GROWERTALKS

Features

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Problem Prevention

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Poinsettia production can be challenging. The list of things that may go wrong can be long for even the most experienced grower. Especially in the early stages of production, issues such as shipping stress of unrooted cuttings, insects, disease and physiological disorders can result in a poinsettia season that feels like an uphill battle. Some things are out of the grower's control, but many issues can be prevented or mitigated with good preparation and solid cultural practices.

Leaf drop and yellowing in propagation

In most cases, sticking poinsettias in extreme heat simply can't be avoided. They're a crop scheduled for the hottest months of the year. Heat stress in shipping and in the early stages of the propagation environment can result in leaf yellowing and leaf loss, which can slow rooting and increase the incidence of disease. Properly handling cuttings can reduce stress.

A poinsettia showing signs of heat stress.

Storing cuttings for at least four hours or overnight in a cooler held at 45F (7C) upon arrival will help the cuttings restore turgidity lost in shipping. That's beneficial because a turgid cutting with a cool leaf surface requires less initial misting in propagation. Keep cuttings in the cooler and only remove the quantity that can be stuck within an hour. While storing the cuttings, prepare the propagation environment ensuring that light levels are low, air flow is reduced and relative humidity is on target.

Have the mist ready to go as cuttings are being stuck and, if possible, reduce night temperatures for the first two to three nights, which will also help reduce mist needs. Should leaf yellowing or leaf loss occur, cleaning and a fungicide application to prevent Botrytis is critical. Cleaning should continue until leaf abscission has ceased. If minor leaf loss occurs, the cuttings should root out as expected. However, if leaf loss is excessive to the point that only one leaf and the growing tip remain, rooting will be slowed and affect crop scheduling.

Schedule changes or late transplanting

Poinsettia scheduling is precise. There's a direct correlation between the amount of time between transplant and flower initiation and how much height can be achieved. When scheduling changes occur, whether it's from propagation issues or supplier issues that delay shipping, it can be exceedingly difficult to make up for lost time.

Transplant cuttings immediately to avoid further issues. Providing an environment for quick rooting is key. Avoid oversaturated media and high media EC, which can slow or inhibit initial rooting. Evaluate PGR needs carefully. It's likely that needs will be reduced when rooting is delayed or initial growth rates are slower. Pinch as soon as roots are active in the media. It may feel like an early pinch, but if the roots are expanding and active in the soil, the plant is ready to put energy towards new shoot growth.

Leaf distortion from heat stress.

Keep plants pot tight as long as possible. Pot-tight production creates a microclimate that encourages soft vegetative growth, leaf expansion and upright branch angles. Begin height tracking as soon as new shoots begin to expand. Early height tracking will allow for more informed height control decisions.

Ammonium-based feeds tend to promote softer vegetative growth. A good starting rate is 200 ppm N. A humid environment also promotes growth. Consider wetting walkways in the heat of the day to cool the greenhouse and maintain adequate relative humidity.

Light levels should be moderate. Low light levels in a warm greenhouse can slow growth. Conversely, high light levels can stress the plants and harden growth. Light levels should remain around 4,000 f.c. (footcandles) or 43,000 lux until the plants are established and actively growing.

As flower initiation approaches and if height tracking indicates that plants are behind, consider lighting to delay flower initiation. When lighting to delay initiation, lights should be on by September 5 and discontinued by October 10.

Another option is to utilize Fascination or Fresco applications to promote stem elongation. If roots and shoots are actively growing, response to Fascination or Fresco will result in elongation that's more natural than when those same chemistries are applied after flower initiation. Drenches tend to result in a more uniform response and are usually applied at 2 to 3 ppm. Remember that each variety will respond differently, so it's always a good idea to trial the application on a few plants first—the response is amazingly fast.

Heat-related physiological stress

Heat stress during the early stages of poinsettia production can be impossible to avoid. Heat stress manifests in the form of strap-like leaves and leaf distortion, which can slow growth, and in extreme cases, stall the crop all together. The damage can be variable because some cultivars are more sensitive to heat stress. Damage begins when tissue is young and forming on a cellular level. As the leaf expands the resulting distortion becomes apparent.

Fungus gnat larvae on a poinsettia.

Heat stress is often mistaken for thrips damage. Actual thrips damage in the early stages of production is uncommon. This is because poinsettias aren't a preferred host for thrips and thrips don't like wet and humid environments typical of poinsettia greenhouses in the early stages.

While most modern cultivars aren't susceptible to blind shoots it can be observed in extreme cases. Excessive heat in the early stages of production can also have an impact resulting in reduced branching. Under high heat, high light, excessive airflow and low humidity, new growth after the pinch can be slow and the number of shoots reduced.

Loss of phytoplasma (MLO) can be a result of exposure to extreme heat. Phytoplasmas are organisms present in the phloem of the poinsettia plant. The phytoplasmas react with poinsettia genes, which trigger a hormone responsible for "free branching" to start working within the plant. Phytoplasma loss may also change the physical appearance of a poinsettia. The response varies by variety.

Heat stress conditions (high light, high heat, low moisture availability) during propagation and the establishing phase can decrease or eliminate phytoplasma from the plant, resulting in poor or uneven branching and physical appearance not characteristic of the cultivar. All poinsettia cultivars can lose phytoplasma, but some cultivars are more susceptible.

