

Plant Wise

IOWA STATE UNIVERSITY
University Extension

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Slug it out with Slugs in Your Garden



Slugs are nocturnal and feed at night when we can't see them.

By Linda Naeve
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Garden crops have a lot of enemies, but few are as non-selective and destructive as slugs. Unlike plant diseases and many insect pests, slugs are not host-specific and have a very diverse diet from asters to zinnias, with hostas being one of their favorites. As much as we hate them for the damage they do to our garden plants, we need to recognize slugs as an important part of the ecosystems because many species are decomposers and feed on fallen leaves, dead insects and dead worms. They are also food for snakes, toads, turtles and birds.

Slugs are easy to identify, but not always easy to find. They are basically snails without their protective shells. Depending on the species, slugs range in size from less than an inch to 10 inches long, such as the banana slug, native to the West Coast. One of the most common slug species found in Iowa gardens is the gray garden slug. They are typically less than an inch long and their plump, slimy bodies range in color from light gray to brownish black.

Most slug species overwinter as adults. In the spring or early summer, eggs are laid in moist areas near the soil surface, such as under dead leaves, rocks, mulch or flower pots. Baby slugs hatch when there is plenty of moisture present and begin feeding immediately. They resemble adults but are smaller and lighter gray in color.

Slugs are nocturnal and feed at night when we can't see them. They prefer cool, dark, moist hiding places during the day. Cool, wet spring conditions are ideal for slugs, resulting in early, serious damage to plants. They destroy young seedlings and chew holes in hosta foliage, leaving them unattractive the entire season.

Unfortunately, they don't die in the middle of the summer when conditions get hot and dry. Slugs bury themselves in the soil or find a moist, well-protected spot where they remain in a state of suspended animation. They secrete a mucous-like cocoon around themselves and wait it out until there is enough rain or moisture to dissolve the mucous and soak the water into their bodies. They can lose as much as 50 percent of their weight during a dry spell and then regain it all after only two hours of rehydrating. Slug damage is often as serious in late summer as it is in the spring due to renewed soil moisture levels and higher populations.

Slugs secrete a slimy mucous trail as they move across plants and smooth objects. This prevents them from drying out and provides a protective track on which they glide across sharp surfaces. It can be seen as a silvery trail on leaves.

Several integrated pest management strategies can be used to control slugs.

Cultural Control. One tactic is to reduce the favorable habitats where slugs live and reproduce. Since they require moist soil in which to lay their eggs and cool, moist, sheltered sites in order to hide during the day, open up the garden to allow more sun and air circulation so that the soil isn't damp for extended periods of time. Keep mulch layers shallow; a uniform, one-inch layer will prevent rapid drying around the plants and will not retain excessive soil moisture. Since slugs also feed on decaying plant material, do not mulch with fresh grass clippings where slugs are a problem, and rake leaves from the garden beds in the fall.

Mechanical Control. Traps are a mechanical form of slug control. Trap boards or moist newspaper or carpet samples, about a square foot in size, can be placed around plants where slugs have been feeding. After a couple of days, check the underside of the traps and remove and destroy the slugs that have gathered there to hide. Inverted melon rinds set on the soil will also attract slugs but may make your garden look like a waste site or compost pile.

Slugs are also attracted to beer, so it is often used to trap slugs. A beer trap consists of a shallow container, such as a yogurt cup, buried to within a half inch of the rim and filled with beer. Slugs will find it irresistible, crawl in and drown. You may want to put a loose cover over the beer trap to shade it and prevent rain from diluting it.

Some gardeners get great satisfaction from stalking slugs early in the morning, sprinkling salt on unsuspecting slugs and then watching them shrivel up as the salt removes water from their bodies. This rather sadistic method is neither an efficient nor effective control method.

Chemical control. Since slugs are not insects, they are not controlled with insecticides, but rather with molluscicides applied as bait. Apply slug baits in the spring or fall when slugs are active. It is a good idea to irrigate before applying a bait to promote slug activity and apply it in the late afternoon or evening. Many baits contain metaldehyde. Although it is effective, it has its faults. It is rapidly inactivated by sunlight and water so has to be reapplied frequently. It cannot be used in vegetable gardens and can be toxic to pets that ingest it. Alternative baits are available that contain iron phosphate (ferric phosphate) as the active ingredient. Trade names include Sluggo and Escar-Go! Schultz Slug and Snail Bait and others. Although some experts consider iron phosphate baits to be slightly less effective than baits containing metaldehyde, they do have several advantages. They can be used more effectively under high moisture conditions because iron phosphate doesn't readily dissolve in water, they can be used around edible crops and they do not pose a threat to pets, birds and other non-target species.

