

Spotted Wing Drosophila – a 2014 season update and a look forward to 2015

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Drosophila suzukii – spotted wing drosophila (SWD)

- Vinegar fly native to Asia - damaging to a wide range of soft and stone fruit giving rise to collapse and juice leakage
- First described in Japan in 1916, then USA first report in Europe 2008, first recording in UK 2012 (Scotland 2014)
- The serrated ovipositor of the female causes physical damage to the host fruit and provides a wound which can be accessed by other insects and pathogens including fungi and bacteria



Martin Hauser, CDFA

SWD Identification – key characters

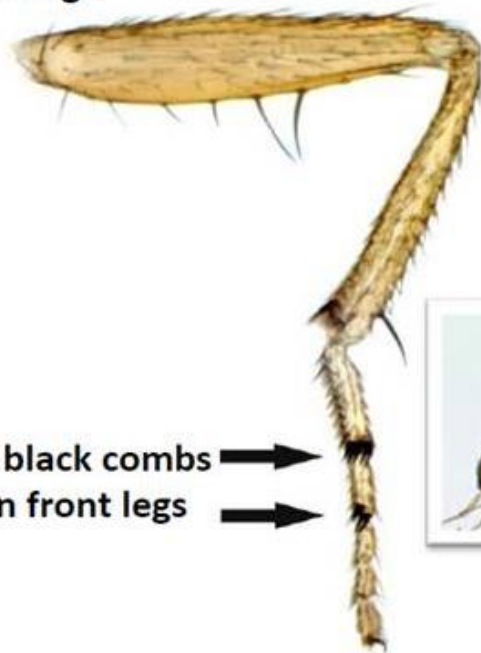


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Male



Black spot
on wings



2 black combs
on front legs



Female



She inserts saw-like device
(ovipositor) into fruits and
lays eggs

characteristics of spotted wing drosophila male and female vinegar flies

SWD – biology

- Female lays eggs in healthy ripening fruit (up to 500 in lifetime)
- Development from egg to adult 8-25 days
- 25°C one generation 8- 10 days , 15°C one generation 21-25 days
- Can survive cool temperatures and high humidity.
- Active flyer – can travel up to several Km
- Also travels in imported fruit



National monitoring project

Project funded from 2013 - 2017 involving EMR, NRI and the James Hutton Institute

- Traps, bait and synthetic lures
 - Habitat studies and looking at wild hosts
 - Time of activity for egg laying and crop preferences
 - Insecticides
-
- Monitoring catches at growers sites
 - Waste handling and disposal
 - Flotation test for detecting larvae



National monitoring sites 2014



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Region and crops

South East England (46 traps)

Farm 1	Raspberry, strawberry
Farm 2	Raspberry, strawberry
Farm 3	Cherry
Farm 4	Raspberry, strawberry
Farm 5	Blackcurrant, cherry, raspberry, strawberry
Farm 6	Blueberry, redcurrant, strawberry

Eastern England (20 traps)

Farm 7	Blueberry, raspberry, strawberry
Farm 8	Raspberry, strawberry

West Midlands (27 traps)

Farm 9	Blackberry, blackcurrant, blueberry, raspberry, redcurrant, strawberry
Farm 10	Blueberry, cherry, raspberry, strawberry
Farm 15	Cherry, raspberry

Scotland (40 traps)

