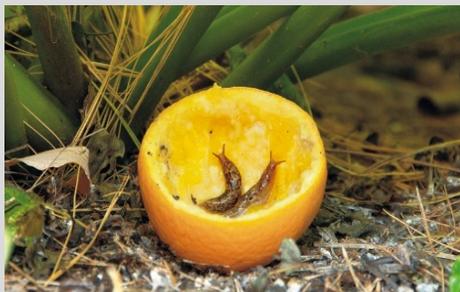


The information offered here is to help gardeners grow vegetables successfully. It focuses on common questions asked as well as conditions, pests, and diseases that occur in St. Tammany Parish home gardens. Every attempt has been made to ensure the accuracy of the information, but references should always be checked, and LSU AgCenter personnel contacted if there are questions.

# Vegetable Diseases & Pests in the Home Garden

*By Jerry Ballanco*



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# Vegetable Diseases in the Home Garden

## Introduction

Try not to be discouraged if one of your plants runs into trouble with one of these problems. We live in a climate that invites all sorts of things to grow rapidly and thrive. That is true for things we want to grow and some we wish were not growing. Good garden practices such as proper location and sunlight for your garden, using drip irrigation, selection of resistant varieties (if appropriate), proper spacing between plants, rapid removal of plant detritus add to the health of the garden. Make daily observation to enjoy but also look for signs of trouble. In particularly cloudy or rainy seasons, a regular schedule of fungicides may be appropriate.

What follows is not an exhaustive list of diseases or therapies of those diseases. It tries to cover the most common diseases that we see in St. Tammany Parish and available, currently approved, relatively easy to use prophylactic measures or therapeutic options. Other techniques and remedies may be available. Always follow the label paying special attention to safety precautions, application intervals and frequency, and PHI, the safe interval from application to harvest.

## Fungicides: Basic Information

Most fungal and many bacterial diseases are caused by organisms that reside in the garden soil. They may arrive on infected soil, seeds, or plants. Once they establish themselves in the garden, they will continue to be a problem. Good garden hygiene is an un-fun task that pays great dividends in minimizing those problems.

Fungicides do not allow healing to occur but help prevent further and future damage. It is best to start fungicide treatment at the first sign of any fungal disease and continue a 7- to 10-day spray schedule. In prolonged rainy periods, fungicide every 5 days may be necessary. Not all fungicides are approved for all crops, some combinations of fungicides may be harmful. Read the label carefully. Always pay attention to the PHI (pre harvest interval) before spraying. If possible, alternate fungicides to discourage resistant strains. Some gardeners will anticipate trouble from weather patterns or other concern and begin a spray pattern before signs of disease are present.

Though it seems strange, fungicides are best applied before rain. If a drying period of four hours is available, that will give good protection.

After a plant is infected, spread can be very rapid. Both sides of the leaves must be sprayed for maximum benefit. Severely infected leaves should be removed. Try not to handle the plants when the leaves are wet and wash your hands after handling infected tissue to minimize spread.

<https://plantpathology.ca.uky.edu/files/ppfs-gen-07.pdf>

## Damping Off

This very destructive disease of seedlings can be caused by several different fungi and molds. It can attack any seedling. Newly emerged or very young seedlings are most susceptible. It especially plagues seedlings grown in germination medium that contains garden soil, compost, or one to which fast acting nitrogen is added.

The accompanying photo is descriptive. The first warning may be that the seedling no longer stands upright. Note the tapering of the healthy stalk as it approaches the soil. This seedling will not recover and will shortly die. The disease may rapidly spread through a seed tray or a planted row. Other manifestations may be discolored or "wet" cotyledons and nearly absent roots.

There are several organisms that are responsible. They attack newly germinated seeds or newly transplanted small seedlings especially when the soil is cool. Long periods of overcast or wet weather are also potential trouble but anything that causes slow growth of the seedling sets the stage. It is counterintuitive, but too much nitrogen too early may make seedlings more susceptible. Keeping the seedling soil too wet also increases the risk of damping off. Be sure the soil is warm enough to permit rapid germination and initial growth for direct seeded vegetables and flowers (see more at <http://sacmg.ucanr.edu/files/164220.pdf>).

For seeds started in trays in preparation for transplant, use only clean germination medium in new or sterilized containers. Do not add garden soil or compost to germination medium. Make sure that the environmental temperature and light are appropriate for rapid growth. A heat mat placed under the seed starting tray may be appropriate. Keep seedlings moist but not drenched. Do not use fertilizer until true leaves start to grow then use at diluted strength until the seedling is put into its garden site. That is usually when the roots start to exit the seed starting container.

