Dynamic Lighting; Poinsettia Calcium & PGRs; Water Quality



Cultural and Technical Information for Greenhouse Professionals

GROWERTALKS MAGAZINE greenPROFIT MAGAZINE

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COMING UP THIS WEEK:

Dynamic LED Lighting
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Change Poinsettia PGRs NOW!
Water Quality Toolkit
More on Water Quality ...
Finish Line: GT Search Function



NEW 2-PART PODCAST! Dynamic Lighting

In the latest two Tech On Demand podcasts (#s 86 & 87), Benefits of Dynamic Lighting with Rose & Michael from Sollum Technologies, I talk to Rose Séguin (agronomist) and Michael Hanan (U.S. sales director) about “dynamic” LED lighting and how this new technology allows for multi-zoning to meet the needs of multiple crops, as well as the ability to control light intensity and spectrums. Learn why fully-dynamic LED lighting is good for your crops AND your bottom line. Rose and Michael share case studies, new research and a fresh approach to LED lighting.



In **PART ONE**, we discuss exactly why the ability to control spectrum and intensity via software (versus simply turning lighting like HPS on or off) leads to flexibility and adaptability for specific

crops—even down to the variety level. Rose and Michael dig into the ability of this kind of lighting technology to dial into specific stages of crop development—from young plants to finished material—and also how dynamic lighting can be customized to deliver specific outcomes based on diverse crop mixes or monoculture ranges.

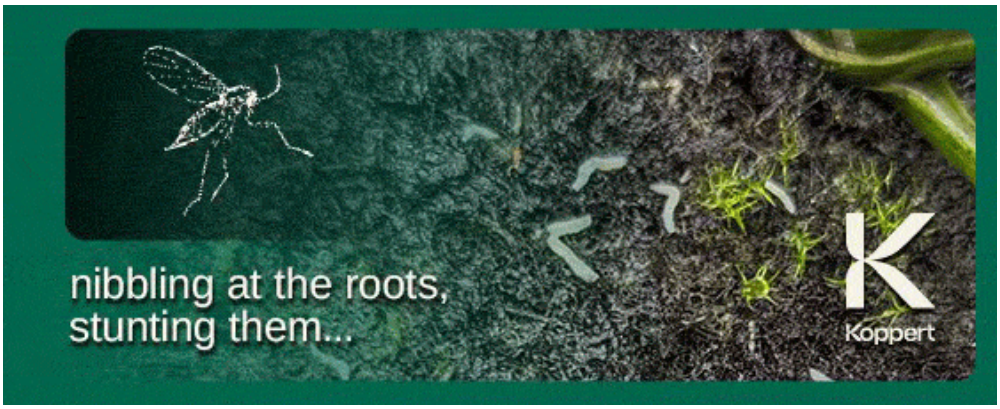
Then they explain the science behind Sollum's lighting strategies by walking listeners through FAQs when planning new projects, as well as how their team helps solve problems and put new users at ease. As a partner and not simply a supplier, they don't install and walk away.

In **PART TWO**, The team from Sollum explains why the dynamic systems they provide can be installed in just about any greenhouse facility, as well as how true partnerships with grower clients lead from goals to outcomes. Rose and Michael share case studies and past experiences with breakthrough results. Then they detail how their team is constantly learning and using data to help growers make improvements from crop to crop, season to season and year to year. Furthermore, partnering with leading researchers in academia promises to bring even more knowledge to the table that can be implemented at clients' operations.

You'll want to listen all the way to the end of this episode as Rose and Michael share thoughts about the future of dynamic lighting and how new research is opening up opportunities to consider how light can be used to reduce disease and truly optimize plant health and quality for growers in all segments of horticulture.

If you have plans to explore new lighting technologies or upgrade your current system in the near future, this episode is for you! It's a perfect blend of science and real-world application with two guests who bring passion and knowledge to an energetic discussion on a critical topic.

