SNAIL AND SLUG MANAGEMENT IN SOUTH FLORIDA

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Snails and slugs are found in great numbers world-wide. Many species inhabit the sea, but others live in fresh water and on land. They are found in virtually all habitats, from the driest deserts to the coldest mountaintops to isolated islands, but are pests mainly in warm, moist climates like ours.

They are invertebrates in the phyllum Mollusca, and the order Gastropoda ("belly-walkers"). They are closely related to clams, oysters, and other shellfish. On their heads they have two pairs of retractable tentacles--the eyes are on the ends of the long pair, while the others are used in smelling. Their mouths have a hard, horn-like organ for rasping. Since they must be moist all the time, they avoid direct sun and dry places.

During the day they hide, emerging to feed at night or on rainy days. They secrete mucus to aid in movement. Where conditions are favorably moist, snails and slugs may become pests. The exotic species are often the worst--the brown garden snail, for instance, was brought into the U.S. as a possible food source, and is now a serious pest in some areas. In Europe and parts of the U.S. snails are not only eaten, but are considered delicacies.

The Shell

The snails share with turtles, armadillos, and pillbugs the ability to withdraw into a protective cover when necessary. Slugs are snails that have lost their shells through evolution. In the fossil record we find very large "paleo-snails" inhabiting trumpet-shaped shells 15 or more feet long.

Presumedly the shell evolved in the ocean for protection; even so, there are many marine slugs managing without them. On land the shell prevents dessication, but in some ways is also a burden because it is heavy and cumbersome. It is made mostly of calcium carbonate (lime), but the outer layer is proteinaceous and horny. Sometimes it is transparent, creating a smooth, glossy surface. If conditions become dry, a snail can pull completely into the shell and secrete a sealant over the opening. Once this hardens, some species can lie dormant for up to four years.

Reproduction

Nearly all land snails are hermaphroditic--with both male and female organs on the same individuals. They usually require a mate for successful breeding, but self fertilization is known to occur. An interesting phenomenon of snail mating is that in some species a spear-shaped "love dart" is released by one or both partners, which lodges in the body of the mate. The pair remain coupled for several hours, unaffected by the love dart.

Slugs and snails usually lay their eggs in the soil, from 20 to over 200 eggs in a group called a clutch, snails laying more than slugs. They vary from soft to hard, and may be round or elongated. They hatch in 14 to 30 days, though some won't hatch for up to six weeks. Juveniles reach sexual maturity in 3-5 months, and may take as long as two years to reach full maturity. The young remain in the nest for several days, then near it for several months. This helps us with management--a lot of young in an area means a nest is nearby. Juveniles and adults past the reproductive stage are the most difficult to control. These factors can be important in management strategies.

Florida Species

In Florida we have about 100 native snail and slug species, and another 40 or so introduced exotics (probably brought in for aquaria and later dumped into bodies of water when no longer wanted. This practice is strongly discouraged, and it's illegal).

Most of the 140 species are less than ½ in long. The largest, found in south Florida, is a tree snail that can reach three inches.

Most Snails are Beneficial

Most land snails are not pests. They feed on algae and fungi, so are probably beneficial. A few species eat slugs, and show promise for slug management.

Worldwide interest was aroused when giant African snails were introduced into south Florida in 1969 by a snail enthusiast who brought them in from Hawaii. At a cost of over $300,000 and including many thousands of man-hours, this exotic was eradicated in 1975.

Most Florida snails are small, seldom noticed, and do not feed on plants. Tree snails are very common and diverse in Florida, and one species, the Manatee snail, is considered beneficial by citrus growers because it clears algae and mold from the leaves. Some tree snails are endangered, and it is illegal to collect or harm them.

Most Slugs are Pests

Most slugs, on the other hand, feed on plants. Florida has nine species, only two of which are natives. One of the most commonly seen is brown with a pale stripe down the back. It feeds on grasses. (If you place a board on the lawn overnight and lift it in the morning, you will probably find several hiding there.) The large slug common in moist habitats, on the other hand, is a harmless fungus-feeder.

