Spotted Wing Drosophila in Ireland:

An increasing threat to the Irish soft fruit sector

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Agriculture and Food Development Authority

Presentation Outline

- Update on 2017 National Monitoring Programme
  - Geographical Spread of Positive findings
  - Increase in established populations nationally
  - Comparing Irish count data to UK data
  - SWD contamination in crops
  - SWD development within fruit
  - Cold treatment of fruit
- UK approach to SWD management
- Conclusions

1. Geographical spread of SWD

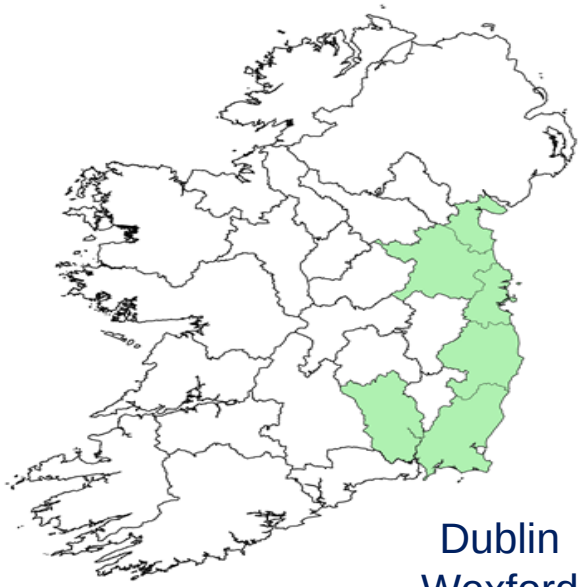
2015

Dublin
Wexford

2016

Dublin
Wexford
Wicklow
Meath

2017



Dublin
Wexford
Wicklow
Meath
Louth
Kilkenny

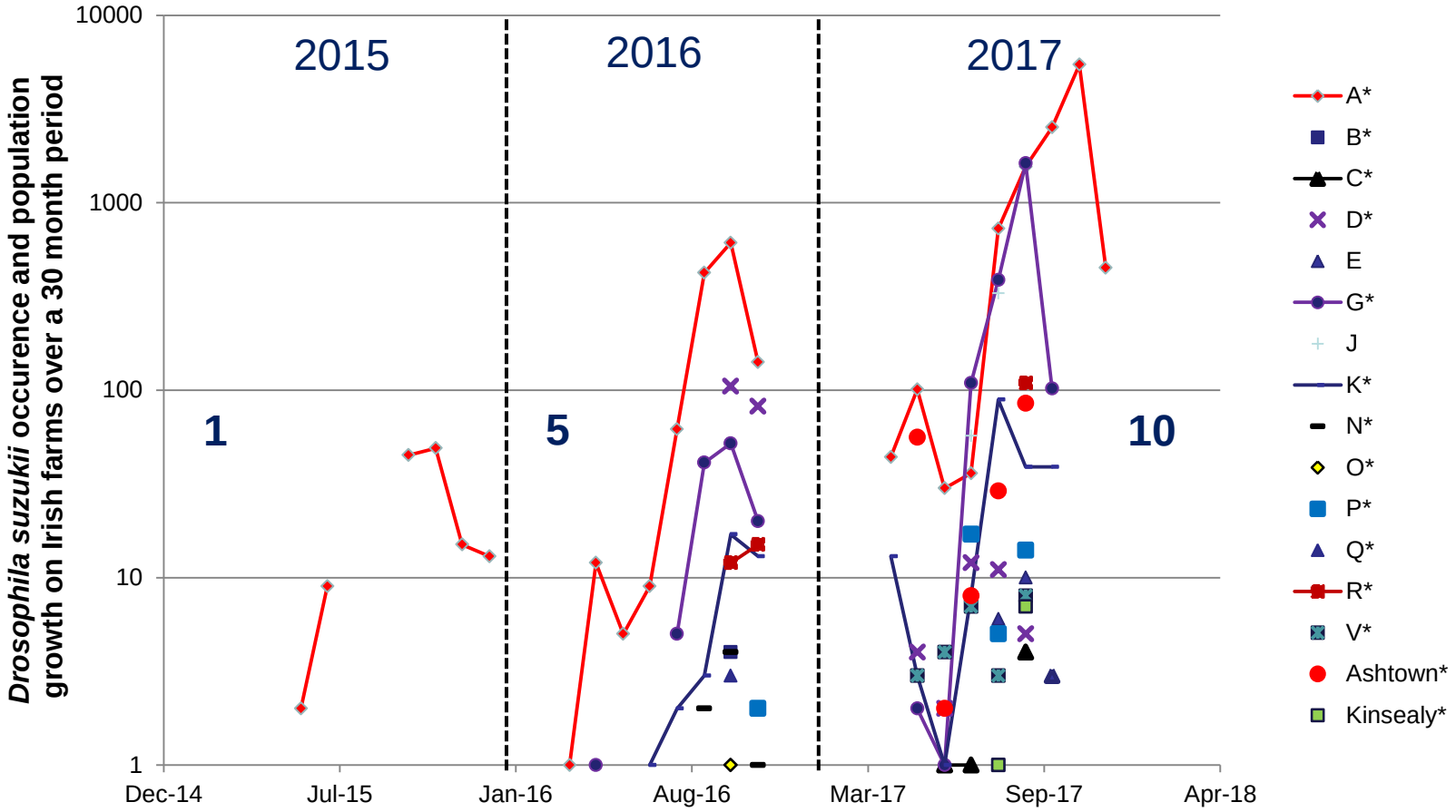
1. Geographical spread of SWD

Red: SWD present
Green: SWD not detected
Grey: SWD not monitored

2015: 3 of 4 sites
2016: 11 of 16 sites
2017: 17 of 19 sites

	Spotted Wing Drosophila Detections				
SWD Present	2017	2016	2015	Farm No.	Farm Code
				5	A
				4	B
				11	C
				3	D
				7	E
				13	F
				9	G
				14	I
				8	J
				6	K
				12	M
				19	N
				15	O
				1	P
				16	Q
				2	R
				17	S
				18	T
				10	V

