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VEGEdge

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Gray Mold on Tomatoes and Flowers in Greenhouses, May 2025

Judson Reid, Cornell Cooperative Extension, Cornell Vegetable Program

Flowers are a symbol of accolade, tribute and memory worldwide. Recently, we've celebrated two holidays that honor important people in our lives: Mother's Day and Memorial Day. However, weeks of cool, cloudy weather have cast a shade on these two important holidays. This particularly impacts greenhouse growers who depend on the May double-M celebration for sales of flowers. Hanging baskets in particular, are experiencing slow retail movement as the persistent precipitation keeps consumers from frequenting greenhouses. These baskets of petunias, geraniums and calibrachoa are often grown above tomato crops.

The longer these baskets hang, the more shade they cast on the tomatoes below and the more spent flowers fall. Shade, relative humidity and falling flowers are often the catalyst for Botrytis outbreaks. Botrytis is the Latin name of the genus of fungus that causes Gray Mold. This disease is aptly named as it produces a mass of gray, moldy spores that rot foliage, flower and fruit. In cloudy weather, crowded greenhouses can see widespread outbreaks of the disease, wasting much of the marketable yield of tomato.

Reducing relative humidity via ventilation and leaf pruning and plant density are the first steps in managing Botrytis. During spells of cloudy weather, a fungicide application may be the next option to prevent fruit losses.

Hanging baskets cast shade on tomatoes below and drop flowers. These falling flowers are often the catalyst for Botrytis outbreaks. *Photo: J. Reid, CCE*

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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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Decree (FRAC group 17) has a label for indoor tomatoes (prohibited from field use for Gray Mold) with 0 days pre-harvest. This is a unique fungicide label, that also includes ornamentals. In this way, the product has the advantage of a labeled use in a greenhouse mixed with flowers and tomatoes.

However, since Decree is a greenhouse only label, growers may be inclined to consider other options that could also be used on field produce. Luna Tranquility (FRAC groups 7 and 9). An advantage with this product is the inclusion of potatoes, onions, strawberries and apples on the label. From the label "For greenhouse uses apply only in well-ventilated plastic tunnel houses or glass houses. Ventilate for at least 2 hours after application. Prevent intense sunlight exposure for several hours after application."

Brown lesions with circular rings are characteristic of Botrytis Gray Mold infections on tomato foliage (left). The spores of Botrytis Gray Mold often rot fruit and foliage together. (right). *Photos: J. Reid, CCE*

Some growers are seeking less conventional fungicides such as Regalia, as material derived from plant extract (Giant Knotweed). Regalia does include both tomatoes and bedding plants on the label, at the same application rate as tomatoes. It is important to view this and similar sprays as preventative and not curative materials. Regalia is OMRI (organic materials) listed. ●

Calantha Now Registered in New York for Colorado Potato Beetle Control: Tips for Effective Use

Marcelo Dimase and Brian Nault, Cornell University, Cornell AgriTech

Calantha®, a new RNAi-based insecticide targeting Colorado potato beetle (CPB), is now registered for use in New York potato fields (https://www3.epa.gov/pesticides/chem_search/ppls/094614-00002-20250306.pdf). Its active ingredient is ledprona, which belongs to IRAC Group 35, the first product in this group to reach the market. This is the first time a double-stranded RNA (dsRNA) insecticide has been registered for commercial agricultural use in New York State. With cases of CPB resistance to conventional insecticides, Calantha offers a novel mode of action and a promising new tool for growers—when used correctly. Success of using Calantha depends heavily on application timing, especially because only two applications are permitted in New York State. Below we describe our previous research that helped us determine when best to make the two applications.

Application Timing Evaluation

We conducted field trials in Wayne County, NY in 2023 (a low CPB pressure year) and 2024 (a high-pressure year) to evaluate Calantha's performance in reducing larval development and defoliation at the labelled rate (16 fl oz per acre) when initially applied at four different times based on CPB development. These studies were conducted before EPA limited the number of applications to only two sprays.

Table 1. Application timing and frequency of Calantha sprays for New York field trials in 2023 and 2024.

Timing of first application and total number of sprays	2023 Dates	2024 Dates
Adult colonization (4 applications)	June 8, 15, 22, 29	June 4, 12, 19, 25
10% Egg hatch (3 applications)	June 15, 22, 29	June 12, 19, 25
7 days after egg hatch (3 applications)	June 22, 29, July 6	June 19, 25, July 2
14 days after egg hatch (2 applications)	June 29, July 6	June 25, July 2

CPB Suppression and Defoliation

In both years, **the best results were consistently observed when Calantha was applied at adult colonization or around 10% egg hatch.** These timings reduced large larvae populations and defoliation compared to untreated plots or later initial applications. However, suppression was more complete in 2023, when CPB pressure was lower (Table 2, Figure 1). In 2024, under high CPB pressure, delayed applications resulted in heavy defoliation and higher numbers of large larvae, indicating that waiting too long to spray Calantha will result in poor CPB control (Table 3, Figure 2).

