

Evaluation of experimental fungicides against Botrytis blight on geranium, 2018.

Plugs from a 128-cell flat of Geranium 'Pinto Premium White' were transplanted into 4-in. pots containing a soilless media (Suremix MI Grower Products Inc, Galesburg, MI) on 29 Sep and placed inside an 80% shaded research greenhouse on the campus of Michigan State University. Plants were fertilized three times weekly with 200 ppm Peters 20-20-20 liquid fertilizer (ICL Specialty Fertilizers, Dublin, OH). Greenhouse temperatures averaged 78°F and ranged from a low of 71°F to a high of 85°F. Six, single-plant replications per treatment were arranged in a completely randomized design. *Botrytis cinerea* cultures were grown on potato dextrose agar for four weeks. Plates were flooded with sterilized distilled water and scraped with a sterile spatula to dislodge spores. Liquid from the plates was strained through cheesecloth, and diluted to 5.0 x 10⁶ conidia/fl oz. Fungicides were applied to glistening with a hand pump compressed air sprayer. Treatments were applied at the intervals described in the table below, on 13, 21, and 28 Dec. A single inoculation was conducted on 14 Dec, post initial fungicide application, by spraying 0.1 fl oz of the conidial suspension onto each plant. Immediately after inoculation, the plants were enclosed in translucent plastic bags for increased relative humidity. The plants remained in the bags for the entirety of the experiment. The total number of leaves and the number of leaves with sporulating *B. cinerea* were counted, a disease severity rating (1 to 10, where 1=healthy, 2=small/isolated lesions, 3=moderate sized isolated lesions, 4=numerous moderate sized lesions, 5=large necrotic areas, 6=large necrotic areas/30-50% defoliation, 7=large necrotic areas/51-70% defoliation, 8=large necrotic areas/71-90% defoliation, 9= \geq 91% defoliation, 10=plant death) and flower infection severity (1 to 10; where 1=healthy, 2=limited sporulation observed on flower petals, 3=moderate sporulation, 4=petals highly infected, 5=stem infection, 6=stem with sporulation, 7= multiple flower stems with sporulation, 8= abscission of one flower stem due to *B. cinerea* infection, 9=abscission of two flower stems, 10= abscission of all flower stems) were noted on 20 and 27 Dec 2018 and 4 Jan 2019. Data were analyzed using SAS PROC GLM and statistical differences were compared using the Fisher's Protected Least Significant Differences test ($P=0.05$).

Disease pressure was severe in this experiment with the untreated inoculated control plants averaging 62.8% leaves with *B. cinerea* sporulation on 4 Jan. At the final rating, all treatments significantly limited *B. cinerea* infection compared to the untreated inoculated control. Treatments with Picatina, Picatina Flora, or Decree (industry standard) resulted in significantly fewer leaves with sporulation and healthier flowers compared to all other products. Decree was the only treatment that resulted in leaves without *B. cinerea* symptoms on the final rating. Although Botector, BWN165N, EcoSwing, S2200, and SP2480 significantly limited disease symptoms compared to the untreated inoculated control, the severity of the symptoms observed would likely render them unmarketable. A rate response was not observed for the products BWN165N, S2200, and SP2480; all were similar for disease severity and percent leaves with sporulating *B. cinerea*. Chlorosis on the lower leaves was observed for plants treated with Picatina Flora; in previous studies fludioxonil caused this symptom on geranium. With the exception of the Picatina Flora-treated plants, phytotoxicity was not observed.

