

Potted Plants On CRFs



How does the use of CRFs affect potted flowering crop production? Three studies seek to answer that question, as well as look at some of the economic and environmental benefits of using CRFs in the greenhouse.

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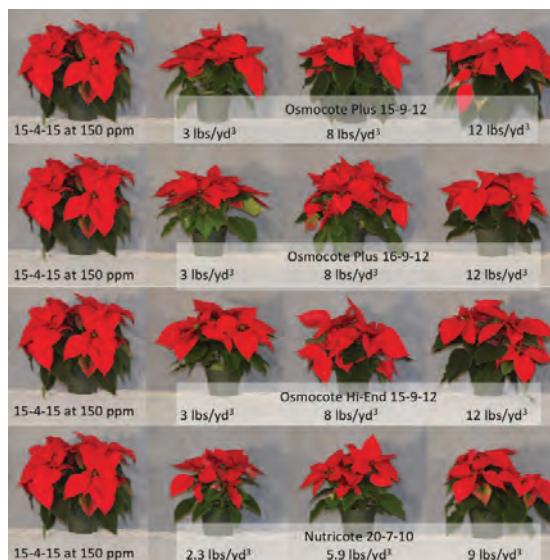
AFTER seeing how bedding plants are affected by controlled-release fertilizers, three separate studies were conducted to show how the use of these fertilizers influenced the production of potted plants.

The Poinsettia Experiments

Rooted liners of 'Premium Red' poinsettias were potted into 4.5-inch containers filled with a commercial soilless substrate that was amended with CRFs: Osmocote Plus 15-9-12 and Osmocote Plus 16-9-12 applied at a rate of 7.9 and 7.4 pounds per square yard (lbs./yd³), respectively, and Nutricote 20-7-10 at 5.9 lbs./yd³.

For comparison, a treatment of constant water soluble fertilizer (WSF) [15-4-15 Poinsettia FeED at 150 ppm nitrogen (N)] was also included. The plants were watered using drip irrigation as needed throughout the experiment, and a leaching fraction between 20 to 25 percent was maintained and adjusted weekly to accommodate for plant growth. Total leachate was also collected from the treatments and analyzed for nutrients each week.

A second poinsettia experiment was conducted using larger containers and a range of CRF rates. Rooted liners of 'Premium Red' were planted in 6.5-inch containers filled with a commercial soilless substrate amended with Osmocote Plus 15-9-12 or Osmocote Hi-End 15-9-12 (both at rates of 3, 8, or 12 lbs./yd³), Osmocote Plus 16-9-12 at (2.8, 7.4, or 11.2 lbs./yd³) and Nutricote 20-7-10 at 2.2, 6 and 8.9 lbs./yd³. A constant WSF treatment (15-4-15 at 150 ppm N) was also included. In this study, plants were evaluated for growth and marketability.



The Growth Index of 'Premium Red' poinsettia was similar for all plants, regardless of fertilizer or rate used.

The Gerbera Experiment

Rooted liners of *Gerbera* 'Drakensberg Daisy Apricot' were potted in 4.5-inch containers filled with a commercial soilless substrate that was amended with different CRFs: Osmocote Plus 15-9-12 (7.8 lbs./yd³), Osmocote Hi-End 15-9-12 (7.8 lbs./yd³), Harrell's 15-9-12 (7.8 lbs./yd³), Harrell's 15.5-5.2-15.5 (7.6 lbs./yd³), Florikote 16-5-11 (7.4 lbs./yd³) or Florikote 11-3-12 (10.7 lbs./yd³).

A constant WSF treatment (15-4-15 Poinsettia FeED) was also included. Plants were irrigated as necessary while maintaining a leaching fraction between 20 to 25 percent. Total leachate was collected and analyzed weekly.

