyrethroid resistance





Grain aphid sample contains kdr mutation, L1014F

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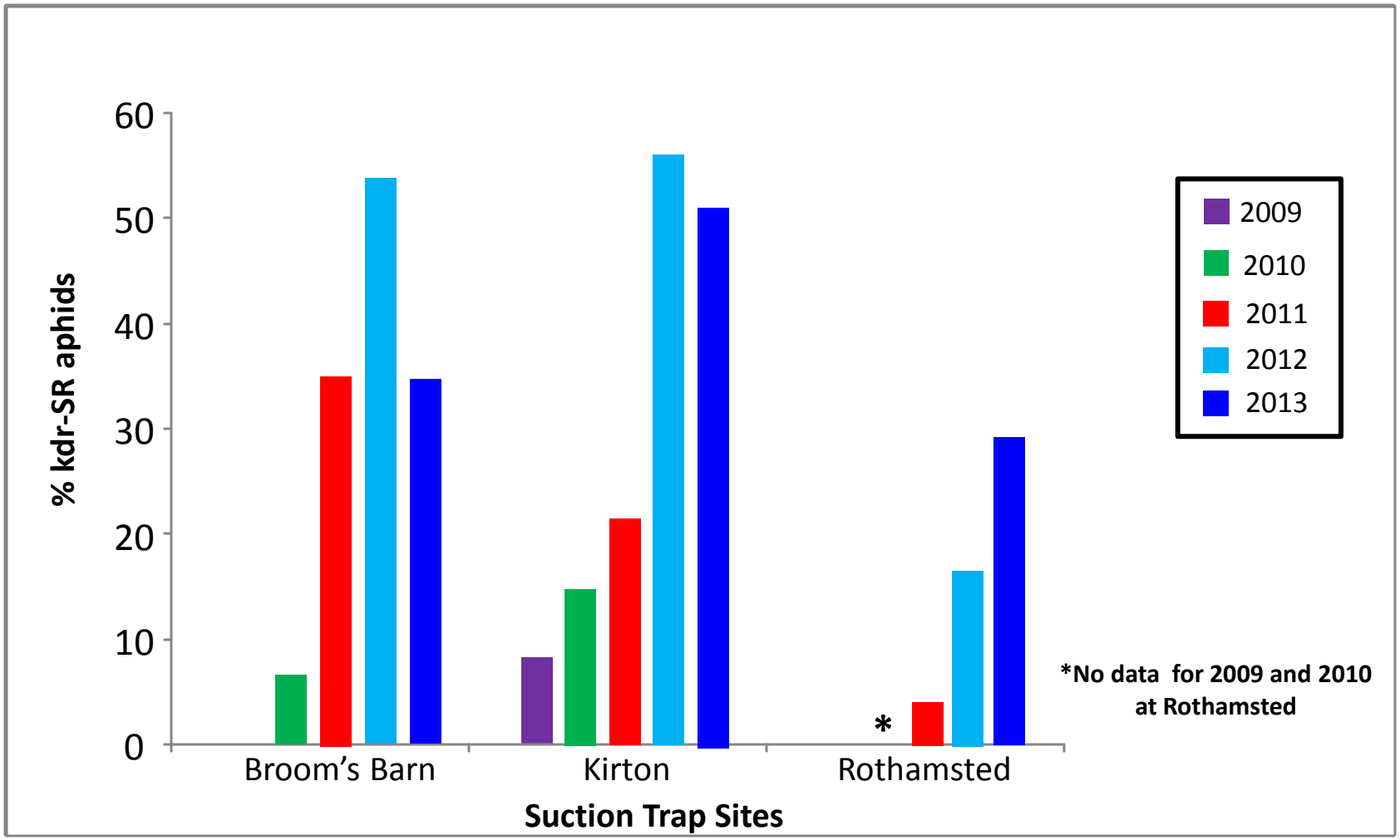
Frequency of resistant Grain aphid in three suction-traps (2009-2013)