These results align with Calantha's mode of action: the product is most effective against small larvae (less than 5 mm in length). Calantha has no activity on eggs, limited impact on adults, and reduced efficacy against large larvae (greater than 5 mm in length), which likely explains the increasing defoliation and reduced performance in later timings. Because the effects are not

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immediate, suppression can appear delayed after application—even though small larvae stop feeding within days of exposure and die gradually.

Table 2. Cumulative number of different CPB life stages per plant and maximum (max.) defoliation per plot for different application timings in NY in 2023 (low pressure).

Application Timing	Adults	Egg Masses	Small Larvae	Large Larvae	Max Defoliation (%)
Untreated Control	2.5	0.8	7.8	13.2	18.5
Adult colonization	0.4	0.6	7.1	7.7	6.0
10% egg hatch (EH)	0.6	0.9	12.9	9.9	6.0
7 days after EH	0.7	0.8	6.8	12.9	9.8
14 days after EH	3.3	0.9	7.4	17.4	24.1

Table 3. Cumulative number of different CPB life stages per plant and maximum (max.) defoliation per plot for different application timings in NY in 2024 (high pressure).

Application Timing	Adults	Egg Masses	Small Larvae	Large Larvae	Max Defoliation (%)
Untreated Control	19.7	1.1	48.7	27.4	97.7
Adult colonization	18.3	0.9	54.9	5.8	21.1
10% egg hatch (EH)	23.5	1.1	44.5	11.3	45.1
7 days after EH	27.5	1.0	48.9	15.2	55.4
14 days after EH	7.5	1.0	42.1	21.5	75.4

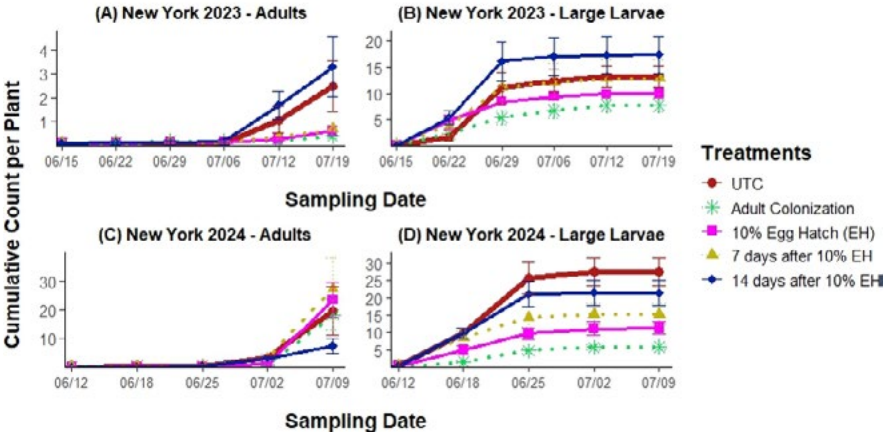

Figure 1. Cumulative count of CPB adults and large larvae in New York in 2023 (A and B, respectively) and 2024 (C and D, respectively).

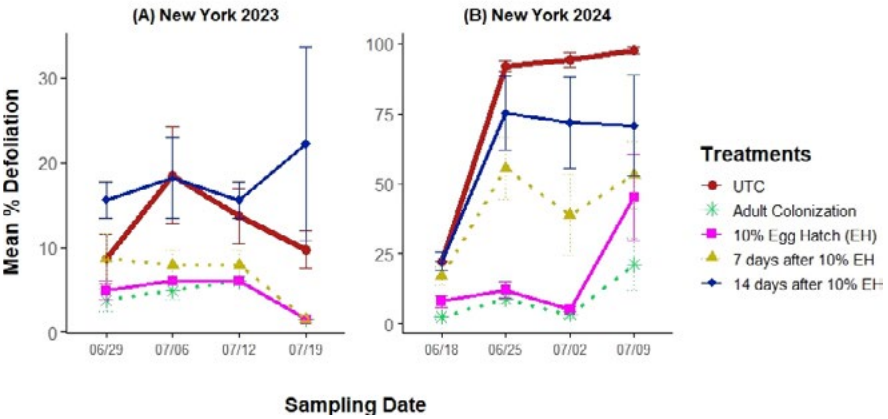

Figure 2. Defoliation by sampling date in New York in 2023 (A) and 2024 (B).

