DROSAL®

Cup trap system for monitoring and mass trapping Spotted-Wing Drosophila (Drosophila suzukii)
The spotted-wing drosophila fly *Drosophila suzukii*

The Spotted-Wing Drosophila, *Drosophila suzukii*, originates from Southeast Asia (Korea, Thailand, China, Japan, ...). *Drosophila suzukii* belongs to the family of drosophilidae (also called fruit flies or vinegar flies). It was first described in Japan in 1931 by Matsumura, but has spread over all continents in recent years. The first damage in Switzerland – to blueberries and raspberries – was discovered in the autumn of 2011. However, the pest can develop not only on these crops but also on a range of wild plants. In warmer regions of Europe, the mature flies can hibernate in the ground. The females lay up to 380 eggs over 7–16 days, with 2–3 eggs being deposited per puncture site. Ideal development conditions for the spotted-wing drosophila are at 20 °C, but they tolerate temperatures from 0–30 °C. Dormancy (diapause) is triggered at temperatures under 5 °C.

**Distinguishing features**
- Black ridge on front legs
- Dark spots on ends of wings

![Mature male Drosophila suzukii (G. Arakelian)](image-url)
**Damage**

**Affected crops**
- **Berries:** blueberries, raspberries, strawberries, blackberries
- **Fruit:** cherries, plums, apricots, figs, kiwi, persimmons
- **Viticulture:** table and wine grapes
- **Vegetables:** tomatoes, peppers
- **Ornamental plants:** camellias camelia japonica, Japanese snowbell styrax japonicus

**Risk of confusion**

*Drosophila suzukii* lays its eggs in fruits that are not yet fully ripe. In contrast, *Drosophila melanogaster* prefers overripe and damaged fruits that can no longer be sold.

Both species can frequently be found on fruits and in traps. You can find an identification key at [www.export.biocontrol.ch ➜ Pests ➜ Spotted-Wing Drosophila](http://www.export.biocontrol.ch).

**Fruit damage**

Fruit infested by the spotted-wing drosophila can be recognised from the puncture sites, which collapse and rot rapidly. This effect is caused by the penetration of fungi (e.g. *botrytis*) or secondary pests like *Drosophila melanogaster*. Damage varies considerably, but can lead up to total loss of the harvest.

**Risk periods in Europe**

<table>
<thead>
<tr>
<th></th>
<th>Jan</th>
<th>Feb</th>
<th>Mar</th>
<th>Apr</th>
<th>May</th>
<th>Jun</th>
<th>Jul</th>
<th>Aug</th>
<th>Sep</th>
<th>Oct</th>
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<th>Dec</th>
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Preventive measures

Maintain good hygiene in stock and remove all old, overripe fruit from the cultivated area.

Removal of harvest waste
- Feed old fruit to incineration or directly to a closed fermentation process (biogas system).
- Fruit to be removed can also be left in the sun for 7–10 days if tightly packaged (plastic containers, sacks) (beware of fermentation!).
- Do not compost fruits

Other comments
- These preventive measures do not apply if there are household gardens, wild fruit or untended sites in the vicinity of the crop being protected.
- Sites can also be covered with crop protection nets.
- Increase harvest frequency so that no overripe fruits remain in the stock.

DROSAL cup trap system against spotted-wing drosophila (Drosophila suzukii)

The DROSAL cup trap system was developed by the RIGA company in scientific collaboration with the Swiss research institute Agroscope Changins und Conthey (ACW) and has been successfully used by leading Swiss berry producers on berry crops for 3 years now.

The cup traps are filled with a highly attractive and selective lure. Holes in the cover sheeting allow the lure to escape. This is how it attracts spotted-wing drosophila into the body of the trap, where they drown. Given the appropriate assembly and trap accessories (see last page), the cup trap system can be reused year after year.

The DROSAL cup trap system can be used in both ecological and conventional production.
Infestation monitoring with DROSAL cup traps

The cup traps must be set up before the first appearance of the spotted-wing drosophila (at the latest when the fruit begins to change colour). In order to monitor when the spotted-wing drosophila begin to fly, the DROSAL cup traps must be placed at the border of the cultivated area and, if available, at neighbouring forest edges/bushes at intervals of 5–10 m.

Important: Check cup traps on a weekly basis and swap traps if the lure fluid has dried up (approx. 3–4 weeks after being set up).
Mass trapping with DROSAL cup traps

As soon as the first spotted-wing drosophila are caught in the monitoring traps or in the region, a belt of traps must be laid around the cultivated area: a cup trap (with rain shelter) must be installed every 2 metres at the border of the cultivated areas.

Standard strategy for mass trapping

In case of strong infestation
After 10 days place another trap in between and tighten the trap belt around the crop.

Important: Check cup traps on a weekly basis and swap traps if the lure fluid has dried up (approx. 3 – 4 weeks after being set up).
## Application area

<table>
<thead>
<tr>
<th>Crop</th>
<th>Positioning of the traps</th>
<th>Recommendation</th>
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<tbody>
<tr>
<td><strong>Strawberries</strong> (greenhouse)</td>
<td>Put into the rain gutter or use the wires (hanging or insertion 20 cm) to position the trap near to the fruits</td>
<td>Alternate the height of positioning in the range of 10–30 cm. Put also some traps in front of the greenhouse entry.</td>
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<tr>
<td><strong>Strawberries</strong> (open field)</td>
<td>Place the cups near to the fruits of the outer rows</td>
<td>Use the strategy “strong infestation” in case of remontant varieties.</td>
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<tr>
<td><strong>Raspberries</strong> (open field)</td>
<td>Place the cups near to the fruits of the outer rows, below the foliage</td>
<td></td>
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<tr>
<td><strong>Stone fruits</strong> (cherries, plums etc.)</td>
<td>Place 1–3 traps per tree (depending on the waist) at a height of 1.5 to 2 metres. Place the cups on the border rows of the parcels and around the trees at the end of the rows.</td>
<td>Position the traps toward the north-east, where the climatic conditions are cooler. Alternate the height of positioning in the range of 20–50 cm.</td>
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<tr>
<td><strong>Vineyards</strong></td>
<td>Use the suspension wire to fix on the tying wires.</td>
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**Important Information**

- Store the cup traps at temperatures between 10 and 18 °C.
- The DROSAL cup trap system is exceptionally suited to be a component of a comprehensive control strategy in combination with other measures against spotted-wing drosophila.
- An important factor is early placement of traps to catch hibernating pests and reduce the starting density of the pest population.
- Change the cups in due time (after approx. 3–4 weeks, depending on weather conditions)
- The cup traps are also helpful in the treatment-free period before the harvest.
DROSAL cup trap system

✔ Very easy set-up
✔ Reusable components
✔ No cleaning or refilling of traps needed (simple replacement saves time and work)
✔ Solution approved in practice
✔ Can reduce use of insecticides or make it unnecessary (no waiting periods, no residue problem)