2. SWD populations on fruit farms increasing nationally



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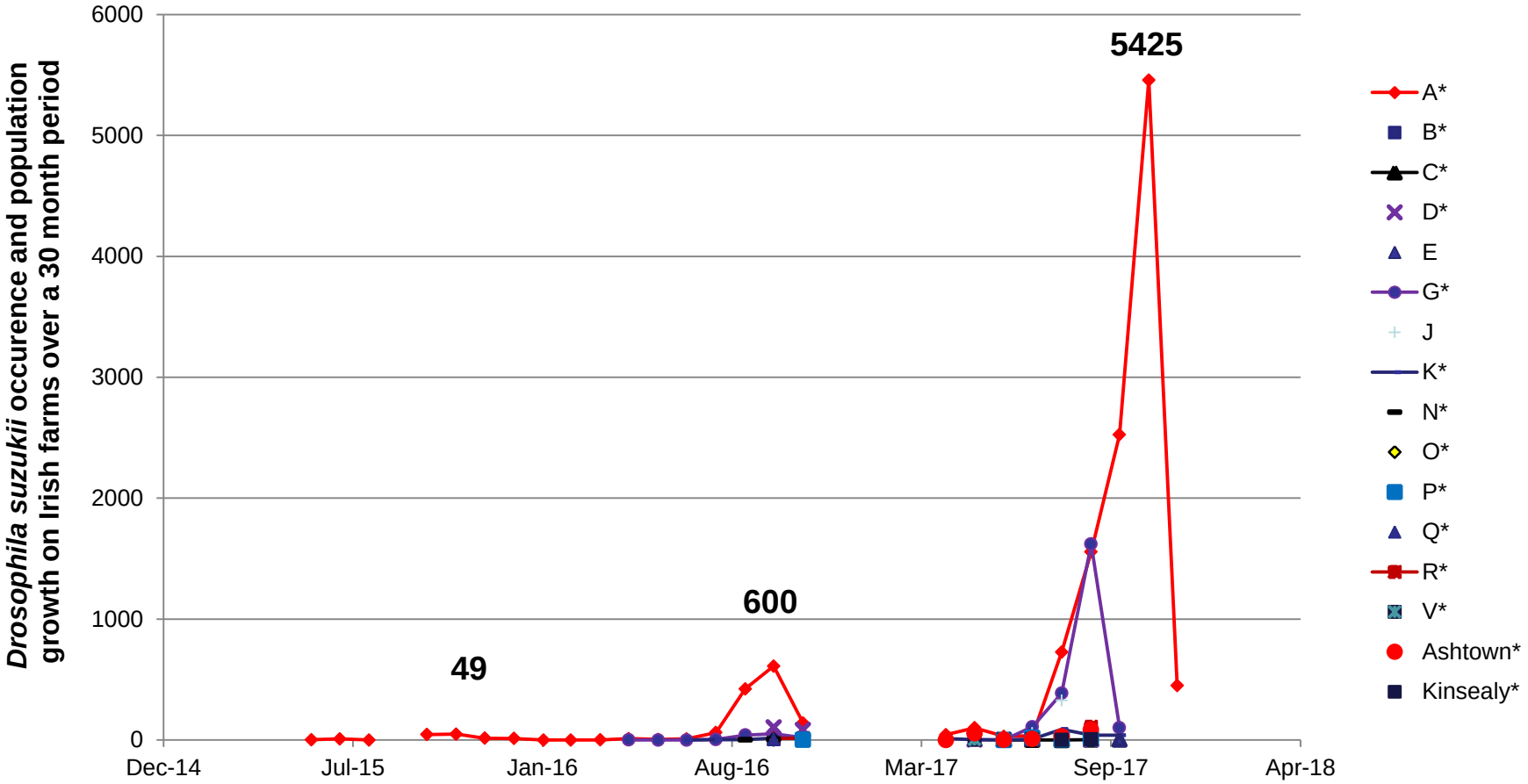
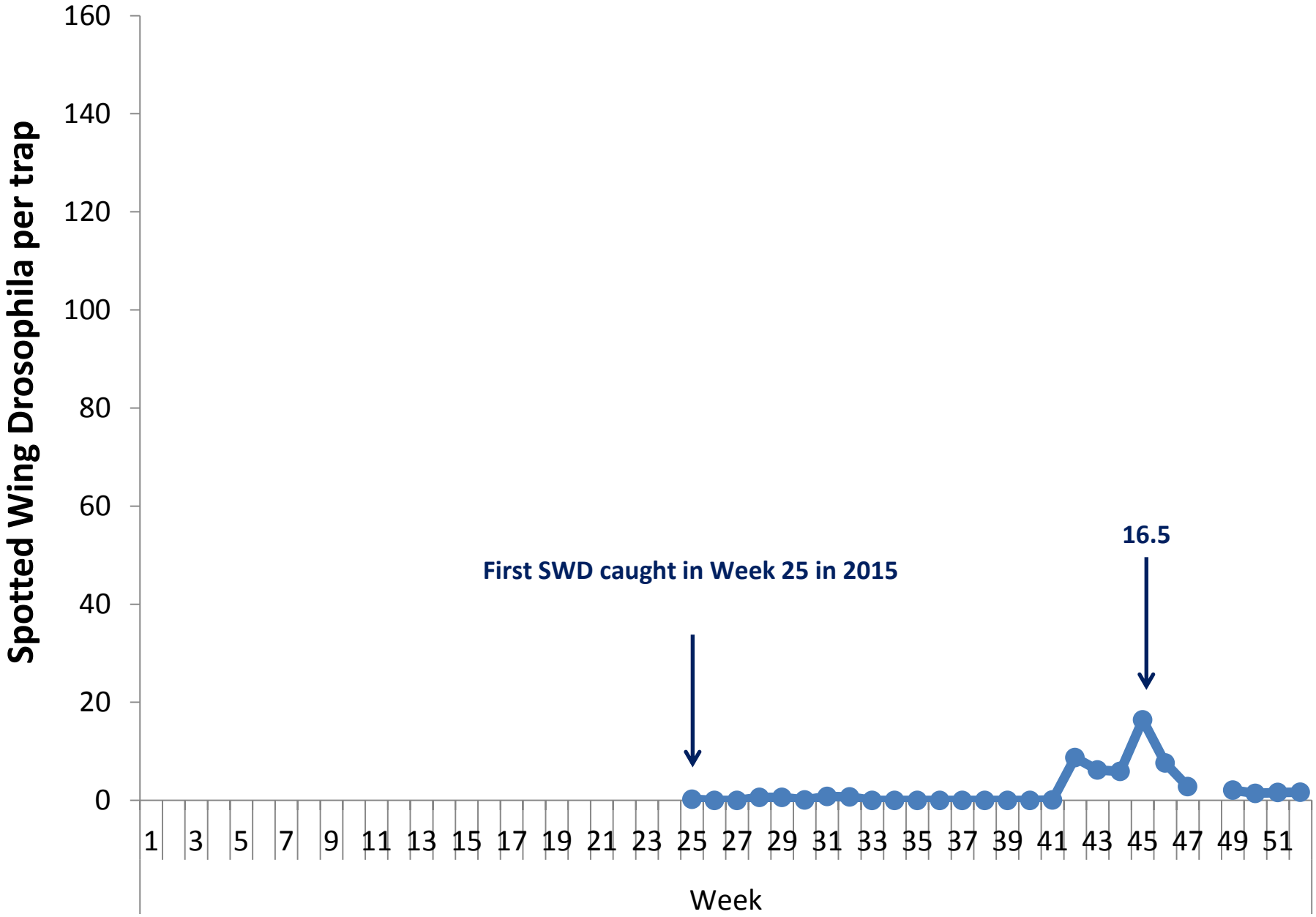