When used as part of a season-long IPM program, Calantha can be a valuable tool to reduce reliance on older chemistries and improve long-term sustainability of CPB management. Because Calantha is specific to CPB, its best use is during the first generation when other important pests such as aphids and potato leafhoppers are typically not present. This allows growers to avoid early-season broad-spectrum sprays and better conserve beneficial insects.

Best Practices for Calantha Use

- **Target the spring generation:** Use Calantha in June to manage the spring generation rather than in July and August for summer generations.
- **Scout early:** Look for CPB adults and egg masses from late May to early June.
- **Start applications early:** Apply Calantha when adults are present and when about 10% of the egg masses have hatched.
- **If pressure is high, with more than 25 adults per 50 vines, spray at adult colonization.**
- **If pressure is low or intermediate, with less than 25 adults per 50 vines, wait until 10% egg hatch to spray.**
- **Follow the label:** In NY, Calantha is limited to two applications per year. Applications must be at least 7 days apart.
- **Plan your program:** If control is not acceptable with only two applications, follow with another product like Agri-Mek SC or Rimon 0.83EC. Because Calantha only targets CPB, a follow-up insecticide may be needed later in the season for pests like aphids and potato leafhoppers.
- **Rotate modes of action:** To avoid resistance, do not rely on Calantha as your only tool—rotate with insecticides from different IRAC groups.

Bottom line

Our results indicate that Calantha must be applied early to achieve effective control of spring generation (first-generation) CPB. **Only two applications of Calantha are permitted in New York and this may be appropriate to manage low to moderate infestations of CPB. However, additional applications of another product may be expected to manage high infestations of CPB.**

Disclaimer: Changes in pesticide registrations occur constantly and human errors are possible. Read the label before applying any pesticide. The label is the law. No endorsement of companies is made or implied.

Managing the Invasive Leek Moth

Elisabeth Hodgdon, Cornell Cooperative Extension, Eastern NY Commercial Horticulture Program

The leek moth is a relatively recent invader of New York, first documented in Plattsburgh in 2009. Over the past 15 years, the pest has spread throughout northern NY and Vermont, with newer reports of the pest in the Capital District of NY and in Maine and New Hampshire. Caterpillars of this pest burrow into and feed on the leaves and bulbs of allium crops, causing crop loss. All allium crops are susceptible to damage, including onions, shallots, scallions, leeks, and chives. Effective timing of management strategies, including application of insecticides, biological control, and netting, are informed using flight information from monitoring traps.

Adult leek moth are small brown moths with a distinctive white patch on their wings (Fig. 1). They overwinter as either adults or pupae in crop debris or in protected areas and begin flying in April. Trapping in northern New York this season found moths in early April, with the flight ending in late May. A second flight occurs in late June through early July, and a third in late July through early August. Adults lay eggs on the leaves of allium crops, where they hatch into larvae (caterpillars) that feed on and burrow into the leaves. Leaves with "windowpane" feeding damage can be split open to reveal the caterpillars and frass inside (Fig. 2). Long season alliums, such as fall leeks, are most susceptible to economic damage because they are present in the field for all three generations of this insect. Pheromone monitoring traps provide important information on the timing of flights and management practices.

Figure 1. Leek moth adult with characteristic white spot on wings. *Photo: Dan Olmstead, Cornell*

Figure 2. Yellow leek moth caterpillar feeding on chives with dark frass and windowpane feeding damage. *Photo: E. Hodgdon, CCE*

Insecticide application should be timed approximately 7-10 days after peak flight, before young larvae burrow into the leaves. A threshold of 5% damaged plants can also be used to inform spray decisions. Warrior II, Radiant SC, and Lannate LV (conventional), and Entrust and DiPel DF (organic) are labeled for leek moth in NYS with 2(ee) labeling*. Netting over top of allium crops is effective when placed over crops immediately after transplanting, as long as seedlings are not infested. Because the moths are nocturnal, netting can be removed during the day for weeding and other activities. New research from the University of Vermont has shown that the commercially available egg parasitoid, *Trichogramma brassicae*, can reduce leek moth damage to onion crops by 50% when applied during the leek moth's second flight, which is the most damaging for onion crops. Additionally, their research found that topping onions up to 1" above the shoulder before bringing crops in for drying and storage nearly completely reduced leek moth caterpillar boring holes and damage to onion bulbs without harming storage ability. On farms with large populations of leek moth, some growers opt to forgo leek production in favor of shorter season alliums to avoid economic losses from this pest. Crop rotation is an important consideration for managing leek moth as well, as the moths are relatively weak flyers. A combination of integrated pest management strategies, including the aforementioned cultural, physical, biological, and chemical controls, allow for effective management of this pest on both conventional and organic farms.