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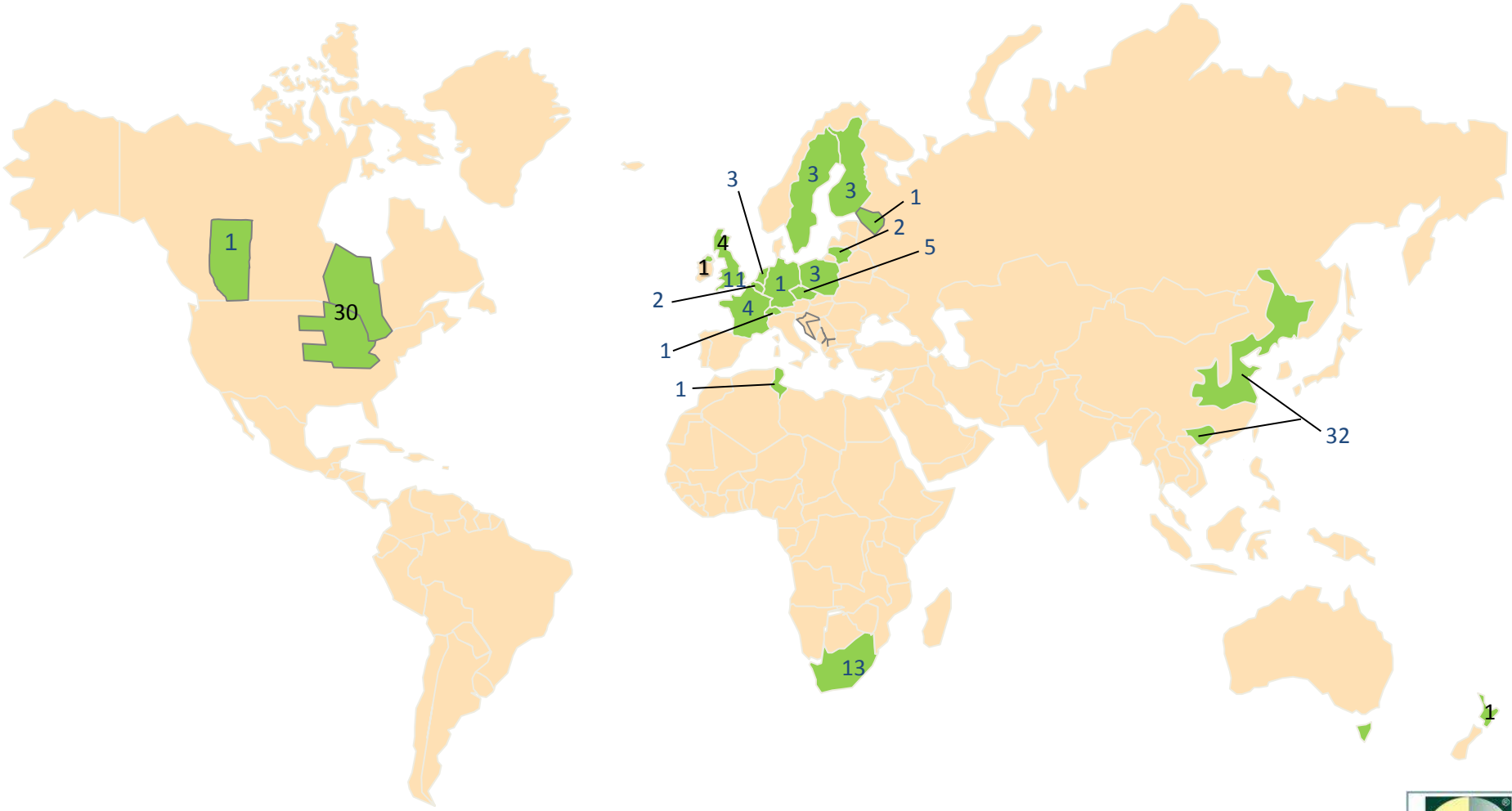
THE INTERNATIONAL DIMENSION

Suction-traps 2014



122 known sites in 18 countries

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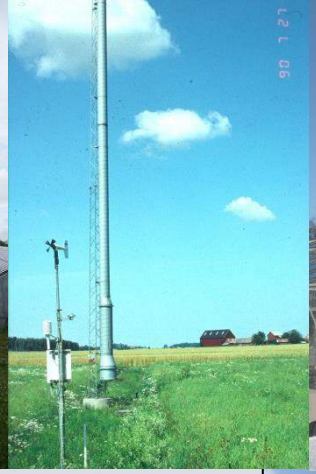



