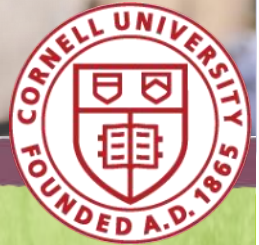


Vegetable News



Environmental Causes of Tip Burn on Transplants

Ethan Grundberg—CCE ENYCHP

As discussed in last week's article "[Growers are Producing Great Transplants Despite Tough Weather Conditions](#)" by Crystal Stewart, the cool, overcast, and wet spring has posed a number of challenges in propagation greenhouses. As Crystal noted, "high humidity and low light means almost no transpiration by the plants, so soil that is wet stays wet." These environmental conditions can result in a myriad of problems, including fungus gnat infestations, foliar diseases, and the fertility issues discussed by Crystal in the aforementioned article.

Calcium deficiencies in transplants can be another consequence of the short day lengths, overcast skies, cool temperatures, and high humidity that characterized most of the spring. Growers who have battled blossom end rot in tomatoes or tip burn in lettuce likely already understand that these disorders are, technically, caused by calcium deficiencies at the growing point of plants. However, the true culprit is typically not a calcium deficiency in the soil or growing media, but rather erratic watering that prevents the calcium in the soil or potting mix from becoming soluble and being taken up by plants. Getting the calcium into the roots is just the first part of the battle, however.

Calcium is not mobile within plants; instead, it is carried through the plant vascular system along with water that is being sucked through the plant by the process called transpiration. The small openings along leaves, stomata, open up to take in carbon dioxide for photosynthesis and release water in the process. This transpiration is what drives water movement up to the new growth points on plants and, in so doing, carries



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that calcium to the rapidly growing leaves to reinforce cell walls. What happens to transplants in a cool greenhouse at 95% relative humidity without supplemental light? They transpire exceptionally slowly and don't move calcium to the leaf margins. What happens when such conditions are followed by really warm weather and full sunlight? Plants grow and transpire quickly, but can't immediately supply the calcium demand at growth points which can result initially in small brown spots along the leaf edges that eventually turn papery and can be quickly colonized by secondary foliar pathogens.

Extensive research on tip burn has shown that supplying extra calcium through foliar feeding or fertigation will NOT help plants avoid calcium deficiencies if they are growing under low transpiration conditions. What can growers do to avoid calcium deficiency induced transplant tip burn?

1. As Crystal mentioned, "if heading into a period of cold, wet days, minimize watering. And don't be afraid to use gable end vents or ridge vents if it is too

wet in the greenhouse!"

2. Try to avoid dramatic temperature swings through supplemental heating, venting, and shade cloth; if plants have been grown in the mid-50s, a sudden surge into the 90s can lead to excessively quick growth that results in tip burn.
3. Don't panic! Most plants will outgrow early calcium deficiency symptoms once they're in the field under more consistent growing conditions. However, tip burn on quick turn baby lettuces and other leafy greens both reduce the crop's shelf-life post-harvest and, even if minor, can make them unsellable.
4. Don't throw water on a grease fire! It's easy to think providing extra calcium will help a plant experiencing a calcium deficiency. However, if the potting mix has sufficient calcium and the deficiency is environmentally-induced, adding extra calcium can actually interfere with the plant uptake of other essential nutrients like magnesium and potassium

This Investment Pays Off

Amy Ivy, CCE ENYCHP

May is an insane time around any NY vegetable farm and it's a challenge to prioritize the mountain of tasks each day. But a little time spent pruning and training your high tunnel tomato plants now can really pay off later. Not only will they yield better, your labor will be more efficient during harvest since workers won't be plowing through a dense tangle of leafy stems to get to the tomatoes.

