Avoiding Top Problems of Poinsettias

Prevention and early detection of poinsettia problems are critical to growing a high-quality crop. Here, learn how to identify and correct nutritional, physiological and insect- and disease-related maladies.

Left: Lower leaf yellowing and loss can occur if the fertilizer injector malfunctions and the plants are under-fertilized; Right: Calcium deficiency of the upper leaves of actively growing plants can occur after a period of overcast weather. (Photos courtesy of Brian Whipker)

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Poinsettias can, at times, be a problematic crop, but being aware of the more common nutritional, physiological and insect and disease-related problems encountered during production can help reduce the headaches. By watching for potential problems, understanding their causes and knowing the proper corrective actions to take, one can avoid most of these issues.

NUTRITIONAL AND PHYSIOLOGICAL DISORDERS

High pH. High substrate pH can induce nutrient problems in poinsettias. The recommended pH range in a soilless substrate is 5.8-6.5. Iron deficiency is the most common problem at a substrate pH above 6.5, at which point new leaves will exhibit interveinal chlorosis (yellowing). Lower the pH with an iron sulfate drench or by using an acidic fertilizer. Iron deficiency can also occur with root death, over-irrigation, poor substrate drainage or insect damage. Inspecting the roots will help determine the cause of the problem.

Low Electrical Conductivity. When the root substrate EC is too low, plants are stunted, and mineral deficiencies occur. Low salts can occur due to excessive leaching, too many clear-water irrigations between fertilizations, a broken injector or an improper injector ratio. Deficiency symptoms such as lower leaf yellowing (nitrogen) or lower leaf speckling (phosphorus) are common when EC values are below 0.25 mS/cm (1:2 extraction), 0.75 mS/cm (SME extraction) or 1.0 mS/cm (PourThru extraction) during the active growth stage. Normal fertilizer rates for poinsettias are between 175 and 250 ppm nitrogen.

Calcium Deficiency. Symptoms appear at the top of the plant. Young leaves may develop variable patterns of chlorosis and distortion such as dwarfing, strapping or marginal leaf burn. Leaf edges may become necrotic. Typically, symptoms in young plants occur during periods of overcast weather when the plant's ability to uptake calcium is inhibited. Bracts can also develop a marginal necrosis. Sunny weather, avoiding water-logged substrates, low humidity and calcium chloride or calcium nitrate foliar sprays will help prevent the problem.

Magnesium Deficiency. Lower leaves develop interveinal chlorosis; under advanced conditions, the leaf margins turn necrotic. On younger ➧

Additional information about poinsettia problems is available in the *PICT Guide to Poinsettia Disorders*. It is a 54-page guide that contains 72 photographs of poinsettia problems along with descriptive information. The 3- x 6-inch guide is printed on UV-resistant plastic. To order a copy of the PICT Guide to Poinsettia Disorders, call the North Carolina Commercial Flower Growers' Association at (919) 334-0093 or log on to www.nccfga.org ($20.00 plus postage).

plants, symptoms appear on the lower leaves. On flowering poinsettias, symptoms tend to develop on the top half of the plant. One or two applications of magnesium sulfate (1 lb. per 100 gal. of water) or a magnesium-containing fertilizer will help prevent the problem.

Molybdenum Deficiency. Symptoms appear as chlorosis (yellowing) of the recently mature leaves (middle of the plant), rolling of the leaves and leaf edge burn. The leaf chlorosis of molybdenum deficiency resembles magnesium deficiency, except that the thin, marginal band of chlorosis is expressed from the leaf tip to the leaf base. Molybdenum deficiencies can cause distorted leaves due to the failure of the interveinal areas to expand normally. Monthly molybdenum applications should be made to poinsettias.

Leaf Distortion. Plants develop distorted or cupped leaves, most often during the early stages of the crop (within a few weeks of being pinched). Most poinsettias will outgrow this condition, but shoots with extreme distortion may not improve. It is unclear what causes this disorder, but thought that rapid changes in humidity, which can occur early in the morning when the vent fans come on, may lead to an accumulation of salts along the leaf margins and veins, resulting in leaf injury. Leaf distortion becomes apparent as these injured leaves grow and expand.

Excessive Plant Stretch. Plant growth regulators are excellent tools to control excessive plant stretch. Overdoses can result in stunted growth of the newly expanding leaves or smaller bract size. Because of their greater degree of activity, overdoses are more common with the use of B-Nine + Cycocel tank mixes, Bonzi or Sumagic. Applying the labeled concentration at the proper time, mixing correctly and using proper application techniques can help avoid most problems.

