

Evaluation of fungicide programs for management of downy mildew of cucumbers – Trial 2, 2016.

The experiment was conducted at the University of Delaware’s Thurmond Adams Research Farm, Carvel Research and Education Center near Georgetown. The experiment was a split plot with fungicide program as the main plot (four programs and a nontreated control) and cultivar (susceptible ‘Vlaspik’ and moderately resistant ‘Citadel’) as the subplot. Plots were arranged in a randomized complete block design with four replications. Main plots consisted of 4 20-ft rows, 2 rows of the susceptible and resistant cultivars were planted side-by-side, with 2.5 ft between rows and a 5-ft alley between treatments within the row. Seeds were planted with a Monosem planter at 60,000 plants per acre on 20 Jun. Downy mildew was present in an adjacent field on the farm when seedlings emerged. A total of 100 lb/A of nitrogen was applied and a standard herbicide program (Curbit plus Command) was used along with mechanical cultivation. Assail and Bifenthrin insecticides were used for cucumber beetle control. Trials were overhead irrigated as necessary. Percent downy mildew severity was evaluated on five leaves of similar maturity in each plot on 3 and 15 Aug as the percent of the leaf area with necrosis or water soaking due to downy mildew. Fungicide applications began on 30 Jun. Fruit in a 20-ft section of one inner row of each cultivar per plot were harvested, counted, weighed, and graded on 8 Aug.

Disease severity ratings were lower on 15 Aug than on 3 Aug because downy mildew was assessed on younger leaves on the second rating date. There was a significant cultivar x fungicide program interaction for disease severity on both assessment dates. Citadel had a lower numerical downy mildew severity rating than Vlaspik on 3 and 15 Aug, although the difference was only significant when Bravo Weather Stik was applied alone, and for the nontreated control. There were no significant differences among fungicide spray programs on Citadel on either date. However, on the susceptible cultivar Vlaspik, plots sprayed five times with the Ranman, Previcur Flex plus Bravo Weather Stik (BWS) alternation and the plots sprayed with the rotation of Orondis, Ranman, Previcur Flex plus BWS had lower downy mildew severity ratings than the BWS only plots. There was no interaction between cultivar and fungicide program for yield. Citadel produced significantly more fruit than Vlaspik (19.8 lb/plot vs. 13.1 lb/plot, $P < 0.0001$). All fungicide programs improved yield compared to no fungicide application. There were no significant differences among fungicide programs. No phytotoxicity was observed.

Treatment and rate/A	Application dates ^z	Cultivar	% Downy mildew severity		Yield ^x lb/plot
			3 Aug	15 Aug	
Bravo Weather Stik 2 pt	1-5	Vlaspik	40.1 b ^y	23.3 bc	18.1a
		Citadel	15.4 cd	6.4 e	
Ranman 2.75 fl oz + Bravo Weather Stik 2 pt	1,3,5	Vlaspik	24.1 c	9.4 de	18.1a
Previcur Flex 1.2 pt + Bravo Weather Stik 2 pt	2,4	Citadel	15.3 cd	5.6 e	
Ranman 2.75 fl oz + Bravo Weather Stik 2 pt	1,5	Vlaspik	10.5 d	17.4 cd	18.7a
Previcur Flex 1.2 pt + Bravo Weather Stik 2 pt	3	Citadel	5.1 d	8.8 e	
Orondis 34 fl oz + Bravo Weather Stik 2 pt	1	Vlaspik	13.4 cd	9.7 de	19.0 a
Ranman 2.75 fl oz + Bravo Weather Stik 2 pt	3	Citadel	11.0 cd	5.4 e	
Previcur Flex 1.2 pt + Bravo Weather Stik 2 pt	5				
Nontreated		Vlaspik	62.8 a	59.7 a	8.4 b
		Citadel	37.7 b	27.6 b	
<i>P</i> value ^w			0.0061	0.0001	0.0001

^zApplication dates were 1= 30 Jun; 2= 7 Jul; 3= 14 Jul; 4= 21 Jul; 5=28 Jul.

^yMeans within a column followed by the same letter are not significantly different according to Fisher’s Protected LSD test ($\alpha=0.05$).

^xYield pooled across cultivars within each fungicide program to analyze the main effect of fungicide program on yield.

^w*P* values ≤ 0.05 indicate significant differences among treatments.