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Report of a Pest Risk Analysis for *Drosophila suzukii*

This summary presents the main features of a pest risk analysis which has been conducted on the pest, according to EPPO Decision support scheme for quarantine pests.

Pest: ***Drosophila suzukii***
PRA area: EPPO region
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STAGE 1: INITIATION

Reason for doing PRA:

In November 2009, Italy notified the occurrence of *D. suzukii* in the Trentino-Alto-Adige region. In El Perelló, Spain (150 km from Barcelona, Catalonia) the insect has been detected in traps since October 2008. In France *D. suzukii* was collected in traps and identified in both Montpellier and Minière de Vallauria in 2009. It was subsequently officially identified in June 2010 on cherry, peach and apricot in Corsica, and on strawberry in the Alpes Maritimes.

In the USA and Canada this species is an important pest which has spread very fast through the fruit and wine growing areas. This pest has a very high reproduction potential and poses a serious threat to soft skinned fruit.

In Canada *D. suzukii* is not regulated as a pest but a recent pest categorization has determined that it meets the official definition of a quarantine pest by IPPC criteria (Damus, 2010). It has also been declared a quarantine pest by New Zealand (Anonymous, 2010), and the pest also came under Australian regulation (Public Quarantine Alert PQA0665, effective from 18 May 2010).

Taxonomic position of pest: Arthropoda, Insecta, Diptera, *Drosophilidae*, *Drosophila suzukii*

STAGE 2: PEST RISK ASSESSMENT

Probability of introduction
Entry

Geographical distribution:

EPPO region:

- Russia (southern Siberia, Storozhenko *et al.*, 2003)
- Spain (detected in traps in El Perelló Catalonia, from 2008, EPPO 2010)
- Italy (Trentino-Alto-Adige region, EPPO 2010 a); Toscana region, EPPO 2010b); Piemonte (EPPO 2010d)
- France (Corsica, Languedoc Roussillon, Midi Pyrénées, Provence Alpes Côte d'Azur and Rhone Alpes, EPPO 2010a & 2010b).
- Slovenia (detected in traps, Benko, pers. comm. 2011)

Central America :

- Costa Rica (Ashburner *et al.* 2005)

North America:

- USA: California (2008), Oregon (2009), Washington (2009), Florida (2009), Louisiana (2010), North Carolina (2010), South Carolina (2010) and Utah (2010) [Hauser, pers. comm. 2010]
- Canada: British Columbia (in the Fraser River and Okanagan Valleys (Damus, 2010); Vancouver, in private Gardens [Damus, pers. comm. 2010])

South America :

- Ecuador (Ashburner *et al.* 2005)

Oceania:

- Hawaii (since at least 1980) (Kaneshiro 1983)

Asia:

The fly was first observed in Mainland (Honshu) Japan in 1916 (Kanzawa 1936).

- Japan (Amami, Hokkaido, Honshu, Kyushu, Shikoku, Okada 1964; Ryukyu)
- China (Guangxi, Guizhou, Henan, Hubei, Yunnan, Zhejiang) [Toda, 1991]
- India (Chandigarh, Jammu and Kashmir, Uttar Pradesh) [Singh & Negi, 1989]
- Thailand (Toda, 1991)
- Korea (Delfinado & Hardy 1977, Okada 1964)
- Burma (Damus 2010)

