

VEGETABLE CROPS

Diseases of Lettuces in Connecticut

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Moist growing conditions are very problematic for lettuce growers in Connecticut. Major fungal diseases thrive in cool and wet environments including sclerotinia drop and gray mold, while others such as bottom rot favor warm and moist conditions. Lettuce is also susceptible to bacterial diseases such as those caused by the lettuce mosaic virus (LMV) and aster yellows phytoplasma.

This document is meant to help growers manage lettuce crops based on common warning signs and symptoms, fungal and bacterial disease identification factors, commonly used prevention methods, and research based practices.

Fungal Diseases

Sclerotinia Drop

Other names include lettuce drop or white mold.



Figure 1. Noticing lettuce drop in a bed of lettuce. Photo by Dr. Lina Quesada, NC State Vegetable Pathology Lab.

Symptoms & Fungal Growth Behavior

Usually, the first symptom of sclerotinia drop noticed by growers is the wilting of the outermost leaves. Before the leaves wilt, however, a water-soaked

area caused by the growing fungus, appears on the stem near the soil. The fungus grows from here down into the roots and up through the rest of the stem. As the fungus grows into each leaf, the base of the leaf rots. This causes the leaves to droop and wither, and their tips to touch the soil or rest on the leaves below. As the fungus grows up the plant, each leaf is affected in turn. The inner leaves usually remain moist enough for the fungus to completely invade them and reduce them to a slimy mass. Under such moist conditions, a snowy white mass of fungus, resembling spider webs, is produced over the entire head. Black structures called sclerotia, as small as a mustard seed or as large as a bean, may be formed in this web of fungal growth, usually on the undersides of the leaves touching the soil.



Figure 2. Sclerotia, hardened masses of fungal mycelium form where the lettuce plant is in contact with the soil. Photo by S Butler, NCSU PDIC.

Identification

Snowy white web-like fungal growth is present. You may also notice a water-soaked ring around the stem where it meets the soil.

Prevention & Control Measures

Pathogens from two common species of *Sclerotinia* found in Connecticut – *S. minor* and *S. sclerotiorum*

– can survive in the soil for 2 to 3 years without a susceptible host. Therefore, a multi-layered approach to prevention is recommended.

- 3-year crop rotations avoiding common hosts such as lettuce, beans, celery, or carrots. Small grains are non-hosts for this fungus and can be included in rotations.
- Plant in well-drained soil and/or use raised beds.
- Soil steaming for one hour at 131°F or for 36 hours at 113°F, or solarization can reduce inoculum levels.
- Increase spacing between plants and control weeds to improve airflow. Important to note, common chickweed, green foxtail, common lambsquarters, prickly lettuce, wild mustard, eastern black nightshade, field pennycress, redroot pigweed, wild radish, common ragweed, shattercane, annual sowthistle, common sunflower, and Canada thistle are common host of this disease.
- Avoid excessive nitrogen fertilization.
- Plant varieties that have shown some tolerance to this disease. See [Disease Resistant Lettuce Varieties](#).
- Irrigate in the morning and avoid overhead irrigation to keep surfaces dry.
- Removing infected plants from small plantings is effective in preventing spread of the disease to other plants.
- Trim outer leaves after harvest, before packing, to avoid rot in storage.
- Refrigerate plants after harvest.
- Immediately plow debris under after harvest.
- Biofumigation with mustard crop may suppress this disease.

Chemical controls can also be used to help manage viable sclerotia in the soil or foliar disease. Actinovate AG, Bio-Tam 2.0, Contans WG, and BotryStop WP are some examples OMRI listed fungicide. More options are available for non-organic systems. For example, Cannonball WG, Endura, Fontelis, Oso 5% SC, and Switch 62.5 WG. To see the most up to date recommendations for chemical control measures, visit the [New England Vegetable Management Guide](#) website.

Bottom Rot

Bottom Rot, caused by the fungus *Rhizoctonia solani*, affects lettuce, escarole, endive, potato, pepper, eggplant, radish, cucumber, and many other fleshy plants. It is a greenhouse and field disease that favors warm, wet conditions. Plants are usually affected when they are nearly mature.