INSECTS

Fungus Gnats and Shoreflies. Fungus gnat larvae are one-eighth of an inch long, white, transparent, legless and have a black head capsule. Fungus gnat larvae feed on poinsettia roots and may even tunnel into plant stems, especially newly planted cuttings. This causes plant stunting and wilting. Fungus gnat larvae feeding provides entry sites for soil-borne pathogens. Fungus gnat adults are winged, one-eighth of an inch long, with long legs and antennae. Each wing has a "Y-shaped" vein. Adult shoreflies resemble houseflies. They are one-eighth of an inch long and deep black in color with red eyes. Each wing usually has approximately five white or light-colored spots. The antennae and legs are short. Shoreflies are a nuisance pest, as the larvae don't directly

Left: Late-season magnesium deficiency can occur in the middle part of the plant; Middle: Excessively high or late applications of plant growth regulators can slow bract development; Right: Fungus gnat larvae can cause stem cankers at the soil line. (Photos courtesy of Brian Whipker)

feed on plant roots. The lifecycle from egg to adult for both fungus gnats and shoreflies ranges from 15-28 days, depending on temperature. Control measures for fungus gnat larvae include pyriproxyfen (Distance), Cyromazine (Citation), *Steinernema feltiae* (Nemasys, Entoneem), Chlorpyrifos (Duraguard) and *Bacillus thuringiensis var. israelensis* (Gnatrol). Control measures for fungus gnat adults include bifenthrin (Talstar), cyfluthrin (Decathlon) and paraffinic oil (Horticultural oil). Shorefly larval control may be obtained with either pyriproxyfen (Distance) or cyromazine (Citation).

Western Flower Thrips. Less than one-sixteenth of an inch long, western flower thrips have piercing-sucking mouthparts that cause direct damage to poinsettias by feeding on leaf buds before they open. This results in leaf scarring and new growth distortion, as the remainder of the tissue expands around areas fed upon by the thrips. Poinsettias are not susceptible to the viruses transmitted by thrips, including impatiens necrotic spot virus (INSV). Although not a primary host, thrips will feed on poinsettias if no other food source is available in the greenhouse. Control measures include spinosad (Conserve), abamectin (Avid) and methiocarb (Mesurol).

Whiteflies. Whitefly adults are white to slightly yellowish in color, narrow-shaped and approximately one-sixteenth to one-eighth of an inch long. Most of the whitefly stages are located on the undersides of poinsettia leaves. Whitefly "crawlers" hatch and crawl about, inserting their threadlike mouthparts into the lower leaf surface to feed on plant fluids. This may result in leaf yellowing, plant stunting, plant wilting and plant death (if populations are high enough). Whiteflies produce honeydew, a clear, sticky liquid, during feeding that serves as an excellent medium for black, sooty mold fungi. Control measures include imidacloprid (Marathon), pymetrozine (Endeavor), pyriproxyfen (Distance)*, potassium salts of fatty acids (Insecticidal Soap), *Beauveria bassiana* (Botanigard / Naturalis), bifenthrin (Talstar), cyfluthrin (Decathlon), kinoprene (Enstar II) and pyridaben (Sanmite). (*Distance cannot be used on poinsettias when bracts are visible.)

Spider Mites. Spider mites are oval-shaped and can be yellow-orange, green or red. Adult mites have two dark spots on both sides of the abdomen. Spider mites feed primarily on leaf undersides and remove chlorophyll (green pigment) with their stylet-like mouthparts. Damaged leaves appear stippled or "dirty" with small, silvery-gray to yellowish speckles. Webbing may be present if populations are high. Spider mites prefer warm, dry conditions with low relative humidity. Lewis mite injury to poinsettias is similar to that of the ➧

Left: Late-season infestations of the two-spotted spider mite can cause bract distortion; Middle: Botrytis bract and leaf damage; Right: Early powdery mildew infestations appear as yellow spots on the leaf tops. (Photos courtesy of Brian Whipker and Colleen Warfield)

two-spotted spider mite. Lewis mites are smaller and have several small black spots on both sides of the body. Control measures include abamectin (Avid), bifenazate (Floramite), bifenthrin (Talstar), pyridaben (Sanmite), clofentezine (Ovation), hexythiazox (Hexygon), fenpyroximate (Akari) and chlorfenapyr (Pylon).

