GROWERTALKS

Features

8/1/2020

Best Practices for DIF on Poinsettias

Julie Martens Forney

DIF and poinsettias go together like peanut butter and jelly—or the American Floral Endowment (AFE) and industry-changing research. For over 60 years, AFE has been funding progress for generations of future growers. Through industry support, AFE builds grower success. It's all about equipping growers with the latest information and techniques to solve their most pressing problems.

How plant growth responds to temperature is one research project that AFE helped fund. Today, that research is known as DIF, which is short for the "difference between day and night temperatures." With DIF, you can regulate stem elongation by manipulating the growing environment. A negative DIF (day temperature – night temperature = DIF) means day temp is less than night temp, while a positive DIF occurs when day temp is greater than night temp. Plant stems grow longer (height increases) as DIF increases.

Benefits of DIF with poinsettias

Poinsettias respond readily to temperature changes, making DIF a valuable cultural practice for growers.

"I use DIF as my first tool for poinsettias," says Aaron Bivens, Western Division Head Grower at Altman Plants, Inc. in Colorado. "I like the results it gives—ultimately, plants that ship better and have a better shelf life."

But the benefits of using DIF on poinsettias don't stop there.

"With DIF, growers save money on growth regulator chemicals and the labor needed to apply them," says Dr. John Erwin, University of Maryland, and one of the original DIF researchers. "There's cost savings on heat when growers drop the temperature before the beginning of the day—also known as morning DIP."

Maybe the top advantage to using DIF is gaining "day to day control of stem elongation," John says. "When the weather changes, you can adjust your growing practices to increase or decrease stem elongation. If you spray a growth regulator and the weather changes, you're stuck."

Best DIF practices: Timing

Using DIF on poinsettias is most important during September and the first week of October, when poinsettia stems

are elongating the most.

“DIF is most important during this window and it’s also the time that many people can use it,” John says. “The idea is that you can start managing the crop in early fall before all of your growth control options are taken away.”

Aaron puts DIF into play starting three weeks after pinching and continues for up to seven to 10 weeks, depending on pot and finish size.

“That timeframe is the linear growth phase of the crop,” he says. “If your crop is lagging behind, you can use positive DIF to increase stem elongation. Or if the crop is getting too tall too fast, you can use negative DIF.”

Best DIF practices: Morning DIP

Plant stems elongate most at the end of the night and beginning of the day, so dropping temperatures at that time reduces plant height most. The temperature drop doesn’t have to be large—seven to 10 degrees works. “The more sudden that change in temperature can be, the bigger the effect,” John says.

At Catoctin Mountain Growers in Maryland, Head Grower Julie Iferd uses “morning DIP” with poinsettias, although “it only works when outside temperatures cooperate. We often have a very warm September and October where it’s too warm in the early mornings to have enough of an effect,” she said.

When the weather permits using morning DIP, the process is simple.

“About 30 minutes before sunrise, we open the thermal curtains quickly,” Julie said. “If it’s not cool enough outside to naturally drop the temps by only adjusting the curtains, we also use the vents to lower temperature.”

She adds that DIP isn’t an ideal option if you have a house filled with different poinsettia varieties.

“When you use environmental controls like DIP, you really need the whole house to be at the same place on the graph.”

Aaron is on board with the morning DIP, citing it as the reason for brighter bract color and stockier plants.

“A sturdier plant with brighter color is a general benefit of growing cool at finish, but if your climate doesn’t allow for cool growing—or maybe you still need active growth—you can achieve those same results with DIP,” he said.

Pictured: DIF works well on poinsettia crops, delivering a bright bract when finished cool. n Weekly poinsettia measurements are marked on a yardstick. • Five sample plants from each poinsettia crop are flagged, tagged and measured each week as part of the graphical tracking process. Photos courtesy Aaron Bivens, Altman Plants.

Best DIF practices: Measuring plants

It’s vital to measure plants weekly.

“At the end of September, if you miss measuring one week, your plants could grow up to 2 inches,” John says.

No matter how busy you are, make time to measure.

“We use a yardstick with a level line that shows our height goal,” Julie says. “How do we manage to do it weekly? With poinsettias, it’s important, so you just make the time.”

At Altman Plants, a yardstick is also the measuring device of choice.

“We choose five average plants from each variety and finish date, and tape a yardstick to one of those plants,” Aaron explains. “Each time that plant is measured, the worker marks the yardstick, so you can visually see the progress the plant is making. During poinsettia season, I walk around with a yardstick so I can check crops anywhere, anytime.”

