

# Vegetable Pest Alert

July 22, 2023

## Updated flooding resources

If you have not already done, please report your estimated losses from the recent flooding through an [online reporting tool](#). This data will be shared with USDA Farm Service Agency and UConn Extension. By filling out this information it will assist these entities in determining if a disaster declaration can be obtained. Your farm name and contact information is not required, but if you would like to be contacted, please share that.

Please also contact your local **Farm Service Agency County Office** to report your damages as well as your **insurance agent** to report impacts for covered crops if not already done. UConn Extension is part of the Produce Safety Alliance, and there are [guidelines for flooded farms](#). We also recommend reviewing our [farm worker training video series](#) as the principles will help guide farm recovery after a flood.

- [UConn flooding resources](#)
- [Connecticut Department of Agriculture Disaster Relief Resources](#)
- University of Vermont Extension factsheet on [FAQs about handling flooded produce](#)

## How do vegetable crops react to waterlogging?

Much of the state (and the region) has received excessive rains in recent weeks.

- When soils are saturated, vegetable crops suffer. Wilting occurs because roots in waterlogged soil cannot breathe due to lack of oxygen and do not uptake water and nutrients to support the aboveground portion that may continue to grow for some time even after the root has stopped.
- The demand for oxygen by roots and soil microbes is greater at higher temperatures, and so lack of oxygen leads to more injury in warm soils.
- Ethylene buildup in saturated soil conditions can cause leaf drop, flower drop, fruit drop, or early plant decline in many vegetable crops.
- Oxygen starvation in root crops such as potatoes will lead to cell death in tubers and storage roots. This will appear as dark or discolored areas in the tubers or roots.
- In carrots and other crops where the tap root is harvested, the tap root will often die leading to the formation of unmarketable fibrous roots.
- Lack of root function and movement of water and calcium in the plant can lead to calcium related disorders in plants. There is a potential for higher incidence of blossom end rot in tomatoes, peppers, watermelons, and other susceptible crops when fruits are forming and soils are saturated.

- Leaching and denitrification losses of nitrogen and limited nitrogen uptake in flooded soils will lead to nitrogen deficiencies across most vegetable crops.

### **What steps can be taken to minimize plant stress from waterlogged soil?**

- One option to aid in vegetable crop recovery after floods or waterlogging is to aerate the soil by cultivating (in crops that can be cultivated) as soon as you can get back into the field. This allows for oxygen to enter the soil more rapidly.
- To address nitrogen leaching and denitrification losses, sidedress with 40-50 lbs of N where possible depending on the crop and crop stage.
- In vegetable fields that remain wet, consider foliar applications of nutrients. Nitrogen is the key nutrient to supply. Up to 10 lbs of actual N per acre can be sprayed using, urea ammonium nitrate (28 % N solution), urea, or calcium nitrate. Use 5 to 20 gallons of water per acre. The higher gallons per acre generally provide better coverage. As with all foliar applications, keep total salt concentrations to less than 3% solutions to avoid foliage burn.
- Diseases like phytophthora root rot and blight, caused by a water mold, and bacterial diseases thrive in saturated/wet soils. Take precautions to minimize the spread. More on phytophthora is below.

This note was adapted from the following articles.

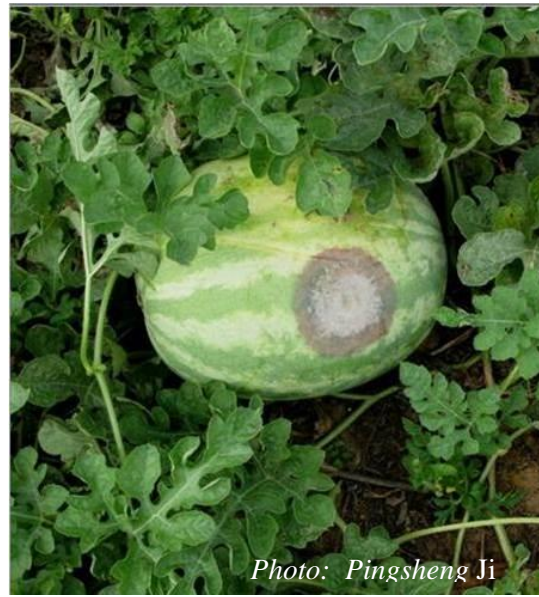
- *Gordon Johnson. 2023. [Flooding, waterlogged soils, and effects on vegetables with special consideration for plasticulture vegetables](#). University of Delaware*
- *Liz Maynard. 2015. [Waterlogged Soils and Plant Growth](#). Purdue University.*

### **Phytophthora**

Phytophthora (*Phytophthora capsici*) can infect all cucurbits (pumpkins, squash, melons, etc.) as well as peppers, tomatoes, eggplants and beans. Phytophthora is long-lived in the soil and driven by moisture.

