



Blossom End Rot in Container Tomatoes



Why Are My Pea Plants Dying?



CROP Insights

- Observations
from the Field and
Research-Based
Recommendations



NY Sweet Corn Trap Network Report, 6/14/22

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Blossom End Rot in Container Tomatoes

Judson Reid, Cornell Cooperative Extension, Cornell Vegetable Program

Locally grown greenhouse tomatoes are making their way to farm stands and produce auctions throughout the region this week. Consumers are eager to start summer picnics and celebrations, and if we are honest with ourselves, no celebration is complete without a few tomato slices. Growers are in a celebratory mood as well with high prices for these early fruit. Those returns are crucial to justify the investment in heat, particularly with record high fuel costs this year. There are a couple of growing methods that can magnify the benefit of heat inputs for tomatoes. One of these is to grow in containers such as pots or grow-bags.

Greenhouse tomatoes in containers will mature sooner than those grown in the soil, helping maximize yield during spring price peaks. With the full root-zone above soil, the heat inputs benefit the entire plant, not just the canopy (commonly the case in soil-based greenhouses). The warmer rootzone encourages more root growth, which means the crop has higher potential for nutrient uptake and yield.



Growing in containers maximizes the benefit of fuel inputs to heat early tomatoes as the entire rootzone is warm. Photo by Judson Reid, CCE Cornell Vegetable Program

About VegEdge

VegEdge newsletter is exclusively for enrollees in the Cornell Vegetable Program, a Cornell Cooperative Extension partnership between Cornell University and CCE Associations in 14 counties.

The newsletter is a service to our enrollees and is intended for educational purposes, strengthening the relationship between our enrollees, the Cornell Vegetable Program team, and Cornell University.

We're interested in your comments. Contact us at: CCE Cornell Vegetable Program 480 North Main Street, Canandaigua, NY 14224 Email: cce-cvp@cornell.edu Web address: cvp.cce.cornell.edu

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The next issue of VegEdge newsletter will be produced on June 22, 2022.

Accumulated Growing Degree Days, 6/13/22

Emma van der Heide, CCE Cornell Vegetable Program

Accumulated Growing Degree Days (AGDD) Base 50°F: April 1 - June 13, 2022

Location**	2022	2021	2020
Albion	591	601	473
Appleton	534	556	427
Arkport	474	509	402
Bergen	557	558	473
Brocton	584	613	489
Buffalo*	575	631	462
Ceres	457	516	401
Elba	530	537	447
Fairville	551	544	457
Farmington	560	580	474
Fulton*	546	535	464
Geneva	581	595	485
Hammondsport	555	560	471
Hanover	573	586	483
Jamestown	486	540	404
Lodi	663	544	502
Lyndonville	454	567	466
Niagara Falls*	603	581	454
Penn Yan*	595	624	498
Rochester*	573	592	481
Romulus	603	602	509
Sodus	607	615	441
Versailles	565	562	478
Waterport	516	536	442
Williamson	532	516	440

^{*} Airport stations

^{**} For other locations: http://newa.cornell.edu



This highlights some of the risks associated with container growing that favor Blossom End Rot. This dry rot of the fruit drastically reduces yield and increases labor cost, as the damaged fruit must be removed. Blossom End Rot is a localized calcium deficiency in the fruit that leads to cell break down on the far end of the tomato. In soil-based operations lack of rootzone moisture is the most common cause of Blossom End Rot. There is generally sufficient calcium in the soil and additional fertilizers are not the solution.

In containers, however, we not only have to monitor moisture, but also focus on higher calcium fertilizers as there is no calcium reservoir. Calcium nitrate is a 15-0-0 fertilizer, with many formulations containing 18% calcium. Injected around 150 ppm N, this material can maintain calcium levels in plant tissue. Note that there is no phosphorus, potassium, or micronutrients in calcium nitrate, so it must be alternated with another fertilizer containing those elements. Do not tank mix calcium nitrate with these other fertilizers as it can precipitate and damage injection systems.



