Cornell Cooperative Extension

Eastern NY Commercial Horticulture Program

Vegetable News E-Alert ~ June 23, 2021

In this issue:

Be on the Lookout - Cucurbit Downy Mildew Confirmed in New Jersey!

by Chuck Bornt, CCE ENYCHP

This is probably the earliest I've heard of Cucurbit Downy Mildew, but if you are signed up for the alert system, you should have gotten an email yesterday warning you that CDM has been found and identified in cucumbers in Salem County, New Jersey. On top of that, the forecasting program indicates "*Moderate Risk in central and southern FL, southeast GA, northern DE, NJ, eastern PA, southeast NY, western CT, and western MA.* Low Risk for cucurbits in Long Island, east-central NY, eastern CT, RI." However, with yesterdays drizzly on and off showers and this morning's heavy dew, I would be sure to have at least a protectant on your cucumbers and melons, even if they are still very small.

I also cannot stress enough that you will need to get out there and start scouting your cucumbers. When scouting look for yellow spots on the upper sides of the leaves. When turned over, especially in the morning when there is dew present or damp conditions, you should be able to see a grayish/purply fuzzy growth opposite where the yellow spots are. CDM prefers cool, damp conditions – but with the possibility of all kinds of frequent showers popping up all over the region, the moisture and delivery of the spores will possibly be enough to get it started. According to our plant pathologist Meg McGrath, "Start with protectant fungicides alone when there is a risk of downy mildew for the specific crop based on the forecasting program. Include targeted fungicides when downy mildew is present." Protectant fungicides include chlorothalonil (Bravo Weatherstik, Praiz etc.) and mancozeb (Roper DF, Dithane etc.). Remember that any of the mancozeb products generally have a long pre-harvest interval and should probably be used on early stages of crop growth so you can avoid long delays in harvesting crops that are or will be ready. Targeted labeled materials include Ranman, Orondis Ultra, Orondis Opti, Omega, Zampro and should be combined with protectants and not used alone. For organic growers, Regalia plus copper or Actinovate is labeled for control but you must have the products on prior to the disease getting started. Here is the link to the table of registered fungicides with rates, REI's, PHI's, Fungicide Resistance Action Committee codes (FRAC) to help you rotate the different families of fungicides and notes about certain products etc. Remember to pay attention to the FRAC (Fungicide Resistance Action Committee) codes or the numbers that we include in the tables and that are on all the labels. Try to rotate or use the different codes to slow the onset of CDM resistance to these products.

For more information on Cucurbit Downy Mildew from Dr. McGrath, visit: https://www.vegetables.cornell.edu/pest-management/disease-factsheets/downy-mildew-of-cucurbits/

To visit and sign up for the Cucurbit Downy Mildew Forecast Program, go to: https://cdm.ipmpipe.org/

Table 1: Fungicides labeled for Cucurbit Downy Mildew. Most also labeled for Phytophthora Blight Control in cucurbits. Products in RED are labeled for organic use but you should check with your certifying agency to be sure. More organic controls can be found at: https://www.vegetables.cornell.edu/crops/cucurbits/downy-mildew-of-cucurbits/list-of-biopesticides-for-organic-production/