Leek moth has spread east and south in recent years. If you suspect you have leek moth, contact your local extension office for confirmation and to help document the current distribution of this insect. For more information on leek moth, see the University of Vermont's Leek Moth Information Center webpage and the Ontario Ministry of Agriculture and Rural Affairs leek moth webpage.

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CROP Insights

Observations from the Field and Research-Based Recommendations

GENERAL

Black Cutworm (BCW): Our field crops colleagues have pheromone traps set up in our region. They have reported significant flights of BCW moths each week since May 5. The growing degree day (GDD) model suggests that egg hatch began last week. Newly hatched larvae cannot chew entirely through a leaf and create a "window pane" effect. Somewhat more mature cutworms create small pinhole damage. During the fourth instar, ½-inch larvae chew through the stem at or just below the soil surface. Although we still need some GDD for the May 5 and later flight populations to reach the cutting stage it is time to start watching fields. Beets, carrots, cucurbits, leafy greens, peas, potato, beans and sweet corn are all susceptible. For photos and more information see https://vegento.russell.wisc.edu/pests/black-cutworm/ – JK

Effects of Wet Weather on Weed Control *from Lynn Sosnoskie, Cornell Weed Science:*
Pre-emergence (PRE) herbicides. While rainfall is needed to incorporate soil-applied, PRE herbicides, heavy rainfall can have negative impacts:

- Heavy rainfall can lead to the loss of treated soil, reducing herbicide effectiveness.
- Weed seeds can disperse through running water, leading to new infestations.
- Herbicides may concentrate in low-lying areas, increasing the risk of crop injury in those zones.
- Uneven herbicide distribution results in inconsistent weed control.
- Wet conditions can delay crop emergence and/or stress crops, decreasing their vigor and ability to compete with weeds. It may also make the crop less able to metabolize herbicides, leading to increased injury.

Post-emergence (POST) herbicide use can also be affected:

- Most POST herbicides require 1–8 hours of dry weather after application; rainfall during this period can reduce herbicide performance.
- Weeds that are stressed by wet conditions may be less responsive to herbicide treatments.
- Weeds that survive initial control efforts may re-root, regrow and become harder to manage.

Cultivation is also affected:

- Saturated soils delay cultivation and reduce its effectiveness (i.e., clumps that protect seedlings), while increasing the risk of soil compaction.

ASPARAGUS

Orange rust pustules are starting to appear on the cut stems of susceptible varieties. Rust has several successive life cycle stages throughout the year in asparagus. The control objective is to interrupt progression of the stages. This can usually be managed in the post-harvest period with application of fungicide. If rust begins appearing on the marketable portions, it may be necessary to consider application during cutting. However, options are more limited during harvest and we are approaching June, so consider whether that might be a cue to wrap up for the year.

COLE CROPS

Flea beetle and caterpillar damage are occurring in the field.

CUCUMBERS

On Tuesday I saw a handful of stripped cucumber beetle adults emerging from a field that had vine crops last year. The overwintering generation will be out in force soon. This could coincide with transplant timing for a lot of cucurbits because of the rain and cool temperature delays. Be sure to have a protection plan ready and keep an eye out for them. You, too, can scout last year's fields for stripped cuke beetles, or set out a sacrificial six pack near your last planting of last year's cucurbits.

LETTUCE AND GREENS

Slugs and snails will be a big problem for many farms. Mollusk baits can be the most useful but with new batches of slugs and snails turning up, there stands to be a fair amount of damage this spring.

Lettuce rots. If putting out new plantings, provide more space to allow for greater air flow and for the sun (wherever it is) to reach the soil and dry things down quicker. – RH

ONIONS

The onion crop just came out of 4 days of rainy and cloudy weather, then saw the sun for a couple of days and rain is in the forecast again! As is continued cool temperatures. Thankfully, last week's rain was gentle and less than 1 inch to not much more than 1 inch. Much of the direct seeded crop is 1.25- 1.5 leaf stage with some fields in various stages of flag leaf stage, and barley nurse crops are dying or dead. Earliest planted transplanted onions have 7 leaves.

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According to degree day models available on NEWA (Network for Environment and Weather Applications: https://newa.cornell.edu) onion maggot has or will reach peak emergence of the overwintering generation this week. Adult females live for 2-4 weeks and will begin to lay eggs 7-10 days after they emerge, so we should begin to see early onion maggot damage very soon and certainly within the next couple of weeks. When environmental conditions are cool and wet as they have been and will continue to be, the parasitic fungus *Entomophthora muscae* and infect and kill large numbers of flies (Fig. 1). I saw a fly infected with this fungus this week and am hopeful that one benefit of this miserable spring may be some natural biological control of onion maggot. Apon close inspection, the infected flies can be found dead clinging to the leaf tips of onion plants.

