



Cabbage stem flea beetles and the neonic ban – UK perspective

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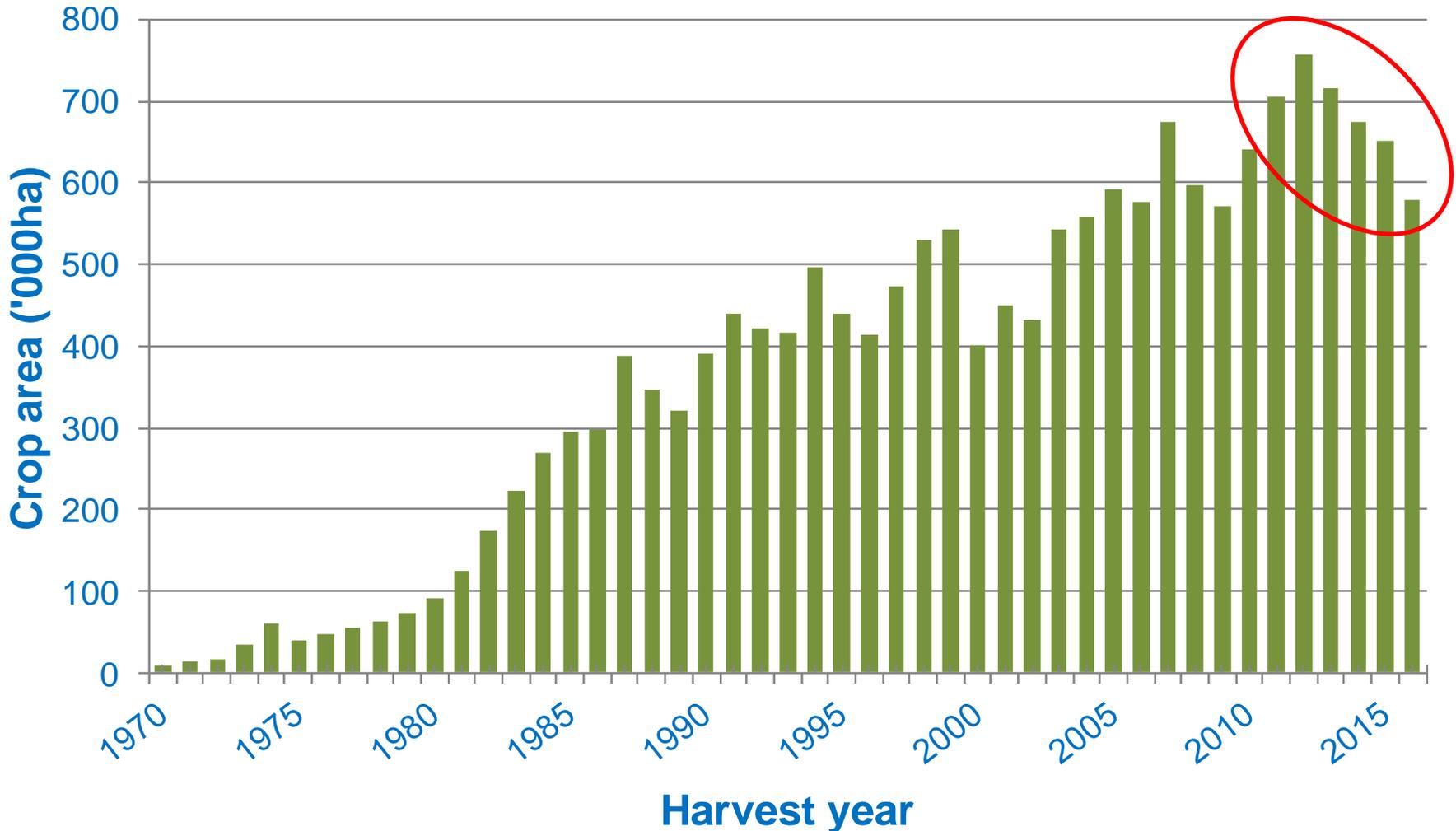
emphasisproject.eu