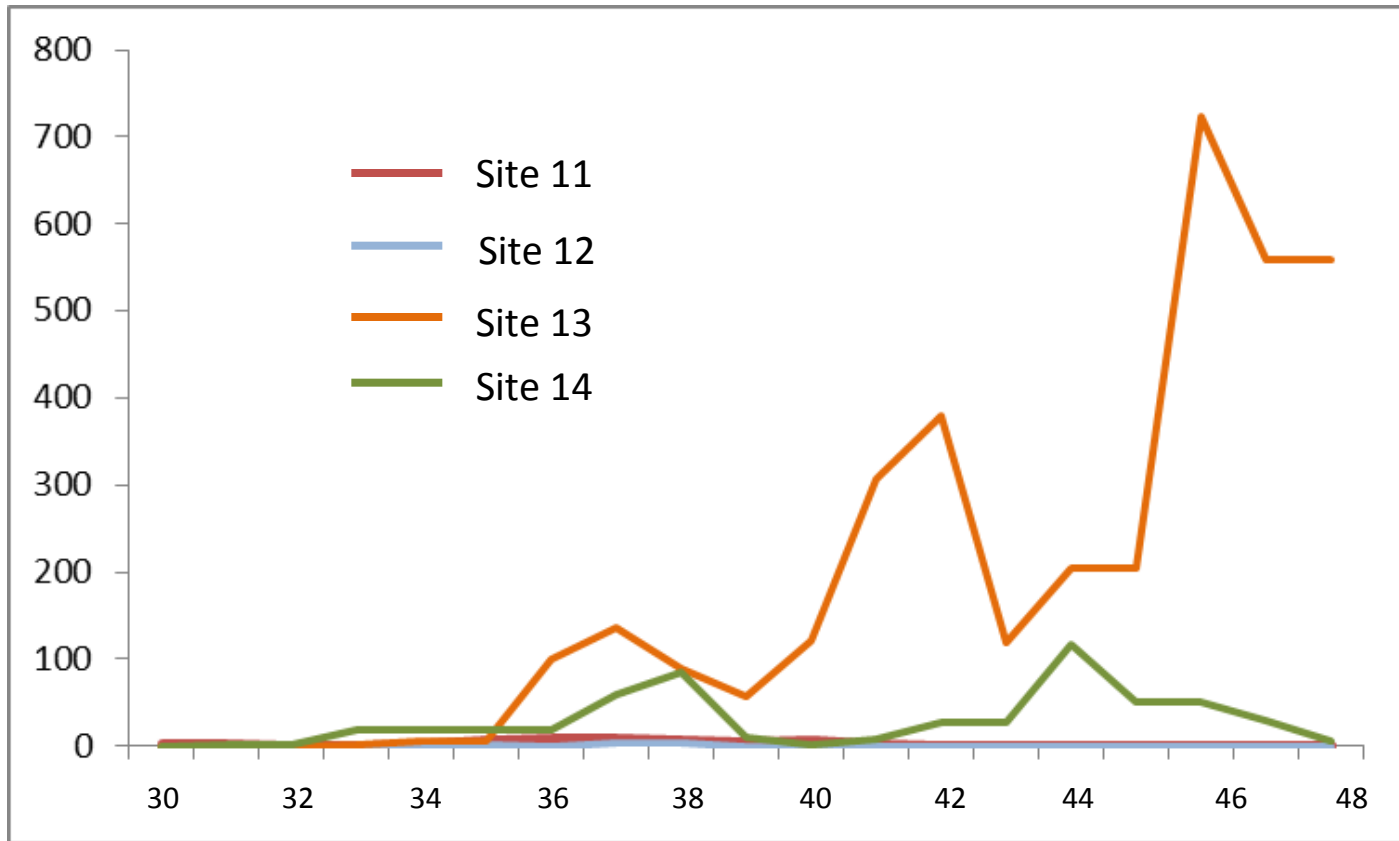
Farm 11	Blackcurrant, blueberry, raspberry, strawberry
Farm 12	Blueberry, cherry, redcurrant, strawberry
Farm 13	Blackberry, blueberry, raspberry, strawberry
Farm 14	Blackberry, blueberry, raspberry, strawberry

Total number of SWD caught at 4 monitoring sites in Scotland



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Total
number of
SWD
trapped
per week