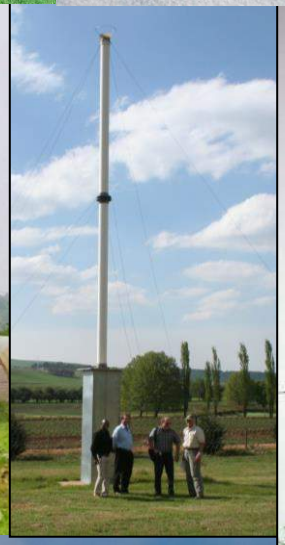


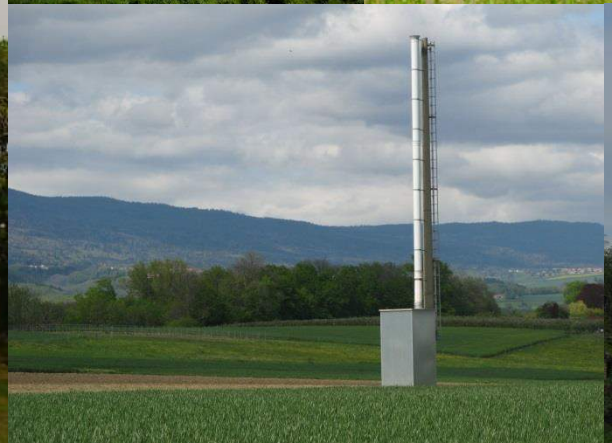


NOT JUST APHIDS

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