2. Development of SWD populations over a 30 month period



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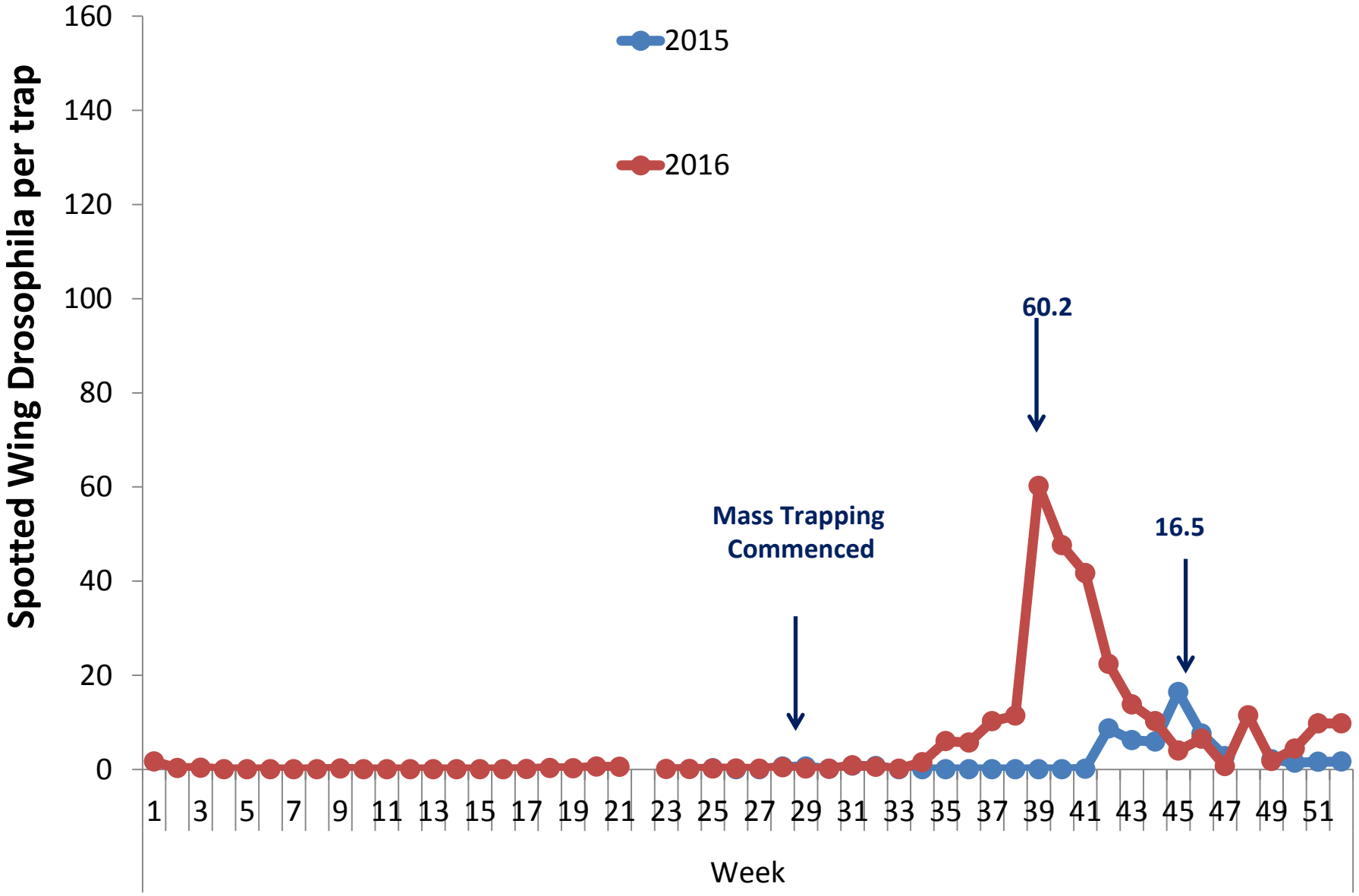
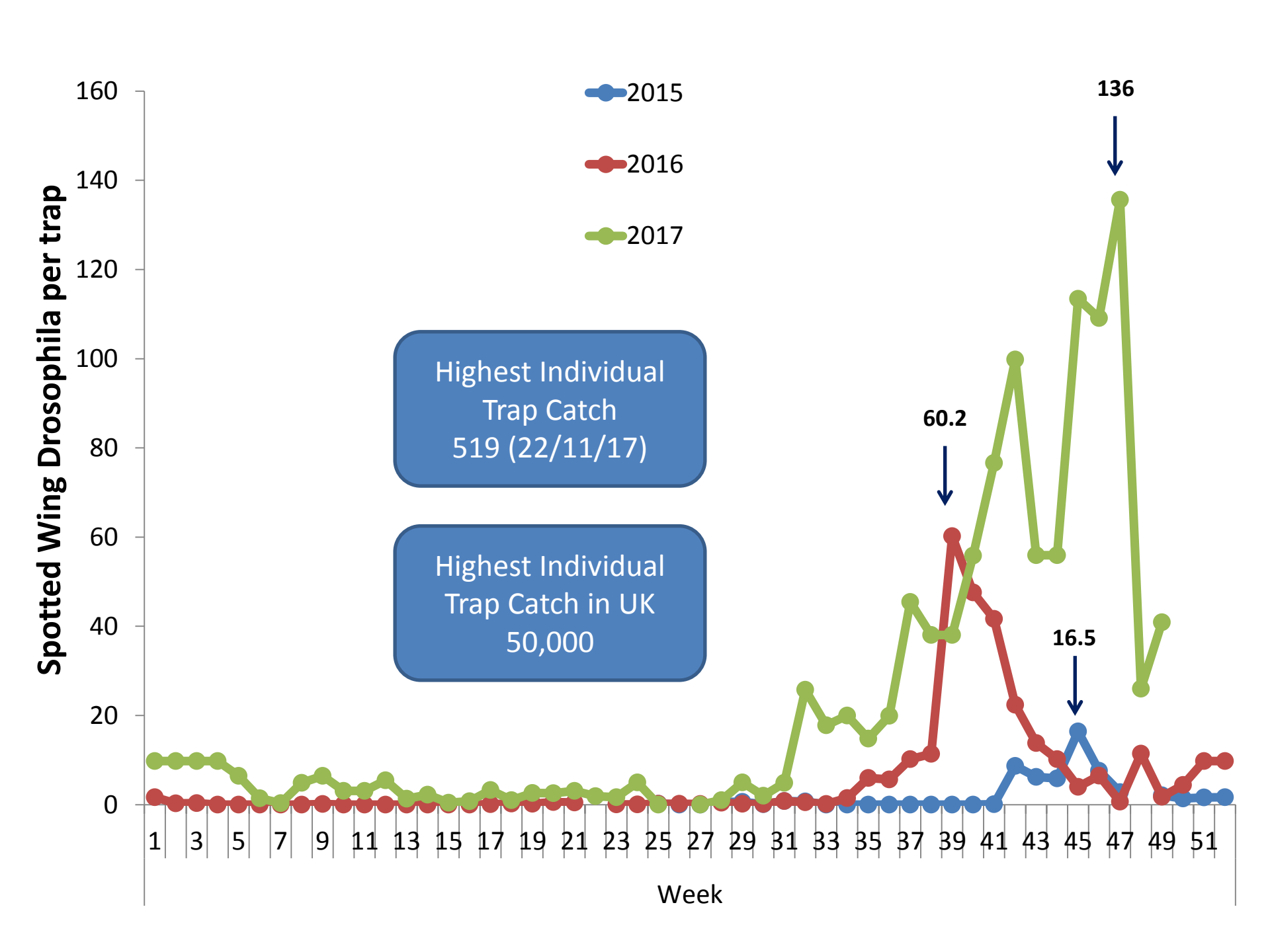
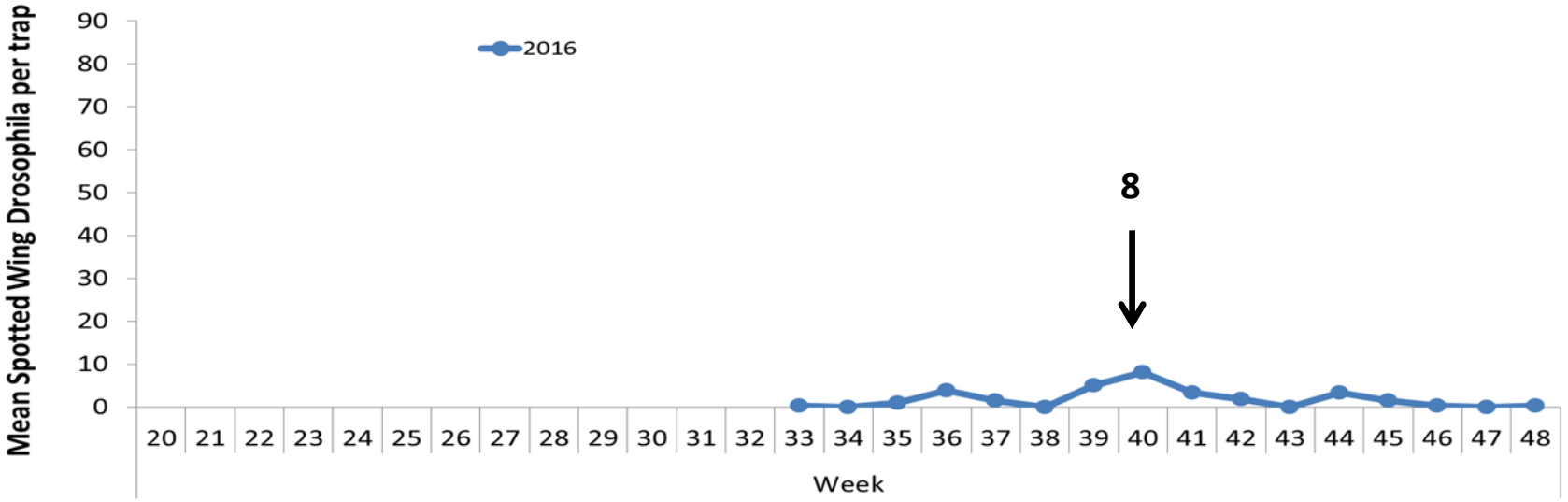
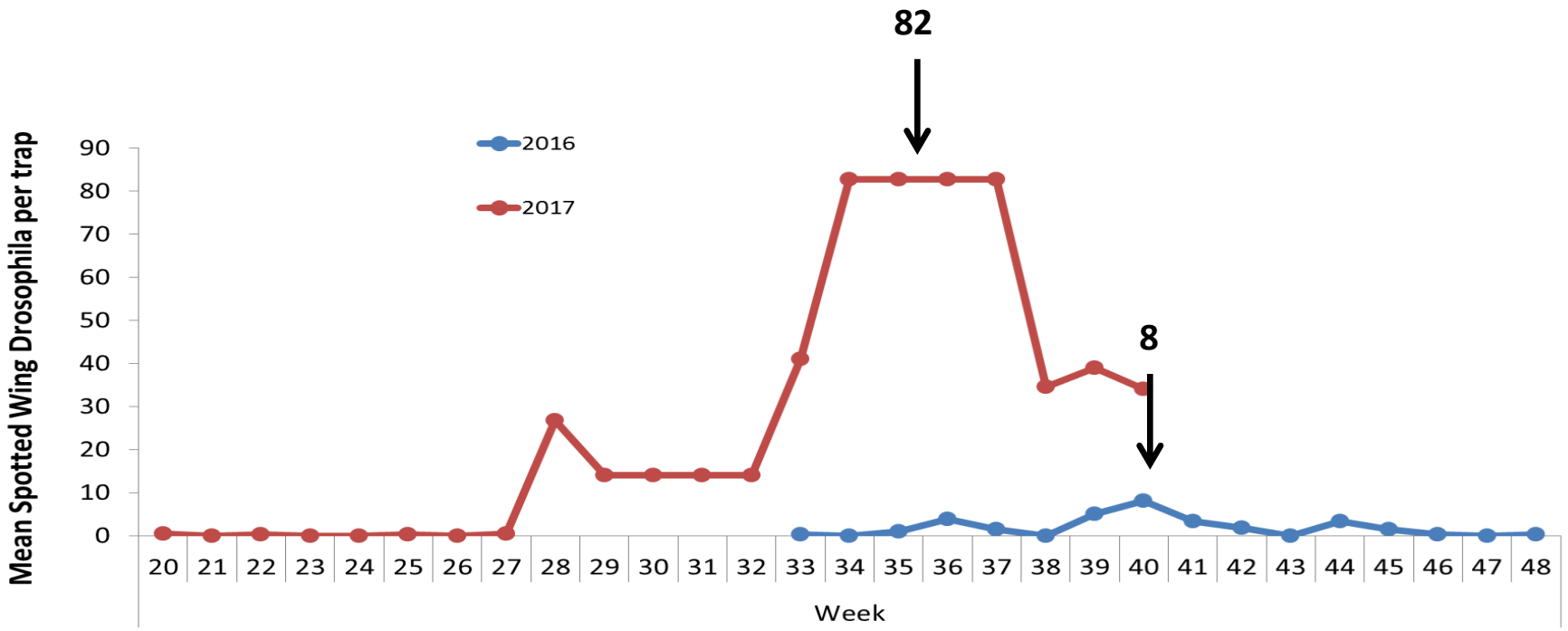
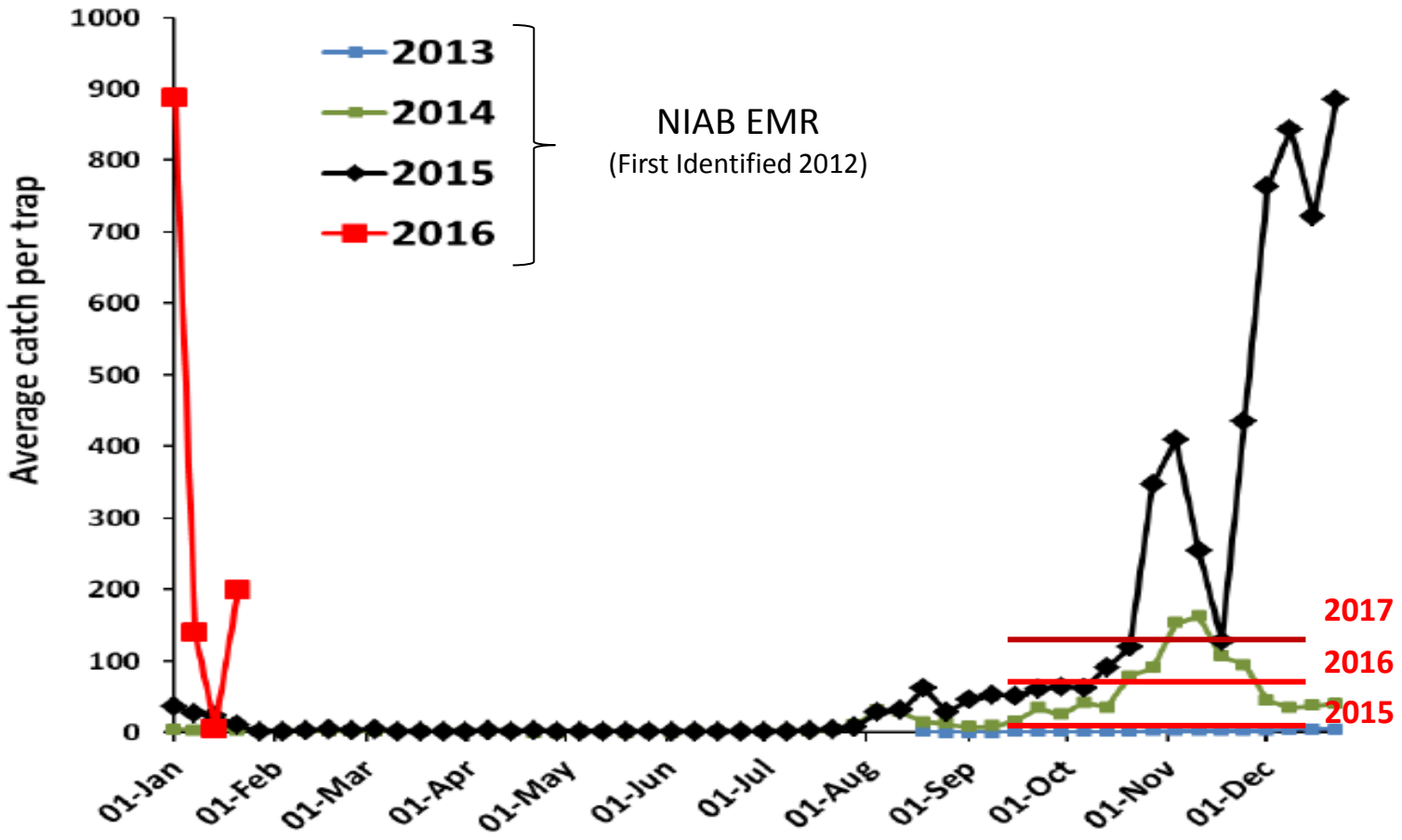



