

Garden weevil

(Phlyctinus callosus)

Monitoring for garden weevil in vineyards

Bragato Research Institute
info@bri.co.nz

85 Budge Street, Blenheim 7201
PO Box 845, Blenheim 7240, New Zealand
📍 bri.co.nz

KEY CONSIDERATIONS

Should I be concerned about garden weevil?

- ▶ Garden weevil (aka Vine Calandra or Banded fruit weevil) is well established in New Zealand and has been reported in vineyards
- ▶ Garden weevils are a known pest of grapevines and can cause commercial damage to vines, berries and bunches
- ▶ Reports from industry in the last 2-3 seasons suggest that weevil numbers and damage may be increasing in vineyards in Marlborough, Hawkes Bay and Wairarapa

What should I do?

- ▶ Follow best practice vineyard biosecurity and reduce the risk of spreading garden weevil and other unwanted pests through blocks and between vineyards (**Vineyard biosecurity plan**)
- ▶ Ensure your team can identify garden weevil and add to your watch list for regular pest and disease scouting this season
- ▶ Consider if a detailed monitoring program is warranted
- ▶ **Report sightings to Bragato Research Institute (info@bri.co.nz) AND report on the Find a Pest app. The app uses a photograph and a geolocation to record a find**

How should I monitor for garden weevil?

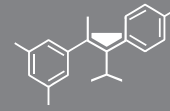
- ▶ **At a basic level to establish the presence or absence of garden weevils, simply keep an eye out for leaf damage and the presence of weevils on vines during the growing season, particularly in the late spring and early summer**
- ▶ Other approaches to monitoring are outlined in this document



Figure 1 - Adult garden weevil (Photo 36013555, (c) Maarten, all rights reserved)



Figure 2 - Garden weevil damage to grapevine leaves (New Zealand Winegrowers, 2021)



BACKGROUND

Bragato Research Institute (BRI) with support from the NZ Winegrowers Biosecurity team are investigating the occurrence and distribution of garden weevil in New Zealand's vineyards.

This monitoring guide has been prepared to act as an initial guide to enable identification of garden weevil and monitoring options. Updates will be made to this guide as new information becomes available and monitoring protocols refined over time.

The Extension team at BRI are available to provide more detailed guidance and discuss monitoring options (info@bri.co.nz).

MONITORING AND IDENTIFICATION

Garden weevil has been reported as being present in vineyards in Hawkes Bay, Wairarapa and Marlborough and has been present throughout New Zealand for some time (first reported in 1893).

Based on industry reports during recent seasons, garden weevil incidence appears to be localised within sub-regions and 'hot spots' of high incidence within blocks.

Adult garden weevils are distinctive and easy to identify but because of their colour they are often well camouflaged with the natural environment. The adult garden weevil has a distinctive V-shaped white marking across the rear of their body (Figure 1).

The garden weevil lays very small eggs in the soil during winter, which hatch within 10-14 days. Larvae live in the soil. Feeding can severely damage young vine roots and cause stunting and water stress. The larvae pupate for 3-4 weeks in the soil. Adults emerge from spring onwards and are most numerous in vineyards from November through to February.

Many die off after this, although some will survive until after harvest. Adults climb into the vine canopy and feed at night on foliage, flowers, buds, and fruit.



Figure 3 - Garden weevil damage to berries (New Zealand Winegrowers, 2021)



Figure 4 - Adult garden weevil in a grape bunch (Holly Johnson-Barrett, 2021)

The simplest way to monitor for garden weevil is to watch for leaf and bunch damage during the growing season (particularly late spring and early summer) and search for garden weevils on vines.

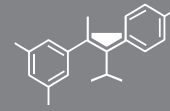
Leaf damage is easy to identify, with chewing damage causing a pattern of leaf holes, that looks as if the leaf has been hit with pellets from a shotgun blast (Figure 2). Damage to leaves will appear on water shoots, from near the base of the trunk in early spring and later from shoots in the vine canopy. Damage can also extend to grape bunches, with weevils causing noticeable scarring on berries and bunch and berry stems and sometimes completely chewing through the stems (Figures 3 & 4).

As garden weevil are largely nocturnal, you are most likely to find them taking shelter from the sun behind bark on the trunks and in the crown of vines and inside rolled leaves or amongst other shaded, sheltered areas along the vine canopy. They may also be found on the ground in leaf litter, inside of vine guards, on weeds or in the top layer of soil. At night, it may be possible to find them actively feeding in the vine canopy.

The following section outlines approaches to monitoring for the presence and impact of garden weevil in vineyards.

We are recommending that growers adopt a basic level of monitoring and report the presence of garden weevil to the BRI team to help improve our understanding of the current distribution.

More intensive monitoring should be undertaken if there is a history or current knowledge of damage from garden weevils.



APPROACHES TO MONITORING

Random scouting



NZ Winegrowers, 2021

WHY: Recommended, basic monitoring this season to confirm presence or absence.

WHEN: Late spring & summer.

HOW: Staff trained to recognise and report damage and included as a specific scouting pass or as part of a standard P&D scouting programme. Take representative photographs of the leaf damage and weevils.

Report to BRI (info@bri.co.nz) and log your finds using the **Find a Pest app (findapest.nz)**

IDENTIFICATION: Scalloped leaf margins and 'shotgun' damage to leaves appearing on trunk suckers first, then leaves in main canopy later (particularly around the heads or the vines).