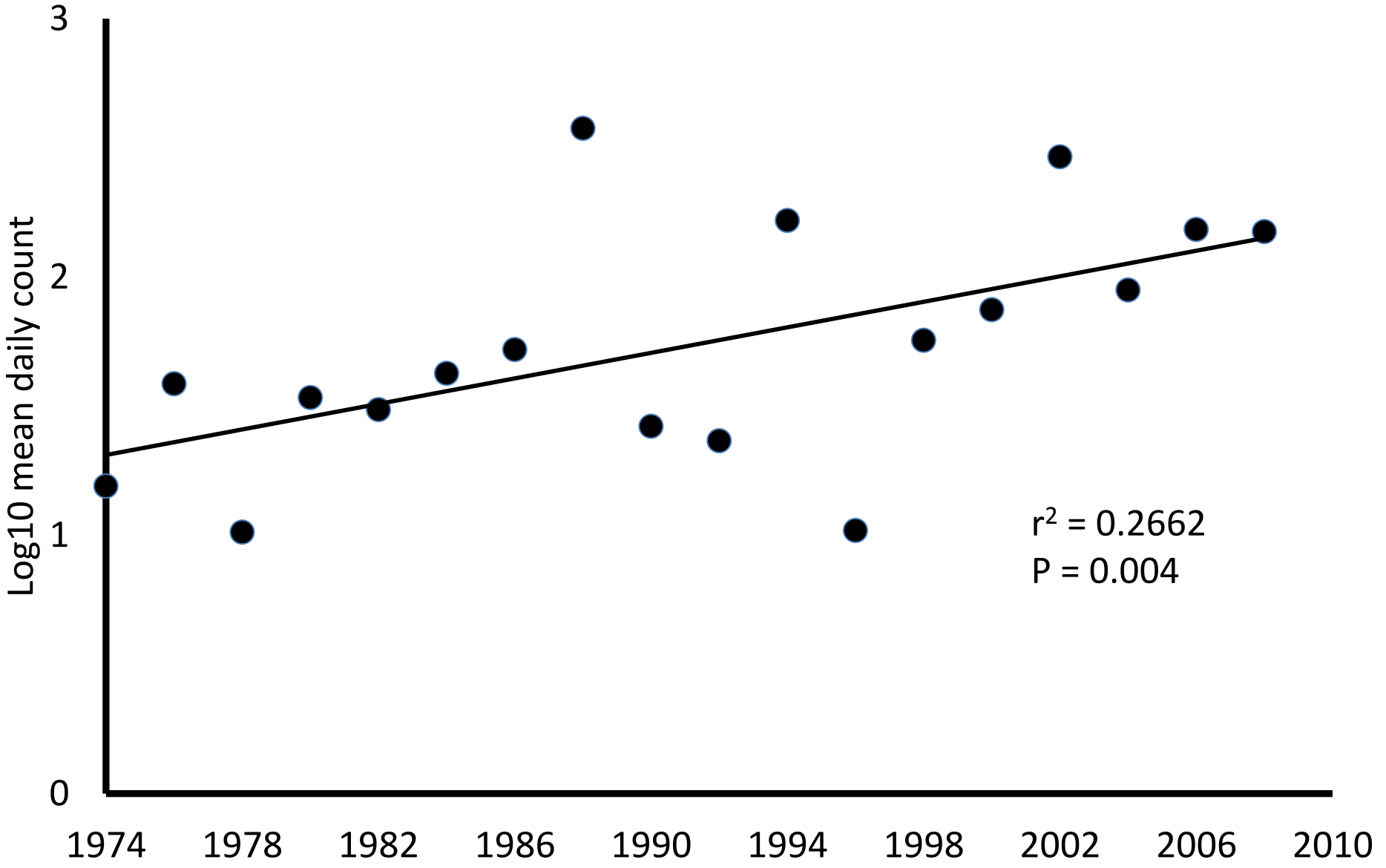
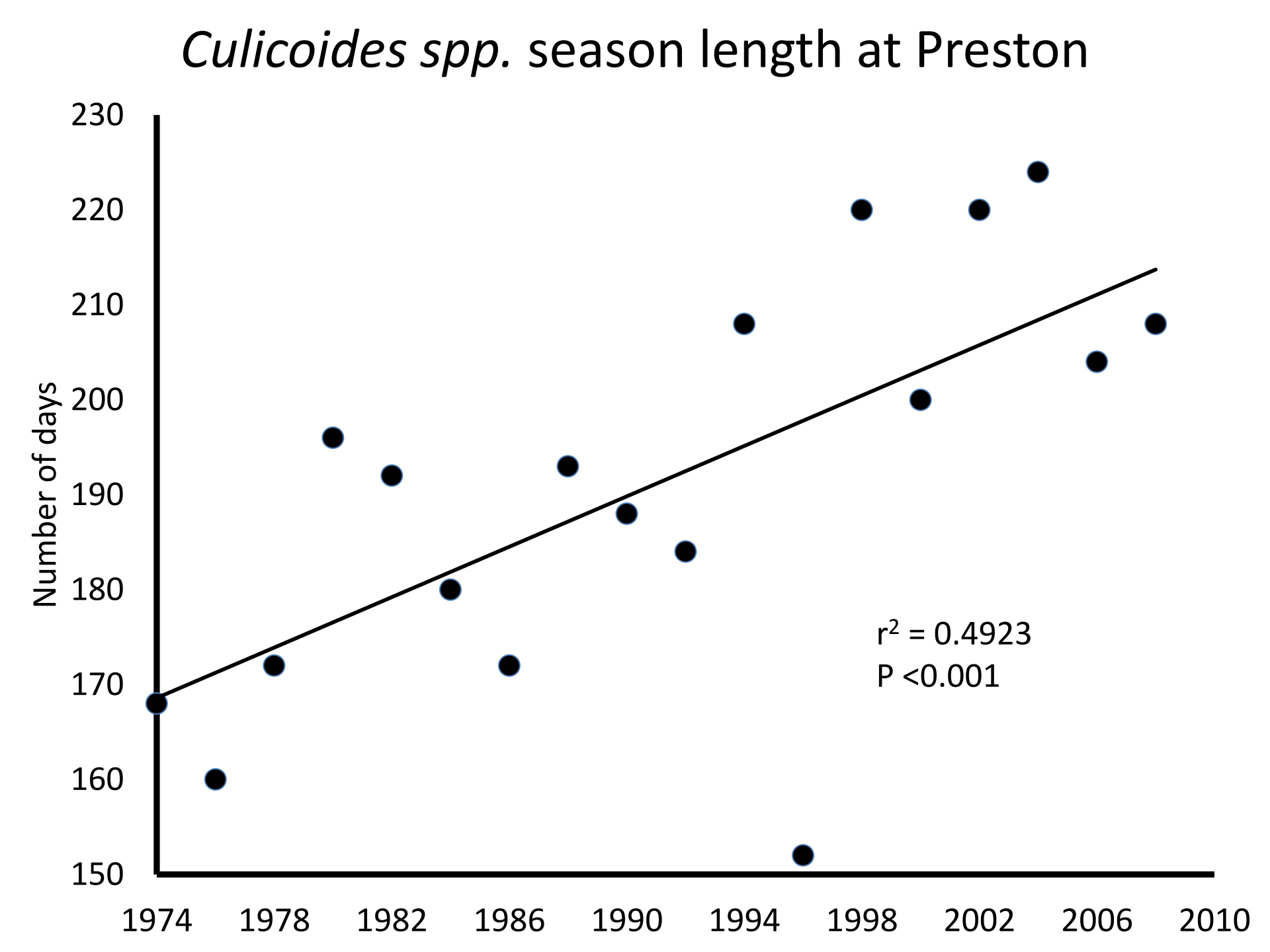
Culicoides
biting midges