Damping off disease may destroy the entire planting of seeds started in trays. These suggestions may not apply in hydroponic gardening.

A way of sterilizing containers is to make a bleach solution of 9 parts water and 1-part bleach. Soak containers and tools in this solution for 20 minutes. Tools should be treated in the same manner or a dedicated set available. Bleach can be tough on tools so be sure to rinse well after bleach treatment. Wash your hands free of garden soil when handling the trays.

<https://extension.umn.edu/solve-problem/how-prevent-seedling-damping#:~:text=Damping%20off%20is%20a%20disease%20of%20seedlings&>



*Damping off. Photo by Jerry Ballanco.*

## Powdery Mildew

This photo is of a mustard plant but powdery mildew looks the same on any plant. The disease favors cucurbits but may occur on almost any vegetable plant, especially those with broad leaves. Patches or islands of a white powdery looking substance appear on the leaf. If you see this, act quickly.

Powdery mildew is most seen when there is little rain, cool to warm days, and high humidity. The leaves look like someone sprinkled baby powder on them. The top of the leaf may be dusted or splotchy appearing. If not corrected, it quickly spreads and may cause considerable foliar loss. The leaves progress from white covered to brown and shriveled. Generally, the fruit is not directly impacted but sunscald may cause damage and foliar loss will reduce plant vigor.

Powdery mildew especially bothers plants grown in shade vs full sunlight and those with poor air circulation. (Poor air circulation may be caused by thick foliage or not enough distance between plants). It can be easily spread by wind or tools. Leaves that are covered with mildew or are already turning brown should be removed after spraying the with fungicide.

Resistant varieties are available and should be considered if you are continually bothered with powdery mildew. Fungicides, Neem oil, and bicarbonates are usually effective in control. (See references below for use).

<https://extension.colostate.edu/topic-areas/yard-garden/powdery-mildews-2-902/>

<https://hgic.clemson.edu/factsheet/cabbage-broccoli-other-cole-crop-diseases/>



*Powdery mildew on mustard plant. Photo by Jerry Ballanco.*

## Downy Mildew

Downy mildew, caused by water mold, can impact many vegetables and, untended, is a serious threat to the general health of the plant. It occurs in wet weather or plants with overhead watering. It begins, as in the accompanying photo, with yellow spots on the top of the leaf. Soon, a grey mold starts to appear on the undersurface of the leaf. Spread, at that point, is very fast. Proper plant spacing reduces the incidence of downy mildew. Resistant varieties are available for some crops. Treatment is with approved fungicide. (See links below).

Chlorothalonil may provide more effective control than fixed copper. The appearance of the leaves may not be very different after treatment, but disease progress should be temporarily halted. Do not become complacent. Consider a regular regimen of fungicides and monitor closely.

<https://hgic.clemson.edu/factsheet/cabbage-broccoli-other-cole-crop-diseases/http://blogs.cornell.edu/livegpath/gallery/cucurbits/downy-mildew-o-cucurbits-early-%20symptoms/>



*Downy mildew (shown here on a cucumber plant) looks the same on any green leaf plant.  
Photo by Jerry Ballanco.*

## Alternaria Leaf Spot

Alternaria leaf spot is a common disease in cucurbits, cruciferous vegetables, chenopods (beets, Swiss chard, spinach), legumes, tomatoes (called early blight), and other nightshades (peppers and potatoes). Unhappily for those living in the Coastal South, it thrives in warm humid environmental conditions. It is made worse by plant crowding and overhead watering. It can spread rapidly by wind, water, tools, and gardeners' hands.

It starts as small grey/brown areas that enlarge and usually has a distinctive concentric ring pattern. Eventually, this area becomes a hole. Alternaria may progress to involve every part of the plant, ruining or reducing the quality of the anticipated harvest or rendering the fruit inedible.

It survives in gardens on infected plant debris. If it occurs in your garden, treat it aggressively and remove all plant debris. If an individual plant or leaf escaped early detection and developed severe involvement, it is safest to remove that leaf or the entire plant. Destroy, do not compost. Rotate crops in that bed with non-susceptible (or resistant) vegetables on a three- to four-year cycle.

Treatment is with fungicides. One suggested treatment employs Chlorothalonil alternating with fixed copper. Often, a schedule of regular treatments with fungicides is needed. Resistant varieties are available for some crops.