Figure 1. Nature's biological control of onion fly. Light colored stripes are thousands of spores of a parasitic fungus *Entomophthora muscae* that infected and killed this only fly. Such infected flies can be found on the tips of onion leaves where they go to die so that they can shower their spores to infect even more flies. *Photo: C. Hoepting, CCE*

It is also **time to hand weed volunteer onion plants and ideally remove them entirely from onion fields, because volunteer onions serve as sources of overwintering diseases Stemphylium leaf blight (SLB) and Iris yellow spot virus (IYSV)**. In a recent study (2022-2023) conducted in Elba muck by Cornell Plant Pathology Ph. D student Natalia Pineros-Guerrero, SLB was detected in 59% of volunteer onion plants (range: 20-91% per field). Genetic analysis revealed that the SLB population in volunteer onion plants was identical to the SLB population later found in the onion crop. Furthermore, genetic analysis revealed that the SLB population in the onion crop was very similar between 2022 and 2023. Thus, volunteer onions are an important source of inoculum for SLB epidemics (Fig. 2). Unfortunately, volunteer onions are not the only source of inoculum (other sources include crop residue and alternative hosts) and their removal will not prevent SLB disease entirely (but I would like to think that it would help – doesn't every little bit help?). Also, onion thrips often colonize volunteer onions before they move into the onion crop and can easily pick up IYSV from the volunteer onions and then transmit the disease to the onion crop. I've often wondered if this is why we see IYSV hot spots? When onions become infected early in the growing season with either of these diseases it can increase the severity of the disease throughout the growing season. – CH

Figure 2. The necrotic leaf tip of a volunteer onion plant that is exhibiting symptoms of Stemphylium leaf blight (tan spots and black sporulation. *Photo: C. Hoepting, CCE*

PEAS

Seed rot is ruining many plantings. Seed maggots are also causing problems. The wet soil is allowing for root rots to take down some of what plants have emerged. If the weather turns and brightens, another planting may be successful but June can be known for bouts of hot temperatures so this could make the pea crop be unproductive. – RH

POTATOES

Colorado potato beetles are starting to come out. Adults will feed on volunteer potatoes or weed hosts before making their way to potato fields. See article on the effective use of Calantha for Colorado potato beetle control on page 3.

SQUASH

Young summer squash under plastic in the lake plains came through the cold well and is looking nice. I've not seen crop that was set out under row cover or further south in the hill country where temps run colder.

SWEET CORN

The Cornell IPM Sweet Corn Blog https://sweetcorn.nysipm.cornell.edu/ contains a wealth of information for managing pests in sweet corn. There are links to videos about how to scout sweet corn and set up traps as well as links to fact sheets with pest identification, biology and management information. Again this year, the Cornell Vegetable Program is collaborating with Cornell IPM to monitor the flights of European corn borer, Corn ear worm, fall armyworm and western bean cutworm. Trap reports begin this week and are posted on the blog site. You can sign up for a direct email when reports are released by creating a free subscription – please see the sign-up information on the right-hand side of the blog page. For more information contact Marion Zuefle (Cornell IPM) at mez4@cornell.edu. – JK

TOMATOES & PEPPERS

Early field plantings in warm regions made it through the chill last week with minor to tolerable damage. Most crop is not yet in the ground and is getting large in cells. You can slow them down by kicking them out to harden off and running them on the drier (not dry!) side. That technique relies on giving less water more often instead of one big shot of water each day.

Soil Test Interpretation for Urban Growers: Part I – Organic Matter, Nitrogen, Potassium

Lori Koenick and Judson Reid, CCE Cornell Vegetable Program, Sam Anderson, CCE Harvest NY, and Jonathan Russell-Anelli, Soil and Crop Sciences Section, Cornell University

This two-part series focuses on how we interpret fertility information from soil tests for urban soils to make informed management plans and troubleshoot challenges. Part I discusses organic matter, nitrogen, and potassium considerations for soil management. Part II will follow in next week's VegEdge discussing pH, bulk density, urban high tunnels and contaminants.

How do urban soils differ? Why does this matter when interpreting soil test results?

Due to a history of human land use and ongoing activities, urban soils are often compacted, contaminated or of poor quality. Because of this, many urban growers produce crops in constructed soils. Urban agricultural soils are commonly referred to as "constructed" when they are made or heavily amended with materials brought in such as screened topsoil, compost, mulch, yard scraps and manures in raised beds. Due to smaller spaces, there are limited options for crop rotation on urban farms. It is possible for this continuous intensive production to lead to gradual reduction in soil fertility and tilth.