Psylliodes chrysocephala

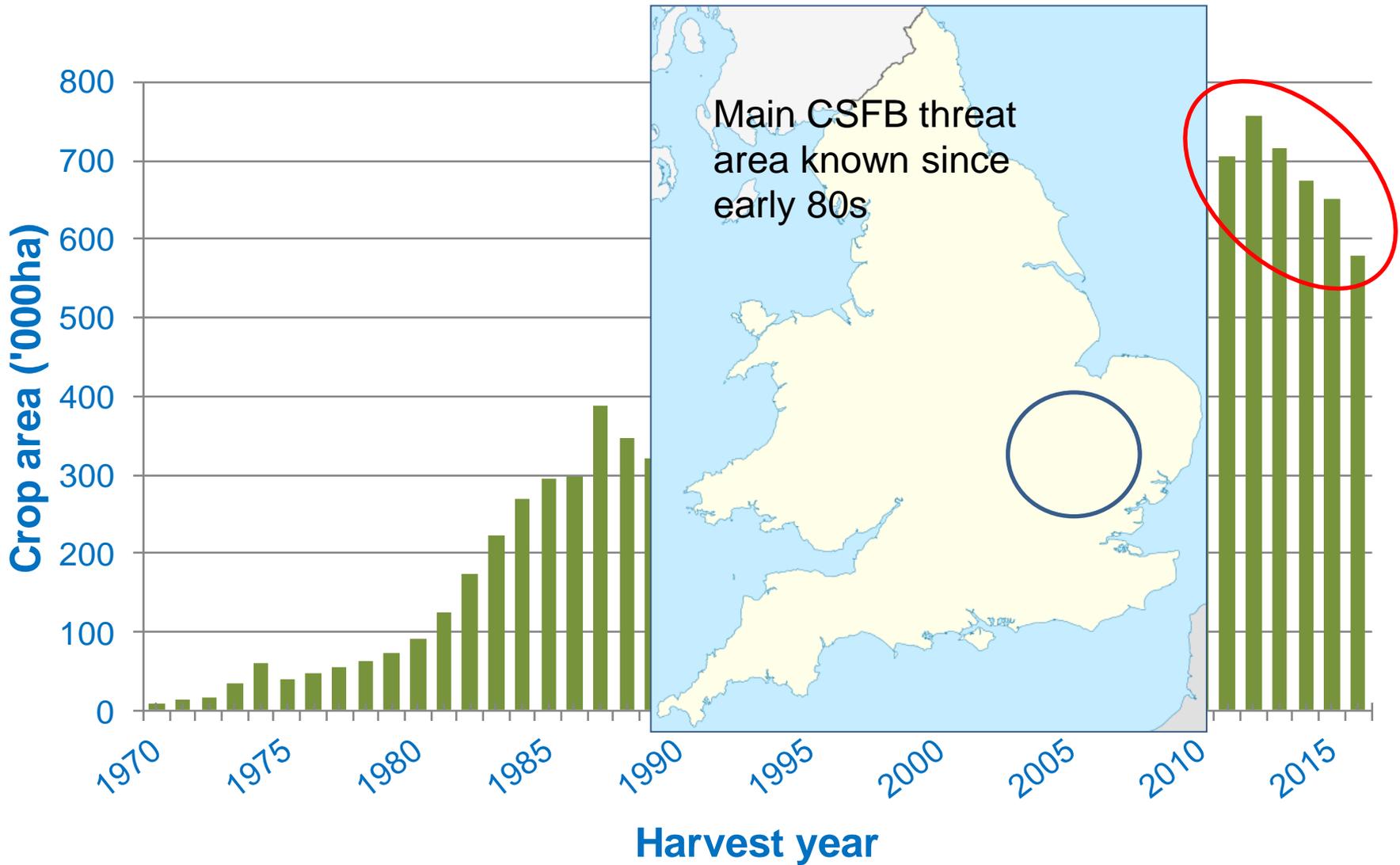


Public
enemy
Number
one!

UK oilseed rape crop areas – 1970-2016



UK oilseed rape crop areas – 1970-2016



Control products recommended in 1989

- Carbofuran
- Cypermethrin
- Deltamethrin
- Fenvalerate
- Fonophos
- Gamma-HCH
- Permethrin
- Phorate
- Primiphos-methyl
- Captan + gamma-HCH

Control products recommended in 1989

- | | |
|---------------------------------|-------------------------------|
| • Carbofuran | BANNED/WITHDRAWN |
| • Cypermethrin | INEFFECTIVE/RESISTANCE |
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In 2000
neonicotinoids came
to our rescue.....