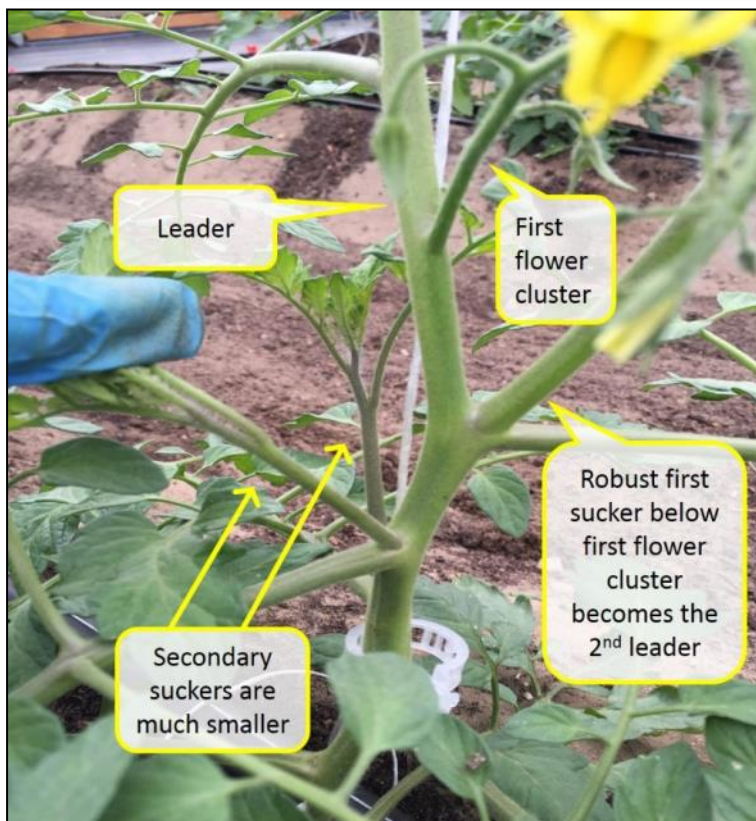
Here's a quick review:

- **Remove lower leaves up to the first fruit cluster.** Bend the leaf up, then down and it should snap off cleanly, making quick work of this simple but important task. **Why?** It increases airflow around the plant to discourage disease and makes the plant easier to work around.
- **Strong Y** – whether you are training **determinate** or **double leader indeterminate** (see below) start both with the Strong Y. See the photo to locate the weaker suckers to remove and the co-dominate sucker to keep just below the first flower cluster. Allow only the main leader and co-dominate leader to develop, removing all the other suckers and leaves up to this 'Y' junction on the plant. **Why?** The lower suckers are less productive. Removing them sends the plant's food energy to the remaining stems, shoots and fruit.



- **Determinate tomatoes** – train them to the 'stake and weave' aka 'Florida weave' system. Set a post between every 2-3 plants and start the horizontal twining early so the plants can grow up through the support. **Why?** This level of support will keep the aisles open for efficient worker movement and will keep the fruit up off the ground for easy harvest.
- **Indeterminate tomatoes** – For large slicing tomatoes some growers prefer single leaders, some prefer double. When in doubt, the double leader system works well in most situations.

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- In our cherry tomato trial we found the double leader system was the best option in terms of labor efficiency and yield, compared to a single or multi leader system.

Check out these **helpful factsheets** for more photos and details:

- ⇒ Training and Pruning Tomatoes: https://rvpadmin.cce.cornell.edu/uploads/doc_346.pdf
- ⇒ Tomatoes for High Tunnels: https://rvpadmin.cce.cornell.edu/uploads/doc_345.pdf
- ⇒ Cherry Tomatoes in High Tunnels: https://rvpadmin.cce.cornell.edu/uploads/doc_677.pdf
- ⇒ Optimal Spacing for High Tunnel Tomatoes: https://rvpadmin.cce.cornell.edu/uploads/doc_360.pdf

Mix and Match: Compatibility of Biocontrol with Other Pest Management Strategies

Amara Dunn, NYS IPM

By Amara Dunn, Biocontrol Specialist, NYS Integrated Pest Management Program (arc55@cornell.edu)

