



# VEGE

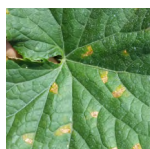
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Volume 18 • Issue 14 • July 13, 2022



The Post-Harvest Practices Garlic Competition – And the Winner Is...

PAGE 1



Alert: Cucurbit Downy Mildew is Knocking on Our Door

PAGE 8



Japanese and Asiatic Beetles Busy in the Fields

PAGE 8



Tips for Managing Too Little Water

PAGE 9

## The Post-Harvest Practices Garlic Competition – And the Winner Is...

Christy Hoepting, Cornell Cooperative Extension, Cornell Vegetable Program

### Post-harvest Practices Vary Widely Among New York Garlic Growers

Some New York growers top the plants to varying lengths before curing, while others cure whole plants. Curing may take place in barns/sheds, high tunnels or outside, either in direct-, partial- or with no sunlight. During curing, garlic may be hung, boxed, layered or piled in many different configurations with highly variable temperature and ventilation regimes. Similarly, garlic may be stored under dozens of scenarios. Likewise, garlic quality can vary widely from firm tightly wrapped healthy white bulbs to lightweight, diseased bulbs with baggy and discolored wrapper leaves.

### Put to the Test

In 2019 and 2020, we conducted a post-harvest practices garlic competition where a planting of German hard neck garlic was divided up among 13 and 24 different curing/storage regimes. As soon as possible after harvest, 100-200 bulb samples of this garlic were distributed to different growers who were instructed to cure and store the garlic samples exactly as they would their own. The garlic samples were collected in early October and evaluated for several quality traits. This project generated a massive amount of data, which has now been summarized. It is our intention to have the data vigorously statistically analyzed for significant differences and relationships. At this time, we can share some trends and insights from our first look at the data summary.



Photo: Christy Hoepting, CCE Cornell Vegetable Program

continued on [page 3](#)

## 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.

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VegEdge is published 25 times per year, parallel to the production schedule of Western New York growers. Enrollees in the Cornell Vegetable Program receive a complimentary electronic subscription to the newsletter. Print copies are available for an additional fee. You must be enrolled in the Cornell Vegetable Program to subscribe to the newsletter. For information about enrolling in our program, visit [cve.cce.cornell.edu](http://cve.cce.cornell.edu). Cornell Cooperative Extension staff, Cornell faculty, and other states' Extension personnel may request to receive a complimentary electronic subscription to VegEdge by emailing Angela Ochterski at [aep63@cornell.edu](mailto:aep63@cornell.edu). Total readership varies but averages 700 readers.

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# Contents

The Post-Harvest Practices Garlic Competition – And the Winner Is...	1
Accumulated Growing Degree Days, 7/11/22.....	2
CROP Insights.....	6
Alert: Cucurbit Downy Mildew is Knocking on Our Door.....	8
Japanese and Asiatic Beetles Busy in the Fields .....	8
Tips for Managing Too Little Water .....	9
Upcoming Events .....	10
Veg Pest and Cultural Management Field Meetings for Auction Growers .....	10
Niagara County Twilight Meeting .....	10
NY Sweet Corn Trap Report, 7/12/22.....	11
Contact Us.....	12

The next issue of VegEdge newsletter will be produced on July 20, 2022.

## Accumulated Growing Degree Days, 7/11/22

*Emma van der Heide, CCE Cornell Vegetable Program*

### Accumulated Growing Degree Days (AGDD)

Base 50°F: April 1 - July 11, 2022

Location**	2022	2021	2020
Albion	1143	1198	1123
Appleton	1073	1102	1040
Arkport	967	967	955
Bergen	1093	1102	1089
Brocton	1120	1140	1089
Buffalo*	1130	1211	1128
Ceres	921	984	925
Elba	1034	1052	1050
Fairville	1052	1059	1057
Farmington	1067	1107	1084
Fulton*	1034	1067	1090
Geneva	1110	1146	1118
Hammondsport	1063	1081	1066
Hanover	1104	1122	1090
Jamestown	968	988	940
Lodi	1227	989	1127
Lyndonville	995	1113	1094
Niagara Falls*	1185	1159	1093
Penn Yan*	1147	1212	1152
Rochester*	1128	1149	1119
Romulus	1139	1175	1149
Sodus	1164	1169	1043
Versailles	1076	1075	1059
Waterport	1060	1083	1064
Williamson	1032	1046	1026

\* Airport stations

\*\* For other locations: <http://newa.cornell.edu>

**Bulb quality characteristics included:**

- % shrink (difference between harvest and post-storage bulb weight)
- Bulb density
- Bulb firmness
- Tightness of wrapper leaves
- Bulb color with white being most favorable
- Fusarium disease (culls in October, Fusarium clove coverage after storing in cool and humid conditions until December, and Fusarium clove coverage after storing in warm and dry conditions until January/February)
- Black mold in October
- Bulb quality (shrink, sprouting, bulb firmness and overall quality) after 4.5 months in cold storage (44°F, range 35-59°F/ 85% RH, range 56-95°F) from early November to late March.