<https://hgic.clemson.edu/factsheet/cabbage-broccoli-other-cole-crop-diseases/>

<https://extension.umn.edu/diseases/alternaria-leaf-blight>



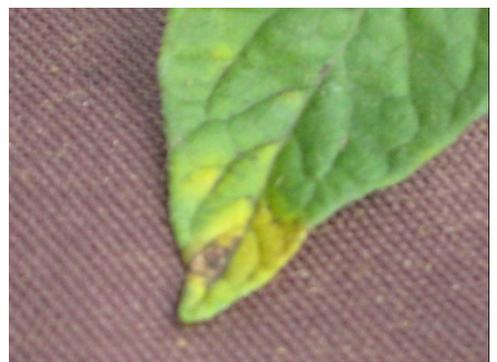
*Alternaria leaf spot on broccoli leaf. Photo by U Mass.*



*Alternaria on bean leaf. Photo by Jerry Ballanco.*



*Early blight of tomato. Photo by Jerry Ballanco.*



*Early blight on tomato, larger view. Photo by Jerry Ballanco.*

## Cercospora Leaf Spot

Cercospora fungi are common soil-inhabiting pathogens. They can infect multiple crops as well as ornamental favorites such as roses and hydrangea. Their favorite crops are cucurbits and chenopods (beets, Swiss chard, spinach), but legumes are also vulnerable. The spots start as small grey or brown lesions which gradually enlarge. As they enlarge, the margins typically turn a reddish hue. If conditions remain favorable and no intervention is taken, rapid spread within the plant and plant to plant is likely. Entire leaves may become necrotic.

Chenopods leaves with few, widely scattered lesions are ignored by most home gardeners at harvest time and can be safely eaten. If there are multiple leaf spots on the leaves, the beets tend to be smaller. The leaves are edible but less appetizing. In crops other than beets, the fruit is usually not affected.

The disease favors wet, warm weather so common in St. Tammany Parish even in winter months. The responsible organism can survive in the soil for two to three years and reaches the leaves primarily by splash from rain or overhead watering. Cercospora leaf spot can be controlled by copper fungicides (among others), which might be used preemptively in warm rainy weather, during periods of high humidity, or for crops with overhead watering.

<https://ag.umass.edu/vegetable/fact-sheets/cercospora-leaf-spot-of-swiss-chard-beets-spinach#:~:text=Cercospora%20leaf%20spot%2C%20caused%20by,diseases%20affecting%20the%20Chenopodium%20group.&text=Leafy%20greens%20become%20unmarketable%2C%20and,size%20when%20disease%20is%20>

<http://blogs.cornell.edu/livepath/gallery/beets-and-swiss-chard/cercospora-leaf-spot-on-beets-and-swiss-chard/>



*Cercospora leaf spots on beet leaf. Photo by U Purdue Ag College.*



*Cercospora lesions on Swiss Chard. Photo by Cornell U*

## Bacterial Soft Rot



*Crown rot in broccoli. NCSU photo.*



*Bacterial soft rot on peppers. Photo by omfra.gov.on.ca*

Crown rot and bacterial soft rot are caused by a group of bacteria that flourish in warm, wet weather. It cannot be treated, but it can be prevented in brassicas, primarily by taking precautions to avoid pooling of water on the flower head or cut stem.

In nightshades, the entrance is usually through an insect-inflicted wound; in potatoes, this disease usually begins with infected seed potatoes. The population of bacteria is so great in an infected plant, that the disease can readily spread to other fruit on the plant or neighboring susceptible plants. Cruciferous and nightshade vegetables are especially vulnerable.

Fixed copper may reduce the spread of infection in nightshades. If bacterial soft rot occurs in your garden on broccoli or cauliflower, pull the plant, be fastidious about cleanup, and look to resistant varieties.

Preventive measures are those to allow drying of the plant but in wet, warm weather, but the infection may be unavoidable. Be very diligent about crop rotation. Resistant varieties are available.

<https://growingsmallfarms.ces.ncsu.edu/growingsmallfarms-problembroccoli/> (cucurbits)

<http://vegetablemdonline.ppath.cornell.edu/NewsArticles/BacteriaIRot.htm> (cucurbits)

<https://plantpathology.ca.uky.edu/files/ppfs-vg-18.pdf> (potatoes)

<http://www.omafra.gov.on.ca/IPM/english/peppers/diseases-and-disorders/bacterial-soft-rot.html> (peppers)

## Sclerotinia (aka White Mold)



*Wilt in kale plant caused by Sclerotinia. Photo by Jerry Ballanco*



*Girdling of the stem of a kale plant. Photo by Jerry Ballanco.*



*Sclerotinia in the crown of a kale plant. Photo by Jerry Ballanco.*

This disease is not only ugly, it is devastating and ultimately fatal to the plant.

