e-GRO Alert

Ornamentals

Volume 15 · Number 3 · January 2026

# Little Plant, Big Plans: Starting Strong



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*Successful spring production starts in the liner. It is important to promote vigorous shoot growth early to prevent production stalls and achieve the desired finish plant size and target dates.*



## Spring Plant Nutrition

When considering spring plant nutrition, one can easily picture fully finished bedding plants at the garden center. However, to achieve optimal plant growth at the end of production, a strong start is required. This guide aims to provide tips to promote optimal plant growth starting when plants first arrive in the greenhouse.

Figure 1. Tip abortion is often caused by localized calcium deficiency. (© Patrick Veazie)

## Plant Nutrition Starts in Propagation

Plants during propagation have no or limited root systems, so nutrient delivery must be gentle, consistent, and well-balanced. Prior to root development, cuttings are reliant on the carbohydrates and nutrients that are stored within the cutting until roots are developed to uptake additional nutrients. Root development is an important aspect for nutrient uptake, and monitoring environmental conditions is as important as the fertility type and rate supplied during propagation.



## Environmental Considerations

High humidity and over-misting during propagation can reduce transpiration, limiting calcium (Ca) uptake and transport to the growing tip and actively expanding portions of the plant. This often results in localized

Ca deficiency, leading to symptoms such as tip abortion, distorted new growth, or necrosis in sensitive species, such as petunia or calibrachoa (Fig. 1). Similarly, overly saturated substrates reduce oxygen availability in the root zone, impairing root development and function and iron (Fe) uptake. This can manifest as interveinal chlorosis in young leaves, especially in iron-sensitive crops like petunia and calibrachoa, even when adequate Fe levels are provided (Fig. 2). Root zone temperature plays a critical role in root initiation, elongation, and nutrient uptake during propagation. Cool substrates (below 65°F) can inhibit root initiation, reduce root growth rates, and impair phosphorus availability. Conversely, excessively warm substrates (above 75–80°F) may increase respiration and potential dry down. Maintaining optimal root zone temperatures, between 68–72°F, supports root development and improves crop uniformity.

**Fertility Type and Rate**

***Fertilizer Type:*** Fertilizer selection can have a significant impact on young plant growth. Examining your nitrogen type and nutrient ratios is important when selecting a fertilizer for young plant production. Fertilizers that contain greater amounts of ammoniacal-nitrogen ($NH_4^+$) (such as 20-10-20) will promote an increase in plant stretch and lush growth and would be considered an acidic fertilizer. In contrast, fertilizers that contain a greater percentage of nitrate-nitrogen ($NO_3^-$) (such as 17-5-17 or 13-2-13) will create more compact transplants and would be considered a basic fertilizer. To determine if a fertilizer is acidic or basic, examine the guaranteed analysis for a potential acidity or basicity rating. Additionally, in some species, like pansies, in cold climates, ammonium toxicity can be observed with high rates of ammoniacal fertilizer.

***Fertilizer Rate:*** During propagation, once roots are developed and shoot growth is initiated, it is important to start fertilizing transplants. Beginning with a low rate of fertility (50-100 ppm N) to promote growth is important to prevent plant stall. As transplants develop, it is important to increase your fertility rate (100-150 ppm N) to meet the growth requirements and promote active growth at transplant. If plants receive inadequate fertility

Figure 2. Iron deficiency caused by a result of the root zone remaining oversaturated can result in interveinal chlorosis. (© Patrick Veazie)

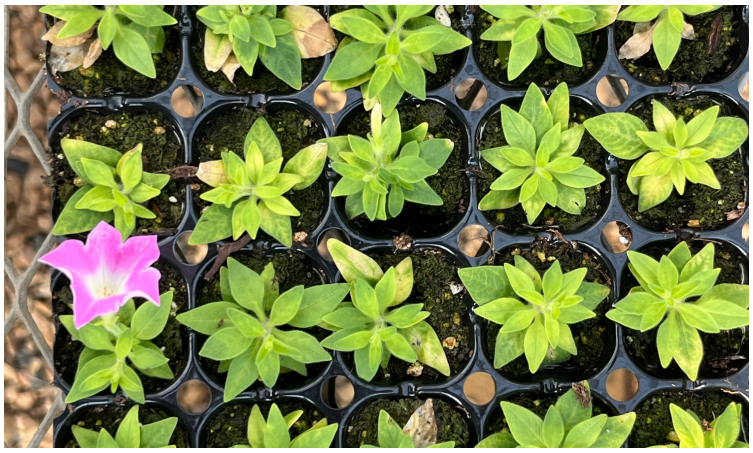

Figure 3. Plugs utilize large concentrations of stored nutrients during propagation. Without adequate feeding, plugs can exhibit limited shoot and root development, both during the plug stage and after transplant. (© Patrick Veazie)

