
# Slug control in vegetable crops

Slugs are a major economic pest in most horticultural crops. There are at least eight pest slug species in Australia, all of which have been introduced.

Slugs are primarily pests of vegetable and cereal crops. They feed above and below the soil surface, damaging seeds, shoots and roots. In some crops the main issue is at planting, while in others problems occur during the growing season and/or at harvest.

*Deroceras reticulatum (below)*

*Milax gagetes (above)*

Slugs favour heavier soil, surviving summer in cracks and under clods; they do not survive well in fine, light or compacted soils. Slugs are not active during the day and damage is often blamed on poor germination or other pests.

## Environmental influences

The environment has a major impact on the life cycle of the slug. Air and soil temperature, wind-speed, humidity and soil moisture content are all correlated with slug activity. Slugs frequent moist shady places and their daytime resting site can be crucial to survival.

Slugs are active throughout the year, causing trouble whenever temperature and moisture conditions are favourable. The temperature range at which slugs are active varies with species.

The grey field slug, *Deroceras reticulatum*, is active at air temperatures of 11-25ºC and soil temperatures of 8-20ºC. Slugs are extremely susceptible to dehydration, but are able to rapidly rehydrate through skin absorption of water. Damp, mild and calm conditions are optimal for slug activity.

Slugs are hermaphrodites and both members of a mating couple can lay eggs. Mating usually takes place in autumn, however some species lay eggs whenever conditions are suitable.

## Control methods

Slug management is difficult - often single agent control methods are ineffective and a combination of cultural, chemical and biological methods should be utilised to minimise damage. Unfortunately, soil management practices that increase soil water holding capacity and organic matter also favour slugs. Slug problems are also greatly influenced by crop rotations.

## Sampling

The first step in any slug control program should be the use of sampling methods to determine numbers and species present. Sampling will also identify hot spots within paddocks and provide knowledge of slug life cycles.

## The Bottom line

- At least 8 introduced slug species are in Australia
- Sampling is the first step in slug control
- A combination of cultural, chemical and biological methods are necessary for slug management
- Timing is vital when using chemical control methods
- Biological control agents are limited and easily killed by insecticides or tillage

Knowing how weather and environmental conditions affect slug activity and biological processes of both slugs and eggs can assist in planning control strategies.

The simplest way to sample slug populations is with refuge traps (shown above). These can be made from materials such as sacking, carpet squares, roof tiles, hardboard and corrugated iron. Layer mash (chicken feed) can be placed under the trap as a food source.

## Cultural practices

Effective cultural practices include:

- reducing soil moisture,
- removal of materials/weeds that provide favourable habitats,
- soil cultivation to expose eggs and slugs,
- production of fine seed beds to reduce movement between habitat and crop,
- deeper drilling of seeds,
- selection of suitable cover crops,
- use of trap crops to keep slugs away from crops
- planting before slug populations build up,
- cultivating a weed free strip between crop and headland to prevent migration,
- keeping gully lines clean,
- minimising pesticide use to encourage build-up of predator populations.

## Chemical control

Chemical baits can be effective, particularly when used in conjunction with cultural practices. However, timing is critical - baits need to be applied before populations reach damaging levels.

Use of refuge traps and regular monitoring will provide information on fluctuations in slug populations, allowing baits to be laid before slugs become a major problem. Once crop damage is evident it is too late to lay baits.

Bait choice is important. Those available in Australia are either methiocarb, methidathion, metaldehyde or iron based. Small, even sized pellets/granules will give better coverage, increasing the likelihood of slugs finding the baits. Under humid or wet conditions, metaldehyde baits are often less effective, as slugs can rehydrate. Some slug species are naturally tolerant to methiocarb.

Although slower acting, iron chelate baits appear to be more consistent in their effects than methiocarb or metaldehyde baits. They also have low toxicity to domestic pets and wildlife and are non-toxic to beneficial insects and earthworms.

## Biological control

Biological control agents are limited. Birds, rats, frogs and lizards feed on slugs. Ducks, chickens and Guinea fowl can be effective in orchards and vineyards. Recent Australian research has shown carabid beetles and native earwigs feed on slugs. However they are easily killed by insecticides targeting insect pests or by tillage at critical times.

## Physical barriers

Although not feasible in broadacre cropping, the use of physical barriers may be of assistance in high value crops. Lines of sawdust, ash, lime and copper sulphate are effective barriers, but efficacy is reduced on wetting. Copper bands or sprays, and aluminium oxide sandpaper are also effective barriers.

## Further Information

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## Acknowledgements

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ISSN: 1449 - 1397



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