Brassicas and lettuce are the primary home garden crops susceptible to sclerotinia, but it can infect tomatoes, peppers, legumes, and several ornamentals as well.

Sclerotinia usually occurs in wet and cool conditions (60-70 degrees). Our St. Tammany winters are prime conditions and, in very rainy seasons, positively inviting to these organisms. Once this disease gets into soil, it can survive a while even with good crop rotation. (If it becomes a repeating problem, solarization of the bed should be done).

The infection enters through the roots or trivial damage sites. The earliest symptoms are usually yellowing or wilt of the leaves (first photo). It rapidly progresses to total collapse of the plant. The last photo of the group indicates symptoms too long ignored. The infection can spread from plant to plant.

It is hard to overstate how dependent the disease is on excess moisture in the soil. Gardening in raised beds allows the soil to dry faster than native soil. In cool, wet periods, remove mulch, weed barrier cloth, and Reemay or Agribon row covers to allow the soil to dry faster. Once the disease infects a plant, there is no effective treatment. Fungicides do not work. All efforts must be to prevention.

Immediately get rid of infected plants and all debris including leaves that have fallen to the garden floor. Unfortunately, resistant varieties of vegetables are not available.

<http://ipm.ucanr.edu/PMG/GARDEN/VEGES/DISEASES/whitemoldlet.html>

[https://ipm.ifas.ufl.edu/pdfs/White\\_mold.pdf](https://ipm.ifas.ufl.edu/pdfs/White_mold.pdf)

## Black Rot



*Early infection of black rot on cabbage leaf.*



*More advanced black rot on cabbage leaf.*

Although kale and radishes are less susceptible, black rot can infect any plant in the brassica family. The bacteria that causes black rot comes to the garden from infected seeds, transplants, or organisms on cruciferous weeds (such as wild mustard). Once established in a garden, the organism can be spread by wind, tools, or insects.

The infection usually starts at the leaf edge. If not interrupted, it may spread toward the center of the leaf, ultimately entering the vascular system. It is not uniformly fatal, but the crop produced will be markedly diminished in quality. Copper fungicide will not halt an infection but will reduce the damage caused. Home gardeners may do well to remove and destroy any infected plant to prevent it from becoming established in the garden.

St. Tammany Parish winters are ideal for development, relatively warm and very moist. Fortunately, it is not common in-home gardens. Once established, however, it mimics other pathogens in its ability to lay dormant in the soil and enter new transplants through the roots.

Resistant varieties are available.

<https://hort.extension.wisc.edu/articles/black-rot-crucifers/#:~:text=Black%20rot%20of%20crucifers%20is,and%20transplants%20of%20susceptible%20vegetables.&text=Once%20introduced%20into%20a%20garden,vegetables%20or%20on%20weed%20hosts.>

# Vegetable Pests in the Home Garden

## Introduction

Gardening in Louisiana, especially in St. Tammany Parish, is amazing. It is possible to harvest something from an outdoor vegetable and herb garden every day of the year. Unfortunately, pests have found this haven for growing and are always ready to share or completely devour the vegetable plants in your garden.

You will encounter a variety of insects in your garden. Fortunately, many of them are good neighbors helping to pollinate or act as protectors of your plants by predatory behavior to pests. It is not always obvious which bugs are beneficial and which are potentially harmful to the vegetables. It pays to learn the difference. Beneficial insects are attracted to and held in your garden by diverse plantings of vegetables and flowers. Minimal use (and careful selection) of pesticides avoids harming beneficial insects, many of which are efficient killers of pests and may make pesticides unnecessary. Beneficial insect discussion is out of the scope of this document but spending a time on an internet search for "beneficial garden insects" could start your journey to a pesticide free garden. If you send a photograph of the suspect insect to the county agent or look on the internet, you can usually identify it as beneficial or destructive and act accordingly.

The pests discussed in the following pages are those most frequently encountered in St. Tammany Parish. Not all possible pests are covered. The strategies for control are those reasonably available to the home gardener. If you use a pesticide, even an organic pesticide, read and follow the label to protect yourself and the environs of your home.

One non-chemical control method has already been mentioned: attracting beneficial insects. A second method is more involved but very effective: insect exclusion cloth. (This material may also be referred to as "season extending" material or "barrier cloth".) Although several "weights" of cloth are available, all are very lightweight. The woven material is suspended above a newly seeded or transplanted crop and anchored to the soil so that no openings are available to insects. By being suspended above the foliage and not touching it, frost damage may be avoided. Search the internet for "insect excluding material." To be effective, these materials must be deployed immediately after planting and meticulously maintained.