Potential vectors of bluetongue disease

Log10 mean daily count of *Culicoides spp*. at Preston from April - June




Culicoides spp. season length at Preston
Number of days
230
220
210
200
190
180
170
160
150
1974
1978
1982
1986
1990
1994
1998
2002
2006
2010
r^2 = 0.4923
P <0.001

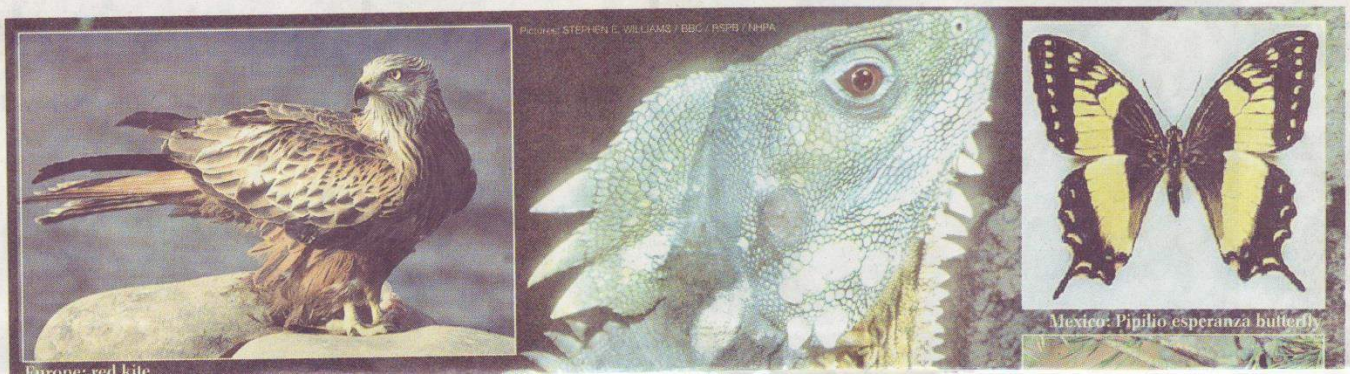
THE DOUBLE WHAMMY

Climate change threatens a million species

A quarter of land animals and plants could be extinct in 50 years, writes Roger Highfield

A MILLION species worldwide are threatened with extinction by climate change over the next half century, according to the most comprehensive analysis of its kind.

Climate change has already produced shifts in the distribution of some species, such as amphibians, grasses, mi-



Pictures: STEPHEN E. WILLIAMS / BBC / RSPB / NHPA

Mexico: Pipilio esperanza butterfly

Wildlife in peril around the world

The predicted impact of climate change by 2050 includes:

Australia: of the 24 endemic species of butterfly studied, all but three may no longer be able to survive in most of their current habitats. As many as 54 per cent of species may eventually become extinct, including the orange white-spot skipper and western jewel.

Brazil: the Cerrado, also

Palmy days for pests

PESTS and diseases are thriving in Britain's warmer weather as more are surviving the milder winters.

Scientists say it is still too early to know if the man-made Greenhouse Effect will push temperatures still higher. But they all agree the past two mild winters have benefited pests and diseases.

Who will benefit from a warmer Britain? After two exceptionally mild winters the beneficiaries include aphids, slugs, rats, mice and many more pests, diseases and weeds. **Robert Davies, Alan Barker, Douglas MacSkimming** and **Richard Wilson** investigate.

damage." The weevil reduces plant quality and its lavae feed on the nitrogen-fixing root nodules, degrading clover's value to pasture management, he adds.

Not only pests and diseases benefit from milder weather. Their predators, such as ladybirds, are also thriving, say scientists at

Global warming could herald return of malaria to Britain

By Charles Clover
Environment Editor

of ministers, said one of the most adverse effects was that the lesser form of malar-

malaria in Britain. But warmer summers would mean that the number of ...ths in which the mosqui... ...as active would increase ... two to four.

...e more serious form of ...ria, *plamodium falci-...m*, found in Africa, was ...y to affect travellers to ... destinations, for exam... ...estern Turkey.

