POINSETTIA PRODUCTION GUIDELINES FOR THE GULF SOUTH

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Cultivar Selection

Choosing which cultivars to use out of more than 100 on the market is an important decision for poinsettia growers. Growers must evaluate their intended markets (mass market, florist, or retail nursery) in terms of bract color, plant size, and plant type desired. The sales date (early, late) will influence selection because poinsettias can be scheduled for optimum development using the flowering response time. In recent years cultivars have been bred to flower naturally early enough to meet the demand for early sales. Other considerations may be space efficiency of cultivars and how many cultivars can be managed effectively.

Some cultivars which are being grown successfully in the Gulf South are:

Red

Bright Red Freedom	Festival Red	Red Angel
Capri Red	Freedom Fireworks	Redberry Punch
Carousel	Freedom Red	Red Elf
Chianti Red	Nutcracker Red	Red Velvet
Christmas Cookie	Olympus	Santa Claus Red
Christmas Dream	Orion Red	Silverstar Red
Coco 2000 Red	Pepride Red	Sonora Dark Red
Cortez Dark Red	Peterstar Red	Sonora Red
Cortez Red	Petoy	Spotlight Dark Red
Dynasty Red	Pizarro	Success Red
Early Joy Red	Premium Red	Winter Rose Dark Red
EuroGlory	Prestige	

White

Cortez White	Pepride White	Snowcap
Festival White	Peterstar White	Sonora White
Freedom White	Santa Claus White	White Christmas
Nutcracker White	Snowberry Punch	Whitestar

Pink/Rose/Salmon/Coral

Capri Pink	Freedom Pink	Peterstar Pink
Carousel Pink	Freedom Rose	Santa Claus Pink
Cortez Hot Pink	Freedom Salmon	Silverstar Pink
Cortez Pink	Maren	Sonora Pink
Cranberry Punch	Noblestar	Spotlight Pink
Early Joy Pink	Nutcracker Pink	Strawberry Punch
Enduring Pink	Nutcracker	Success Light Pink
Festival Rose	Salmonstar	Winter Rose Deep Pink
Flirt	Pepride Pink	Winter Rose Pink
Freedom Coral		

Marble

Marblestar	Peterstar Marble	Santa Claus Marble
Pepride Marble	Puebla	Sonora Marble

Jingle Bells

Freedom Jingle Bells	Jingle Bells 3	Sonora Jingle
Jester Jingle	Jingle Bells 4.0	Sonora White Glitter

Novelties

Amazone	Christmas Candy	Lemon Snow
Peppermint	Cortez Burgundy	Monet Twilight
Avant Garde	Da Vinci	Plum Pudding
Champagne Punch	Heirloom Peach	Strawberries 'N Cream

Substrate

There are many good premixed substrates for growing poinsettias. When selecting a substrate the three most important concerns that one should take into consideration are bulk density, moisture retention and aeration.

Bulk density is particularly important if very small (4" container) or very large (tree poinsettia) plants are being grown as these plants can become top-heavy. This problem can also be partially remedied by using the appropriate container size. The bulk density of a substrate for production of a standard 6" pinched poinsettia can be accommodated by almost any substrate as long as one follows the rule of a standard size plant. A standard sized poinsettia is considered to be no greater in height than 1.5 to 2 times the height of the container.

Moisture retention and aeration properties should be decided by the person doing the irrigation. If the person irrigating prefers to minimize the number of irrigations and is careful not to over-irrigate a crop or a subirrigation and flow system is being used, then a substrate with more peat moss should be used. If the person irrigating tends to over-irrigate then a substrate with more pine bark should be considered. The moisture retention and aeration of peat moss is approximately 76% and 8% at container capacity; bark is approximately 59% and 20%; perlite is approximately 38% and 25%. A good mix that combines all three is a 7 pine bark: 2 peat moss: 1 perlite, with moisture retention and aeration of approximately 65% and 17% respectively. Substrate pH should be 5.5-6.5.

Poinsettias are very susceptible to root rot. A substrate with high moisture retention may provide an optimal environment for fungal or bacterial infections. Infections caused by these pathogens are also aided by wounding caused by fungus gnat larvae. Fungus gnats and larvae prefer a consistently moist substrate for reproduction and growth. Therefore a substrate that has good moisture retention and also good aeration will help lower the incidence of infection by pathogens and fungus gnats.