Harvesting Sweet Corn

Adapted from an article
by Charlie Baier
Howard County ISU Extension



Harvesting sweet corn at the proper stage of maturity is essential to ensure a high-quality crop.

Sweet corn should be harvested at the milk stage. At this stage, the silks are brown and dry at the ear tip. When punctured with a thumbnail, the soft kernels produce a

milky juice. Over mature sweet corn is tough and doughy. An immature ear is not completely filled to the tip, and the kernels produce a clear, watery liquid when punctured.

The harvest date can be estimated by noting the date of silk emergence. The number of days from silk emergence to harvest is approximately 18-23 days. Prime maturity, however, may be reached in 15 days or less if day and night temperatures are exceptionally warm. Most hybrid sweet corn varieties produce two ears per plant. The upper ear usually matures 1 or 2 days before the lower ear.

Sweet corn remains in the milk stage for a short time. The weather determines the length of this stage. Sweet corn remains in prime condition for only 1 or 2 days during hot (85° F and above) weather. As the sweet corn approaches maturity, check it frequently during summer weather to ensure high quality sweet corn.

Harvest sweet corn by grasping the ear at its base and then twisting downward. Use or refrigerate sweet corn immediately because its quality rapidly declines after harvest. If not refrigerated, standard sweet corn (su) varieties may lose 50% of their sugar content within 12 hours of harvest. Optimum storage conditions for sweet corn are a temperature of 32° F and a relative humidity of 95%. The maximum storage life for sweet corn is 4-8 days. Sugar-enhanced (se) and supersweet (sh2) varieties are slower to convert sugar to starch and may be harvested over a longer period. They also have a longer storage life.

Let's Get Canning!

By Joann O'Leary
ISU Master Gardener Intern
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To can means to heat process food in a glass jar with a lid in place. Processing kills microorganisms, bacteria, yeasts, and molds that contaminate food and cause food spoilage and/or food borne illness. Processing can be done in a water bath canner or a pressure canner, depending on the food's acidity.

Acid foods (fruits and acidified tomatoes) are safely processed in a water bath canner. Microorganisms in or on acid foods are easily killed at 212°F (the temperature of boiling water).

Low-acid foods (meat, vegetables and tomatoes that are not acidified) must be processed in a pressure canner. The bacteria that produce the botulism toxin cannot grow in acid foods, but can grow in low-acid foods. The bacteria have spores that survive hours of boiling water temperature. However, these spores are destroyed within a reasonable time at 240°F (the

temperature reached inside a pressure canner at 10 pounds pressure).

If low-acid food is processed in a water bath canner, botulinum spores on the food will survive. In the absence of air (a condition found inside a jar after processing) the spores become living bacteria. As the bacteria grow, they form toxin. Eating even a drop of this potent toxin can be fatal to humans and animals.

To make sure your home canned foods are safe, carefully follow instructions found in the latest version of books such as So Easy to Preserve or The Ball Blue Book. Process acid food in a water bath canner, and low-acid foods in a pressure canner. Never process any foods in a conventional oven, microwave oven, steamer or dishwasher, as these methods do not kill microorganisms that cause food spoilage and/or food borne illness.

Recommended Canning Equipment

Before each canning season, assemble and evaluate all canning equipment:

Canning Jars: Use only standard canning jars (also called Mason jars) with the manufacturer's name printed on the side. These jars can withstand the temperature extremes of canning. Never use commercial jars such as mayonnaise and pickle jars for home canning. These jars are not very resistant to temperature extremes, and they break easily. Also, lids may not seal on these jars because their sealing edge may be rounded rather than flat. Canning jars must be in perfect condition. Check all jars, new and used, for hairline cracks, chips or nicks on the sealing edge. Such defects can result in breakage or failure to seal.

Canning Lids: The only safe way to seal a canning jar is with a two piece canning lid. The set consists of a flat metal lid and a screw band. The lid has a sealing compound around the edge. The screw band holds the lid in place during processing. A vacuum seal forms during cooling, after the jar is removed from the canner. Screw bands that are in good condition may be reused, but always use new lids. Do not use screw bands that are bent or badly rusted.

Water Bath Canner: Use a water bath canner to process acid foods. A water bath canner is a large deep kettle that has a cover and a rack to hold jars. You can also use a big, covered pot that is deep enough to allow water to extend 1 to 2 inches over the tops of the jars, and with enough room for the water to boil briskly. Also add a rack to keep the jars off the bottom of the pot.

