



Controlling Slugs and Snails in Utah

Larry A. Sagers, Extension Horticulture Specialist Thanksgiving Point
Kerry A. Rood, MS, DVM, Associate Professor and Extension Veterinarian

Summary

Slugs and snails are rated by many gardeners as the worst garden pests. Considering their competition, this is a dubious honor. These pests are not insects but are mollusks that are more closely related to shellfish, such as mussels and clams.

Slugs and snails have similar characteristics except snails have an external, spiral shell. Both glide with a long, flat, muscular organ called a foot. Mucus or slime secreted by the foot aids in locomotion and dries to form a shiny white silvery trail, indicating that the pests are present.

These pests are active at night or on dark, cloudy days. During the day they seek relief from the sun and heat in shade under plants, rocks, wood, or compost piles. They need moisture to thrive but survive in reasonably dry conditions by hiding in protected areas.

These creatures are hermaphrodites, meaning they are not male and female but all are capable of reproducing. They can lay multiple clusters of eggs throughout the growing season. These resemble small, white pearls about 1/8 inch in diameter. Depending on the species, there are 3 to 40 eggs in each cluster.

Fall control of these pests is important because each pest eliminated then eliminates 300 possible offspring for the next year. Although the pests cause less damage to plants in the fall, aggressive control measures prevent large numbers the following spring.



Slugs have no external shells, but are similar to snails.



Snail damage on Hemerocallis (daylily).

Damage

Slugs and snails feed on a wide variety of living plants, on fungi and decaying plant materials. They are particularly damaging to new seedlings and maturing vegetables or fruits that touch the soil.

They chew irregular holes that have smooth edges in leaves. They eat flowers and clip off small plants and plant parts. They damage strawberries, tomatoes, basil, lettuce, beans, cabbage and many other vegetables.

They love certain ornamentals and are very destructive on hostas, daylilies, dahlias, delphiniums and marigolds.



Slug damage to cabbage.

Because other pests can cause damage that resembles their feeding, look for the silvery mucous trails. That confirms that it is slug or snail damage and not earwigs, caterpillars or other chewing insects.



Snail and slime trails are visible signs of their movements.

Control Measures

Effective control measures include cultural practices, plant selection, sanitation, hand picking,

barriers, traps, natural enemies, bait stations and chemical baits. These pests are extremely difficult to control, so focus efforts on reducing their numbers and their damage to valuable plants.

Cultural Practices

Cultural practices that retain soil moisture and promote good plant growth also promotes slug and snail habitat. Organic matter retains soil moisture and keeps the pests protected. It also provides food for them in some cases.

Water management is critical to control these pests. They are always a more serious problem under high moisture conditions. Stretch irrigation intervals as long as possible and avoid watering in protected hiding areas if there are no plants there. Do not over-water when using chemical baits. The water dilutes the bait and makes it ineffective.

Drip irrigation is one way of reducing the available moisture and can also help reduce problems with these pests.

Plant Selection

Selecting resistant plants is another effective method of controlling slugs and snails. While many plants are susceptible, others are not likely to suffer much damage. Resistant plants include begonias, California poppies, fuchsias, geraniums, impatiens, lantana and nasturtiums.

Slugs and snails usually avoid plants with aromatic foliage or very stiff leaves. These include lavender, rosemary and sage. Trees, shrubs and ornamental grasses are not usually bothered much so select resistant plants to avoid problems.

Sanitation

Control programs begin with sanitation or garden clean up. Remove boards, stones and any debris that shelters the pests. Remove weeds or unnecessary foliage so the soil surface dries out rapidly. Dense groundcovers and turf are ideal hiding places. Locate vegetable and flower gardens away from these protective hiding places.

Handpicking

Handpicking is a time consuming but effective method of controlling slugs and snails when done regularly. Daily removal is most effective but after

initially reducing the population, handpicking once a week will keep the numbers down.