Moisture retention is also very important for those poinsettias that are grown in containers that may have a large plant compared to the container size as mentioned earlier. As these plants mature, irrigation may have to be increased to two or three times a day if the substrate has too much aeration. The distance that the finished plant has to be shipped is also an important factor to keep in mind. A plant that must be shipped for longer than a 12 hour period and then set on a retail shelf and not irrigated for 2 days

should also be given special consideration prior to planting. A substrate with better moisture retention may be a necessity in this case.

The importance of selecting a substrate that works well with the irrigation program and type of poinsettia crop being grown cannot be stressed enough. Therefore it is imperative that the person in charge of irrigation be included in the decision when selecting substrates.

Transplanting

Unrooted cuttings should be unpacked and stuck in the finished pot size as soon as possible. Unopened boxes can be stored at 50 F for no more than 24 hours. One should try to maintain air temperatures below 80F while rooting if possible. Indole butyric acid (IBA) may be applied at a rate of 0.1 to 0.3% on the base of the cutting for faster rooting. After sticking, cuttings must be misted so that the leaves do not roll and the leaves remain moist but not with standing water. A spreader-sticker such as Capsil 30 can be used to help maintain turgidity. A heavy shade (80 to 90%) until callus is recommended for growers in the Gulf South. A fungicide should be used to prevent Botrytis soon after sticking. A broad spectrum fungicide should be applied as drench approximately 3 to 10 days after sticking. Once the cuttings are rooted, approximately 2 weeks, the plants can be treated as one would a transplanted rooted cutting.

Rooted cuttings should be unpacked and thoroughly watered immediately after receiving and kept in a cool area away from direct sunlight. If a tray of rooted cuttings is allowed to dry out, the stress that is incurred makes it very difficult for the cutting to recover. If rooted cuttings are kept in the packing box at high temperatures a similar stress will occur and thus the same poor performance. Therefore, transplanting of rooted cuttings should be done as soon as they are received. The longer the cuttings remain unplanted the greater the chance for water stress or root rot. Rooted cuttings should also be inspected upon arrival for quality. A good quality rooted cutting should have minimum stem diameter of 0.25 inches (smaller diameters will result in poor lateral stem strength) and a stem length of approximately 3 inches with 2 to 3 fully expanded leaves.

When planting the rooted cutting, the rooting cube should be placed slightly below the substrate surface. This will help prevent evaporation of water from the cube, which can cause moisture stress. Placing a crop in full sunlight is usually not recommended until the plants are well established, pinched, and lateral growth has begun. A broad-spectrum fungicide drench should be applied approximately 1 week after planting.

Planting dates will vary according to the predetermined finish date and response group. Shipment of rooted cuttings usually begins the second week of August. All transplants should be established by September 25 as this is the beginning of natural short days or critical day length which is 12 hours and 20 minutes. Flower initiation occurs naturally around this date. This will be discussed more thoroughly in lighting and photoperiod.

The number of transplants per pot will depend upon the pot size and type of desired finished plant. Poinsettias can be grown as non-pinched, single-stem or branched, multi-bloom plants. The typical poinsettia produced in the U.S. is grown in a 6-inch container with one branched plant. Single-stem plants are grown in 6- to 6.5-inch containers (3 transplants), 7-inch containers (4 or 5 transplants), and 10-inch containers

(6 to 10 transplants). Branched plants can also be grown in a 4-inch container (1 transplant), 5-inch container (1 transplant), 6.5-inch container (1or 2 transplants), 7-inch container (2 or 3 transplants), 10-inch containers (4 or 6 transplants), 12-inch containers (8 or 10 transplants). Poinsettia trees are grown one cutting per 8- or 10-inch container. They are grown in a range of sizes primarily determined by the start date which may be May 1, June 1, or July 1.

Irrigation

As with all other flowering pot plants, irrigating a crop is as much an art form as a science. Poinsettias are no exception and they do have some peculiarities of their own. Since poinsettias are very susceptible to root pathogens, to help prevent a fungal infection the substrate should be allowed to dry slightly prior to the next irrigation. This will also help prevent or reduce incidence of fungus gnats and stretching. The dark green leaved poinsettia cultivars ('Freedom Red' for example) tend to incur minor leaf curl, burn, or dehydration if the substrate is allowed to get too dry and wilting of the plant occurs. This necrosis also occurs with rapid changes in light and temperature conditions. The medium green cultivars do not tend to have this problem. Consistent underwatering of all cultivars can also cause the leaves and bracts to be abnormally small and cause leaf drop. Therefore, irrigations cycles must be watched carefully so that plants are not underwatered or overwatered. Other factors that will affect irrigation are container type and size, substrate type, plant vigor, greenhouse structure, type of irrigation, climate, and other environmental conditions.

