

**MOST
UNWANTED**



Biosecurity

Pest and disease identification guide

Most unwanted vineyard
pests and diseases

Help us to protect
the places that make
our famous wine



New Zealand Wine
Altogether Unique.

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YOUR FEEDBACK IS APPRECIATED: We want these resources to be useful for New Zealand Winegrowers members. If you have any feedback or suggested improvements, please contact the NZW biosecurity team on biosecurity@nzwine.com.



SEND US YOUR PHOTOS: We would be appreciative of photographs of any insects, pests and diseases that winegrowers are finding in New Zealand vineyards. You can send them to us at biosecurity@nzwine.com.

BACTERIA  **FUNGI**  **INSECT**  **PHYTOPLASMA**  **WEED** 



Brown marmorated stink bug (*Halyomorpha halys*)

HIGHEST
THREAT



Anna Rathe

The brown marmorated stink bug is the number one biosecurity risk to the wine industry in New Zealand. It is an invasive hitchhiking insect pest with a high likelihood of entry into New Zealand. Feeding damages fruit, encourages bunches to fall and promotes fungal growth. It emits a foul-smelling odour similar to rotten coriander or sweaty socks when threatened, which can taint grape juice at harvest. The adult brown marmorated stink bug is shield-shaped, has white banding on the antennae, alternate black and white markings on the abdomen and is about 17mm long.



Brown marmorated stink bug egg mass and 1st instar nymphs

BMSB eggs 1460052-LCPT Allentown, PA in October, 2001.



— approx size +
17mm



Brown marmorated stink bug life stages - nymphal instars and adult



Glassy winged sharpshooter (*Homalodisca vitripennis*)

HIGHEST
THREAT



Alamy



Plant Health and Environment Laboratory, Ministry for Primary Industries



Johnny N. Dell, Bugwood.org

The glassy winged sharpshooter is a xylem feeding leafhopper that causes direct damage to grapevines through its feeding activities. It is highly efficient as a vector of the exotic bacterium *Xylella fastidiosa*, which causes the vine-killing Pierce's disease. Adult glassy winged sharpshooters are about 12-14 mm long with a dark brown to black colouring and a lighter underside. The wings are partly transparent with reddish veins.



approx size -
12-14mm



Ken Peek/Alameda County Department of Agriculture

Glassy winged sharpshooter egg masses on the underside of leaves



Pierce's disease (*Xylella fastidiosa*)

HIGHEST
THREAT



Plant and Pest Diagnostic Laboratory, Purdue University



Plant and Pest Diagnostic Laboratory, Purdue University

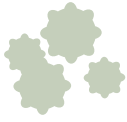


Lindsey Burbank USDA-ARS

Pierce's disease is a severe disease of grapevine caused by the bacterium *Xylella fastidiosa*. It blocks the xylem vessels which transport water and nutrients from the roots up to the shoots and leaves and is eventually fatal to infected vines. Symptoms include lack of productivity, leaf scorch and wilting, which is commonly confused with water stress. Symptoms would typically be observed in mid-late summer. If you suspect you see symptoms of Pierce's disease, you need to contact MPI to get your vines tested. **Call the Biosecurity New Zealand pest and disease hotline 0800 80 99 66.**



John Hartman, University of Kentucky, Bugwood.org



Black rot (*Phyllosticta ampellicida*)

HIGHEST
THREAT



Black rot of grape is caused by the fungus *Phyllosticta ampellicida*, which attacks grapevines during hot and humid weather and may result in substantial losses. Symptoms include reddish brown and circular to angular spots appearing on the upper surface of the leaves, starting in late spring. As spots merge, they form irregular, reddish-brown blotches. Infected berries first appear light or chocolate brown, but quickly turn darker brown and shrivel into hard black raisin-like bodies. It can also appear on the grape stem.

Bruce Watt, University of Maine, Bugwood.org



Brian Olson, Oklahoma State University, Bugwood.org



USDA Cooperative Extension Slide Series, Bugwood.org





Flavescence dorée (*Candidatus Phytoplasma vitis*)

HIGHEST
THREAT



Biologische Bundesanstalt für Land- und Forstwirtschaft, Bugwood.org

Flavescence dorée is a phytoplasma which could be imported on infected plant material or introduced via an insect vector. Infection is serious and can result in significant yield reductions and reduced wine quality. The most characteristic symptoms occur in summer and include discolouration of leaves, shrivelled berries and poor lignification.

Wiki Source Josef Klement



Wiki Source Josef Klement



Wiki Source Sabrina Herndl-Lanz



Bois noir phytoplasma (‘*Candidatus Phytoplasma solani*’)

SIGNIFICANT
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Bois noir is caused by a phytoplasma and is the most widespread grapevine yellows disease in Europe and the southern Mediterranean. The key symptoms include leaf discoloration, flower abortion, cluster collapse, berry shrivel and poor or delayed lignification of shoots and canes. Consequences are significant as both yield and wine quality are affected, with infected grapes typically being high in acid and low in sugar content. Bois noir is spread by insect vectors and infected plant material.