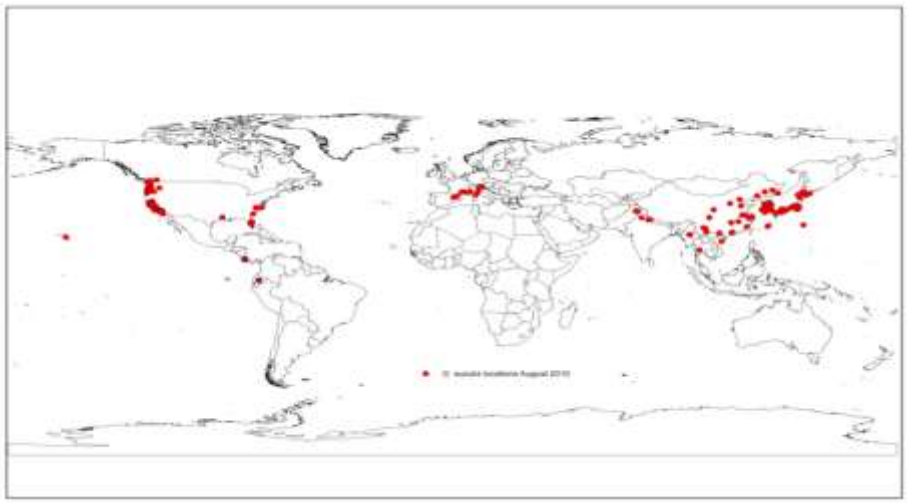


Fig 1 global distribution of Drosophila suzukii (2010-08)

Major host plants or habitats:

D. suzukii infests both cultivated and wild hosts.

Crops on which significant economic damage has been reported are:

Fragaria anannassa (strawberries), *P. armeniaca* (apricots), *Prunus avium* (sweet cherries), *P. persica* (peaches), *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).

Crop on which damage has been reported in the past, but no recent publications confirm it.

Vitis vinifera (table and wine grapes).

Damage on *Vitis vinifera* (table and wine grapes) has been recorded in Japan (Kansawa, 1939). From different observations both in the US and Japan, it is difficult to conclude whether grapes are host and there is uncertainty whether they can be considered as important as those for which significant damage is repeatedly reported (for more details see PRA record).

Other recorded hosts include:

Actinidia arguata (hardy kiwis), *Cornus* spp., *Diospyros kaki* (persimmons), *Ficus carica* (figs), *Prunus domestica.*

D. suzukii can be present in already damaged fruits, e.g. *Malus domestica* (apples) and *Pyrus pyrifolia* (Asian pears).

D. suzukii was reared on *Lycopersicon esculentum* (tomato) in the laboratory but no natural infestation has been recorded.

The list of hosts is presented in Appendix 1 of the PRA record.

Which pathway(s) is the pest likely to be introduced on:

The EWG considered that the **main commodity pathways** are:

Fruits

D. suzukii lay eggs in fruits. Larvae develop in fruits and pupae usually develop in fruits. The most likely pathways for *D. suzukii* are consequently fruits of host species.

These commodities have been considered in detail in the entry part. Major host fruits and minor host fruits are separated as hosts on which important damage is recorded are more likely to be major pathways:

Major hosts were considered to be:

Fragaria ananassa (strawberries),

Prunus avium (sweet cherries),

P. persica (peaches),
P. armeniaca (apricots)
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).

Minor hosts (or less preferred hosts) were considered to be:
P. domestica (plums),
Vitis vinifera (table and wine grapes).

It should be noted that fruits are the only pathway considered in the PRA conducted for Canada. The EPPO expert working group considered that a separation between major hosts and minor hosts was useful. No such distinction is made in the Australian PRA.

Boxes and crates
Larvae and pupae usually remain in the fruit and fruits that are traded are likely to be free from symptoms of attack (so mainly infected with young larvae that will not leave the fruit). It cannot be completely ruled out that some larvae (the most mature) leave the infested fruit during the transportation and wander on the crates to search for a place where to pupate. However, the high humidity requirements for survival during the pupation stage makes that this is a very unlikely pathway.

Natural spread
Natural spread will be possible from areas where the pest has been detected in the EPPO region. THis pathway has not been analysed in detail in the entry section but is considered in the management part.

Other pathway identified but not studied further in the entry section
Natural spread
(not considered in the entry section of the PRA but see section on spread of the assessment part).

Plants for planting
Kanzawa (1939) have described the life cycle of *D. suzukii.* It lays eggs in mature fruits. Larvae develop in fruits. Pupation in the fruit seems to be the most frequent form of pupation but some may form between the fruit and the growing media or creep into the soil.
From this information it can be deducted that the main risk for plants for planting is when soil is attached. Infestation could result from fruits that have fallen on the growing media or from pupae which have developed in the growing media.
Plants for planting transported bare rooted are consequently not considered as a likely pathway.

