

What is the best way of trapping slugs?

Background

The slug is almost certainly the most hated pest in horticulture, causing widespread damage and sometimes complete crop failure.

Slugs belong to the class 'Gastropoda' which means 'stomach foot' and describes their unusual anatomy perfectly. The muscles on the underside of this foot are contracted in waves which help to propell them along the ground, aided by slimy mucus secretions to smooth their path. Slugs have two pairs of tentacles, the upper pair used for vision, and the lower pair for feeling and tasting.



Slugs eat using a radula which is like a tongue covered in fine teeth that rasps and shreds plant material. Different species of slugs have different diets. Some species do cause extensive damage to garden plants. The grey field slug (*Deroceras reticulatum*), the keeled slug (*Tandonia budapestensis*) and the common garden slug (*Arion hortensis*) are the most common culprits. However, many species, such as the large black slug (*Arion ater*) have a preference for rotting vegetation so are important in the compost heap. Others are oniniverous so will eat decaying animal material or even other slugs. An identification sheet is included with this pack.

Slug control is amongst the most widely discussed topics amongst gardeners. There are many methods of slug control that vary widely both in their effectiveness and their impact on the environment. Many traditional gardeners are likely to turn to treatment with slug pellets. The majority of these contain metaldehyde, a chemical that can be highly toxic to other wildlife, so would never be used by organic gardeners.

Organic gardeners have a range of other methods that they can use for control:

- Barriers – copper tape is the most effective barrier for growing in containers but is expensive. Plastic bottle cloches are a cheap solution for young plants, but labour intensive for large numbers of vegetable transplants. Coffee grounds and other irritants such as sheeps wool have been met with very varying degrees of success. All barriers need to be inspected regularly as slugs will always find any gaps or bridges of foliage across them
- Biological treatments - nematodes are watered onto the soil and are effective at reducing the soil-dwelling slug population, but are pricey and the instructions need to be followed carefully.
- Ferric phosphate slug pellets – although these are acceptable for use in organic systems, they really should only be used when everything else has failed. There are concerns that the formulation could have a detrimental effect on earthworm populations.
- Choice of plants – some plants are far less susceptible than others, but only choosing slug resistant plants can severely restrict the range of produce grown.
- Night patrols – slugs are most active at night, so collecting them and disposing or relocating them is an effective way of reducing the population. This is only practical if you live near your growing site and traipsing around the garden on a wet night might not appeal to everybody.

For more information about controlling slugs look at www.gardenorganic.org.uk/slugs-and-snails

Background to this experiment

We wanted to investigate how attractive slugs find different types of drinks. Beer traps are effective over a short distance as long as the contents are replaced regularly. Some people may wonder if the traps merely attract and trap slugs that wouldn't have otherwise come to the plot. However, trials have shown that the more slugs that are caught, the less damage is done to plants, so this suggests that they are effective at diverting

them away from the crop.¹ Slugs are attracted to volatiles given off by fermentation as they were not attracted to wine or a solution of ethanol and water.²

Methods

Four glasses were placed spaced 10 cm apart amongst a slug susceptible crop. They were placed sunken below the soil surface with a lip of 0.5 cm protruding above the soil to avoid trapping ground beetles.

Each glass was $\frac{3}{4}$ filled with either:

1. Water
2. Lager
3. Bitter
4. Drink of choice

Participants used the same brand of drink throughout the experiment.

Twice a week, the number of slugs in the traps were counted, and identified, where possible using the id sheet provided. Participants left out the traps for the duration of the growing season from April to October. Drinks were replaced, every week, or when required.

Much of the season was very dry, resulting in few slugs in many cases. Consequently, many people did not fill out the datasheets and slugs were only recorded at 30 sites. Despite the low response rate, this still gives a comparison of slug traps at a range of sites, albeit in a season where slugs were far and few between at times.