Overhead irrigation is not recommended for poinsettia production. This can be especially deleterious as plants approach anthesis because the bracts may be damaged. When overhead irrigation is used and greenhouses are closed up leading to high humidity, optimum conditions are created for infection by botrytis blight.

Drip irrigation or subirrigation is preferable. This prevents getting water on the leaves and bracts, provides for a lower humidity, provides uniform irrigation, uniform fertilizer application, and saves water and fertilizer. Draw backs to drip and subirrigation are high initial installation costs and increased maintenance. A substrate that has a high porosity may not wet evenly or distribute fertilizer throughout the substrate. Thus, a substrate with greater amounts of peat moss will help prevent these problems.

Irrigation water should have a pH below 7 and an SAR value of less than 9. To help correct these problems, please refer the following NCSU web page http://www.ces.ncsu.edu/depts/hort/floriculture/hils/HIL558.pdf.

Fertilization

Fertilization programs can vary greatly from one grower to the next. The program depends on cultivars being grown, stage of growth, substrate, irrigation methods, climate, and water quality. Liquid fertilization is the most common method of fertilizing poinsettias. Liquid fertilizer can be applied as a weekly application or applied at every irrigation (fertigation). When fertilizing once a week fertilizer should be applied at a concentration of 300 to 400 ppm N. The electrical conductivity (EC) (not greater than 2.5 mmhos/cm based on saturated media extract) of the substrate should be checked frequently to insure that over fertilization does not occur.

Constant liquid feed (CLF) or fertigation provides a consistent supply of nutrients to the plant. This method of fertilization can be wasteful and costly if not monitored and properly applied. Recommended rates can range from 200 to 300 ppm N each irrigation. Research has indicated that these rates can be reduced to 100 to 150 ppm N for dark leaf cultivars without deleterious effects. This lower rate reduces runoff and also provides for a stronger plant. Medium green leaf cultivars require about 20-25% more feed. Because growers typically have a mixture of dark and medium green leaf cultivars in the same greenhouse, fertilization at the lowest rate required is recommended, with the application of one-half rates of controlled release fertilizer or a periodic booster feed to those cultivars requiring a higher feed level. When using a lower fertilizer rate 1 or 2 complete micronutrient applications at one-half to one-third the label rate may be necessary. The first application would be late September-early October, followed by a second in early November. Slowly reduce the feed rate as bract color intensifies.

The electrical conductivity of the medium should be monitored and used as a tool to determine if the fertilizer rates should be changed. Electrical conductivity greater than 3.5 mmhos/cm or below 2.0 mmhos/cm may indicate a nutritional problem and fertilization rates should be adjusted accordingly. A PourThru leachate can be conducted to help quickly determine EC and pH. For detailed information on the Web see the NCSU Floriculture site at http://pourthruinfo.com. A liquid fertilizer that is high in ammonium, up to 60%, should be applied after transplant to encourage rapid growth. After pinching a fertilizer that has a greater amount of nitrate, preferably calcium nitrate, should be used. This will provide for a stronger plant with greater lateral stem strength and less breaking at finish. Calcium has been shown to help prevent bract edger burn. Symptoms of bract edger burn include small, submarginal necrotic spots and marginal necrosis of bracts. Calcium sprays at 200 to 400 ppm calcium as calcium nitrate (15 to 30 oz/100 gal) or calcium chloride (10 to 20 oz/100 gal) can be applied as a foliar spray with a spreader sticker. Magnesium uptake can be antagonized if too much calcium is used causing a magnesium deficiency. The visual symptom of magnesium deficiency is interveinal chlorosis of the older leaves. Magnesium deficiency may also occur when the air temperature is below 50^{o} F in the greenhouse. Magnesium can be supplemented by using magnesium sulfate at a concentration of 40 to 50 ppm Mg. Poinsettias also have a high requirement for molybdenum. If it is not supplied in the liquid fertilizer being used, molybdenum can be supplied at 0.1 ppm Mo from sodium or ammonium molybdate (approximately 2.67 oz/100gal).