Spotted Wing Drosophila per trap
160
140
120
100
80
60
40
20
0
1
3
5
7
9
11
13
15
17
19
21
23
25
27
29
31
33
35
37
39
41
43
45
47
49
51
Week
2015
2016
2017
136
60.2
16.5
Highest Individual Trap Catch 519 (22/11/17)
Highest Individual Trap Catch in UK 50,000


Mean Spotted Wing Drosophila per trap
90
80
70
60
50
40
30
20
10
0
2016
8
20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48
Week


Mean Spotted Wing Drosophila per trap
90
80
70
60
50
40
30
20
10
0
2016
2017
82
8
20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48
Week

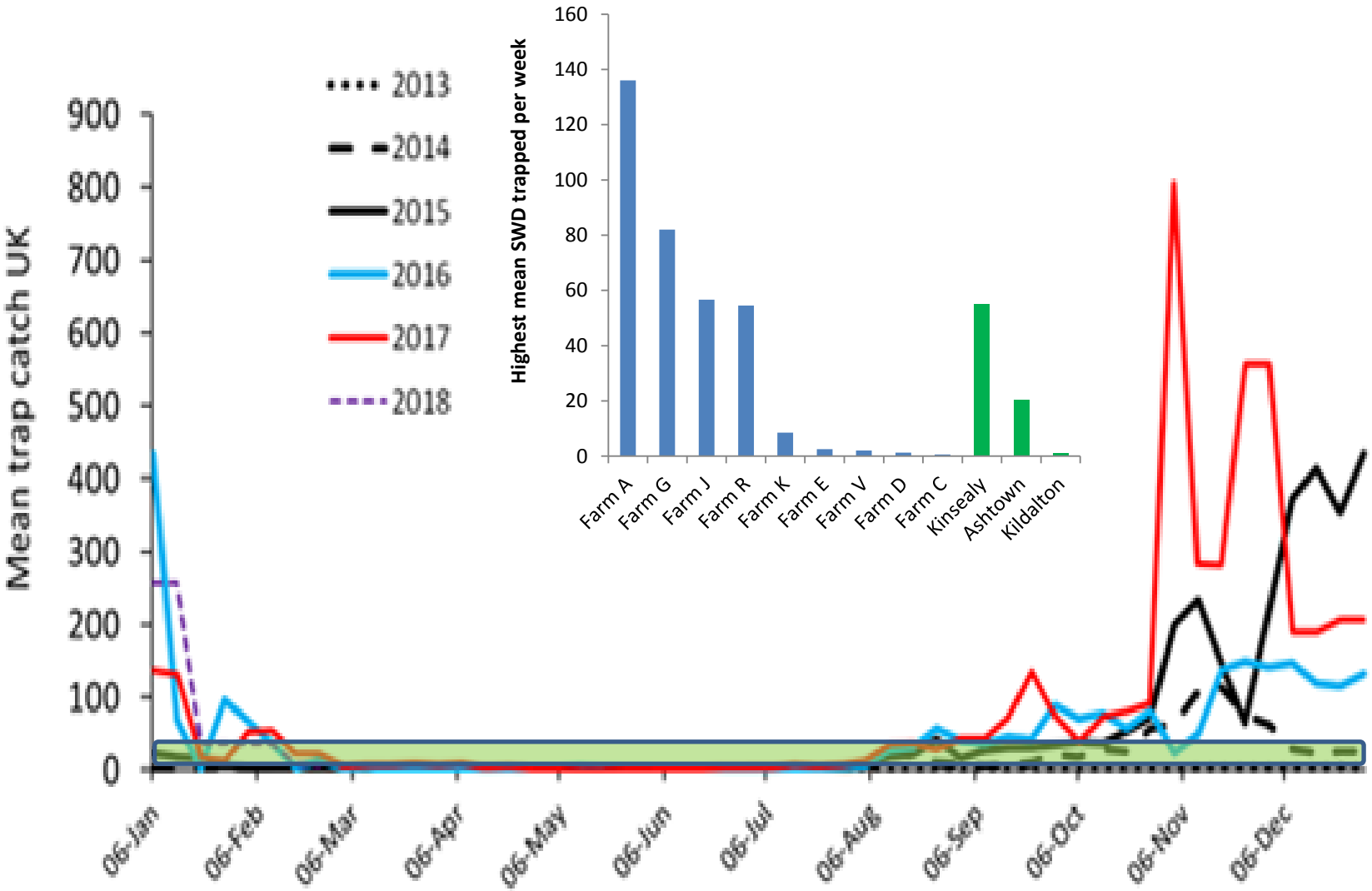
3. Comparing Irish SWD populations to UK data



Trapping data for *D. suzukii* from Sept 2013 to Feb 2016. Displayed are the average catch per trap numbers. The November peak in 2013 is less than 10 individuals per trap (Blue Line), over 160 individual per trap in 2014 (Green Line) rising to 900 individuals per trap in 2015 (black line).

