Spotted wing drosophila (SWD) - Code of practice for growers

The spotted wing drosophila (SWD) is a major threat to soft fruit (Figure 1), stone fruit, tomatoes, vines and other crops and could cause serious losses in the UK if not controlled. Its presence in the UK has been identified and was confirmed in September 2012. It is now present (2014) in low numbers in all fruit growing areas of England.

Best practice on fruit farms

- Early season trapping and monitoring of adult males is essential. The males are easier to identify than the females by the spot found on each wing (Figure 2) and two dark combs (Figure 3 – overleaf) on the forelegs.
- 3 Male spotted wing drosophila has two dark combs on the forelegs
- To monitor for adult males, use a modified version of the Biobest Droso Trap, which has additional small holes (Figure 4 – overleaf). A video clip showing the modifications is found on the dedicated SWD site of the HDC website www.hdc.org.uk/swd.
- Use Dros’ Attract or Gasser lure liquid bait in traps.
- At the start of the production season, it is best to use traps in wild areas of the farm, such as hedgerows and woodland.
- Traps in wild areas should be hung 1 metre above ground level and in part shade, part sunlight. Clear any tall vegetation away from the trap so that it’s easily accessible.
Traps should not be placed in crops at the start of the season as this can encourage SWD into the crop.

When high populations are being caught in wild areas, start monitoring in crops but not before. Use two traps per cropping situation but remember that traps should be hung on the shady side of crop rows.

In stone fruit, cane fruit and bush fruit crops, hang the traps at one third of the canopy height out of direct sunlight.

In outdoor strawberry crops, hang on a post above the ground and below the spray boom height.

In tunnel strawberry crops, hang in the leg row at a height of 10 cm.

Monitor traps weekly from April until late November.

From the start of fruit ripening onwards, it is essential that ripe fruits are monitored on a weekly basis for the presence of SWD larvae using the floatation method.

Collect up to 100 fruits across a plantation, sampling fully and over-ripe fruits from the middle and lower parts of crop canopies. Crush them either on a tray or in a polythene bag.

Make up a solution using 1 part salt to 3 parts sugar in 16 parts warm water and pour over the crushed fruit. The fruit should be allowed to settle for 10 minutes, stirred again and defoamer added if necessary. Any living larvae will float out within 10 minutes. A video clip showing how to carry this out is found on the dedicated SWD site of the HDC website www.hdc.org.uk/swd.

If you suspect SWD is present on your farm, but aren’t sure of the identification, send samples of the adults in the liquid bait to the entomology team at East Malling Research, clearly labelling the sample bottle with your business name and contact details, location of the catch and details of the crop or vegetation where the trap was sited. Growers in Scotland should send samples to Alison Dolan at The James Hutton Institute.

Samples will be examined and responses sent to growers. Any such information will be held in strict confidence at East Malling Research and James Hutton Institute.

Crop hygiene

Good hygiene in the crop is essential to prevent initial infestation. It is important to keep up with picking and not allow quantities of ripe and overripe fruits to develop, which will be very attractive to SWD. During picking, all waste fruit should be removed from the field and not left between rows or in a pile on the headland. Collection containers should be washed every day to remove old or waste fruit which will attract adult flies. If SWD is confirmed or suspected in a crop, all infested material should be removed from the field, and disposed of.

Waste fruit can be disposed of in several ways:

1. Puree the fruit – SWD needs intact fruit for egg laying.
2. Place affected fruit in a freezer/cold store plant and hold at a constant temperature of -1.6°C or below for 96 hours and inspect for complete kill at the end of the period.
3. Put all the affected fruit through an anaerobic digestion plant.
4. Ferment the fruit in a sealed container for two weeks.

5. Fruit can be fermented in sealed containers
The industry funded research project (SF 145) has investigated the fermentation of fruit in sealed containers, filling them with waste fruit to within 10 cm of the lid (Figure 5 on previous page). The lid was sealed with tape and a pressure valve fitted to allow excess gas to escape. All SWD larvae had died within two weeks of sealing by which time the waste has separated into 90% liquid and 10% solid on the surface. The solid material is still attractive to SWD adults.

Whichever treatment is used, the waste (solid and liquid) must be disposed of. Spreading it on field soils is one way of disposal, but solids must be incorporated into the soil to avoid attracting SWD. Decisions on where this can be done will vary from farm to farm but should always be away from water courses. Growers should check the Environment Agency web pages for more information on what is permitted.

Gaining control of spotted wing drosophila on your farm

Should your farm become infested by spotted wing drosophila, follow these control guidelines:

- **Precision monitoring** – 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). This can help to slow the ingress of SWD from woodlands and hedgerows to ripening fruit.

- **Insecticides** should be targeted against the adults, which is the easiest stage of the SWD life-cycle to control. A number of insecticides offer potential control – seek advice from your BASIS qualified advisor who will know of current and emergency approvals available for specific vulnerable crops.

- **Post harvest** use of insecticides will help to control spotted wing drosophila before the winter period and reduce the danger to neighbouring farms. Lowering populations before the pest overwinters will reduce populations emerging the following spring. Be guided by a BASIS qualified advisor.

Avoid bad practice

- **Do not** send infested fruit to landfill unless it has been completely liquidized, as burial of intact fruit could allow the pest to survive and migrate to wild hosts or vulnerable produce growing nearby.

- **Do not** tip into open skips or bins.

- **Do not** leave whole ripe fruits on the ground when harvesting in any plantations.

- **Do not** leave produce waste in open piles on your farm or any other area.

- **Do not** sell any infested fruit.

- **Do not** tip the Dros’ Attract liquid or Gasser lure (or any bait) out onto the ground, where it will continue to attract adult flies.

Good practice

- **Do** use traps and monitor weekly from April until late November.

- **Do** monitor ripe fruits from the start of harvest onwards (Figure 7), using the floatation method.

- **Do** follow exemplary hygiene practices on the sites around your farm.

- **Do** remove all produce from the field, plant, tree, vine or bush when harvest is completed. Any vulnerable crop left behind will attract SWD and become a breeding haven.

Good hygiene and regular monitoring and inspection are vital. Please behave responsibly and play your part in helping to contain this pest.
Further information

Crops vulnerable to spotted wing drosophila

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<thead>
<tr>
<th>Berries</th>
<th>Stone fruits</th>
<th>Others</th>
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<tbody>
<tr>
<td>Blueberries*</td>
<td>Sweet cherries*</td>
<td>Tomatoes</td>
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<tr>
<td>Blackberries*</td>
<td>Plums</td>
<td>Grapes</td>
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<td>Raspberries*</td>
<td>Peaches</td>
<td>Apples</td>
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<tr>
<td>Black raspberries and other cane fruits*</td>
<td>Apricots</td>
<td>Pears</td>
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<tr>
<td>Strawberries*</td>
<td>Nectarines</td>
<td>Figs</td>
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<td>Currants</td>
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<td>Kiwi fruits</td>
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* Denotes fruits at highest risk

Periods of risk when spotted wing drosophila infests fruit in the field

<table>
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<tr>
<th>Jan</th>
<th>Feb</th>
<th>Mar</th>
<th>Apr</th>
<th>May</th>
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Hibernation: Low risk
Medium risk
High risk

More useful information

Comprehensive information about SWD and the research results being delivered by the industry funded project (SF 145) and other funded projects, is available on the HDC website at www.hdc.org.uk/swd.

Plant Health contact details for assistance and advice

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