Special Research Report #117: Disease Management

Managing Botrytis Blight on Geraniums

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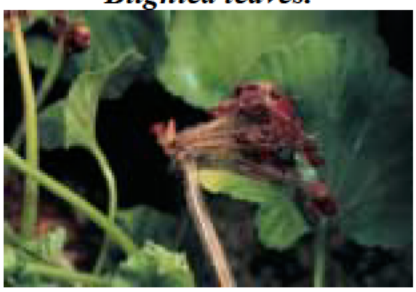
BACKGROUND

Stem, leaf, and flower blights caused by the fungus *Botrytis cinerea* can limit all phases of ornamental production. *Botrytis* is known for its ability to produce large masses of gray conidia (spores) on infected or dead tissue. The conidia may be picked up and carried on air currents and transported to healthy plants where blight can become established.

Botrytis blight is a significant disease of geraniums. It typically becomes established and reproduces on the aging lower leaves that are near the moist soil surface and under the plant canopy. In addition, *Botrytis* readily infects broken or cut stem surfaces of stock plants.

Dieback of geranium stems.

Blighted leaves.



Blighted flowers.

It can progress downward and cause a dieback of the entire stem. Conidia are readily produced on the diseased tissue.

Managing Botrytis blight is complicated by the resistance of some strains to dicarboximide (iprodione) and benzimidazole (thiophanate-methyl) fungicides.

MATERIALS NEEDED

Products were tested in replicated greenhouse trials. Treatments were applied every 7 to 14 days. Plants were maintained in an environment favorable for growth and reproduction of *Botrytis*.

RESULTS

Chlorothalonil (Daconil Weatherstik, Echo 720) limited *Botrytis* reproduction in every trial. Since Spectro 90 is a mixture containing chlorothalonil, it also limited disease spread. Other fungicidal standards including fenhexamid (Decree) and iprodione (Chipco 26019, 26GT) were highly effective. Cyprodinil/ Fludioxonil

Fungicides used in trials.

Fungicide	Active ingredient	Registered
710-145f	*Bacillus licheniformis*	no
Chipco, 26GT	iprodione	yes
Compass	trifloxystrobin	yes
Cyprodinil/Fludioxonil, Switch	cyprodinil + fludioxonil	no
Daconil, Echo	chlorothalonil	yes
Decree	fenhexamid	yes
Endorse	polyoxin D zinc salt	no
Fungo	thiophanate-methyl	yes
Heritage	azoxystrobin	yes
Insignia	pyraclostrobin	no
Medallion	fludioxonil	yes
Mycostop	*Streptomyces griseoviridis*	yes
Serenade	*Bacillus subtilis*	no
Spectro	chlorothalonil + thiophanate-methyl	yes
Terraguard	triflumizole	yes
Timsen	dimethyl benzyl ammonium chloride	no
ZeroTol	hydrogen dioxide	yes

(Switch) showed promise, but did not always provide consistent control. Endorse was effective in these trials, and is classified as a biopesticide or a "soft" product.

Heritage, Compass, and Insignia are strobilurin fungicides. While Heritage provided control in two trials, it was not effective in a third trial. Insignia was consistently effective, whereas, Compass sometimes benefited from the addition of a surfactant.

CONCLUSIONS

Several products are candidates for use in a management program that alternates fungicides with different modes of action. Chipco 26019 and 26GT, while effective, are dicarboximide fungicides. There have been documented cases where greenhouse strains of *B. cinerea* have developed resistance to these products after prolonged use. Delaying fungicide resistance is important. Benzimidazole fungicides (thiophanate-methyl) such as Fungo may not be highly effective for blight control due to widespread development of resistance in *B. cinerea*.

IMPACT TO THE INDUSTRY

This information may be used to support labeling of new products to manage Botrytis blight on geraniums.

Research cooperators included: Margery Daughtrey, Cornell University; and Larry Barnes, Texas A&M University.