Fungicide	FRAC Code	Recommended Rate/Acre	REI	PHI	Seasonal Limits	Adjuvant Recommendations
Chlorothalonil (Bravo Weather Stik, Praiz etc.)	M5	1.5 -2 pints*	12 hours	See label	21 pints per acre	Please note the "Special Eye Irritation Provisions" on the labels. *When using in combination with a Powdery Mildew material, 2-3 pints should be used.
Ranman 400 SC[1] *(cyazofamid)*	21	2.75 fluid ounces	12 hours	0 days	6 sprays	Organosilicone or non-ionic surfactant. No more than 3 consecutive applications
Mancozeb (Dithane DF, Roper DF etc.)	M3	See your specific product label for this information.				
Orondis Ultra[1] *(oxathiapiptplin + mandipropamid)*	49 + 40	5.5 – 8.0 fluid ounces	4 hours	0 days	See label for special notes	non-ionic or organosilicon surfactant. Should also be mixed with a copper fungicide. 4 sprays or 33% of all applications containing Orondis products
Orondis Opti *(oxathiapiptplin + chlorothalonil)*	49+M5	1.75 – 2.5 pt	12 hours	0 days		4 sprays or 33% of all applications containing Orondis products **Orondis Opti is not labeled for Phytophora blight**
Tanos 50 DF[1] *(cymoxanil + famoxadone)*	27 + 11	8 ounces	12 hours	3 days	4 sprays	
Omega 500 SC[1] *(fluazinam)*	29	0.75 – 1.5 pt	12 hours	See notes	No more than 7.5 pints per acre or 4 applications	PHI – 7 days pumpkins, cucumbers, squash; 30 days melons and watermelons. Omega is more expensive than other fungicides.
Curzate 60 DF[1] *(cymoxanil)*	27	5 ounces	12 hours	3 days	9 sprays	Include with one of the other materials listed if DM is detected because this product has a very short residual but has exhibited some burnout activity. **Not labeled for Phytophora blight**
Zampro[1] *(ametoctradin + dimethomorph)*	40 + 45	14 fluid ounces	12 hours	0 days	3 sprays	Do not apply more than 2 consecutive applications before switching to a fungicide with different FRAC code.
Zing! *(zoxamide +*	22 + M5	36 fluid ounces	12 hours	0 days	8 sprays	Actual rate of chlorothalonil is below the recommended rate to control CDM or

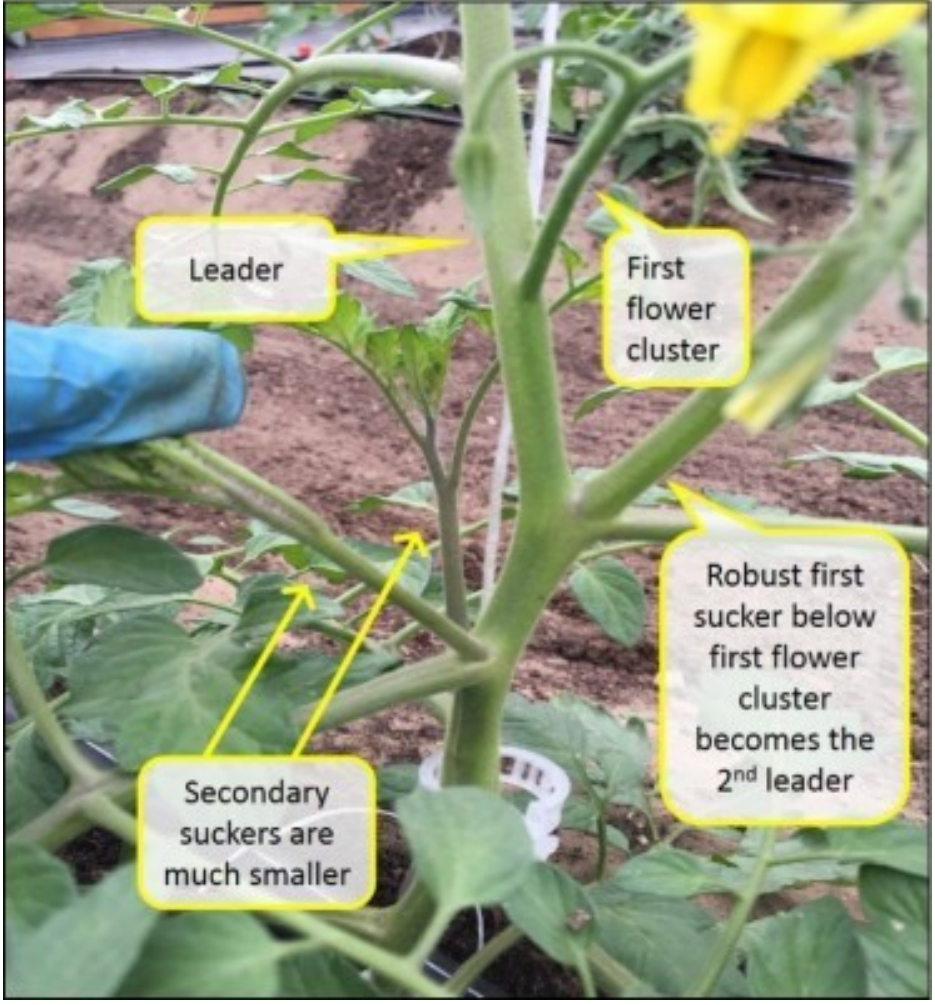
chlorothalonil)						Powdery Mildew. Add 0.43 – 1.43 pints Bravo WeatherStik to the tank to achieve the rate of chlorothanonil required to control these diseases. **Not labeled for Phytophora blight**
Phostrol, ProPhyt, Fosphite (phosphorus acid containing products)	P 07	2.5-5.0 pints*	4 hours	0 days	7 sprays	*Rates vary depending on product used. Please review the label for the correct rates.
Copper—Various formulations please see labels for more information						
Regalia Biofungicide	NA	1—4 quarts	4 hours	0 days	NA	Should be applied with copper fungicide
Serenade ASO Bacillus subtilis str QST 713)	NA	2—6 quarts – see label for rates.	4 hours	0 days	NA	Only labeled for *Phytophthora parasitica* so knowing which species you have is important!
Actinovate AG *(Streptomyces lydicus* WYEC 108)	NA	3 –12 fluid ounces	1 hour or until dry	0 days	NA	
[1] Should mix with a protectant partner such as chlorothalonil. None of the above fungicides will control Powdery Mildew with the exception of fungicides with chlorothalonil or copper, Regalia Biofungicide, Serenade ASO and Actinovate AG. More organic controls can be found at: https://www.vegetables.cornell.edu/crops/cucurbits/downy-mildew-of-cucurbits/list-of-biopesticides-for-organic-production/						