As always, make sure you subscribe to the Tech On Demand Podcast, brought to you by* GrowerTalks *on your favorite app, like Apple, Spotify, Google, Audacy and more. That way you'll never miss an episode. And if you have a few seconds, please leave a positive rating or review to help out our algorithm.



Nick's Tip of the Week: Poinsettia (Ca)tch-up Game

Each week, I'll work with my buddy Nick Flax, a technical services expert at Ball, to share a concern that's come up during one of his numerous calls with growers across North America. This week, he and the tech team have been seeing a lot of poinsettias showing signs of calcium deficiency.

PROBLEM: Right on cue, now that we're solidly into natural short days for poinsettias in North America, I've started to get reports of crinkled, wrinkled, and distorted new leaves and bracts on poinsettias. Do you have plants where it looks almost as if someone pulled a drawstring along one side of the leaf or bract? If so, chances are you've encountered calcium (Ca) deficiency.



NICK'S TIP: It's critical to react quickly when symptoms are first spotted to ensure that your poinsettia bracts develop properly into the big, beautiful tapestries of holiday cheer that we know them to be, because once the damage is done, affected foliage does not recover. While this is not an issue that all growers encounter each year, it's most often facilitated by rapid changes in weather and, subsequently, greenhouse environmental conditions. If this is a new challenge for you, here are a few indicators of Ca deficiency to look out for, reasons why Ca deficiency may pop up in your poinsettia crop, and strategies to help overcome this unsightly mineral nutrient deficiency.

What are Common Calcium Deficiency Symptoms in Poinsettias?

Leaf and bract tip necrosis is generally one of the earliest indicators of an issue. Oftentimes, necrosis will progress outward along the margin from the tip as the leaf/bract continues to expand, and the leaf edge will become distorted. As symptoms become more severe, leaves/bracts will begin to cup upward. Affected foliage does not recover or "return to normal" once symptoms progress, so be sure to look for early signs and react quickly to correct the cause.

What Causes Calcium Deficiency?

Some varieties are affected by Ca deficiency more severely by different causes than others due to differences in physiology (genetics are funny that way ...), so early symptoms will likely pop up on one or two varieties first. On a basic level, however, two things cause Ca deficiency in plants: 1) not enough Ca is being supplied to or taken up by the crop, or 2) there is insufficient movement of Ca within your plants.

- In cases where supply/uptake is the limiting factor, too-low overall fertilizer rates, use of a fertilizer with too little Ca during fall and winter months, or an imbalanced Ca to magnesium (Mg) ratio (ideal range is 3:1 to 5:1 Ca-to-Mg), often due to poor/changing water quality that has gone unmanaged could be the cause.
- Calcium only moves via bulk flow of water through plants. When environmental factors like sudden drops in air temperature, high relative humidity, and lower light levels limit uptake

of water and transpiration, the flow of Ca slows or stops in the plant.

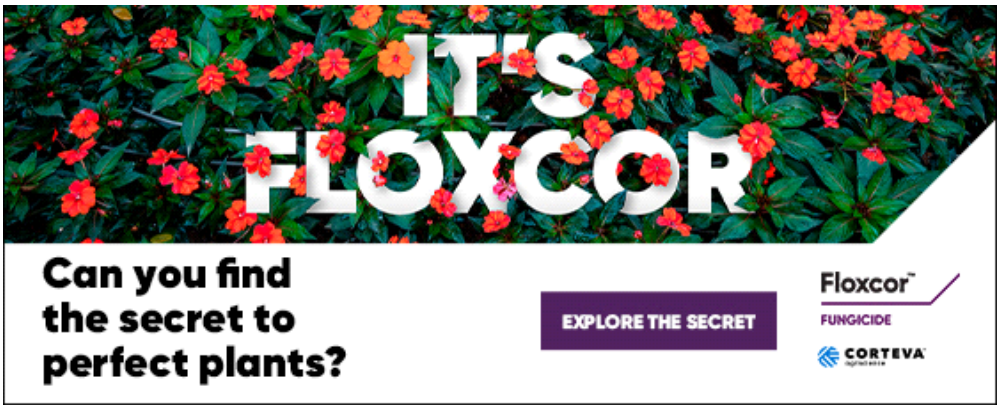
How Do You Combat Ca Deficiency?