All of these categories were ranked using a scaled system, and then the total “rank score” was used to determine which entry resulted in the highest quality garlic.

**Best Treatment Cured in Greenhouse, Stored in Steel Barn, Both with Natural Ventilation (Fig. 1)**

Two of the top three highest ranking treatments in 2019 and the top-ranking treatment in 2020 were from the same farm.

- Topping prior to curing and storage varied and included tops on, 1.5” and 6” tops.
- Curing conditions: In a high tunnel (with shade cloth in 2019) with the sides rolled up and the doors open (natural/passive ventilation, no fans) in a single layer on top of wooden pallets.
  - Temperature and relative humidity fluctuated a lot from 54-123°F (average 75°F) in 2019 and from 65 to 106°F (average 80°F) in 2020, and from 35-59°F (average 44%) in 2019, and from 26-87% (average 66%) in 2020.
- Storage conditions: In a steel barn
  - In a pile 5 layers deep just inside an open door (natural ventilation) in 2019.
  - In plastic bins on a counter with the doors to the building closed (poor ventilation) in 2020.
  - Temperatures never dropped below 50°F, and averaged 65°F in 2019 and 70°F in 2020, while relative humidity was in the 70s and 80s in 2019, and in the 60s in 2020.
  - Storage conditions fluctuated more in 2019 when the door of the steel barn was open then when the doors were closed in 2020.
- In each year, there was **another treatment at this farm that was cured and stored identically to the top performing treatments that ranked poorly overall** (12th out of 14 in 2019; 19th out of 24 in 2020). The poor ranking of these treatments was due to high incidences of Fusarium disease and consequently less firm bulbs. **It was interesting that the conditions that resulted in the best quality bulbs also resulted in issues with Fusarium in 2 out of the 5 cases (= 40% of the time).**



Figure 1. Post-harvest practices implemented for the first-place winner of the post-harvest practices garlic competition. Top: Curing conditions consisted of laying the garlic in single layer on wooden pallets in a high tunnel with sides and doors open (natural ventilation). Lower left: Storage conditions consisted of laying the garlic in a 3-ft high pile on a pallet box inside an open door of a steel barn. Lower right: Garlic cloves on October 13 after curing, storage, trimming and cleaning. *Photos: Christy Hoepfing, CCE Cornell Vegetable Program*

### Fusarium Favored by Different Conditions

- Fusarium clove coverage was 3-times higher following clove storage at room temperature in paper bags than when cloves were stored in plastic bags in the fridge (~ 40 °F, RH unknown) in both years. In the paper bags, the average temperature was 63 °F (range 60-69 °F) and average relative humidity was 41% (dry).
- In the October evaluations, the treatments with the highest levels of Fusarium had different curing/storage conditions that ranged from hot and dry to cool and damp.
  - We had a treatment staged to result in poor quality garlic by curing and storing it on a damp basement floor with the tops on and poor ventilation. The temperature stayed between 66 and 68 °F, and the relative humidity was the highest in the trial (average 95%, range 75-100%). In both 2019 and 2020, this treatment resulted in the highest levels of disease (Fusarium and black mold).
  - Alternatively, we had a cool and dry treatment in 2019 that resulted in lowest disease (both Fusarium and black mold) in the trial. It was cured in front of an air conditioning vent (active ventilation) where the temperature ranged from 58-76 °F (average 66 °F) and relative humidity ranged from 48-71% (average 58%). **The comparison between these two treatments illustrates the importance of keeping garlic dry to avoid disease.**
  - The treatment that resulted in the second-highest level of Fusarium in both trials was stored under the warmest conditions in the trial (in a greenhouse with 2" tops and fans /active ventilation) (Fig. 2). During storage, this garlic experienced wide fluctuations in temperature and relative humidity from 49-123°F (average 73°F) and 14-95% (average 64%).
- The data need to be mined to identify specific post-harvest conditions/practices that favor Fusarium disease.