Water the garden in the afternoon to encourage them to come out after dark. Then come out and find them and destroy them. Pick them up and seal them in a plastic bag or drop them in a bucket of soapy water.

Do not crush snails and slugs in the garden as the eggs remain in the carcass and will hatch even though the parent is dead. Throwing them over the fence is another futile method as they will find their way back to your garden.

One often promoted method of controlling the pests is to put salt on them. This is not recommended because salt is very damaging to plants and might build up in the soil.

Barriers

Slugs and snails avoid irritating barriers. Numerous barriers are recommended but barriers only work if slugs and snails have other desirable places to feed or hide. Mesh copper screens or sheeting 8 inches wide make effective barriers.

They do not like to slide over the copper so it keeps them out of small, selected areas and prevents damage to valuable plants. Barriers are not lethal and divert the pests to other nearby vegetation.



Copper strips repel slugs and snails.

Traps

Traps are an effective method of controlling the pests. One inch strips of lumber nailed on two sides of a 12"x12" board make an excellent trap. The pests crawl underneath it each day. Start by crushing one of the pests on the bottom of the board. Go out each day, turn the trap over, and destroy the pests.

Bait traps using beer, yeast water or even plain water also attract slugs. Use a pie plate with the edges buried at ground level so the pests crawl in and are drowned. Fill reservoir with beer or yeast water. The slugs and snails are attracted to this, enter the liquid and drown. Remove the carcasses to maintain the appeal of the trap. Snails and slugs are not attracted to alcohol.

Covered, deeper containers are more effective than shallow pans of liquid. Beer or yeast water is less likely to become diluted from rain or irrigation in covered traps. The greater depth prevents pests from escaping. Remove and dispose of the pests each morning. These traps are illustrated under chemical methods.

Inverted melon rinds and other produce scraps are also attractive to these creatures.

Natural Enemies

Natural enemies, including geese, ducks and other birds, seek out and destroy slugs and snails. These predators may damage young seedlings or cause problems with their droppings. Some ground beetles, rove beetles, and certain flies are natural enemies of snails, as are toads and snakes.

The predacious decollate snail, which is a voracious predator of the common garden snail, is often promoted as an effective biological control. It is not recommended for garden situations, since decollate snails may feed on seedlings, small plants, and flowers once other snails are controlled. It is illegal to import exotic snails into Utah without a permit.

Bait Stations

Exposed baits may be attractive to pets, birds or other non-target animals. Instead, try placing bait stations in strategic spots which will be more efficient and effective since slugs and snails are attracted to bait several feet away. This reduces their availability to pets and they last longer than those exposed to rain or sun.

Here are two ideas for making traps or stations.

Small piles of bait covered with a board trap are the simplest bait station. The area remains somewhat moist so slugs and snails tend to congregate under these. Milk cartons with "doorways" may be placed

on their sides. Baits are accessible but protected from rain or irrigation and do not touch the soil.

Use plastic food containers with tight, fitting lids to create other bait stations. They make it more difficult for non-target species to access the bait.



Bait station for slugs and snails made from inverting the top of a pop bottle.

Another idea is to cut a 1/2 - 1" slot on two sides of a carton. The cartons may be painted to blend in with the garden surroundings. Bury the trap so the slots are level with the soil.

Combine these containers with baits to lure the slugs and snails to their final meal. Commercial baits are even more attractive when moistened slightly with apple or orange juice. Check the traps frequently and remove dead pests and replenish the bait as needed.



Bait station made from a discarded container keeps bait dry and away from birds and pets.

Use bait stations anywhere pests are active. The can or carton keeps the baits from contacting the soil or plants. Place the bait stations around the edge of the garden to intercept pests migrating from lawns, groundcover or other favorable habitats. If the pests are already established in the garden, place the stations where they are active.

Chemical Bait

If natural controls are not effective, consider using chemical baits to increase control program

effectiveness. Baits are only effective until they become wet. For best results use baits in small shelters or traps. When using any bait always read and follow all label directions and keep away from pets and children.