Spotted wing drosophila (*Drosophila suzukii*)

**SIGNIFICANT
THREAT**



Judy Gallagher, Wikimedia Commons

Martin Hauser Phycus, Wikimedia Commons



Spotted wing drosophila larvae

Hannah Burrack, North Carolina State University, Bugwood.org



Hannah Burrack, North Carolina State University, Bugwood.org



Male adult



Female adult

Shane F. McEvey, Australian Museum Wikimedia Commons

Spotted wing drosophila (SWD) is an invasive vinegar fly native to southeast Asia. It is a pest of soft-skinned fruit and grapes are a key host, along with cherries, berries and other soft fruits. Females can lay eggs in undamaged fruit due to a large, serrated ovipositor which causes physical damage and increased likelihood of fungal infections. Spotted wing drosophila are small flies (2-4mm), with yellow-brown bodies and red eyes. Adult males have a small black spot near the tip of each wing. Larvae are milky white and resemble maggots.





Spotted lanternfly (*Lycorma delicatula*)

SIGNIFICANT
THREAT

Wikimedia Commons, Author: Waithery Lawrence Barringer Pennsylvania Department of Agriculture



Pennsylvania Department of Agriculture, Bugwood.org



Spotted Lanternfly egg masses in oothecae (egg cases) covered by a waxy deposit

Spotted lanternflies look similar to moths. They are approximately 18mm long and have two sets of wings. Their forewings are light brown with black spots at the front, and the hindwings are scarlet with black spots at the front and white and black bars at the rear. Nymphs change in colour as they develop through 4 instars, changing from black with white spots before turning red. Egg masses are a waxy brown colour. Spotted lanternflies feed on grapevines and produce honeydew, leading to outbreaks of black sooty mould, vine weakening and production losses. It is a highly mobile pest and congregates in large numbers.



— approx size —
18mm

KFKASW Alamy



Spotted lanternfly life stages - nymphal instars and adult



Lawrence Barringer Pennsylvania Department of Agriculture



Vine mealybug (*Planococcus ficus*)

SIGNIFICANT
THREAT



Adult vine mealybug female tended by ant

René FH Sforza USDA ARS EBCL



Rachel Naegele Research Horticulturalist USDA ARS SJVAS



Vine mealybug on grape secondary damage by honeydew and fungi

René FH Sforza USDA ARS EBCL



René FH Sforza USDA ARS EBCL

Vine mealybugs are slightly smaller than the *Pseudococcus* mealybugs that are present in New Zealand. They have a soft, oval, flat, distinctly segmented body that is covered with a white, mealy wax that extends into spines and are about 3mm in length. Vine mealybug can transmit grapevine leafroll-associated viruses and produce honeydew that acts as a substrate for black sooty mould. Females can lay up to 700 eggs in a season. Populations are generally highest at harvest, which increases the risk of spread.





European grapevine moth (*Lobesia botrana*)

THREAT



Approx size 1
11-13mm

Todd M. Gilligan and Marc E. Epstein, TortAI, Bugwood.org



Alamy

The European grapevine moth is small, approximately 6-8 mm long, with a wingspan of 11-13 mm. The female is slightly larger than the male, and both males and females have similar mosaic-patterned wings. Damage is caused by larvae which feed on flower clusters and green and ripening berries. Berries become hollowed out, contaminated with larval excrement and exposed to a secondary infection. Larval feeding post-veraison also increases the risk of fungal infection.



Alamy

European grapevine moth larva



Alamy

European grapevine moth egg



Fruit fly

THREAT

Fruit flies can lay eggs in ripening fruit and the larvae pulp fruit from the inside. They also increase the risk of secondary fungal infection.

Vanessa Dias, University of Florida.



South American fruit fly (*Anastrepha fraterculus*)

The South American fruit fly is 12mm to 14mm long (a little bigger than a house fly), has distinctive patterned wings with yellow to orange-brown bands and has a yellow to orange-brown body.



approx size
12-14mm

Wikimedia Commons Author: Kaija Schulz



Mediterranean fruit fly (*Ceratitidis capitata*)

This fruit fly is a serious pest, 3.5mm to 5mm (slightly smaller than a house fly). It is yellowish in colour with a brown tinge and the wings have yellow, brown, and black spots and bands.



approx size
3.5mm

Antoine FRANCK Entomologiste & Photographe CIRAD



Natal fruit fly (*Ceratitidis rosa*) and *Ceratitidis quilicii*

Natal fruit flies have banded wings, and a swollen scutellum which is marked yellow and black. They also have a pattern of grey flecks in the basal wing cells.



approx size
4.3-5.3mm

Wikimedia Commons, Author: James Niland



Queensland fruit fly (*Bactrocera tryoni*)

This distinctive Australian pest has been caught in New Zealand several times but has not managed to establish here as a result of successful eradication programmes. Adult flies are 6-8mm long and have reddish-brown bodies with yellow markings and clear wings. Females have a pointed ovipositor at the end of the body.



approx size
6-8mm