

Snail control in Vineyards with...

METAREX[®]

ALL WEATHER SLUG AND SNAIL BAIT

The complete guide to snail control in grapevines

Snails are becoming a significant problem in vineyards. With the adoption of measures to conserve soil moisture such as cover crops, surface mulch and decreased cultivation, an ideal environment is created for snails to thrive.

Snails can impact on production in a number of ways, including:

- Contamination of fruit and must delivered to wineries.
- Contamination of bunches at harvest that reduces the quality of table and dried fruit.
- Damage to buds and young leaves during feeding that reduces shoot growth, fruit yield and even plant vigour in severe, long-lasting infestations.
- Clogging sprinkler heads and dripper lines resulting in decreased irrigation efficiency and increased labour costs.

PEST

While there are many snail species found in Australian vineyards only a few actually cause problems, and most of these have been introduced from overseas.

White Italian Snail, *Theba pisana*

White Italian snail is present in WA, SA, VIC, NSW and Tasmania and occurs in most viticultural regions. This snail is white in colour with brown markings, although the level of patterning can vary between individuals.

Adult snails are up to 2.5 cm in diameter when fully mature and can feed on many plants including cereals, legume-based pastures and weeds like horehound and turnip weed.



Photos courtesy SARDI Entomology

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White Italian snail lays clutches of eggs in the soil about 3-4 cm deep and can lay around 400 eggs per year. Egg laying takes place during autumn, winter and spring as long as the soil is moist. The lifecycle can be annual or biennial depending on environmental and climatic conditions. White Italian snail can reach very high numbers with infestations of 200-250 snails per vine recorded[†]. In a sultana vineyard, 87 kg of snail mass (on-vine) was recorded on vine blocks yielding 30 tonnes of fresh fruit[†].

Common Garden Snail, *Cantareus aspersus* (*Helix aspersa*)



Common garden snail can grow up to 4.5 cm wide when fully mature and is brown in colour with distinct patterning on the shell. This snail is European in origin and is one of the species farmed for food both in Australia and overseas.

Common garden snail feeds on a wide range of plants and occurs in most Australian viticultural regions as well as urban garden environments. It is also a pest in citrus and a variety of horticultural crops. In South African viticulture, severe infestations of the common garden snail are estimated to cause up to 25% crop loss*, however little research has been undertaken with this species in Australian viticulture.

In Australia, as many as 70 common garden snails have been recorded per vine, and these will often feed on developing buds and new foliage[†]. The common garden snail lays clutches of eggs 3-4 cm deep in the soil, with each egg measuring around 4 mm in diameter.



Other snails may be found in the vineyard, including the common white snail *Ceruella virgata*, small pointed snail *Prietocella* (*Cochlicella*) *barbara* and pointed snail *Cochlicella acuta*.

All of these species have a similar annual life cycle, which includes mobile and dormant periods depending on the season and available moisture.

General Lifecycle

The biology and ecology of snails in vineyards has not been studied extensively but a general picture of the snail lifecycle through the seasons is outlined below.

Summer

In summer, most snails will shelter in the vine canopy to escape from the heat. The white Italian snail shows strong climbing behaviour and will often shelter amongst fruit in bunches and in the vine canopy.

Once in the canopy, snails are largely inactive and enter dormancy (aestivation). Aestivation can last for a few days, weeks or months, and snails in this state can also be found sheltering on fence posts, at the base of weeds and grasses, as well as under rocks and rubble at or below the soil surface.

Aestivation can be broken by rainfall events and snails may move temporarily out of the canopy to feed. The type of ground cover and availability of other foods influences snail movement at this time. The common garden snail may be more active during summer than the white Italian snail depending on climatic conditions.

AgNotes



Photos courtesy SARDI Entomology

Autumn

Snail movement from the vine canopy is triggered by autumn rains and changing environmental conditions that break aestivation. Dry conditions in late summer/early autumn can delay movement out of vines while wet weather in early autumn can hasten movement. After aestivation is broken, generally in mid-late autumn, snails will begin to feed, mate and lay eggs.

Winter

The majority of egg laying occurs in winter but can continue if the soil remains moist. Eggs are generally white or clear in colour, around 1-4 mm in diameter, depending on the species, and can be found 2-4 cm below the soil surface. As eggs develop, the shell of the developing snail may be visible through the egg wall.

