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## Strong Starts for Stunning Finishes: Best Practices for Floriculture Transplants

*Successful floriculture production begins with a successful transplanting season and is the foundation for producing high-quality plants.*

Successful floriculture production begins with a successful transplanting season and is the foundation for producing high-quality plants. Proper handling, nutrition, and environmental management at the early stages ensure rapid establishment and uniform growth. By following best practices for transplant care, growers can set their crops up for success, leading to robust plants that thrive through the entire production cycle.



Figure 1. Insect damaged plugs prior to transplant should be discarded or treated prior to transplant to prevent introducing pests to the operation. (Photo: Brian Whipker)

### Inspection and Acclimation:

There are a variety of ways that insects and diseases can enter your facility. One way is through receiving plugs and liners, once plants arrive checking for signs of damage, pests, and disease is an important step to not introducing problems into your greenhouse. Inspecting plants for abnormal growth or signs of feeding should be conducted upon arrival and periodically after in case unhatched eggs were on the plants at arrival (Fig. 1). Additionally, if there are current pest pressures from other crops segregating new shipments is important to stop the spread of pests from one portion of the facility to another.

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### Transplant Timing and Handling:

Holding liners or plugs too long before transplanting can negatively impact plant growth once transplanted. Prolonged time in propagation trays can cause root binding or root wrapping limiting their ability to establish properly after transplanting. This restriction can stunt growth, reduce overall plant vigor, and lead to delayed or uneven development. Additionally, overcrowded and stressed plugs or liners can result in early flowering, especially in day-length-sensitive species, diverting energy away from vegetative growth and reducing final plant size (Fig. 2). Nutrient imbalances can also arise, as root-bound plants struggle to take up water and nutrients efficiently, further compounding stunting and overall poor performance.

### Watering:

When liners are shipped they are generally ready to be transplanted and can rapidly uptake the available water in the cell. Drought stress while holding plugs or liners can result in stunted growth, root loss, and leaf loss (Fig. 3). It is important to monitor the moisture levels and ensure that trays are watered to level 4 but do not dry down below level 2 to prevent stunting.

### Fertigation Before Transplant

Often liners or plugs receive a low level of fertility during propagation to prevent plant stretch or salt accumulation within the cell. Once plugs and liners arrive, supplying a fertilization of 75 to 100 ppm N irrigation to boost nutrient levels in the plug is important to giving the plants a boost at transplant. A few North Carolina growers will go further to boost fertility by applying 200 to 250 ppm N from a high ammoniacal-



Figure 2. Holding plugs for an extended amount of time resulting in transplanting delays can result in excessive root wrapping or early flowering. (Photo: Patrick Veazie)



Figure 3. Plugs that experience drought stress can result in stunted growth, lower leaf loss, or root damage. (Photo: Patrick Veazie)



Figure 4. Plugs with limited nutrient concentration prior to transplant can result in plant stall and visual nutrient deficiency symptoms. (Photo: Brian Whipker)

nitrogen fertilizer such as 20-10-20 to jump-start the plants for establishment. Plants that are transplanted with low nutrient levels may exhibit plant stunting, chlorosis (N deficiency), or lower leaf purpling (P deficiency) (Fig. 4). Promoting plant growth initially will help the roots reach the side of the pot and increase shoot growth earlier.

### PGR's

There are a variety of reasons for the use of PGR's at the liner stage, however, selecting the correct rate and chemical used is important. Utilizing liner soaks or foliar spray are excellent options when considering holding back plug development. One option to consider is ancymidol (Abide or A-Rest), often considered a "softer" PGR provides options when growers need to hold back growth on plugs. If PGRs are used at an excessive rate leaf stippling and plant stunting may be stunted throughout production (Fig. 5).

### Photoperiod

Some plants such as dahlias, iresine, strobilanthes, and tuberous begonias require long daylengths to remain vegetative. If supplemental daylength extension is not provided during propagation, then tuber formation in the case of dahlias or tuberous begonias can form, which hinders vegetative growth. Premature flowering can also occur with iresine and strobilanthes (Fig. 6) if the daylength is too short. Night interruption lighting can be used to ensure that the plugs remain vegetative.

### Conclusion

Utilizing best management practices when plugs or rooted liners arrive is important for establishing season-long success. Proper fertilization, timely transplanting, and watering help



Figure 5. Excessive plant growth regulator rates at the plug stage can result in foliar damage and stunted plant growth throughout production. (Photo: Brian Whipker)



Figure 6. Flowering in strobilanthes can occur under short day conditions, which result in stalled vegetative growth. (Photo: Brian Whipker)

optimize early growth and prevent problems later in production. By focusing on these best management practices early, growers can promote root and shoot development, increase uniformity, and develop a better crop for the finishing phase.

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