When compared to rural agricultural soils, urban agricultural soils are more likely to have a combination of higher organic matter, pH, contaminants and soluble salts, lower bulk density, and shallow depth. Soil tests are useful, and urban growers will need to adapt the results and recommendations to their urban setting.

It is useful to note that most commercial soil tests ask for the **soil name** or **texture** on the submission form. The labs use this information as the basis of their interpretation and recommendations.

Soil name is a classification that can be found in the Web Soil Survey from USDA-NRCS, yet it is important to note that most urban soils have the generic classification of "urban land."

Texture is the relative amount of sand, silt and clay particles in the soil; soil texture affects most of the chemical, biological and physical processes in the soil. Organic matter and rocks are not considered as part of a soil's texture.

Organic Matter – What is it and what does it mean if you have high organic matter?

Soil organic matter is a measure of the carbon-containing material that comes from living and dead organisms, or what may be simply described as the living, the dead, and the very dead. Organic matter affects nearly all other soil properties, including nutrient cycling, soil structure, and water availability.

Constructed soils for urban agriculture often have a high proportion of organic matter as compared to their rural counterparts, usually in the form of large volumes of compost. In New York City, urban ag soils typically have organic matter ranging from between 8 and 15%, with some as high as 30%. There are many advantages to the high organic matter in urban ag soils including:

- Well-balanced water retention and drainage
- Low occurrence of compaction
- Improved tilth
- Steady supply of some macronutrients (especially phosphorous, calcium, and magnesium) and most micronutrients
- Slow release of nitrogen as organic matter decomposes

Compost typically provides many of the nutrients needed for plant growth, but vegetables and other crops may benefit from more potassium (K) and nitrogen (N) than compost alone can provide. For example, many urban farmers see improved yields by adding potassium sulfate at spring planting.

However, with high levels of organic matter, we may also see some challenges:

- May dry out fast, especially highly organic soils that are newly constructed or frequently tilled
- High pH related to excess nutrients
- Excess N becomes available often in late spring/early summer
- With excess nitrogen and phosphorous, there is potential for leaching, downstream eutrophication, and other water quality concerns

Nitrogen: The Jolly Green Giant of Nutrients

Nitrogen (N) is often the nutrient of primary management concern for urban and rural farmers. There are several reasons why:

- N is among the soil nutrients used in highest quantity by produce crops (up to several hundred pounds per acre per year!)
- Decomposing organic matter releases N, but rates of availability depend on soil microbial activity.
- N is highly influential in shoot production, which influences the yield potential of all fruits and vegetables, as well as the plant's ability to make use of other soil nutrients.
- N is highly mobile and often will escape the root zone through volatilization (in the air) or leaching (down through the soil profile) before it is taken up by the crop, resulting in economic and environmental losses.

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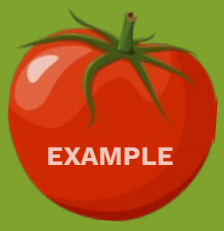
Urban farmers face some unique challenges around N management. Since most urban ag soils are high in organic matter, there is a considerable bank of N in the soil itself. However, it is difficult to predict when soil microbes will 'mineralize' this N into plant available forms such as nitrate N. We often observe a flush of nitrate N released from high organic matter soils in late spring, when temperatures and moisture favor mineralization, resulting in excessive vegetative growth, leading to foliar disease and delayed maturity of fruiting vegetables.

For this reason (and to avoid loss) we do not recommend large additions of N fertilizers to high organic matter (OM) soils. Bulk forms of N, such as feather or soy meal, are common fertilizers on rural organic farms, however the release of nitrates from these sources is similar to soils with high organic matter soil. We suggest more frequent but modest applications of soluble forms of N (such as side dressing blood meal), or where drip irrigation systems are in place, the injection of a soluble source of N at modest rates on a weekly basis to avoid excess levels and loss. Or for some urban growers, such as community gardeners, it may be acceptable to not apply any additional nitrogen.

How much N does organic matter release?

Estimates vary, but a safe assumption is that a soil with 1% OM will release around 10 lbs of N per acre per season. For example, an acre soil with 10% organic matter may release 100 lbs of nitrogen over the course of the season. Our challenge is knowing when this will be released and balancing it with crop demand. Crop demand beyond existing soil supplies can be estimated on a weekly basis. Taking the remainder of the N needs of the crop not met by mineralization, we can divide the amount of N desired by the anticipated number of weeks the crop will be in the ground.



How much fertilizer should an urban grower add to a tomato planting each week?