Reference: Project Number SF145: Understanding and developing methods for managing spotted wing drosophila (SWD) in the UK: vital research to maintain the viability of the UK fruit industry. AHDB Horticulture.

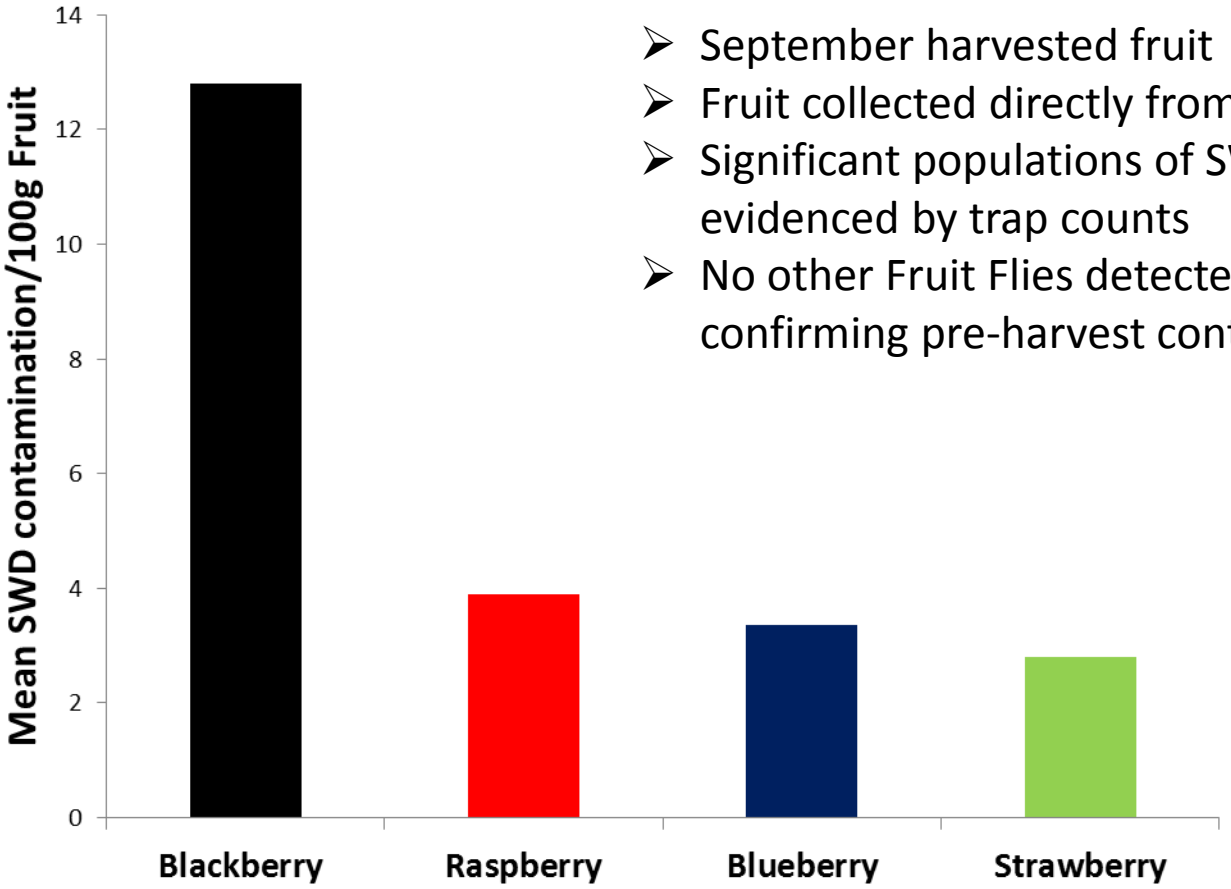
3. Comparing Irish SWD populations to UK farm average



National SWD Monitoring Programme Synopsis

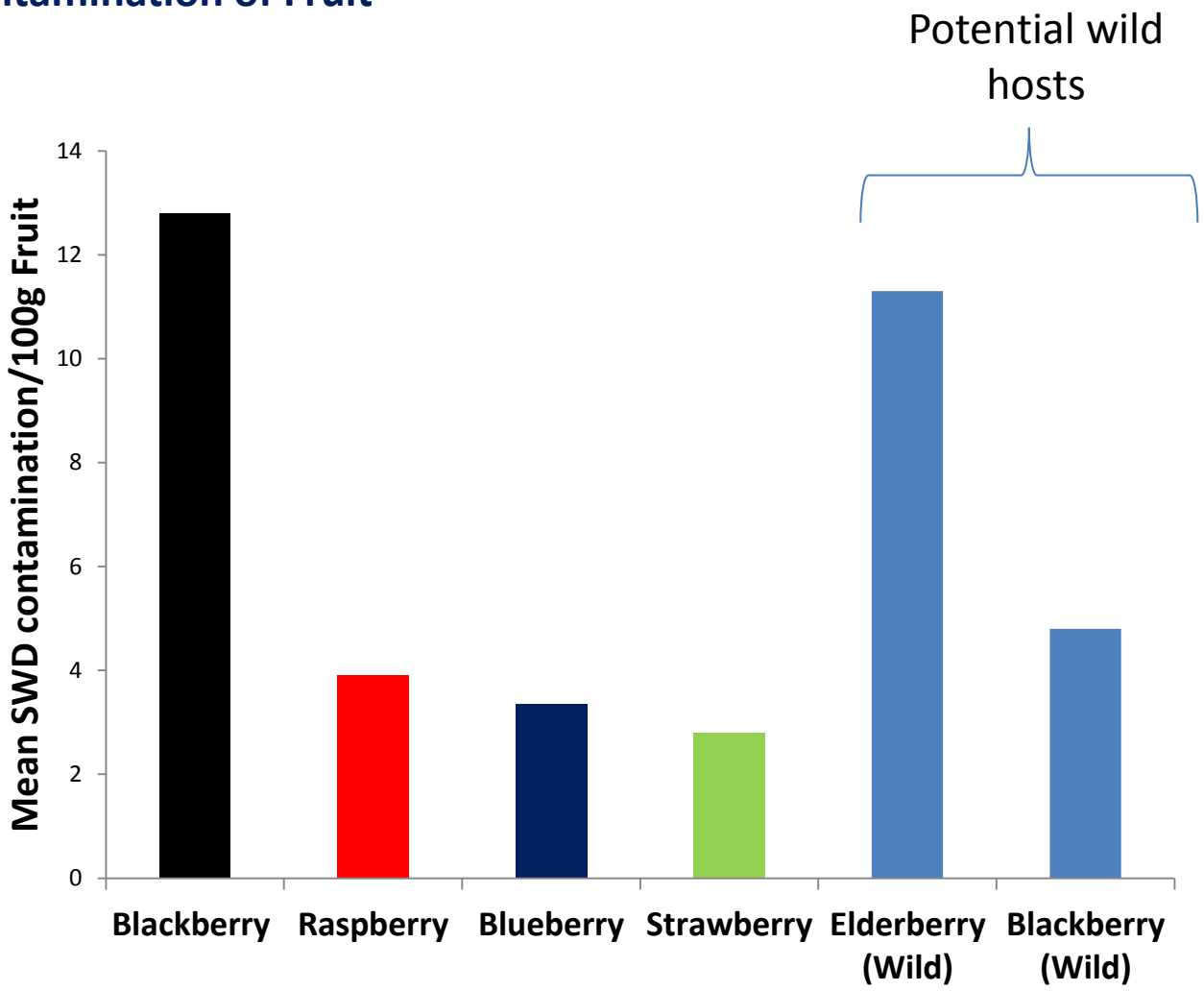
- Populations are continuing to increase and geographical range of SWD increasing
- Large farm to farm variability in relation to population increases – Impact of landscape?
- Impact of mass trapping?
- Usefulness of in-crop trapping as a treatment threshold?

