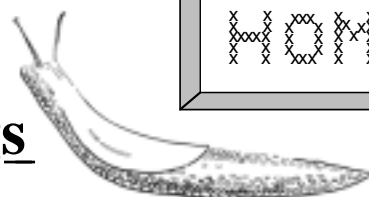


# Alternatives

A Washington Toxics Coalition Fact Sheet



## Protecting Your Plants from Slugs

by Philip Dickey

Few people in the Pacific Northwest have kind thoughts about slugs. “Horrible,” “gross,” and “disgusting” would be considered compliments. Vegetarians, conscientious objectors, liberal Democrats, and people who otherwise never use pesticides line up at the store to purchase products with names like “Deadline,” “Slug Death,” and “Slug’s Last Lunch.” Rumor has it that even some animal rights advocates pour salt on them, arguing that slugs aren’t actually animals. What is it about slugs that seems to elicit such strong reactions? Well, arguably, they are ugly, even disgusting. They eat your favorite plants, leaving behind nothing but a trail of slime. And they seem to be everywhere. Out here, some of us don’t eat clam chowder that we didn’t make ourselves.

Metaldehyde, the pesticide ingredient most commonly used to kill slugs, is highly toxic to pets. Every year, cats and dogs are made ill or killed by eating slug and snail poison. Containers of slug bait stored in the home represent a real hazard to children, too. Unwanted slug bait is a hazardous waste and must be disposed of at a household hazardous waste collection site (see back page). Slug killers that include the pesticide carbaryl in combination with metaldehyde are highly toxic to birds, bees, and fish. For these reasons, I recommend trying alternative controls.

A wide variety of home remedies have been described to combat slugs. Some work and some don’t. By using a combination of the effective controls, you can avoid poison baits.

### Slug Biology 101

Slugs are mollusks, landlocked relatives of clams, squid, and octopus. Essentially they are snails without shells. A number of different types of slugs occur across the country, varying in size and color, but usually shades of brown, black, green, and gray, often decorated with bands or spots. As with people, most slugs in the Pacific Northwest are not natives, but rather immigrants who just stayed because they like the climate. Only the large, yellow banana slugs are native. With slugs, however, identification is seldom the problem. The only possible confusion may involve small slug-like larval stages of some insects, called pear slugs, cherry slugs, and rose slugs. Contrary to their names, these larvae are not slugs at all. True slugs share two characteristics: they leave a silvery slime trail and they never become insects and fly away. As was aptly put in a recent article, “the true slug is cursed to remain a slug for its entire life.”

Moisture is essential to slugs’ survival, a fact which comes as no surprise to residents of the Pacific Northwest, where winter’s seemingly endless gray, drizzly days and long nights provide a better environment for slugs than for people.

Slugs spend daylight hours hiding. You can find them under boards and other debris, low-growing plants, mulches, and inside lettuce and cabbage heads. At night they come out and eat your plants. Slugs can eat 30 to 40 times their weight every day.

Slugs are hermaphroditic, meaning that each slug has both male and female reproductive systems. Convenient for an animal so ugly, but actually that isn’t how it works. They mate in a process that scientists, with their unique knack for understated description, call “cross fertilization.”



*Slugs hide under boards, low-growing plants, and garden debris. Tip pots over frequently and remove any slugs underneath. Keeping the garden tidy helps to reduce slug habitat and damage.*

Eggs are laid in the soil or under garden debris throughout the summer and fall. The eggs will not hatch until they come in contact with moisture, usually in the fall, when the weather turns wet again. Eggs are found in masses of up to 100 or so. Each egg is about 1/8 to 1/4 inch in diameter and appears colorless or white. A single slug can lay up to 400 eggs in a year, and they start doing it at the age of three months, before they are fully developed in other respects. (There must be a Gary Larson cartoon of this somewhere.)

Slug damage is easy to recognize. Usually it takes the form of large, ragged holes in the leaves, but sometimes whole young plants are consumed, leaving only stubs. The telltale slime usually gives away the culprit.