...troducing the report, ... Liam Donaldson, the ...f Medical Officer, said ...did not mean necessarily ... malaria would become ...blished, but just that the ...itions were present for ...do so.

...alaria carried by mosquitoes "hitchhiking" in aircraft has been known to strike people living near airports in Britain.

The last big outbreak was after the First World War when around 200 people in Kent caught it from soldiers back from the tropics, said Prof Donaldson.

West Nile Fever, a potentially fatal form of encephalitis which has been found in New York, was an example of "the kind of unexpected thing" that could arrive with warmer weather, he said. The report says that cases of food poisoning, running at 100,000 annually, would be likely to increase by about 10,000 a year by 2050. Air pollution from low-level ozone caused by the breakdown of hydrocarbon fuels in sunlight was likely to increase, with several thousand extra deaths.

It is already warmer on average than for 350 years, according to the report. By 2050, temperatures are expected to rise by between 0·8°C and 2·3°C. Waterborne diseases, such as cholera and typhoid, were unlikely to become problems, but toxic algal growths would increase. The tick-borne Lyme disease was also expected to increase, but the impact on health would be small.

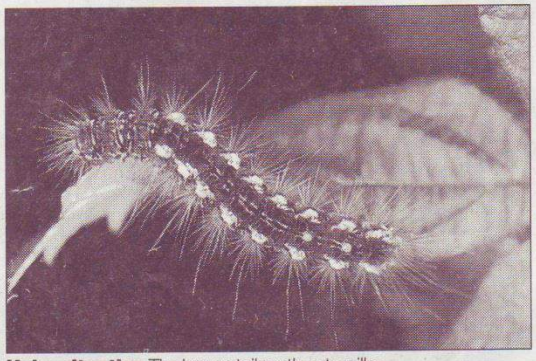
Poisonous caterpillars wriggle north as climate warms up

RICHARD GRAY
Science Correspondent

POISONOUS CATERPILLARS are spreading across England, prompting warnings from environmental health officers.

A series of mild winters has seen swarms of brown tail moth caterpillars move from their usual habitats along the south-east coast to as far north as Yorkshire.

The brown and red grub is covered in millions of tiny hairs that contain a toxin that can cause painful rashes, eye infections and, if inhaled, serious breathing difficulties.



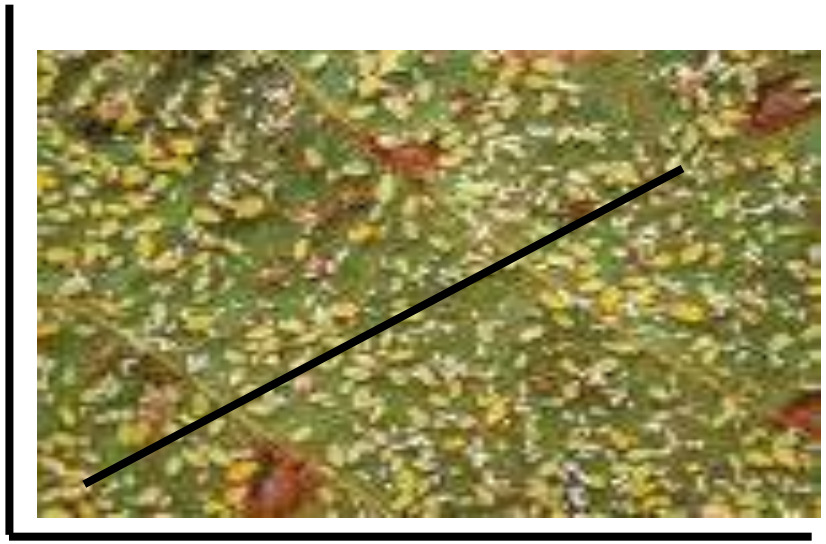
Hairy situation The brown tail moth caterpillar

also appeared along the coast in Dorset. In Portsmouth, council officials have been spraying affected trees and bushes in a bid to control the numbers.

Phil Harris, the director of the pest control company Exosect, which specialises in tackling brown tail moths, said: "They seem to have been a particular problem around Kent and Bournemouth while we are also hearing reports from some areas of London. Last year was a bad year for them, and although it is still early, this year may be as bad."


DOUBLE
WHAMMY

Impacts of Climate Change



TRAITS?