The common garden snail may hibernate during winter if temperatures are too cold by burying itself in the soil or at the base of plants.

Spring

Egg laying may still occur in spring if soil is moist, however the majority of eggs will already have been laid. As temperatures increase, snails will begin to find spots for summer aestivation.

Increased movement into the vine canopy is likely during spring and may increase if cultivation or other management practices disturb snails on the vineyard floor and remove their food source. The white Italian snail can move up to 55 metres in one month[#], so although snails may not be visible in the vineyard, populations from surrounding areas can quickly migrate in to aestivate.

When is the best time to control snails in vineyards?

Most growers don't see or think about snails until they start to cause problems with sprinklers; snails may also cause damage in the canopy and contaminate fruit. Control measures are essential long before this time in order to achieve optimum results.

Snails move up into the canopy on posts, around sprinklers, risers etc during late spring and summer. This is driven by a search for food if suitable food sources are scarce at ground level, along with the need to aestivate (dormant period) over the hot summer months and conserve water.

Once snails have moved up into the canopy they are very difficult to control. Baits placed on the ground under the vine during this period will not entice snails back down to feed, and the use of chemicals to drive them out is not always desirable or effective.

Baits must be placed in close proximity to snails so they can be easily discovered and become a source of food.

Hence it is essential to target snails when they are most active, especially after the first breaking rains of the season in early autumn. At this time, snails move down onto the ground again and within weeks become sexually active. Egg laying into the topsoil commences soon after, and occurs from late autumn to early spring.



The ideal time to target snails is during this period of activity to achieve the greatest population reduction in the vineyard.

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Strategies to reduce snail numbers in vineyards

Key points:

<p>1. Use palatable, attractive bait that controls snails quickly</p>	<p>Baits must be both attractive and palatable to snails, as there are many alternative food sources on the vineyard floor. Metarex® is both attractive and palatable to snails and ensures a lethal dose.</p>
<p>2. Use rainfast bait</p>	<p>Metarex is a proven wet weather performer, originally developed for very wet European conditions. Metarex will continue to perform long after other baits have collapsed from rain or irrigation.</p>
<p>3. Apply baits at the correct timing</p>	<p>Snails need to replenish their energy reserves after aestivation and before breeding. The normal trigger for them to move to achieve this is rainfall. This is traditionally in autumn with the first breaking rains of the season, but movement can also be triggered by overhead irrigation where the vine canopy, posts, etc are sprayed. Drip or low throw sprinkler irrigation that does not significantly wet the foliage will not normally trigger snail movement.</p> <p>Hence bait must be on the ground before snail movement is triggered.</p>
<p>4. Bare ground under vines</p>	<p>Maintaining bare soil under vines with minimal trash reduces shelter and competitive food sources for snails, and thus enhances the uptake of Metarex.</p> <p>An even application of Metarex to bare soil is important to optimise control. Green plant material between vine rows can also harbour snails and will be attractive to them during the breeding season. Applying baits in this area can have varied results as snails may feed on both plants and baits. If snails have traditionally been difficult to manage, temporary removal of this material will enhance control using baits. Once snail numbers have been reduced to an acceptable level, these inter-row crops can be re-established.</p> <p>A continual supply of Metarex on the ground under the vine row throughout autumn, winter and spring will maintain a level of control as snails move around the vineyard floor.</p> <p>With the arrival of summer, snails will again look for off-ground refuge and the baited area under the vine row will offer a last line of defence.</p>
<p>5. Look beyond the boundary</p>	<p>A maintenance application of Metarex around the vineyard boundary will reduce the likelihood of new infestations of snails from neighbouring properties or roadsides.</p>

†Sanderson, G. (1995) Snails in viticulture. Australian Grapegrower and Winemaker 378a, 115-118.

#Baker G.H (2002) Helicidae and Hygromiidae as pests in cereal crops and pastures in southern Australia. In Molluscs as Crop Pests (ed G.M. Barker).

*Sanderson G. and Sirgel W. (2002) Helicidae as pests in Australia and South African grapevines in Molluscs as Crop Pests, G.M. Barker Ed.

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