Container grown tomatoes are at higher risk for Blossom End Rot due to low calcium and moisture, as well as pH and EC irregularities. Photo by Judson Reid, CCE Cornell Vegetable Program

The potting media in containers does not have the same moisture retention as a mineral soil. This means watering several times per day for most growers. Some like to include some level of field soil, compost, or peat moss in their potting mix to increase moisture retention. Container growers also need to monitor salt levels (EC) and pH, which can further reduce calcium uptake and lead to Blossom End Rot. A portable pH/EC meter can be used to collect irrigation leachate from containers. We would like to keep our pH close to 6.0 for containers and the EC around 2.0-2.5 millimho per centimeter (mmh/cm or dS/m). Values outside this range indicate leaching or fertilizer reduction (to lower EC) or further adjustments to the acid level in irrigation water (to adjust pH).

Why Are My Pea Plants Dying?

Julie Kikkert, Cornell Cooperative Extension, Cornell Vegetable Program

Are your pea plants yellow and wilting or are they just plain dead? You can probably blame too much rain this spring. Peas are one of the least tolerant crops to waterlogged soils, with changes in their cellular structure being observed within hours of sitting in water. These plants are "gasping" for oxygen which is important in cell division, growth, and the uptake and transport of nutrients.

If the peas didn't die outright from waterlogging, the damage can inhibit future root growth, subjecting the plants to injury during hot, dry periods because the root systems are not developed enough to support the top growth. Furthermore, saturated soils and damaged roots favor the development of diseases. Plants weakened by other stresses such as soil compaction or herbicide damage are more susceptible to root rot pathogens, making the cause of crop decline difficult to pinpoint.

Several pathogens alone or in combination can cause root rot symptoms in peas. Fusarium cortical rot (*Fusarium solani f. sp. pisi*) has been the most prevalent disease of peas in Western NY in recent years, followed by Fusarium wilt and near wilt (*F. oxysporum f. sp. pisi*) (G. Abawi, Cornell). These pathogens only infect peas and you will only see these diseases if peas have been grown in a field before. These fungi can survive for a very long time in soil. Root and stem rots can also be caused by *Rhizoctonia* and *Pythium spp.*, which can affect a number of other vegetable crops as well. If that isn't enough, pea roots can also be infected with Thielaviopsis and Aphanomyces spp.

To check for root rot, look at plants whose oldest leaves are yellowing and dig them up with a trowel or shovel. Discoloration and shriveling of stems and roots are the symptoms. Root symptoms are variable but often diagnostic of pathogen(s) involved. For instance, if you scrape away at the lower stems and roots, and find a brick red color, it is an indication of Near Wilt. Healthy root systems should be plump, have a good color (not dark brown/black), and contain numerous small fibrous roots.

Best Practices to Keep Pea Roots Healthy

- Use high quality, pathogenfree, and fungicide treated seed.
- Plant in well-drained soils, free of compaction.
- Plant peas only once every four years in a field.
- Avoid fields with a history of severe root rot.
- Rotations
 with grain crops
 will improve soil
 structure and
 reduce
 disease
 severity.
- Use tolerant varieties.

CR P Insights

Observations from the Field and Research-Based Recommendations

GENERAL

Ragweed and mugwort can look similar when they are young.
Ragweed has a finer leaf. Ragweed is slower developing originating from seed. Mugwort is a perennial with a rhizome, tends to move into fields, and is easily propagated by cultivation. (See photo to the right.) – EB

BFFTS

Beet leaf miners are evident in both high tunnel and field grown beets. They may make the foliage unsightly for fresh market bunched beets, but otherwise don't affect the roots. See the June 16, 2021 VegEdge, for more information on management. (See photo to the far right.) – JK



Ragweed has finer leaves (top) than mugwort (bottom). *Photo: Elizabeth Buck, CVP*