Pressure Canner: Use a pressure canner to process low acid foods. A pressure canner is a deep, heavy kettle that has a rack on the bottom for jars to stand on, a tight-fitting lid with a gasket, and a pressure gauge. The gasket keeps steam from leaking out around the cover. If the gasket is worn, stretched, or hardened,

replace it. There are two types of pressure measuring gauges-dial gauge and weighted gauge.

A **dial gauge** has a needle that moves along a numbered scale to indicate the pressure inside the canner. Each year check the dial gauge, old or new, for accuracy. (Call your county Extension office to find out where testing can be done.)

A **weighted gauge** fits over the air vent tube. It permits pressure in the canner to rise to the desired point and then releases excess steam by "jiggling" or "rocking" to keep the pressure from going higher. Weighted gauges do not need testing for accuracy, but they do need to be kept clean. Check the vent tube to be sure it hasn't been bent or damaged during use.

Getting Canning Equipment Ready

Wash canning jars in a dishwasher or in hot soapy water, and rinse well. Keep jars hot by leaving them in the dishwasher or hot water until you are ready to fill them. Jars do not need to be sterilized, as this will be accomplished during processing. Wash and rinse canning lids and screw bands. The flat lids will need to be in boiling water for several minutes to soften the sealing compound.

Preparing Fruits and Vegetables for Processing

Select high quality, unblemished fruits and vegetables for canning. Canning will not improve quality. Can them as soon as possible after harvesting. Thoroughly wash fruits and vegetables before canning even if they will be peeled. Wash by scrubbing with a vegetable brush and rinsing thoroughly. Or, if more practical, soak in water for several minutes. Peel, pit, and/or slice only as much food as you can process at one time. Some fruits and vegetables (apples, apricots, nectarines, peaches, pears and potatoes) darken when cut. To prevent darkening, keep raw, prepared produce in a solution of cold water with a ¼ cup of lemon juice.

Packing Instructions

The two methods of packing food into canning jars are raw pack and hot pack. **Raw pack** is packing raw, prepared food into clean, hot jars and then adding hot liquid. Fruits and most vegetables need to be packed tightly because they will shrink during processing; however, raw corn, lima beans, and peas should be packed loosely, as they will expand. For **hot pack**, heat prepared food to boiling, or partially cook it. It should be packed loosely, boiling hot, into clean, hot jars. For either packing method, pack acid foods to within ½ -inch of the top of the jar. Pack low-acid foods to within 1 inch of the top of the jar. After food is packed into jars, wipe the jar rims clean. I like to use a cloth soaked in a vinegar water solution. Put on the lid with the sealing compound next to the jar rim. Screw the band down firmly so that it is hand-tight only. There must be enough "give" for air to escape from the jars during processing. Process food promptly after packing it into jars and adjusting lids.

Processing in a Water-Bath Canner

Use a water bath canner to process acidified tomatoes, and all other fruits. Fill the canner half full with water; then cover and heat. For raw-packed food, have the water hot but not boiling. For hot-packed food, have the water boiling. Using a jar lifter, place jars filled with food on the rack in the canner. If necessary, add boiling water to bring water 1 to 2 inches over the tops of the jars. (Do not pour boiling water directly on jars.) Cover.

When water comes to a rolling boil, start counting the processing time. Keep water at a boil for the entire processing time. Add more boiling water as needed to keep water 1 to 2 inches above jars.

As soon as the processing time is up, use a jar lifter to remove jars from canner. If liquid boiled out of the jars during processing, do not open them to add more. Do not retighten screw bands, even if they are noticeably loose. Place hot jars upright to cool on a towel or rack. Leave space between them so air can circulate. Protect the jars from drafts by covering with a kitchen towel.

Processing in a Pressure Canner

Pour 2 or 3 inches of water in the bottom of the canner and heat to boiling. Set hot jars on the rack in the canner. If you have two layers of jars in the canner, use a rack between them and stagger the second layer. Fasten the canner cover securely so steam cannot escape except through the vent.

Once steam pours steadily from vent, let it escape for 10 minutes to drive all air from the canner. During processing, the canner must be filled with steam, not air, since it is steam that reaches the desired temperature of 240°F. If the canner has a weighted gauge, start counting the processing time when it jiggles or rocks.

The target pressure is 11 pounds pressure. Adjust heat so that gauge jiggles 2 or 3 times a minute or maintains a slow, steady rocking motion. If the canner has a dial gauge, bring pressure up quickly to 8 pounds, and then adjust the heat to maintain 11 pounds pressure. Start counting the processing times when the gauge registers 11 pounds pressure.