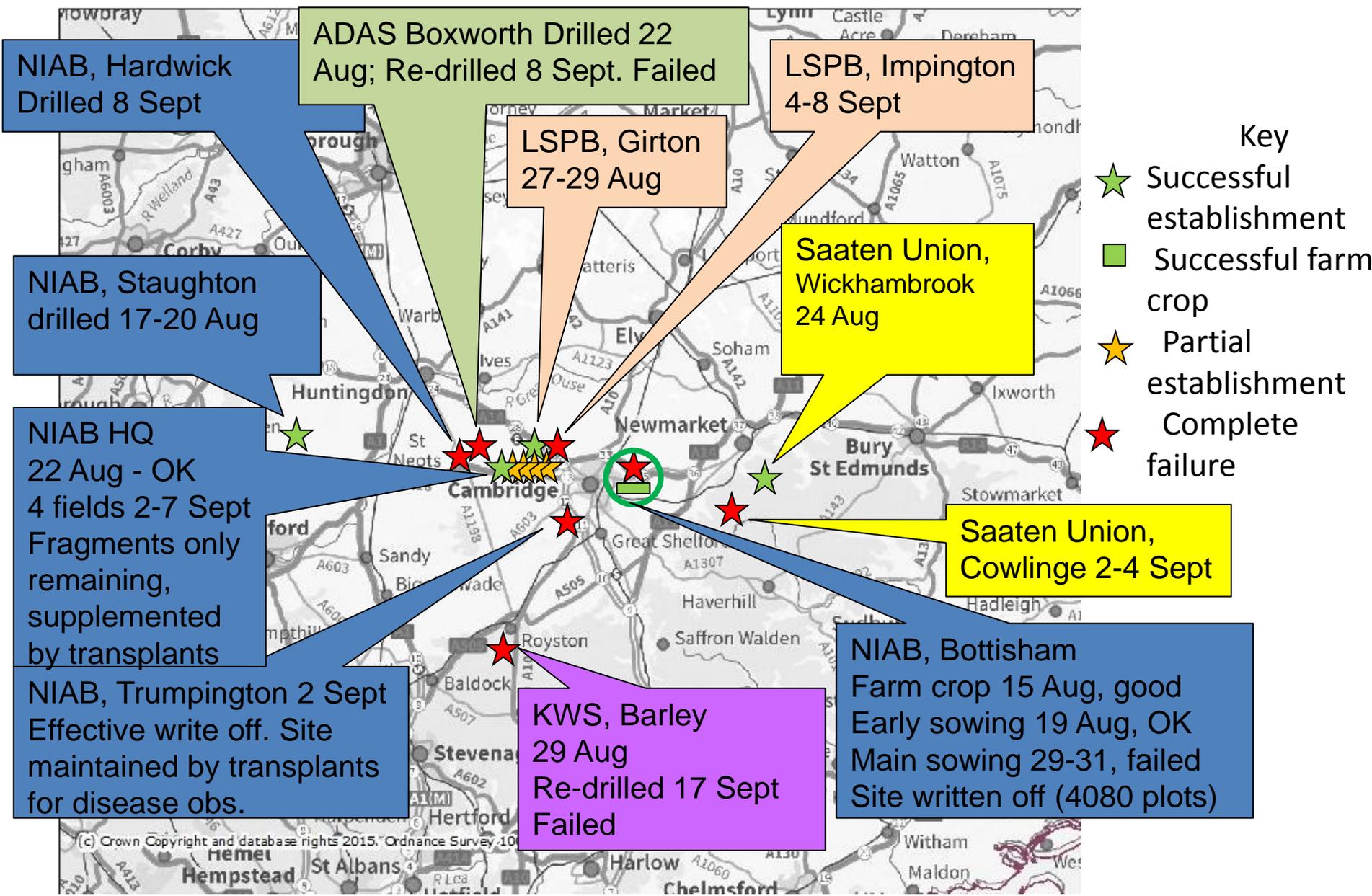
2014, 2015, 2016 & 2017

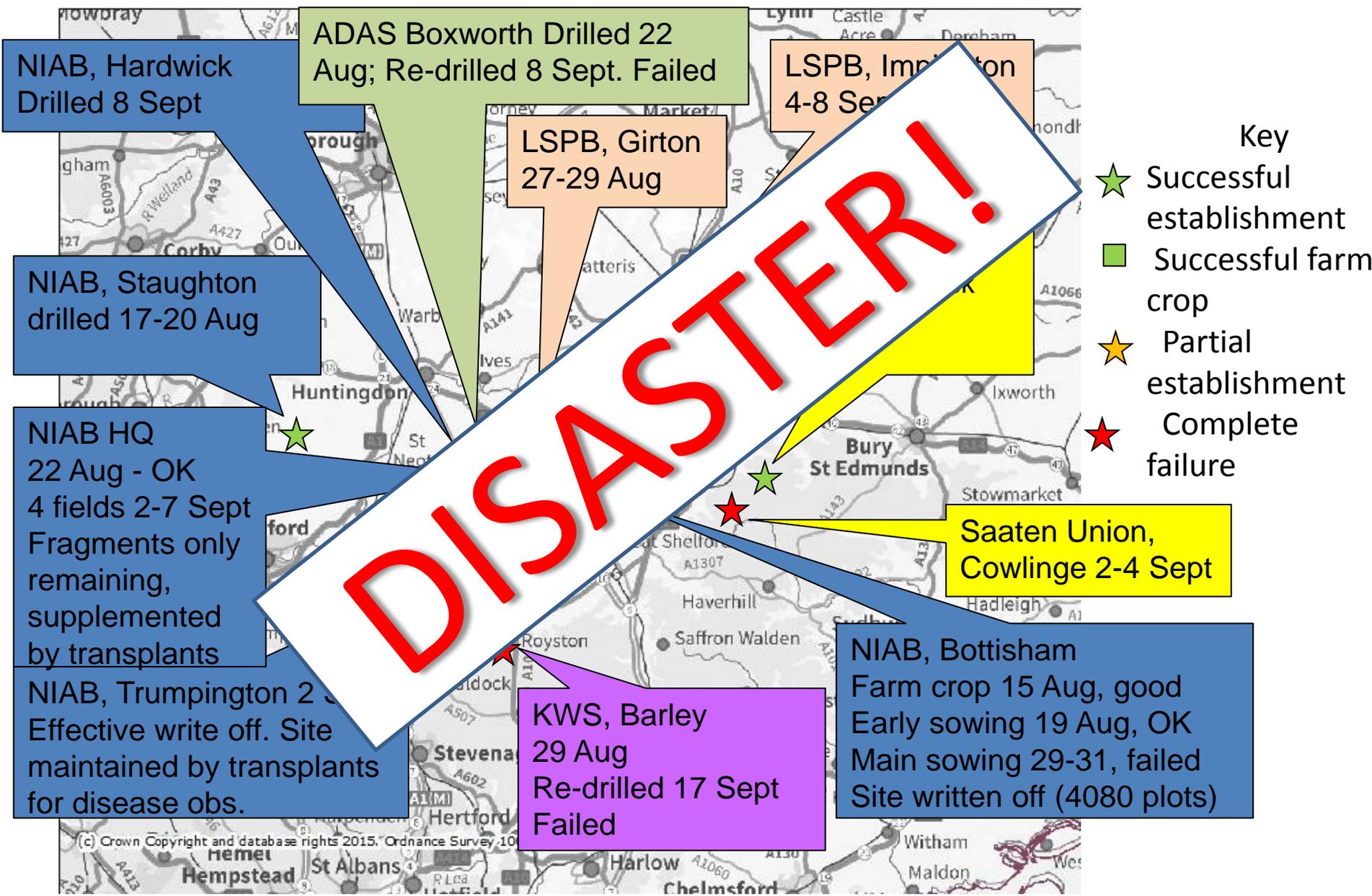
Four autumns of contrasting
experiences.....

And most of them very
unpleasant and depressing!

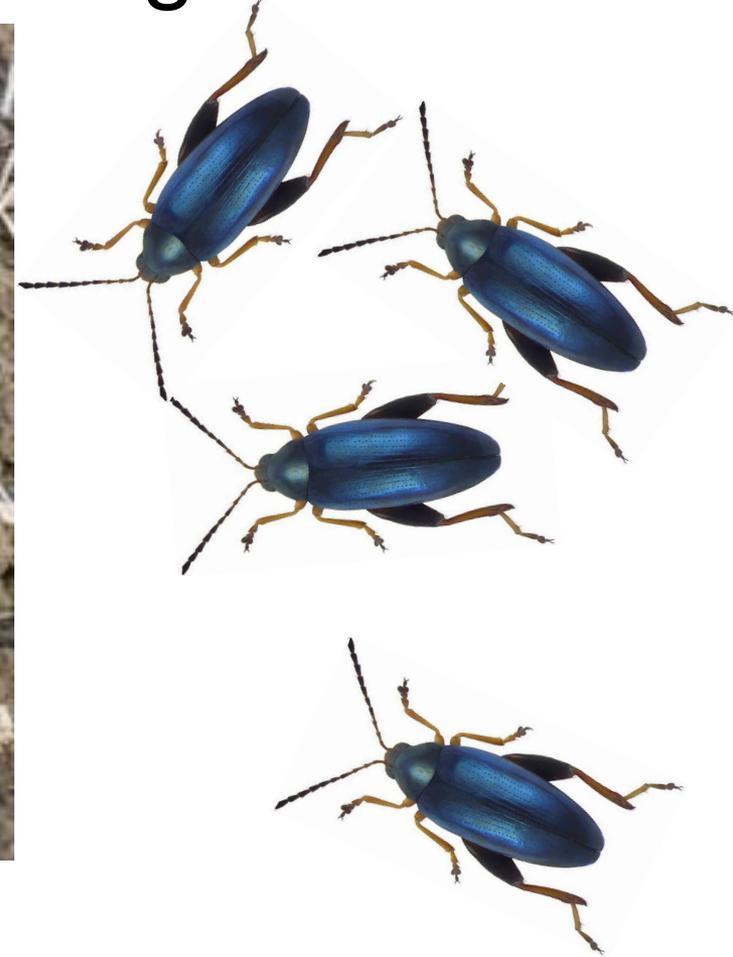
Season comparisons

- 2014/15: Cool dry September; winter above average temperatures





Adult damage to crop establishment - before, during and after emergence



Season comparisons

- 2014/15: Cool dry September; winter above average temperatures
- 2015/16: Warmer September with better rainfall; winter above average temperatures
- 2016/17: Dry September; Early October/November frosts and more normal winter
- 2017/18: Good rainfall – so far so good.....