Damage scoring



NZ Winegrowers, 2021

WHY: Desire to identify hot spots in blocks, track spread and establish baselines to compare for future seasons. Develop economic thresholds knowing the pest is present.

WHEN: From budburst, throughout the season with a focus on late spring and summer.

HOW: The same monitored vines assessed at regular intervals. Shoots and bunches assigned a score based on visible damage. Take representative photographs of the damage and weevils.

Refer to [Table 1](#) for a suggested scoring protocol developed by researchers in Australia.

RECORD KEEPING: Digital records maintained and maps created for spatial assessment.

Trunk band monitoring



©2021 Department of Primary Industries and Regional Development, Western Australia

WHY: To confirm presence or absence. Desire to identify hot spots in blocks, track spread and establish baselines to compare for future seasons. Generate quantifiable data to allow relative comparisons between blocks, seasons, or trials. Help establish economic thresholds. Track and report on adult emergence timing and patterns.

WHEN: From budburst, spring, and summer with a focus on late spring and early summer.

HOW: Monitored vines assessed at regular (weekly) intervals. Adult weevils are removed from the band and counted. Take representative photographs of the weevils. Bands must be removed temporarily during the application of any insecticides.

Contact BRI for more detailed information and guidance (info@bri.co.nz)

RECORD KEEPING: Digital records maintained and maps created for spatial assessment.

Soil monitoring



©2021 Department of Primary Industries and Regional Development, Western Australia

WHY: Desire to identify hot spots in blocks, track spread and establish baselines to compare for future seasons. Generate quantifiable data to allow relative comparisons between blocks, seasons or trials. Track and report on adult emergence timing and patterns.

WHEN: Late winter, spring and early summer.

HOW: Soil from under vine and mid-row sampled regularly. Soil volume should be consistent at each sample point (i.e., a spadeful or a grid of 300 x 300 mm and to 100mm depth). Larvae, pupae, and adults identified and counted. Take representative photographs of weevil larvae, pupae and adults.

Contact BRI for more detailed information and guidance (info@bri.co.nz)

RECORD KEEPING: Digital records maintained and map created for spatial assessment.

Harvest



NZ Winegrowers, 2021

WHY: Desire to compare relative yields from areas affected by weevil or compare weevil management options. Assess economic impact and effectiveness of control options (if undertaken).

WHEN: Autumn.

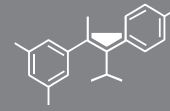
HOW: Manually or mechanically harvest selected vines or blocks for comparison.

Contact BRI for more detailed information and guidance (info@bri.co.nz)

RECORD KEEPING: Digital records maintained

Less Intensive

More Intensive



OTHER WEEVIL SPECIES

When scouting for garden weevils, you may come across other species of weevils. BRI are interested in reports of all weevil types found in vineyards. In particular the White fringed weevil, which is known to cause significant issues during vineyard establishment, ring-barking and feeding on the roots of young vines. Figure 5 shows adult and larvae for several other species you may find in the soil or above ground in vineyards.



Figure 5 - Weevil Larvae and corresponding adult (left to right): Apple weevil, Garden weevil, White fringed weevil, Fuller's rose weevil, Vegetable weevil (©2021 Department of Primary Industries and Regional Development, Western Australia)

Table 1 - Garden weevil scoring system for Grapevines. Source: [Sustainable protection of grapevines from Garden weevil](#) (Learmonth, Gibberd & Stanaway, 2011).

Vine Part	Growth stage	E-L number	Damage description	Damage score
Bud	1st leaf separated from shoot tip	7 to 9	No damage	B0
			< 5% buds chewed / killed	B1
			> 5% buds chewed/killed	B2
Canopy	4 leaves separated	10 to 31	No damage – but signs of weevil feeding could be present at a low level	0
	Inflorescence developing		Minor – leaf damage easily seen, no apparent bunch damage	1
	80% capfall		Obvious – leaf damage obvious and low level of bunch damage	2
	Berries up to pea size (7mm diameter)		High – leaf damage obvious and high level of bunch damage	3
Water shoot (trunk sucker)	Any stage of canopy development up to berries pea size	Up to 31	No damage – but signs of weevil feeding could be present at low level	W0
			Minor – obvious but low level of leaf damage	W1
			Major – severe leaf damage	W2

ACKNOWLEDGMENTS

This factsheet was produced to support industry funded research project NZW 21-106: Weevils in New Zealand vineyards. The information in the Factsheet reflects input from the entire project team and incorporates insights and experience from project industry partners. Much of the information relating to weevil behaviour and monitoring is drawn from previous research and the first-hand experience of researchers based in Western Australia: Stewart Learmonth (retired), Alison Mathews & Richard Fennessy (Western Australian Department of Primary Industries and Regional Development).

FURTHER INFORMATION

Refer to the following sources for additional information relating to Biosecurity, weevil identification, lifecycle, and potential control options.

- NZ Winegrowers Vineyard Biosecurity Plan
- NZ Winegrowers Pest and disease information: Garden weevil
- NZ Winegrowers Biosecurity Pest and disease identification guide
- Garden weevil in vineyards
- Identifying soil pests
- Citizen science hub NZ
- Invasive species compendium

