

Poinsettia Guidelines

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Poinsettia production starts with planning and not with panning. The first step in the planning process is to determine when you want plants salable. From that date, the timing of every other process is determined. It is real tempting to write this from flowering to propagation, however I will not do that to avoid confusion.

Planning (scheduling) Decisions

Flower date (response group)	-	?
Short days start	-	?
Pinch date	-	?
Pot date	-	?
Propagation date	-	?

Stock and Propagation

Poinsettia stock can be planted in March for a 3 pinch program, April for a 2 pinch program, or May for a 1 pinch program. Each of the programs have advantages and disadvantages. Less cuttings are produced per plant with the later planting, however the saving of early spring space for other production is often more valuable. Single pinched stock plants can also be grown in small containers but certainly require more greenhouse space. Stock plants should receive adequate light and space for pinching and harvesting of cuttings.

Stock plants must be grown in long days. Incandescent lighting (10 foot candles) should be provided from 10 p.m. to 2 a.m. from planting until mid-May. Plants are pinched 2 weeks after potting and every 4-6 weeks to buildup cuttings and to maintain soft vegetative growth. 2-4 nodes are left on the pinched shoot. Poinsettia cultivar does affect the number of cuttings from a stock plant as well as scheduling of pinching and cutting removal. Seek guidelines for specific cultivars and follow those guidelines. Those guidelines are available from the breeders and suppliers.

Poinsettia cuttings 2.5-3 inches long are snapped or cut from stock plants with a sharp clean knife. The knife should be disinfected between stock plants. Cuttings should be taken in the morning when plants are turgid and should be placed in clean plastic bags or on clean newspaper. Cuttings should be treated with a rooting hormone to improve rooting uniformity and speed, stuck quickly, and not allowed to wilt. It is not necessary or desirable to remove leaves from the cuttings.

Poinsettia cuttings can be rooted in peat pellets (Jiffy 7's, Jiffy 9's), phenolic foam (Oasis), rockwool, or root medium filled cells. Cuttings can also be direct stuck in the finish container but this method requires a great deal of mist space. Whatever root medium or method is selected, great care should be taken to assure the medium is free of disease at the start and remains disease free through out propagation.

Cuttings must be rooted under intermittent mist. Mist is applied from sunrise to sunset at a frequency that keeps cutting leaves uniformly moist. Mist frequency may start with a mist cycle of 10 seconds every 4-6 minutes for the first 4 days. Mist frequency is reduced every 4-5 days as plants callous and root. After cuttings are stuck, it is very important to arrange leaves so cutting terminals (growing points) are not covered.

Temperature is very important during propagation. Minimum air temperature should be 70°F. Bottom heat should maintain a root medium temperature of 75-80°F. Cuttings should show visible roots in 21 days and be ready for potting in 28 days. Cuttings should be fertilized under mist beginning 14 days after sticking.

Scheduling

Poinsettia scheduling is required to provide top quality plants to the ever lengthening poinsettia market. The present market requires flowering plants from as early as the first week in November through the Christmas season. It is impossible to provide plants in prime condition without scheduling. Growing temperature should not be used to schedule poinsettias. Low temperatures, less than 62°F. night/70°F day, will delay flowering but will also reduce bract size.

High temperature, greater than 65°F night/80°F day, will speed flowering but reduces plant quality and fades bract color. Cultivars can also be selected for early or late flowering, however your customer may complain if cultivars are changed during the marketing period. Therefore cultivar selection, although useful in specific cases, can not always be used to spread poinsettia flowering.

<u>Response group (short days start until flower)</u> 8 - 10 weeks Natural season flower dates (Nov. 20 - Dec. 4) 2 weeks is a big difference
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What is flowering in poinsettias? Anthesis or visible pollen on the first cyathia should be used as your guide to a salable poinsettia. Plants without pollen will never develop to their full potential in the post harvest environment and plants held in the greenhouse after anthesis, even at cool temperatures, will show reduced postharvest quality and longevity.

With all the new cultivars and their differences, along with the need for prime plants over a four week period, make poinsettia scheduling much more difficult. Different growth habits among cultivars also adds to the complexity. And on top of this complexity add the differences in growing conditions between the northern and southern production areas.

<u>Cultivar</u>
<u>Growth Habit</u>
Short
Medium
Tall

But there are some general guidelines that are very important to remember: Natural short days start around 25 September (probably a little earlier for Freedom). If you do nothing, flower initiation will occur on that date. Lighting, to prevent initiation and make sure the plants remain vegetative, should start on September 5.

Lighting should begin September 5.