Larval feeding damage



What we learnt about good establishment

- Trap cropping with treated seed
- Early sowing
- Fine seed bed
- Seed bed moisture
- Seed bed nutrients
- Insect monitoring
- Avoidance of pre-emergence herbicides

CSFB Monitoring



Yellow sticky Traps



Blue sticky Traps



Pheromone Traps

- Good success with Yellow Sticky traps
- Water traps – effective but management issues
- Inform pesticide applications
- Monitor progress of migration

What we learnt about good establishment for trials:

- Trap cropping with treated seed
- Early sowing
- Fine seed bed
- Seed bed moisture
- Seed bed nutrients
- Insect monitoring
- **Avoidance of pre-emergence herbicides**

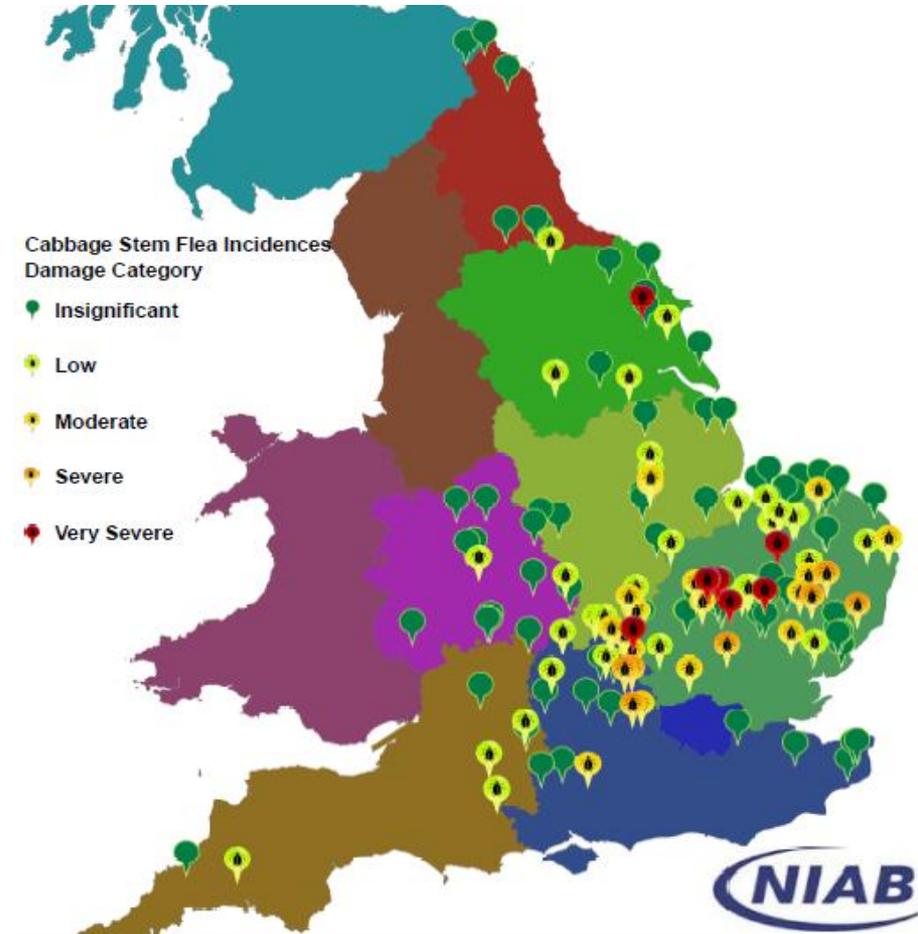
Two new initiatives introduced for Autumn 2015