FECUNDITY
MOBILITY

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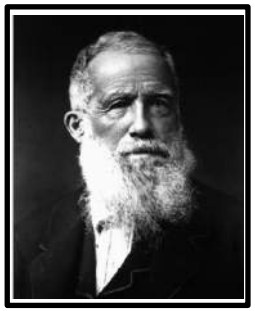
Acknowledgements

All Rothamsted Insect Survey and SASA Group, past and present

All trap operators

SASA
Science and Advice for Scottish Agriculture
Rural Payments and Inspections Directorate

Lawes Agricultural Trust



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50
Display Seasons
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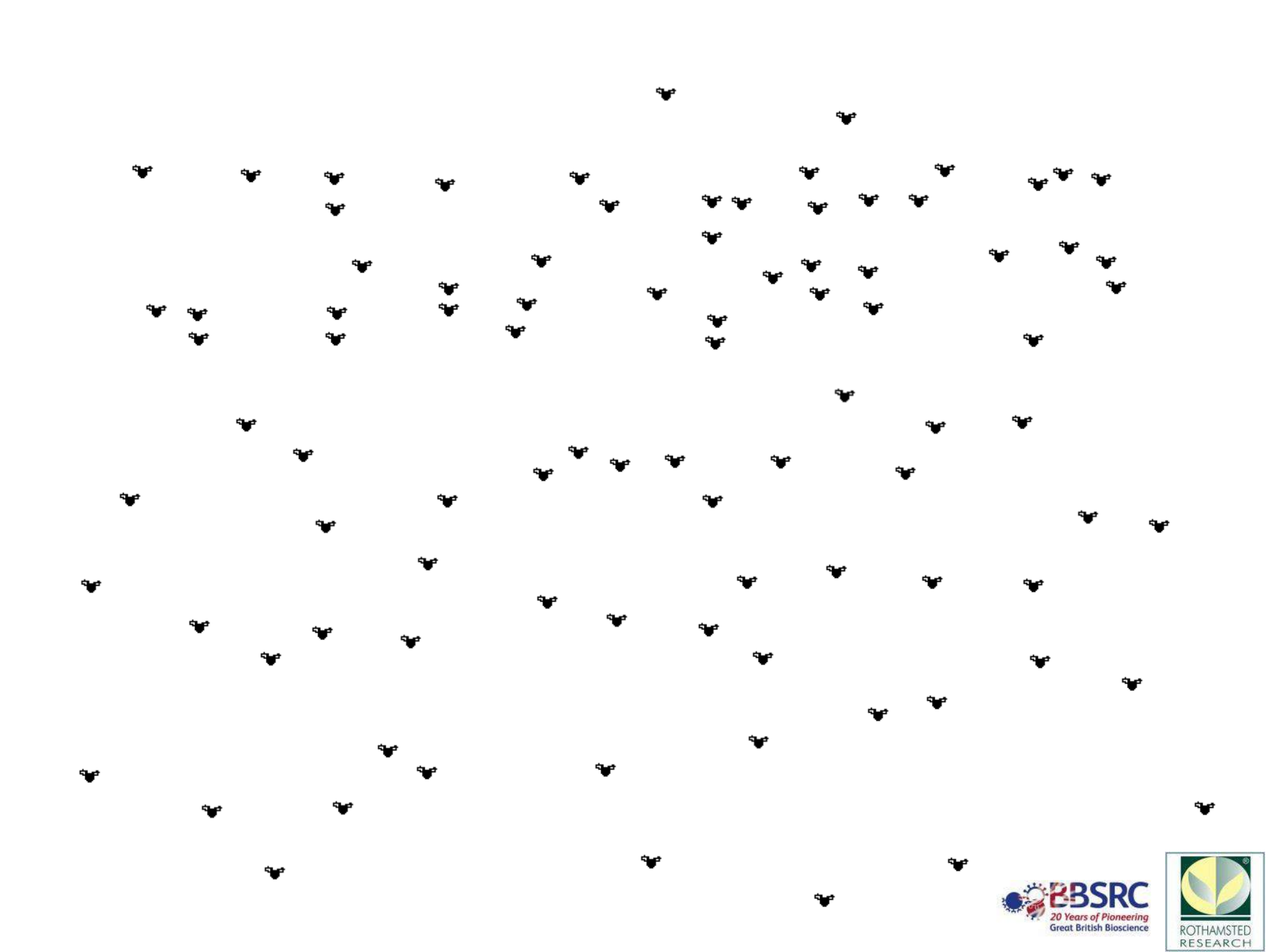
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