Insect exclusion materials, unfortunately, completely cover the crop. That means that you do not get the pleasure of watching all of your garden grow. That is not a trivial consideration in a home garden.

A second problem occurs if an insect, or insects, gets under the barrier, there are no natural predators looking for them and you cannot see them because the crop is covered. They have free reign. If you use barrier material it is important to employ it immediately after planting and make sure ground openings are not present. Check every so often, during the mid-day, to make sure problems are not developing.



*Pest free lettuce and collard greens grown under Agribon insect barrier material. Photo by Jerry Ballanco*



*Swiss chard, Rainbow mix. Photo by Jerry Ballanco  
These plants were grown under Agribon insect exclusion cloth making insecticide use unnecessary.*

*The information in the following pages is intended for home gardeners. It is not definitive and, although precautions and editing have been done to prevent errors, those processes are not absolute. Refer to the links at the end of articles for more information or contact your county agent. Happy gardening.*

[https://www.lsuagcenter.com/~media/system/4/5/e/0/45e043276ea679962dcb700848c51f78/41\\_vegetables\\_home%20gardens%202020%20dr%20bentley%20kp\\_correctedpdf.pdf](https://www.lsuagcenter.com/~media/system/4/5/e/0/45e043276ea679962dcb700848c51f78/41_vegetables_home%20gardens%202020%20dr%20bentley%20kp_correctedpdf.pdf) In this table, the pesticide imidacloprid is recommended as a possible choice for several insects. This chemical has been banned in the EU and has been implicated in loss of bee population. Attempts to have it banned in the US have been unsuccessful. Because of environmental concern, the author does not recommend this pesticide for use in home gardens.



## Aphids

A gardener could learn to not like aphids. Although aphids are selective about what plants they bother, the variety of aphids easily matches available vegetables. Flowers, fruit, leaves, stems, even roots are all aphid territory.

Aphids may be white, brown, black, or green. They are small, about the size of a mustard seed but flatter. The rear end always has two projections that look like tail pipes extending beyond the body. Some magnification is usually necessary to see this characteristic feature. If you see tan, slightly rounded, aphids that appear to not move, those may be aphid mummies and evidence that predatory wasps have been active.

Aphids have sucking mouth parts. They do not make holes in leaves but may cause leaves to turn slightly yellow or curl or otherwise become distorted. Sometimes the gardener notices ants on a plant such as okra. Following them may lead to a colony of aphids. At other times, aphids give no hint to their presence but are found by accident. In addition to direct harm, they may transmit serious viral diseases.

Treatment is tricky. If the infestation is not too extensive, spraying of the plant and leaves with a strong stream of water may be adequate. Do not spray randomly. Find the aphids and spray them directly. Try this for at least several days if necessary. Beneficial insects such as some wasps, assassin bugs, etc. may move in and quietly assist, even control the infestation. The importance of welcoming predatory insects into the garden by diversity of crops and flowers combined with minimal use of insecticides cannot be overstated. This is the best and should be the primary line of defense. Putting a sticky substance (Tanglefoot) on foil or duct tape wrapped around the trunk of plants such as okra discourages ants, which may be shepherding and protecting okra aphids.

Organic products such as Neem oil, horticultural oil, and insecticidal soaps are effective but must be used with caution in the summer when temperatures approach 90 degrees. They must be applied in such a way as to completely cover (and smother) the aphid. Pyrethrin is an organic spray that is effective. Pyrethroids, bifenthrin, malathion, and others are effective but have residual activity and kill beneficial insects as well as pests. Especially try to avoid these last three products on flowering plants as visiting pollinators may also be harmed.



*Aphids on okra. Photo by JLD.*



*Cabbage aphids.*

<https://www.missouribotanicalgarden.org/gardens-gardening/your-garden/help-for-the-home-gardener/advice-tips-resources/pests-and-problems/insects/aphids/aphids-outdoors.aspx>

<http://ipm.ucanr.edu/PMG/PESTNOTES/pn7404.html#:~:text=Some%20aphid%20species%20inject%20a,certain%20vegetable%20and%20ornamental%20plants.&text=A%20few%20aphid%20species%20a ttack,other%20than%20leaves%20and%20shoots.>



*Aphid mummies do not move. These tan bodies may be aphid mummies and evidence that predatory wasps have been active. Photo by Art Scott.*

## Slugs and Snails

Snails and slugs in all gardens are indiscriminate about what plants they eat. For the most part, slugs are most threatening to young seedlings. The amount of foliage damage that can occur may significantly weaken the seedling, making it vulnerable or too weak to survive. The harm to mature plants usually happens in leafy plants where they can live "inside" day and night and not have to eat and run. Though the damage is not extensive, finding one or several slugs in the lettuce intended for salad is gross.