- Crowd Sourcing farm survey
- Experiments with companion crops

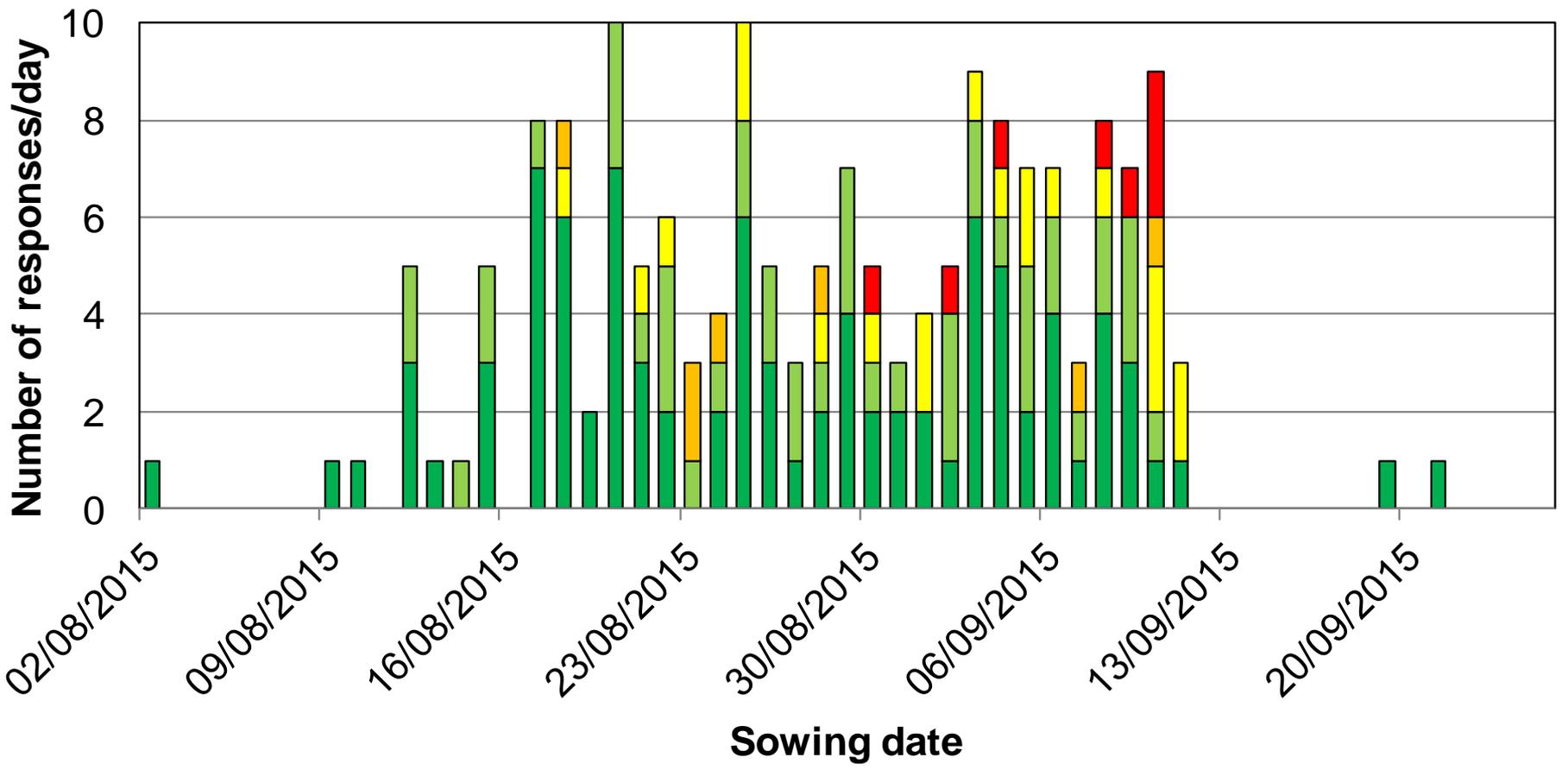
Crowd Sourcing map-Autumn 2015

Questionnaire

- Sowing date
- Crop area
- Cultivation/Establishment
- Insecticide seed treatment and sprays
- Variety type
- Classify crop into 5 damage categories (1 = good; 5 = bad)



Crop damage intensity



Provisional findings

	Combined damage score	No. of obs.
Variety type		
Mixed	25.3	30
Conventional	25.4	78
Hybrid	27.7	73
Establishment method		
Autocast	15.4	7
Plough	21.4	33
Non-inversion	24.1	63
Subcast	27.7	32
Direct drill	33.5	46
Seed treatment		
Other	22.3	65
None	26.3	95
Neonicotinoid	36.2	21

Crowd sourcing - Autumn 2016

We asked for responses from farmers who had stopped growing oilseed rape – Black pins

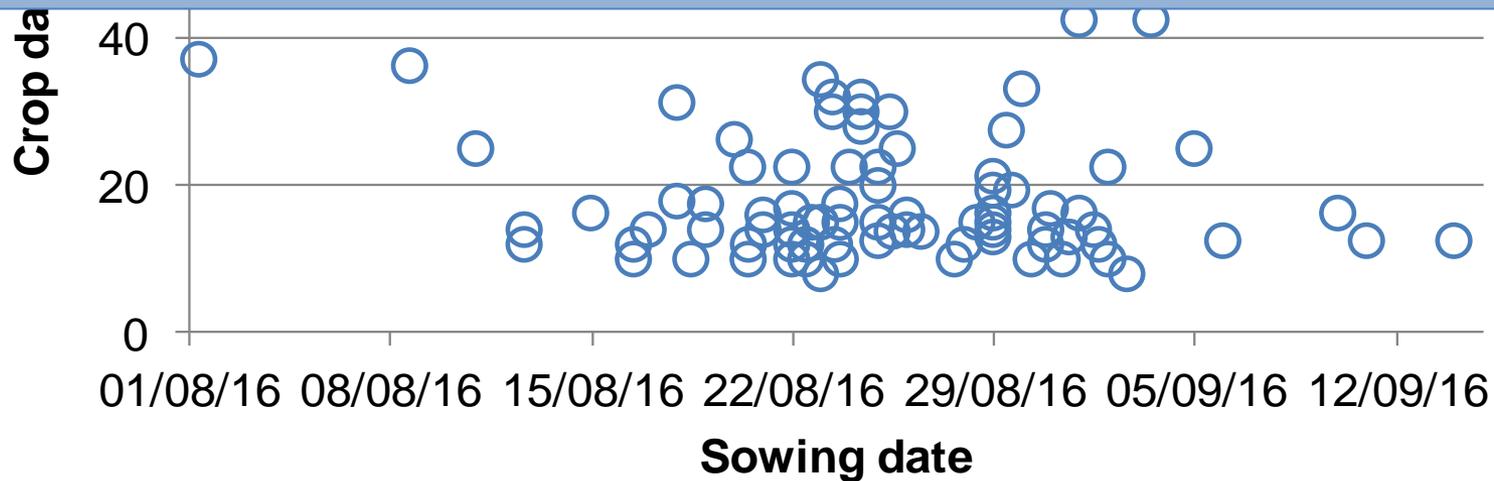
Fewer responses:

Had become over complicated



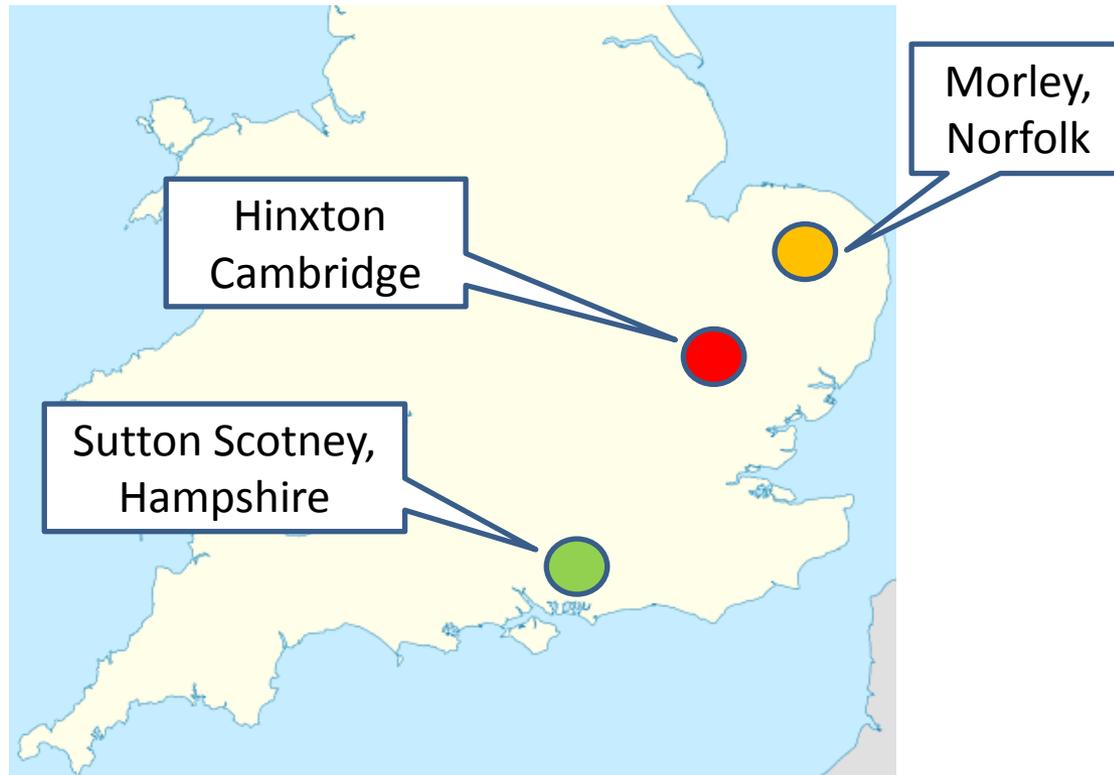
Sowing date x beetle damage

A less clear relationship with sowing date because the dry conditions delayed emergence, especially in the south-east



Experiments with companion crops

Three locations with **low**, **medium** and **high** CSFB pressure



Seed rate x companion crop experiment

Companion crop	OSR seed rate/m ²			
	60	80	100	120
No companion crop	N60	N80	N100	N120
Mixture A	A60	A80	A100	A120
Mixture B	B60	B80	B100	B120
Mixture C	C60	C80	C100	C120

OSR variety:

CHARGER

A = Insect deterrent?:

Fenugreek (*Trigonella foenungraecum*)

B = Insect attractant:

Pak choi/Chinese cabbage/salad rocket/linseed

C = Insect neutral:

Berseem clover/crimson clover/Persian clover/common vetch

Replicates:

4

Sites:

3 – Cambridge (Hinxton), Morley, Sutton Scotney

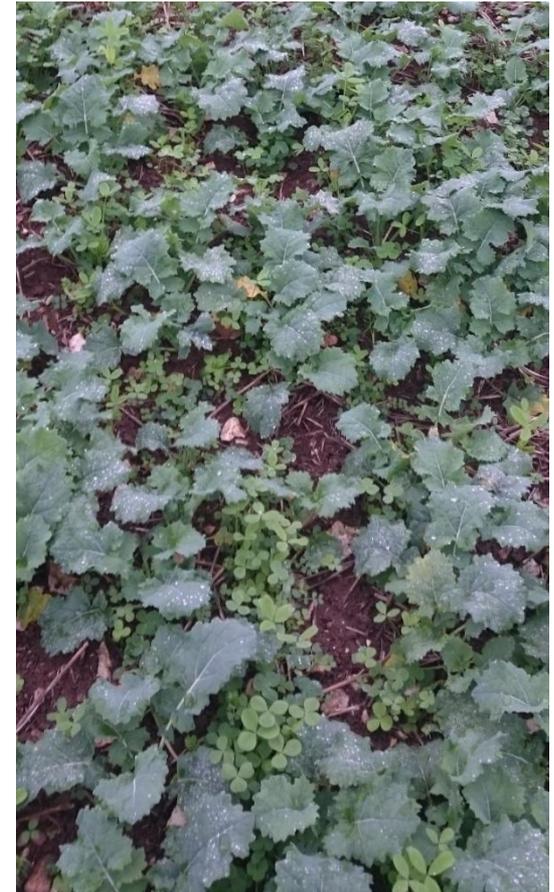
Early establishment



Fenugreek



Brassica -
linseed mix

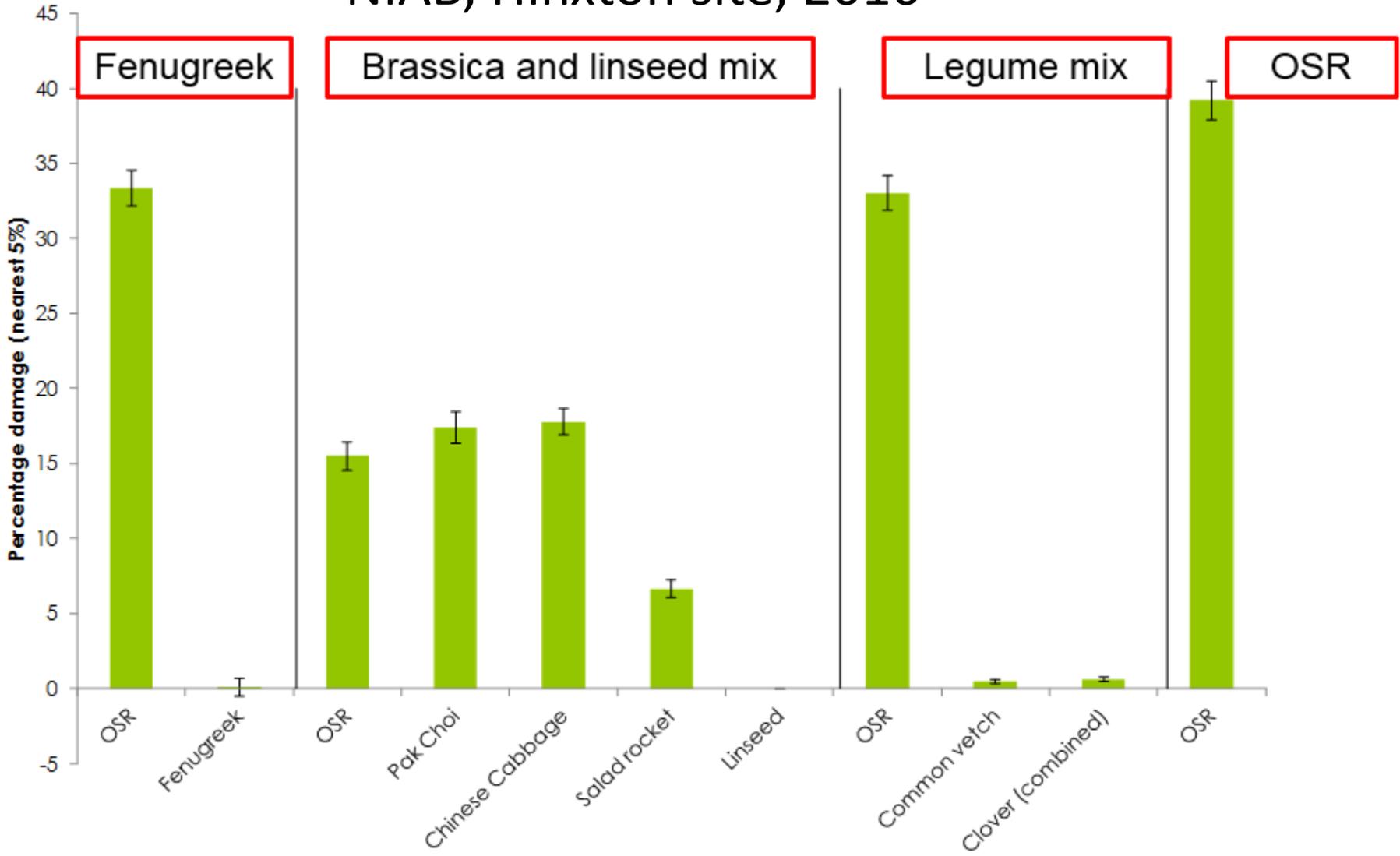


Legume mix

Collaborative results with PhD student Duncan Coston, Supervised by Sam Cook & Lin Field (Rothamsted Research); Tom Breeze & Simon Potts (University of Reading)



NIAB, Hinxton site, 2016



Damage observations (1 good; 5 bad)

Cambridge obs.				
Treatment name	Trt x sdrt		Trt means	
	29/09	15/10	29/09	15/10
OSR 60	3.8	4.3		
OSR 80	3.5	3.8		
OSR 100	3.3	3.5		
OSR 120	3.8	3.3	3.6	3.7
A OSR 60	4.0	3.3		
A OSR 80	3.5	2.8		
A OSR 100	3.5	3.3		
A OSR 120	3.5	3.0	3.6	3.1
B OSR 60	2.3	1.0		
B OSR 80	2.0	1.0		
B OSR 100	2.3	1.0		
B OSR 120	2.5	1.0	2.3	1.0
C OSR 60	3.5	2.8		
C OSR 80	3.3	2.5		
C OSR 100	3.0	2.5		
C OSR 120	3.3	2.5	3.3	2.6

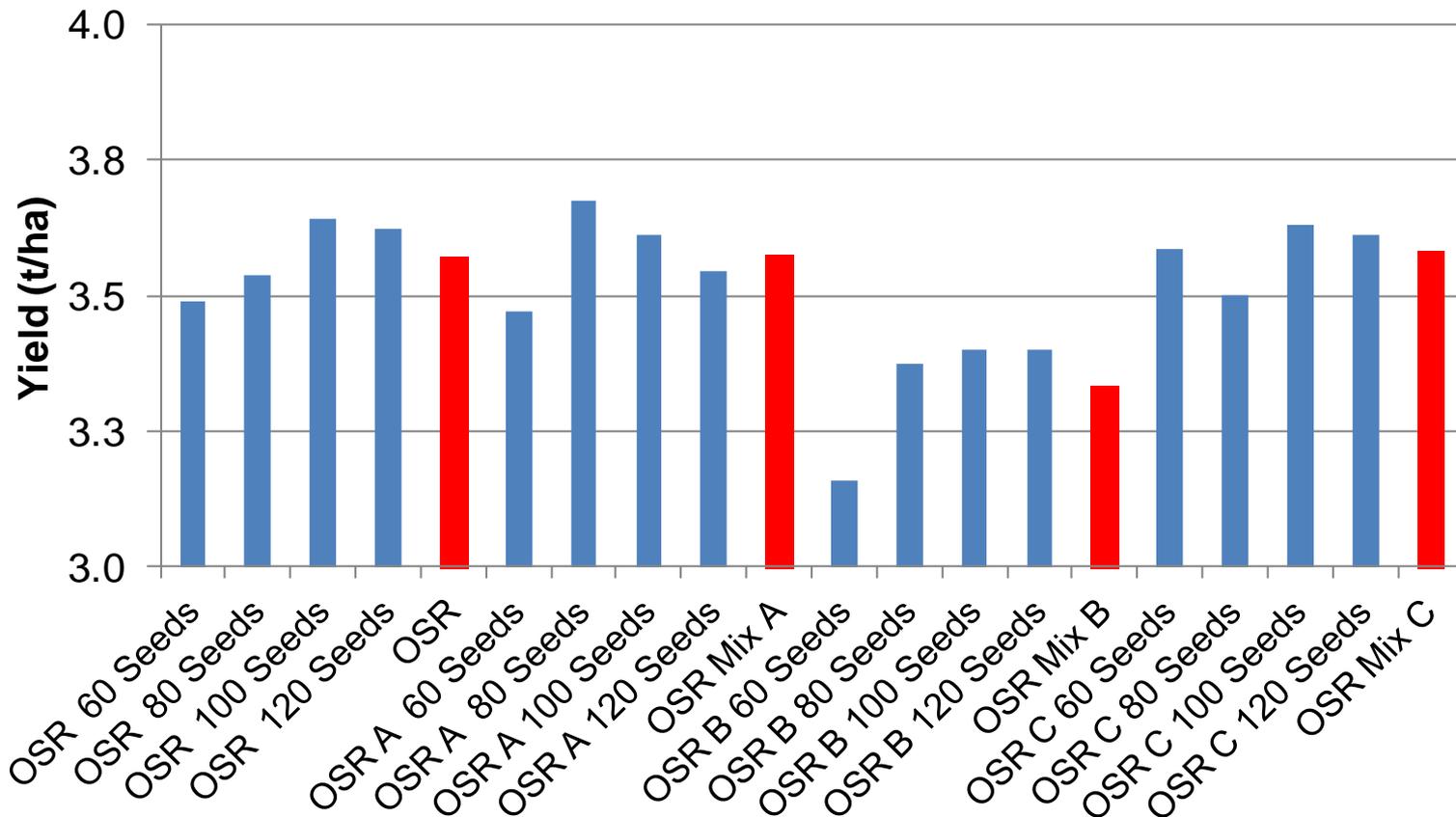
Morley obs.				
Treatment Name	Trt x sdrt		Trt means	
	12/1	26/1	12/1	26/1
OSR 60	3.5	3.5		
OSR 80	3.3	3.3		
OSR 100	3.5	3.5		
OSR 120	3.5	3.3	3.5	3.4
A OSR 60	3.3	3.0		
A OSR 80	3.3	2.8		
A OSR 100	3.5	3.0		
A OSR 120	3.3	3.0	3.4	3.0
B OSR 60	3.0	3.0		
B OSR 80	3.0	2.8		
B OSR 100	3.0	3.0		
B OSR 120	3.0	2.3	3.0	2.8
C OSR 60	3.3	3.0		
C OSR 80	3.3	2.8		
C OSR 100	3.3	2.5		
C OSR 120	3.3	2.8	3.3	2.8