Description of the different commodities for host plants for planting

- Plants of woody trees e.g. *Prunus avium* (sweet cherries), *P. domestica* (plums), *P. persica* (peaches): in nurseries plants usually do not produce fruit as they are too young. Usually plants for planting of fruit trees for professional orchards are traded bare rooted. Fruit trees for private backyard gardens are usually traded in containers but given the poor fruit production the risk is considered negligible.

The risk of infestation of plants for planting of woody trees is consequently negligible.

- Plants for planting of *Rubus* spp two types of production are recorded for Rubus. *Plants produced in the field are usually traded bare rooted, the risk is consequently negligible*. Other plants for planting are less than two years old and will not set fruits so there is no risk of infestation (Nursery PEPIMAT French nursery specialized in small fruits, pers. comm. 2010).
- *Vaccinium* spp. plants for planting are usually traded in containers and may fruit in nurseries, consequently the growing media attached to the plants may be infested if the plants are produced outdoors.

Information is not sufficient to make a detailed evaluation of the entry part for these pathways (no detailed information on trade for these species, no information on the association or the concentration).

Soil/growing media

Soil from places of production where the pest is present may be infested, though possible, it was considered improbable. This pathway was not considered further

Cut flowers

The Expert Working Group did not consider cut flowers as a relevant pathway at its meeting in July. However, this pathway has been identified in the Australian PRA (Biosecurity Australia, 2010) although considered as presenting a very low risk. The species considered as potential hosts as cut flowers are *Styrax japonicus* and *Camelia japonica*. These species are not recorded as cut flowers in the booklet of the Flower Council of Holland which contains 756 cut flowers in demand (Flower Council of Holland, 2009). Furthermore it is reported that flowers are only known to be attacked by *D. suzukii* in the absence of host fruits. Flowers have only been recorded to be attacked in spring, after adults emerge from winter diapause and before fruits ripen in late spring (Mitsui *et al.* 2010). This pathway is consequently not considered further in this PRA.

Commodities that are not pathway

Bulbs and tubers: not relevant
Seeds not relevant
Cut branches without flowers: not relevant
Wood and wood products not relevant

Establishment

Plants at risk in the PRA area:

Many soft-skin fruits (see host plants) are grown in the PRA area.
Production figures for Europe, North Africa, West Asia (Source FAO Stat accessed 2010/07/02)

Preferred host crops

Fruit	Surface ha 2007	Surface ha 2008
Cherries	265756	280447
Strawberries	207760	195010
Raspberries	92784	82167

Blueberries	17365	17504
Current	139890	115548
Other berries	38632	38964
Apricot	282160	271968
Peaches and nectarines	412533	468637
Total (hosts)	1455880	1470245
Total all fruits (including non hosts)	12871995	12790219

This represents approximately 12% of the total area of fruit production.

Wild species of host plants are widely distributed in the wild in the PRA area e.g. *Prunus avium*, *Vaccinium myrtillus.*

Climatic similarity of present distribution with PRA area (or parts thereof):

Visual examination of the Köppen-Geiger climate zones, hardiness zones and degree day maps shows that the climate in its current area of distribution is largely similar to that in the PRA area where hosts are present. Only northern areas of Europe and Russia where hosts are present are unsuitable. In many areas, there are sufficient accumulated degree days for numerous generations to be completed in the summer. Although the higher the degree day accumulation above 10ºC, the greater the number of generations expected, the species cannot tolerate high temperatures if humidities are low and, in the southern Mediterranean areas, the species may survive only in irrigated crops. Information from Trentino-Alto Adige region suggests that the species can be abundant even in areas where the degree day accumulations indicate that only one or two generations per year can be completed.
The pest overwinters as adult consequently cold winter are not favourable for its survival. However, Kimura (pers. comm.) considers that in Hokkaido, severe winter causes high mortality but population survives in habitats associated with human habitation and is increased by entry with fruit imports from elsewhere in Japan.

Characteristics (other than climatic) of the PRA area that would favour establishment:

Under good climatic and resource conditions, *D. suzukii* has a high reproduction rate up to 15 generations (Kanzawa, 1935). A small number of adults should be sufficient to build up a large population over the growing season. The distribution in USA and Canada underline this potential.
Host plants are present both in crops and in private gardens.
Few natural enemies are reported in the area of origin, and the outbreaks in Italy and France prove that presence of potential natural enemies was not sufficient to prevent establishment.
Current pest management: in many orchards and soft fruit crops few insecticides are used particularly before harvest. Most of the listed insecticides in fruit production are not effective against *D. suzukii* or cannot be used at the most critical moment due to the regulated pre-harvest interval.