### Eriophyid Mites Thrived in Dry Conditions at Room Temperature

- Almost all (91%) of the cloves that were stored in dry conditions at room temperature (average 63°F, 41% relative humidity) for the Fusarium clove coverage evaluation, were infested with Eriophyid mites (Fig. 3).
- Alternatively, no E. mites were detected when cloves were stored in plastic bags in the refrigerator (not measured, but probably ~ 40 °F) for Fusarium clove coverage evaluation, or in the bulbs that were stored for ~20 weeks in cold storage (average 43.8°F, 85% RH).
- The literature states that optimum conditions for E. mites are 77°F at 85-90% RH with reproduction ceasing below 43°F.
- Since the relative humidity was optimum in the fridge and cold storages, it was most likely the lower temperatures that halted E. mite infestation in these conditions. It was interesting to see how abundantly E. mites proliferated under the dry conditions, however.



Figure 3. Garlic clove infested with Eriophyid mites, which is characterized by white mealy texture on the surface of the clove. Also, the dry scale easily comes off as the clove is slightly dehydrated. The actual mites cannot be seen with the naked eye. Photo: Sarah Caldwell, Cornell Vegetable Program

### No Consistent Trends Between Topping and Not Topping Garlic During Curing

- The data needs to be mined to determine what effect topping garlic has on the different aspects of bulb quality, but at a glance there were no consistent trends in whether topping or not topping garlic resulted in better quality garlic.
- The purpose of curing garlic is to remove moisture from the stem, roots and protective scales to form a papery suit of armor to protect the cloves from desiccating and from disease. Curing is complete when the outer skins are dry and crispy, the neck is constricted, and the center of the cut stem is hard.
  - **It is important to note that it will take longer to cure garlic that has not been topped (Table 1).**
  - We suspect that garlic was kept in the curing conditions too long in some of the treatments, especially when curing conditions were warm/hot, active ventilation was used (fans) and tops were short (3" or less), which may have resulted in excessive moisture loss, less tight wrapper leaves and less firm bulbs.

**Table 1. Total time required to cure garlic topped to 2-3" vs. 6-7" (Callahan et. al. 2020).**

Curing Condition		No. of Days to Complete Curing	
		Topping Condition of Garlic During Curing	
Temperature	Relative Humidity	Topped to 2-3" necks	Topped to 6-7" necks
80°F	90 %	19 days	33 days
80°F	70%	11 days	19 days
105°F	90 %	7 days	9 days
105°F	70 %	6 days	7 days

### Washing or Rainfall During Curing Reduced Bulb Quality and Increased Disease

- In a direct comparison of washing vs. not washing garlic prior to curing with all other conditions the same (topped 4", single layer on mesh screens in closed building with fans, stored in crates in wooden barn with doors open), the washed garlic was of similar bulb quality as the unwashed garlic at the October evaluation, except that the washed bulbs were significantly less dense.
- After the long-term cold storage evaluation, washed garlic was of poorer bulb quality (washed: placed 12th; not washed: placed 3rd), had more disease (washed: placed 15th; not washed: placed 3rd) and was of poorer quality overall (washed: placed 14th, not washed: placed 4th).
- Another treatment that was cured with tops on several layers deep in the field in direct sunlight had the worst bulb quality in the trial at the October evaluation with low bulb density as well as some of the least firm bulbs, least tight wrapper leaves and highest levels of disease in the trial.

### Curing Garlic in 1-ton Boxes with Heated Forced Air Reduced Bulb Quality

- In 2020, there were two treatments that were cured in 1-ton pallet boxes on a drying wall with heated forced air (active ventilation), which placed 17th and 20th out of 24 overall. These treatments were topped to 2" and 6" necks.
- At the October evaluation, the bulbs had above average % shrink and below average density, firmness and tightness of wrapper leaves.
- One of these treatments had the hottest temperatures (average 89°F, range 75- 110°F) and driest conditions (average 58%, range 30-100% RH) during curing in the trial (although with very wide fluctuations in RH), which also had high levels of black mold (51%) and Fusarium (10%) at the October evaluation.
  - This treatment was also topped to 2" necks and it is possible that the shorter necks were possibly more prone to drying out and could pack tighter in the box, creating conditions more favorable for disease.

### Majority of Grower Practices Resulted in High Quality Garlic

No matter the post-harvest practices used by our grower cooperators, the garlic came back in fairly high quality. If you are happy with the quality of your garlic, do not change a thing. If your garlic has softer bulbs and looser wrapper leaves than you would like, consider adjusting your curing or storage conditions. Perhaps, it is being kept in the curing phase for too long and is being overdried. Maybe, you can cure it slower with natural ventilation instead of with fans, or top the bulbs to leave a longer neck (e.g. 6"). If you have issues with E. mites showing up after storage, consider storing your garlic under cooler conditions. In very general terms, high humidity (> 85%) for prolonged periods of time, no matter the temperature can exacerbate diseases. ●