Symptoms

The first symptom seen from above is usually wilting of the outer leaves. Before this happens, the fungus enters the plant through lower leaves in contact with the soil. Slightly sunken spots, rust-colored to chocolate brown, appear on the leaf petioles and midribs. These spots can be very small or can grow rapidly to cover the entire petiole/midrib area. While these spots are being formed, they may ooze a light brownish or amber colored liquid. If conditions are unfavorable for the fungus, the rust-colored spots on the petioles will dry and turn chocolate brown.



Figure 3. Early-stage indication of *Rhizoctonia* Bottom Rot. *Photo by G. Holmes Cal Polytechnic.*



Figure 4 Late-stage indication of *Rhizoctonia* Bottom Rot. *Photo by G. Holmes Cal Polytechnic.*

Under warm, wet conditions, the fungus will continue to grow upward into the leaf blades and destroy them as it grows from leaf to leaf. The entire head may become a slimy brown mass that soon dries and becomes darker. The stems are usually the last part of the head to decay. Tan to brown web-like fungal growth is (usually) easily seen on the infected head tissues. Small, irregularly shaped cinnamon brown to dark brown lumpy structures, known as sclerotia, may be seen on the head and on the soil under it. The fungus also provides a path for the entry of secondary rot bacteria.

Identification

Small, rust-colored brown spots underneath lower lettuce leaves in contact with the soil.

Prevention & Control Measures

- A lot of the practices mentioned for sclerotinia (crop rotation, resistant variety, improving airflow and drainage, and plowing the residue) will help control this disease as well.
- Upright varieties are less susceptible because their leaves do not touch the soil.
- Growing on a 4-inch-high and 6-inch-wide ridge may be helpful in preventing this disease because there is increased air flow, better drainage, and less contact between the bottom leaves and the soil.
- Avoid succession plantings and rotating potatoes and other very susceptible crops with lettuce.

Chemical control measures can also be used to help manage the fungus causing bottom rot. Chemicals that target *Rhizoctonia* include Cease, Companion Liquid, Obtego, Rootshield, Stargus, and Theia. To see the most up to date recommendations for chemical control measures, visit the [New England Vegetable Management Guide](#) website.

Gray Mold

Gray mold is caused by the fungus *Botrytis cinerea*, which infects lettuce and many other plants - few vegetables are not hosts of *Botrytis*. A very common fungus, it's particularly a problem in greenhouse lettuce. It is important to note, however, gray mold occurs wherever lettuce is grown. The fungus grows in a wide range of temperatures but thrives in cool (65°F to 75°F), moist weather.

Symptoms

Gray mold starts on the older or damaged leaves and progresses upwards. As the fungus grows and expands throughout the plant, inner leaves first become water soaked, then grayish green or brown, and finally turn into a brownish-gray, slimy mass. The fungus can also grow up the stem and rot out the inside of a head, causing the plant to collapse before any symptoms are visible outside. If lettuce is allowed to flower, the flowers can be infected during and after the flowering period.



Figure 5. Foliage damage caused by Botrytis rot. Photo by J. Kelly Clark, UC Statewide IPM Project.



Figure 6. Gray mold is evident on a lettuce crown. Photo by J. Kelly Clark, UC Statewide IPM Project.

Identification

Look for ashy gray spores on plant parts, giving them a fuzzy appearance.

Prevention & Control Measures

Overall, gray mold is a weak pathogen that is unable to infect healthy, robust plant tissue. It also requires moisture on the leaves for infection. *Botrytis* commonly occurs as a secondary pathogen, following infections and damage done by other fungal disease (such as bottom rot).



Figure 7. Gray mold overtakes lettuce plant.
Photo by G. Higgins, UMass Vegetable Program.

