

Editors comment: This is the first of a series of articles on insect pests that afflict fruit growers in China. Beasts that Australian growers don't want. Beasts that you should be aware of in case you are the first to see them in Australia. Faint hearted fruitgrowers should seek parental guidance before reading these articles.

Beasts of the Orient!!!

Starting small - Spotted wing drosophila *Drosophila suzukii*



Spotted wing drosophila – length about 3 mm

Photograph by Martin Hauser, California Department of Food and Agriculture.

Spotted wing drosophila is a close relative of the common vinegar fly *Drosophila melanogaster* – the ones that come around your fruit bowl when the grapes are getting a bit elderly. The vinegar fly cannot lay its eggs under the skin of the fruit and comes in only when the skin of the fruit is broken and fermentation has started so it is of little or no commercial significance. Spotted wing drosophila is its nasty cousin. The ovipositor on the spotted wing drosophila is hardened and serrated. It is able to penetrate the skin of soft fruit like cherries, plums, blackberries, Asian pears, raspberries, blueberries and the like, close to harvest to lay its eggs.



The hardened saw edged ovipositor of the female Spotted wing drosophila. This allows it to penetrate the skin of intact soft fruit. Photograph by Martin Hauser, California Department of Food and Agriculture.

This leads to deformations in the fruit and a cluster of little maggots feeding under the skin. The fruit quickly collapses and rots. If uncontrolled, it is capable of taking out 50% of a cherry crop and making the rest suspect.

Life cycle and behavior.

Spotted wing drosophila is a tiny insect. Adult flies are about 3 mm long. A female can lay up to 600 eggs and egg to adult can take one week in warm weather. They can survive as adults through winter in Ontario, Canada, so there is nowhere in Australia where cold conditions would limit them. Their optimum temperature is 20°C



Infested cherry fruit . Photograph by Martin Hauser, California Department of Food and Agriculture.

History

Spotted wing drosophila was first identified by a Japanese entomologist (hence the species name *suzukii*). Scientific publications relating to the pest status and attempts at control of this insect in Japan go way back.

About 8 years ago, it turned up in cherry orchards and berry fruit plantings in California and the Pacific northwest of USA. It has since spread across the continent. It is now present in Europe and causing the same problems there. More recently it has turned up in Chile and Brazil. It was unheard of in China, until about 5 years ago. Their appearance followed a substantial increase in cherry plantings – now around 80,000 hectares. Cherries are one of those crops which are sufficiently profitable to reverse the drift of the rural populations of China to the cities. Spotted wing drosophila is also a pest in the red bayberry which is a traditional and important tree fruit grown in the vicinity of Shanghai. Although mentioned as a pest in grapes in USA and Europe, it does not appear to be of much consequence in that crop in China.



Red bayberry - a traditional and important tree fruit grown in China.

Control of spotted wing drosophila.

This insect is a serious pain in the pronotum. It comes in very close to harvest when choice of insecticides is limited. Researchers in USA have identified food based attractants that work as monitoring tools. Trapping out the spotted wing drosophila has not been successful in USA. They say that although they can trap large numbers of flies, 90% + stay on the outside of the traps and disperse to attack the crop. Some European companies claim to have had success with traps but to my knowledge, the results have not been published in any scientific literature. Sinogreen has developed a product which uses one of the best attractant blends in a bag with a contact insecticide on the outside. We trialed the system in Qinghuangdao, an important cherry growing area east of Beijing, and had very promising results. With an insect like this, insecticide resistance can develop rapidly.

Movement and threat to Australia and New Zealand

Spotted wing drosophila is not a strong flier but can move in the wind like aerial plankton. A few flies could easily hitch a lift in an international aircraft without being noticed. Australian and New Zealand bush have wild raspberries and blackberries and a host of other wild fruits through most of the year. Once in, it will stay with us.

Can we keep it out?

AQIS is well aware of this insect and they are doing their best to keep it out. The fact that it has spread throughout the world means that sooner or later, an

invasion of Australia and New Zealand is inevitable. Growers of susceptible crops such as cherries, plums and berries should be vigilant and contact local experts if fruit with suspicious symptoms turn up.

About the author

Stephen Sexton is an Australian entomologist and agricultural scientist now based in Nanjing in China. He is the principal scientist of a Chinese company Sinogreen which specializes in development of products based on insect behavior modifying chemicals – like pheromones and host plant volatiles. He founded Biocontrol and Pacific Biocontrol and pioneered commercialization of pheromone mating disruption technology with the Isomate range of products. Stephen and his wife Hilary now live most of the year in Nanjing.

Further reading

<http://spottedwing.org/#>

<http://spottedwing.org/content/integrated-pest-management-swd>

http://www.entnemdept.ufl.edu/creatures/fruit/flies/drosophila_suzukii.htm