Pruning Field Tomatoes

By Crystal Stewart Courtens, CCE ENYCHP

As the last planting of field tomatoes takes off and the to-do list might be resembling a to-do novel, one might wonder if circling back to remove suckers is a good use of time. I would argue that it is, though the plants will produce a similar volume of fruit without suckering. The reason I still argue for pruning, especially at this point, is because the removal of suckers will improve the ability to reach into the canopy with sprays. Better coverage means better protection for scary late season diseases like late blight. Overall fruit quality may also be improved, with fruit size increasing. Finally, ease of picking increases, with fewer tomatoes stuck in the maze of stems and twine at the center of the plant.

Outdoor determinate tomato plants are almost all pruned to what is called the “strong y”. This involves removing suckers up to right below the first flower cluster (see image). Ideally these suckers are removed while they are still smaller than a pencil in diameter; if you are not able to get to them that quickly, take care not to tear the stem and ideally remove them early in the day so the plant has time to heal the wound before humidity and diseases can enter at night. Small suckers should be able to be removed with just your fingers by rocking them back and forth. Larger suckers may need to be gently pruned with a knife, taking care not to cut surrounding plant tissue.



Avoiding Aphid Outbreaks in Tunnels

By Elisabeth Hodgdon, CCE ENYCHP

Aphids are tough pests to manage in greenhouses and high tunnels. It only takes one aphid entering a tunnel to cause a full blown outbreak due to their manner of reproducing. Females can give birth to live, pregnant female clones without mating. Aphid feeding results in deformed and weakened plants. They also leave behind honeydew, a sugary waste product that grows dark mold on leaves and fruit. The mold reduces photosynthetic ability of leaves and can be laborious to wash off of produce before selling. Managing aphids effectively involves frequent scouting to identify and manage the problem early.

Scouting for aphids
Scouting for aphids begins in the spring in your propagation house. Check new growth and undersides of leaves for aphids. Some aphids, such as the common green peach aphid, is often found on meristems. Look for live aphids, as well as sooty mold and white “skins” that they leave behind. Sticky cards can also assist with picking up aphid issues, including winged individuals that may fly in.

Identifying aphid species - is it necessary?
If you plan to use a biological control agent, such as a parasitoid wasp, it is necessary to identify the aphid species you have in your tunnel. The most commonly released wasp, *Aphidius colemani*, attacks melon and green peach aphids. If you have potato or cabbage aphid, for example, then releasing this species will be a waste of money. If using pesticide applications or generalist predators, identifying the species is not critical.

To identify the aphid species, you will need a good hand lens or microscope. Examining the shape of the aphid’s head and other body features is necessary. The University of Vermont has an excellent fact sheet with photos and descriptions of the most common aphid species in high tunnels: green peach, potato, melon, and foxglove aphids. Reach out to your local CCE specialist for assistance with

identification. Sending a high quality, close-up image of the aphid's head and body can aid in ID via email or text.