The following techniques are examples of measures that can be taken to prevent or manage the spread of gray mold:

- In a greenhouse or high tunnel, keep the humidity low, the temperature warm and sterilize soil before planting.
- Keep the plants as dry as possible to prevent infection and avoid overhead watering. Water early in the day to allow plants to dry thoroughly.
- In the field, plant in well-drained soil, and orient rows with the prevailing winds to keep air circulating.
- Avoid planting near buildings or large trees that shade the plants to keep the stems from twisting as they grow and thus becoming damaged.
- Since infection often occurs from damaged tissue, it is important to control other diseases and avoid excessive nitrogen and low calcium.
- Avoid bruising and other injury during harvest. Remove or plow under debris after harvest.
- Keep harvested plants refrigerated between 32°F and 36°F.

There are no varieties that are resistant to this disease. Chemicals that target *Botrytis cinerea* include ChampION, Oxidate, Trilogy/Triact, Milstop SP, Regalia, and PerCarb. To see the most up to

date recommendations for chemical control measures, visit the [New England Vegetable Management Guide](#) website.

Yellows and Viral Diseases

Lettuce Mosaic Virus

Lettuce mosaic is caused by the lettuce mosaic virus (LMV). This virus affects all types of lettuce and many other hosts, including other greens, pea, spinach, aster, marigold, sweet pea, zinnia. Weeds such as chickweed, groundsel, cheeseweed, henbit, lambsquarters, milk-thistle, ox tongue, shepherds' purse, sowbane, sow-thistle, and scarlet pimpernel are hosts as well.

LMV is most commonly transmitted through infected seeds. However, infected plants as well as weed hosts can also serve as virus reservoirs, enabling visiting insects such as aphids to spread the virus to nearby healthy plants. Old and young plants can contract the virus, causing decreased vigor and stunting plant growth. Plants infected through seed will show signs early on, never growing enough to become marketable. Older lettuce plants that contract LMV through secondary infection show mosaic, leaf puckering, and exaggerated serrations of the leaf.



Figure 8. Lettuce leaves with showing signs of LMV infection. *Photo by UCCE Riverside County – UC ANR.*

Symptoms

Symptoms of this disease can vary considerably, depending on the age of the plant at infection, the variety and the temperature. Plants infected as seedlings are very stunted. Leaves of infected plants are often irregularly shaped and mottled yellow and

green. Mottling is most noticeable on leaf lettuce. It is easiest to see on cool cloudy days, and when holding the leaf up to the light and looking through it. When plants are in the early-rosette stage, the veins appear clear and the smaller veins have brown flecks on them. In very sensitive lettuce varieties, there may be browning of the veins or on the edges of the leaves. The leaves may die. Leaf margins may become ruffled and distorted, and the leaf tips roll back. This downward curling of the leaf tips can be diagnostic in older plants of the crisphead variety.

When plants are older, the yellow green mottling may be difficult to see, although it may be visible on the edges of the leaves. Plants are often a uniform dull pale green to slightly yellow and severely stunted. Outer leaf tips roll downward. The serrations of the younger leaves may be particularly prominent. The plants appear flatter than healthy plants. They may fail to head, produce a small, loose head or, if infected later, may produce a deformed head.

Vector

This disease is transmitted by the green peach aphid (*Myzus persicae*) in a nonpersistent manner. The aphid acquires the virus from infected plants almost immediately. However, aphids are only able to infect healthy plants for a short time, usually within a few days to a week. The green peach aphid transmits more than 100 viruses to many different plants. They can be pale green to pink and may or may not have wings. In temperate regions, these aphids spend the winter on woody plants (e.g. peach trees) and summers on nonwoody plants.



Figure 9. Closeup image of adult, nymph, and exuvia of green peach aphids. Photo by J.R. Baker.

Prevention & Control Measures

- Use certified disease-free seed. Healthy seed is the best way to prevent this virus from getting into your fields.
- If you're skeptical of seed infestation, you can use ELISA (enzyme-linked immunosorbent assay) testing to test for LMV.
- How water seed treatment is another cheap and effective way to kill pathogens.
- Control weed hosts.
- You may consider releasing beneficial insects to mitigate the population. Convergent lady beetles (*Hippodamia convergens*) and lacewings (*Chrysoperla* spp.) prey on green peach aphids.
- Manage previous crop residue by plowing under debris as soon as possible.
- Remove infected fields before planting lettuce in nearby beds.

