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Propagating With Controlled-Release Fertilizers©

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INTRODUCTION

What started as a way to reduce the amount of liquid fertilizer applied to the floor of our greenhouses during the production of spring annuals and forced crops has blossomed into a much more targeted and accurate way of applying nutrition. I kept looking at crops that were spaced between 50% and 88% and thinking how much liquid fertilizer was being wasted every time the injector clicked and pumped. By providing individual plants the nutrients they need instead of supplying water-soluble fertilizer to an entire growing area we can reduce the amount of fertilizer that is applied to the spaces, walkways, greenhouse ends, and voids within a group of plants. We asked ourselves what other crops were spaced or shipped at staggered times from the greenhouses. Various programs and propagation schedules began popping up. Potted liners were spaced between varieties for watering needs and shipped at different times when orders were taken. Different evergreen varieties were taken at different times leaving gaps and spaces within the crops. *Populus* seedlings were grown outside on benches after germinating and watered with overhead sprinklers. Different taxa of perennials and softwood cuttings that were propagated in packs were all spaced due to the different misting requirements they call for and then shipped as there numbers were called for planting or shipping. As we began critically evaluating the programs within the greenhouses, we found several great candidates for the incorporation of controlled-release fertilizer (CRF).

MATERIALS AND METHODS

Different products and formulations of CRF allow us to better match fertilizer type and the nutritional needs of specific crops. Duration of time the crop is to be grown helps identify products with sufficient release periods. If the crop is only grown for 3 months before being transplanted or sold there is not much need for a fertilizer longevity that exceeds this time period. The individual tray size and configuration also lends itself to using different types of product. We have been successfully using Harrell's Apex / Polyon 20N–8P–8P 12–14 month and Scott's Osmocote 18N–5N–9K 5–6 month mini-prill formulations. The rates we have incorporated vary from 6 to 10 lb/yd^3 depending on the type of crop being fertilized. Just by switching from a traditionally sized CRF prill to a mini prill a grower can increase the distribution in the medium by approximately 5X. In 1 pound of fertilizer there are approximately 18,614 prills of traditional-sized product. One pound of mini prills will contain approximately 98,506 prills. This is especially important when trying to incorporate CRF evenly into the small cells most often used in propagation trays. Trying to distribute fertilizer evenly can be challenging. Even when using a mini-prill formulation we have experienced uneven plant growth related to the varying amount of fertilizer in the cells. We have helped correct this problem by making some adjustments in our system after the fertilizer has been added to the medium before the blending process occurs. Proper distribution is essential to using CRFs successfully.

RESULTS

Successful results, across many of the different types of propagation, have been observed at Bailey Nurseries Inc. over the last few seasons. Trials have been conducted thoroughly and repeatedly to ensure our standards of high-quality plants continues to be met. Most forms of initial propagation have been evaluated at all times of the year. Seeds have been propagated into media blended with CRF, as have root pieces and divisions. Hardwood and softwood-stem cuttings of both evergreen and deciduous plants have been started. Most have responded equally as well or better when using CRF in propagation. Crops from tender perennials to dormant evergreens have each shown preference to this method of nutrient delivery.

We feel this can be attributed to several factors, most namely when plants are just beginning to seek out fertilizer there is a charge present for them to use. The presence of nutrients is immediate and does not need to be initiated by someone at the end of a hose.

Using CRF in propagation allows us to provide a drier environment for rooting. By relying on the prills to release nutrients we are able to deliver water just when the medium is dry and not as a way to deliver fertilizer. Before, if we wanted to provide any food to the plants we were also required to add water. This led to a moister, less air-filled rooting environment during a critical time in the rooting process. The rooting time of many varieties has been hastened in this drier environment.

Incorporating fertilizer at planting also allows our growers to spend more time with the crops by eliminating the need for rinsing after using liquid fertilizer. A grower can set the time clocks on the irrigators and not have to double back at a certain time to rinse.

Conversely, *Rhododendron* taxa have shown preference to clear water during the root initiation process with liquid fertilizer applications only being given once rooting has started. Rooting percentages have decreased and overall root mass has been insufficient when CRF has been trialed.

By concentrating fertilizer inside the propagation trays themselves and only applying clear water to the greenhouse as a whole we have witnessed a reduction of algae in our aisles and walkways. Our propagation areas appear cleaner where CRF is used.

Plants that leave our greenhouses with CRF blended into the medium are likely received by customers and our other production areas alike containing a higher fertility charge than if fed with water soluble fertilizer alone. They can be more properly maintained with clear water and will have an extra reservoir of nutrition when transplanted.

CONCLUSION

Using CRF in propagation at Bailey Nurseries, Inc. has reduced the amount of water-soluble fertilizer that we apply. The controlled-release fertilizer has helped improve the growth of many of the liners we produce by increasing their size in a shorter period of time and by giving us a head start in the next phase of production. Targeting individual plants with nutrients instead of large areas of propagation houses appears more environmentally sound. By looking at the type of container we are using and the length of time we spend propagating certain plants we are successfully pairing different fertilizer formulations with different crops. Continued research in new technologies and products will undoubtedly lead us to produce new plants and programs in more efficient and environmentally sensitive ways.