They are rather easily trapped by one of two means. Beer poured into a shallow container having a rim that is almost level with the soil is effective. Put it out in the early evening. Attracted by the smell of the yeast in the beer, slugs and snails go into the beer and drown. A hollowed-out orange also works, but the harvested slugs must be killed. A second method puts a brick or piece of wood on the ground between plants. Slugs and snails use it for shelter during the day and come out at night to feed, returning to their hiding place near daybreak. They may be harvested from the bottom of the board or brick by scraping them into soapy water or simply smashed. Do not shoo toads as they will eat slugs. Non-venomous snakes will too but that is a big ask for many. Some gardeners put a copper collar around the plant as slugs are reluctant to crawl over copper.

In areas where slugs are large or very numerous, a 10% solution of household ammonia sprayed directly on the slugs causes them to die almost immediately. It also provides ammonia to fertilize the garden.

Commercial baits are available. Diatomaceous earth and wood ashes sprinkled around plant base discourages slugs, but these wash away after rain.



*Snails feeding on orange rind functioning as a bait. Snail harvest is usually in the morning. Photo by Gardengate magazine.*

## Cutworms



*The piece of wood is a 2x4 for size estimate. When found, almost invariably, the cutworm will be in this curled position. Photo by Jerry Ballanco.*



*Cutworm collars. Photo by Jerry Ballanco.*

Cutworms are bad actors. Usually, a healthy seedling is proudly planted in the garden but before it has a chance to thrive, it is cut off just above the ground, leaving the top of the seedling lying on the soil. That is cutworm activity. They are likely to be present in most gardens but not in huge numbers. Invariably, cutworms feed at night and may destroy several plants. Some cutworms climb a bit higher to eat the leaves, buds, or fruit of a more mature plant.

Sometimes, by digging about in the region of a cut seedling, a gardener can un-earth this well camouflaged caterpillar. Occasionally, one or more are unearthed when turning the garden soil for planting. Many times, however, they cannot be located. They seem to be regular visitors to soil with high organic content. To avoid damage, many home gardeners employ cutworm exclusion collars made of cardboard, foil, Styrofoam, or other material to limit the cutworm access to the stem of the seedlings. (Seldom do the common cutworms climb over the cutworm collars). It is common practice in my garden to use cutworm collars to protect virtually all seedlings that are planted in the garden soil.

This year is the first year that I have had cutworms in container grown vegetable plants. Logically, since the cutworm egg is laid by a moth, there should be little discrimination about what egg laying site is selected.

Cutworms are usually solitary creatures. In large plantings, seldom do they cause significant loss. However, to a home gardener, the loss of one or two plants may be all of that vegetable planted. It probably is best to not fight nature and just use a cutworm collar. There is no practical chemical treatment.

<https://extension.umn.edu/yard-and-garden-insects/cutworms>

## Flea Beetles



*Flea beetle on mustard plant. UMN photo*



*Flea beetle significantly magnified. UMN photo*

Flea beetles are tiny black creatures (about 1/8-inch long) that hop just like a flea when disturbed. They make multiple tiny holes in the leaves usually 1/8-inch diameter or less, and many holes are usually seen. They do not bother fruit. The biggest threat is to young plants that do not have leaves to spare. They do not usually kill a young seedling outright but weaken it significantly.-Adult plants have more resistance but may be significantly weakened by flea-beetle infestation.

Most gardeners tolerate the damage flea beetles do. If they cause significant damage, almost any common home-garden use pesticide is effective. Always read the label.

<https://extension.umn.edu/yard-and-garden-insects/flea-beetles#:~:text=Flea%20beetles%20are%20common%20pests,in%20wilted%20or%20stunted%20plants.>

## Lepidoptera (Caterpillars)

Several lepidopteron species will bother the vegetable plants in your garden. Perhaps the most frequently seen in St. Tammany Parish is the beet armyworm. For us, it is an all-year pest and involves many different crops favored by home gardeners.

Holes in the leaves are a clue that should never be ignored. A relatively small caterpillar can make a relatively large holes in leaves. The damage done by young armyworm larvae may be relatively trivial, initially. When the caterpillars are small, they eat only the underside of the leaf. That area soon becomes brown and skeletonized. As the larvae mature, the holes they make get bigger and often frass is seen, as in the second photo.

Other common lepidopteron in St. Tammany Parish are:

- Cabbage Looper
- Cabbage Webworm
- Cross-Striped Cabbageworm
- Diamondback Moth Caterpillars
- Imported Cabbageworm
- Pickleworm (destroys cucurbit fruit)

Any of these caterpillars can cause damage to your vegetables. Many of them favor brassicas but few are confined to a single class of crop.