# CROP Insights

*Observations from the Field and Research-Based Recommendations*

## BEETS

Non-irrigated beets continue to struggle with the hot, dry conditions. Irrigated beets are growing well. There has been very little leaf disease to date. Late July is when we start to see Cercospora leaf spot (CLS) coming in, however, the weather and more open plant canopies do not favor CLS at this period. Reminder that there is a [Cercospora Leaf Spot of Table Beets](https://newa.cornell.edu/beet-cercospora-leaf-spot/) forecaster on the NEWA website at <https://newa.cornell.edu/beet-cercospora-leaf-spot/>. All the weather stations in our area have low risk of CLS from July 11-15th, except for Medina which had moderate risk on July 12-13th. You can look up the forecast numbers on your own at any time, but we will continue to download and report here in VegEdge or to the beet grower email list twice per week starting next week. – JK

## CUCURBITS

Powdery mildew is beginning to show up in early-planted summer squash, which is an indication that it's time to start scouting all cucurbits for this disease. Look for patchy white spots that resemble a dusting of flour on the leaf surfaces. Symptoms usually show up first on crown leaves and shaded lower leaves. Dry leaf surfaces and high humidity favor this disease. There are many labeled products for powdery mildew; keep in mind that the disease has developed resistance to some products. Fungicides containing FRAC 3 or pre-mixed FRACs 3 and 7 (e.g. Proline, Aprovia Top, and Luna Experience) are good choices. Vivando (FRAC 50) and Gatten (FRAC U13) also work well. Rotate fungicides for resistance management. – SC

## DRY BEANS

Mexican bean beetle (MBB) adults are starting to feed in dry beans. Once in a field, MBB can quickly defoliate plants. Treatment should be considered when there is 30-40% defoliation pre-bloom, or greater than 15% defoliation during pod-fill stages. Leafhoppers are showing up in dry beans, but Cruiser applications should continue to protect against damage. The presence of nymphs will indicate when the Cruiser application is no longer working. Earlier planted fields are starting to enter bloom, so white mold management should now be considered. An initial application of Omega 500F is recommended followed by a second application of Endura 70 WDG. The first application should be made at the early bloom stage. – ML



Mexican bean beetle adults will quickly defoliate dry beans and leave behind skeletonized damage to leaves. Photo: M. Lund, CCE CVP

### Western Bean Cutworm Report

Western bean cutworm trapping has begun at 12 locations in the region: Alexander, Avoca Hill, Avoca Valley, Caledonia, Churchville, Pavilion, Penfield, Penn Yan 1, Penn Yan 2, LeRoy, Wayland, and Wyoming. Most trap locations have started to collect low numbers of moths, and numbers are expected to increase over the next couple of weeks. Currently all trap locations are below the 50 cumulative moth threshold for scouting, and peak flight is expected around the end of July to early August. In addition to the WBC traps listed in the Sweet Corn Pheromone Trap Network Report, dry bean trap sites are being monitored this year (see table). This project is funded by the NYS Dry Bean Endowment and led by Margie Lund, CVP.

### Western bean cutworm (WBC) adult numbers by date for each dry bean trap location. Traps were set on 6/27/22.

Dry Bean Location	7/5/22	7/12/22	Cumulative WBC
Alexander (Genesee Co.)	0	1	1
Avoca Hill (Steuben Co.)	0	1	1
Avoca Valley (Steuben Co.)	0	2	2
Caledonia (Livingston Co.)	1	3	4
Churchville (Monroe Co.)	0	3	3
LeRoy (Genesee Co.)	0	2	2
Pavilion (Genesee Co.)	0	1	1
Penfield (Monroe Co.)	3	2	5
Penn Yan 1 (Yates Co.)	1	2	3
Penn Yan 2 (Yates Co.)	0	0	0
Wayland (Steuben Co.)	1	1	2
Wyoming (Wyoming Co.)	0	3	3

## ONIONS

Conditions are dry. All fields are now bulbing, and foliage remains green to their tips. During bulbing is the most critical timing for water in onion. Thus, onions are being irrigated where they can be and the differences between irrigated and

*continued on page 7*

non-irrigated onions with respect to plant growth is becoming more and more distinct. Although, even non-irrigated onion fields are looking good for how dry it has been. Perhaps the cool nights are contributing to the vigor of the crop. Harvest of the earliest planted early varieties of transplants is scheduled to begin this week.

Dry conditions have not been favorable for leaf diseases Botrytis leaf blight (BLB), Stemphylium leaf blight (SLB) and downy mildew. BLB halo counts were down this week with no new infections and several fields with practically no BLB. Although SLB spore colonization of necrotic leaf tissue (tips, outer leaves, necrosis caused by herbicides) and the odd target spots are detectable, this disease is quiet and behaving more as a secondary pathogen. Majority of growers are using protectants mancozeb and Bravo for disease control this week, while some are skipping fungicide applications altogether or stretching the spray interval from 7 to 10 days.