Figure 4. Plants that receive a high $NH_4^+$-based fertilizer or an excessive fertility rate can result in lush, weak cuttings at the time of transplant. (© Patrick Veazie)

overall chlorosis, slow rooting, and limited shoot development may occur (Fig. 3). However, in contrast, if plants are over-fertilized, plant stretch resulting in weak cuttings may develop (Fig. 4). If you are receiving rooted liners or plugs, providing a boost in fertility can be helpful to help promote active shoot growth at transplant.

One important thing to consider if you are purchasing rooted liners is the need to potentially "jumpstart" liners. Providing an initial dose of 20-10-20 at 150 ppm N to promote rapid growth for rooted liners can boost shoot development and root growth for rooted liners that may not have received adequate fertility during propagation. A few North Carolina growers utilize this practice to help ensure their plants get off to a good start and avoid the potential for plant stall.

**Timing, Timing, Timing**

Receiving plants at the correct time when labor and space allow for transplanting is an important factor in promoting optimal plant growth. If plants are held too long during the plug stage, plants may stretch due to limited light, resulting in elongated internodes or premature flowering (Fig. 5). However, additional resources, such as plant growth regulators (PGRs), can prevent potential internode stretch and hold plugs until transplant can occur. It is important to follow recommendations for plugs of each species to prevent overdosing, resulting in a potential plant stall.

**Conclusion**

Spring plant performance begins long before the first blooms appear; it starts with strong, well-nourished liners. By managing fertility early, monitoring environmental conditions, and transplanting at the right time, growers can prevent production stalls and set crops on a trajectory toward uniform, high-quality plants. Attention during propagation and early transplant stages, especially with regard to nutrient delivery, substrate temperature, and spacing, can significantly reduce potential problems and promote optimal plant growth.

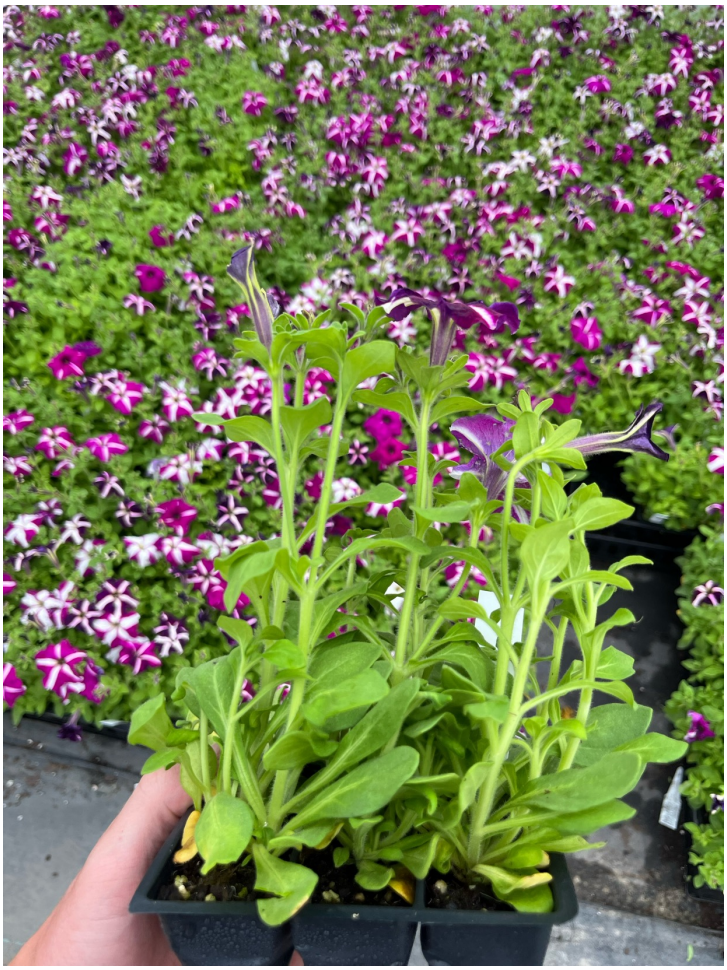

Figure 5. Plants overheld during the plug stage can result in significant internode stretch if not treated with PGRs. (© Patrick Veazie)

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