At night or early in the morning gardeners often see an inch-long slug which appears to have a saddle on its back. This is a pest that feeds on many plants, causing severe damage to flowers and foliage. They are especially prevalent during summer.

Detection and Management

Because slugs and snails are active at night or during rain, many gardeners never see them. Their damage is easy to identify -- chewed flowers and leaves, the same as caterpillar damage, plus shiny slime trails.

If you think slugs are damaging your plants, before doing anything else, check at night to be sure the problem is caused by slugs. If you find that slugs are the problem, use the least-toxic controls first. The best management practices should include several strategies, with chemical treatments last on the list.

The University of Florida Cooperative Extension Service recommends the following control measures:

1. non-chemical controls, and
2. several baits, dusts, and sprays.

Habitat Reduction will aid in control. Remove anything they may hide under--boards, bags, brush and debris. Some birds, especially ducks, feed on slugs, but who has ducks?

Traps Plus Hand Picking with gloves or pliers can be useful in home gardens. During the night place a board on the ground near the damaged plants. Elevate the board with four stones placed under the corners. Slugs will take shelter under the board in the morning, and can be removed during the daytime. Drop them into a jar with a little rubbing alcohol, then just throw away the jar.

A second type of trap is based on slugs being attracted to beer (the yeasty smell) and decaying fruit. Take a shallow saucer and sink it into the soil so the edge is level with the ground. Place some beer and a few slices of banana in the saucer. They crawl in for a taste, but can't crawl back out--they keep slipping back in. Just empty the saucer every day or so.

Such methods can be effective in home gardens, but less useful to farmers, including nurserymen, since populations in heavily infested areas may number in the thousands per acre.

Baits are popular and effective for controlling slugs that forage on the ground. These pesticides usually contain up to 4% metaldehyde, which acts both on contact and internally. In low doses it cause oversecretion of mucus, resulting in dessication. In higher doses it acts as a nerve poison. Methiocarb (Mesurol) is another active ingredient found in baits. Baits should not be your only means of control, because they can damage the environment, and are a danger to humans and pets.

Contact Sprays. Pesticide sprays containing metaldehyde can be effective, but rapidly degrade in sunlight, making repeated evening applications best. In addition, certain liguid formulations contain tallow (fat) as an attractant. Since fats have a short shelf life, these products should be bought as a need arises, not stockpiled.

Copper Barrier Sprays are on the market, and can be useful as slug deterrents. These have been used successfully by greenhouse growers, spray the legs of the benches, thus keeping the pests from reaching the crop plants.

In Summary, if slugs are a problem, base your management strategies on non-chemical methods, turning to baits only if necessary. Don't expect total control -- look instead for a reduction of damage.

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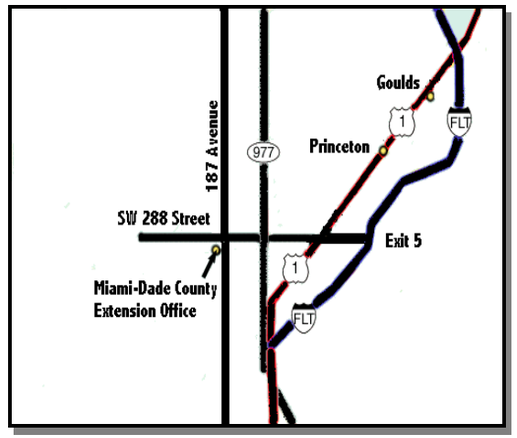

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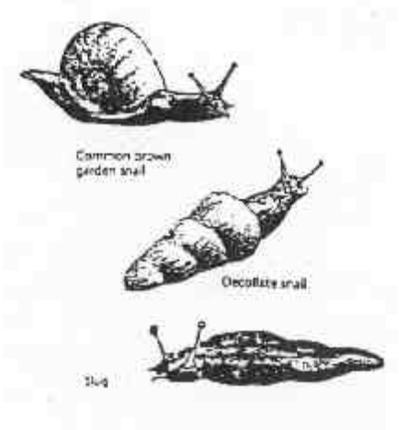

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