Metaldehyde has been the standard bait used for many years and is most effective in dry, warm weather. It does not kill pests directly but it paralyzes them and causes them to froth and lose large amounts of water. During warm weather or on dry days, the pests die of desiccation. It is less effective in rainy weather or in cool areas because the pests recover a few days after eating the bait.

Metaldehyde baits can be used around food plants as long as the edible parts of the plant do not contact the bait. Metaldehyde and Sevin (carbaryl) are sometimes combined as baits. Sevin increases the effectiveness against cutworms, sow bugs, earwigs and other insect pests. Use baits in groundcovers, hedge rows, and other shady, moist areas where slugs and snails hide.

Metaldehyde is the active ingredient in most slug and snail baits. Because there are few other chemical controls, continuous use of this product can make resistant slug and snail populations. Use baits only when necessary and as part of an integrated pest management program that emphasizes other control measures.



Bait containing metaldehyde.

Most metaldehyde baits break down rapidly when exposed to sunlight and high irrigation; however, some paste or bullet formulations (e.g., Deadline) hold up somewhat longer in these conditions.

Iron phosphate (FePO_4) is a newer registered molluscicide that kills slugs and snails. It shows control activity equal to or better than most other slug and snail baits. It is a naturally occurring soil component and is less toxic to pets and desirable species. It sells under many trade names including Sluggo and Escar-Go. They are usually safe around children, pets, birds and fish. Once they consume

the bait, the snails and slugs stop feeding but it can take several days for them to die.

Iron phosphate baits are more effective than metaldehyde baits under moist conditions. After ingesting iron phosphate, the slugs and snails usually hide before they die, so the empty shells or carcasses are usually not visible.



Slug and snail controls



Baits containing iron phosphate are less toxic to pets or children and can be used by organic gardeners.

The table on the following page lists molluscicide (pesticides that control slugs and snails) that are available at local nurseries and some mail order locations. Always read and follow all label directions when using any pesticides.

Preventing Poisoning of Pets when Using Slug and Snail Baits

The active ingredient of most molluscicides (slug and snail bait) is metaldehyde. It can be combined with carbaryl (Sevin) and this increase the toxicity to pets and wildlife.

According to research and the clinical experience of Dr. Kerry Rood, MS, DVM, Utah State University

Extension Veterinarian, the most common poisoned domestic animal are dogs.

When both the compounds are absorbed through the gastrointestinal tract, they work on the central nervous system. Clinical signs include tremors, weakness, excitability, increased heart rate, and increased body temperature. These signs can worsen into convulsions and death.

Treatment

Call a veterinarian immediately if ingestion of snail bait is suspected. Treatment must continue for as long as it takes for the animal to get rid of the metaldehyde. This can take several days and up to a week.

Recovery is likely good when caught early and identified. Note the brand or bring the bait container to the veterinarian to help to determine which ingredients are contained in the bait and what treatments the animal needs.

To prevent pet poisoning, keep them out of the treated area while the bait is still visually present. Store the product in a room where pets do not have access and up, out of reach, in case the room is accessed by pets.

Disclaimer: Note: many other brand names are available locally including Vigro, Spectracide and many others. Mention of trademark names does not constitute a guarantee, warranty, or endorsement of the named products nor does it imply criticism of similar products not named.