←→ ←→ ←→ ←→ ←→
July Aug Sept Oct Nov

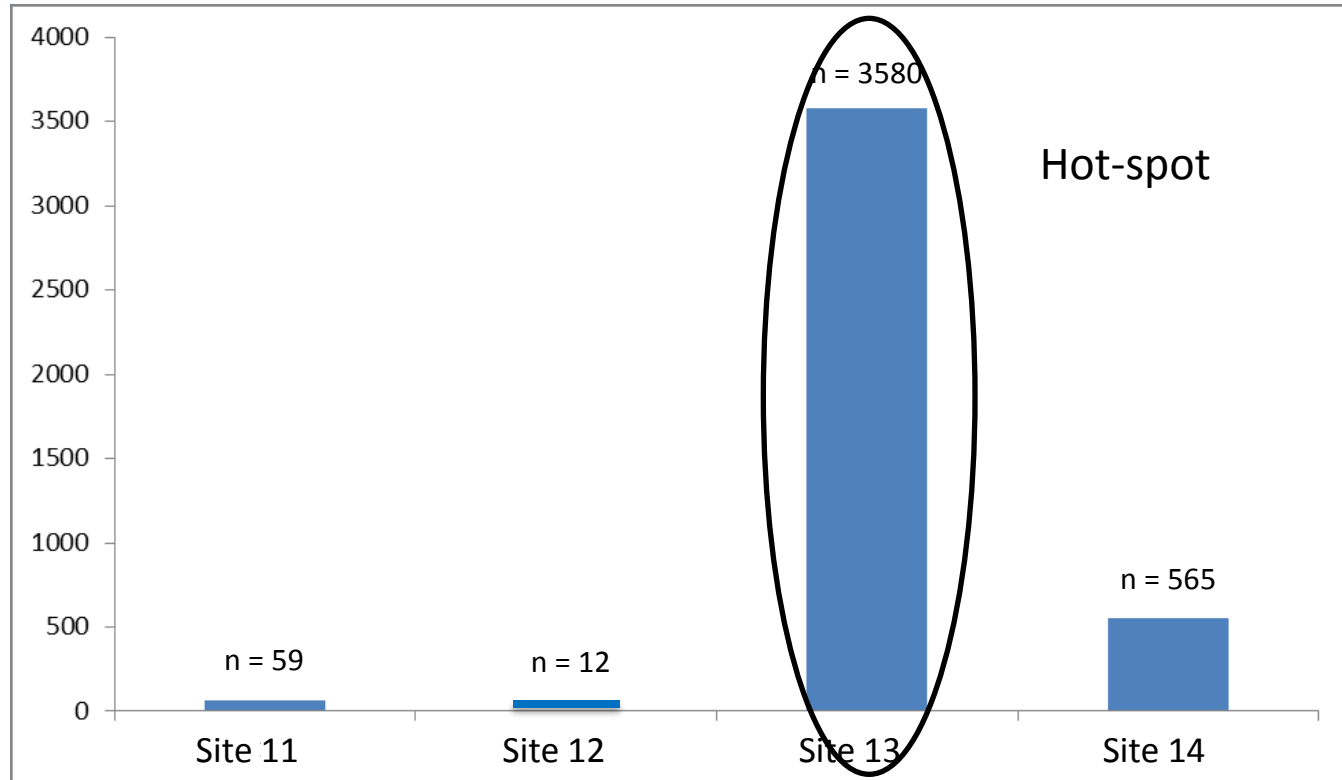
Weeks 30 to 48 (July to November 2014)

Total number of SWD caught at 4 monitoring sites in Scotland



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Total
number of
SWD
trapped in
monitoring
period