The Cyclamen Experiment

Rooted liners of *Cyclamen* 'Laser Synchro Scarlet' were transplanted in 4.5-inch containers filled with a commercial soilless substrate that was amended with CRFs: Osmocote Plus 15-9-12 (3 or 6 lbs./yd³), Osmocote Hi-End 15-9-12 (3 or 6 lbs./yd³), Nutricote 20-7-10 (4.5 lbs./yd³) and Osmocote Bloom 12-7-18 (3.7 or 7.5 lbs./yd³).

Controlled-Release Fertilizer

Like the other studies, a constant WSF (15-4-15 Poinsettia FeED) was also included. Plants were irrigated as necessary while maintaining a leaching fraction between 20 to 25 percent. Total leachate was collected and analyzed weekly.

Similar Growth Index For Poinsettias, Gerberas and Cyclamen With CRFs

Plant height at flower and the average plant diameter of the finished plants were combined into one number that we called Growth Index (GI). The GI was obtained by adding the height to the diameter and dividing by two, which gives us a relative quality rating.

The GI of poinsettia and gerbera were all similar regardless of fertilizer or rate used. Only cyclamen fertilized with Osmocote Plus 15-9-12 at 3 lbs./yd³ had a significantly lower GI than the WSF treated plants. Poinsettias in the first experiment were of similar total height re-

gardless of fertilizer treatment.

Poinsettia plants treated with Osmocote Plus 16-9-12 and Nutricote 20-7-10 had lower dry weights than the other treatments. Osmocote Plus 16-9-12 and Nutricote 20-7-10 are labeled to have five-to-six month and seven-to-nine month release rates, respectively.

In both cases, it is probable that the plants were not receiving adequate nutrition early in the crop cycle, during the period when most growth occurs due to the release rate of these two products. During the second poinsettia experiment, all CRF-treated plants began to show mild symptoms of nitrogen deficiency during the last three weeks of production. The plants were treated with several applications of WSF and symp-



Gerbera 'Drakenberg Daisy Apricot' also had a similar Growth Index for all plants, regardless of fertilizer or rate used.

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toms disappeared.

When the amount of nitrogen leached between the WSF and CRF treatments is compared, the environmental benefits of using CRFs is clear. The amount of nitrogen in the leachate continued to increase dramatically through the production period for WSF, while for CRF the amount of nitrogen in the leachate was much less, declining over time until it was barely detectable after six weeks.

Consider More Than Just The Per Bag Cost

Cost is always an important aspect to consider when evaluating a new product or production procedure. Many growers have indicated that the price of CRFs is too expensive to even consider using them in the greenhouse. That is a reasonable reaction when you consider that a 50-pound bag of CRF can cost around \$100 and a 25-pound bag of water soluble fertilizer costs around \$30 to \$40.

In terms of dollars per pound of nitrogen, CRF is more expensive; however, it is important to factor in the overall cost of fertilizing the crop, not just how much the material costs. For our poinsettia crop, over the course of the experiment, we used 6.8 liters (1.8 gallons) of water.

When the cost of WSF is calculated (considering fertilizer is applied at every irrigation), it costs about \$3.26 to fertilize 100 containers when the fertilizer costs \$40.35 for a 25-lb. bag. At the application rates used, the CRF treatments cost between \$0.70 to 1.03 for 100 containers when the CRFs cost \$100 for a 50-pound bag.

Trial CRF Products For Best Results

CRF fertilizers show great promise for potted flowering crop production. Cost per container is drastically reduced and the amount of runoff is also reduced. Although in most cases growth was similar to constant WSF, there were some symptoms of nutrient deficiencies — mainly nitrogen.

As suggested in the first article in this special report, it is recommended that growers gradually transition to CRFs and use a combination of WSF and CRF. An alternative is to apply WSF to green up

plants before they are sold or as soon as nutrient deficiencies are observed. Not all CRFs are coated in similar ways, and this will affect the release rate of nutrients. Therefore, it is important for growers to conduct their own trials to determine how their crops respond to different rates and different CRF products. **GG**

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