

Configure: Expanding A Plants Growth Potential

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There is a wide range of PGRs for growers to choose from in order to meet the growing requirements of their crops and the shipping requirements of their customers. One of the newest chemicals on the market is Configure, from Fine Americas Inc.. Configure is a synthetic cytokinin that is labeled for use on herbaceous ornamental crops as a branching agent.

Configure – What is it?

Configure is a 2% liquid solution of benzyladenine, a synthetic cytokinin. Configure is a branching agent. It was released onto the market in 2007 for use as a foliar spray on Christmas cactus, Echinacea and hosta. In 2008, it was approved for all 50 states and it received a supplemental label for experimental use on any annual, perennial, foliage or tropical crop grown in a greenhouse.

How BA Affects Plant Growth?

The primary activity of Configure is to interrupt apical dominance and stimulate axillary buds to break. Apical dominance is the phenomenon where the terminal bud on a branch inhibits axillary buds along the branch from breaking. Apical dominance is maintained by a balance of auxin produced in the apical meristem of the plant and cytokinin produced in the roots of the plant. Apical dominance can be interrupted by increasing the ratio of cytokinin to auxin with a foliar application of the synthetic cytokinin contained in Configure. This reduces the ability of auxin to prevent axillary bud break and allows the axillary buds to escape from apical dominance. This ability to break apical dominance may potentially be used in certain crops to stimulate early flowering and to force buds out of winter dormancy early. Decreased plant size may be a side effect of reduced apical dominance because the plant has to divide its energy budget amongst a greater number of side shoots. As a result, growers may observe that their plants are shorter. Depending on the overall structure of plant, an increase in branching may result in a wider plant or in a narrower plant.

Research Results with Configure

Extensive research has been done to study the affect of cytokinins on ornamental crops. Research from Japan in the 1970's showed that cytokinins increase branching in Christmas cactus. Configure has been shown to increase branching of the phylloclades of Christmas cactus. In addition, if Configure is applied during the floral initiation stage of flower development, then it can increase flowering in Christmas cactus by stimulating additional flower buds to break (Figure 1). The floral initiation period in Christmas cactus begins after a certain number short days have occurred. The exact number is different for every cultivar. The increase in flowering caused by Configure depends on the concentration used. A single foliar application of 100 to 200 ppm Configure is ideal for increasing the number of flowers and branches. Higher concentrations cause many small buds to form, but many of them may not completely flower.

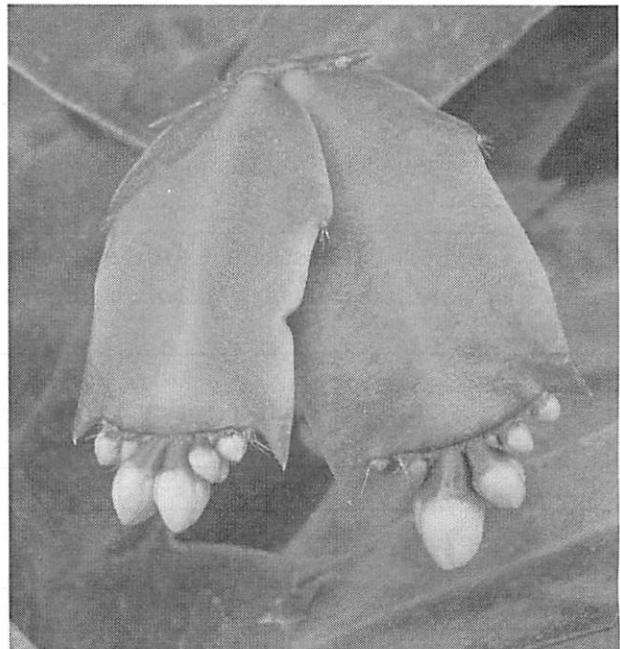


Figure 1. Bud count increases on phylloclades with Configure foliar sprays after floral induction.

Configure can increase the number of branches that form in a hosta crown. A number of researchers (Gary Keever, Auburn University; Joyce Latimer, Virginia Tech, and Paul Pilon, Perennial Solutions Consulting) have worked on suitable Configure rates for hostas. Hostas require high rates of Configure, from 500 to 3000 ppm. For optimal results, pot the hosta roots in the fall to allow them to become established. Spray the plants in early spring once new growth has just emerged, and then 2 weeks later. Paul Pilon recommended two sprays of 500 ppm instead of a single higher dose. Dr. Latimer has also studied Configure on Echinacea and found that 300 to 900 ppm foliar sprays increased branching by 3 times over the control, but noted cultivar differences.

Our research at NC State University focused on applying Configure onto a wide variety of annuals and a few perennials. Configure is effective on slower growing, petunia cultivars such as 'Improved Charlie' at 80 to 160 ppm. Configure greatly increased branching of this prostrate plant and as a result it reduced the average diameter of the plants. On slow growing but highly branched cultivars 'Surprise White' and 'Surprise Blue Vein Improved', Configure at 80 to 160 ppm tightened up the somewhat loose canopy of the plants. The overall width was reduced but the overall height was slightly increased. However, on the fast-growing Wave petunias, Configure had no effect at the concentrations trialed.

Configure is very effective on Hens and Chicks at increasing the number of offsets that form. Out of

seven cultivars that were trailed, five had an increase in the offset number. The ideal concentration of Configure for Hens and Chicks is from 200 to 400 ppm and the number of offsets increased from 2.5 to 10 times over the untreated plants (Figure 2).

Configure was also effective on reducing the height and increasing the branching of Salvia 'Caradonna' at concentrations of 400 to 800 ppm. Flowering was delayed by 3 weeks, however once flowering began, up to 3 times as many inflorescences were produced.