Which part of the PRA area is the area of potential establishment:

Hosts are very widespread in the EPPO region except for the extreme north and the arid areas of Asia. Consequently *D. suzukii* is likely to find large areas with suitable conditions for establishment in the EPPO region although the establishment of *D. suzukii* in more northern parts of the

EPPO region is likely to depend on the presence of overwintering sites associated with human habitation.

POTENTIAL ECONOMIC CONSEQUENCES

How much economic impact does the pest have in its present distribution:

North America

In less than two years, *D. suzukii* spread along the West Coast of North America, from California's Central Valley to British Columbia (Lies, 2009) and damage has been recorded. Several berry growers in California, Oregon and Washington have reported up to 100% crop losses in some fields. In Willamette Valley (Oregon) peach growers experienced losses of up to 80 % in some orchards (Herring, 2009). In 2009, California lost some one-third of its cherry crop from Davis to Modesto. Crop losses up to 20 % were seen in Oregon raspberries (Herring, 2009). In addition, the spotted wing drosophila has been found infesting the fruit of raspberry, blackberry, blueberry, and strawberry plantings on the central coast. It was estimated that 25% of late season blueberries and raspberries in Oregon were destroyed (Lies, 2010).

However it should be noted that recent experience in California has demonstrated that damage can be quite sporadic. The pest is quite sensitive to local climate factors and damage is determined by whether or not conditions are optimal. Therefore different patterns of damage are seen.

Oceania

In 1980 the species was collected on a single Hawaiian island and was then observed to spread to several other Islands of Hawaii, though without any reports of it causing damage. It is likely that this is due to the fact that there are few suitable commercial host crops in this location (Hauser *et al.,* 2009).

EPPO region

In the part of the PRA area where the pest has been detected the situation is as follows:

In 2010 losses of up to 80% occurred in strawberry crops of the Alpes Maritimes region of southern France (pers. comm. Reynaud, 2010). Similar losses have also been quoted in raspberries in the Trentino-Alto Adige region (pers. comm. Grassi, 2010).

Asia

Regarding *D. suzukii* damage in Asia, there is clear evidence of *D. suzukii* infestation of blueberry in Kisarazu City, Chiba Prefecture, Japan (Uchino, 2005). Blueberries from three areas out of five investigated areas of the province showed *D. suzukii* damage. In the PRA prepared by biosecurity Australia it is reported that *D. suzukii* has been recorded to be the main pest damaging cherry in Fukushima Prefecture (Sasaki and Sato, 1995a). Damage levels are low at the start of harvest and have been recorded to reach a maximum of 77% by the end of the season (Sasaki and Sato, 1995a). Investigation by the EWG shows that crops prone to damage such as cherry and late ripening berry fruits, tend not to be important crops in Japan and areas of China in which *D. suzukii* occur (pers. comm. M. Kimura, Hokkaido University, 2010). In addition Kumura commented that even if serious damage occurs it is not likely to be widely reported.

Describe damage to potential hosts in PRA area:

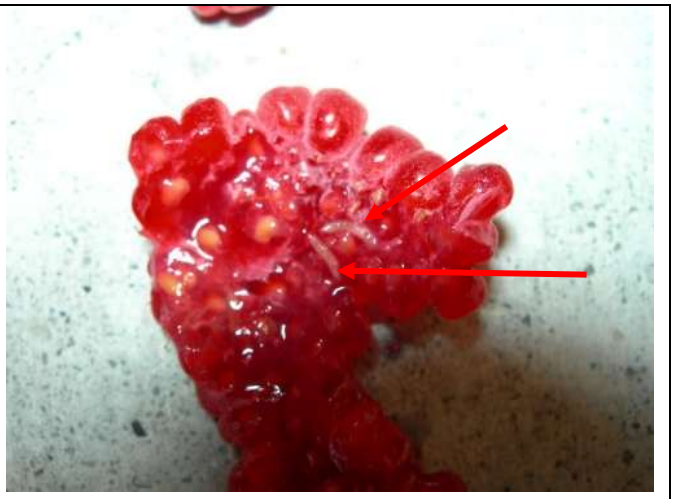
D. suzukii is one of the very few *Drosophila* species which are **able to feed on healthy ripening fruit while they are still attached to the plant**. Infestation of fruit therefore reveals small scars ('stings') and indented soft spots or bruising on the fruit surface. Damage is caused by one or more 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).
Some pictures of damage are presented below.

