



Dr. Sharon M. Douglas
Department of Plant Pathology and Ecology
The Connecticut Agricultural Experiment Station
123 Huntington Street, P. O. Box 1106
New Haven, CT 06504

Phone: (203) 974-8601
Fax: (203) 974-8502
Email: Sharon.Douglas@po.state.ct.us

POINSETTIAS: DISEASE PREVENTION AND CONTROL

A major limiting factor in the production of a timely and healthy poinsettia crop is disease control. Effective disease control integrates a strict sanitation program, cultural manipulations, and appropriate pesticide applications. Sanitation is the first line of defense against disease, both **before** each crop is started and **during** crop production. Clean greenhouse benches and floors, disinfested equipment, tools, and supplies are very important. Pasteurizing or sterilizing all potting media before use and storing it in such a way so as to prevent recontamination can limit disease occurrence. Cultural manipulations such as adjusting soil pH, selecting potting media, and modifying watering practices all contribute to maintaining plant vigor and reducing the threat of disease. For commercial growers, pesticide applications applied following the specific recommendations found in the current edition of the *New England Greenhouse Pest Control and Growth Regulator Recommendations (NE Recommendations)*, also reduce the impact of disease.

The primary disease problems on poinsettia can be divided into those that occur during propagation (*Rhizoctonia* stem and *Pythium* root rots, bacterial soft rot) and those that occur during finishing or on mature plants (*Pythium* root rot, *Botrytis* leaf, stem, and bract infections, *Thielaviopsis* root rot, and bacterial stem and soft rots).

DISEASES THAT OCCUR DURING PROPAGATION:

The primary disease problems are *Rhizoctonia* stem and *Pythium* root rots and bacterial soft rot. These diseases are usually spread by mechanical transfer of mycelia, sclerotia, or resting spores of these pathogens in infested soil particles on flats, tools, baskets, or the end of watering hoses or from infected plant tissue.

Rhizoctonia Stem Rot, caused by *Rhizoctonia solani*, is characterized by tan to brown, fairly dry, well-defined stem cankers at the soil line or brown discolorations at the base of the cutting. Roots are rarely affected in soilless mixes. Symptoms usually appear shortly after cutting or planting and are more prevalent on cuttings that have been handled improperly during shipment or transplanting. Lesions that quickly girdle the stem cause whole plant death. If disease progress is slower, foliage becomes chlorotic and lower leaves abscise. This disease is most severe at high soil temperatures and intermediate soil moisture.

Control: Sanitation is very important for disease control since this fungus has no significant airborne spore stage to complicate disease spread. Fungicides can limit losses from this root rot and can be applied according to *NE Recommendations*.

Pythium Root Rot, caused by *Pythium* spp., is characterized as a soft, brown-black, wet rot and decay of roots, sometimes extending up into the stem where it causes a brown or black basal canker. A diagnostic symptom of this root rot is the ability to slip the rotted outer covering of the root from the stele or central core. Infected plants appear wilted, stunted, or show lower leaf yellowing and drop. This rot is usually associated with poorly aerated or waterlogged soil and is favored by cool temperatures.

Control: Since excessive levels of ammonium or soluble salts promote disease development, their levels can be monitored. Use a well-drained potting mix and avoid overwatering. Fungicides are effective in reducing disease incidence and spread and can be applied according to *NE Recommendations*.

Bacterial Soft Rot, caused by *Erwinia carotovora*, is characterized as a soft, watery rot that occurs before or shortly after potting. Infected plants often show a sudden wilt or collapse of the main stem and leaves.

Control: Since pesticides are not effective for control of this bacterial disease, a strict sanitation program throughout all stages of crop production is very important. Roguing and destroying infected plants and limiting overhead or excess watering also reduce disease spread.

