

Sanitation:

To reduce the chance of fungal and bacterial infections, it is important that the propagation area is cleaned and sanitized before cuttings arrive. Weeds should be removed and algae-infected areas scrubbed and cleaned. All benches and floors should be thoroughly disinfected using a greenhouse disinfectant containing quaternary ammonium.

Make sure sanitation protocols are in place as the greenhouse is prepared to receive cuttings. Foot baths containing disinfectant should be placed at all entrance ways into the propagation area. These baths should be renewed daily with fresh disinfectant. Managers and workers should wash hands with a disinfectant or anti-bacterial soap before entering the propagation area after lunch and breaks.

Upon Arrival:

Make sure that the rooting media is laid out on clean benches several hours (or the day before) cuttings arrive. For direct-stick programs and those where cuttings are handled in sticking lines, make sure that all workers are present and that equipment is working correctly. Workers should be prepared for the day's shipment.

Store opened boxes at 50-55°F/10°C for no more than 24 hours and prevent cutting dehydration during storage (ideally 90% relative humidity in coolers). Do not open up the individual bags of cuttings as this helps maintain high humidity around the cuttings.

Stick the cuttings immediately if possible. For relatively large shipments, pull out only enough cuttings for each worker to stick within an hour or so before replenishing with another fresh box of cuttings from the cooler. If cuttings can't be stored in a cooler, then try to store in the coolest area of the facility and monitor closely for humidity and cutting water loss. Some growers without cooler space also lay opened bags on the propagation bench and begin misting. Do not leave opened, un-stuck cuttings on the propagation bench for more than a few hours or they can become twisted and curled.

Temperatures

Warm temperatures and humid conditions are needed for successful poinsettia propagation. Bottom heat is very helpful, especially in northern areas where night temperatures are relatively cool. Try to maintain temperatures between 73°-75°F/23°-24°C in the media until the cuttings are fully rooted. Poinsettias are propagated during the warm summer months so greenhouse day temperatures will normally be significantly higher than night temperatures and constant temperatures are more difficult to hold. If at all possible, try to avoid night temperatures below 70°F and day temperatures above 85°F the first two weeks of rooting.

After good root development, temperature and humidity can be reduced and the cuttings acclimated to higher light intensities. Ideal media temperatures would be between 70°-72°F/21°-22°C with air temperatures varying based on climatic conditions. Again, try to avoid relatively low night temperatures and relatively high day temperatures as cuttings are finishing up the propagation process.

Most varieties are generally well rooted in four weeks using these recommended temperatures.

Rooting Hormones

Many growers feel they do not need to use rooting hormones if they have good bottom heat and good healthy cuttings. Syngenta Flowers suggests that rooting hormones slightly reduce rooting time and even out rooting along the bench. Some growers use powdered material while others use liquid types (e.g., Dip'NGrow[®], Hortus IBA water soluble salts[®], or Rhizophon[®] AA water soluble tablets). When applying, use a 0.1%-0.2% IBA or combination IBA + NAA applied **only at the base** of the cutting. Trials are recommended before using new rooting compounds or concentrations. It is not recommended to use IBA overhead sprays in propagation since leaf burning and distortion can occur, especially when using alcohol-based IBA sources.

Relative Humidity

High humidity, especially for the first five days, is critical to reduce stress on the cuttings and to help get them out of a wilted and flagged stage. Many growers are now using fog systems to maintain humidity above 90% in the poinsettia propagation area. High humidity should be combined with heavy shade and minimal air movement. This helps reduce the amount of misting that is needed and reduces the chances of *Botrytis* and other diseases.

Misting

Use a fine mist, applying enough to wet the foliage but not to the point of drip. Short and more frequent bursts of mist are better than long mist cycles with less frequency. Adjust mist daily according to weather and the condition of cuttings. Avoid standing water on the leaves if possible. Puddles of standing water on young leaves for lengthy periods of time can cause tissue breakdown, water-soaked areas, and eventual disease.

It will take a day or two for the unrooted cuttings to become completely rehydrated and turgid after sticking. Avoid excess air movement across the leaf surface, especially in the first week. Mist so that the leaves do not roll --- you do not want to see severely flagged poinsettia cuttings after becoming rehydrated following sticking. Severely flagged cuttings in the early morning indicate that inadequate mist was applied during the night. Running cuttings too dry causes leaf scorch, delays in rooting, and possible leaf loss. If the cuttings look stressed on sunny days, shade is recommended rather than additional mist.

Use a spreader-sticker (like CapSil[®] 30, at a rate of 2-4 ounces/100 gallons) on cuttings as soon as possible after sticking to reduce leaf surface tension and improve moisture uptake into the leaves. CapSil 30 causes the water to spread more evenly across the leaf surface. Many growers combine the CapSil 30 with an appropriate fungicide for *Botrytis* control. Reapply whenever water droplets are forming on the leaves and the moisture is not evenly distributed across the leaf surface. CapSil 30 at similar rates above can also be used as a pre-plant spray or dip on cuttings. Avoid dipping the cut end if possible when using pre-plant dips. When CapSil 30 is used in propagation, mist levels and frequency can normally be reduced. Avoid over-misting cuttings when using CapSil 30 or water-soaked young foliage might occur. Other adjuvants (ex. Uptake[™] or Suffusion[®]) can also be used instead of CapSil 30, but these should be trialed extensively before implementing.

Shade

Provide heavy shading until the cuttings develop a good callus. Try to keep maximum light levels between 900-1,100 foot-candles (4-6 mols/day). It is critical to pull enough shade under bright sunny conditions to help reduce stress and heat load on the plants. This will also help reduce the amount of misting needed which leads to less *Botrytis* and bleached foliage.

Once roots begin to form (10-12 days or so for most varieties), light levels can be gradually increased to 1500-2,000 foot-candles (8-10 mols/day) as long as misting does not have to be significantly increased. When the plants are well rooted (~ three weeks), light intensities can increase to 3,500 foot candles (15-18 mols/day).

Fertilizer

Start the fertilization program early. Poinsettias have relatively long requirements for misting during propagation and leaves can get heavily leached of nutrients, especially medium-green-leaf varie