When the processing time is up, turn off the burner. Let the pressure in the canner drop to zero by itself. This may take 45 to 90 minutes depending on your canner. If the vent is opened before the pressure drops to zero or if the cooling is rushed by running cold water over the canner, liquid will be lost from the jars.

When the pressure has dropped to zero, open the vent or remove the weighted gauge. Remove canner cover carefully, tilting it away from your face so that the rising steam cannot burn your face or hands.

Remove jars from canner in the same manner as described for using a water bath canner.

Check Seals

Vacuum seals form as the jars cool. When jars are cool (24 hours after processing), check the seals. If the lid is depressed or concave and will not move when pressed, it is sealed. If sealed, carefully remove screw bands and clean the jars. If a band sticks, loosen it by covering it for

a moment with a hot, damp cloth. Bands left on jars during storage may rust, making later removal difficult. If you find an unsealed jar, do one of the following:

1. Refrigerate the food and use it within 2 to 3 days.
2. Freeze the food. (Drain vegetables before freezing.)
3. Reprocess the food. If more than 24 hours have gone by since processing, throw out the food. It might be unsafe to eat.

Label and Store Sealed Jars

Label sealed jars with the processing date. Store them in a cool, dry, dark place. Properly stored canned foods will retain their quality for at least a year. Never store canned foods near a heat source or in direct sunlight because they lose quality.

Signs of Spoilage

Before using, always check canned foods for signs of spoilage-- leakage, bulging lids, or loss of seal. Bulging or loss of seal indicates gas formation inside the jar. When opening the jar, look for spurting liquid. After opening, check for gassiness, cloudy liquid, bad odor, or mold. Never taste food that shows any sign of spoilage. Throw it out; it might be unsafe to eat. Cloudy liquid may be a sign of spoilage or be due to minerals in hard water or starch from overripe vegetables. If liquid is cloudy, check for other signs of spoilage. If there are not other signs of spoilage, boil the food. Do not eat any food that foams or has a disagreeable odor during heating. Always boil home-canned, low-acid foods for 10 minutes before tasting. Do not use this method to make improperly processed food "safe." If enough bacteria is present (due to improper process), it is not certain that ten minutes will destroy the toxin.

Canning is a great way to enjoy the bounty of your garden, farmer's market or local source all year long!

Contact the Extension office (712/624-8616) for more information or to purchase the book "So Easy to Preserve", or to view the DVD set "So Easy to Preserve".

Emerald Ash Borer Update: Still None Known in Iowa

By Mark Shour and Donald Lewis

Department of Entomology

Iowa State University

Attention to and concern about the emerald ash borer remains high with numerous calls, email messages and samples received this month. Here are the answers to the most common recent concerns or questions.

- There are no known infestations of emerald ash borer (EAB) in Iowa. A large number of specialists and regulatory persons have descended on the site of a reported larva and have found NO evidence that EAB is present.
- We hope that education and common sense will circumvent intense insecticide sales pressure, misinformation and fraud to prevent unnecessary treatment and expense.
- It is not prudent to treat ash trees with insecticide to prevent EAB until there is a confirmed infestation within 15 miles of your tree.
- It is a waste of time, money and insecticide to treat ash trees at this time of year (July). No treatment is guaranteed to always be effective, but treatments are doomed to fail if applied at the wrong time of year (outside the treatment window of mid-April to mid-May).
- Treatments will not be effective on trees that are not healthy and vigorously growing (full, thick canopy, good shoot elongation and no loose or injured bark).
- Now is the time to be evaluating tree health and diversity in your landscape in order to be making tree replacement decisions. A new guide on **suggested tree replacements** for ash is available from Dr. Jeff Iles, ISU Extension Horticulturist.
- A new ISU Extension publication is available on how to use insecticides to protect high-value, ash trees from (EAB) damage. **Pamphlet PM 2084, Emerald Ash Borer Management Options**, offers recommendations for homeowners and for commercial pesticide applicators on products that can be used to protect healthy ash trees from attack by EAB.
- A publication on **Options for Protecting Ash Trees from Emerald Ash Borer** is available from the North Central IPM Center

A Perfect summer day is when the sun is shining, the breeze is blowing, the birds are singing, and the lawn mower is broken. ~James Dent



Upcoming Horticulture Events of Interest:

Glenwood Lake Park Farmers Market

Wednesdays 4:00pm – 7:30pm

Vendors offering locally-grown garden and orchard produce, baked goods, eggs, & crafts.

ISU Mills County Master Gardeners will again have a question/answer table to help you solve your garden problems.

Silver City Farmers Market

Saturdays 8:00am – 11:30am

ISU Mills County Master Gardeners on hand to answer all your gardening questions!