Management options

Prevention: Scout plants for aphids before planting in high tunnels. Identify and manage aphids in propagation greenhouses. If purchasing plants, scout thoroughly before purchasing and transplanting. "Clean breaks" between crops help break aphid cycles. Avoid excessive nitrogen application, which favors aphid outbreaks.

Chemical control: When applying pesticides within high tunnels, be sure to read the label first—the label is the law. In NYS, a pesticide must be labeled for the pest, crop species (and growth stage when pertinent), AND greenhouse use for it to be used in a high tunnel. Labels that do not mention greenhouse or indoor use cannot be used, even if the label does not prohibit greenhouse use. Beleaf, Admire Pro, M-Pede, Azera, Pyganic, and Mycotrol are a few of the products labeled for aphids inside greenhouses. For products without systemic action, coverage of the leaf undersides is essential. For moderate to severe outbreaks, a spray application prior to releasing a biocontrol may be necessary.

Biological control: Several biocontrol agents are available to purchase to manage aphids. These systems can be highly successful when released early. Parasitoid wasps lay eggs within aphids, killing the aphid and leaving behind "mummies" where the new wasp emerges (Fig. 2). Ladybeetles, lacewings, and predatory midges are generalist predators that feed on many aphid species and other pests. Consult your biological control supplier to determine the best species, quantity, and delivery schedule for your situation. The best species for your tunnel will depend on the aphid species, time of year, and other factors.

Fig. 1: Distortion of high tunnel cucumber plants (left) caused by melon aphid (right). Melon (aka cotton) aphids have dark cornicles (projections on backside) and can range in color from green to dark green/black. Photos: Amara Dunn (left) and Elisabeth Hodgdon (right).

Fig. 2: Aphid 'mummy' with parasitoid wasp exit hole. Photo: Kenneth Wise

Flower Drop/Fruit Abortion in High Tunnels

By Teresa Rusinek, CCE ENYCHP

We've had several days in June where outdoor temperatures reached 85 F or higher and unfortunately we are seeing some fruit disorders as a result. It's important to take extra steps to manage temperatures to avoid fruit defects in tomato, pepper and cucumber crops. Tomatoes, for example, grow best at 70 to 75°F. Temperatures higher than 85°F stress tomatoes and result in flower abortion, pollen sterility and ripening disorders.

Table 1. Crops and their optimum temperature for different growth stages

Crop	Growth stage	Optimum temperature (°F)	Maximum temperature (°F)	Threshold temperature for venting (°F)
Tomato	*Transplant-flowering*	70-75°F	85°F	75°F
	Flowering-harvest	70-75°F	85°F	65°F
Pepper	*Transplant-flowering*	70-80°F	85°F	75°F
	Flowering-harvest	70-80°F	90°F	75°F
Cucumber	*Transplant-flowering*	70-85°F	90°F	80°F
	Flowering-harvest	75-85°F	90°F	80°F
Leafy Greens	Seeding-harvest	60-65°F	75°F	55°F

https://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/stelprdb1261940.pdf
Controlling the High Tunnel Environment, NRCS, USDA

Ventilation in a high tunnel will bring down temps and also lower humidity which is helpful for disease management too. To maximize passive ventilation, high tunnel sidewalls should be 5 feet or greater. A ridge vent is effective in moving heat out from the top of the high tunnel and drawing in cooler air through the side and end walls. Under dense canopies, fans placed at the ends of the tunnels may not effectively cool the center of the tunnel where it is most needed. Consider shade fabric, which can lower air temperatures by as much as 5-8°F over the high tunnel if temperatures exceed 90F for several hours a day. 30% shading material is commonly used for summer fruiting crops like tomato or cucumbers whereas 50% shade fabric is more appropriate for leafy greens.

Also, monitor soil moisture and irrigation systems, it doesn't take long for blossom end rot (BER) and potassium deficiencies to show up under hot and dry conditions. Irrigating more frequently, for shorter durations can help prevent BER as well as fruit splitting.

Do Vegetables Need Extra Boron?