Control of companion species

- No killing frosts in 2015/16 winter
- Several herbicide applications were tried but were rather ineffective post-Christmas and limited by label regulations
- Brassica/linseed mix was particularly resilient – crowded-out the OSR

Yield - No CSFB pressure

Yield (t/ha) Sutton Scotney - 2016



Companions for 2016/17

Crop	Mix code	1000 seed weight	seeds /m ²	seed wt/m ²	Plot size	Packet size
OSR		4.5	60	0.27	20	5.4
OSR		4.5	90	0.41	20	8.1
OSR		4.5	120	0.54	20	10.8
Companions						
Fenugreek	A	12.0	250	3.00	20	60.0
Pak choi	B	1.9	80	0.15	20	3.0
Chinese kale	B	4.0	80	0.32	20	6.4
Choi sum	B	2.4	80	0.19	20	3.8
Rocket	C	1.4	125	0.18	20	3.5
White mustard	C	7.4	125	0.93	20	18.5
Buck wheat	D	33.4	250	8.35	20	167.0

14/12 2016 Cambridge - Fenugreek



No surviving oilseed rape

14/12 2016 Cambridge – Brassica mix



No surviving oilseed rape

Buck wheat, with OSR plots in foreground



No surviving oilseed rape

White mustard, and 34 ha of weeds and desolation



But what have we here?!



Autumn 2016 – Morley - damage

Trt. No.	WOR sdr	Companion mix	09/09	14/09	19/09	26/09	07/10	12/10
1	60	-	1.0	2.7	2.7	3.3	2.0	1.0
2	90	-	1.0	3.0	2.7	3.7	2.3	1.3
3	120	-	1.0	3.0	3.0	3.3	2.3	1.0
4	60	Fenugreek	1.0	2.7	2.7	2.7	2.0	1.0
5	90	Fenugreek	1.0	2.7	2.3	2.7	2.0	1.0
6	120	Fenugreek	1.0	2.0	2.3	3.0	2.0	1.0
7	60	Chinese brassicas	1.0	2.7	3.0	3.3	2.7	2.3
8	90	Chinese brassicas	1.0	2.3	3.0	3.3	2.7	2.0
9	120	Chinese brassicas	1.0	2.7	3.0	3.7	3.0	1.7
10	60	Mustard & Rocket	1.0	1.7	1.7	2.0	2.3	1.0
11	90	Mustard & Rocket	1.0	1.7	2.0	2.0	2.3	1.3
12	120	Mustard & Rocket	1.0	2.0	2.0	2.0	2.0	1.3
13	60	Buck wheat	1.0	1.7	2.0	3.0	3.0	1.0
14	90	Buck wheat	1.0	2.7	3.0	3.0	2.7	1.0
15	120	Buck wheat	1.0	2.7	2.7	3.0	3.0	1.0
Averaged over treatments			1.0	2.4	2.5	2.9	2.4	1.3

Good companion-bad companion



Salad rocket

White mustard

OSR stunted in mustard mix



Observations on the 2017 companions

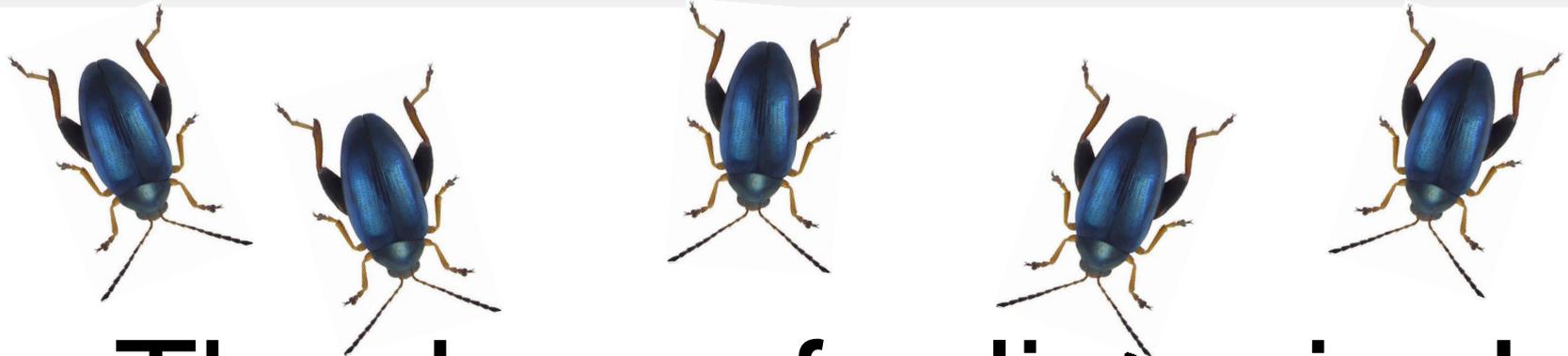
- All except Rocket (*Eruca sativa*) proved susceptible to the frost
- The white mustard/rocket mix appeared to have potential for protecting the crop
- But:
- If not controlled until after the winter, it will stunt the OSR and reduce yield potential
- Much work still to do

Overall conclusions

- Cabbage stem flea beetles remain a huge threat to the oilseed rape crop
- Threat is greater for later sowings
- Attention to improved conditions for rapid germination is important
- No immediate promise of chemical control
- Successive cold winters may help
- Companion crops have potential and white mustard seems to be the best candidate
 - **More work needed**

2017/18

- Companion crop studies concentrating exclusively on white and brown mustards
- Early indications of lower flea beetle pressure in traditional areas
- Problems increasing in more peripheral areas
- Repeat survey – with wider participation?



Thank you for listening!