Insecticides that target green peach aphids include Pyganic, M-PEDE, AZA Direct, Actara, and Orthene. To see the most up to date recommendations for the chemical control of aphids visit the [New England Vegetable Management Guide](#) website.

Aster Yellows

This disease is caused by the aster yellows phytoplasma. The phytoplasma has a wide host range including lettuce. Carrot, escarole, endive and celery are additional common vegetable hosts, as well as occasionally onions and potatoes. Weed hosts include thistle, fleabane, sow thistle, wild lettuce, plantain, wild chicory, dandelion and galinsoga. Ornamental hosts include gladiolus, poppy, chrysanthemum, phlox and veronica. Aster yellows phytoplasma can occur anywhere lettuce is grown, causing bitter, stunted and disfigured heads.

Symptoms

The young heart leaves become white to yellow and fail to develop normally remaining as short, thickened stubs in the middle of the head. Light brown to pink latex spots collect on the undersides of the midribs of the leaves. When young plants are infected, outer leaves become yellow and twisted. These plants may be severely stunted. Heads often taste bitter. Bushy outgrowths (often referred to as Witch's Broom) may be present on the flowering stalks, and the plants may be sterile or abort seeds. Infected heads are often unmarketable.

Identification

Stunted plants, twisted leaf growth, deformed foliage, and yellow or white leaf discoloration are all potential indicators of aster yellows.



Figure 10. A twisting head of lettuce showing signs of aster yellows infection. *Photo by Whitney Crenshaw, Colorado State University, Bugwood.org.*



Figure 11. Adult aster leafhopper, identifiable by its tan body and double set of spots on its head. *Photo by Lior Carlson.*

Vector

Aster yellow phytoplasma is transmitted from one plant to another by the six-spotted leafhopper and the aster leafhopper (*Macrostelus fascifrons*). The aster leafhopper, a grayish-green insect about 1/8" long, is found throughout the U.S. The adults must feed on an infected plant for about eight hours before they acquire enough of the phytoplasmas to infect a healthy plant. After the leafhopper has acquired the phytoplasma, it is able to transmit it to healthy plants for the rest of its life.

Prevention & Control Measures

- Leaf lettuces are less susceptible and show fewer symptoms of aster yellows infection than head lettuces.
- Control weed hosts! This is the most important way this disease starts in an area. The insect that spreads the disease may spend the winter on wheat, rye, barley and some grasses. Plant far from grains. Control the insect on the grains, especially near grain harvest time. Row covers can be an effective way of keeping leafhoppers away from healthy lettuce plants.
- Do not plant lettuce near other stands of diseased lettuce.
- You may consider releasing beneficial insects to mitigate the population. Green lacewings are known to prey on leafhoppers.
- Effective scouting and timing insecticide applications to coincide with peaks in aster leafhopper populations can help manage outbreaks.

Insecticides that target leafhoppers include Pyganic, Aza-Direct, Sivanto, Surround and JMS Stylet Oil. To see the most up to date recommendations for the chemical control of the six-spotted leafhopper and the aster leafhopper visit the [New England Vegetable Management Guide](#) website.

References University of California Agriculture and Natural Resources Statewide Integrated Pest Management. (2017, April). *Lettuce Drop*. Retrieved January 17, 2025, from <https://ipm.ucanr.edu/agriculture/lettuce/lettuce-drop/>

UMass Extension Vegetable Program. (2024, February). *UMass Extension Vegetable Notes*. Retrieved January 17, 2025, from https://ag.umass.edu/sites/ag.umass.edu/files/newsletters/february_15_2024_vegetable_notes.pdf

UMass Extension. (2025, January). *New England Vegetable Management Guide*. Retrieved January 17, 2025, from <https://nevegetable.org>

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