

HOW THE WEATHER WILL AFFECT SLUG AND SNAIL POPULATIONS IN 2023: DON'T WAIT TO BAIT!

Crop establishment, particularly of canola, is critical to maximise yield potential. Diligent planning to protect seeds and seedlings from slugs and snails should be top of mind in 2023.

Key points:

- 1) High soil moisture is the main predictor of high slug and snail activity.
- 2) Wet winters extending into long cool springs, combined with bulky crops, provide ideal conditions for breeding.
- 3) Proactive management gives the best return on investment, long-term monitoring of slugs and snails in spring is vital to provide information on population dynamics.
- 4) Paddocks with infestations in 2022 are likely to also have greater threats in 2023.
- 5) Use a long-lasting slug and snail bait that is resistant to rainfall, attractive, palatable and spreads evenly.
- 6) A proactive program is best. A reactive approach equals losses.

Based on above-average rainfall across most cropping regions of Australia in 2021, projections indicated that black keeled slugs were going to be a major threat to establishing crops in 2022 ("When do I need to bait for snails and slugs?" Rural Business, March 2022).

As 2022 progressed, those model projections proved correct, with a resultant record tonnage of molluscicides applied. Industry was surprised by slugs damaging crops in new areas: for example, regions north of Dubbo, the Riverina including Finley, and west of St Arnaud to Warracknabeal. These observations support previous modelling that projected black keeled slugs have a much larger area of suitable habitat across southern Australia than where they have occurred historically (Figure 1).

Slugs and snails can be moved by water; hence populations are expected to further expand into new areas impacted by spring 2022 floods. It is essential to be vigilant in the coming months to see how far slug and snail populations move.

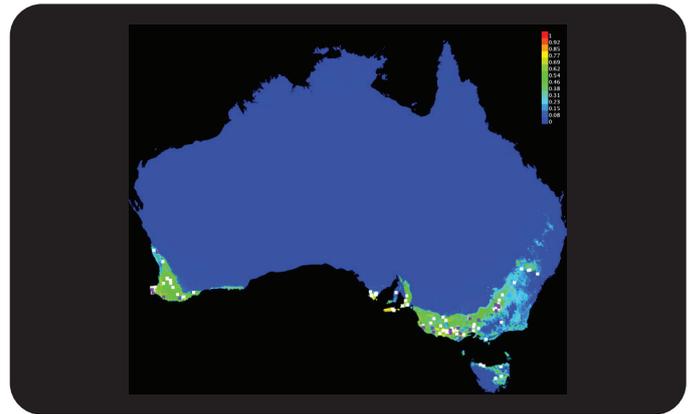


Figure 1. Areas suitable for black keeled slugs as determined using Maxent modelling based on historical data (squares) up to 2012. Blue is 0% probability of suitable habitat. Green represents a 50% probability of suitable habitat.

Slugs can cause damage outside known hot spots within paddocks: for example, considerable damage occurred in canola crops away from creek lines in 2022. The patchy distribution of black keeled slug populations has made management difficult.

Growers across northern Victoria and southern NSW reacting to slugs have found re-sowing canola seed with bait to areas eaten out by slugs was successful, however some yield losses are expected. One estimate of losses is \$800–\$1000/ha. This estimate was based on irrigated canola from northeast Victoria where slug control was poor due to bait being applied reactively, compared with proactively applying bait directly after sowing. Those observed losses were due to biomass prior to bolting being below 5 tonne/ha and seedling numbers less than 40/m², values which have been determined as optimal for hyper yields.

Recent weather conditions linked to an extended La Niña would suggest slug and snail numbers are likely to be greater than ever in 2023; akin to 2011/12 leading into 2013. Spring 2022 observations of juvenile slugs feeding in wheat heads indicates these species are still breeding as of October 2022. Black keeled slug eggs were observed recently in southwest Victoria. Large numbers of small conical snails are also being observed in wheat heads that may contaminate grain at harvest.

By linking climate tools such as spring rainfall days, NVDI and soil moisture to spring paddock observations of slug

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and snail activity, each region can predict potential threats next sowing. For example, a wheat crop with a large green canopy starting to lodge in November, a full moisture profile and small grey field slugs feeding in the heads (Figure 2), will have a large reservoir of slugs that will survive in the ground over summer ready to ravage next year's crop. Even with a dry summer/autumn, that population will become active and feed on seedlings in late autumn, once soil moisture is about halfway between wilting point and field capacity (20–25% m³/m³). Note, grey field slugs continue to migrate from below the ground for 9–15 months, and for black keeled slugs, for up to 20 months. Hence, in the scenario provided, management will need to be precise, integrating baiting with cultural practices to ensure successful establishment of canola.

In high threat years, budgets for susceptible crops, like canola, need to include the cost of multiple applications of short-window baits (e.g. Snalex) or at least one application of a high-quality, long-window bait (e.g. Metarex Inov[®]) directly after sowing at maximum label rates. A second application may be required where a proportion of the black keeled slug population becomes active late May/early June.

Reactive management compounded by logistical constraints in 2021 and 2022 led to poor crop protection as slug and snail baits were applied too late. Black keeled slugs that became active in late autumn decimated canola in less than a week, resulting in major yield losses. Remember, slug and snail baits can be stored over the summer to ensure product is available when it needs to be applied. (<https://grdc.com.au/resources-and-publications/grdc-update-papers/tab-content/grdc-update-papers/2022/07/slugs-what-can-we-learn-from-2022>}).

Understanding when individual species are active, mating and breeding underpins successful management of snails and slugs. Knowledge of pest population dynamics will avoid molluscicide supply shortfalls by allowing for proactive baiting next autumn of snails once they become active, before they start laying eggs, and of slugs directly after sowing to protect establishing crops.

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Figure 2. Grey field slugs: a) adult in BASF Ascot[®] 10 Nov and b) juvenile in RGT Accroc 11 Nov 2022.