Tunneling from beet leaf miner in a beet leaf. Photo: Julie Kikkert, CVP

COLE CROPS

Early cabbages have nice sized heads on them, beginning to tighten up. Planting continues. Hot days are good for reducing cabbage maggot survival in the soil and subsequent damage. The warm humid nights accompanying those days are however bad for head quality of spring broccoli. Varietal selection is the best tool for broccoli. – EB

CUCURBITS

Striped cucumber beetles like whoa. Not seeing any bacterial wilt yet; that takes some time after infection to become apparent. All the while those black and yellow menaces move around your field, liberally spreading their nasty bacteria-laden backwash with every bite. – EB

LETTUCE AND GREENS

Lettuce crops are looking nice out there. Flea beetles and leps (aka lepidopterans, aka worms, aka caterpillars) have generally been well controlled on the brassica greens. – EB

Tarnished plant bugs (TPB) are keying in on the heavy ribbed romaine and white chard; they'll feed on many greens. In lettuce, the injury shows up mainly along the midrib and leaf stems causing most visible when the leaf tissue turns rust-colored or leaves scabs. When alfalfa is being cut nearby, TPB will look for new hosts to feed. Row cover over lettuce and other crops is a reasonable deterrent. Check the 2022 Cornell Integrated Pest Management Guidelines for a list of chemical spray options.

NOTE: Tarnished plant bugs attack a wide assortment of vegetables and small fruit. Presently, strawberries are particularly at risk. TPB feed

on strawberry fruit and bloom,
which causes misshapen Photo: OMAFRA
fruit. For more information on TPB on strawberries,

see: https://blogs.cornell.edu/berrytool/strawberries/
strawberries
<a href="mailt





Tarnished plant bug damage to lettuce (left) and TPB adult (right). Photos: Judson Reid, CVP

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ONIONS

The majority of the direct seeded onion crop is at 3-5 leaf stage in Elba and Oswego and 2-4 leaf stage in Wayne. Earliest transplants have 1-1.5" bulbs. Check your transplanted onions at 7-10 leaf stages to see if they are starting to bulb. Ideally, for early onion thrips control, two applications of Movento/Senstar should be applied 7-10 days apart between early bulb swell and 1" bulbs. After this, the efficacy of Movento declines considerably. We recommend applying Movento/Senstar when thrips pressure is 0.6 to 1.0 thrips per leaf or at early bulb swell, whichever comes first. Thrips and Botrytis leaf blight (BLB) pressure remained low this week with the odd field reaching the spray threshold of 1.0 BLB halo lesions per leaf. BLB halo lesions have been detected in most fields with at least 3 leaves. Mancozeb 1 lb/A can be applied for BLB halos at first detection, but once pressure exceeds 2 BLB halos/leaf, the rate needs to be increased for it to be effective. — CH

This is the time of year when weed escapes can exceed the height of the onion crop if not controlled. Last week when onions were in 2.5-4 leaf stages, higher rates of post-emergent herbicides were applied to control weed escapes for good. Generally, the size limit for weed escapes that can be controlled with post-emergent herbicides is 3-4". Unfortunately, less than ideal conditions for post-emergent herbicides last week resulted in 15% or higher crop injury in some cases (Figs 1 & 2). Applying Buctril (a.i. bromoxynil, tradenames Broclean, Brox, etc.) Goal 2XL/tender and Chateau to onions when foliage is wet or soft (e.g. not much waxy buildup following cloudy rainy weather), humidity is high and/or soil surface is wet, and/or when onions are under stress (such as from saturated soil conditions), can increase crop injury. Also, in very general terms, onion injury may be aggravated by lower spray volume and fine droplet size, making some sprayer set ups more injurious than others. I personally have had best results for crop safety and weed control with 40 gpa and medium droplet size (with my backpack sprayer). It is often a choice between the lesser of the two evils: 1) out-of-control weeds that will reduce yield and require expensive and destructive hand weeding, vs. 2) herbicide injury that could hurt the onions. Fortunately, weed control in the fields that sustained high injury is fantastic – if the onions are going to get hurt, the weeds better be dead. If onion injury is 10% or more, you should give the onions a break to recover before applying more post-emergent herbicides (if at all). – CH





