AgNOVA TECHNOLOGIES

An American Vanguard Company

AgNote

CONICAL (POINTED) SNAILS – WHEN IS IT BEST TO BAIT?

IRONMAX PRO®
SLUG AND SNAIL BAIT

Overview

Snails cause major damage and contamination to Australian crops. Successful management of snails requires understanding of the individual species' biology and of interaction with local conditions. Unlike insects, snails do not have a set seasonal life cycle; they breed when conditions are favourable. They can change their behaviour in response to novel conditions and respond quickly when suitable. Due to their adaptive life history, monitoring should be conducted throughout the year, when conditions are suitable for their activity.

Proactive monitoring ensures baits are applied when snails are most susceptible to **Metarex Inov®** or **IRONMAX Pro®**, and before they start laying eggs. For conical snails originally from the Mediterranean region, autumn to winter is the most effective time to bait – as soon as they start to feed (Fig. 1). For the temperate areas of southern Australia, the life history and climatic triggers of most species is known, which is presented below to inform when the right time is to apply **IRONMAX Pro**.

Summary

Conical snails can cause significant damage to seedlings, especially when plants are under stress.

Conical snails can breed opportunistically but their main breeding time is usually winter, though it can commence from late autumn. Conical snail activity begins later in the year than other co-occurring species, such as Italian round snails.

IRONMAX Pro (containing IP^{Max}, an optimised form of iron phosphate) causes greater mortality than metaldehyde, especially during winter–early spring. Treatment effects generally diminish from October–March, depending on the year, due to increased natural mortality and less snail activity/feeding.

Consider a double knock strategy to control conical snails by rolling over summer, then using **IRONMAX Pro** when conical snails are active.

Plate 1: Conical snail consuming an IRONMAX Pro bait*

*Images courtesy of Dr Michael A Nash

Conical (pointed) snail [*Cochlicella acuta* (Müller 1774)]

Conical snails have an elongated shell with a height to maximum diameter ratio of greater than 2:1, growing up to 16 mm in height. Breeding usually occurs once snails are >6 mm in height, during the winter and early spring months. Individuals typically live for 1–2 years with the capacity to lay 128–186 eggs/individual taking 2–5 weeks for first laying in late autumn/winter. During torpor (a state of lowered metabolism and activity) throughout the summer months, conical snails will shelter in protected areas either on the ground or in elevated areas, to avoid the heat.

Life history information is limited, with no optimal temperature data available. Similar to other snail species, 5 mm of rain and an RH >90% is considered an ideal level of moisture for breeding, however specific numbers need to be validated. Conical snails are typically found in coastal environments that exhibit a Mediterranean climate with an annual rainfall of 300–450 mm. They prefer sandy calcareous soil with a pH >7.5. Conical snails only breed once in their lifetime then die. This condensed, massive reproductive episode means it is vital to accurately time baiting before adults lay eggs.

During torpor, snails will not consume baits, hence appropriate timing of bait applications is crucial. Conical snail activity occurs later than co-occurring species, such as Italian snails, hence timing of bait application for this species is more challenging than other species. Mortality data from semi-field cage trials (Fig. 1) and laboratory experiments conducted

