GROWERTALKS

Features

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Prevent Botrytis Blight on Poinsettia

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Poinsettia (*Euphorbia pulcherrima*) is a popular ornamental with showy bracts and an exceptional branching habit. Greenhouses producing poinsettias use advanced methods to time and deliver a high quality plant for Christmas and the holiday season.

The crop has been extensively studied to optimize each stage of production from propagation until the mature plant is sleeved and shipped to market. Reducing losses from abiotic disorders, diseases and insects is important in producing an attractive plant. Root rots caused by Pythium, Phytophthora and Thielaviopsis cause wilting and plant death, and can be problematic on cuttings and vegetative plants.

Foliar diseases—including Alternaria leaf spot, powdery mildew (*Oidium* spp.) and Botrytis blight (*Botrytis cinerea*) cause significant damage, notably towards the end of the cropping cycle after bract formation. Bacterial canker (*Curtobacterium*), bacterial stem rot (*Erwinia carotovora*), Amphobotrys stem blight (*Amphobotrys ricini*) and scab (*Sphaceloma poinsettiae*)—appear more sporadicly, but can also incite major losses at specific growth stages.



A focus on Botrytis

Botrytis blight or gray mold is a constant problem during production of many potted flowers in the greenhouse and Botrytis is the primary foliage pathogen of poinsettia. In the greenhouse, geranium, carnation, cyclamen and bedding plants are also affected by the pathogen.

Figure 1. Left: Developing cyathium infected by Botrytis, note the fuzzy sporulation. Right: Infected poinsettia stem with abundant gray sporulation.

Botrytis is able to grow at a wide range of temperatures and can survive as a necrotroph on decaying plant parts. Large masses of gray spores produced on infected leaves are carried by air currents to neighboring plants. Often times, dead leaves on the greenhouse floor that are covered by “spores” are actually Botrytis. Flowers are an especially good nutrient source for the pathogen and poinsettia with cyathia that develop early may be more prone to infection (Figure 1).

Initially, gray mold appears as a brown lesion on leaves or bracts, and latex may exude from the lesion edges. Infections often start at the bract or leaf margins. Necrosis at the bract margin from phytotoxicity or nutrient

deficiency can provide an entry point for the pathogen.

Plants that are low in calcium have been shown to be at increased risk for disease. Calcium strengthens the plants cell walls and foliar calcium applications have reduced gray mold incidence on other ornamental crops such as roses. Poinsettia that are in an area of the greenhouse with limited air movement and excessive moisture may also develop lesions on the lower stems. The wilted leaf symptoms appear similar to Pythium root rot; however, gray sporulation is visible at the soil line (Figure 1), a good indication of Botrytis. Closely spaced plants can develop stretched lateral branches that crack at the stem and provide another avenue for the pathogen to enter. As infection progresses, the entire leaf or stem becomes covered with brown-gray sporulation.

A cloud of gray spores can sometimes be observed from sporulating plant tissue that spreads via air currents in the greenhouse. Condensation in the plastic protective sleeves at harvest time promotes ideal conditions for Botrytis (Figure 2) and plants may not recover after unsleeving. Plants sitting on the cart for an extra week prior to shipping are prone to infection and should be monitored to reduce the chances of a gray mold outbreak.

Preventing Botrytis

The environmental conditions that favor Botrytis often occur in the greenhouse. High relative humidity (>93%) is necessary for spore germination and infection. When temperatures are cool and moisture is high, Botrytis can spread rapidly. These conditions can occur when temperatures in the greenhouse drop in the evening and relative humidity is high. Keeping the greenhouse dry improves the success of disease management programs. Adequate air flow and forced air under benches can prevent localized high humidity in the plant canopy. Many progressive greenhouse operations that use ventilation and forced air have limited issues with Botrytis. Avoiding pooling water on flood floors and ebb-and-flood benches is further helpful in reducing relative humidity around the plants.



Figure 2. Left: Poinsettia plants were sleeved and carted for an extended period providing ideal conditions for gray mold. Right: Red bracts with phytotoxicity from a malathion insecticide application. The damaged cuticle can provide an entry point for infection. Photos by Charlie Krasnow.

Gray mold management in greenhouses takes a multifaceted approach. Sanitation can reduce inoculum levels as dead plant tissue is an ideal substrate for the pathogen. Crop resistance isn't available for Botrytis, although reduced susceptibility has been observed in the older cultivars Mollgard, Eckespoint C-1 and Improved Red Rochford.

There's recently been significant interest in biologicals. Biological fungicides including Serenade ASO, Botrystop, AmyloShield and Lalstop G46 are labeled for Botrytis and can be applied preventively as part of a management program.

In Michigan, multiple fungicides were tested on the cultivar Early Prestige Red: Astun (10 to 17 fl. oz./100 gal.), Mural (7 oz./100 gal.) and Orkestra (8 fl. oz./100 gal.) treatments showed less than 6% gray mold incidence. A recent trial at the University of Connecticut displayed high levels of Botrytis control on the cultivar Christmas Eve Red with Astun (10 to 17 fl. oz./100 gal.), Mural (4 to 7 oz./100 gal.) and Affirm (6.2 oz./100 gal.).

There are many fungicides currently labeled for this pathogen that are shown in Table 1. To ensure phytotoxicity doesn't develop (Figure 2), test fungicides on a limited number of plants—especially with bracts present—prior to widespread adoption. Alternating among FRAC groups and with a protectant fungicide, such as Daconil

WeatherStik, is important in resistance management. Mature plants are at high risk of infection and the need for fungicide application is heightened after bracts develop. **GT**

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> **Cultural strategies to limit poinsettia gray mold:**
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> - Remove debris from greenhouse floors and benches
> - Sanitize cutting tools with sodium chloride (10%) or ethanol (70%)
> - Monitor cuttings during mist propagation
> - Limit overhead irrigation and reduce leaf wetness
> - Use forced air under benches to reduce humidity in canopy
> - Space plants to improve air circulation
> - Heat the greenhouse and ventilate during periods of high humidity
> - Keep trash containers covered