Treatment and rate/100 gal, <i>application interval</i>	Leaves with sporulating <i>B. cinerea</i> (%)			Disease severity*		
	20 Dec	27 Dec	4 Jan	20 Dec	27 Dec	4 Jan
Untreated inoculated	13.3 c**	40.2 c	62.8 c	3.7 c	7.3 c	8.8 e
Botector WG 8 oz, 7-day	6.0 abc	21.4 bc	34.0 b	2.5 b	4.7 b	5.7 cd
BWN165N 3 lb, 7-day	9.9 bc	21.0 bc	37.7 b	2.8 bc	5.5 b	7.2 cde
BWN165N 4 lb, 7-day	11.8 c	24.3 c	38.4 b	2.7 bc	5.8 b	7.5 de
EcoSwing F 2 pt, 7-day	8.7 abc	19.5 bc	30.5 b	2.5 ab	4.2 b	5.7 cd
Picatina SC (A19649B) 13.7 fl oz, 14-day	0.8 ab	8.4 ab	9.3 a	1.3 a	2.7 a	2.8 b
Picatina Flora SC (A20808C) 27.8 fl oz, 14-day	0.0 a	1.7 a	0.0 a	1.0 a	1.5 a	1.0 a
S2200 SC 7.5 fl oz, 14-day	6.2 abc	20.1 bc	33.9 b	2.3 b	4.5 b	6.2 cd
S2200 SC 15 fl oz, 14-day	5.3 abc	14.7 bc	26.2 b	1.7 ab	4.3 b	5.2 c
SP2480 SC 20 fl oz + Capsil 0.03%, 7-day	6.7 abc	23.7 c	30.0 b	2.7 bc	5.3 b	5.7 cd
SP2480 SC 30 fl oz + Capsil 0.03%, 7-day	6.2 abc	22.0 bc	34.1 b	2.5 b	5.5 b	6.3 cd
Decree 50 WDG 1.5 lb, 7-day	0.0 a	0.5 a	0.0 a	1.2 a	1.3 a	1.2 a

*Rated on a scale of 1-10, where 1=healthy, 2=small/isolated lesions, 3=moderate sized isolated lesions, 4=numerous moderate sized lesions, 5=large necrotic areas, 6=large necrotic areas/30-50% defoliation, 7=large necrotic areas/51-70%defoliation, 8= large necrotic areas/71-90% defoliation, 9= \geq 91% defoliation, 10=plant death.

**Column means with a letter in common are not significantly different (Fishers protected LSD; $P=0.05$).

Treatment and rate/100 gal, <i>application interval</i>	Flower disease severity*		
	20 Dec	27 Dec	4 Jan
Untreated inoculated	1.3 a**	4.2 bc	9.5 f
Botector WG 8 oz, 7-day	1.3 a	3.0 abc	5.0 bcd
BWN165N 3 lb, 7-day	1.0 a	3.8 abc	7.2 def
BWN165N 4 lb, 7-day	2.3 b	5.0 c	8.8 ef
EcoSwing F 2 pt, 7-day	1.0 a	2.5 abc	5.3 bcd
Picatina SC (A19649B) 13.7 fl oz, 14-day	1.0 a	1.2 a	3.0 ab
Picatina Flora SC (A20808C) 27.8 fl oz, 14-day	1.0 a	1.8 ab	2.0 a
S2200 SC 7.5 fl oz, 14-day	1.2 a	2.5 abc	4.8 bcd
S2200 SC 15 fl oz, 14-day	1.0 a	1.8 ab	3.8 abc
SP2480 SC 20 fl oz + Capsil 0.03%, 7-day	1.0 a	2.8 abc	6.5 cde
SP2480 SC 30 fl oz + Capsil 0.03%, 7-day	1.0 a	2.3 ab	7.5 def
Decree 50 WDG 1.5 lb, 7-day	1.0 a	1.2 a	2.0 a

*Flower disease severity rated on a scale of 1-10, where 1=healthy, 2=limited *B. cinerea* sporulation observed on flower petals, 3=moderate *B. cinerea* sporulation, 4=petals highly infected, 5=stem infection, 6=stem with sporulating *B. cinerea*, 7=multiple flower stems with *B. cinerea* sporulation, 8= abscission of one flower stem due to *B. cinerea* infection, 9=abscission of two flower stems, 10= abscission of all flower stems.

**Column means with a letter in common are not significantly different (Fishers protected LSD; $P=0.05$).