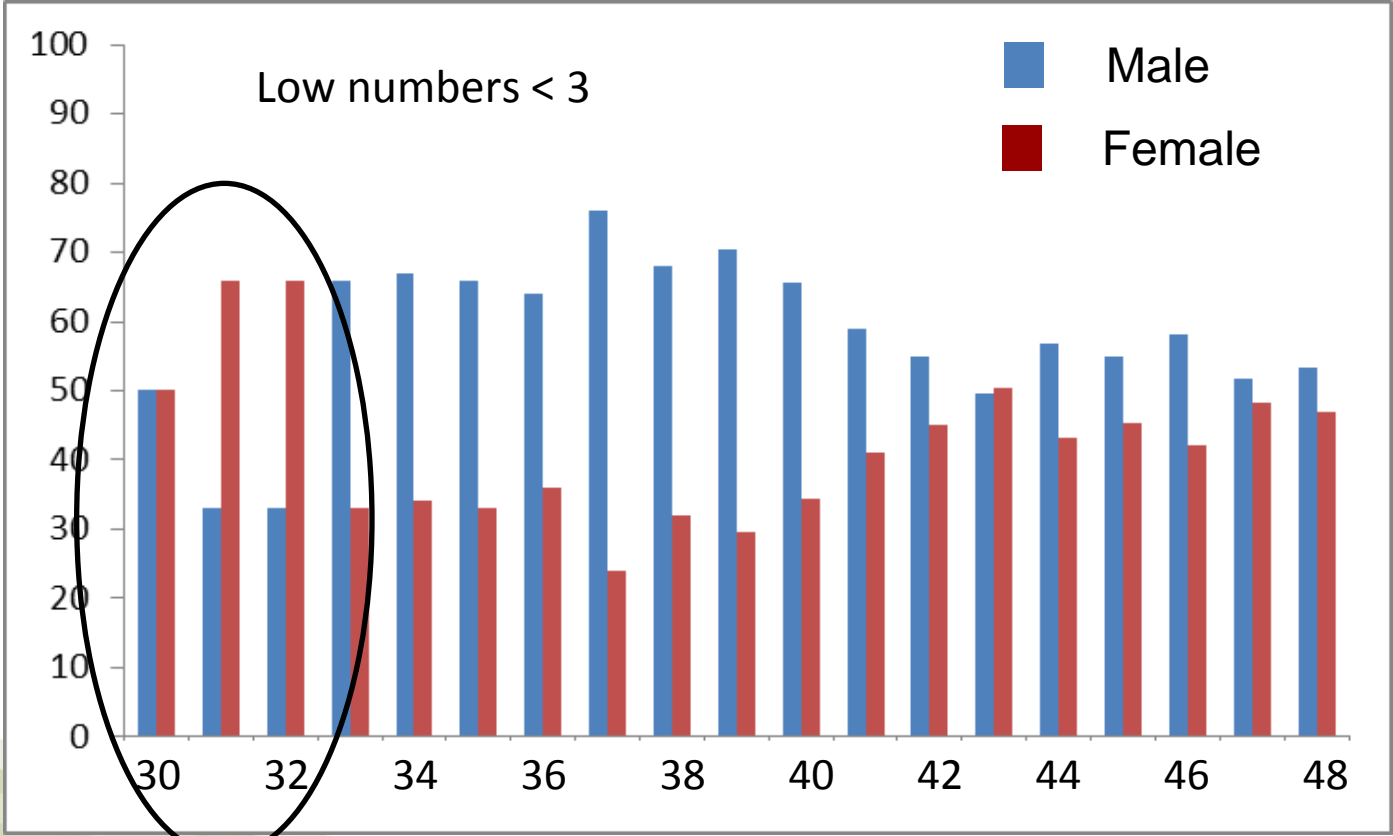


21st July – 30th November 2014

Gender ratio of SWD caught in Scottish traps over the 2014 monitoring period