Effective slug control takes advantage of several of the aptly-named creature's most important characteristics: they are slow, not too bright, like to drink beer, and prefer the dark. Does this sound like your brother-in-law?

## Prevention

Prevention of slug damage boils down to reducing their habitat and interfering with their life cycles. Keep the garden free of unnecessary debris, such as boards, rocks, bricks and other objects slugs may hide under (unless you are using these items as traps, as discussed later). Be prompt about cleaning up material that you prune or pull out. Keep pathways clear of overgrown foliage.

Unfortunately, some good garden practices actually can increase slug problems. Mulch and ground covers provide ideal slug habitat. Avoid heavy mulching around plants that are particularly slug-prone if damage is unacceptable. In planning your garden, try to keep slug-prone plants away from tall grassy areas, groundcovers, or other places where slugs may hide.

If your lawn and garden seem particularly slug-infested, you might want to take some care in plant selection, avoiding plants that slugs particularly relish and concentrating on those that are less tasty. The plant lists at the right are offered merely as starting points, without any guarantees of accuracy or completeness. You should compile your own lists of plants that the slugs are eating, as well as those that they avoid. If a plant proves too susceptible, try something else. It also may help to keep transplants indoors until they are larger than snack size. Beware of some publications that list marigolds as a way to deter slugs. This is incorrect; actually, marigolds attract slugs. They can be used as a "trap crop" to lure slugs which you then kill. But if you don't follow through, the slugs first eat the marigolds as an appetizer and then look around for the main course.

## Natural Predators

Believe it or not, slugs have many predators in the natural world. Garter snakes, birds, rats, rabbits, moles, hedgehogs, skunks, toads, and frogs are just a few. A number of insects, including some types of flies and beetles prey on slugs. There is even a predacious slug—that's a slug that eats other slugs—but it is relatively rare. Ducks and geese are domesticated animals that can actually provide slug control if you are set up to handle them. Not for everyone, certainly not those with small city gardens, but they can be effective in the right environment.

## Slug Hunting

Slug hunting is a euphemism for handpicking, a term which implies more direct contact than most people like to think about. The best time to do it is at night, when the slugs are active. A flashlight is essential, and a set of tongs is advised. Some people

## Slug-resistant Shade Plants\*

Agapanthus	Galium odoratum
Alocasia	Gaultheria
Anemone japonica	Impatiens
Arum italicum	Jedychium
Aspidistra	Juniper
Astilbe	Kenilworth Ivy
Baby's Tears	Linnaea
bamboo	London Pride
bedding begonias	Nandina
Begonia 'Cleopatra'	Oxalis oregana
bleeding heart	Sansevieria
Campanula porscharskyana	Endymion hispanicus
coral bells	sedums (except S. maximus)
Cyclamen	Sempervivum
Dichondra	Solomon's Seal
Duchesnia	Taxus
Epimedium (taller species)	Thalictrum
Evergreen Candytuft	Thymus serpyllum
ferns	Viola hederacea
foxglove	Viola rupestris
	Wandering Jew

\* List from *The Complete Shade Gardener* by George Schenk, published by Houghton Mifflin

## Copper Slug Barriers



Copper slug barriers can be attached to raised beds. Bending the top over makes them work better, but the sharp edges can scratch your ankles.

## Slug-resistant Flowers\*\*

Flowers**	
Achillea	Lobelia
Ageratum	Mentha
Alyssum	Nasturtium
Arabis	Paeonia
Armeria	Penstemon
Aster	Phlox
Calendula	Poppies
Campanula	Portulaca
Cosmos	Potentilla
Dianthus	Ranunculus
Dicentra	Rudbeckia
Eschscholzia	Saxifraga
Galium	Sedum
Hemerocallis	Thymus
Iberis	Verbena
Kniphofia	Vinca

\*\* As reported in an informal survey of Seattle Master Gardeners. This list is purely anecdotal and has no scientific basis.

