

Evaluation of pyriofenone for powdery mildew in tomato, 2014.

The experiment was conducted at the Long Island Horticultural Research and Extension Center in Riverhead, NY, in a field with Haven loam soil. Controlled release fertilizer (N-P-K, 15-5-15) was applied at 675 lb/A (101 lb N/A). Drip irrigation tape was laid as the rows were covered with black plastic mulch. Tomato seeds were sown on 6 May in the greenhouse. Seedlings were transplanted by hand on 9 Jun into holes opened in the plastic mulch by a waterwheel transplanter that also placed in the holes a starter fertilizer, Black Label Zn (6-20-0 N-P-K). Plants were staked and trellised following standard procedure for fresh-market tomato production. Weeds between mulch strips were managed early in the season by applying post-transplant Devrinol DF (2 lb/A) plus Metribuzin (1.33 lb/A), and then by mowing and hand removal especially in the transplant hole. Actigard (0.75 oz/A) was applied on 19 Jul and 4 Aug to manage bacterial speck. Late blight was managed by applying Ranman (2.75 fl oz/A) on 20 Aug, 2 Sep, and 10 Sep. Insects were managed by applying Assail 70 WP (1.7 oz/A) on 17 Jul, Lannate (1 pt/A) on 4 Aug and 18 Aug, and Hero (10.3 fl oz/A) on 26 Aug and 2 Sep. Plots consisted of 10 plants in a single row with 24-in. plant spacing and 68-in. row spacing. There was 8-ft spacing between plots in a row. Plots for each of the four replications were in single adjacent rows. There was a spreader row planted between the second and third replication. Leaves with powdery mildew were put on plants in the spreader row on 18 Jul. Other diseases that occurred started from naturally-occurring inoculum. A completely randomized block design with four replications was used. Foliar applications were made using a CO₂-pressurized backpack sprayer with a boom that had a single twin-jet nozzle (TJ60-11004VS), calibrated to deliver 50 gal/A when operated at 54 psi and 2.4 mph. Each side of the planted row was treated with the boom held sideways to obtain thorough coverage of foliage and to mimic the coverage obtained with a drop nozzle on a tractor sprayer. A 7-day application schedule was used. Applications were made on 7, 15, 20, and 27 Aug, and 5 Sep. Leaves were examined routinely for disease symptoms beginning on 14 Jul. Disease was assessed by estimating number of leaves with symptoms (incidence) and estimating severity of symptoms on affected leaves. Canopy severity was calculated by multiplying these values. AUDPC was calculated from 12 Aug through 16 Sep. Defoliation was assessed on 29 Aug, and 4, 9, and 16 Sep as percent of leaves that had died. Average monthly high and low temperatures (°F) were 79/60 in Jun, 82/67 in Jul, 81/64 in Aug, and 77/61 in Sep. Rainfall (inches) was 2.47, 2.24, 2.42, and 1.86 for these months, respectively.

Powdery mildew was first observed on 25 Jul in three plots. On 6 Aug symptoms were found in all plots. Average incidence of affected leaves was 6% and average canopy severity was 0.31%. Treatments were started the next day. All treatments with IKF-309, which contains the active ingredient pyriofenone (FRAC Code U8) were highly effective for powdery mildew. Efficacy was evident following two applications at the 19 Aug assessment; there were no significant differences among any treatments on 12 Aug (data not shown). Symptoms were not found in treated plots on 9 Sep likely reflecting healthy new growth concealing old affected leaves. Excellent control also was evident on 16 Sep, which was 11 days after the last application. The 14-day spray interval was as effective as the 7-day interval. Late blight and bacterial speck both occurred at uniform, very low severity that did not appear to interfere with evaluation of IKF-309 for powdery mildew.

Treatment and rate/A (application dates) ^y	Canopy severity (%) ^z				Incidence (% leaves affected) ^z		
	Powdery mildew				Powdery mildew		
	29 Aug	9 Sep	16 Sep	AUDPC ^x	9 Sep	16 Sep	AUDPC ^x
Untreated control	3.8 a	6.7 a	18.100	240.3 a	28.8 a	33.75 a	111.5 a
IKF-309 300SC 4 fl oz (1-5)	0.2 b	0.0 b	0.013	5.6 b	0.0 b	0.5 ab	12.3 b
IKF-309 300SC 5 fl oz (1-5)	0.3 b	0.0 b	0.025	6.3 b	0.0 b	0.25 b	14.4 b
IKF-309 300SC 5 fl oz (1,3,5)	0.1 b	0.0 b	0.025	7.8 b	0.0 b	0.5 ab	15 b
<i>P-value</i>	<i>0.0001</i>	<i>0.0119</i>	<i>0.0712</i>	<i>0.0001</i>	<i>0.0013</i>	<i>0.0283</i>	<i>0.0015</i>

^z Numbers in each column with a letter in common are not significantly different from each other (Tukey's HSD, P=0.05).

^y Rate of formulated product/A. Foliar application dates were 1=8/7, 2=8/15, 3=8/20, 4=8/27, and 5=9/5.

^x AUDPC values were square root transformed before analysis. Table contains de-transformed values.