Usually, if you find holes in leaves, especially if you also find frass, and are persistent in looking you can usually find the responsible party. If only one or two plants are involved, it is often possible to find the perpetrators and remove them. Their presence, though, means that the parent organisms (moths) and their ilk are about in your garden and likely to continue mating and laying eggs.

The details of appearance of different caterpillars are hard to notice especially if they have been smashed. That is good because the symptoms are similar: fairly big holes in the leaves, frass on the leaves or stems. Insect row cover, if applied at the time of planting, will prevent the moths from laying eggs. Bt (*Bacillus thuringiensis* product), Spinosad, malathion, carbaryl and others can be effective if applied early, when the caterpillars are small. Often, the treatments need to be applied several times during the growing season. Read and follow the labels.

<https://edis.ifas.ufl.edu/in262>

<http://www.missouribotanicalgarden.org/gardens-gardening/your-garden/help-for-the-home-gardener/advice-tips-resources/pests-and-problems/insects/caterpillars/cabbage-looper.aspx>



*Beet armyworms shortly after hatching on a bean plant. This could easily be on a tomato or beet leaf. Most of the "black dots" in the photo are tiny, newly hatched armyworms. Photo by Jerry Ballanco.*



*More mature larval form of beet armyworm on tomato leaf. The small black dots on the stem are frass. Photo by Jerry Ballanco.*



*Beet webworm. Photo by UGA.*



*Cabbage looper. Photo by Missouri Botanical Garden.*



*Infested kale leaf. Photo by Jerry Ballanco.*



*Pickleworm frass and entry opening on patty pan squash. The gelatinous frass is typical of pickleworms. They attack most fruiting cucurbits (pickles are their favorite) and become more prevalent as the summer progresses. Their four-day egg to invasion period makes chemical control difficult. Photo by Jerry Ballanco.*



*Pickleworm in melon. The small green caterpillar destroyed this cantaloupe. Often, multiple worms will invade an individual fruit. Photo by Jerry Ballanco.*

## Root Knot Nematodes



*Root Knot Nematodes on roots of tomato plant. Photo by Jerry Ballanco.*

**A NEMATODE IS A MICROSCOPIC SOIL dweller** that invades the roots of susceptible plants. There are many kinds of nematodes: some very specific, some beneficial, and others a more general nuisance. When the nematode population is significant, the root knot nematode invasion results in stunting, slow growth, easily wilting plants, yellow leaves, poor production, susceptibility to disease, and a gross-out when you pull the plant to end its misery. In root crops, distortion or gall formation may occur.

Discovery of this nematode pest in your garden is a great disappointment. It will be there for a while, is difficult to get rid of, and best to not let it get a start. By rotating non-susceptible crops on a 3- to 4-year schedule, the nematode population is not able to build up to a level that is harmful. If that is not possible, resistant varieties of some vegetables have been developed. The letters RKN will appear after the variety name.

Two techniques are available to reduce the population of nematodes in the soil.

French marigolds invite the nematodes into their roots but, when they enter, they can develop no further thus reducing the population by diminishing reproduction. The best time to use this technique is in the spring when the marigolds have the possibility of a long time in the garden. However, if the tell-tale galls of root-knot nematodes are present when spring crops are removed, start the French marigolds growing as soon as possible. The plants are easy to start from seed and are available in many seed catalogues.

Another technique involves addition of chitin to the soil. When fungi in the soil dissolve the chitin for their use, they secrete an enzyme that ultimately compromises development of young nematodes. In Louisiana, chitin is in crab, shrimp, and crawfish shells. Add the shells, raw or cooked to the soil, breaking them up as much as possible with the shovel. Wait at least two weeks before planting anything in that area, as the ammonium released in the chitin degradation process may damage young plants.

Commercial chitin products are available to gardeners.

<http://entoweb.okstate.edu/ddd/diseases/rktomato.htm>

<https://www.lsuagcenter.com/profiles/coverstreet/articles/page1486135407127>

## Spider Mites

Spider mites are tiny, spiderlike creatures that especially love tomatoes, beans, and cucurbits but are opportunists and will settle on many vegetable plants. They are most abundant in the hot, dry summer but, in St Tammany parish, they are year-round pests.

Spider mites have sucking mouth parts. This means that they do not make holes when they feed. They live on the underside of the leaf and extract plant juices causing the white/tan/yellow stippled appearance seen in the first photo. With heavy infestation, often web-like material is seen between leaves and stems but finding the spider mites usually requires a close look. If you were to place a white piece of paper under a leaf and tap the leaf, several would fall to the paper. The mites are tan and about the size of a period. They would probably move about a bit.