## A Homemade Slug Trap



*Cut several openings around the top of a plastic margarine tub. Fill it with beer and sink it into the soil. Put the lid back on. Empty the dead slugs often.*

devise a hat with the flashlight attached in order to keep their hands free. Drop the slugs into an old mayonnaise jar for disposal later. You may want to fill this container with soapy water to kill the slugs immediately, since slugs tend to try to climb up the sides to get out. They can push upward with enough force to pop the lid off of a yoghurt container, so use a container with a screw top. Pleasant dreams.

Slugs can be disposed of in the trash, flushed down the drain, or buried in the garden. Individual slugs can be tossed a great distance, such as into the street. Keep a rough tally of the slugs caught because over time these numbers will tell you if you are getting control of the problem.

Most people are probably content, even exhilarated—well, maybe content is strong enough—to catch 50 slugs in an evening. Not to discourage you, but one study concluded that for every slug caught by Pacific Northwest gardeners, 20 more are hiding. The champion slug catcher that I know bagged—or rather bottled—over 800 slugs in one night. Slug hunting is most useful when combined with the other measures described here.

Slug hunting is especially fruitful in the fall, when stomping on or crushing egg masses can eliminate hundreds of future slugs in seconds. Routine cruising of the garden is probably the most effective way to reduce the slug population quickly. Just don't expect to get them all.

## Barriers

Over the years, many substances, from egg shells to fireplace ashes, have been said to stop slugs in their tracks. Wood ash, cinder bits, and diatomaceous earth are quite effective when dry. The trouble with most of these barriers is that they work poorly in rainy conditions, just when they are most needed. Tests have shown that the most effective slug barrier is copper. There is evidence that zinc may work, too. The slugs may receive an electric shock when they try to cross copper, and after crawling about an inch on the metal, they turn to the left and go back. (Would they turn right in the Southern Hemisphere, I wonder.) In these tests, copper was more than 95% effective at stopping slugs, when the upper edge of the strip was bent over and down to form a flange. (See the illustration opposite.)

You can buy copper barriers commercially (see box on page 4), or you can make your own from scrap copper sheeting. Cut it into strips about four inches wide. Since copper is fairly expensive, you may want to group together slug-prone plants that require the same growing conditions. Copper strips can be nailed to the raised bed timbers to protect plants inside. The barrier should be vertical to keep it free of debris that might interfere with its effectiveness. It is essential that as many slugs as possible be removed from inside the barrier right away. Otherwise, they are trapped inside, and with all that food they really don't mind. After installing the barrier, water the plants well and do some intensive slug hunting each night for a week.

One you have set up your slug fence, you need to keep the plants trimmed back so that no leaves or branches drape over the copper and provide a bridge for the slugs.

You may have heard that you can grind up slugs in a blender and use the resulting mixture to repel other slugs. It makes sense to me; even a slug wouldn't eat lettuce that had that glop all over it. Forget it! Research has shown that it only works if you do it **every day**. And you would have to have a second blender to use just for this purpose. It was probably a sales campaign started by the Juice Man. Save your money.

## Slug Traps

Boards, asphalt shingles, or inverted flower pots placed around the garden will attract slugs during the daytime and can serve as traps. You just go around and turn them over during the day, removing the slugs from underneath. If you don't remove the slugs, however, they will hide there and forage at night.

As many readers may already know, slugs are attracted by the smell of beer. A container of beer, sunk into the ground so that a one inch lip protrudes, will often be full

## Summary of Slug Control

- ❖ Keep garden free of debris.
- ❖ Keep any grass near garden trimmed.
- ❖ Avoid heavy ground covers and mulches near susceptible crops.
- ❖ If slugs are a particular problem, select plants that slugs don't like to eat and avoid plants that slugs really like.
- ❖ Hand pick slugs at night.
- ❖ Use traps to catch slugs.
- ❖ Use copper borders around susceptible plants.