Despite the dry conditions, onion thrips are mysteriously still quite low. Most fields are still experiencing residual control of thrips from the double application of Movento/Senstar, with 1-2 week(s) ride with the “momentum of Movento” in several fields. When you are scouting for onion thrips and see mostly adults following/during Movento applications, this is an indication that Movento is still in the plant and working. Once you see plants with bursts of newly hatched larvae, that is an indication that the Movento is starting to “run out of gas”. Typically, you should wait until the spray threshold of 1.0 thrips per leaf is reached before making the next insecticide application following Movento. However, if you anticipate a significant influx from a nearby onion field that is about to be pulled or from a hayfield about to be cut, then you may want to apply an insecticide 2 weeks past the second application of Movento even if thrips are still below the spray threshold. This should guard against a dramatic jump in thrips counts, such as from 0.3 to 4.0 thrips per leaf. Iris yellow spot virus, which is vectored by onion thrips and typically starts to show up in July, has not yet been detected. – CH

### PEAS

The hot, dry weather is not favorable for pod set and fill. Continue to scout for aphids and possible diseases. – JK

### POTATOES

Leafhoppers and aphids are moving into potatoes. Low numbers of white flies and tarnished plant bugs were found too.

Simcast forecasting indicates that Fulton, Medina, and Versailles have reached the 30 blight units (BU) needed to trigger a spray for late blight this week, while Buffalo, Dansville, Fairville, Penn Yan, Rochester, Sodus, and Wellsville will surpass 30 BUs by the end of the week. Dry weather throughout the region has kept the threat of late blight low. However, preventative sprays should not be dismissed, especially in low-lying fields and where rows have closed. If the weather station closest to you has not yet reached 30 BU and the forecast indicates that it will in the next 2-3 days, a spray is still recommended. Because weather conditions can vary depending on topography and altitude, the recent disease information and disease forecasts will be most accurate very close to the weather station used. For locations that are not close to a weather station, forecast information should only be used as a *general indication* of how favorable weather has been for late blight. Nationally, late blight is in Florida. – ML

### SNAP BEANS

Processing fields without irrigation are growing very slowly. Growers are working hard to irrigate where the infrastructure is available. Leafhoppers and other insects generally build during warm, dry weather. The risk of white mold and other diseases is currently low, but should be watched in irrigated fields. Extreme temperatures can cause yield loss or split sets. – JK

### SWEET CORN

Some fields of processing corn were not able to be planted because of very dry soils in some of our region. – JK

### TOMATOES

Recent dry conditions have favored the two-spotted spider mite (TSSM), which is easily detectable in some field tomato plantings. Scout fields for this tiny, spider-like mite by looking for yellowing on leaves, especially lower leaves and in weedy areas. Flip the leaves over to check for TSSM on leaf undersides. With the naked eye this creature looks like a small moving dot, and you may see webbing on leaf undersides in an advanced infestation. Under a hand lens, the TSSM has 2 body segments, 4 pairs of legs, and 2 red-dish-brown spots on top. As TSSM is not an insect, many insecticides will not provide control. Apply products with miticide activity, such as Acramite (Group 20D), Agri-Mek (Group 6), or Portal (Group 21A). – SC ●

**Late Blight Risk Chart, 7/13/22**

Location	Blight Units 7/6-7/12 <sup>1</sup>	Blight Units 7/13-7/15 <sup>2</sup>
Albion	8	18
Arkport	0	10
Baldwinsville	0	10
Bergen	0	0
Brant	5	15
Buffalo	18	35
Burt	-	-
Ceres	21	26
Dansville	22	40
Elba	2	12
Fairville	24	35
Farmington	15	25
Fulton	34	54
Geneva	5	5
Hammondsport	0	0
Knowlesville	5	15
Lyndonville	13	23
Medina	33	43
Niagara Falls	11	28
Penn Yan	19	30
Rochester	20	37
Sodus	22	34
Versailles	31	41
Wellsville	24	42
Williamson	14	14

Calculated using a May 26 crop emergence date, last fungicide application July 6, cultivar Reba. Numbers in red indicate locations that have or will surpass the 30 BUs needed to trigger a fungicide application.

1 Past week Simcast Blight Units (BU)

2 Three-day predicted Simcast Blight Units (BU)

## Alert: Cucurbit Downy Mildew is Knocking on Our Door

Elizabeth Buck, Cornell Cooperative Extension, Cornell Vegetable Program

**Cucurbit downy mildew** is present on cucumbers in northern Ohio. **Yesterday, (Tuesday, July 12)** saw an appreciable risk of it **spreading across most of northern PA and bits of Chautauqua and Cattaraugus counties**. It is not currently known if the strain in Ohio will impact cantaloupes or other vine crops.