Measurement data goes into charts to show the height range of the crop for the week. A measuring team handles the weekly job, with one person assigned to each growing zone. To eliminate bias, the same person measures the same crop throughout the growing cycle.

“We try to choose someone who has good attention to detail for this task,” Aaron says.

When measuring, John says it’s important to know “that plants are most sensitive to being touched in the morning (just like they’re most sensitive to temperature in the morning). If you’re touching the same plant each week for a morning measurement, you can actually end up reducing the height.”

To overcome this, he suggests measuring different plants each week.

Best DIF practices: Graphical tracking

Using graphical tracking with poinsettias works best when you bring the graph in the greenhouse.

“Measure your plant, mark it on the graph and see if it’s too tall or too short,” John says. “Make the decision right then on the spot of what you’ll do in response to the measurement.”

Julie uses the University of New Hampshire’s FloraTrack for Poinsettias, which generates a graphical track based on data entered for each crop (start and end dates, cultivar, pot size, etc.).

“I prefer using a graph in the greenhouse so I can see the growth curve while I’m looking at the crop. Then I adjust parameters to get the growth to the intervals or size that I want,” she says.

When looking at plant height, “it’s so important to not just look at where the height is at that moment,” Julie adds. “Also consider the growth trend over the last week and where that plant will be if it continues that trend. That way you can see if what you’re doing with temperatures is working or if it’s working too well. Be careful not to over-react—not all varieties fit the graphs perfectly.”

Aaron is a big fan of web-based tracking. “It lets us overlay graphs from year to year, which helps me understand in my mind how a variety had aggressive growth in September and finished well. If I see that it’s 2 inches taller on this year’s measurement, then I know I need to slow growth.”

Altman’s also creates tables from the plant measurement charts that show the high and low point for each crop by week. These charts are laminated and posted in the greenhouse.

“This is more helpful to me because I can quickly see if from the current week until the next I’m expecting an inch-plus of growth or maybe only need a quarter to half an inch,” Aaron explains. “This helps me decide if I need to push, pull or hold the growth rate—and then I decide to implement negative or positive DIF.”

Research matters

DIF changed how poinsettias are grown. That kind of industry-changing research is what AFE is all about. AFE welcomes feedback and suggestions from the industry to help identify key research needs. Contact Dr. Terril Nell (tnell@afeendowment.org) to share your ideas and needs.

Also consider a tax-deductible contribution to AFE. It’s an investment with a terrific return. Industry-funded research benefits every grower when AFE is behind it. Reports on DIF and other AFE-funded research are available at

endowment.org.

Advice to Growers New to DIF

Tips from Julie Iferd, Head Grower at Catoctin Mountain Growers in Maryland:

• DIF works both ways. “The principles of DIF work in both directions. You can control plant height, but if you are behind on the graph, you can have a lower night temperature and a higher day temperature for a positive DIF and really see an impact on internode elongation.”

• DIF & timing. “Morning DIP affects overall average daily temperature. We aim for a 68 ADT for timely bract development. The longer we sit at a cool temp in the morning, it affects our overall ADT. We may have to adjust night or day temp to compensate to reach that overall ADT or crop timing is affected.”

• DIF & bracts. “DIF is a good tool to use after October 15 when we want to eliminate chemical applications to expanding bracts. If weather doesn’t permit DIF, then we use a paclobutrazol micro drench for height control.”

Tips from Aaron Bivens, Western Division Head Grower at Altman Plants in Colorado:

• DIF & real-time conditions. “If you use DIF, you need to be able to quantify what’s happening in the greenhouse. Invest in a data logger to record your growing environment. We use WatchDog data logger and move it around to different spots constantly. We compare the data from that to our environmental control computer to find microclimates.”

• DIF & varieties. “DIF becomes a really good, predictive tool you can rely on when you don’t make huge changes in the varieties you grow each year.”

• DIF & plant health. “An important factor in using DIF is plant health. If you have diseased roots, hungry plants or plants that are stressed due to an insect infestation, DIF won’t be as effective because the plant is struggling to survive.” **GT**

Julie Martens Forney is a freelance writer with more than 25 years of experience writing about floriculture industry issues and gardening for consumers. To read her current bylines, check out SAF’s Floral Management, HGTV.com and DIYNetwork.com. Julie’s also an avid gardener, tending edibles and perennials in a wildlife-friendly garden that features year-round color.