Editor's Note: This is an excerpt from a recent post on Amara's blog. The complete posting with images of resources and more details is available at <https://blogs.cornell.edu/biocontrolbytes/2018/04/30/mix-and-match-compatibility-of-biocontrol-with-other-pest-management-strategies/>

If you were going to tank mix chemical pesticides, you would of course read the label to check for compatibility before mixing products. The same concept applies when using living organisms for pest control. Whether you are using parasitoid wasps, predatory mites, microorganisms, or nematodes, you need to know whether your biocontrols are compatible with each other and any other pest management products you plan to use. For example, a biocontrol fungus might be killed if you tank mix it with (or apply it just before) a chemical fungicide. Insecticides (whether or not they are biological) could be harmful to natural enemy insects and mites. Even some beneficial insects are not compatible with each other because they may eat each

other instead of (or in addition to) the pest.

It's a good idea to keep an updated list of the products and organisms you plan to use for pest management, and their compatibility with each other. For biopesticides (remember the difference between "biopesticide" and "biocontrol"?), start by reading the label. You must follow all instructions you find there. Many manufacturers also provide lists, tables, databases, or apps to



This small black Delphastus (a predatory beetle) is helping to control whiteflies in a greenhouse. It's important that other pest management strategies in this greenhouse are used in such a way that they do not harm the Delphastus.

help you find compatibility information. This is especially useful for insect, mite, and nematode natural enemies, which are not pesticides and do not have pesticide labels. When possible, obtain compatibility information from the manufacturer or supplier *you* will be using. Different strains of the same microorganism or nematode may have different sensitivities to chemicals. Remember that NY pesticide labels (including biopesticide labels) can be found through the [NYSPAD](#) system.

Below are some links to resources from several manufacturers and suppliers of biocontrol products. No endorsement of specific companies or products mentioned in this post is intended.

- [Beneficial nematodes from BASF](#)
- [Biobest Side Effect Manual](#)
- [Compatibility of BioWorks products](#)
- [Koppert Side Effects Information](#)

Allium Leafminer Spring Flight Has Begun

Ethan Grundberg—CCE ENYCHP

On Friday, April 27th, Teresa Rusinek confirmed the first signs of adult allium leafminer (ALM) activity on garlic in Ulster County. We anticipate adults will continue to mate and lay eggs on allium crops through the month of May. As the larvae feed on tissue inside of the leaf, they can cause considerable damage to crops like scallions and chives that are marketed with green tops. The physical damage caused by adult oviposition and larval feeding also opens wounds in the leaf tissue that can serve as entry points for other pathogens that cause botrytis leaf blight and soft rot.

We are conducting insecticide efficacy trials this year in conjunction with Cornell entomologist Dr. Brian Nault to better understand which active ingredients are most



Adult allium leafminer alongside diagnostic vertical line of oviposition scars

effective at reducing damage from ALM and also how many applications are necessary for acceptable ALM control. There are a number of insecticides labeled for leafminer control on bulb vegetables: the insect growth regulator cyromazine (Trigard), spinosyns (Radiant, Entrust (OMRI)), and several pyrethroids (Mustang Maxx, Warrior). Note that abamectin products (Agri-Mek), neonicotinoids (Assail, Admire Pro), and cyantraniliprole formulations (Exirel) are labeled ONLY for *Liriomyza* leafminers and/or thrips, but may be effective at managing ALM. Since allium species have a waxy leaf cuticle, it is highly recommended that insecticides be mixed with a compatible penetrating adjuvant (LI 700, M-Pede (OMRI), etc.) As always, follow the labeled directions for use for any pesticide!

Managing Basil Downy Mildew

Teresa Rusinek, CCE ENYCHP

There are already concerns from growers about downy mildew and with good reason; this disease is difficult to control and destructive. Basil downy mildew can be seed borne but does not persist long in the environment when the host plant is not present. It does not overwinter in the field, but can persist in a greenhouse if basil is grown continuously. Once basil is in the field it may be infected by wind-blown spores from other areas.