### Take Action Now

Given the geography of potential spread and roving rain showers, **growers in Chautauqua, Cattaraugus, Allegany should treat their cucumbers with an effective downy mildew treatment material as soon as you have suitable spray conditions**. Curzate is a good choice if rain/wind prevent spraying for a couple days. Growers slightly further afield (Erie, Genesee, Wyoming, Steuben) should keep cucumbers well covered with downy mildew effective protectants.

It take about 5 days after exposure for downy mildew symptoms to appear. **It is highly recommended that all cucumber fields be scouted twice a week**. Cantaloupe fields should be scouted and also treated with a protectant.

**If you suspect downy mildew, please contact CCE**. By reporting downy mildew, you are allowing us to give advanced warning to other growers and we will help you craft an effective, early-intervention management plan. There are numerous effective conventional products to treat cucurbit downy mildew. For organic production, keep the crop well-covered with copper. Oxidate and Serenade have effectively reduced sporulation and slowed progression in past trials. ●



Yellow, rectangular lesions on cucumber leaves are a diagnostic symptom of downy mildew. Photo: CCE CVP

## Japanese and Asiatic Beetles Busy in the Fields

Robert Hadad, Cornell Cooperative Extension, Cornell Vegetable Program

### Japanese Beetles

I think by now everyone recognizes Japanese beetles. Over the years (decades) the thought was that sooner or later, these pests would move westward, and the local populations would decrease. Well, they indeed have moved westward but the local populations seem to have remained. In some areas the numbers of beetles may vary from season to season and their choice of plant hosts might change (feeding can affect a wide assortment of host plants) but overall, they are a pest that seems to persist.

In the past week or two, adult beetles are showing up in vegetable plantings. They are **feeding on corn tassels and silks**. They are being **found in squash flowers**. **Green beans, basil, rhubarb, brassicas, peppers and asparagus can also be attacked**. Large infestations can cause leaf damage and in sweet corn, enough silk can be lost to affect ear fill.

Eggs are laid in grassy areas later in summer. Grubs emerge and feed on roots in the soil where they will overwinter. Adults emerge in mid-June to early July.

Management is difficult. Larvae can be some distance away from production fields and turf treatment is often not attempted. For sweet corn, some of the same chemical compounds used for sap beetles also work for Japanese beetles. Assail 30SG and Fastac CS are two examples. Sevin XLR Plus works on Japanese beetles and Asiatic beetles. Check the Guidelines for further information.

### Asiatic Garden Beetles

These beetles appear as smaller, brown or copper in color. The body shape is plumper than Japanese beetles. Asiatic beetles hide in the soil during the day, around plant crowns and roots. The adults feed on root crops such as onions, carrots, beets, turnips. Corn, cabbage, and peppers are also damaged. Larvae will feed on roots of these crops, as well. ●



Japanese beetle (left) versus Asiatic beetle (right). Photos from UMass Extension and Michael Reding, USDA Agricultural Research Service, Bugwood.org

# Tips for Managing Too Little Water

Elizabeth Buck, Cornell Cooperative Extension, Cornell Vegetable Program

As of last Thursday, U.S. Drought Monitor officially designated almost all of the Cornell Vegetable Program area as “abnormally dry”, which is their first stage of drought. It’s not hard to spot the corn rolling as you drive, particularly in the later plantings, and the ground cracks developing. Streams are running low and ponds are getting drawn down. The depletion of those surface water resources is quickly demanding a question be answered: How do I make the most impactful use of the water I do have?

1

## Watering Efficiency

Look for and fix leaks. Trickle tape is highly efficient. For overhead systems, watering at night reduces losses to heat and sun driven evaporation. Trade off: watering at night can increase disease risk. Rather windy conditions drive droplets off course and increase evaporation. If your crop can wait until night when the wind often drops, you’ll increase your watering efficiency. But when it is that windy and dry, the crop often can’t wait, especially big leafy crops like pumpkins and winter squashes on plastic.

2

## Know Your Soils

Do you have high or low organic matter? What’s your field’s innate ability to hold water? Higher OM fields will provide more water storage and improve the infiltration of any irrigation or rain.

Where are the high patches in a field, or the sandier, gravelly areas? The heavier ground? Can the irrigation be adjusted to deliver variable amounts of water to these zones? With a reel this will take manual monitoring and adjustment of the reel speed and could be a strategy if you have big soil differences along the length of a pass.

For trickle, do you have a single header watering several kinds of crops? Say you have a couple cuke rows and some cabbages or kale. The cole crops don’t need as much water as the cukes and tolerate drought much better, so consider shutting off their header valves every other watering or part way through an irrigation.