Figure 1. Post-emergent herbicide applications of Goal 2XL + Buctril resulted in excellent weed control that killed pigweed and ragweed up to 6". Unfortunately, the onions also sustained significant injury when these herbicides were applied in sub-optimal conditions. *Photos: Hoepting*





Figure 2. Necrotic spotting caused by post-emergent herbicides Chateau and/or Goal 2XL. The herbicide kills the plant cells that it comes in contact with and then the healthy cells continue to grow around it, which causes the onion plant to twist, kink and curl. Usually, onions grow out of this injury just fine. What is more damaging is when whole leaves are burned up (not shown). *Photos: Christy Hoepting, CVP*

Looking forward to seeing you at the Muck Onion Twilight Meeting this Thursday, June 16 at Williams Cattle Farm in Wolcott, at 4 pm – rain or shine! – CH

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PEAS

There are some very nice-looking processing pea fields out there, but some are starting to show symptoms of root rot with yellow lower leaves (or the whole plant) and stunting. Hot, dry weather will cause plants with poor roots to go downhill fast. Dig up some plants to look at the roots and compare them with healthier plants. See the article on page 3. – JK

POTATOES

Colorado potato beetles and potato leaf hopper adults are out in potatoes. Insecticides applied to seed or at planting should help control early populations. – ML

TOMATOES

Corn earworms are already active in many locations, earlier than we typically see them. Corn earworms are also called tomato fruitworm. Without silking corn the adults will lay eggs on other hosts, meaning that early tomatoes in tunnels could be at elevated risk. It is worth scouting these high value crops for caterpillar pressure. You will not be able to spot the eggs, they are too small.

Also seeing some **aphids** and **Colorado potato beetles (CPB)** in tomatoes. The CPB are often limited to a few adjacent plants rather than a widespread problem. – EB



Colorado potato beetle eggs on tomato. Photo: Elizabeth Buck, CVP



Colardo potato beetle larvae feeding on tomato. *Photo: Elizabeth Buck, CVP*

Upcoming Events

Cattaraugus Fresh Market Vegetable Meeting

June 29, 2022 (Wednesday) | 6:30 pm - 8:30 pm Henry D. Stutzman Farm, 7700 East Flats Rd, East Otto, NY 14729

Produce walk will feature peer-to-peer learning. All attendees should wear long pants. Free to attend. 2.0 DEC credits requested in categories 1a, 23. Contact Elizabeth Buck for more information: 585-406-3419, emb273@cornell.edu

Orleans Fresh Market Vegetable Meeting

July 6, 2022 (Wednesday) | 6:00 pm - 8:00 pm

Curvin Martin Farm, 12829 Eagle Harbor, Knowlesville Rd, Albion NY 14411

Produce walk will feature peer-to-peer learning. All attendees should wear long pants. Free to attend. 2.0 DEC credits requested in categories 1a, 23. Contact Elizabeth Buck for more information: 585-406-3419, emb273@cornell.edu

Chautauqua Vegetable Grower Meeting

July 12, 2022 (Tuesday) | 6:30 pm - 8:30 pm Hidden Valley Produce, 324 Warren Rd, Frewsburg, NY 14738

Produce walk will feature peer-to-peer learning. All attendees should wear long pants. Free to attend. 2.0 DEC credits requested in categories 1a, 23. Contact Elizabeth Buck for more information: 585-406-3419, emb273@cornell.edu

Lake Erie Regional Produce Meeting

July 13, 2022 (Wednesday) | 5:15 pm dinner followed by the educational field walk from 6:00 - 8:00 pm Agle's Farm Market, 7952 Gowanda State Rd, Eden, NY 14057

Pre-registration for dinner required by NOON on July 8th to Elizabeth Buck: 585-406-3419, emb273@cornell.edu

NY Sweet Corn Trap Network Report, 6/14/22

Marion Zuefle, NYS IPM Program; from http://sweetcorn. nysipm.cornell.edu

Statewide, 7 sites reported corn earworm (CEW) catches this week.

