

Basil downy mildew control using organic fungicides and nitrogen fertilization rate, 2012.

Seven-week old sweet basil seedlings were transplanted into plots on 4 Jul and 5 Jul at two locations in Connecticut; Community Farm of Simsbury (CFS) and the UConn Plant Science Research Farm in Storrs, respectively. Plant spacing was 9-in. within 10-ft. rows spaced 1-ft. apart. Plots consisted of two 10-ft. rows. At CFS, raised beds with black plastic mulch and drip irrigation were used. At UConn, plots were mulched with hay. A randomized complete block design with three replicates was used and plots were separated by 6-ft. alleys. Fungicide treatments included Milstop, Cueva, OxiDate, Actinovate, a biweekly rotation of OxiDate and Actinovate and an untreated control. To evaluate the effect of nitrogen fertility on disease severity, nitrogen was applied at three different rates. Fungicide treatments were applied to plots at all three nitrogen levels. Fish meal plus blood meal for necessary nitrogen was applied just prior to planting. An additional nitrogen side dress was done on 21 Aug at CFS and on 22 Aug at UConn at a rate of 30 lb/A for all plots. Products were applied using a CO₂ backpack sprayer. Three Tee-Jet 11002 flat-fan nozzles were used on a handheld boom. Sprays were applied at 30 psi to deliver a volume of 62 gal/A. An adjuvant was used, which is recommended on the product label. Treatments were applied weekly at both locations beginning one week before disease was detected. Infection was from naturally occurring inoculum. Disease was assessed visually on all individual plants (18 plants per plot) on 11-12 Sep at CFS and 13-14 Sep at UConn. The rating scale was as follows: 0 = no symptoms, 1 = symptoms with 0-10% leaf area with sporulation, 2 = 10-50% leaf area with sporulation, and 3 = >50% leaf area with sporulation.

Downy mildew was confirmed at the plots at both locations on 9 Aug during the second week of treatments. Weather during the season was favorable for disease with regular precipitation and moderate summer temperatures. There were no significant differences between fungicide treatments and the untreated control this season with the exception of OxiDate at CFS. OxiDate was also associated with a lower disease severity during trials in 2011. Nitrogen fertility rate did have a significant effect on disease severity at both locations with higher disease severity being associated with a higher nitrogen application rate at UConn and a greater disease severity at lower nitrogen fertility rates at CFS.

Treatment and rate/A	Days after first application ^z		Mean rating		Odds ratio ^y	
	UConn	CFS	UConn	CFS	UConn	CFS
Fungicide						
Untreated control		.....	2.68	2.68	---	---
Milstop 2.5 lb	0, 7, 14, 21, 28, 35	0, 7, 14, 21, 28.....	2.73	2.62	NS ^x	NS
OxiDate 0.6 gal + Yucca Ag- Aide 0.125% v/v	0, 7, 14, 21, 28, 35	0, 7, 14, 21, 28.....	2.70	2.58	NS	0.63 ^{*w}
Actinovate AG 10 oz + ThermX70 0.06% v/v	0, 7, 14, 21, 28, 35	0, 7, 14, 21, 28.....	2.77	2.62	NS	NS
OxiDate/Actinovate	0, 7, 14, 21, 28, 35	0, 7, 14, 21, 28.....	2.72	2.61	NS	NS
Weekly rotation (same rates/A)	21, 28, 35	21, 28.....				
Cueva 1.0 gal	0, 7, 14, 21, 28, 35	0, 7, 14, 21, 28.....	2.70	2.60	NS	NS
Nitrogen Rate						
80 lb/A (control)		.....	2.70	2.71	---	---
120 lb/A		.....	2.71	2.61	NS	1.69 ^{***uv}
150 lb/A		.....	2.74	2.54	0.71 ^{**vt}	1.32 ^{*st}

^z First treatments were 2 and 3 Aug at CFS and UConn, respectively.

^y Likelihood of plants to score a different rating than the control as determined using SAS 9.3 Ordinal Logistic Analysis Program.

^x NS = not significant at $P = 0.05$.

^w * Significantly different from the control at a 0.1 confidence level.

^v Compared to the 80 lb/A control.

^u *** Significantly different from the control at a 0.01 confidence level.

^t ** Significantly different from the control at a 0.05 confidence level.

^s Compared to the 120 lb/A treatment.