Application Cost

As with all PGRs, the cost per pot is an important variable to consider when deciding whether or not to use it. A representative cost for Configure is \$85 for a 2-quart container, but every grower will have different costs, so they will need to do their own cost determination. Table 1 has some example costs for the spray recommendations discussed above. For the significant improvement in plant quality, the per pot costs are very economical for using Configure. To treat single Christmas cactus costs less than one-tenth of a cent, while at the upper end, it costs 1 cent to treat a hosta with 1000 ppm.

Application Methods

As with all PGRs, the way you apply Configure is very important. Configure is similar to B-Nine in that it takes several hours to be fully absorbed across the leaf cuticle. Thus, the best time to apply Configure is when the leaf surface will stay wet for >4 hours, such as early or late in the day when the

Table 1. Chemical costs for Configure foliar sprays.

Based on pot tight spacing of plants, using 0.5 gallons of solution per 100 square feet of bench area.

Plant	Concentration (ppm)	Pot spacing (pot tight)	Cost per pot	Cost to treat 1000 pots
Christmas Cactus	100 to 200	4 inch	<\$0.0005 to \$0.001	\$0.50 to \$1.00
Hens and Chicks (Sempervivum)	200 to 400	4 inch	<\$0.001 to \$0.002	\$1.00 to \$2.00
Saliva 'Caradonna'	400	6 inch	\$0.0048	\$4.30
Echinacea	300 to 900	Gallon	\$0.0032 to \$0.0096	\$3.20 to \$9.60
Hosta	1000	Gallon	\$0.01	\$10.06

sun is low, or on cloudy days. It is better to apply Configure when humidity is high in the greenhouse such as early in the morning or on rainy days. Do not water the plants via an overhead method soon after spraying Configure or you will wash it off of the leaves. Configure is similar to Bonzi in that it does not move very far from the point of contact. Configure moves primarily in the xylem and much less so in the phloem. Thus it will tend to move upward/outward in the plant from the point of contact. Configure affects the axillary buds. Thus complete spray coverage is vital so that the spray comes into contact with the axillary buds and their nearby stems. This is even more important once the crop's canopy has closed over. Growers will need to apply Configure with a high pressure spray and a swirling motion in order to drive the mist under the canopy and into the axils. On plants that have a tight rosette or crown, a high volume spray (srench) may be the best way to get the chemical down into the crown. Configure is best absorbed when the tank solution has a near neutral pH (5.0-8.0). Acidic and basic tank solutions reduce the solubility of benzyladenine in water and may result in precipitation.

Spray timing and repetition is also very important with Configure. Configure does not cause buds to form. Rather it affects quiescent buds that have already formed. Thus, in order to increase the effect of Configure on branching it must be applied during a time when the plant is forming new buds. Some plants only form buds at a certain time of the year. This is the best time to influence their growth with Configure. Other plants continuously produce new buds. Thus, multiple applications of Configure may

provide better results than a single application. The benzyladenine in Configure is metabolized by the plant fairly rapidly (roughly 10 days). Thus, multiple lower dose applications throughout the production cycle may work better than a single spray application.

Sensitivity / Overdose / Phytotoxicity

Configure is not effective on all plants though. Some plants such as pansy and exacum appear to be very sensitive to foliar spray applications of Configure. Concentrations as low as 50 to 100 ppm can cause long lasting leaf yellowing and other phytotoxic effects on these sensitive plants. Other plants such as petunia will display minor levels of leaf yellowing at higher concentrations, but the discolorations disappear in a few weeks. On other plants, phytotoxicity can appear with excessively high concentrations in the form of leaf cupping (Iresine and Zinnia), changes to leaf morphology (e.g., more lobes) or leaf edge necrosis (Salvia, Heuchera). In cases where you discover that a plant is sensitive to Configure, multiple applications of a lower concentration may provide better results than a single high concentration application.

Conclusion

Configure is a good addition to a grower's PGR toolbox. It is inexpensive and effective on a number of plants by encouraging axillary shoots.

Dennis Carey is a former graduate student at NCSU who conducted research on benzyladenine as part of his Master's thesis. A version of this article was originally published in GPN.

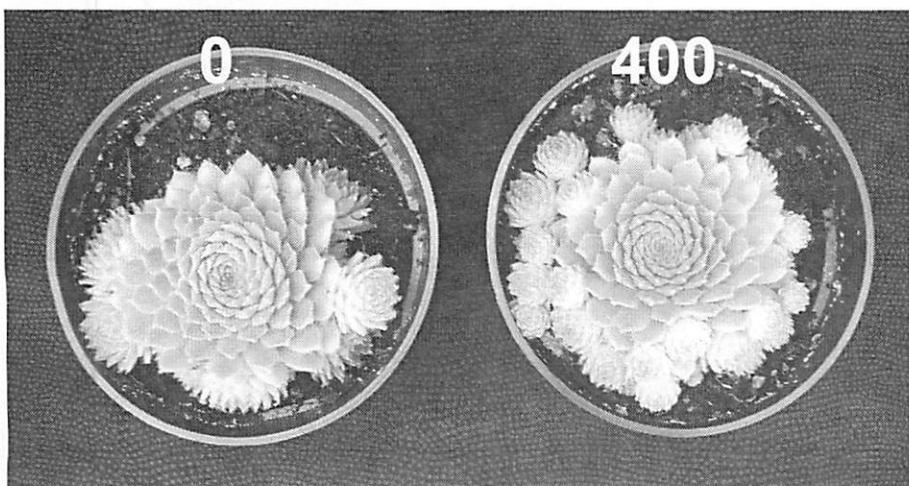


Figure 2. Offset number is increased on Hens and Chicks with Configure foliar sprays (left: untreated control and right: 400 ppm).