Close management of your fertilizer program is the first line of defense against supply/uptake-related Ca deficiency. To prevent or correct this group of causal agents, be sure to:

- Pick a fertilizer suited for the crop, your growing environment, and the time of year. Some growers use all-purpose fertilizers or ones formulated with higher amounts of ammoniacal nitrogen (ex. 20-10-20) to push early growth on poinsettias. However, unless additional Ca is added to your feed later on or you alternate with 15-0-15 (calcium nitrate), many all-purpose feeds will not provide enough Ca to your crop. Use a Cal-Mag type feed (17-5-17 or 15-5-15), a “cool-weather” feed, or fertilizers formulated for poinsettias (like Jack’s Poinsettia LX 20-5-19) to stay ahead of your crop’s Ca needs.
- Properly mix your fertilizer to avoid accidental underfeeding and always double-check your fertilizer injector’s calibration each time you mix up a new batch of feed. Remember that poinsettias are generally “high feeders” so periodical feeding at ~300 ppm N or constant feed at 150–200 ppm is a good target for when plants are actively growing.
- Get periodical irrigation water tests done if your water quality changes significantly throughout the year (especially if you use surface water). If your alkalinity is high, the chances that your Ca:Mg ratio may become unbalanced if you pick the wrong fertilizer increases. Having a recent water quality report will help you make informed decisions on fertilizer section or if you need to acidify your water before injecting fertilizer, etc.

If lack of Ca movement in your plants is the most likely cause of deficiency symptoms, do what you can to modify the growing environment to increase water uptake and movement:

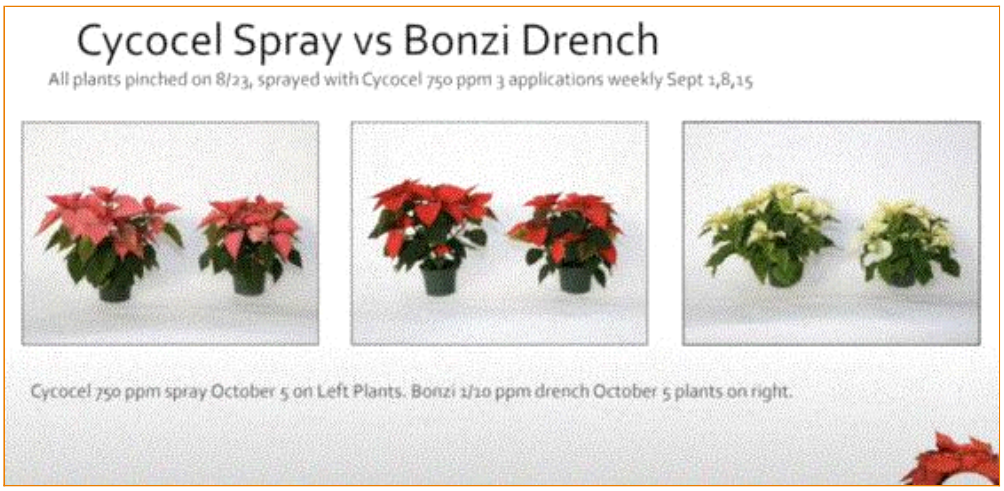
- When temperatures begin to drop, transpiration will reduce and relative humidity levels in the greenhouse will increase. Be sure not to run your greenhouse air temperature too cool, and dehumidify during the day when possible while your plants are actively growing.
- Adjust your greenhouse venting setpoints to avoid “crashing” too much cool air down on your crop and causing transpiration to grind to a halt. When the seasons start to turn—like now, between October and November—be sure to restrict how wide your vents can open when outdoor air temperatures are in the 50s F or below.
- Increase air flow in your greenhouse, especially if venting/dehumidifying isn’t possible due to too-cold outdoor air temperatures. Add HAF fans if you have too few or make sure they are running more frequently. This can help drive transpiration and Ca movement, even under adverse conditions.
- If changing fertilizer and doing your best to manage the greenhouse environment still isn’t enough to prevent Ca deficiency, periodical foliar calcium chloride (CaCl) sprays may be your best option. Apply CaCl sprays at 200–400 ppm to “glisten” (not runoff) and be sure to mix in a wetting agent to ensure the solutions spreads out across the leaf surface. Adding a wetting agent to the solution will enhance the rate of absorption and reduce the chances of phytotoxicity occurring. Weekly or bi-weekly sprays are appropriate, depending on the severity and frequency of the issue, but the goal should be to apply CaCl as few times as possible. Be sure to only use technical- or reagent-grade CaCl, as impurities in lower-grade CaCl can cause unrecoverable damage to your crops.