4. SWD Contamination of Fruit

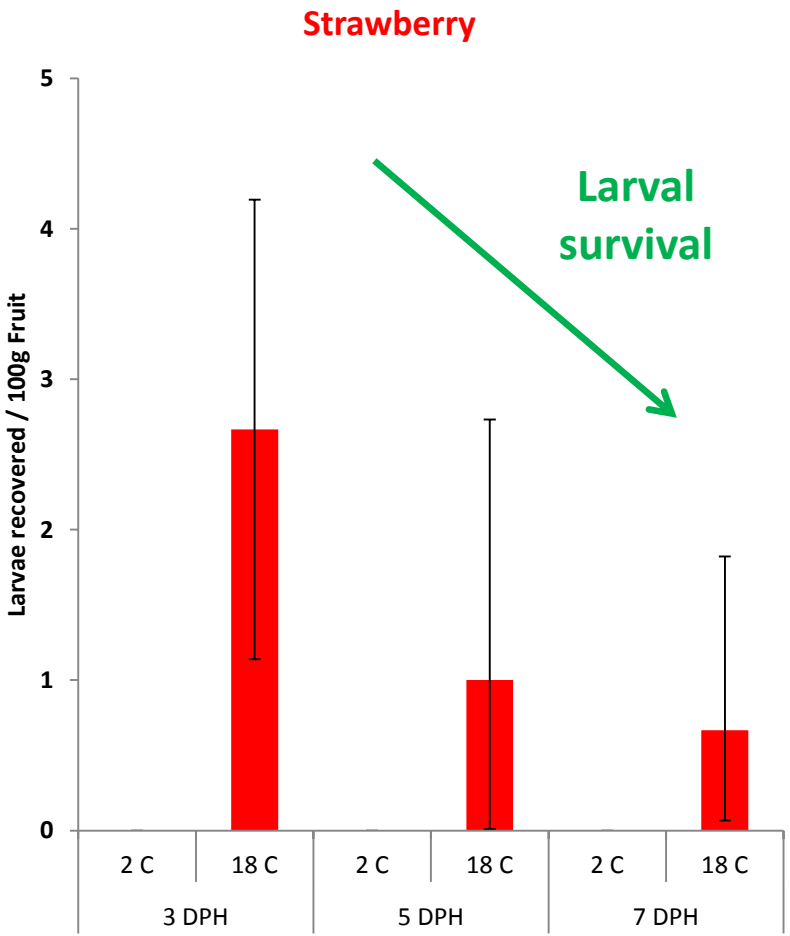


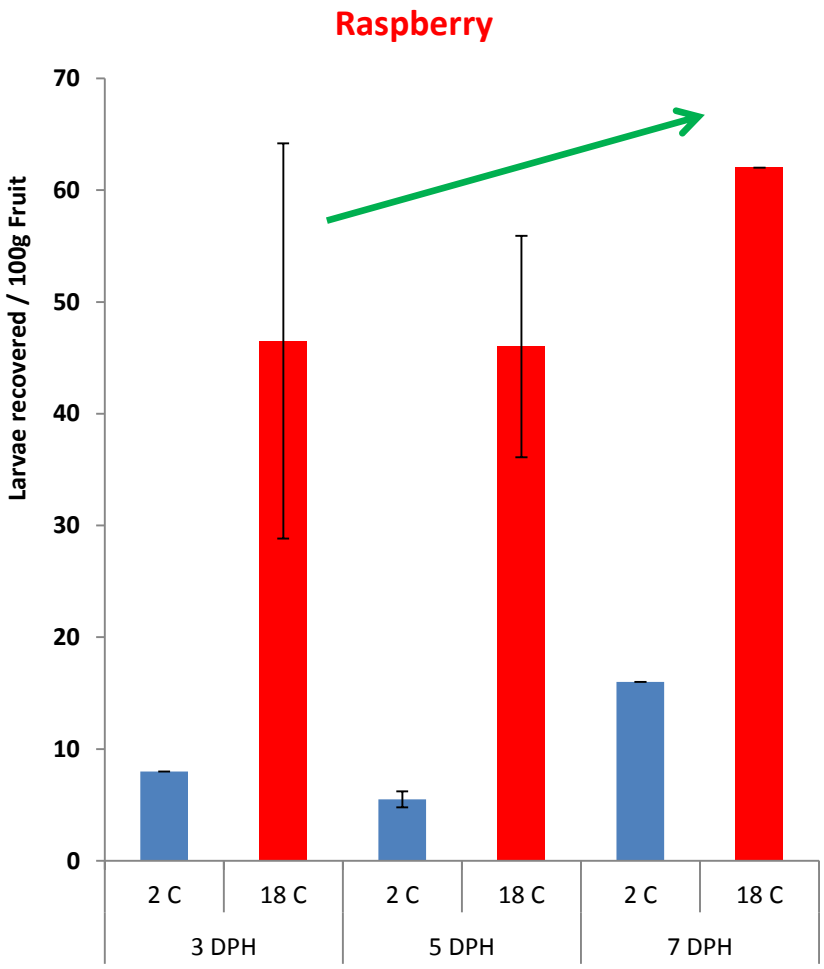
- September harvested fruit
- Fruit collected directly from field
- Significant populations of SWD as evidenced by trap counts
- No other Fruit Flies detected, confirming pre-harvest contamination

4. SWD Contamination of Fruit

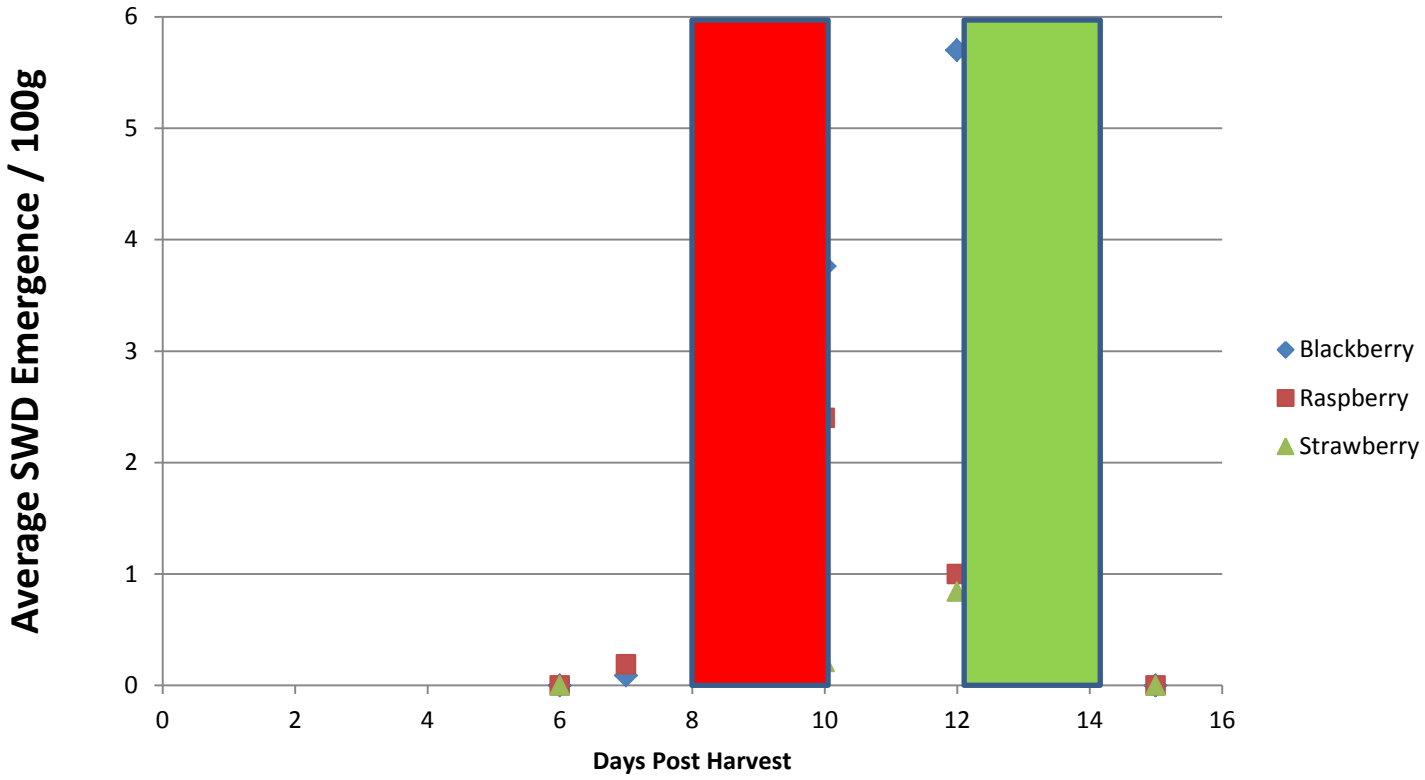


5. Cold treatment of Fruit





5. SWD development within Fruit



Experiment conducted at
Room temperature (18^{o}C)

Fruit Monitoring Programme Synopsis

- SWD can access over ripe fruit - Waste management critical to manage pops
- Blackberry > Raspberry > Blueberry > Strawberry
- SWD contamination identified in produce
- SWD seem to develop less successfully in Strawberry
- Cold treatment shows some promise in managing contamination (v. preliminary)

Current UK approach to SWD Management

'SWD was initially in higher populations in the south of the UK but is now widespread and without management can cause significant crop losses.'