As mentioned earlier controlled release fertilizers (CRF) can also be used as a supplemental fertilizer for poinsettia production. There are many different types of CRF and selection should be based on a 3 to 4 month release and without micronutrients. Most all premixed substrates contain ample micronutrients for plant growth. When used in conjunction with a constant liquid feed program, CRFs will supply approximately 50 to 75% of the nutritional needs of the plant. Therefore, the liquid fertilizer rate of application can be reduced accordingly. Controlled release fertilizers can be applied as a top-dressing or incorporated in the substrate. Rates should not exceed 3 pounds of nitrogen per cubic yard of substrate if incorporating the CRF or 1 tablespoon per 6” container as topdressing.

If nutritional problems are suspected, leaf tissue analysis of the most recently mature leaves that show symptoms and those that do not should be analyzed. The table below indicates the sufficiency range of nutrients in poinsettia leaf tissue.

Sufficiency range of macro- and micronutrients for recently mature poinsettia leaves.

Macronutrients			**Micronutrients**	
Nitrogen	4.00-6.00 %		Iron	100-300 ppm
Phosphorus	0.30-1.08 %		Manganese	45-300 ppm
Potassium	1.50-3.50 %		Boron	30-100 ppm
Calcium	0.70-2.40 %		Copper	3-25 ppm
Magnesium	0.30-1.00 %		Zinc	25-150 ppm
Sulfur	0.25-0.70 %		Molybdenum	0.01-0.50 ppm

Adapted from the Plant Analysis Handbook II by H.A. Mills and J.B. Jones. MicroMacro Publishing, Athens, GA.

A substrate test can also help provide useful nutritional information. The following table indicates normal elemental values from the Saturated-Paste Extract Method.

Elemental concentration (ppm) guidelines for a Saturated-Paste Extract Method for general floriculture crops.

Interpretation	**Nitrate-N**	**Phosphate-P**	**Potassium**	**Calcium**	**Magnesium**
Extremely Low	0-29	0-3.9	0-74	0-99	0-29
Optimum	100-174	8.0-13.9	175-244	250-324	80-124
Excessively High	275-299	40.0 +	350 +	500 +	175 +

Adapted from Greenhouse Operations and Management, 6th Edition by P.V. Nelson, Prentice Hall, NJ.

Pinching

Pinching the terminal growing point to stimulate lateral shoot development is usually conducted when sufficient root growth occurs or the roots are visible on the outer edges of the substrate. This should occur at approximately two-three weeks after planting a rooted cutting or four to five weeks after direct sticking a cutting. Pinching must also occur early enough to allow the developing stems time to attain some size prior to the start of short days, usually two to three weeks. Less vigorous cultivars need more days of vegetative growth to reach full size. Premature or late pinching can lead to a plant that has a less than desirable quality.

The pinch should be performed so that 7 nodes per stem are left on the plant. This will result in 5 to 6 lateral branches or inflorescences. If more nodes are left on the main stem, this will result in greater lateral branching and weaker stem strength, thus reducing plant quality and shipability. For those cultivars that are non-branching a pinch to 6 nodes will usually result in only 3 or 4 lateral branches.

There are three types of pinches: soft, hard, and very hard. A soft pinch is made above an unexpanded leaf and may lead to slow, uneven lateral branching. A hard pinch

is made above the first fully expanded leaf and will provide the most vigorous, uniform lateral branching. A very hard pinch is made on older stem tissue below fully expanded leaves and may result in slow, uneven branching with poor lateral stem strength and plant quality. The quality of rooted cutting that is received will probably determine the type of pinch that is going to have to be made. Therefore it is very important that rooted cuttings are of the proper quality when received as referred to in the transplanting section.

Spacing

Containers should be spaced according to the recommended final spacing as indicated in the following tables.

Spacing guide for pinched poinsettias.

Pot Size	Plants/pot	Spacing	Square foot/pot
4 inch	1	9 x 9 inches	0.5
5 inch	1	12 x 12 inches	1.0
6 inch	1	13 x 14 inches	1.2
6 inch	2	15 x 15 inches	1.5
7 inch	2	17 x 17 inches	2.0
8 inch	3	19 x 19 inches	2.5

Adapted from The Poinsettia Manual by Paul Ecke Ranch.

Spacing guide for single-stem poinsettias.

Pot Size	Plants/pot	Spacing	Square foot/pot
4 inch	1	9 x 9 inches	0.5
5 inch	2	12 x 12 inches	1.0
6 inch	3	15 x 15 inches	1.5
6 inch	4	17 x 17 inches	2.0
7 inch	7	19 x 19 inches	2.5
7 inch	7	22 x 23 inches	3.5
8 inch	9	25 x 26 inches	4.5

Adapted from The Poinsettia Manual by Paul Ecke Ranch.

