

## **FOLIAR FEEDING OF CALCIUM**

Calcium is an essential nutrient in building strong cell walls. Poinsettias are often deficient in calcium. This deficiency causes their stems to be weak, flower bracts to be soft and increases the tendency toward the development of bract edge burn. The best way to diminish calcium deficiency is to get the calcium right to these locations as the cells are developing.

The most natural way for plants to get the mineral nutrients they need is to take them up through the roots, dissolved in the water available in their growing medium. The plants may not get enough calcium through the roots because there isn't enough calcium dissolved in the growing medium solution, or there isn't enough water moving through the plant. Poinsettias need a balanced fertilizer solution containing all the essential nutrients, including calcium. Many of the soluble fertilizers like 20-10-20 or 15-5-25 alone do not supply calcium. Supplement these fertilizers with other fertilizers like 15-0-5 or 20-0-20 or 15.5-0-0 (calcium nitrate) which are good sources of calcium. Other sources of calcium are dolomite, limestone or gypsum that may be pre-mixed with the growing medium. Also, irrigation waters may contain some level of calcium.

Calcium deficiency situations may also occur when the roots are inactive and very little water is moving through the plant. When there is little air movement in the greenhouse or the relative humidity is high, the plants use less water and take up fewer nutrients. This may lead to a calcium deficiency.

It is good practice to apply calcium as a fertilizer to the root zone and ensure that the greenhouse environment provides for rapid movement of water through the poinsettia plant. However, these practices do not always guarantee that the calcium will reach the regions of cell development fast enough to prevent leaf edge burn or bract edge burn. When these situations occur, it may be advisable to spray calcium solutions directly on the poinsettia leaves or flower bracts. Leaf or bract tissues absorb calcium and other nutrients directly into the cells, avoiding any delay or deficiency to the area needed.

### **How to Spray Calcium**

- Mix a water solution containing 200 to 400 ppm calcium from calcium chloride and add a spreader-sticker known not to burn poinsettia leaves or bracts.
- Put the solution in a clean sprayer that has not been used for herbicides or other toxic substances.
- Spray the plants with a fine mist, only until the leaf or bract surface glistens. This is a similar procedure used for spray applications of growth retardant.
- Weekly applications seem to be frequent enough to provide the needed calcium for rapidly expanding leaves or bracts.

### **Important Notes**

- Practice foliar feeding of calcium on only a few plants before spraying the entire crop. Spray injury should be evident in 3 to 4 days if it is going to occur.
- Calcium solutions may be sprayed on poinsettia stock plants as well as the flowering crop. Foliar sprays help prevent leaf edge burn, intensify leaf color and encourage stronger growth.
- If you are spraying calcium solutions to prevent bract edge burn, you must spray the colored bracts from the time you see first color, until the time you see first pollen on the flowers. If you are spraying calcium solutions on green leaves and stop spraying when bracts start to color, you will not get protection against bract edge burn. Calcium will not move from the green leaves into the colored bracts.

- A common rate for spreader-stickers is 2 to 4 ounces per 100 gallons of water when mixing foliar sprays. Use 1 to 2 ounces per 100 gallons of water when using on bracts. Use only enough spreader-sticker to prevent the spray solution from “beading-up” on the leaf surface. Soft water will require less spreader-sticker than hard water. To avoid possible leaf distortion, do not use water which has been treated with phosphoric acid.
- Follow the same precautions used for spraying pesticides. Spray plants when the growing medium is moist and plants are not wilted or showing stress. Spray when greenhouse temperatures are less than 80°F/26°C to prevent burn. It is usually safer to spray in early morning since late afternoon spraying may not allow the plants to dry before nightfall, and this would encourage *Botrytis* development.
- Make calcium solutions from calcium chloride (CaCl<sub>2</sub>). Fertilizer grade calcium nitrate (Ca(NO<sub>3</sub>)<sub>2</sub>) or liquid calcium preparations used for foliar feeding and vegetable crops frequently burn bracts. You should use refined grades of calcium chloride known as “laboratory” or “reagent” grade. Calcium chloride is available in the dihydrate or anhydrous forms; dihydrate is usually less expensive. Fertilizer grades of calcium chloride may contain enough impurities to burn the leaves or bracts of the poinsettias. Horticulture grade of calcium nitrate has also been used without causing injury to poinsettia bracts.

#### Dilution Table for Calcium Solutions

Amount of Final Spray Solution	Calcium Chloride Dihydrate CaCl <sub>2</sub> · 2H <sub>2</sub> O	Calcium Chloride Anhydrous CaCl <sub>2</sub>
	~ 27% Calcium	~ 39% Calcium
100 gallon	1 lb.	12 oz.
25 gallon	4 oz.	3 oz.
3 gallon	½ oz.	3/8 oz.
Approximate ppm calcium in final solution	324 ppm	357 ppm