% male or female SWD trapped per week over the four sites



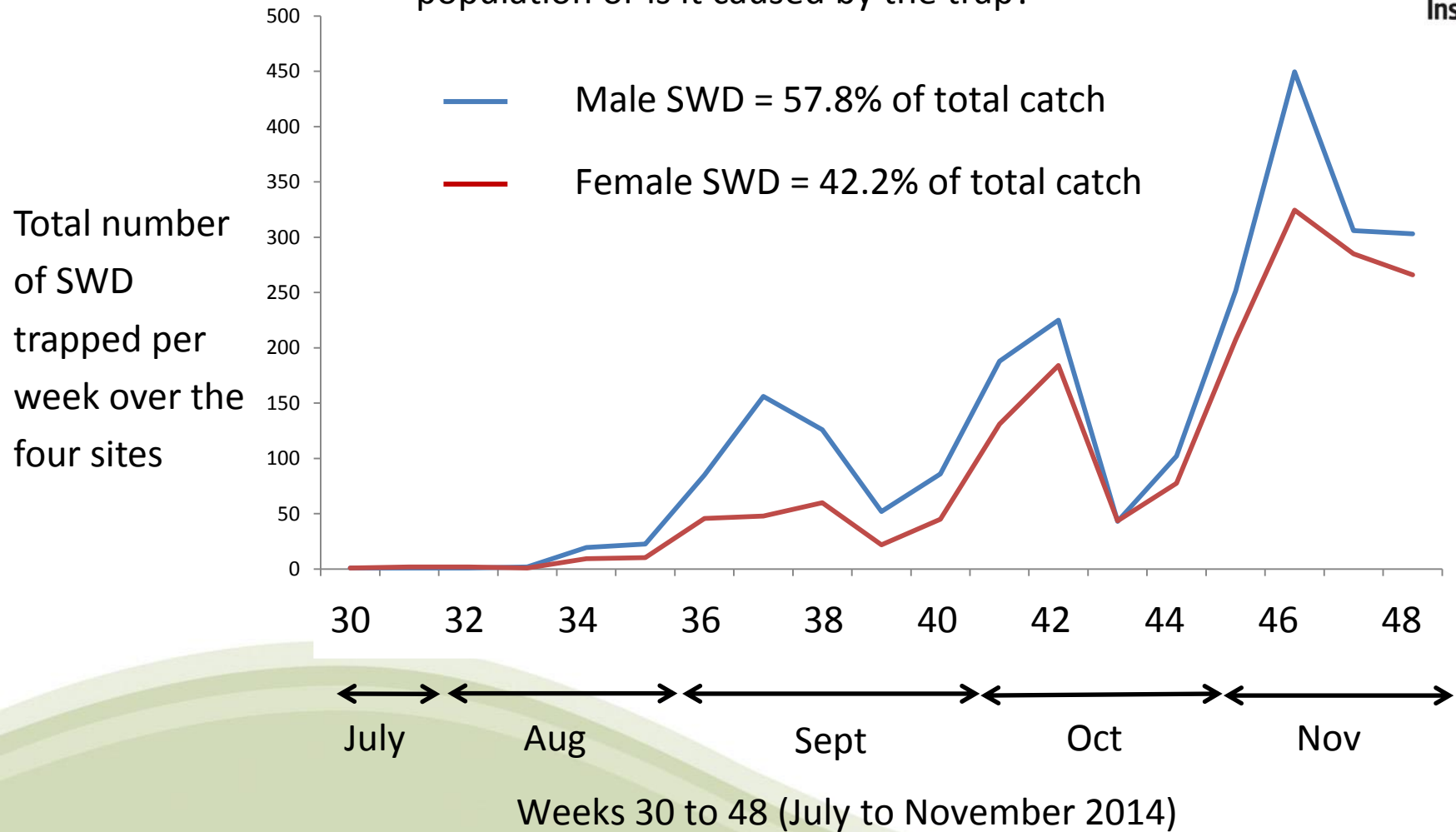
July Aug Sept Oct Nov
Weeks 30 to 48 (July to November 2014)

