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Watch out for Botrytis! Overcast conditions can increase your risk

The current wet, overcast weather is extremely conducive for *Botrytis* infection in greenhouse crops. The fungal pathogen, *Botrytis cinerea*, is easy to recognize because it causes the characteristic fuzzy “gray mold” on infected tissues. The fungus produces spores profusely under moist and humid conditions, which can lead to explosive epidemics. Senescing and wounded tissues are particularly susceptible to *Botrytis* infection. *Botrytis* will continue to produce spores on dead plant tissues such as those on or under benches, on floors, and even discarded plant parts in trashcans. For this reason, sanitation to remove old plant debris between crops, keeping floors and benches clean, removing senescing leaves and flowers, and emptying trash cans regularly is extremely important in reducing *Botrytis* growth and spread within the greenhouse.

Symptoms of *Botrytis* infection can include blighting of tissues with easily visible fuzzy fungal growth (Figure 1), zonate leaf lesions (Figure 2), damping-off or collapse of lower stems (Figure 3), and spotting of flowers (Figure 5). A profuse amount of gray-colored spores is produced on the infected tissues that are easily spread by air movement or water-splashing. Since *Botrytis* tends to infect senescing tissues, it can often lurk in shaded areas, particularly underneath the plant canopy near the soil line. Crops should be scouted carefully and regularly for symptoms and signs of *Botrytis*.

Geraniums and *Botrytis* should be considered almost synonymous with each other. Geranium flower stalks are almost always infected with *Botrytis* as they age. Senescing flowers should be removed from the plant routinely to reduce *Botrytis* development. A major source of leaf infection is from

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infected petals falling onto wet leaves resulting in tan, zonate leaf spots (Figure 2). This is a major concern when hanging baskets are produced above a bench crop. Wounded tissues, such as when cuttings are taken from stock plants, are also very susceptible to infection. During periods of plant susceptibility, preventive fungicides should be used to protect the wounded plants.

Water is important for *Botrytis* infection. It only takes 4-8 hours of plant wetness for *Botrytis* spores to germinate and infect. High humidity (above 85%) allows *Botrytis* to produce an abundant amount of spores (Figure 4). Clouds of spores can be released into the air when infected tissues are disturbed by plant movement, wind, or water-splashing. Days of overcast, wet weather, increases the risk of Botrytis outbreaks. Management of Botrytis is multi-pronged. Plant wetness should be minimized by avoiding wetting the foliage as much as possible. Using drip irrigation, directing water to the base of the plant, and irrigating at times when the plants will dry quickly can help reduce infection. Increasing plant spacing to allow more light penetration and air movement can aid in plant drying as well. Humidity levels within the greenhouse can be reduced by heating and venting the air at dusk; however, this only works when the air moisture outside the greenhouse is less than inside. During periods of high Botrytis risk, this often is not the case. Fungicides also play an integral part of Botrytis management.

Preventive fungicide applications should be applied to protect plants during periods of high risk of a Botrytis outbreak. There are numerous fungicide labeled for *Botrytis* management (Table 1). Fungicide resistance is known for Botrytis, especially to thiophanate methyl and iprodione. It is



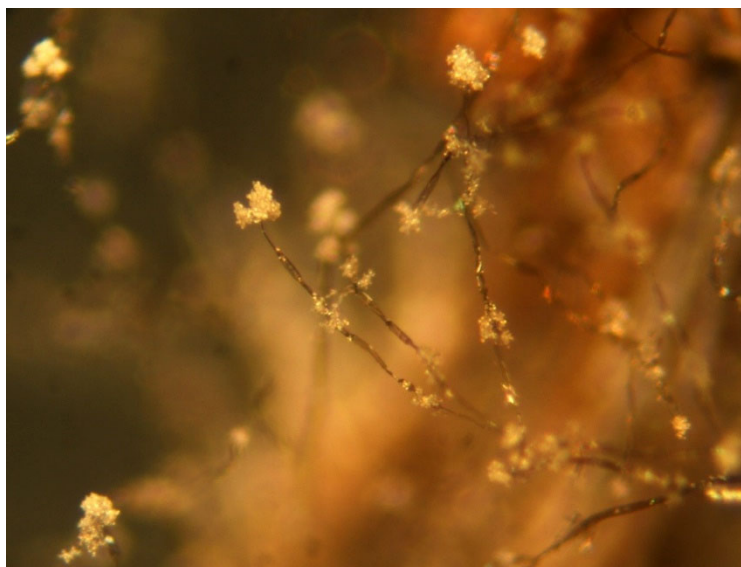
Botrytis produces an abundant amount of spores on blighted tissues. Spores are seen as fuzzy, gray-colored growth. Senescing leaves are very susceptible to infection. These spores are easily spread by plant movement, air currents, and water-splashing.



Fallen flower petals, such as on this geranium plant, can be a source of inoculum for leaf infections. *Botrytis* leaf spots are often tan colored and zonate. Botrytis sporulation is often seen within the leaf spot under humid conditions.



Botrytis can cause damping-off and collapse of lower stems in densely growing plug trays and shaded canopies.



Spores of Botrytis are produced in grape-like clusters on elongated stalks (conidiophores).



Spotting and blighting of flowers is common with Botrytis infection. Spotting is light-colored on pigmented flowers and tan to brown on white flowers.

extremely important to apply no more than two applications of a particular fungicide before rotating to a fungicide with a different mode of action (different numerical FRAC code) to reduce fungicide resistance development. Be sure to read all fungicide labels and follow directions for rates and use precautions. Several fungicides can cause damage when applying to plants in bloom. Chlorothalonil is known to discolor blooms. Pageant (pyraclostrobin + boscalid) can discolor impatiens and petunia blooms. Several others can cause stunting and phytotoxicity on impatiens, New Guinea impatiens, ferns, Pothos, or some geranium cultivars.

FRAC	Active Ingredient	Trade name	Efficacy
1	Thiophanate methyl	3336, OHP 6672, Transom, etc.	Poor to Good
2	Iprodione	Chipco 26019, Raven, etc.	Poor to Good
7	Isofetamid	Astun	Good
7 + 11	Fluxapyroxad + Pyraclostrobin	Orkestra Intrinsic	Good
7 + 11	Boscalid + Pyraclostrobin	Pageant Intrinsic, Pageant TR	Fair to Good
7 + 11	Benzovindiflupyr + Axoystrobin	Mural	Fair to Good
7 + 11	Fluopyram + Trifloxystrobin	Broadform	Good
11	Azoxystrobin	Heritage	Fair to Good
12	Fludioxonil	Medallion, Spirato, Mozart TR	Fair to Good
17	Fenhexamid	Decree	Good
19	Polyoxin D zinc salt	Affirm	Good
M5	Chlorothalonil	Daconil, Exotherm Termil, etc.	Good

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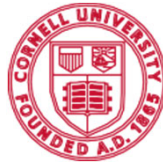
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