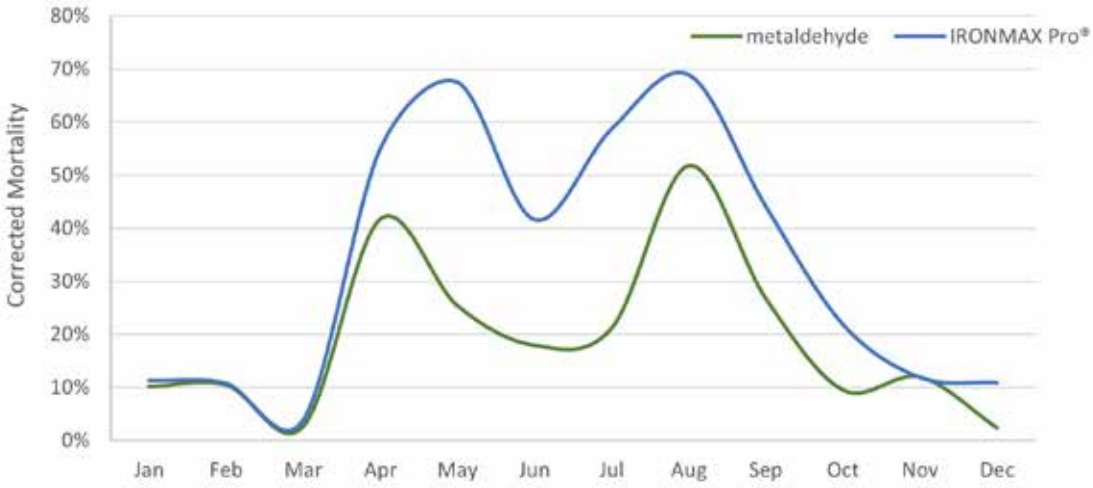

Figure 1. Smoothed line graph of corrected mortality using Schneider-Orelli's formula for conical snails exposed to 7 kg/ha IRONMAX Pro (63 g/ha IP Max™) or 300 g/ha metaldehyde. Mortality was tested using 1 m by 1 m field cages with results from Warooka SA in each month of the years combined for 2023–2025.

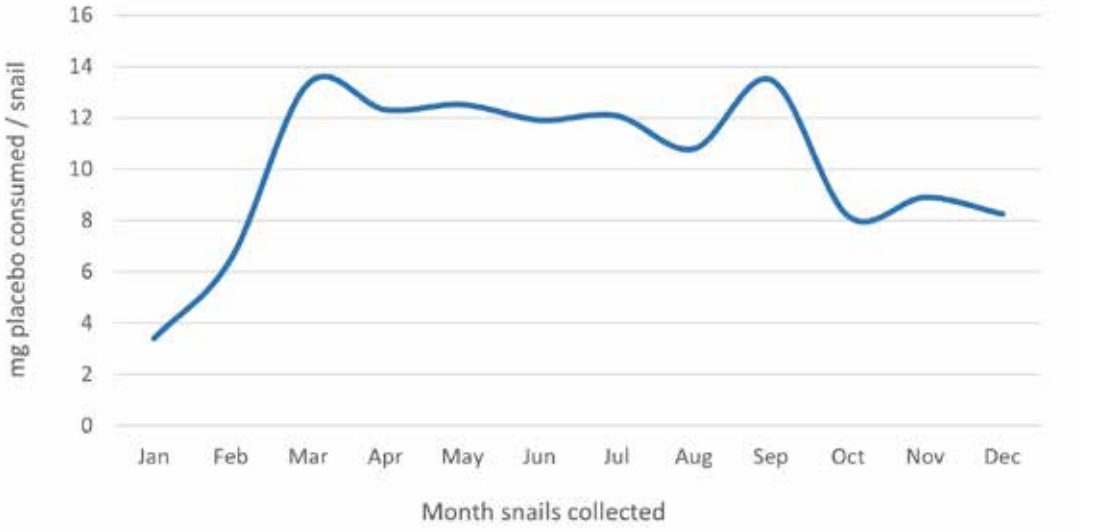

Figure 2. Smoothed line graph of consumption of placebo baits by conical snails after 3 days in laboratory trials (22°C, 100% RH), for snails collected from Warooka SA in each month of the years combined for 2023–2025.

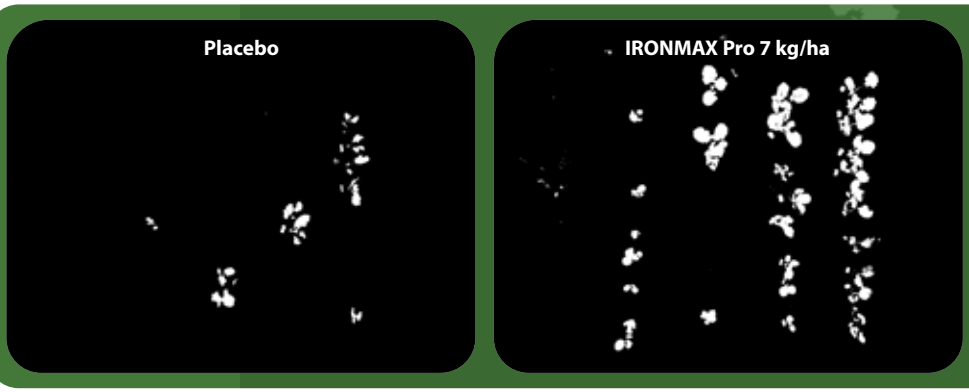

Plate 2: Canola (cv. Raptor TF) GS 1.3 surface leaf area measured using the green canopy measurement tool Canopeo[1], showing the effect of IRONMAX Pro on plant establishment*

by AgNova demonstrated all metaldehyde baits are less effective when applied to conical snails during winter but improved into spring until juvenile snails (<6 mm in length) became the greatest proportion of the population from September onwards. Note: LD_{50} values have not been calculated for conical snails. Based on combined monthly feeding data from AgNova trials (Fig. 2) when mortality was greater than 50%, the number of conical snails controlled at the maximum label rate of (7 kg/ha) **IRONMAX Pro** would be 90–210/m^2 (95% CI). Due to local paddock conditions influencing control and the amount of **IRONMAX Pro** consumed, monitor after bait application and reapply baits as needed (see decision key on page 4).