### Slug Traps

- ❖ Slug Saloon
- ❖ Slug Bar
- ❖ Garden Sentry
- ❖ Snailproof

### Copper Barriers

- ❖ Dr. Harvey's Copper Mountain™
- ❖ Snail Barr™
- ❖ Surefire™ Slug Barrier Tape

## Disposal of Slug Bait

Slug bait is considered a pesticide and if no longer wanted should be disposed of at a household hazardous waste site. For information on disposal of pesticides, contact your local household hazardous waste agency. In the Seattle/King County area, call the Hazards Line at 206-296-4692

*Illustrations by Beanne Hull*

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of slugs in the morning. The slugs apparently are attracted by the yeast smell and fall into the beer, where they are anesthetized by the alcohol and drown. This curious behavior is the principle behind homemade traps, as well as commercial plastic traps called "Slug Saloon." A couple of tips, however. Slugs prefer fresh beer, so be prepared to keep the tap flowing. Some experimenters have gone so far as to compare the slug catching power of various brands of beer—light beer versus regular, ale versus lager, etc. In my opinion, slugs don't deserve these beer tasting parties. Besides, if you serve really good beer, word of these parties may spread, and slugs will come over from the neighbors' yards as well. During rainy periods, you should cover the trap with some kind of lid to prevent dilution of the beer—reportedly slugs aren't crazy about weak beer either. Fussy little critters, aren't they? Supposedly green-colored traps are most attractive to slugs. If you don't want to use beer, a yeast, sugar, and water mixture reportedly works, too.

While beer traps certainly can catch slugs, you may need quite a lot of them to really make a difference. In the end, faced with the choice of sacrificing either your lettuce or your beer, you may opt for losing the lettuce. The staff at the Bio-Integral Resource Center suggest a more efficient way to use beer to catch slugs: drink the beer yourself, then strap on a flashlight and go catch the suckers.

## Salt and Ammonia

Who hasn't put salt on a slug and watched it "melt?" This amazing phenomenon, recalling a scene from the Wizard of Oz, has induced thousands of people to use salt for slug control. The trouble is that salt doesn't deter slugs, it kills them, something that is better done by other means. It can't be used as a slug barrier because it dissolves in water. Repeated use of salt in the garden can make the soil toxic to plants. For that reason, I don't recommend salt for slug control. Commercial salt-impregnated barriers may not be as useful as the copper ones because slugs may die crossing the barrier and eventually their bodies provide a bridge for other slugs to cross. Ammonia isn't all that helpful either. If you can see the slugs, just pick them up or stomp them rather than using a chemical.

## Slug Baits

I do not generally recommend poison baits, especially as an ongoing method of control. Conventional slug baits are extremely hazardous to dogs. They should be considered only as a last resort. New baits based on iron phosphate (trade names Sluggo,™ Escar-go™ or Worry Free™) do appear to be less hazardous than those based on metaldehyde. They are quite effective when spread on the ground as directed.

If metaldehyde baits are used, they should be put inside covered, tamper-proof bait stations, not broadcast around the lawn or garden, especially if dogs are present. Be aware that use of baits creates a disposal problem for you. What will you do with this material after it has served its purpose?

If you consider slug bait to be fairly innocuous, just look at this label. "*Harmful if swallowed or absorbed through the skin. This pesticide may be fatal to children and dogs or other pets if eaten. Protect dogs from treated areas, since they may be attracted to this product when applied. This product is toxic to birds and other wildlife. Birds feeding on treated areas may be killed.*"

Now, where did I put that flashlight? ■

## For Further Reading

Grossman, J and H Olkowski. "Stopping Slugs and Snails." *Common Sense Pest Control Quarterly* VI (1). 1990.

Antonelli, A and D Mayer. "Slug Control." WSU Cooperative Extension Bulletin EB 0968. Available on the Internet.

Gordon, David. *Field Guide to the Slug*. Sasquatch Books, Seattle, 1994. A humorous viewpoint on these amazing mollusks. Highly recommended.