

GROWERTALKS

Pest Management

6/29/2016

Slugs and Snails in Greenhouses

Stanton Gill

The Northeast had one of the longest rainy periods from the end of April to the end of May that we've experienced in several decades. We had over eight weeks of rain and cloud cover. This wet, overcast period didn't make many greenhouse growers happy, increasing both botrytis incidence and resulting in an explosion in slug and snail populations. With the heavy rains on most weekends and plant sales weak, the plant material stacked up in many greenhouses, making perfect conditions for slugs and snails to flourish.



Pictured: Close-up of a snail.

Eons of time ago, slugs and snails moved from the oceans to land. These migrating sea creatures adapted to feed on terrestrial plant material with their rasping mouthparts. They thrived in areas with abundant moisture. Snails kept their protective calcium-based shell that shielded them from predators in the oceans. Slugs were a little more adventuresome and their protective cover was reduced to a small mantle plate on their dorsal side. This gave them more mobility than snails that were encumbered with their shell. When slugs are threatened with drying winds or someone with a salt shaker, they pull back and try to squeeze as much of their body as possible under the protective mantle cover.

How to deal with slugs and snails?

When we saw the population of slugs and snails increase in our Maryland greenhouses, we went to the Queen of Slugs—Robin Rosetta or Oregon University Extension.

She told me that slugs were “the gift that keeps giving when you have high moisture abundance.”

She also pointed out that not all slugs are alike; there are species that prefer cooler temperatures and some that prefer warm temperatures. One can successfully treat one species at one time and miss another species not yet emerged from the soil due to temperature/seasonal preferences. It's useful to ID the species, just as with insects, to become more familiar with timing, preferred habitat, etc. Robin suggested that one of the better tools for this purpose is the Terrestrial Mollusca Tool: <http://idtools.org/id/mollusc/index.php>.

Many snail species, once detected, can trigger quarantines in nurseries. A common species inducing this reaction is the brown garden snail—*Cornu aspersum*—originally a European species, now established in many areas of North America.

Finding the slugs and snails may be slightly challenging. Slugs and snails prefer darkness or dim light provided by evenings, or overcast or rainy days. Slugs hang in dark, moist places protected from the desiccating sun. You're going to have to lift flats and pots to find the slugs or snails.

After you ID the species of slug or snail you have in your greenhouse, the next step in reduction starts with sanitation. Most snails and slugs are decomposers. Feeding them leaf debris and cuttings will increase their survival. Slug populations can be reduced by eliminating their breeding and hiding places.

Unfortunately, as greenhouse operations get backed up with plants or in the landscape, people create dense plantings, also creating ideal conditions for slugs and snail populations. Slugs and snails love to hide under greenhouse flats and pots. In the landscape, they prefer dense plantings and large rocks and objects left lying in the garden. (A humorous solution is in a South African vineyard where they released 900 ducks to feed on weeds and slugs and snails: www.businessinsider.com/ducks-south-africa-vineyard-2016-4.)

The goal is to reduce the shelters for slugs. In the greenhouse, growing on the floor is a good way to encourage a slug and snail population. Placing plants on raised benches can help increase air circulation around the flats and pots and make conditions less conducive for slugs and snails.

In the nursery and landscape, as much as possible, try to remove logs, pots and other debris from the area. Encouraging toads in the garden helps reduce slug populations. Also, lightning bug larvae feed on slugs in the gardens.

Slime, excreted by the Mollusca, is indisputable evidence of presence of slugs and snails. Slugs are in the Class called Gastropoda. Their peak-like mouthparts cause rasping damage to foliage. I've often found stringy damage with their feeding, particularly in the interior of a leaf versus the edge.

Good news for biological control

In late March of 2016, I traveled out to Salt Lake City, Utah, for the International IPM meetings. At the meetings, I met with Dr. Parwinder Grewal, Department Head at the University of Tennessee. We worked with Dr. Parwinder back in 2006 and 2007 in trying to find a beneficial nematode called *Phasmarhabditis hermaphrodita* that attacks slugs and snails. *Phasmarhabditis hermaphrodita* has been found in California. This find might open the door to bringing a product with this beneficial nematode from the UK here. This

nematode enters the slug or snail through its breathing opening and feeds on the interior of the slug or snail, then excretes a deadly bacteria that kills its host.

Robin Rosetta commented, “Fortunately, the folks at UC-Riverside have found the *Phasmarhabditis* nematodes and there is work to see a product develop.” (She wasn’t sure at which stage they’re at.) It will be great to have another tool in the tool kit. Rory McDonnell, who found the nematode, has been hired by Oregon State University to be the new “Slug and Snail Czar.” Robin also commented that “along the Oregon Trail are slime trails too numerous to count.”

Suzanne Wainwright-Evans, AKA The Bug Lady, commented that “the nematode for slug control is still not registered for use in the U.S. BASF has applied for the permit, but nothing yet. Also, it was only found in California, so no one knows if it will be labeled in other states.”

How about drying them out?

These wise words came from Oregon: “Desiccation is your friend in the war on slugs.”

Morning irrigations, drip irrigation and fast draining media help to reduce some of the issues with slugs. Being a dry grower has its real benefits in a soggy season when it comes to slug and snail control.

Outdoors in the nursery and landscape, rain isn’t in our control but reducing habitat that stays moist during rains (weeds, loose soil, moss, liverwort, etc.) near plants makes life harder on the slugs.

Traps in the nursery and landscape

For nursery owners with time on their hands or the avid gardeners with lots of energy, place boards or other flat objects on the soil in the garden. Each morning, remove the slugs from beneath the traps and destroy them. Beer or yeast in a can? Many articles mention placing a can in a landscape and placing beer in it to attract slugs. This does attract them and they can drown in the liquid, but the can needs to be emptied regularly. This is probably not practical in most cases. You may have better uses for the beer, especially if you’re suffering heavy losses.

Chemical control

Chemical control is frequently necessary during extended rainy periods. For the best control, apply molluscicide, usually a pesticide mixed with a bait formulation.

Iron phosphate works well. Some growers have combined iron phosphate and a spinosad combo product and a chelated iron product such as Ferroxx, as the slugs tend to seek out hiding sites post-feeding. Evaluation of how effective these treatments are needs to be determined by a cessation in feeding damage. Suzanne commented that “iron phosphate product really needs the EDTA in it to make it work.” Older materials that are still effective include Mesurol and Metaldehyde products mixed with bait products.

If used in the landscape, make sure the baited material is placed under a board or trash can lid to prevent pets from contacting or ingesting the bait. Metaldehyde affects the cells involved in mucus production, leading to eventual dehydration and death. It works best in conditions when snails have been out feeding (warm periods with high humidity), followed by hot, dry weather. It breaks down rapidly in moisture or sunlight. Snails

and slugs might recover if wet conditions reduce their dehydration.

Methiocarb (Mesurol) is another carbamate used to control snails and slugs. It interferes with the nervous system. This molluscicide works better under cool, damp conditions, but is a restricted-use pesticide.

Eventually, the weather will turn to sunny and dry and the snail and slug problem will dissolve, except if you're growing in high, moisture climates such as Southern Florida, West Coast Washington State or Oregon. In that case, move or learn to live with slugs and snails. **GT**

Stanton Gill is an Extension Specialist in IPM for Greenhouses and Nursery at the Central Maryland Research and Education Center for the University of Maryland and Professor of Landscape Technology at Montgomery College. He can be reached at Sgill@umd.edu or (410) 868-9400. <http://Extension.umd.edu/ipm>