Spotted Wing Drosophila oviposition holes in blueberry.
(T. Hueppelsheuser, British Columbia Ministry of Agriculture and Lands)
http://www.agf.gov.bc.ca/cropprot/swd.htm

Spotted Wing Drosophila-infested blueberry fruit with pupae.
(T. Hueppelsheuser, British Columbia Ministry of Agriculture and Lands)
http://www.agf.gov.bc.ca/cropprot/swd.htm

Cherry with oviposition scars:
http://cisr.ucr.edu/spotted_wing_drosophila_cherry_vinegar_fly.html

Cherries damaged by *Drosophila suzukii.*
http://www.doacs.state.fl.us/pi/enpp/ento/images/drosophila_Fig_3_large.jpg

 Cherry damage http://cemariposa.ucdavis.edu/files/67726.pdf	 Raspberry damage and larvae: http://ucanr.org/blogs/blogcore/postdetail.cfm?postnum=821

How much economic impact would the pest have in the PRA area:

Based on the information available regarding significant damage already occurring within the PRA area, the EWG felt that the likelihood of 'massive' negative effects on crop yield was high, and with 'low' uncertainty.

It was noted that recent experiences in North America since 2008 have shown that the impact of *D. suzukii* on local agriculture tends to decrease, although the conditions each year cause variations in populations, increased awareness, improved monitoring, and treatments may have reduced populations (Hueppelsheuser & Hauser, pers. comm., 2010).

Regarding control costs, the EWG was confident that increased associated costs would be incurred at least in the first years of infestations, but given the inexperience with the pest the level of uncertainty was considered high. Costs will be incurred for labour and materials associated with monitoring, sanitation management, and additional targeted applications of plant protection products. Due to limited experience in areas experiencing *D. suzukii* infestations, there is some uncertainty regarding exactly how expensive control and management strategies may be. Optimal control management strategies are yet to be well defined and these may or may not incur increased costs in terms of chemical use and/or labour.

As far as is known, there are no specific records referring to environmental damage caused by *D. suzukii*.

CONCLUSIONS OF PEST RISK ASSESSMENT

Summarize the major factors that influence the acceptability of the risk from this pest:

D suzukii is a pest of soft-skinned fruits which are important in the PRA area.

Severe damage have been noted in North America and in the countries in Europe where outbreaks have occurred.

The part of the PRA area where damage can occur is the whole PRA area except the northern areas of Europe and northern parts of Russia where climatic conditions are not suitable.

Producers will have to change their pest management practice to cope with this new pest.

Rapid spread is a factor of risk.

Estimate the probability of entry:

The EWG considered that the risk of entry was **high with a low**

uncertainty for the main host fruits. The fact that the pest has established in Italy and France and was also introduced in the US and Canada was considered as a strong indication that the pest can enter easily. Volumes of imports are not large but the concentration of the pest is likely to be very high on the fruits.
For minor host fruits, the risk is considered as medium with low uncertainty. The difference is due to the fact that the concentration of the pest is not likely to be very high on these hosts, and the fact that they are less likely to be infested than the major hosts.

Estimate the probability of establishment:

The risk of establishment was considered to be **high with a low uncertainty**. This is due to the fact that host plants are widely present in the PRA area (cultivated but also backyard plants). Climatic conditions are suitable (only northern areas of Europe and Russia where hosts are present are unsuitable). The management practices can be adapted but the experience so far in the parts of the PRA area where the pest has established was that they could not prevent *D. suzukii's* establishment. The EWG debated whether this should be considered very high but as the PRA area included parts where climate is not suitable (see above), the final conclusion was high.