More on Poinsettias: Changing Your PGRs—NOW IS THE TIME!

In our Tech On Demand group meeting this week, the team mentioned these are the weeks in poinsettia production when growers should change their PGR strategies from sprays to low-rate drenches. This is because continuing spray programs too long results in severe reduction in bract size. If you want to hit your target ship dates, this is super critical!

Because our goal is always to help you grow your best crops ever, we have a video recorded with experts from Selecta One that digs into this topic. Take 10 minutes and watch this one—as a refresher or to help explain the PGR shift to new team members.



In **THIS VIDEO**, the experts spend quite a bit of time on PGRs for finishing a poinsettia crop. There's a lot of intricacy to this and you'll want to follow closely and pause as needed to make notes. They cover the differences in effectiveness between sprays and drenches, as well as offering detailed advice on exactly when to apply PGRs and at what rate.

About halfway through the video, the experts show results from trials using Cycocel sprays and Bonzi drenches to illustrate the differences. The video closes with a discussion about drench techniques and controlled-volume drip irrigation.



Water Quality Diagnosis & Management

Every season, the Tech On Demand team receives a ton of questions related to water quality. Usually, these challenges are fairly site-specific, and the solutions are equally unique. But there are certainly many resources available to help you solve problems when they occur.

First is a **"TOOLKIT"** from Penn State Extension that walks you through some of the measurements needed to determine water quality. As stated in this update, a comprehensive water analysis is always recommended prior to starting production, and periodic lab testing is suggested throughout the year. Be sure to keep records to follow trends and year-to-year changes.



The article linked above digs into four metrics specifically used to determine water quality: pH, alkalinity, hardness and electrical conductivity (EC). It's good to know the definitions and importance of each. If you have new growers on your team this year, be sure to print out and share this fact sheet so they know the foundations for successful water management.



Water Quality for Crop Production

Once you know the basics (above), the next step is to dig into **BEST PRACTICES FOR WATER QUALITY**. Thankfully, University of Massachusetts offers a manual that concisely covers the topic. In this fact sheet, researchers share information on how poor-quality water can impact crops, resulting in slow growth, poor quality and even plant death.



Once you know your water quality data, you can look more closely to determine beneficial (or adverse) effects on plant nutrition, as well as impacts on pesticide effectiveness. Both of these factors are explained, along with the appropriate charts and tables to dial in your strategies. The manual also looks at how you can adjust alkalinity using acids, as well as how to select an injector and the correct types of acid to use.

This detailed report doesn't stop there. It goes on to cover soluble salts and EC before moving on to micronutrients, water purification and removing salts. It's heavy reading but well worth the time and attention. In many cases, quality and efficiency starts with the water in your greenhouse. The effort put in learning your unique situation will pay big benefits as you move through the year and into the future.