Compaction, amount of ground cracking, and prior root development will play a role, too. Compacted ground keeps roots shallow and more dependent on supplemental water. Soils prone to cracking can drop a lot of the water you give below the bulk of the root zone. Plants that were in wet spots earlier and crops that have always been regularly irrigated to soils saturation or sufficiency tend to have shallower root systems. Crops with shallow feet are much more dependent on regular irrigation and show more stress when you shift to maintaining the soil water in a somewhat-of-a-deficit condition.

3

## Know Your Prioritization

What are you most economically important crops? Which crops are in their most important stage for receiving water? Which crops are unlikely to be economic performers and could be sacrificed? If you’re choosing between a bean field about/in flower, and a bean field with poor stand and past root rot, it is a better economic move to water the plants in the critical flowering stage to ensure that you realize your yield potential.

4

## Know When it is Time to Quit Watering a Crop

Have a zucchini crop filled with powdery and a second planting coming into production? Or a cuke crop blasted with downy? Fresh market beans that you’ve already been through 2 or 3 times? Quit watering them and if they’re diseased mow them off. On the upside, you’ll save time and money by no longer needing to manage the diseases and pests and realize labor savings by forgoing an inefficient (small amount, lots of hunting) harvest.

Yes, it can be a gut-punch to sacrifice a planting or give up on something while there’s still a bit of fruit coming. But think longer-term and think economically, not emotionally. Save your water for areas with better economic performers.

5

## Don't Get Too Far Behind

There are some soils and crops that are very difficult to catch up on water status. Fields that are cracked, crusted, or that have a heavy dust mulch can become difficult to move water into the root zone. Some crops can tolerate living in the somewhat stressful, slight water deficit conditions. Other crops have a very hard time recovering to full water status once they become overly dry.

6

## Use Monitoring Tools

I like the [Cornell Climate Smart Farming Water Deficit Calculator](#) for a monitoring tool. It’s user-friendly, it only takes 3-5 minutes to set up a field, you can save many fields in the tool, and you can enter your irrigation events. Each setting has a little info button to help you quickly make the right choices. Very helpful for the crop groupings.

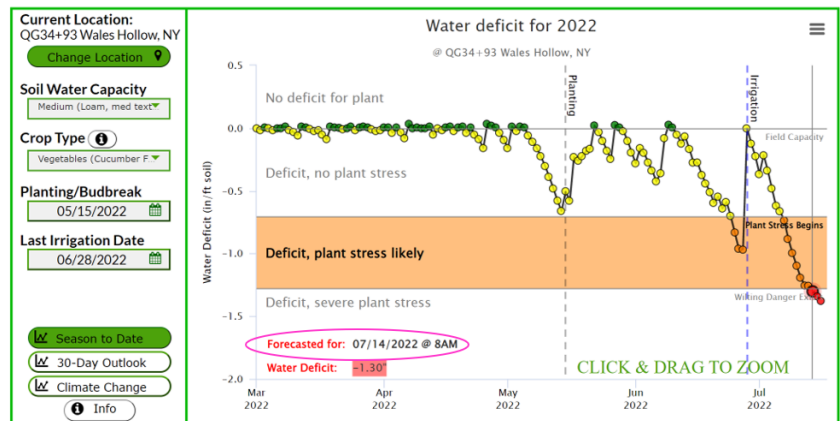
*continued on page 10*

The CSF Water Deficit Calculator uses your soil texture, crop category, and high-resolution weather data as the base of the model. Importantly, it takes evapotranspiration into account, meaning it models more water loss from the soil on those hot, windy days. The tool then forecasts the amount of water stress your plant will experience and groups the water depletion into categories that I'll paraphrase as "green – full water", "yellow – sufficient", "orange – I'm stressed, but I'll live", and "red – water me yesterday" categories.

The goal is to water when you enter the orange zone and never let the crop get into the red zone. The orange zone may be insufficient for some crops at some stages. The orange zone would be too dry for corn during pollination, beans during flowering, or fruiting tomatoes that aren't used to infrequent or variable water availability.

If you know your most water-sensitive stages and crops, you can use the CSF Water Deficit Calculator to help you decide which field has to get water today and which one has some room to go before it gets into a troublesome zone. Of course, nothing is better than going out and sticking your hand in the soil, but this tool can provide a good starting point.

