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INSECTS

Snails and Slugs

Snails and slugs are destructive pests of landscapes and gardens, feeding on such plants as annuals, perennials, bulbs, ground covers, trees, and shrubs. They can also devour young seedlings overnight. They especially like to feed on the hosta plant.

Snails and slugs are mollusks, related to oysters and clams. Snails transport a protective shell on their backs, basically carrying their homes with them. They are generally brown and from 1 to 1-1/2 inches long. Slugs are referred to as “naked snails” because they have no shell. Gray garden slugs are brownish and from 1-1/2 to 2 inches long, while spotted garden slugs are yellowish with black spots and may be 6 inches long. Both snails and slugs lay clusters of translucent, pearly-shaped eggs under debris or beneath the soil surface. They can lay from 20 to 100 eggs several times per year.

Snails and slugs have chewing mouthparts. They cause plant damage by creating large irregularly shaped holes with tattered edges in plant leaves. They prefer to feed on succulent foliage such as seedlings and herbaceous plants and on fruit that is lying on the ground.

Snails and slugs require moisture to move around, and they secrete a slimy mucus trail, which they use for this purpose. These secretions then dry up into a shiny, noticeable trail. Snails and slugs are active at night when humidity is high from evening rains or irrigation. During the day, they hide under mulch, plant debris, rocks, boards, weeds, and ground covers.

Managing snails and slugs involves a combination of strategies, such as handpicking, habitat modification, barriers, traps, baits, and commercial molluscicides. Monitoring is important to determine the effectiveness of these strategies. This involves going out in the evening with a flashlight and looking for snails and slugs. At this time, you can handpick snails and slugs to reduce their populations. Handpicking is

especially effective during moist weather conditions. Placing snails and slugs in a jar with soapy water kills them. Another possibility is employing children to collect snails and slugs. (Keeps the kids off the streets and is more educational than midnight basketball.)

There are two other methods of killing snails and slugs after they have been collected, but both are quite macabre. One method simply involves stepping on the critters. Snails give off a crunchy sound; slugs do not. The other method involves scattering snails and slugs on a driveway and driving back and forth over them with a truck or car. Although this is not the most environmentally sound method, it seems to be psychologically satisfying to most individuals.

Habitat modification is one of the most effective strategies in reducing snail and slug populations. This method involves eliminating hiding places such as mulches, weeds, old vegetation, and debris. Proper watering practices can also minimize their populations. Avoid watering late in the day as this creates moist conditions conducive to snail and slug activity. Water plants early in the morning. Also, using drip irrigation systems, with water directed toward individual plants, may lead to fewer snails and slugs.

Copper barriers can be placed around the bases of shrubs and trees that are being fed upon. Snails and slugs receive a slight electric shock when their moist bodies contact the copper; this then repels them. However, widespread use of this method may not be feasible. In addition, copper bands have sharp edges that can harm children and pets.

Diatomaceous earth, shredded bark, eggshells, and wood ash have been used as barriers to prevent snails and slugs from feeding on plants. These materials work best during dry periods when snails and slugs are less active; however, their effectiveness is reduced by rainfall, which means they have to be reapplied regularly. They also lose their effectiveness after becoming wet. The use of some of these materials, such as eggshells and wood ash, is discouraged because they may raise the pH of the soil over time. Also, never pour salt on snails and slugs as this may burn plant foliage and roots.

Traps, such as wooden boards or rolled-up newspapers, can be placed where snails and slugs are feeding. Check traps early in the morning once or twice a week, and place snails and slugs in a jar with soapy water to kill them.

Also available are baits that attract snails and slugs into traps where they then drown. One popular type of bait is beer. Although there are better uses for beer, some die-hard practitioners swear that it reduces snail and slug populations. Pour beer into a shallow pan and sink it into the ground with the pan edges sticking up 1/8 to 1/4 inch. Snails and slugs are attracted to the yeasty smell of beer, and they fall into the pan and drown. (Some folks claim that slugs and snails have a massive beer party and, after a while, they become very “sluggish,” with an alcohol content so high that it eventually kills them). Beer does not have an EPA registration number, however, so the use of beer as a pesticide is not technically legal.