Proper spacing of plants will produce higher quality plants with greater stem strength and usually results in reduced use of chemical growth retardants. Spacing can greatly affect the branch angle of the laterals. For superior stem strength an angle from the main stem to the lateral should be approximately 45^{o}. This can be achieved by placing containers pot-to-pot after transplanting and then moving them to final spacing once the leaves of the plants next to each other just begin to touch each other. This should occur in approximately 4 or 5 weeks. If plants are left pot-to-pot after this point, stem strength will be reduced, lateral stems will become elongated and weak, bract size will be reduced and the lower leaves may turn yellow and fall off prematurely.

Height Control

There are various factors and options that should be taken into consideration when determining the best approach to height control. These include: irrigation, fertilization, spacing, light intensity, temperature, number of days from pinch to start of short days,

and growth retardants. Because many of these factors are related to the greenhouse environment, many growers will use different methods of height control.

Restricting irrigation, as mentioned earlier, can be used to reduce stretching and therefore reduce the amount of growth retardants that need to be used. However, only a very experienced grower should use this as a supplemental method of height control. Some poinsettia cultivars are very sensitive to wilt and permanent crop damage may occur if one is not careful.

Restricting fertilization is also a very good method of height control. Using low rates of fertilizer (150 ppm N or lower) with drip or subirrigation systems can be used as a supplemental method of height control. Although not as sensitive to causing crop damage as restricting irrigation, only experienced growers should use restricted fertilization.

Spacing poinsettias as recommended will help prevent stretch and thus reduce the amount of chemical growth retardant needed. Spacing more closely will provide for greater production quantity, but the quality of the crop and the greater amount of growth retardant will reduce any increased income from the sale of a greater amount of poor quality plants.

Low light intensity (less than 3,500 fc) can cause stretching. Spacing too closely will reduce the light intensity on the sides of the plants and also cause stretching. This will result in increased use of growth retardants.

Temperature has been used very successfully to control plant height. DIF (difference in day and night temperatures) can be used by altering temperatures to stimulate or retard elongation on a daily basis. This type of height control does not work well for most growers in the Gulf South, as manipulating day and night temperatures enough to reduce height is almost impossible. Reducing temperatures in the early morning hours (referred to as DROP) may be useful late in the growing season in the Gulf South.

The greater the number of days from pinching to start of short days the greater the amount of vegetative growth and also the node number. Thus, more vigorous cultivars should be planted and pinched later in the season than less vigorous cultivars.

The commonly used growth retardants are A-Rest, B-Nine, Bonzi, Cycocel, and Sumagic. Each of these products contains different active ingredients and will require different rates and application procedures to arrive at the desired result. There are also several new growth retardants coming onto the market that will soon be added to the list of products to control poinsettia height.

Application of a growth retardant generally begins when lateral shoots are 3/4” to 1” long. Light or moderate control can be achieved by spraying a tank mix of B-Nine and Cycocel at 1,250 ppm each or Cycocel alone at 1,500 ppm. Growers in the Gulf South will probably benefit from using a stronger concentration of 1,500/2,500 B-Nine/Cycocel tank mix. This tank mix should not be used after the start of short days as it may delay bract development. Stronger control can be achieved by spraying 30 to 45 ppm Bonzi or 5 to 10 ppm Sumagic. Neither of these sprays should be used after October 25. Apply Bonzi as a drench using 1 to 3 ppm in 4 fl oz of solution/6-6.5 inch container. A-Rest should be applied as a drench at 2 to 4 ppm. The active ingredient of both Bonzi and A-Rest may be less effective when used as a drench in a substrate containing pine bark and rates may need to be increased as much as 25%. The only acceptable growth retardant

from flower initiation through mid-October (natural-day schedule) is Cycocel as either a spray or a drench. The use of any others is not recommended as they may delay flowering and reduce bract size. After mid-October growth retardants should only be used late in the crop to prevent stretching due to high temperatures or cloudy weather. Some cultivars are more susceptible to late stretching than others. Drenches of A-Rest at 1 to 3 ppm or Bonzi at 0.5 to 2 ppm can be used without being deleterious to finished plant quality. Apply when plants are 1 inch below the finish height.