There are options to limit your risk. In the greenhouse, avoid favorable conditions for disease development. The basil downy mildew pathogen needs humidity of at least 85% in the plant canopy to be able to infect. This disease can be controlled effectively by keeping humidity low. Practices to achieve this include base watering, wide plant spacing, circulating fans, lights, and increasing temperature. Base heating is an especially effective method to reduce humidity. Set up sensors in the plant

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canopy to monitor humidity to ensure implementing practices are sufficient.

One of the most effective management strategies is planting a downy mildew resistant variety, and the good news is that there are more of these varieties available to growers. Below is an update from Margaret McGrath.

New Downy Mildew Resistant Basil Varieties: Devotion, Obsession, and Thunderstruck are the first varieties developed at Rutgers University through a USDA-funded project that included evaluations at LIHREC, which documented high level of resistance in preceding experimental lines. Reports are posted at [http://blogs.cornell.edu/livepath/extension/basil-downy-](http://blogs.cornell.edu/livepath/extension/basil-downy-mildew/)



Yellowing of the upper surface of affected basil leaves often occurs in sections of the leaf delineated by veins because the downy mildew pathogen cannot grow past major veins in leaves. Photo: Margaret McGrath

mildew/ These varieties are available from VanDrunen Specialty Seeds. Amazel is another new variety reported to be highly resistant. Emma and Everleaf (aka Basil Pesto Party and M4828Z when evaluated at LIHREC) have moderate resistance. Everleaf exhibited better suppression than Eleonora, the first commercially-available resistant basil, when evaluated at LIHREC. To achieve acceptable control, all resistant varieties need to be used with other management practices, in particular fungicides, due to very low tolerance for symptoms in herbs especially when used fresh.

Long Island Fruit & Vegetable Update; No.4; April 26, 2018



*Purplish gray spores of the downy mildew pathogen only develop on the lower surface of leaves.
Photo: Margaret McGrath*

Properly Labeling Service Containers

Charles Bornt, CCE ENYCHP

Tanks with spray materials that travel on the road or that are idle for any period of time are considered service containers and therefore require special labeling. NYSDEC requires that for spray tanks with material that travels on the road; or if mixed product is being stored in a sprayer tank (not actively being used), a copy of the pesticide label(s) must be securely affixed to the tank with the maximum weight or volume the tank can hold. If a label(s) cannot be located, then include the following information: name and address of the manufacturer or registrant as it appears on the pesticide label; registered product name and EPA number; and maximum weight or volume of material that container can hold. It is

recommended that the label(s) be placed in a clear plastic covering mounted on the sprayer. Clear plastic pockets can be purchased from suppliers such as Gemplers for this purpose. Additionally, if the service container contains pesticides 'in quantities highly toxic to humans' (word DANGER is on the pesticide label), the service container must also have a skull and crossbones and the word 'POISON' prominently, in red, on a background of distinctly contrasting color plus a statement of the antidote for the pesticide. For additional information about these requirements contact NYSDEC Region 4 office at 518-357-2045 or Region 5 office at 518-623-1265.

Can this be True?

Charles Bornt, CCE ENYCHP



As you know, new products for enhancing growth are coming onto the market every year and we do our best to bring you what we know from reputable sources. Last week in reviewing some other newsletters that I subscribe to I ran across an article

by Dr. Gordon Johnson, Extension Vegetable & Fruit Specialist, University of Delaware in regards to a product labeled to aid in reducing transplant shock in certain vegetables called LandSpring made by AgroFresh. I looked up the product in the NYS DEC database to make sure that it is labeled in NY and it is. There are PPE and WPS requirements so be sure to review the label carefully. This product is also incompatible with copper products. The label is also very specific with agitation and making sure that the material is applied within 15 minutes of final agitation. Other considerations from the label:

- When mixing, agitate or stir gently for 3 minutes after adding the LandSpring WP. DO NOT EXCEED 3 MINUTES OF AGITATION. Do not use agitator during spraying.
- Initiate spray application as soon as possible after mixing and no later than 15 minutes after preparation of tank mixture.
- Spray Volume - apply LandSpring WP in a sufficient amount of water to ensure good drenching of the seedlings. Product efficacy requires that the foliage receive uniform spray coverage.
- For best results, apply under slow drying conditions, e.g. early in the morning or at night, in order to ensure adequate absorption.
- Do not apply if rain or overhead irrigation is expected within 1 hour of application.
- LandSpring WP has a 1 day preharvest interval (PHI)

- Apply LandSpring WP alone on seedlings, without tank mixes or adjuvants

If you apply it and I've linked the label here to our website: [LandSpring label](#) and below is the article from Dr. Johnson (source: *Weekly Crop Update*, April 27, 2018,, Volume 26, Issue 5)

New Technology for Reducing Transplant Shock by Dr. Gordon Johnson - A new tool is available for reducing transplant shock. The chemical 1-methylcyclopropene (1-MCP) which is marketed as the product LandSpring by the AgroFresh company reduces ethylene production and stress on young plants.

Ethylene in the plant hormone released when plants are injured or are under stress, as is common during transplanting. Excess ethylene can cause leaf drop and wilting and can increase transplant losses.

The way 1-MCP works is that it has a similar molecular structure to ethylene but without the negative effects on the plant. It binds to ethylene receptors in the plant and thus blocks ethylene from causing damage.

LandSpring is labelled on broccoli, brussel sprouts, cabbage, cantaloupe, cauliflower, cucumber, eggplant, muskmelon, bell pepper, nonbell pepper, summer squash, tomato and watermelon. According to the company "When applied to seedlings 1 - 5 days before transplanting, LandSpring WP helps decrease transplant shock enabling plants to more rapidly establish and grow. Observed benefits include increased crop biomass due to better root and shoot development when plants are subjected to stress in the weeks following transplantation. More information can also be found at: <http://www.landspring.info/>



Effects of Mulch on Soil Temperature

Crystal Stewart, CCE ENYCHP

During the waiting game that has been April, I've been occasionally poking thermometers into the ground to see just how cold it is. It's been especially interesting to do this in my garlic trial, which has black plastic, bare ground, white plastic, and straw mulch, arranged in random rectangles on a raised bed. Here are a couple of snapshots of the temperatures at 6 inches in the plots.

What to say about this? We are finding that traditional plastic doesn't heat the soil as much as we might hope (ours is black on white, which probably slows warming somewhat). That said, covering the ground has a variety of benefits for weed control and soil health, so take this information as one piece in the greater puzzle.

One nice side effect of laying plastic of any color in the spring on days that are too cold to plant but dry enough to work the soil is that you might be able to flush some weeds before poking holes in the plastic, eliminating that little bit of hand weeding. Plastic also helps regulate moisture levels, holding in soil moisture.

An interesting side note to this story is that there is some "normal" black plastic and some IRT (infra-red transferring) plastic near the trial. Of course we stuck the thermometer in there too, and the IRT plastic covered beds were 6 degrees warmer than the black covered beds. When we went *another* row over and stuck the thermometer in an IRT bed under row cover, the temperature advantage was lost.

Date:	Black plastic	White Plastic	Bare Ground	Straw
April 8 th (cloudy)	36	34	36	32
May 1 st (mostly sunny)	56	54	58	50



The Saratoga Giant Pumpkinfest!