DISEASES

Botrytis. (Gray Mold) quickly colonizes damaged or senescing plant tissues and initially appears as brown spots on the leaves and flower bracts. Large numbers of gray to olivaceous green spores are produced on the infected tissues. This fungal pathogen thrives under cool temperatures around 68-77° F. The relative humidity within the plant canopy should be kept below 93 percent throughout the production cycle. Large, tan, sunken cankers may form on the older stems, girdling the stem. Promptly remove fading flowers and dead plant tissue from the greenhouse. Fungicides such as chlorothalonil, fenhexamide and fludioxonil, in conjunction with good cultural practices, can help prevent this disease. Carefully read and follow label precautions to avoid damaging flower bracts.

Powdery Mildew. This pathogen can be moved from greenhouse to greenhouse on infected cuttings or plants. Yellow spots form on the upper surface of leaves indicating the location of grayish-white fungal colonies on the undersides of the leaves. Characteristic white, powder-like colonies may also be present on both leaves and flower bracts. However, it is important to control this disease before the bracts become infected, as the white fungal patches are not "erased" by fungicide applications. Frequent and careful scouting of the crop for powdery mildew symptoms should begin when greenhouse temperatures begin to drop below a daytime high of approximately 86° F. Temperatures above this point are inhibitory to the infection process. Powdery mildew can be controlled with the application of fungicides such as myclobutanil, kresoxim-methyl, piperalin, triadimefon, triflumizole and trifloxystrobin when fungal colonies are first observed. Piperalin does have curative activity, but like all fungicides, it cannot erase the damage already done.

Pythium Root Rot. This is most likely to show up early in the season, soon after cuttings are planted. The base of the cutting will appear brown, and severely infected cuttings will wilt and quickly die. Infected plants are usually stunted and show signs of wilt during the heat of the day. Infected roots are dark brown, and the outer cortex of the root is easily slipped off, leaving a thread-like strand of vascular tissue. Plants that survive until flowering will often flower prematurely and defoliate. Control of this pathogen is difficult once infection has begun. Sterile potting mix and disinfestation of work surfaces will help avoid the contamination and spread of this fungal pathogen. Fungicides and biological control agents can be applied as protectants to help manage this disease.

Preventative applications of mefenoxam, propamocarb or etridiazole may be applied.

Rhizoctonia stem rot. An important disease most likely to occur during propagation, Rhizoctonia stem rot causes small lesions to develop at the point on the stem that is even with the top of the rooting cube. If the rooting cube is later transplanted too deeply, it may appear that the lesion is originating at the roots. Stem lesions have a dry appearance, with a tan center and dark border. The stem lesion may expand, girdling and quickly killing the cutting. Web-like hyphae can sometimes be seen at the base of the rooting cube. Leaves may become infected when they contact the potting mix or bench surface and can become quickly colonized. The fungal infection can move down the leaf and infect the stem. Once a cutting strip is infected, the fungus can move through the entire strip and infect other cuttings. The entire strip should be discarded if any diseased cuttings are found. Fungicides such as chlorothalonil, flutolanil and iprodione have been shown to prevent colonization of the rooting cube by this fungus.

***Scab* (Sphaceloma poinsettiae).** Symptoms of this pathogen appear as small, circular spots on the leaves. The lesions are raised above the top surface of the leaf, giving them a blister-like appearance. The center of the spot is initially white, turning to brown as the fungus begins to produce spores within the affected leaf tissue. The leaf spots have a reddish-purple border that is often surrounded by an area (halo) of yellow tissue. Stems may develop raised cankers that appear white with red pigmentation around the border. Often before the stem cankers are actually noticed, an abnormal elongation of shoots (that may also be curled or twisted) is observed. These affected stems are much taller than the rest of the crop due to a natural, growth-regulating chemical produced by the fungus. Inspect cuttings for leaf spots at the time they are received. Keep plant leaves dry and lower the humidity to control this disease. Routine scouting of the crop for leaf and stem lesions can help reduce losses through early detection and treatment. Fungicides can be used as protectants against this disease. Axoystrobin, chlorothalonil, mancozeb, chlorothalonil + thiophanate-methyl and myclobutanil have all been shown to be effective protectants against poinsettia scab. GPN

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