Taking steps to manage the greenhouse environment properly can reduce stress. Keep light levels low to moderate. Avoid excessive airflow and maintain good relative humidity. Watering the base of the plants with cool, clear water in the hottest part of the day can cool the leaf surface. Be careful not to oversaturate the media and apply the water only to the cutting.

Pot-tight spacing helps maintain a microclimate that reduces stress. Frequent monitoring of the greenhouse environment allows for quick action if changes are needed. Cultivar selection is also important. Breeders make that easy by identifying cultivars known to perform better in regions of extreme heat.

Rhizoctonia

Rhizoctonia solani is a fungal disease that's only an issue in the early stages of production because the disease is favored by warm, humid conditions. Symptoms include a reddish, dry lesion at the base of the soil line that can girdle the stem and cause collapse. Damping off, root rot and aerial blight are also possible. Symptoms can often look like Pythium, so proper identification is key.

Signs of Rhizoctonia on a poinsettia.

Chemical controls differ depending on whether you have Rhizoctonia or Pythium, so submitting a sample to a local diagnostician for proper identification is always a good idea. Proper sanitation and environmental management to mitigate stress can reduce the likelihood of Rhizoctonia.

The pathogen prefers high salts in the media, so avoid high fertilizer rates before the plant can utilize it in the early stages of production. When preparing your fertilizer program, make sure the roots are active and shoots are growing before increasing initial feed rates and frequency.

There are many chemical choices available for suppression and prevention of Rhizoctonia, Fludioxonil is considered highly effective. Other choices would include Strobiliruns (Group 11), Thiophanate-methyl, etridiozole and iprodione. Biological agents such as Trichoderma harzianum have also been shown to offer prevention. Applications are most effective when applied as a drench. Always consult labels for recommended rates and methods of application. Always adhere to local regulations and follow manufacturer's instructions for safe application.

Insects

If cuttings arrive clean and have been inspected carefully upon arrival, the chances of an insect problem in propagation are unlikely. Be mindful of pet plants or weeds in or around the greenhouse that may harbor pests.

The most common issue early in production is fungus gnats, which prefer a humid environment and wet organic matter. Fungus gnat larvae feed on new roots and root hairs, limiting the plant's ability to effectively absorb water and nutrients. Damage from feeding can also increase the risk of pathogens. Early scouting for adults with yellow sticky cards placed at soil level is key. It's old school, but placing potato wedges in the greenhouse is a good way to scout for larvae. Maintaining moderate soil moisture and allowing at least the surface of the soil to dry between irrigations will mitigate risk.

Scouting for whiteflies and Lewis mites should also begin early. Most chemical options to prevent or control fungus gnats are also integral components in a sound Lewis mite and whitefly prevention program. Chemical prevention is a good idea; options include insect growth regulators like pyriproxyfen. Microbials are also effective for prevention. Consider *Bacillus thuringiensis subsp. israelensis*. Use contact chemicals like chlorfenapyr when necessary. Biologicals are also an option. Three choices include the rove beetle (*Dalotia coriaria*), the predatory mite, *Stratiolaelaps scimitus*, and the entomopathogenic nematode, *Steinernema feltiae*. Biologicals are best used when population levels are low.

Nutrition

It's typical for poinsettias to be a little on the hungry side as they emerge from the propagation environment. There's limited opportunity to boost feed rates in propagation and to avoid issues with phosphorus toxicity. Most propagators use a fertilizer formulation low or lacking phosphorus altogether. It's important to correct any nutritional deficiencies quickly so the problem doesn't continue to manifest as the season progresses. However, until roots are active, there's no need for high feed rates.

Start with low rates of 150 to 200 ppm nitrogen and use a formulation that also contains calcium and complete trace elements. Roots also need encouragement to do their job, which is to look for nutrients and water. High feed rates and wet soil where resources are readily available can slow or inhibit root development.

As plants establish and roots are active, and as a more frequent wet dry cycle becomes appropriate, feed rates can be increased to 250 ppm. This is typically around the pinch or shortly after as new shoots are forming. If boom or overhead watering is necessary, continue to avoid formulations with high levels of phosphorus or rinse immediately before the foliage dries after fertilizing to avoid issues with phosphorus damage.

Adjust feed rates as necessary using frequent EC readings. As the plants are actively growing, target ECs by measurement method are PourThru: 2.0 to 4.5 mS/cm, Saturated Media Extract (SME): 1.3 to 3.3 mS/cm, 1:2 Extraction: 0.6 to 1.5 mS/cm.

Media pH is also critical—when the pH is between 5.8 to 6.2 all nutrients are readily available to the plant. As new shoots expand after the pinch, it's also time to send in tissue and media samples. Early monitoring will allow for any necessary adjustments long before flower initiation slows growth rates and shifts the energy focus to forming flowers, which can slow nutrient uptake.

While this article can make it seem like poinsettias are problematic during the early stages of production, a few simple steps can have a significant impact. Start with a clean greenhouse, cuttings that are free from insects and diseases, and continue to scout for insects and diseases as your plants grow. Have the environment ready and

monitor frequently, plan and execute your preventative chemical rotation, and monitor nutrition early and often. Vigilance and prevention are key. React as needed and your crop will finish successfully. **GT**

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