Every time it rains the tool calculates if the rainfall was enough to bring the soil completely or only partially back to full water status. If you enter an irrigation date, a dashed vertical blue line will appear. Right now, the tool assumes you're irrigating back to field capacity. This is a flaw that you'll have to take into consideration. There are plans to add a new feature with the next update that will allow growers to input the amount of their last irrigation to further increase the accuracy of the tool. Case studies have shown that the current version of the CSF Water Deficit Calculator is still a useful irrigation management tool. ●



The current CSF Water deficit calculator readout for a loamy field of cucumbers located in East Aurora (Wales), NY planted on May 15, 2022. The dashed vertical gray planting date line and vertical dashed blue line for date of last irrigation, which was well timed in the mid-orange zone. The solid gray line is the forecasted water deficit. Today, July 13, the crop is at the very bottom of the stressful, pre-wilt orange zone. Tomorrow severe stress is forecast to begin (red zone). The crop should be irrigated today, July 13, and as fully as possible. *From the Cornell Climate Smart Farming Water Deficit Calculator*

## Upcoming Events

### Vegetable Pest and Cultural Management Field Meetings for Auction Growers

July 19, 2022 (Tuesday) – *notice the new date for this meeting* | 6:00 pm - 8:00 pm  
L. Stoltzfus Farm, 4825 Rt 414, Romulus, NY 14541 (Seneca County)

July 22, 2022 (Friday) | 7:00 pm - 9:00 pm  
Ray Hoover Farm, 4341 Rt 14A, Rock Stream, NY 14878 (Schuyler County)

July 26, 2022 (Tuesday) | 7:00 pm - 9:00 pm  
L. Weaver Farm, 3396 Depew Rd, Canandaigua, NY 14424 (Ontario County)

These courses will demonstrate pest management in fresh market vegetables in both field and greenhouse (high tunnel) vegetables, primarily for those growing for wholesale auction. A hands-on demonstration of weed, insect and disease identification in vegetables including management options such as inter-row cover crops, grafting and where appropriate, spray options will be used to educate growers. Judson Reid, Senior Extension Associate with the Cornell Vegetable Program, along with CCE staff will instruct participants and facilitate peer-based learning. Details on each topic will focus on field observations at these farms.

Free to attend. DEC recertification credits will be offered (2.0 credits in categories 10, 1a, 23; 1.75 credits in category 24). For more information, contact Judson Reid at 585-313-8912.

### Niagara County Twilight Meeting

July 28, 2022 (Thursday)  
Rickard Nursery Growers and Harris Farm Market, Gasport, NY 14067

Topics include fresh market field walk on pest and disease management, laser scarecrows, powdery mildew management, phytophthora mitigation. Contact Elizabeth Buck for more information: 585-406-3419, [emb273@cornell.edu](mailto:emb273@cornell.edu)

## NY Sweet Corn Trap Report, 7/12/22

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

Statewide, Western bean cutworm (WBC) was caught at fifteen sites. WBC usually peaks the last week of July into the first week of August. Numbers are still low but more sites are reporting catches. Flight for WBC is only near  $\leq 5\%$  flight completion based on degree-day accumulation.

The flight for all species has been very low so far this season.

Average Corn Earworm Catch			Days Between Sprays
Per Day	Per Five Days	Per Week	
<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.

### WNY Pheromone Trap Catches: July 12, 2022

Location	ECB-E	ECB-Z	ECB Hybrid	CEW	FAW	WBC	DD to Date
Batavia (Genesee)	0	0	NA	0	0	1	2155
Bellona (Yates)	0	0	0	0	0	0	2201
Collins (Erie)	NA	NA	NA	NA	NA	NA	2053
Eden (Erie)	0	0	NA	0	0	1	2149
Farmington (Ontario)	2	0	NA	2	0	10	2198
Geneva (Ontario)	0	0	0	1	0	1	2177
Hamlin (Monroe)	NA	NA	NA	NA	NA	NA	2092
Leroy (Genesee)	0	0	NA	2	0	0	2140
Lyndonville (Orleans)	0	1	NA	1	0	1	2065
Oswego (Oswego)	0	0	NA	1	0	1	1956
Panama (Chautauqua)	0	0	NA	0	0	5	1895
Penn Yan (Yates)	0	1	0	1	0	0	2136
Portville (Cattaraugus)	0	0	NA	0	0	3	1904
Ransomville (Niagara)	0	0	NA	1	0	0	2131
Seneca Castle (Ontario)	0	0	0	1	0	1	2130
Williamson (Wayne)	0	0	0	NA	NA	NA	1963

ECB: European Corn Borer; CEW: Corn Earworm; FAW: Fall Armyworm; WBC: Western Bean Cutworm; DD: Degree Days; NA: not available; DD: Degree Day based on accumulation starting March 1 (base 38F) for WBC emergence ●

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# Cornell Cooperative Extension Cornell Vegetable Program

480 North Main Street  
Canandaigua, NY 14424



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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Cornell Vegetable Program**

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