- Monitoring of adult populations and fruit essential
- Removal and destruction of damaged and unmarketable fruit
- Prevention of SWD continuously entering the crop using insect mesh screens and judicious use of PPPs
- Harvested fruit must be checked before leaving farm to maintain integrity of the industry
- Cold chain of harvested fruit must be maintained (incl. at retailers shelves)
- Training of staff to recognise importance of SWD control to the success of the business

All approaches necessary for successful production of Grade 1 fruit

Spraying alone will not be effective

Conclusions

- SWD posses a significant threat to the viability of the Irish soft fruit sector
- Populations on some farms have increased to levels where contamination in fruit is evident – preventative measures in 2018 will be required
- However, 2017 data indicates that populations on most farms are low and there is still the potential to effective cultural management
- The lack of coordinated industry response will result in issues at the retailer level
- The current lack of a monitoring programme severely hampers our ability to actively support the sector
- Without an effective response the SF industry is most likely facing significant increased costs from yield loss, staff costs, waste management, increased use of PPPs, use of physical barriers etc.

Outputs of the National SWD Monitoring Programme

- Has prevented a significant increase in the unnecessary use of PPPs
- Participating growers were informed of population counts and able to make crop protection decisions based on farm specific data
- 10 training courses over 2016 and 2017 have been held where 200 growers have received training in SWD identification and monitoring techniques
- Monitoring data has provided an evidence basis for access to additional pesticides either through EAMU / 120 day approvals (2016, 2017 and 2018)
- Provided preliminary data to secure funding for a 4 year PhD study funded by Teagasc (€180,000) on non-chemical SWD control approaches in collaboration with NIAB EMR and MSU

Acknowledgements

Collaborators:

Dr Jan Robert Baars, UCD

Dr Elaine Keenan, Technician SWD monitoring Programme 2016

Ms Martina Caplice, Technician SWD monitoring Programme 2017

Ms Aisling Moffatt, UCD, Mr Chris Ovenden, Teagasc

Mr David Brogan, UCD / Teagasc, Mr Leo Finn, Teagasc

Funders:

Bord Bia (2016 & 2017)

Teagasc (2015, 2016, 2017)

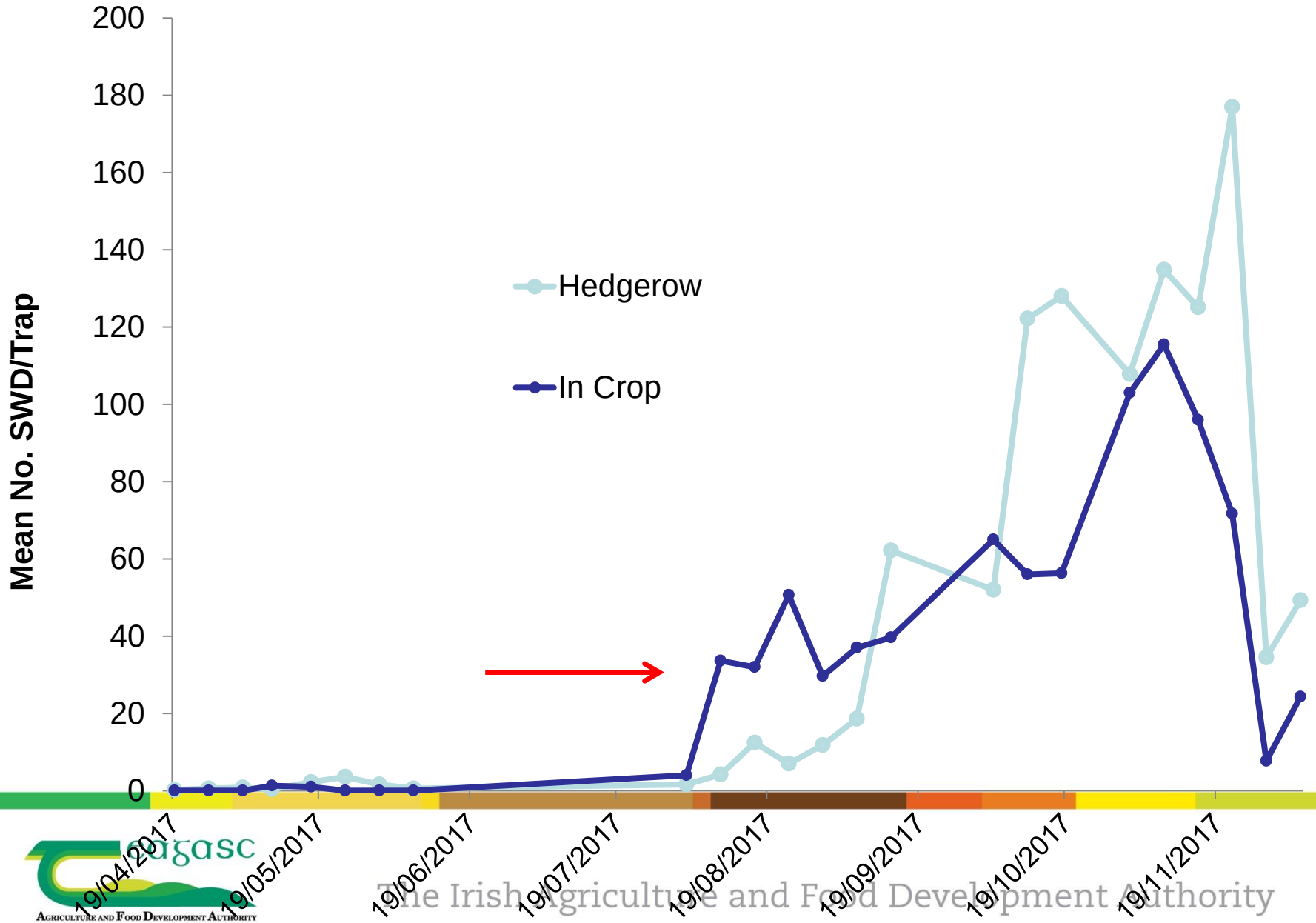
Growers:

Our sincere thanks to all growers who have assisted by collecting and returning traps for the last 30 months. Particular thanks to those growers who have allowed us access to their farms to collect samples and agreed to allow us present data collect from their samples.

Thank you

Questions?