- Disease can infect all parts of the plant tissue, and the most apparent symptom is wilting and white, powdered sugar-like spores on infected plant tissue.
- It requires 24 to 48 hours of soil saturation to start the disease cycle. Water management is crucial to prevent the disease cycle from starting.
- Break beds to allow water to leave field through lowest paths.
- Avoid bringing Phytophthora-contaminated soil into clean or fumigated fields on farm equipment by working in clean fields first and cleaning equipment after working in contaminated fields.
- Do not throw rotting host crops purchased off-farm on fields, or into compost piles for use on fields.
- Alternating between two or more soil-applied fungicides, beginning at planting, and continuing throughout the season, has been shown to be more effective than foliar

applications. Several products are labeled for drench or trickle applications. See label rates and directions.



Phytophthora on summer squash, tomatoes, cucumber, and watermelon.

**For crown and stem rot:** To see the more complete list of pesticides, see [New England Vegetable Management Guide](#).

- **Zampro**, Groups 45 & 40. Labeled for foliar, soil and drip applications. Do not use in greenhouse or high tunnel crops.
- **Ranman**, Group 21. Labeled for foliar, soil drench or overhead irrigation application.
- **Presidio**, Group 43. Must be applied in a tank mix with another labeled fungicide with a different mode of action. Labeled for foliar, soil and drip applications. Do not use in greenhouse or high tunnel crops.
- **Orondis Gold 200**, Group 49. Apply at planting in furrow, in transplant water, or by drip irrigation.

- **ProPhyt**, Group 33.
- **Actinovate AG**, Group Not Classified.

**For foliar and fruit rot:**

- **Tanos**, Groups 11 & 27. Must be tank-mixed with a contact fungicide. Rotate with an appropriate fungicide with a different mode of action.
- **ProPhyt**, Group 33.
- **Actinovate AG**, Group Not Classified.

**Bacterial canker** (*Clavibacter michiganensis*) was confirmed in field-grown tomato. Bacterial canker is one of the most devastating bacterial pathogens of tomato. The pathogen enters the tomato through natural openings, wounds (roots, stem, or fruits), or from infected seeds. Once inside a plant, this bacterium multiplies in the cells of plants that are responsible for water transport. A slimy biofilm is produced by the bacteria, which aids in pathogen colonization and movement. If conditions are favorable (77-86 °F), disease symptoms can develop in approximately a week.



*Bacterial canker of tomato often causes brown and yellow margins on leaves and stem canker and pith necrosis develop as a result of bacterial canker.*

- Recommendations for next season would be, buy hot-water treated seed or seed certified to be free of bacteria. Hot water seed treatment can be done at home. Treat seed for 25 minutes at 122°F. Use copper or streptomycin on plants before transplanting.
- Disinfect stakes before reusing.
- Plow under infected field debris or remove the crop debris and rotate out of tomato or pepper for a minimum of 3 years.
- *Bacillus subtilis* strain QST 713 (Serenade ASO) is labeled for both field and greenhouse use. Also, Copper-based products can help protect healthy plants.
- See [New England Vegetable Management Guide](#) for labeled pesticides.

**Verticillium wilt on eggplant** was seen this week. It can also infect tomato, pepper, cucurbit, and many other plants. A yellowing of lower leaves followed by wilting is the first sign of disease. Lesions have a characteristic V-shaped pattern which is widest at the leaf margin. Symptoms can appear on one side of the plant or on one side of a leaf, more prevalent in eggplant and tomatoes. When the stems of infected plants are cut lengthwise, the vascular tissue exhibits a brown discoloration. *Verticillium* species can persist in the soil for many years in the absence of susceptible plants. Follow a 4- to 5-year crop rotation with non-solanaceous and non-cucurbit crops to reduce inoculum levels in fields. Include grain crops in the rotation. Control weeds as many weeds are susceptible to *Verticillium*. Remove and destroy infected plant material after harvest. There are no effective chemical controls.



#### **Spotted cucumber beetles**

They do not overwinter here but disperse from southern areas. They were spotted this week. It feeds in a very wide range of crops and weeds and is often found in flowers. Adults are yellowish green with 12 black spots and a black head. This pest rarely builds up to damaging levels in New England. However, note that striped cucumber beetles are a key pest of all cucurbits crops in our region and requires cultural and often chemical controls to prevent direct feeding damage and transmission of bacterial wilt. Scout

and treat for spotted cucumber beetle the same way as for striped cucumber beetles. See [New England Vegetable Management Guide](#).