Two to three weeks of growth is needed between panning and pinching to develop a good root system before pinching. The time between pinching and the start of short days is to me the most critical decision on overall crop quality. This can vary between two to five weeks, depending on the cultivar and growing conditions. I would strongly suggest you seek information from the breeders and universities in your specific area to help in these scheduling issues. The time between the pinch and the start of short days greatly affects final height and overall plant size. We have tools to control size but few tools exist to increase size after the start of short days. The maximum potential height and overall plant size is in some respects determined at the start of short days.

<u>Freedom scheduling as an example between flowering time and region¹</u>				
	<u>North</u>		<u>South</u>	
	<u>early</u>	<u>late²</u>	<u>early</u>	<u>late²</u>
pot	Aug. 05	Aug. 15	Aug. 15	Aug. 21
pinch	Aug. 19	Sept. 05	Sept. 1-7	Sept. 10
short days	natural	Sept. 29	natural	Oct. 06
flower	Nov. 15-25	Dec. 01	Nov. 15-20	Dec. 01

¹long day lighting should start on Sept. 5

²from Nell, Barrett, Hartley Grower Talks/August 1993.

Media and Fertilization

The root medium used for poinsettias should be porous, well-drained, contain a moderate nutrient content, have a pH of 5.8-6.2, be free of insects and disease pests, and be easy to manage. You also want to select a medium that will be appropriate for the consumer. It should not be so well drained that in the home environment it is impossible to keep it moist.

Poinsettias have generally been considered a high fertility requiring crop. Although the light leaf cultivars fit into this category, the newer dark leaf cultivars require lower nutrient levels (150-200 ppm N). In fact, high levels of fertility (300 ppm N) can reduce crop quality in the darker leafed cultivars. My experience would suggest that you really need to fertilize the light and dark leaf cultivars differently and not compromise somewhere between the high and low levels when growing both groups in the same greenhouse.

Micro-nutrients are important in poinsettia production. Poinsettias have a high requirement for molybdenum (Mo) which is generally added at each watering at 0.1 ppm.

0.1 ppm Mo Application

Stock

1 oz. of ammonium or sodium molybdate/40.0 fl. oz. water

Application

0.15 fl. oz. of stock solution/100 gallons of water

Research has also shown the importance of the calcium to magnesium ratio for adequate calcium uptake in poinsettia production. High levels of magnesium interfere with calcium uptake, while too low levels of magnesium will cause magnesium deficiency, another common problem in poinsettia production. The best ratio of Ca:Mg for poinsettia production appears to be 2:1. Both calcium and magnesium should be monitored with root medium analysis because they are both very important macro nutrients in poinsettia production.

Height Control

Growers generally apply a chemical growth retardant to poinsettias to reduce height and tone the plant. Commonly used chemicals are: Ancymidol (A-Rest), Daminozide (B-Nine SP), Paclobutrazol (Bonzi), Chlormequat (Cycocel), (Sumagic), and B-Nine SP/Cycocel tank mix. Different cultivars respond differently to the various chemicals therefore growers must adjust rates in their own production. General ranges are: Cycocel, 1,000 - 3,000 ppm; Bonzi, 10-30

ppm; Sumagic, 2-10 ppm; B-Nine Sp/Cycocel tank mix, 2500 ppm B-Nine SP/1500 ppm Cycocel; and A-Rest, .25 to .5 mg a.i. drench. Chemical growth retardants should not be applied after the start of short days as bract size can be significantly reduced in the northern United States.

Cut-off dates for B-Nine/Cycocel, Bonzi, Sumagic North - start of short day South - 2-4 weeks after start of short days

Research has shown that very low concentrations (1-2 ppm) of Bonzi or A-Rest can be applied as a drench as late as early November for height control without a significant bract size reduction. This approach is useful to correct a height problem occurring late in the production cycle and to avoid late stretch.

<u>Late drenches of growth regulators</u>

A-Rest

1 ppm drench (4 fl. oz./pot) 0.485 fl. oz./gallon
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2 ppm drench (4 fl. oz./pot) 0.970 fl. oz./gallon
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Bonzi

1 ppm drench (4 fl. oz./6" pot) 0.032 fl. oz./gallon

2 ppm drench (4 fl. oz./6" pot) 0.064 fl. oz./gallon

higher rates in the South, lower in the North

DIF is also used to manipulate poinsettia height in those areas with cool day temperatures. A positive DIF increases stem elongation and a negative DIF decreases stem elongation. Computer software is available to use DIF as a tool to control plant height. It is very important that average daily temperature not be changed when using DIF, therefore both day and night temperatures need to be adjusted to maintain the same average daily temperature. Average growing temperature can affect timing and bract size.