Heavy infestation can weaken a plant considerably and reduce the quantity and quality of fruit. More often, however, the presence of mites is noted by the stippled leaf appearance, but the plant still thrives and produces well. There are many predators that attack mites and, frequently, they will keep the mite population under control.

Stressed plants are more susceptible to mite damage. During dry periods, make sure the plants get adequate water. Do not give nitrogen fertilizer to drought stressed plants; it stresses them more and makes them more vulnerable to mite damage.

Often, directly spraying a strong water stream at the underside of infested leaves is effective. This must be repeated several times at three-day intervals for a week or so. If the infestation is heavy (especially in a young plant) or water spray does not work, horticultural oil and insecticidal soap are effective. These products need to contact the mite directly as they work by suffocation. Neither the water spray nor the smothering sprays can be applied casually. As the mites typically inhabit the underside of the lower leaves, directing the spray properly is sometimes difficult.

Broad spectrum insecticides like Spinosad, malathion, etc. are weak miticides. They often kill more mite predators than mites so the infestation may actually worsen.

Given all the problems with various "remedies" for mites, make sure that the infestation is severe enough to merit specific intervention. Give directed water spray and mite predators a chance to keep the population of mites to a level that allows the plant to, physiologically speaking, ignore the surviving mites.



*Typical stippled appearance of spider mite activity. Photo by Bugwood.org*



*Underside of heavily infested leaf. The mites are tan. Photo by Bugwood.org*

<https://entomology.k-state.edu/doc/misc.-extension-document/spider-mites-on-tomatoes.pdf>

<https://extension.umn.edu/yard-and-garden-insects/spider-mite>

<https://ohioline.osu.edu/factsheet/HYG-2012-11>



*Spider mite web with mite activity, approximately 10x magnification. Planet Natural photo.*

## Leaf-footed Bugs and Stink Bugs



Leaf-Footed Bug, Adult. Photo by California Agriculture & Natural Resources.

**THE TOP LEFT PHOTO SHOWS** an adult leaf-footed bug. Often, they will be seen in mating pairs. The accompanying photo shows a group of juveniles (an instar form), one of which is extracting juice from the tomato. The instar forms may cause as much trouble as the adult.

The instar (nymph, juvenile) very closely resembles the juvenile form of the assassin bug, a garden beneficial. However, assassin bugs are lone travelers, and do not have the prominent two dots seen in the middle photo on the leaf-footed bug instar. More obviously, the juvenile leaf-footed bugs travel in groups of three to 15. There is certain sick joy in smashing a whole family at one time, which is how they should be treated. They will not fight back. The assassin bug, however, may deliver a nasty stick. The adult leaf-footed bug offers an offensive odor when smashed or threatened, not so the immature bugs. Removal efforts are best done in the early morning or late afternoon when the bugs tend to be sluggish. Gloves are not essential but make the killing less gross.



A leaf-footed bug instar with proboscis in the green tomato. Photo by Art Scott.

To ingest the vegetable juices, the bug injects digestive enzymes to dissolve the fruit substance (left lower photo). This leaves an area on the fruit or vegetable, just below the skin, which makes it unsightly (see photo below). The fruit is safe to eat.

Leaf-footed bugs are not very discriminating in their preferences and may be found on almost any fruiting vegetable.

The other photos are of the ubiquitous stink bugs, brown and green. They are responsible for the same kind of lesions as the leaf-footed bug and should be given the same reception.

As often as not, if alerted, any of these bugs may fly off or simply drop and get lost in foliage or soil. Trying to kill them in the early morning is most effective as they seem to be sluggish or otherwise distracted. When you kill one of these adults, you will understand how the common name was decided.

[https://www.lsuagcenter.com/topics/crops/fruits\\_and\\_vegetables/blueberries/pests/leaf-footed-bugs](https://www.lsuagcenter.com/topics/crops/fruits_and_vegetables/blueberries/pests/leaf-footed-bugs)

<http://ipm.ucanr.edu/PMG/PESTNOTES/pn74168.html>



The light marks on this cherry tomato are sites of injury cause by leaf footed bugs. Photo by Laura Steffee.



Brown Stink Bug. Photo by Herb Pilcher, USDA Agricultural Research Service, in <https://hgic.clemson.edu/factsheet/tomato-insect-pests/>



Green Stinkbug. Photo Frank Peairs, Colorado State University, in <https://hgic.clemson.edu/factsheet/tomato-insect-pests/>