Other Useful Websites

Slug and Snail Control Resource Collection

<http://www.ipm.ucdavis.edu/PMG/PESTNOTES/pn7427.html>

<http://www.ext.colostate.edu/pubs/insect/05515.html>

References

1. Flint, M. L. 1998. *Pests of the Garden and Small Farm: A Grower's Guide to Using Less Pesticide*. 2nd ed. Oakland: Univ. Calif. Agric. Nat. Res. Publ. 3332.
2. Cranshaw, 2008. W.S. Slugs Available at <http://www.ext.colostate.edu/pubs/insect/05515.html>

SLUG AND SNAIL CONTROL PRODUCTS

| Manufacturer | Product Name | Active Ingredient | Formulation | Comments |
|---------------|--|--|-------------|-----------------------------|
| Bayer | Snail and Slug Killer Bait | Iron Phosphate 1.00 % | Granules | All Weather |
| Bayer | Natria Snail & Slug Killer Bait | Iron Phosphate 1.00 % | Granules | All Weather |
| Bonide | Slug Magic Pellets | Iron Phosphate 1.00% | Pellet | All Weather |
| Cooke | Pest Granules | Metaldehyde 2% Carbaryl 5% | Granule | Weather Resistant |
| Corry's | Slug and Snail Death | Metaldehyde 3.25% | Meal | Weather Resistant |
| Corry's | Slug & Snail Pellets | Metaldehyde 3.25% | Pellet | All Weather |
| Corry's | Slug & Snail Liquid | Metaldehyde 4% | Liquid | Weather Resistant |
| Deadline | Raintough™ Slug & Snail Killer | Metaldehyde 4% | Mini-pellet | Contains Snare Attractant |
| Deadline | Force II Slug & Snail Killer | Metaldehyde 4% | Paste | Contains Snare Attractant |
| Hi-Yield | Improved Slug Snail Bait | Metaldehyde 3.25% | Pellets | Contains Bitrex |
| Lilly Miller | Snail & Slug Mini Pellets | Metaldehyde 3.25% | Mini-pellet | All Weather |
| Lilly Miller | Slug, Snail & Insect Killer Bait | Metaldehyde 2% Carbaryl 5% | Bait | Weather Resistant |
| Lilly Miller | Go-West Meal | Metaldehyde 2% Carbaryl 5% | Bait | Weather Resistant |
| Lilly Miller | Snail & Slug Spray | Metaldehyde 1.5% | Spray | Use on Foliage |
| Lilly Miller | Slug and Snail Bait | Metaldehyde 3.25% | Bait | Weather Resistant |
| Monterey | Sluggo Plus Insect, Slug & Snail Pellets | Iron Phosphate 0.97% Spinosad 0.07 % | Pellet | All Weather |
| Monterey | Sluggo | Iron Phosphate 1.00% | Granule | Organic Certified |
| Monterey | All Natural Snail & Slug Spray RTU | Plant Oils and Others | Liquid | Certified Organic Repellent |
| Natural Guard | Crawling Insect Control & Slug Killer | Silicon Dioxide, 85 % Diatomaceous Earth | Powder | Desiccant |
| Ortho | Bug-Geta Snail & Slug Killer | Metaldehyde 2% Carbaryl 5% | Granules | Contains Bitrex |
| Ortho | Bug-Geta Snail & Slug Killer | Metaldehyde 3.25% | Pellets | Contains Bitrex |
| Ortho | Elementals Slug & Snail Killer | Iron Phosphate 1.00% | Granules | Certified Organic |

Bitrex makes the bait less palatable to animals

Utah State University is committed to providing an environment free from harassment and other forms of illegal discrimination based on race, color, religion, sex, national origin, age (40 and older), disability, and veteran's status. USU's policy also prohibits discrimination on the basis of sexual orientation in employment and academic related practices and decisions.

Utah State University employees and students cannot, because of race, color, religion, sex, national origin, age, disability, or veteran's status, refuse to hire; discharge; promote; demote; terminate; discriminate in compensation; or discriminate regarding terms, privileges, or conditions of employment, against any person otherwise qualified. Employees and students also cannot discriminate in the classroom, residence halls, or in on/off campus, USU-sponsored events and activities.

This publication is issued in furtherance of Cooperative Extension work, acts of May 8 and June 30, 1914, in cooperation with the U.S. Department of Agriculture, Noelle E. Cockett, Vice President for Extension and Agriculture, Utah State University.