More Ethephon Options with Collate on Herbaceous Perennial Liners

Are you looking for an easier, more effective, way to use ethephon on your liners? Try Collate drenches or liner dips.

Collate is the new ethephon formulation registered in the U.S. by Fine Americas in January 2013. This is a concentrated liquid formulation containing 21.7% active ingredient, as compared to the 3.9% formulation, Florel (Southern Agricultural Insecticides, Inc.), with which you may be more familiar.

Etherephon has been used in U.S. ornamental plant production for many years. Ethephon produces ethylene gas inside the plant. Ethylene is a natural plant hormone that influences senescence, branching and growth. To many producers, it is a staple in their growth regulator program to manage flower abortion or timing, to increase branching and in some cases, to manage plant height. Probably the most common usage is to maintain stock plants in a vegetative state by aborting flowers. In many crops, not only are the stock plants vegetative, but they may also produce a greater number of lateral branches providing an increase in harvestable cuttings.

Currently ethephon is only labeled for application as a foliar spray but recent work has found that ethephon has a significant amount of soil activity. Many growers would prefer a media application method especially if the product can be delivered through the irrigation system.

Etherephon Effects on Herbaceous Perennial Liners

Applied to cuttings during propagation, ethephon can prevent flowering, increase branching, and manage elongation, all excellent contributions to a high quality liner. Our previous work with Florel found that Veronica spicata ‘Goodness Grows’ was responsive to ethephon applied as a spray or media drench (Figure 1). There was no difference in the efficacy of the Florel applied as a 500 ppm spray or drench. While neither reduced the height or shoot dry weight of the finished liners, both increased lateral branching. While untreated control plants averaged less than one lateral branch...
at four weeks after treatment, Florel-treated liners had more than four branches per liner. These responses did not carry over in the finished plants. In finished plants, at eight weeks after initial treatment, Veronica plant height and number of lateral branches were not affected by Florel. However, root dry weight of the finished plants was reduced by the Florel drench.

Materials and Methods:
We purchased unrooted cuttings, treated them with a 1,000 ppm IBA dip, rooted them under mist with bottom heat at 22°C (72°F), and applied Collate as either a spray, liner dip or drench (varied with test) the day after the rooted cuttings were removed from mist (stage 3). We grew liners out under greenhouse conditions with 150 ppm N. We assessed the growth and branching of finished liners (2 to 4 weeks after treatment) and the resulting finished plants (8 weeks after treatment) compared to an untreated control and/or a manual pinch (soft pinch at the time of Collate application).

We tested the effect of Collate on Salvia officinalis ‘Aurea,’ Phlox paniculata ‘Starfire,’ Heliopsis helianthoides ‘Loraine Sunshine,’ and Veronica longifolia ‘First Love.’ Collate application rates were based on recent work from Cornell, Purdue and Michigan State Universities on the use of ethephon drenches on bedding plants.
Our Results:

In our spring test, at the rates used, Collate had no effect on growth of Phlox, Heliopsis, or Salvia as liners or finished plants. However while Phlox branching was not responsive to Collate, some treatments increased branching of some of the other crops. Heliopsis liners treated with 10 or 20 ppm liner dips had a 3-fold increase in the number of leaders which did not persist in the finished plants.

Salvia liners in the spring test had a greater number of lateral branches when treated with a 10 ppm liner dip or a 500 ppm foliar spray. This increase in lateral branching was no longer evident in the finished plants. In a late summer trial, the dip treatment at 20 ppm increased the number of leaders and lateral branches without reducing plant growth (Figure 2). Again, there was no effect on the finished plants.

Veronica was most responsive to Collate in both tests. Liners were considered finished at 2 weeks after treatment, at which time there were no lateral branches on any of the plants. However, Collate improved lateral branching of the finished plants (Figure 3). Collate did not delay flowering.

Figure 2. Salvia officinalis ‘Aurea’ liners (left to right): untreated (avg. 0 lateral branches/liner) or treated with Collate as a 250 ppm spray (avg. 0 branches), a 20 ppm drench (10 ml/cell; avg. 0 branches), a 20 ppm liner dip (avg. 6.2 branches), soft pinch (avg. 4.8 branches) at 2 weeks after treatment.

Figure 3. Veronica ‘First Love’ finished plants (left to right): untreated (avg. 17 lateral branches); or treated with Collate as a liner dip at 10 (avg. 22 branches), 20 (avg. 21 branches), or 40 ppm (avg. 20 branches); or soft pinches (avg. 26 branches); or as a foliar spray at 125 (avg. 22 branches), 250 (avg. 26 branches), or 500 ppm (avg. 25 branches) at 8 weeks after treatment.
**Tips from our Collate Trials**

Although some of our liners were responsive to very low drench and liner dip rates, start your own tests at 50 to 125 ppm for most floricultural crops. For very vigorous crops you may want to test up to 250 ppm as drenches or liner dips.

As with spray applications, acidify your Collate solution to a pH of 4 to 5. The Collate formulation contains acidifiers, but your water source affects the final solution pH. Check the final pH of the solution to ensure that the pH is below 5.0. Use the Collate solution within 24 hours of mixing.

Pay attention to environmental conditions at the time of treatment. Foliar spray applications are best made under slow drying conditions for maximum uptake and effect. Liner dips and drenches may reduce the influence of the local environmental conditions on the efficacy of Collate treatments.

In all cases, remember that ethephon produces ethylene in the plant, the stress hormone. Do not treat plants that are already under stress from any cause. Ethylene will exacerbate that stress, causing phytotoxicity symptoms and additional plant damage.

In addition, one of the primary effects of ethylene in the plant is the abortion of flowers. In general, do not apply Collate within six weeks of market unless you have experience with the crop response with respect to flowering. To extend growth regulation or to maintain plants in a vegetative state, Collate may be applied at two to four week intervals.