Here's a water quality checklist to get started:

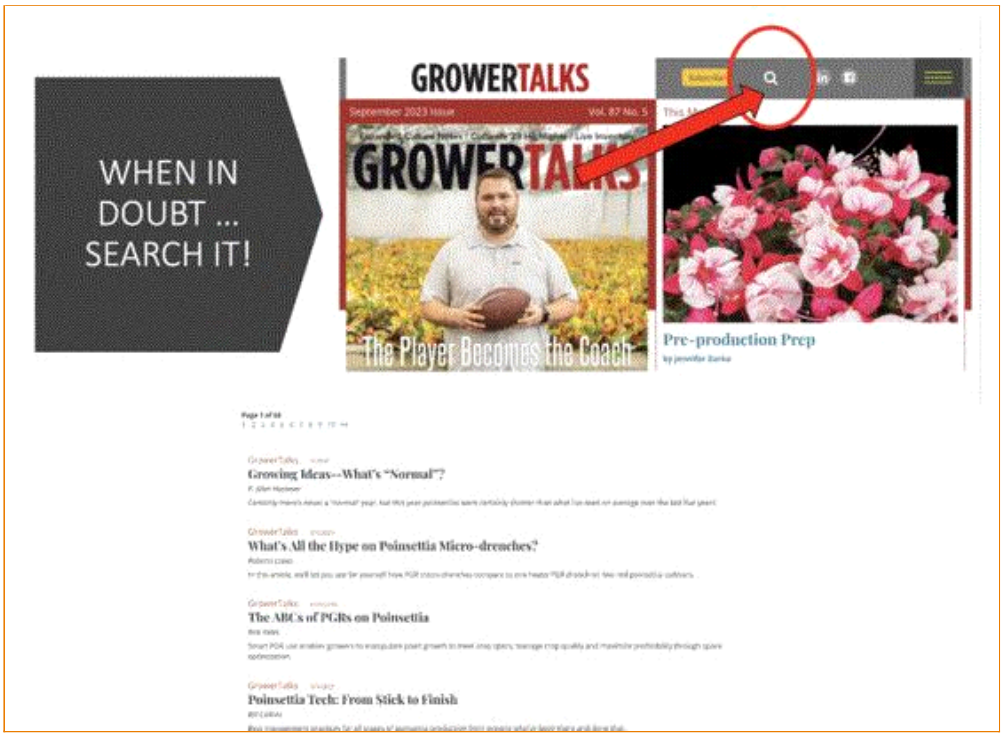
- Have water tested at a laboratory that is equipped to test water for irrigation purposes. Irrigation water tests should always include pH and alkalinity.
- Reclaimed water, runoff water, or recycled water may require reconditioning before use for irrigation since disease organisms, soluble salts and traces of organic chemicals may be present.
- Water quality should be tested to ensure it is acceptable for plant production and to minimize the risk of discharging pollutants to surface or ground water.
- Use filtration to remove suspended solids from water to prevent clogging of pipes, valves, nozzles and emitters in an irrigation system. Suspended solids include sand, soil, leaves, organic matter, algae and weeds.
- Water pH may need to be adjusted before being used for mixing some pesticides, floral preservatives and growth regulators.



Finish Line … Your Greenhouse Search Engine

Have you ever tried to search greenhouse issues via a major search engine and been less than enthused with the results? I know I have. Along the same lines, perhaps you remember reading about something in your favorite trade magazine or topical e-newsletter and can't put your hands

on the article or issue.



Did you know *GrowerTalks* has a handy search function on our website that combs through decades of magazines and thousands of newsletters before returning instant results leading you to the info needed?

You've got to try it out and then bookmark our **HOMEPAGE** on your laptop or phone. Once you do, I bet you'll use it often!

Please feel free to send your comments, constructive criticism and topic ideas to me at bcalkins@ballhort.com.



Bill Calkins
Editor - Tech On Demand

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