Commercial poison baits include metaldehyde (Deadline) and methiocarb (Mesurol). These materials are applied to areas that need protection. Metaldehyde does not kill snails and slugs directly. It works by paralyzing snails and slugs and causing them to secrete excess amounts of mucus. Death generally occurs from water loss and/or exposure to direct sunlight; however, in cool, moist weather, snails and slugs may recover. Metaldehyde is very sensitive to environmental conditions. It breaks down very rapidly in direct sunlight and under moist conditions. The new formulation of Deadline is more resistant to breakdown when exposed to sunlight. Methiocarb is a true nerve poison as it interferes with nerve impulse transmission. It may also be toxic to nontarget organisms, such as earthworms. These materials are less effective during hot, dry times of the year when snails and slugs are less active. Irrigate before applying materials to promote snail and slug activity. Be careful where these baits are applied because dogs can be harmed if they eat them. Make spot applications as opposed to broadscale applications.

Various beetles, such as firefly larvae and ground beetles, feed on snails and slugs. However, these predators may not be present in large enough numbers to keep snail and slug populations below damaging levels. (Raymond Cloyd)

White Grubs

Japanese beetle adults continue to be very numerous in many areas of Illinois. Masked chafer beetles, annual white grub adults, also continue to be present

throughout the state. Because the last few weeks have had little or no rainfall and temperatures in the 90s, nonirrigated turf is starting to go dormant. Its growth has slowed, and it is losing its intense green color. This turf is no longer very attractive to these beetles for egg laying.

This makes it more likely that egg laying will be concentrated in irrigated turf and that damage will start showing up in these areas in mid-August. Application of imidicloprid (Merit, Grubex) or halofenozide (Mach 2) to highly irrigated turf by the end of the third week of July is recommended. Scout areas that have received small amounts to no irrigation during the first half of August to determine if there is a need to treat. Any insecticide applied for white grubs should be watered in with at least 1/2 inch of water to maximize control. (Phil Nixon)

PLANT DISEASES

Spotted Yucca

It's the time of year when we see extensive spotting of yucca leaves. This fungal disease is caused by a species of *Coniothyrium*. It is not a major problem unless your yucca plant has been infected; then it's a major problem. Spots appear as circular to elongated light brown areas with purple edges. The center of each spot is pale brown or tan and has many pinhead-sized black fruiting bodies (pycnidia) arranged in a circular pattern within the spots. These pycnidia contain the spores of the fungus.

Because spores are easily spread with water, avoid watering plants from above. When possible, water the soil around plants and avoid syringing foliage. Rain can be a very efficient vector of this fungus, and there is nothing we can do to stop that spread.

Disease management includes cutting off and removing infected leaves. Fungicides protect the healthy tissue but cannot help infected leaves. The copper fungicides are the only chemical options, and many of these are available for nonwoody ornamental crops. Go to your garden center and find a copper fungicide that is registered for use on yucca or lists a broader host range such as “ornamental plants.” Read labels carefully because many of these products warn of foliar discoloration or possible phytotoxic results on some varieties as a result of spraying. Always read labels carefully to check for crop clearance, disease clearance, rates, and timing, as well as warnings of injury. Spraying now probably won't do much for the

plant. If you have this problem every year, mark your calendar now to spray next spring as plants begin to grow. (Nancy Pataky)

Tree and Shrub Water Injury

Another year of abundant rainfall has set the stage for root problems, often referred to as “wet feet” (feet meaning roots). Symptoms are often the same as those resulting from a lack of water or other root injuries. They include withering of leaves, little terminal growth, yellowing of foliage, and dieback of shoots and roots. Some woody plant species are particularly sensitive to such conditions, including yews (which are injured by as little as 12 hours of saturated soil), rose, white birch (which has seen much injury the last two years), Norway and sugar maples, flowering dogwood, and forsythia, to name only a few. Water tolerance of many plants is discussed in *Diseases of Trees and Shrubs* by Sinclair, Lyon, and Johnson. Most good tree-identification books list such sensitivities as part of the species description.

Interestingly enough, woody plants often show injury from water damage when a hot, dry spell occurs after heavy rains. The roots have been damaged. The water deficit set up by heat, sun, and wind pulls on roots to provide water to the foliage. Even if plants are watered, the injured roots cannot take up water fast enough to meet the demands of such environmental conditions.

Roots need oxygen to grow and to absorb nutrients. In a water-saturated soil, the oxygen content is low and, without oxygen, roots cannot respire or take up water properly. Even though water is abundant, the plant cannot absorb it. For long-term management of such situations, you must improve drainage, lighten the soil with a mixture of organic matter and sand, and avoid too much additional water. Keep in mind that improving drainage includes draining away from the planting site. A well-prepared planting hole with plenty of organic matter still holds water like a bucket if it is in a clay soil that holds water.