Placement of monitoring traps



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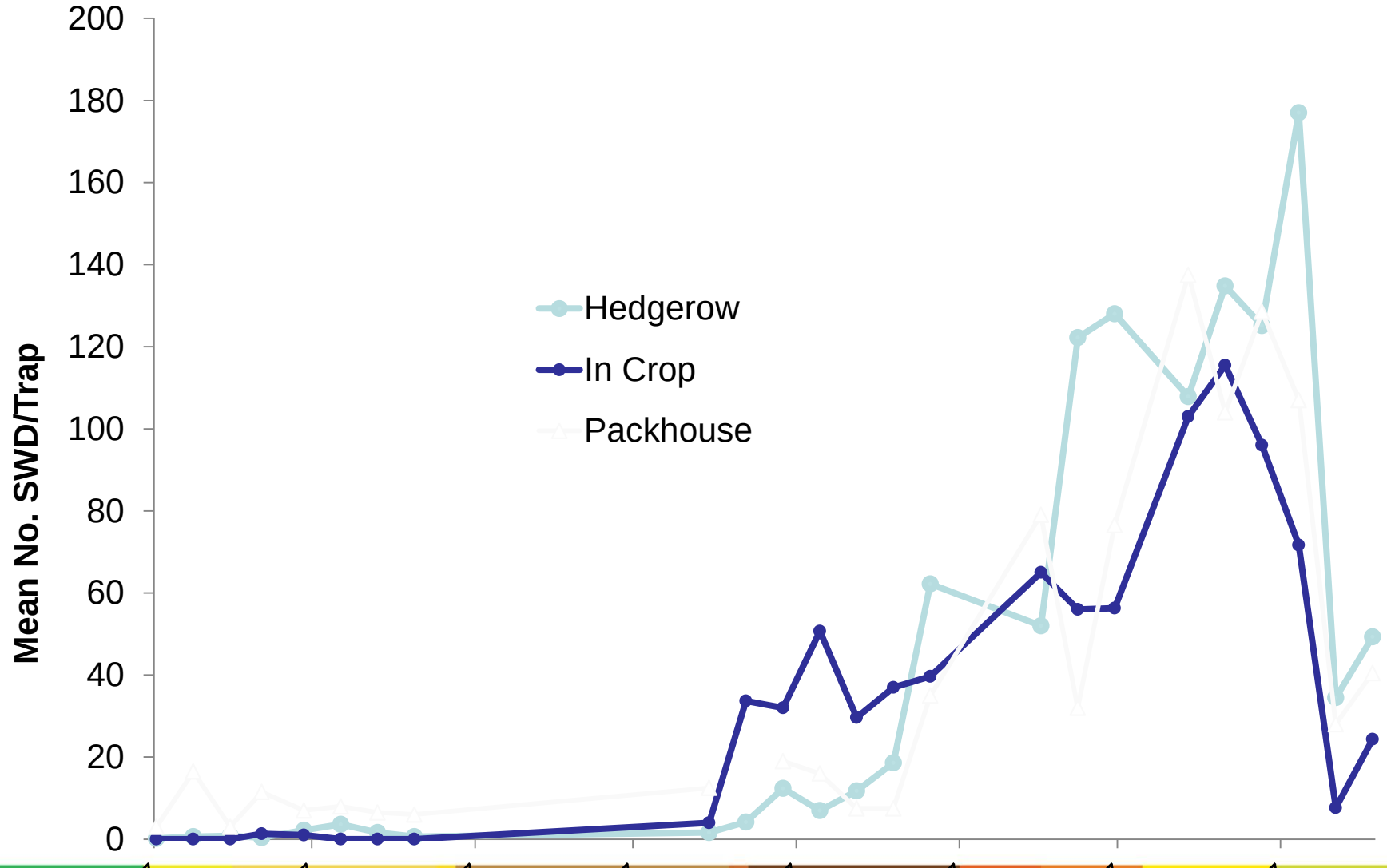
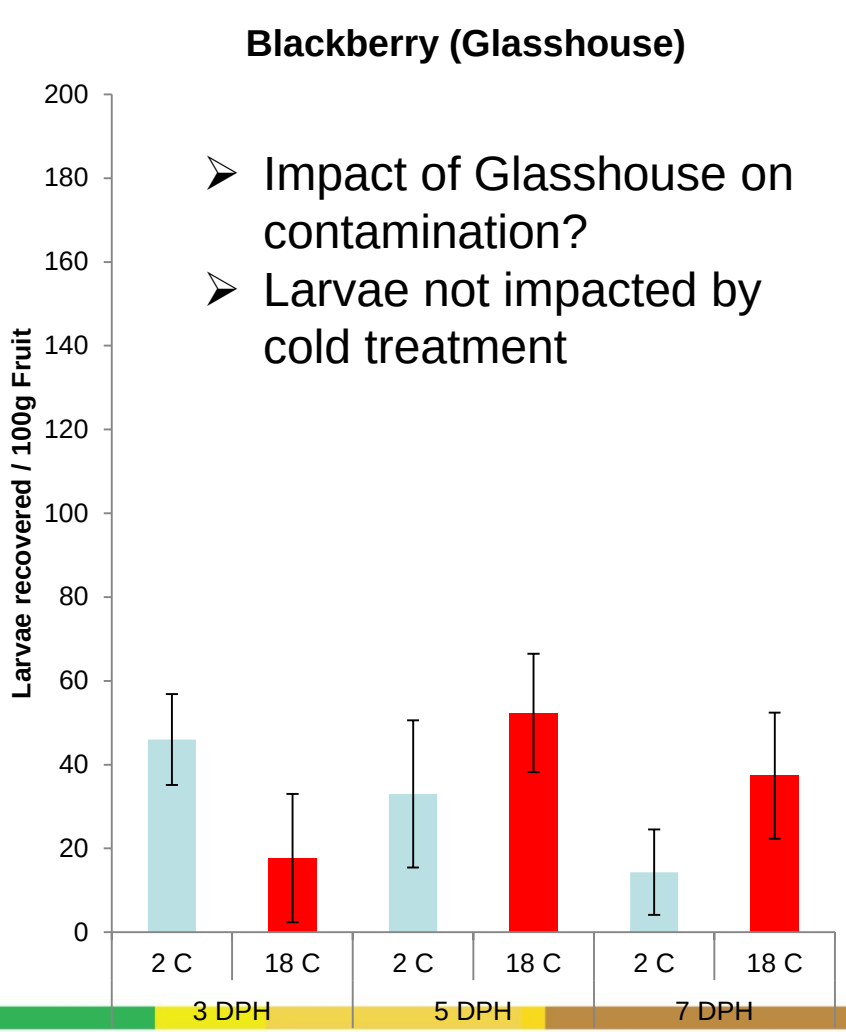
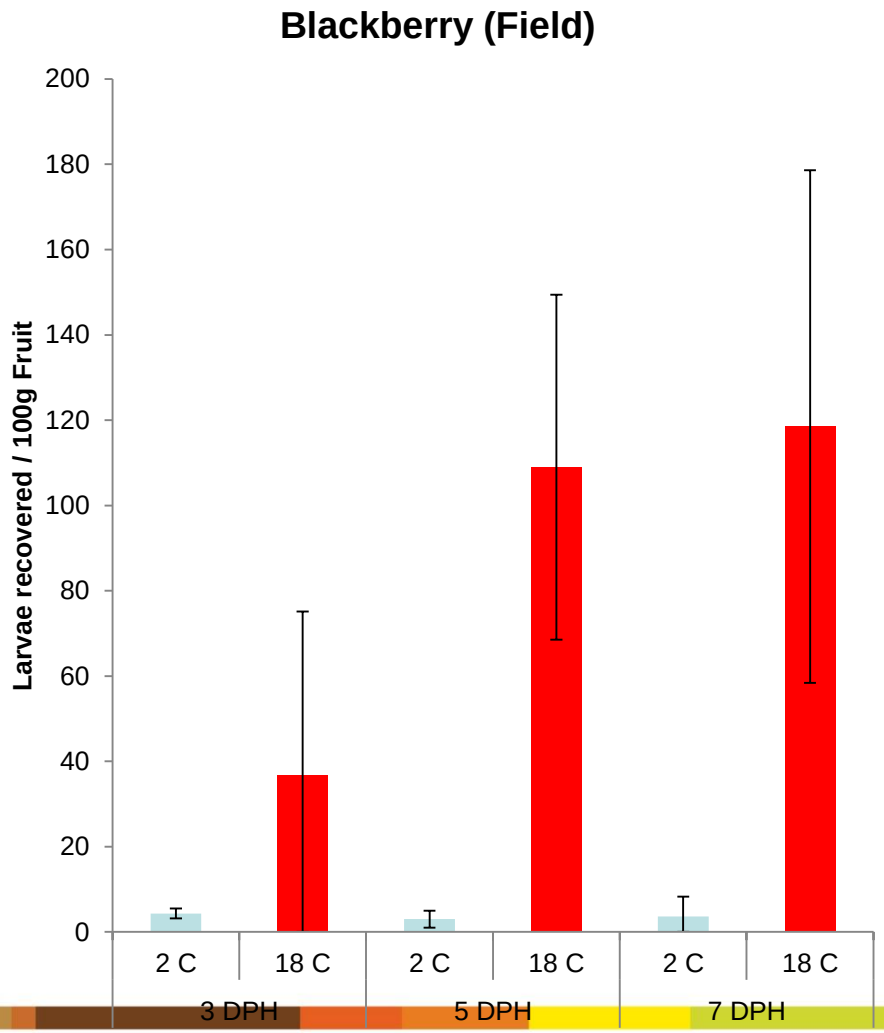


5. Cold treatment of Fruit

- Impact of Glasshouse on contamination?
- Larvae not impacted by cold treatment





4. SWD Contamination of Fruit

	No. of Flies / 100g			
	July		**August**	
	Fruit Flies	SWD	Fruit Flies	SWD
Strawberry	2.95	0.15	2.1	0
Raspberry	0.3	0.2	2.3	1.25
Blackberry	0	0	6.15	1.05