Overall the traps caught more male than female SWD



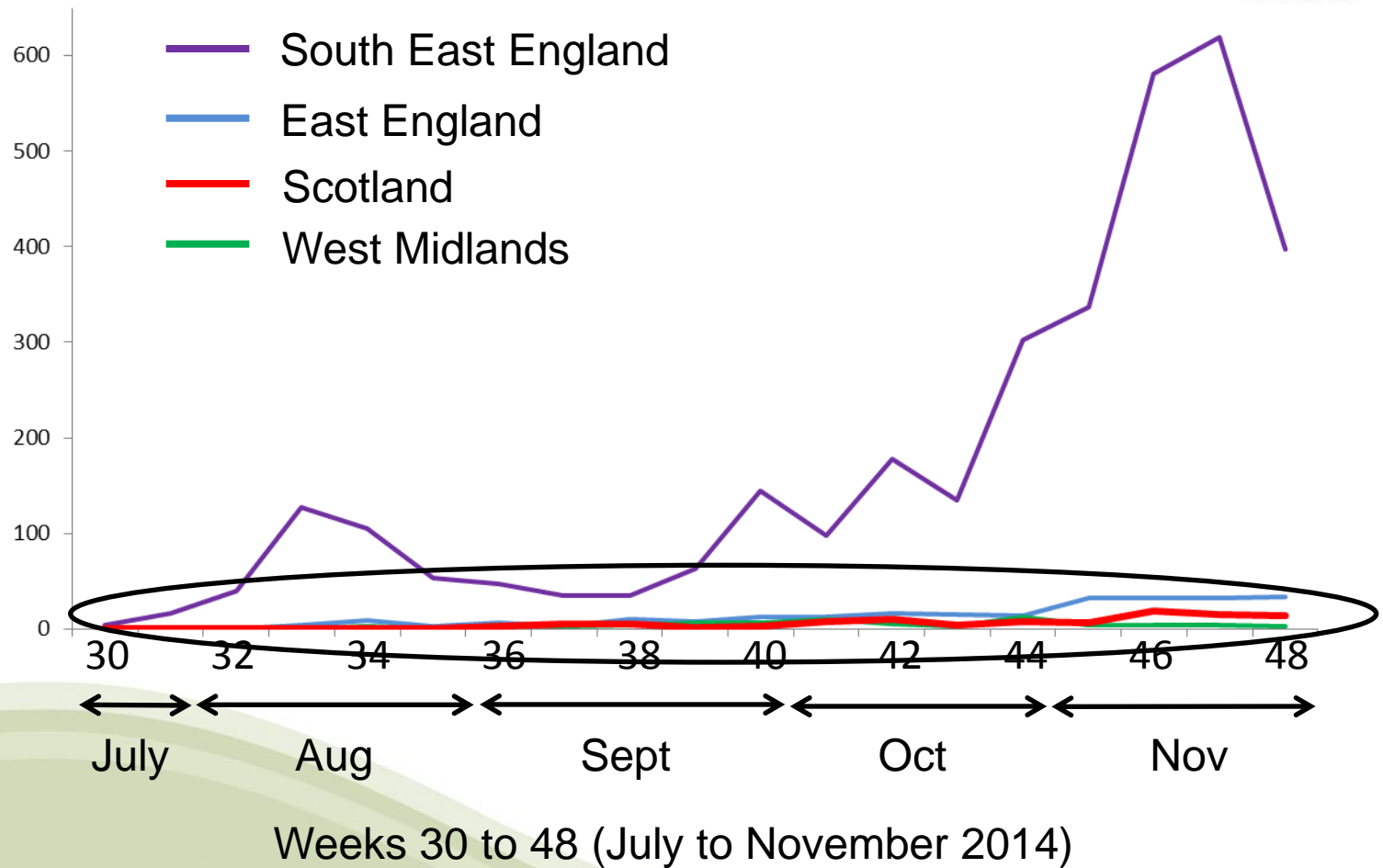
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Is this a genuine gender bias in the SWD population or is it caused by the trap?