Conical snails are considered primarily as a contaminant of grain at harvest, hence **IRONMAX Pro** with a nil withholding period provides a pre-harvest control option. **However, conical snails do feed on green plants.** AgNova research has demonstrated that conical snails cause seedling damage (Fig. 3), and hence, less plants establish, especially in warm conditions when snails are active and plants are under moisture stress. When effective baits, such as **IRONMAX Pro**, are applied at the right time, they will stop conical snails from destroying crop seedlings.

Plate 3: Conical snail on canola seedling*

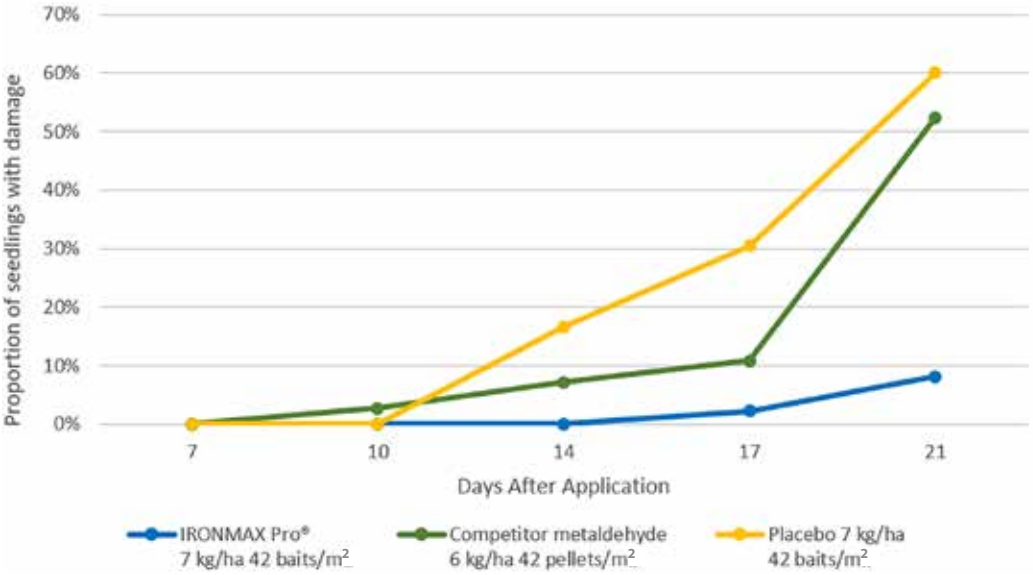

Figure 3. Mean damage to canola (cv. Raptor TF) seedlings where 100 conical snails were exposed to 7 kg/ha IRONMAX Pro (63 g/ha IP Max™) or 300 g/ha metaldehyde or nil (placebo) treatment. This trial was conducted in 2025 over three weeks using 1 m by 1 m field cages with snails released at the same time as 60 seeds were sown.

*Images courtesy of Dr Michael A Nash

[1] Patrignani A and Ochsner TE. 2015. Canopeo: A powerful new tool for measuring fractional green canopy cover. Agronomy Journal, 107(6), pp. 2312–2320

Decision key for baiting

STEP 1.

Assess snail activity state prior to baiting using indicative test – crush 2–3 snails between thumb and finger.

- If juicy when crushed, apply bait – go to Step 2
- If paste-like when crushed, continue monitoring weekly – go back to Step 1.

STEP 2.

Estimate the number of snails and apply IRONMAX Pro.

- If >90/m^2, apply 7 kg/ha of IRONMAX Pro and check within one week of application to assess if bait remains – go to Step 3
- If <90/m^2, apply 5 kg/ha IRONMAX Pro and check within one week of application to assess if bait remains – go to Step 3

STEP 3.

If little or no bait remains, reapply IRONMAX Pro at rates indicated and continue to monitor.

Plate 4: Estimating conical snail numbers using AgNova monitoring mats*

*Images courtesy of Dr Michael A Nash

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