If you are not sure that water is the problem, dig up some of the soil around the suspect plant. Typically, if there is too much water, the soil is saturated and standing water may be evident. Roots are black or brown internally instead of the white color of healthy, new roots. Usually, fungicides do not help. They protect healthy plants from root-rot pathogens, but they do not revive dead roots. The water problem must be alleviated for new roots to form.

In some cases, wet soils predispose plants to root

rots. For instance, *Pythium* and *Phytophthora* are common water-mold fungi that invade stressed plants in wet soils and cause root rot. If the water problem has been eliminated and root rot is still present, a root-rot fungus might be involved as well. This is particularly true if not all plants in a bed are affected. In such cases, consult a lab or specialist who is trained to identify the root-rot fungi. Root rots cause roots to be discolored brown, black, or pink. In the early stages, root tips are discolored or there are lesions on the roots. In more advanced stages, entire roots rot and, at that point, plant decline is very noticeable. Wash roots carefully to remove soil without removing rotted root cortex tissues. Root rots are more evident without soil coverings. Soil fungicide drenches are available to stop the progress of root rots in herbaceous plants and small shrubs, but there is nothing that can be used on mature trees.

Information on root rots is available in *Reports on Plant Disease (RPD)* No. 615, Damping-off and Root Rot of House Plants and Garden Flowers; No. 602, Armillaria Root Rot of Trees and Shrubs; and No. 664, Phytophthora Root Rot and Dieback of Rhododendrons and Azaleas. (Nancy Pataky)

Slime Molds and Fungi on Mulches

Slime molds are beginning to invade gardens. These growths suddenly appear after heavy rains or after plants have been watered in warm, muggy weather. Although these organisms cause much concern, they do not take nutrients from the plant material. They feed on decaying organic matter, fungi, and bacteria in the soil and the turfgrass that layer. During warm, moist weather, the slimy, amoeba-like stage of the mold appears on low-lying objects, appearing as watery white, gray, cream to light yellow, violet, blue, green, or purple-brown greasy masses as large as 1 to 2 feet in diameter. This stage soon develops into colorful, crusty fruiting bodies filled with masses of dusty spores. Slime molds are primitive organisms that flow—too slowly to watch—over low-lying objects such as mulches, sidewalks, driveways, or vegetation such as turfgrasses, strawberries, flowers, ground covers, weeds, and the bases of woody plants. They always concern gardeners.

Most gardeners want to know how to kill them. Chemicals do not provide control. Instead, for abundant molds, break up the unsightly spore masses by vigorous raking, brushing, or hosing them down with a stream of water. Mowing the lawn usually removes the spore masses in turfgrasses. Slime molds disap-

pear with hot, dry weather. For more information about slime molds in turf, read *RPD* No. 401.

The artillery fungus, also known as the shotgun fungus, is another fungus that thrives in mulch. It has become a nuisance as the use of mulch in planting beds near homes has become popular. Again, in wet conditions, this fungus grows in the mulch. The fungus is white and forms tiny, 1/4-inch, puffball-like structures that contain spore masses. You probably won't notice the puffballs. As these structures dry, the spore mass is "shot" out of the fungal vessel as much as 10 to 20 feet away. These masses have a very sticky surface and stand out as pinhead-sized black spots on the sides of homes. It is nearly impossible to remove the spore masses from a house without removing the paint. A colleague in the Ohio Cooperative Extension Service recommends using only bark-based mulch, especially true cypress bark, and avoiding wood-based mulches made from wood chips and ground-up wood pallets. In either case, mulch should be raked or stirred to help it dry out so that it is less desirable to the fungus. Natural mulches are good for garden plants and fungi alike. (Nancy Pataky)

Wilt Disease Conference

The American Phytopathological Society (APS) is sponsoring a national conference on wilt diseases of shade trees at the RiverCentre in St. Paul, Minnesota, August 25-28. The conference will cover the basics of each disease, including current research and manage-

ment practices. Main topics are Dutch elm disease, oak wilt, Verticillium wilt, bacterial scorch, yellows (phytoplasmal) disease, pine wilt, other wilts, and wilt diagnostics. A full-day field tour, included in the \$295 registration fee, will follow the presentations. After July 23, the registration fee will go up to \$345.

For more information, point your web browser to www.scisoc.org/opae/shortcourse/stwd/top.htm, or contact Cynthia Ash, director of scientific services at APS, 3340 Pilot Knob Road, St. Paul, MN 55121-2097. Ash's telephone number is (651) 454-7250; her fax number is (651) 454-0766; and her e-mail address is cash@scisoc.org. (Bruce Paulsrud)

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