Mills County Fair

Saturday, July 18

Open Class Floriculture & Agriculture

Entries received at the Mills County Fairgrounds
8:00AM – 12:00 Noon

Enter your Flowers and Vegetables!

Open Class fair books are available at area banks, libraries and the Extension Office. Call 624-8616 for more information.

First Annual All Horticulture Field Day

Thursday, August 6, 9:00am-12:30pm

On-site registration begins at 8:00am

Iowa State University Horticulture Research Station

This opportunity will showcase research projects being conducted at the station in all areas of horticulture. Special areas of interest will highlight vegetable production, apple, grape, and small fruit production and wine tasting, lawn and turf management, urban tree development, landscape design and installation, organic horticulture, and farm pond and surface water management.

www.hort.iastate.edu/news/all-iowa-field-day-brochure.pdf

Cost: \$20 per person includes lunch by the Iowa Pork Producers

Ask the ISU Extension Gardening Expert

What is a rain garden?

A rain garden is a specially constructed shallow depression in the landscape that collects water from the roof of a house or other building and allows it to slowly filter into the soil. Excellent plant materials for rain

JULY GARDENING TO DO LIST



gardens include deep-rooted native grasses, wildflowers and sedges. Rain gardens provide several environmental benefits. A rain garden reduces the amount of water flowing into storm sewers, thereby reducing the risk of flooding. Rain gardens also reduce the amount of pollutants (lawn fertilizers and pesticides, chemicals from roofing materials, etc.) flowing into nearby streams and rivers via stormwater runoff. They're also attractive additions to the landscape.

What are the orange-colored growths on the leaves of my ash tree? Is control necessary?

Ash rust is probably responsible for the orange growths on your ash tree. Ash rust is caused by the fungus *Puccinia sparganioides*. The fungus produces conspicuous swellings on leaves, petioles, and twigs. Infected leaves, petioles, and twigs may become twisted and distorted. Infected areas eventually produce masses of yellow to orange, powdery spores.

Puccinia sparganioides requires two different plant hosts to complete its life cycle. Part of its life cycle is spent on ash and the remainder on cordgrass (*Spartina* spp.). The spores produced on ash are carried by the wind to cordgrass. The fungus then infects the cordgrass. In spring, spores from infected grasses are blown by the wind to nearby ash trees. Warm, wet weather in spring favors ash infections.

Ash rust does not seriously harm healthy, well established trees. Control measures are usually not necessary.

How can I prevent the squash vine borer from killing my pumpkins, gourds, and squash?

(from Fine Gardening August 2009)

The only thing standing between you and a great pumpkin that would make even Linus envious is the dreaded squash borer. These little bugs dig holes into new, tender stems of any type of squash vine and proceed to eat away at it from the inside out. A dead plant is usually the end result. Plants must be protected from the first day they are planted outside. A small paper or plastic cup surrounding the base of a new plant like a collar is a good mode of protection. Wrapping a 3-inch-long piece of panty hose around the main stem at planting time can also thwart the squash borer. As the main stem grows, the panty hose allows the plant to expand without causing injury.

Extension programs are available to all without regard to race, color, national origin, religion, sex, or disability

- Help control mosquitoes by eliminating all sources of stagnant water in the landscape.
- Some pesticides have a waiting period of several days between the time of last spray and harvest. Read and follow directions on all pesticide labels before applying them to vegetable crops. Wash all produce thoroughly before use.
- Water tomatoes consistently to avoid problems with splitting and blossom-end rot.
- Deadhead annuals to keep them blooming.
- Raise the mower blade to prevent injury to the grass during summer heat.
- Exhibit your fresh flowers and garden produce at the Mills County Fair. Open Class Exhibitor Fair books are available at the Extension office, local banks and libraries, or on-line at www.extension.iastate.edu/mills/
- Check the soil moisture of container-grown flowers and vegetables. With rising temperatures, some containers may require watering at least twice a day.

Resources for Horticulture information

ISU's Hortline at (515) 294-3108

(Monday-Friday, 10 a.m.-noon, 1-4:30 p.m)

ISU/Mills County Extension: 712-624-8616

www.extension.iastate.edu/mills/yardgarden.htm

Iowa State University Publications

PM 1942 Annuals (color book) \$5.00

PM 1266 Tomato Diseases and Disorders (\$3.75)
Full Color 12p.

PM 534 Planting & Harvesting Times for Garden
Vegetables (Free)

IAN 0302 Iowa's Summer & Fall Wildflowers (\$1.00)

SUL 2 Understanding Decline in Trees (free)

Horticulture Publications on-line

<https://www.extension.iastate.edu/store/ListCategories>