Estimate the probability of spread:

The risk of spread is considered **high with a low uncertainty**
Spread noted so far is a consequence of both human and natural spread. Human spread is very likely but the natural spread capacity is uncertain. The EWG decided to rate the probability of spread as 'high', though not 'very high', for that reason.
Drosophila suzukii was first reported in North America in 2008 in California and by 2009 was widespread in a range of hosts from Oregon, Washington (Hauser *et al.,* 2009) and British Columbia (BCMAL 2009). This demonstrates the ability of *Drosophila suzukii* to spread if suitable hosts are present and climatic conditions are favourable. The pest has also spread in France (EPPO, 2010c).

Estimate the potential economic impact:

The EWG concluded that the potential for economic consequences due to *D. suzukii* incursions were **high with a low uncertainty**.
The EWG was confident that when establishment occurs, damage is almost certainly going to be high initially. Management and experience, or even the fact that growers could change their agricultural systems and grow different crops altogether, may well reduce damage levels in the future.

Degree of uncertainty

Major uncertainties are

- Whether grapes could be regarded to be a major host. In such case the potential for economic damage in the region is higher. The possibility of infestation potential could not be ruled out. This is likely to be determined by skin thickness, i.e. the variety.
- Whether establishment will be possible in some parts of the PRA area, for example, in Northern Europe.
- The potential economic costs associated with control and management
- Little information regarding damage in China (but this is often difficult to access information from China)
- Rate of natural spread

Other uncertainties

- Transfer from fruits to host plants (this is a very common uncertainty

for transfer from fruits to host plants and as the pest has been found in invaded areas in crops transfer is possible)
Concentration of the pest on the fruits (has an influence on the risk of entry but the pest has already entered so this uncertainty is less important)
Importance of social and environmental damage

OVERALL CONCLUSIONS

The pest is capable of establishing in the region and can cause economic damage (damage is noted already in the PRA area). The experience in North America and also France shows that the pest is able of very rapid spread.

STAGE 3: PEST RISK MANAGEMENT

From the pest risk assessment it can be concluded that the pest presents the characteristics of a quarantine pest. However as the pest is already present in some parts of the PRA area and spreads rapidly (combination of natural and human spread), this makes its regulation difficult in particular for countries where movement of fruits of hosts of *D. suzukii* is at present not restricted (e.g. countries of the European Union). However regulation is possible and the EWG considered that management measures should be identified so that EPPO member countries could consider including measures in their regulations.

IDENTIFICATION OF THE PATHWAYS

Pathways studied in the pest risk management

- Fruits of major and minor host plants

Other pathways identified but not studied further

- Plants for planting
- Cut flowers
- Soil and growing media
- Natural spread within the EPPO region

IDENTIFICATION OF POSSIBLE MEASURES

Possible measures for pathways

Two pathways have been considered fruits of major hosts and fruits of minor hosts however the measures recommended are the same

- **Fruits of host plants from countries where the pest is present**

Measures related to consignments:

- Visual inspection should not be recommended as a sole measure but for the verification of other measure. Handling and packing of fruits include sorting of damaged fruits; visual inspection during the packing process is possible, however this should be used as a confirmation of efficacy of other measures. Visual inspection on fruits with eneven or hairy surface is more difficult.

- Treatment of consignment: There are no chemical treatments for controlling larvae within the fruit (the eggs are laid in the fruit so the larvae are never found outside the fruit). For **cherries** cold treatment is possible provided that fruits are kept 96 hours continuously at 1.66 degrees (Kanzawa, 1939) for other fruits no information available. It should be noted these are laboratory results which have not been verified in commercial consignments conditions.

- Handling and packing of fruits include sorting of damaged fruits; Visual inspection during the packing process is possible as well as sorting of soft fruits in cold water bath. However this should be used as a confirmation of other measures.

- Imports of fruits for processing only. Escape of the pest should be prevented and wastes should be strictly controlled. The Panel on Phytosanitary Measures considered that such measures should be only allowed on a case by case basis and data should be provided by the company requesting such imports.

Measures related to the crop or to places of production:

- Treatment of the crop: treatment is possible but should not be used as a single measure. However it should be noted that it is important for every grower within and next to a fly-infested area to participate, because a single, unmanaged field or orchard will serve as a source of infestation to nearby susceptible crops. It is important for every grower within and next to a fly-infested area to participate, because a single, unmanaged field or orchard will serve as a source of infestation to nearby susceptible crops. D. suzukii is often not noticed until fruit is being harvested. Sprays at this

time will not protect the crop, because larvae are already in the fruit.