- ✓ **Tomatoes may need as much as 150 lbs of N per acre.**
- ✓ **An urban farm with soil with 10% OM releasing 100 lbs of N per season.**
- ✓ **The grower has 12-15-30 fertilizer on-hand.**
- ✓ **The tomato production area on the urban farm is 0.1 acres.**

Step 1: Calculate the Amount of Supplemental N to Meet the Needs of the Crop
For tomatoes that need 150 lbs of N per acre, with a soil having 10% OM releasing 100 lbs of N per season, the farmer will need to supplement 50 lbs of N to meet the needs of their tomatoes.

150 lbs/acre N needed - 100 lbs/acre N from the soil = 50 lbs/acre of N supplement

Step 2: Calculate the Weekly N Application Rate
Divide the needed amount (50 lbs/acre) over the lifespan of the crop.

You should account for reduced nutrient needs if your crop growth rate decreases at the end of it cropping cycle. In this example, tomatoes would easily have a 20-week lifespan if transplanted on May 1 and terminated on October 1. But their nutrient needs dramatically decrease 15 weeks after transplant, so we can estimate the nutrient needs over 15 weeks.

50 lbs/acre ÷ 15 weeks = 3.33 lbs/acre N per week

Step 3: Determine How Much Fertilizer is Needed
Not all fertilizer is the same so you will need to know how much of the desired nutrients are in the fertilizer. All commercially available fertilizers in the United States are required to provide nutrient weight percentages on the fertilizer bag or bottle. This usually comes in three consecutive numbers, where each number represents the percentage of nitrogen (N), phosphorus (P) and potassium (K), or N-P-K. For this example, a fertilizer labeled 12-15-30 contains 12% nitrogren (N), 15% phosphorus (P), and 30% potassium (K).

How much of this fertilizer (unknown value of **X**) with 12% N would we need to reach our goal of 3.33 lbs/acre per week?

0.12(**X**) = 3.33 lbs/acre N per week

Divide both sides of the equation by 0.12 to solve for **X**:

X = 3.33/0.12 = 27.75 lbs of fertilizer per acre per week

Step 4: Adjusting the Amount of Fertilizer for the Area Size Being Fertilized
Most urban farms are not growing on the acre scale, so it is essential to be able to calculate on the actual acreage or square footage* being fertilized. An urban farm with a tomato production area of 0.1 acres would need 1/10 of the amount of 12-15-30 to achieve a weekly rate of 3.3 lbs/acre N.

27.75 lbs/acre fertilizer ÷ 10 = 2.775 lbs of fertilizer per week

To achieve even more effective nutrient uptake, alternating with clear water irrigations, growers could further divide this rate into 2-3 applications per week to create a more uniform soil status and more productive plants.

* It should be noted that many nutrient recommendations now come with an additional 100 sq foot recommendation. To calculate how much fertilizer is needed for any size smaller urban farm, keep in mind there are 43,560 square feet to an acre. So, when given acre application recommendations, just divide by 43,560 and multiple that by the actual square feet of growing area.

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Nitrogen's Pal: Potassium

Potassium (K) in another 'macro nutrient', and like N, crops use hundreds of pounds per acre per year. K is essential for flower development and fruit quality. When crops are low in potassium, foliage will become discolored, and the plant drops flowers and fruit. Our data reveals that this is the most common deficiency in urban vegetable crops, particularly tomatoes.

K is nitrogen's pal, as we can calculate application rates based on anticipated levels of N. For example, tomatoes in their fruiting stage will use K at almost 3X the rate of N. For vegetative crops, like collards and kale, this ratio is closer to 1:1.

Fortunately, K is not quite as mobile as nitrogen in the soil, and we can pre-plant apply K in bulk forms based on soil tests and projected crop demand. K uptake is influenced by soil pH and the relative value of other crop nutrients in the soil. Avoiding excess levels of phosphorus, magnesium and calcium will also help achieve potassium at appropriate levels in the crop. Further, it is important to consider bulk density when deciding on K applications because lab analysis in high OM soils with low bulk density will be overestimate K levels.

Look forward to Part II of this article in next week's VegEdge discussing pH, bulk density, urban high tunnels and contaminants.

These articles are based off the Urban Farm Soil Test Interpretation resource available on the Cornell Vegetable Program website: CVP.CCE.CORNELL.EDU

This work is supported by SoilNOW and funded by a USDA NRCS Conservation Innovation Grant "Best Management Strategies for High Organic Soils in Urban and Rural Vegetable Production."

Outreach on Wash Water Sanitizer Availability?

Robert Hadad, Cornell Cooperative Extension, Cornell Vegetable Program

This is more of a question on what growers are using and whether or not they are having issues with product availability. Towards mid-fall last year and again this spring, there have questions about obtaining produce wash water sanitizers. These sanitizers are used for adding the proper concentration of sanitizer into dunk tanks, produce washing bins, or for stock batches with inline injectors.