By Steve Reiners, Cornell AgriTech

Vegetable growers seem to have a lot of interest in using boron (B) fertilizers. Boron is an essential plant nutrient, which means plants cannot complete their life cycle unless boron is present in the soil. But unlike essential nutrients like nitrogen, phosphorus and potassium that are needed in large amounts (>100 pounds/A), only small amounts of boron are needed, in the range of 1-3 pounds of B/A.

Even that amount varies by crop. Some crops truly benefit from boron additions and others not so much. For crops like beans and peas, excess boron can cause toxicity. Table 1 provides details on likely vegetable crop responses to boron.

Table 1. Vegetable response to applied boron and recommended application rates.

High B requirement 3 lbs./A	Medium B Requirement 2 lbs./A	Low B Requirement 1 lb./A	No B requirement 0 lbs./A
Beets	Asparagus	Potatoes (sweet)	Beans, all
Broccoli	Carrots	Peppers	Peas
Cabbage	Cucurbits		
Cauliflower	Eggplants		
Celery	Leeks		
Kale	Onions		
Rutabaga	Parsnips		
Spinach	Potatoes (white)		
Swiss chard	Radishes		
Turnip	Sweet corn		
	Tomatoes		

What conditions are most likely to cause a boron deficiency? Very sandy soils, low in organic matter and alkaline soils with a pH above 7 can be the most problematic. But droughty conditions or soils very high in calcium can also cause deficiencies. Like calcium, boron is absorbed by plant roots and moves through the transpiration stream. If you are an organic crucifer grower and maintain a soil pH above 7.2 to control club root, a boron deficiency is likely in susceptible crops.

What are typical boron deficiency symptoms? It depends on the plant. Growing points can dieback, which can be a very common symptom in beets. Also in beets, roots can develop internal black rings. In crucifer crops, typical deficiency symptoms include cracked or corky stems. Broccoli and cauliflower stems are hollow and brown internally.

Crucifer crops, beets and celery are the most likely crops to respond to born applications. Applications to crops with a medium and low requirement are less likely to result in noticeable differences. That's especially true if fields are at the optimum soil pH. A few years ago, there was some discussion that boron could improve yields and quality of tomatoes, but additional research has not shown that to be the case.

Boron can be applied as a broadcast application with other fertilizers in the spring or as a foliar application later in the spring. Remember to adjust your boron application based on the material being used. The rates suggested above are actual pounds of boron per acre. If you want to add 1 pound of actual boron per acre and you are using Borax that contains 11% B, you will need about 9 pounds of Borax (1 / 0.11 = 9.09). If using Solubor at 20% B, you would need only 5 pounds of Solubor (1 / 0.2 = 5).

Those of you that have heard me talk at grower meetings the last 25 years know I'm not a big proponent of foliar nutrient applications. But boron, like many of the micronutrients, can be effective when applied in this manner. It is especially helpful on a high pH soil that may tie up boron and make it unavailable through root uptake. If using foliar applications, rates should be reduced significantly to reduce toxicities, with rates of only 0.1 to 0.3 pounds per acre of actual boron applied. Best to apply in at least 30 gallons of water per acre. Another advantage of the lower rate with foliar applications is

less likelihood of a boron toxicity if beans or peas are in rotation.

If using a foliar application, apply either early in the morning or in the evening when humidity is high, and leaves will stay wetter. Do not apply when plants are drought stressed. Apply when temperatures are below 80F. Optimum temperature for foliar application is 72F. Spray when winds are calm to avoid drift and use smaller droplet size to maximize uptake.

Glyphosate-Resistant Palmer Amaranth and Waterhemp in Orange County

By Ethan Grundberg, CCE ENYCHP

Large populations of two aggressive pigweed species, Palmer Amaranth (*Amaranthus palmeri*) and Waterhemp (*Amaranthus tuberculatus)*, have recently been identified in a soybean field in the black dirt region of Orange County. Both species appear to be resistant to WSSA Group 9 herbicides, like Roundup (glyphosate), but will be evaluated for resistance to other herbicides. Palmer Amaranth and Waterhemp populations in neighboring states have been found to be resistant to ALS inhibitors, triazines, HPPD inhibitors, and dinitroanilines in addition to glyphosate. Each species, if allowed to go to seed, can produce up to 500,000 seeds per plant that are viable for 3-5 years in the soil. These two amaranth species pose the biggest threat to field crop producers, especially of Roundup Ready corn and soy, but can also be extremely difficult to manage in vegetable crops as well.