- Growing the crop in specified conditions: for some of the crops, the plants can be grown under nets with a special mesh size (0,98 mm) (Kawaze 2008). Traps should be placed to control any possible infestation.

- Production of fruits in Pest free place of production: given the spread capacity a pest free place of production will be difficult to maintain with no physical protection in an infested area (see measure recommended above).

- Production of fruits in a Pest free area (following ISPM no. 4) is considered as a possible measure.

Other possible measures
Surveillance
Surveillance will be difficult as the pest is not easy to detect (a trapping network has to be established).

Eradication measures
In a small and restricted area (like a valley) with low abundance and well implemented measures there is a chance for eradication. However, considering the life cycle with up to 15 generation (Kanzawa 1935); the fast development time (8 to 14 days in optimal conditions); some 400 eggs laid per female (maximum of 992 eggs/female); duration of oviposition of 55 days (maximum of 99 days) (Kanzawa 1939); and high insect mobility, it is very unlikely that it will be possible to eradicate the pest in larger infested areas without natural barriers.

Containment
Movement of the pest with infested fruits will be difficult to control in the PRA area as early infestations are difficult to detect. Determining containment measures will be difficult given that natural spread capacity is undetermined.

Conclusion on the measures

- Measures not considered sufficient on their own

Visual inspection (for certain fruits)
Treatment of the crop

- Measures that could be sufficient on their own but have limitations

Specified treatment for certain fruits (e.g. cold treatment for cherries) **however such measures have not been verified for commercial consignments.**
Import for processing provided that it can be guaranteed that no escape of flies possible. **The Panel on Phytosanitary Measures considered that such measures should be only allowed on a case by case basis and data should be provided by the company requesting such imports.**

- Measures that are considered sufficient as single measures
    - Specified growing conditions: provided that the host can be grown under protected conditions, the plants should be grown in screened greenhouses (or under a net) with a mesh lower than 0,98 mm. Visual inspection and trapping are verification procedures which can be applied during handling and packing at the place of production.
    - Pest free area

A possible combination of measures in a Systems Approach could be

- Consignment originating from an Area of low pest prevalence
- Surveillance of the crop based on trapping
- Treatments of the crop
- Inspection during packing and handling

- Cold treatment

However the Panel on Phytosanitary measures considered that such combination should only be considered upon request of an exporting country which should then provide the necessary information to allow a proper evaluation of such combination.

EVALUATION OF THE MEASURES IDENTIFIED IN RELATION TO THE RISKS PRESENTED BY THE PATHWAYS

The trade in the commodities from outside the EPPO region is limited so impact on trade should be minor. However if restrictions are implemented within the region impact is likely to be higher.

Degree of uncertainty	Uncertainties in the management part are: Efficacy of the cold treatment (only tested on cherry and not in commercial conditions) Other treatment possibilities (e.g. controlled atmosphere, irradiation)

IDENTIFICATION OF POSSIBLE MEASURES

PC= Phytosanitary certificate, RC=Phytosanitary certificate of re-export

Pathway Fruits of host plants	PC and, if appropriate, RC

	• **Measures that are considered sufficient as single measures** • Specified growing conditions (growing the plants under a net or in screened greenhouses and trapping to verify pest freedom) • Pest Free Area (following ISPM no. 4) ○
	• **Other measures that can be considered on a case by case basis and upon request** ○ Import for processing provided that it can be guaranteed that no escape of flies is possible ○ A possible combination of measures in a systems approach could be • Consignment originating from an area of low pest prevalence • Surveillance of the crop based on trapping • Treatments of the crop • Inspection during packing and handling • Cold treatment (but see comment just below) ○ Cold treatments for cherry fruits; data are needed for the efficacy on other fruits than cherry and for cherry data on efficacy of the treatment for commercial consignments are lacking. ○ There is no data available for other treatments (controlled atmosphere, irradiation), such treatment can be considered upon request.

References

This includes also all references used in the PRA record (see document 11-17189)