There seemed to be a problem with obtaining products with the active ingredients of peracetic acid/hydrogen peroxide mixtures. Products with these ingredients include Tsunami and SaniDate. SaniDate 5 had been a common product labelled for use on food contact surfaces and for some uses for microbial control in wash water. However, wording on the label and other factors caused the manufacturer to take that particular product off the shelf. The company, BioSafe, came back and replaced it with SaniDate 15 that is good for certified organic operations and has a complete label with the important paragraph required for the use growers really need.

It is as follows: TREATMENT OF RAW, POST HARVEST FRUITS AND VEGETABLES AND PROCESSING WATERS

FOR REDUCTION AND CONTROL OF PATHOGENIC BACTERIA IN RAW, POST-HARVEST FRUIT AND VEGETABLE PROCESS AND WASH WATERS (REGULATED BY US EPA)

- Use SaniDate 15.0 to reduce (in 90 seconds) 99.9% of pathogenic bacteria
- Escherichia coli O157:H7, Salmonella enterica, and Listeria monocytogenes in processing waters used for washing fruits, and vegetables.

The label then goes onto to list the instructions for use including concentrations needed, mixing times, and produce contact times.

Questions for our growers:

- *"Are you having issues in finding this or similar products available on the shelves of farm supply stores or where you usually purchase the sanitizer from?"*
- *"Would it be of benefit to have a company representative visit your farm to get a handle on how much you use in a season and getting the product on time before your run out?"*
- *"What supply companies do you normally purchase these products from?"*

We would appreciate hearing from you. To answer these questions, you can email Robert Hadad rgh26@cornell.edu or call 585-739-4065.

Upcoming Events

Online Berry Office Hours

now - July 9, 2025 (Wednesdays) | 8:00 AM - 8:30 AM
via Zoom

We hope you will join berry specialists Anya Stansell and Heather Kase over Zoom to discuss berry production.

Join Zoom Meeting: https://cornell.zoom.us/j/98945641042?pwd=qtLxLuYLE4uKJrkglzIzz0s8PoOnkL.1. Meeting ID: 989 4564 1042; Passcode: 12345

Muck Donut Hour

starting June 3, 2025 (every Tuesday) | 8:30 AM
corner of Transit Rd and Spoilbank Rd in the Elba muck

All are welcome to join this 25+ year tradition of onion discussion. Contact Christy Hoepting for more info. 585-721-6953.

Webinar: Ag Co-ops for Small Farmers

June 11, 2025 (Wednesday) | 1:00 PM - 2:00 PM
via Zoom

Going it alone has pretty much been the mantra of farmers for many decades, though it wasn't always the case. The age of the Grange movement showcased what strong cooperatives could do for farmers when they worked together. NY FarmNet will be holding a webinar on farmer marketing cooperatives. The speaker is Nicole Tommell, Director of the Cooperative Enterprise Program at the Cornell Dyson School of Applied Economics and Management. She also serves as the Executive Secretary/ Treasurer of the Northeast Cooperative Council which services agricultural and financial cooperatives.

To register for this free webinar, go to https://cornell.zoom.us/webinar/register/WN_iEJ-IzvCRFaYvO67Ba1wXA

Muck Onion Growers Twilight Meeting

June 26, 2025 (Thursday) | 4:00 PM registration
John Dunsmoor Farm, Lake Elizabeth, Oswego, NY

Registration begins at 4 pm, dinner at 7 pm with a whole lot of education in between. This is the onion meeting of the year!

Small Fruit & Tree Fruit Twilight Meeting

June 26, 2025 (Thursday) | 6:45 pizza, 7:00 PM - 8:30 PM
Cornell Orchards, 709 Dryden Rd, Ithaca, NY 14850

Examine seasonal changes in tree fruit and berry crops, demonstrate scouting techniques, and discuss integrative pest management solutions to maximize the health and productivity of berry and fruit plantings. Please bring pictures or descriptions of pests you are concerned about on your farm.

This meeting will include Spanish Interpretation. Este mes en Español también.

1.5 DEC credits will be offered in categories 1a, 10, and 22.

Please arrive at 6:45 PM for Pizza and Soda and to sign-in for DEC credits. No pre-registration required; event is free to attend.

Cornell Cooperative Extension
Cornell Vegetable Program

480 North Main Street
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VEGEdge
YOUR TRUSTED SOURCE FOR RESEARCH-BASED KNOWLEDGE

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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 increased frequency leading up to and during the growing season.

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Cornell Cooperative Extension
Cornell Vegetable Program

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