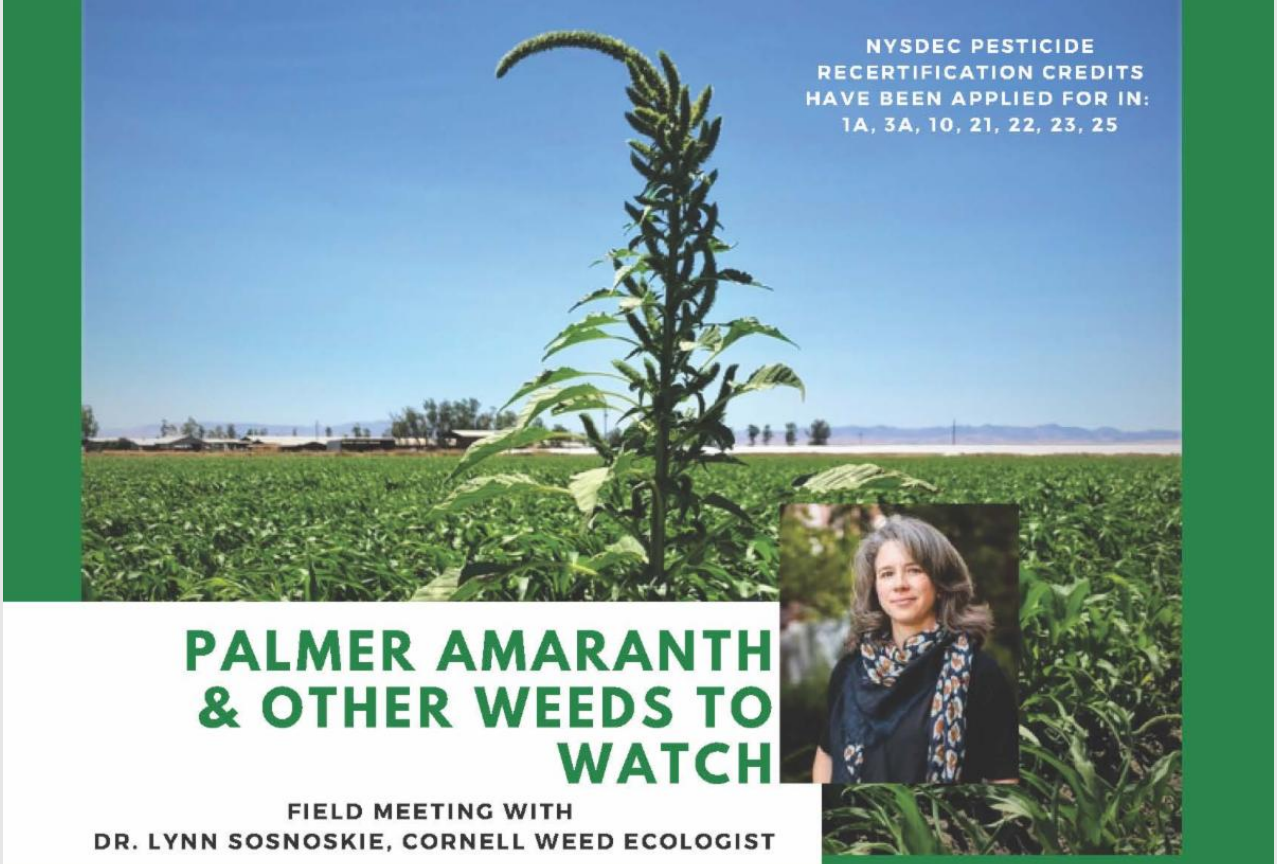
Early identification and intervention is critical if you suspect Palmer Amaranth or Waterhemp on your farm. If you have applied glyphosate to part of the farm and notice pigweeds surviving, please notify your nearest extension specialist immediately. Palmer Amaranth can be identified by looking for long leaf petioles (stems) that are often longer than the leaf blade, a single fine hair at the tip of leaves, and smooth stems without hair. See the resources below for more images and identification guides.