Average number of SWD caught per trap at the 4 UK monitoring regions

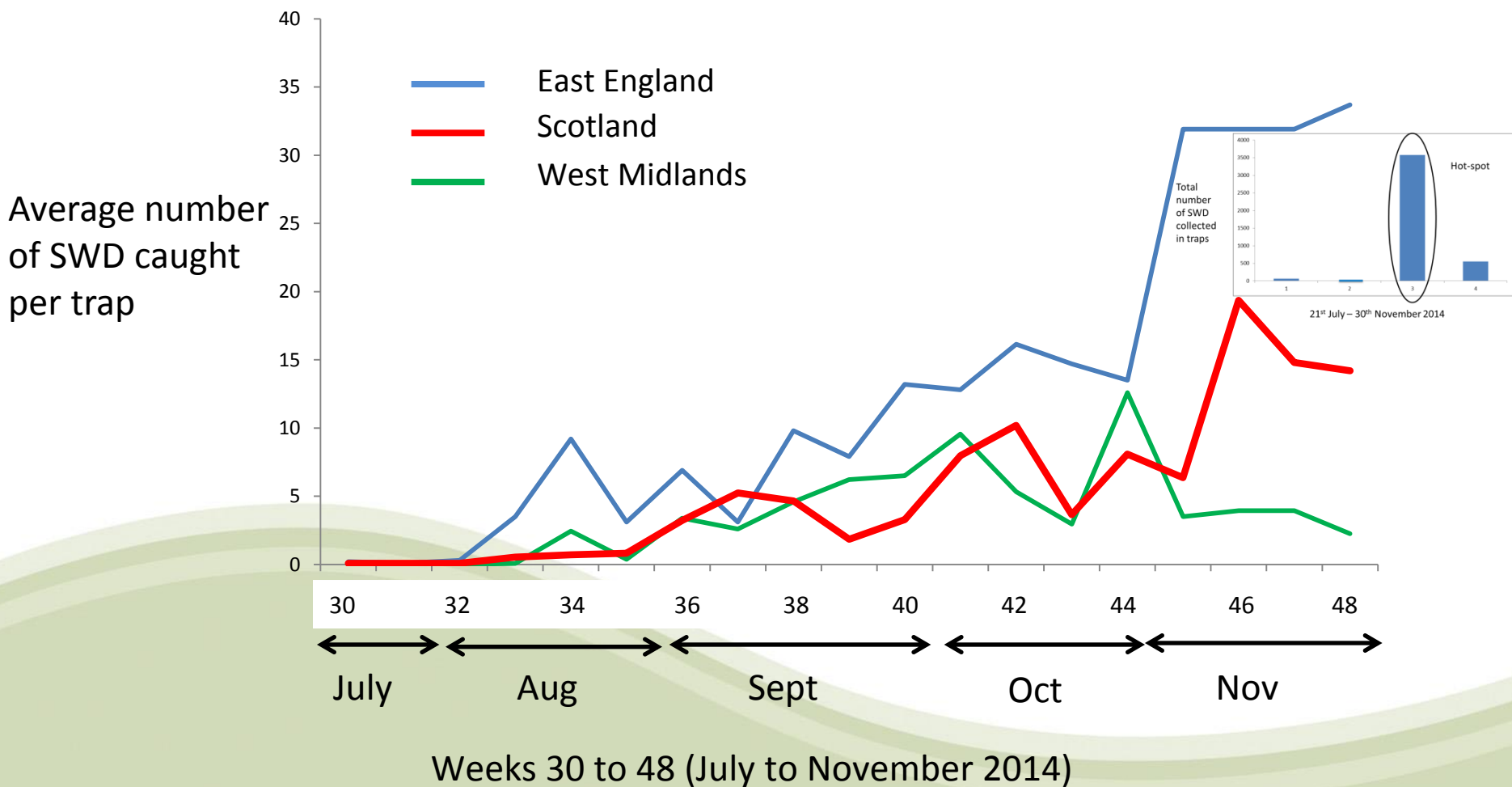
Average
number of SWD
caught per trap



Average number of SWD caught per trap at the 3 of the UK monitoring regions

These regions are not yet experiencing visible crop damage.

Control strategy – need to reduce numbers over the winter period



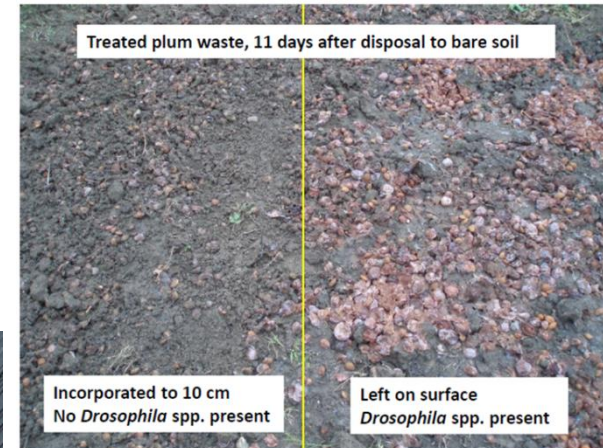
Waste handling and disposal

- Open disposal of fruit is very attractive to SWD
- 15-20% of soft fruit is waste
- 5-100% of stone fruit is waste



Waste handling and disposal

- Disposal of waste fruit – simple composting doesn't kill SWD
- Dolav bins – sealed sheet of black pallet wrap - killed within 48 hours at 18-25oC