European corn borer (ECB)- E was caught at 4 sites and ECB-Z was caught at 2 sites. Degree day accumulation for ECB-E puts their development at peak spring moth flight for most sites. For fields that are in early tassel emergence, scout for signs of eggs, larvae and feeding damage in the emerging tassel. Separate the leaves and look into the tassel for signs of feeding, frass or larvae. The treatment threshold at tassel emergence is 15% infested plants. ECB egg masses are usually located on the underside of the leaf along the midriband consist of 10-35 flattened eggs that overlap like fish scales. Eggs take approximately 100 base 50 degree days to hatch. Egg masses will change from white to cream to black as they age. When they appear black they are in the "black head" stage and will most likely hatch with 24 hours.

European corn borer (bivoltine) development estimated using a modified base 50F degree day calculation

Development Stage	Accumulated Degree Days				
First Generation					
First spring moths	374				
First eggs	450				
Peak spring moths	631				
First generation treatment period	800-1000				
Second Generation					
First summer moths	1400				
First eggs	1450				
First egg hatch	1550				
Peak summer moths	1733				
Second generation treatment period	1550-2100				

WNY Pheromone Trap Catches: June 14, 2022

Location	ECB-E	ECB-Z	ECB Hybrid	CEW	FAW	WBC	DD to Date
Batavia (Genesee)	0	0	NA	0	0	0	630
Bellona (Yates)	NA	NA	NA	NA	NA	NA	651
Collins (Erie)	NA	NA	NA	NA	NA	NA	583
Eden (Erie)	0	0	NA	13	NA	NA	620
Farmington (Ontario)	0	0	NA	0	0	0	651
Geneva (Ontario)	0	1	0	1	0	0	646
Hamlin (Monroe)	NA	NA	NA	NA	NA	NA	588
Leroy (Genesee)	NA	NA	NA	NA	NA	NA	624
Lyndonville (Orleans)	0	0	NA	5	0	0	584
Oswego (Oswego)	NA	NA	NA	NA	NA	NA	543
Panama (Chautauqua)	NA	NA	NA	NA	NA	NA	527
Penn Yan (Yates)	0	0	0	0	0	0	625
Portville (Cattaraugus)	NA	NA	NA	NA	NA	NA	567
Ransomville (Niagara)	0	0	NA	3	0	0	628
Seneca Castle (Ontario)	2	0	0	0	0	0	613
Williamson (Wayne)	NA	NA	NA	NA	NA	NA	531

ECB: European Corn Borer; CEW: Corn Earworm; FAW: Fall Armyworm; WBC: Western Bean Cutworm; DD: Degree Days; NA: not available

Average Corn Earworm Catch			
Per Day	Per Five Days	Per Week	Days Between Sprays
<0.2	<1.0	<1.4	No spray (for CEW)
0.2-0.5	1.0-2.5	1.4-3.5	6 days
0.5-1.0	2.5-5.0	3.5-7.0	5 days
1-13	5-65	7-91	4 days
over 13	over 65	over 91	3 days

Add one day to the recommended spray interval if daily maximum temperatures are less than 80F for the previous 2-3 days.

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VegEdge is the highly regarded newsletter produced by the Cornell Vegetable Program. It provides readers with information on upcoming meetings, pesticide updates, pest management strategies, cultural practices, marketing ideas and research results from Cornell University and Cornell Cooperative Extension. VegEdge is produced every few weeks, with frequency increasing leading up to and during the growing season.

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