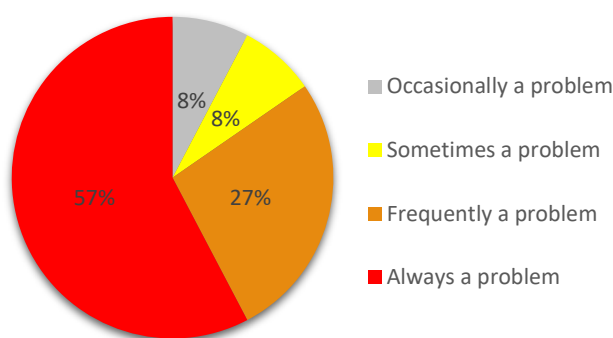
Results

Weather

After a cool start in April, the weather started to warm up considerably in May, giving rise to a long hot and very dry period throughout June and July. Some areas of the country had very little rainfall, and many had less than half the seasonal average amount. The dry weather continued for some areas of the country in August, whereas others experienced stormy rainfall. Overall, this was a dry season, where slug numbers were likely to be low during the summer months especially in June and July.

General slug problems

All respondents experienced slug problems at their site. A large majority (57%) stated that slugs were always a problem.



Respondents at sites with a sandy soil, tended to experience less of a problem than those on clay or silt soils.

“This is probably one of the more disgusting experiments! Smell of dead slugs is not nice.”

¹ Dankowska, E (2011) Effectiveness of beer traps and molluscicides as means of gastropod control. *Folia Malacologica* 19:273-275

² Cranshaw, W. (1997) Attractiveness of beer and fermentation products to gray garden slug, *Agriolimax reticulatum*. Colorado State University Agricultural Experimental Station Technical Bulletin

Preference for beer types

The encouraging message from this trial was that slugs were just as attracted to the cheapest types of lager as they were to the more expensive brands. Although bitter has been touted as being a more attractive than lager, there was little evidence for this here or elsewhere. In this trial, bitter and lager caught similar numbers of slugs. After a period of 3 – 4 days, beer traps caught, on average, 5 – 6 slugs. These are quite low numbers, and reflect the extremely long dry season.

	Water	Lager	Bitter
Average number of slugs caught	0.1	6.4	5.3

Very few slugs were caught in the water, compared to the beer. It is thought to be the combination of volatiles, and yeast that attract the slugs, and the alcohol content has been shown to have little bearing on effectiveness.²

“Beer definitely came out on top!”

“I have always thought that lager did not work, only bitter but this trial has shown that Morrisons Savers lager £1 for 4 has proved the most successful.”

Other drinks

Participants tried other drinks of their choice to investigate how effective they were as an alternative to beer. Most of these observations are from limited numbers of samples at one site, so we need to be careful drawing firm conclusions.

Orange squash was tried at 4 sites and was consistently much less successful than beer at each site. Cider was tried at 7 sites, and the results were inconsistent, attracting similar numbers of slugs to beer at some sites, but virtually no slugs at others. All wine based drinks attracted very few slugs compared to beer and slugs even rejected Cava! Orange juice was only tried at one site, but appeared to be quite successful, so this might be worth trying again. The bakers’ yeast and sugar mix used at Ryton, only caught marginally more slugs than the water, and much less than the beer.

“This seems a very effective way of trapping slugs and I will probably try this again when I can have access to some slops or leftover beer. I’m not a beer drinker myself so I am not likely to buy it for the slugs, and they obviously do not like wine which I do.”

Types of slugs caught

Many participants stated that they found identifying the slugs difficult, especially when there were large numbers of very small young slugs. Acknowledging people’s difficulties with identification, grey field slugs (*Deroceras reticulatum*) and common garden slugs (*Arion distinctus* / *Arion hortensis*) were the most common types reported. These are often deemed the most destructive species, causing widespread damage especially to young plants. Very few leopard slugs (*Limax maximus*) which are helpful in breaking down compost, were caught.

Slug type	Average number caught
Grey field (<i>Deroceras reticulatum</i>)	1.4
Common Garden (<i>Arion hortensis</i>)	3.0
Common Keeled (<i>Tandonia budapestensis</i>)	0.3
Large Black (<i>Arion ater</i>)	0.2
Leopard (<i>Limax maximus</i>)	0.1

Conclusions

It is typical that when you try to do a trial on slugs, there is a very dry season when slugs are far less of a problem. None the less, this trial did generate a few interesting findings. The most important message was that slugs are attracted to beer, but they are not fussy about what type, be it lager or bitter. It is encouraging that the traps mostly caught some of the most destructive grey field and common garden species. Leopard slugs, which have an important role in breaking down compost, were not caught in large numbers, confirming that there are useful types of slugs that spend relatively little time near your plants.