**Early summer-seeded cover crops.** Common choices are sudangrass (or sorghum-sudangrass) and buckwheat. Both grow rapidly if there is sufficient warmth, moisture, and fertility. Sudangrass is preferable for adding to SOM, as it can produce tremendous amounts of biomass when grown for the entire summer. It also has a deep root system that reduces compaction, and it can reduce root-knot nematode pressure. If a cover crop is needed for less time, and/or if weed suppression is the main goal, then buckwheat is preferable as it needs only 35-40 days to produce most of its biomass whereas sudangrass needs 60-70 days.

**Late summer-seeded cover crops.** These are sown after an early-harvested vegetable crop, a month or two before frequent frosts (mid-August to mid-September, in most locations). Winter cover crops such as rye or oats are an option; when sown early, they will produce more fall growth. When sufficient growing time remains in the season, annual ryegrass, forage radish, hairy vetch, and various brassica cover crops can be used. Brassica cover crops can also work as a biofumigant suppressing many soil-borne diseases, including phytophthora and verticillium, and nematodes. They release biotoxic compounds that exhibit broad activity against bacteria, fungi, insects, nematodes, and weeds. Brassica cover crops need to be mowed and incorporated to maximize their fumigant potential.

### **Federal funding available for farmers who experienced USDA discrimination**

Section 22007 of the Inflation Reduction Act provides \$2.2 billion in financial assistance for farmers, ranchers, and forest landowners who experienced discrimination in USDA's farm lending programs prior to January 1, 2021.

The program website, [22007apply.gov](https://22007apply.gov), is now open. The website includes an English- and Spanish-language application that applicants can download or submit via an e-filing portal, information on how to obtain technical assistance in-person or virtually, and additional resources and details about the program.

You are **eligible** to file an application if:

1. You experienced discrimination, prior to January 1, 2021, by the Department of Agriculture (USDA) in its farm loan programs, which are administered by the Farm Service Agency (FSA);

#### **AND / OR**

2. You are currently a debtor with assigned or assumed USDA farm loan debt that was the subject of USDA discrimination that occurred prior to January 1, 2021. (This applies, for example, if you inherited the debt that was the subject of USDA farm loan program discrimination.)

**Application Submission Deadline:** October 31, 2023.

**Number to call for additional assistance**

The DFAP Call Center will assist you with general inquiries and answer questions you may have in completing your application. You can reach them by email at [info@22007apply.gov](mailto:info@22007apply.gov) or phone at 1-800-721-0970.

**Continue to be on the lookout for the following pests that were covered in [the previous pest alerts \(2023\)](#):**

- Powdery mildew of cucurbits
- Downy mildew of cucurbits
- Leaf mold of tomato
- Squash vine borers: report from 1 farm in Berlin: 6 moths/week. 5/week is the threshold for susceptible cucurbits like summer squash.
- European corn borers and fall army worm: report from 1 farm. NY strain- 0, IA-1 and Hybrid-1, and 4% infestation from FAW in the field at a farm in Berlin.
- Corn earworm: 0.5 moths/night in Berlin (= 6-day spray schedule)
- Striped cucumber beetles



## Vegetable IPM Field Workshop

August 8, 2023 Rain date August 9

10am – 2:30pm

UConn Plant Science Research and Education Facility

59 Agronomy Road, Storrs CT

Join UConn Extension Faculty at the Plant Science Research Farm to learn about important vegetable pests and management options.

Presentation topics include:

- UConn Plant Diagnostic Lab updates
- Powdery mildew and downy mildew management
- Alternaria survey results and fungicide sensitivity evaluation
- Biodegradable plastic mulch: impacts on crops and soil
- Allium insect pests
- Evaluation of a push and pull system for diamondback moth management
- Remote sensing of potato leafhopper damage and drone demonstration



- There is no cost to attend this workshop but **registration by July 31 is required**. Seating is limited - reserve your spot today!
- Complimentary lunch and refreshments will be offered
- Register online (preferred) at this link: <https://forms.gle/2pAd28Jg6tRkewzS6> or call 860-486-0572 to register by phone.
- 2.5 pesticide recertification credits approved in PA and 1A categories.
- Questions can be e-mailed to [ana.legrand@uconn.edu](mailto:ana.legrand@uconn.edu) or leave a message at 860-486-0572.
- If you require an accommodation to participate in this event, please contact organizer at above e-mail or phone number by July 31, 2023.

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