Flotation test for larval sampling

- Very difficult to discern larval SDW in fruit by simple visual examination
- Methods have been tested - current method considered the best for a range of soft fruit crops is the sugar test
- Gently crush 100g of fruit in a plastic bag
- Make up a sugar solution (1kg/5.5 litres water) together with a few drops of spray tank defoamer
- Add 300ml of sugar solution to bag of fruit and wait 20 minutes occasionally shaking bag.
- Larvae will rise to the top of the solution





SWD - control



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Spotted wing drosophila (*Drosophila suzukii*) – Control options in 2014

Updated list of Crop Protection Products and essential information for UK growers regarding threshold levels for application

Current situation

Most soft and stone fruit growers in the UK are now monitoring their crops for the presence of SWD. In addition, a comprehensive monitoring programme across the different fruit growing regions of the UK is being conducted as part of the industry funded SWD research programme being undertaken by East Malling Research in conjunction with The James Hutton Institute (HDC Project SF 145). SWD is now known to be present in low numbers in all the fruit growing areas of England. This research programme is also investigating sampling and extraction methods for the pest, ways of disposing of infested fruit safely, attract and kill strategies and crop protection methods. Comprehensive information about SWD, how to monitor for its presence and the latest research results can be found on the dedicated SWD page of the HDC website www.hdc.org.uk/swd.

Control thresholds and precision monitoring

In considering when to commence control measures for SWD, growers should be aware that if they start spray programmes too early, then it is likely that the permitted number of approved products may be reached before populations of SWD have risen to a peak, when significant fruit infestation may occur. However, it is equally important to start a control programme before populations build to a point where fruit damage starts to appear.

Researchers in the USA and Europe have been considering threshold levels. Having experienced and worked with the pest for the past few years, their current advice is to initially monitor for adults in woodland and hedgerows in the vicinity of a crop. When these numbers start to rise, and the crop is just beginning to ripen, then monitoring should be started in the crop itself. At the pre-ripening stage, growers may wish to consider implementing precision monitoring when catches are made in neighbouring woodland and hedgerows. Traps should be placed around the outside perimeter of the crop at a density of 2 metres apart (total of 200 per ha). Swiss research has shown that this can create a barrier between the existing traps and the crop, thereby slowing the ingress of SWD to the ripening fruit. However, at this stage it is still important to monitor the progress of SWD within the crop itself as well.

SWD Groups

SWD Working Group – includes a range of industry organisations, representatives from Defra Plant Health, Scottish Government, CRD, NFU and the Horticultural Marketing Inspectorate

Aim is to share knowledge and new information, to highlight problems and work together to find solutions

SWD Industry Project – steering group – to review the research being funded by Defra, the Scottish Government and the industry at East Malling Research and James Hutton Institute, to ensure that it meets the needs of industry.

Aim is to help to guide and inform the direction the research takes during the course of its four years.



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emr
east malling research
centenary
1913 - 2013



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SWD – control recommendations

- Begin monitoring in February – traps in woodland and hedgerows
- Monitor for adults until November with recommended trap and bait
- Pick fruit regularly, every 2 days
- Remove damaged and fallen fruit – ferment for at least 48 hours
- Do not open compost fermented waste, bury under soil
- Sample harvested fruit for signs of larvae damage – flotation test
- Identify ‘hot spots’ and target with control measures
- SWD page on HDC website – keep up to date with pesticide approvals
- Effective monitoring and good crop hygiene measures are key

Across Europe

- The numbers caught are increasing
- Warm winters – females more resistant to cold than males
- SWD look for shelter
- Mass trapping can be effective but attractant has to be more attractive than the fruit
- 2014 first damage seen in Apricots in France
- Research in to Lime and Thermal pest control
- Reaction must be immediate for all growers in regions where SWD detected



Thanks to the Scottish Government and HDC



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- Gaynor Malloch
- Ailsa Smith
- Yvonne Pitkin and William Deasy

- Staff at EMR – Jerry Cross, Michelle Fountain and David Buss

- NRI – David Hall and Dudley Farman

- Growers in monitoring project

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