Graphical tracking can be used to monitor and control plant height. Information about each cultivar and pot size, including the minimum and maximum acceptable heights, is entered into a graphical tracking program to establish target curves. The program offers a choice of standard, late, no-pinch, and custom curves. Growers generally use the standard curve except for cultivars that stretch late such as the Freedom series, but the late curve may be best for most cultivars in warm climates with large positive differences in day and night temperatures. The maximum recommended finish height for a 6 inch pinched plant or s6 inch single stem plant is 18 inches for a florist quality plant and 15 inches for a mass market plant. This is an excellent tool to help determine timing of growth retardant application. Refer to the Ecke Ranch web site at http://www.ecke.com/new1/poin/points_tech_graph_track.asp.

Temperature

Temperatures are one of the most difficult factors to control in poinsettia production for the south. Recommended night temperatures for growing poinsettias are 65 to 68 ^{o}F. Night temperatures should remain above 60^{0}F throughout the crop and try to maintain day temperatures below 85^{0}F; a range of 75 to 80^{0}F is better. These temperatures are hard to achieve for most of the growing season in the Gulf South. Most poinsettia cultivars will grow to the same quality plant under higher night temperatures (80 ^{o}F) as those in cooler climates due to the interaction with higher light intensities. Some cultivars are not suited to growing under higher temperatures and these should be avoided. Some effects of higher than recommended temperatures are blind nodes (little or no axillary bud development) and poor branching. As mentioned previously, DIF and DROP can be used to control height of poinsettias but are not especially useful in the Gulf South. The last two weeks of production temperatures can be reduced to 60 ^{o}F to enhance bract color.

Lighting and Photoperiod

Light intensity for growing quality poinsettias should be 3,500 to 4,500 fc for cultivars with dark green foliage and 5,000 to 6,000 fc for cultivars with medium green foliage. Shade cloth is generally required in the Gulf South for reducing greenhouse temperatures. A 30-40% shade cloth can be used until October 1 without affecting plant quality. If possible, reduce light intensity to 2,000 fc after primary bracts are fully colored and secondary bracts are almost mature to prevent fading.

Poinsettias are classified as short-day (long-night) plants that initiate flowers when the day length is reduced to a critical amount of time, 12 hours and 20 minutes. This occurs around September 20 to 25, during the fall equinox. Some cultivars initiate flowering prior to the critical day lengths and should be lighted. Night lighting can be provided by incandescent lights with a minimum of 10 fc at plant height from 10 p.m. to

2 a.m. for a total of 4 hours. If the schedule for a cultivar requires start of short days before those naturally occurring, pull black cloth over the plants from 5 p.m. 8 a.m. until early October.

Scheduling

Scheduling a poinsettia crop is an aid to producing plants that flower at the desired height and time. Critical dates for the finished product must be defined by cultivar and pot size.

The growth characteristic referred to as vigor varies by cultivar, ranging from low (short; compact) to vigorous (tall). Low- and very low-vigor cultivars are slower to root and to develop laterals after the pinch. Planting them earlier allows additional time for vegetative growth between pinch and flower initiation to achieve the desired finish height. Low-vigor cultivars should be planted 1 to 2 weeks earlier than those of medium vigor, while vigorous cultivars should be planted 1 week later. An alternative is to plant all at an earlier date and adjust growth regulation accordingly.

Poinsettia cultivars are also classified into flowering response groups, determined by the number of weeks from flower initiation (start of short days) to flowering (anthesis). For example, cultivars with an 8 week response time will be ready to sell 8 weeks after flower initiation. Growers in the Gulf South may experience a shorter response time because of higher light and temperature conditions.

Pot size is a consideration in scheduling because as the pot size increases so must the number of days of vegetative growth from pinch to short days in order to achieve a larger finished plant. Other factors to consider in scheduling are type of production facilities, growing temperatures, and light. The best way to achieve precise scheduling is with photoperiod control.

Pest Control

Whiteflies and fungus gnats are the two major insect that must be controlled when growing poinsettias. Diseases that must be controlled are root and stem rots, botrytis blights, bacterial stem and leaf rot, powdery mildew, fungal blights and leaf spots. For more information on these pests and control please refer to the Ecke Ranch web site at http://www.ecke.com/new1/poin/points_tech_des_insect.asp.

Poinsettia Problem Solvers

There are several very good web sites that are excellent for helping solve poinsettia problems. They include:

Paul Ecke Ranch http://www.ecke.com/html/h_points/tech/diagkey/keystart.html
Fischer USA http://www.fischerusa.com
North Carolina State University http://www.ces.ncsu.edu/depts/hort/poinsettia/