DISEASES THAT OCCUR DURING FINISHING OR ON MATURE PLANTS:

The primary disease problems are *Botrytis* leaf, stem and bract infections, *Thielaviopsis* root rot, and bacterial stem and soft rots. The bacterial diseases and *Thielaviopsis* are spread by mechanical transfer and *Botrytis*, the nemesis of greenhouse floral crops, is spread by airborne spores, splashing water, and mechanical transfer of fungal propagules.

Botrytis Leaf, Stem and Bract Infections, caused by *Botrytis cinerea*, is also called Gray Mold. This pathogen can cause considerable damage during propagation, during the growing season, and most importantly, during the critical flowering period when it causes symptoms on bracts. Symptoms include brown lesions on leaf, stem, and floral tissues which are characterized by the gray, fuzzy growth of the fungus on the affected tissues. Infection and initial disease development occurs on tender new growth or on wounded, weakened, or dead tissues. Leaves and bracts are predisposed to infection if under stress from other agents such as chemical injury (pesticide, growth regulators, fertilizer, air pollutants), drought, or mechanical bruising. Senescing floral parts are particularly prone to infection. These diseases are favored by free moisture, high humidity, and cool temperatures.

Control: Sanitation is very important for *Botrytis* control and periodic removal of plant debris and senescing tissues significantly reduces the spread of disease. Use of heat and ventilation to reduce humidity in the greenhouse and use of circulating fans to keep foliage dry have been shown to contribute to disease control. Since *Botrytis* is a prolific spore former, watering methods which reduce spread from splashing can reduce disease. Fungicides are effective can be applied according to *NE Recommendations*.

Thielaviopsis Root Rot, caused by *Thielaviopsis basicola*, is characterized as a black root rot that occurs near the end of the growing season. Affected plants are usually stunted, often wilt on bright days, and have badly rotted roots. A diagnostic symptom is the upward rolling of leaves before they yellow and abscise. Basal leaves are most frequently affected. While infection is often confined to the roots and underground portions of the stem, black, longitudinal cracks can develop on basal portions of the stem. This symptom helps to distinguish this root rot from *Pythium* and *Rhizoctonia*. *Thielaviopsis* root rot is favored by cool temperatures, high soil moisture, and high soil pH. Poinsettias growing in mixes that do not contain mineral soil are highly unlikely to develop this disease- this helps to explain why this disease has been on the decline in recent years with the widespread use of soilless mixes.

Control: Adjust soil pH to 4.5-5.0. Fungicides should be applied according to *NE Recommendations*.

Bacterial Stem Rot, caused by *Erwinia chrysanthemi*, is characterized by chlorotic lesions on the stems and purplish black petioles. Stem lesions enlarge and form irregular chlorotic blotches. Petioles quickly turn black, collapse, and wilt. Often within a few hours, the stems collapse and tissue appears watery and soft. This disease is most serious on succulent plants grown at 17-23C.

Control: Use maximum sanitation throughout the production of the crop. Diseased plants should be rogued and destroyed. Avoid overwatering.

SUMMARY CHECKLIST FOR DISEASE CONTROL:

1. Clean house, equipment, and supplies.
 - disinfest benches, supports, all irrigation equipment, and tools (use steam, household bleach, etc.)
 - use new or sterilized pots, flats, pans, etc.
 - remove all weeds and debris
 - keep area surrounding house free of weeds and plant debris (remove cull piles)
2. Pasteurize or sterilize all potting media (use steam or chemical fumigants) and store so as to prevent recontamination before use.
3. Use clean, disease-free cuttings.
 - avoid unnecessary wounding
 - use a well-drained potting mix
 - water properly and keep watering equipment off the ground to prevent contamination
4. To insure against recontamination, drench rooted cuttings soon after transplanting with fungicides that are effective against all three major root rot pathogens.
5. Periodically inspect foliage and roots of plants for symptoms of disease. If root rot is found, remove and destroy affected plants, isolate suspect plants, verify type of root rot, and apply appropriate fungicides. If foliar disease is found, apply appropriate fungicide. Refer to *NE Recommendations* for current pesticide recommendations.