More information on Palmer Amaranth and Waterhemp is available at

1. https://blogs.cornell.edu/weedid/pigweed-identification/
2. https://www.extension.purdue.edu/extmedia/WS/WS-51-W.pdf
3. https://extension.psu.edu/invasive-pigweeds-palmer-amaranth-and-waterhemp

Dr. Lynn Sosnoskie, assistant professor of Weed Ecology and Management for Specialty Crops at Cornell University, will be holding two field meetings in Eastern New York on Palmer Amaranth management in July. More information and registration details are available here: https://files.ctctusercontent.com/50bc2eb5701/95a6adb3-c71f-4bac-8223-43f4c893d55b.pdf?rdr=true

Palmer Amaranth plant in Orange County, NY in mid-June 2021. Note the long leaf petiole length and the fine hairs at the tips of leaves. Photo: E. Grundberg



PALMER AMARANTH & OTHER WEEDS TO WATCH

FIELD MEETING WITH
DR. LYNN SOSNOSKIE, CORNELL WEED ECOLOGIST

Two Dates & Locations

TUESDAY, JULY 13, 2021
6:00PM- 7:30PM
Wagon Wheel Farm
363 Sarah Wells Trail
Goshen, NY 10924

WEDNESDAY, JULY 14, 2021
10:30AM-12:00 noon
Stanton's Feura Farm
210 Onesquethaw Creek Rd.
Fuerea Bush, NY 12067

Fees:
$15/Farm before 7/9.
$25/Farm after & at the door.
Cash or check only at the door.
Credit card only for on-line pre registration.

Registration Link:

HTTP://WEBLINK.DONORPERFECT.COM/WEEDSTOWATCH2021

*on meeting date, all in-effect NYSDOH COVID safety protocols will be followed

Cornell Cooperative Extension | Orange County

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From Cornell Cooperative Extension Harvest NY!

With the support of the NYS Department of Agriculture & Markets and in partnership with Cornell Cooperative Extension of Ulster, Greene, Columbia, Dutchess, Sullivan, Delaware, Orange, Rockland, and Putnam Counties, we are launching the NY Farm to School Regional Coordinator Program! What this means for you is that you will now have the support of dedicated Farm to School Coordinators in the Hudson Valley. It is our intention through this program to provide coordinated and comprehensive support to Farm to School stakeholders, including farmers, distributors, processors, food hubs, SFAs, and educators. We aim to increase the volume and variety of local farm products purchased by SFAs for use in child nutrition programs. We will do this by providing boots on the

ground support directly to supply chain partners, and statewide support via resource development, training, and technical assistance to supply chain partners. We will be working collaboratively with partners that are already doing farm to school work at the local level to support and supplement existing efforts.

We're pleased to introduce you to Katie Sheehan-Lopez and Kristy Apostolides, Regional Farm to School Coordinators in the Upper and Lower Hudson Valley. Katie and Kristy are excited to bring their experience to help introduce more high-quality local food to the students in your school district!

Katie Sheehan-Lopez (Upper Hudson Valley Coordinator - Ulster, Greene, Columbia, Dutchess, Sullivan, Delaware Counties)
kms369@cornell.edu
845-340-3990 x 334

Kristy Apostolides (Lower Hudson Valley Coordinator – Orange, Putnam, Rockland Counties)
kda4@cornell.edu
845-429-7085 x 106

Corn Trap Counts

County	ECB-E	ECB-Z	FAW	WBC	CEW
Albany	0	0	0	0	0
Clinton 1	0	0	0	0	0
Columbia	0	4	0	0	5
Dutchess	0	0	N/A	N/A	2
Essex	1	0	0	0	0
Orange	0	0	N/A	N/A	1
Ulster 1	0	0	N/A	N/A	2
Ulster 2	0	4	0	0	2
Ulster 3	0	0	N/A	N/A	0

Vegetable Specialists

Chuck Bornt
Phone: 518-859-6213
Email: cdb13@cornell.edu

Ethan Grundberg
Phone: 617-455-1893
Email: eg572@cornell.edu

Elisabeth Hodgdon
Phone: 518-650-5323
Email: eh528@cornell.edu

Teresa Rusinek
Phone: 845-340-3990 x315
Email: tr28@cornell.edu

Crystal Stewart-Courtens
Phone: 518-775-0018
Email: cls263@cornell.edu

Maire Ullrich
Phone: 845-344-1234
Email: mru2@cornell.edu

Business Specialist

Liz Higgins
Phone: 518-949-3722

Email: emh56@cornell.edu