DIF - difference in day/night temperature

Positive DIF	
warm day/cooler night	taller plants
Negative DIF	
cooler day/warmer night	shorter plants

Bract Disorder

A number of bract disorders can cause serious problems in poinsettia production which appear suddenly at flowering. The grower has little chance to correct these problems once they appear. Research has shown bract necrosis (also called bract edge burn) can be caused by a number of factors including calcium deficiency in the bract tissue, fluoride toxicity, imbalances in Ca/Mg or Ca/K ratios, and pesticide toxicity. The following guidelines can be used to help reduce poinsettia bract necrosis:

- Supply adequate calcium in the fertilization program.
- Provide a calcium uptake environment
 - reduce humidity in the greenhouse
 - maintain good root growth
 - use a well drained root medium
 - reduce fertilizer salts
- Avoid fluoride
- Avoid pesticides on bracts
- Maintain 2:1 calcium: Magnesium ratio
- Avoid excess levels of potassium
- Select cultivars less sensitive to bract necrosis

Weekly sprays of 400 ppm calcium from calcium chloride beginning at first color have significantly reduced poinsettia bract necrosis. Spray plants to runoff making sure bract tissue is covered. I personally do not recommend a wetting agent from fear of phytotoxicity, although other researchers do recommend a wetting agent to improve coverage. Growers that have experienced any bract necrosis should spray plants with calcium as insurance.

400 ppm calcium spray solution
use 'reagent' grade chemical
Calcium Chloride Dihydrate
(CaCl₂ • 2 H₂O)

1.47 gm/liter water
or
55.6 gm/10 gallons water
or
1.96 oz./10 gallons water

Post Harvest

Poinsettia growers have a responsibility in post production longevity of the plants you grow. You simply can not afford to just be happy to have the plant out of the greenhouse door. Happy poinsettia consumers make for repeat customers.

The grower's responsibility in postharvest care is to provide the best poinsettia possible at the proper stage of development, free of insects and diseases, and low in soluble salts (fertilizer). Research has clearly shown that poinsettias have a much longer and better display life when sold at visible pollen. Young underdeveloped bracts will never develop good color in the postharvest environment. Pink bracts on red cultivars result when plants leave the production environment too early. Do not sell a poinsettia before its time!

Fertilizer salts should be reduced before selling, however it is not necessary or desirable to completely eliminate fertilizer application, just reduce the rate to 1/2 or 1/4 the rate used during early production. Poinsettias can also receive chilling injury when exposed to 50°F or less for as short as a two hour period of time. Chilling injury can cause epinasty as well as leaf loss under the most severe case. Transporting plants in unheated trucks in the north and uncooled trucks in the south can significantly reduce poinsettia quality. Certainly a general guideline is that poinsettias do much better when placed in a uniform non stressful environment. The best

environment could be compared to the environment you would provide for a newborn baby but just a few degrees cooler (60 to 65°F).

The greenhouse grower should provide the following instructions to retailers. Upon receiving plants, unpack and unsleeve them immediately. Poinsettias left in the sleeve become droopy. This epinasty is caused by ethylene production from the sleeving process. The longer poinsettias are sleeved and the higher the temperature above 65°F, the greater the droopiness problem. The plants generally recover from epinasty in a couple of days when placed in a lighted area at 65-75°F if the sleeving period was longer than a couple of days.

Poinsettias should be placed in bright light at 60-65°F. They should however not receive direct sunlight under postharvest conditions. The plants should be out of hot or cold drafts. A heat duct or outside door should not expose the plants to sudden changes in temperature. At no time should poinsettias be stored in a garage area.

Poinsettias are fragile. Rough handling will bruise the bracts and cause stem and leaf breakage. Poinsettia plants can not be handled like hard goods. Also be sure to provide adequate spacing in the display area. Plants should not be spaced so close together that the bracts from one plant rub against the bracts of an adjacent plant.

As a poinsettia producer and marketer, you can do a great deal to maintain the potential postharvest beauty and longevity built into the modern poinsettia cultivars. At the same time you can reduce the postharvest life of the poinsettias you handle. It is extremely important that we all do our very best to give the consumer the best possible poinsettia. Plant abuse anywhere in the marketing chain will ultimately show up in the final consumer setting - whether it be a hotel lobby, mall display, or home living room. I like the concept that each poinsettia plant should be handled like it is the one you would take home for Christmas. Every poinsettia consumer deserves such treatment.