Last week I was contacted by Ned Chapman, owner of Sunnyside Gardens in Saratoga asking me if there was any chance I could spread the word about this wonderful event – the Saratoga Giant Pumpkinfest! Last year's event drew thousands of local Capital Region residents and pumpkin growers from across five states. The event will take place at the Saratoga State Park in Saratoga Springs on September 30, 2018. As he started to describe the event he mentioned that there are very few entries from NY, and even fewer from the region and that many of the past winners are from

Pennsylvania or western NY. As many of you know me, I'm a sucker for pumpkins and I see this as a wonderful opportunity for growers in the region be recognized for the excellent job of growing pumpkins that you do as well as possibly go home with the prestige of being a "giant pumpkin finalist" (and a little prize money doesn't hurt either). And to top it all off, Ned has free giant pumpkin seeds available from past giant pumpkin winners that he is itching to give away! If you're interested in the free seed or have questions, Ned's contact information is (518) 584-1034 or ned@sunnysidegardensllc.com Anyone is welcome to enter the contest, whether you're an old pumpkin veteran, newbie or youngster!

Go to www.SaratogaGiantPumpkinfest.com for all the information about entering the contest as well as being a vendor or sponsor for the day.

20 Minute Ag Manager

Summer 2018 Schedule

20 minute lunchtime webinars will be held on Tuesdays this summer covering farm business management topics.

All webinars run from 12:00 until 12:30.

To register, go to <https://tinyurl.com/y9gfqbmx>. Registering once gives you access to the series.

For more information:

Contact Liz Higgins at emh56@cornell.edu.

Cornell Cooperative Extension
Eastern NY Commercial Horticulture Program



May: Basic Farm Finances

- May 15—Setting Up Your Farm's Accounts in Your Financial System
- May 22—Understanding Depreciation
- May 29—Understanding Assets and Liabilities vs Income and Expenses

June: Zoning and Land Use

- June 5—NYS Ag Assessment 101
- June 12—Local Zoning 101
- June 19—NYS Ag Districts 101
- June 26—Using On-line Data and Maps to Assess a Property Remotely

July: Managerial Accounting

- July 3—Budgeting 101
- July 10—Assessing a Capital Investment
- July 17—Relevant Information and Sensitivity Analysis
- July 24—Pricing for Profit
- July 31—Know When to Hold'em, Know When to Fold'em (assessing performance)

August: Insurance

- August 7—Crop Insurance 101
- August 14—Crop Insurance for Diverse Farms
- August 21—Flood Insurance and Other Disaster Programs



UPCOMING Webinar: Ag Labor Tips and Tools

When: May 9, 2018 11:30 AM-1:30PM Eastern Time (US and Canada)

Do you hire H2A, Migrant Farmworkers or farmworkers whose primary language is not English?

Join Mary Jo Dudley, the Director of the Cornell Farmworker Program, Melissa Buckley Supervisor and Foreign Labor Certification Specialist, NYS DOL, and staff from the Finger Lakes Community Health, and NYS Migrant Education to learn about resources to help you manage and support your employees this season. They will also be able to answer questions that you may have.

This free webinar is supported by a grant from NERME and USDA.

For more information, contact Mary Jo Dudley Cornell Farmworker Program at mjd9@cornell.edu.

Cornell Cooperative Extension | Eastern NY Commercial Horticulture Program

UPCOMING Webinar: Produce Safety for Broccoli Producers

When: May 14, 2018 2:00PM

UVM Agricultural Engineer Chris Callahan, Produce Safety Alliance Director Elizabeth Bihn, and their colleagues will present a webinar on Monday, May 14 at 2 p.m. on "Produce Safety for Broccoli Producers", which will include an overview of food safety regulations (coverage thresholds and compliance dates, FSMA, Produce Safety Rule) and broccoli-specific considerations, plus an overview of educational materials being developed through the Eastern Broccoli Project.

You can find more details about the webinar and a registration form on the Eastern Broccoli Project blog at this link: <https://blogs.cornell.edu/easternbroccoliproject/2018/04/24/produce-safety-webinar-for-broccoli-producers/#.Wt991uJmF04.twitter>.

Visit our Website: <https://enych.cce.cornell.edu/>
ENYCHP Facebook: <https://www.facebook.com/>



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