

### Mini data sheet on *Drosophila suzukii*

*Drosophila suzukii* was added to the EPPO A2 List in 2011. A full datasheet will be prepared, in the meantime you can view here the data which was previously available from the EPPO Alert List (added to the EPPO Alert List in 2010-deleted in 2011).

#### *Drosophila suzukii* (Diptera: Drosophilidae) - Spotted wing drosophila

**Why:** *Drosophila suzukii* is an Asian pest of fruit crops which has almost simultaneously been introduced into North America and in Italy (in 2008 and 2009, respectively). In 2010, it was reported from other European countries. Because the pest has a high potential for spread and can cause economic damage to many fruit crops, the EPPO Secretariat decided to add *D. suzukii* to the Alert List.

#### **Where:**

**EPPO region:** France (first records in 2010 - Aquitaine, Corse, Languedoc-Roussillon, Midi-Pyrénées, Provence-Alpes-Côte d'Azur, and Rhône-Alpes), Italy (first records in 2009 - Campania, Liguria, Trentino-Alto Adige, Piemonte, Toscana), Russia (Far East), Slovenia (first records in autumn 2010), Spain (near Barcelona), Switzerland (first record in 2011, in Grisons and Ticino cantons).

**Asia:** China (Guangxi, Guizhou, Henan, Hubei, Yunnan, Zhejiang), India (Chandigarh, Jammu and Kashmir, Uttar Pradesh), Japan (Hokkaido, Honshu, Kyushu, Ryukyu), Korea Democratic People's Republic, Korea Republic (including Cheju island), Myanmar, Pakistan, Russia (Primor'e region - Far East), Taiwan, Thailand.

**North America:** Canada (British Columbia, first found in autumn 2009 in the Fraser Valley area and caught in a cherry orchard in the Central Okanagan Valley), USA (Hawaii introduced into the 1980s; California (2008), Florida (2009), Louisiana (2010), Michigan (2011), North Carolina (2010), Oregon (2009), South Carolina (2010), Utah (2010), Washington (2009), Wisconsin (2011)).

**On which plants:** *D. suzukii* has a wide host range and can attack many fruit crops, including small fruit crops, fruit trees and grapevine. Its host range includes: *Actinidia* spp. (kiwis), *Diospyros kaki* (persimmons), *Ficus carica* (figs), *Fragaria ananassa* (strawberries), *Malus domestica* (apples), *Prunus avium* (sweet cherries), *P. domestica* (plums), *P. persica* (peaches), *Pyrus pyrifolia* (Asian pears), *Rubus armeniacus* (Himalayan blackberries), *R. loganobaccus* (loganberries), *R. idaeus* (raspberries), *R. laciniatus* (evergreen blackberries), *R. ursinus* (marionberries), and other blackberries (*Rubus* spp.), *Vaccinium* spp. (blueberries), *Vitis vinifera* (table and wine grapes).

**Damage:** Although the vast majority of *Drosophila* species are not fruit pests (larvae developing only in damaged or rotting fruits), *D. suzukii* is one of the very few *Drosophila* species which are able to feed on healthy ripening fruit while they are still attached to the plant. Damage is caused by larvae feeding on fruit pulp inside the fruit and berries. Very rapidly, infested fruit begin to collapse around the feeding site. Thereafter, secondary fungal or bacterial infections may contribute to further fruit deterioration (i.e. rotting). In the USA, severe losses have been reported in cherry production in California (estimated at 25% state-wide in 2009). Several berry growers in California, Oregon and Washington, and peach growers from Oregon have reported up to 100% crop losses in some fields.

Adults are brownish yellow flies with black bands on the abdomen, and bright red eyes. Males (2.6 - 2.8 mm long) have a dark spot along the front edge of each wing (hence its English common name), and two rows of combs on each fore tarsus. Females (3.2 - 3.4 mm long) do not have spots on their wings, nor tarsal combs. On average, females can lay 1 to 3 eggs at each oviposition puncture (and more than 300 eggs in their lifetime), but as many females may visit the same piece of fruit up to 60-70 insects may emerge from a single fruit. Larvae (up to 3.5 mm) have white cylindrical bodies, tapered in their anterior part with elevated

posterior spiracles. There are three larval instars before pupation takes place. Pupae (2-3 mm long) are reddish brown with two small projections at the end, and can be inside or outside the fruit.

Pictures can be viewed on the Internet:

<http://cemariposa.ucdavis.edu/files/67726.pdf>

[http://berrygrape.org/files/Dsuzukii\\_alert.pdf](http://berrygrape.org/files/Dsuzukii_alert.pdf)

[http://cizr.ucr.edu/spotted\\_wing\\_drosophila\\_cherry\\_vinegar\\_fly.html](http://cizr.ucr.edu/spotted_wing_drosophila_cherry_vinegar_fly.html)

<http://www.agf.gov.bc.ca/cropprot/swd.htm>

Reproduction in *Drosophila* species is particularly rapid with a short life cycle of 1 to 2 weeks depending of the climatic conditions, therefore a single pair of flies can produce hundreds of offspring within a couple of weeks. In Japan, *D. suzukii* has about 13 generations per year, and predictions made for the Californian climate are of 3 to 10 generations per year. *D. suzukii* seems to prefer high humidity and moderate temperatures. Cold winters do not seem to limit the insect's survival, considering its establishment in Northern China and the Southern part of Hokkaido (Japan).

**Dissemination:** Adults are highly mobile. The rapid spread which is currently being observed in North America demonstrates the high capacity of this insect for natural spread. Over long distances, trade of infested fruit and plants can ensure pest dissemination. For the moment, it is not known how *D. suzukii* was introduced into North America and Europe.

**Pathway:** Plants for planting, fruit of *D. suzukii* host plants.

**Possible risks:** Many host plants of *D. suzukii* (e.g. *Fragaria*, *Prunus*, *Rubus*, *Vaccinium*, *Vitis vinifera*) are economically important crops across the EPPO region. The high reproduction rate and capacity for natural spread probably render containment or eradication very difficult. In addition, early infestations are difficult to detect (small oviposition scars) and these infested fruit are likely to be traded undetected. For the moment, data is lacking on the potential of establishment of *D. suzukii* in the EPPO region, but the fact that *D. suzukii* seems to favour cool and humid climate (e.g. in central coastal California) suggests that it probably has the potential to establish in most parts of the EPPO region. Preliminary results from Climex/Maxent modelling studies (done for North America only) showed that *D. suzukii* has the potential to establish along the west coast of USA and Canada (e.g. British Columbia), and in large parts of Eastern USA. For the moment, data is lacking about field (e.g. 'attract-and-kill strategy') and post-harvest treatments (e.g. cold treatments, fumigation, irradiation) but investigations are being initiated in the USA. It is considered that sanitation techniques (fruit removal, pruning) could help to reduce pest populations. There is no data on biological control but it is mentioned in the Japanese literature that larvae of *D. suzukii* were naturally parasitized by a species belonging to the genus *Phaenopria* (Hymenoptera: Diapriidae). Although data is lacking about the insect biology and its economic impact, preliminary observations made in countries where the pest has been introduced, suggest that *D. suzukii* is a serious threat to many fruit crops in the EPPO region.

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