APPLE (*Malus domestica* 'Idared')
Fire blight; *Erwinia amylovora*

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Fire blight blossom blight test on Idared apple, 2017.

Treatments involving thirteen different products were compared to streptomycin (Firewall), alone and in integrated schedules, for blossom blight control and fruit finish effects. The test was established in four randomized blocks on 34-yr-old trees, using single-tree replications with border rows between treatment rows. The test strategy was to make applications in the morning before inoculating in the evening in anticipation of a relatively warm day to follow. Treatments were applied to both sides of the tree with a Swanson Model DA-400 airblast sprayer at 100 gallons per acre as follows: 9 Apr (early bloom, Bl 1, all trts); 13 Apr (mid bloom, Bl 2, all treatments except #2), 18 Apr (late-bloom, Bl 3, all treatments except #2); 26 Apr (petal fall, PF, all treatments). Four selected branches per tree, each with about 25 blossom clusters, were inoculated by spraying to wet with a bacterial suspension containing $1X10^6$ Erwinia amylovora cells/ml in the evenings of 9 Apr, 13 Apr, and 18 Apr. Trees were not inoculated after the fourth (petal fall) application 26 Apr. Infection data were based on counts of number of blossom clusters present on the inoculated branch at the time of the first inoculation. A cluster was rated as infected if it had at least one blossom with any fire blight symptoms on 24 Apr. Trees were rated again for infection into cluster leaves 4 May. Fruit finish and scab will be rated on 25-fruit harvest samples taken 23 Aug.

Inoculation resulted in strong blossom blight test conditions, especially on the west side of the test trees. Natural *Maryblyt* infection conditions occurred on nine days 12, 15-17, 21 Apr and 28 Apr-1 May, and only the wetting trigger was lacking for 11 Apr, 27 Apr, and 2 May. The treatment involving the four-application schedule of streptomycin (Firewall, trt. #1), was the only one that separated statistically from any other treatment on the west side ratings 24 Apr; there was no significant difference among the treated and non-treated trees on east side or combined (both sides) blossom ratings 24 Apr (Table 1). With 84% of non-treated clusters with infection into cluster leaves, infection was greater 4 May than for 24 Apr ratings, but there were a few more statistical separations among treatments. The four-application schedule of streptomycin (Firewall, trt. #1), and a schedule where Serenade replaced FireWall in applications #2 and #3 were the only treatments that had significantly less infection than the non-treated trees in both sides cluster leaf ratings 4 May. Some treatments which have shown up to 50% control in other test years showed little evidence of control this year. Copper-related treatments #10-13 significantly increased the amount of russet compared to non-treated trees, and treatments #10-12 increased the amount of opalescence. However, Cueva + Double Nickel (#13) had significantly less russet and opalescence than other copper treatments (10-12). A treatment in which included Blossom Protect as only the second and third applications with FireWall as the first and fourth applications had significantly less russet and opalescence than one in which Blossom Protect was applied in the complete four-application schedule.

Table 1. Suppression of fire blight blossom blight.

	Treatment and rate/A	Bloom #[z] 1	2	3	PF	% clusters with any infection present on west side, east side, or both sides[y] 24 Apr 2017 West	East	Both sides	into cluster leaves 4 May 2017 West	East	Both sides	Fruit finish rating (0-5)[x] Russet	Opal-escence
0	No treatment	--	--	--	--	73.7 ab[w]	50.4 a	62.4 ab	86.3 bc	83.5 b	84.9 d	1.5 a-c	1.1 a-d
1	FireWall 17 1.5 lb + Regulaid 1 pt/100gal	X	X	X	X	53.2 a	35.3 a	44.3 a	65.3 a	51.4 a	58.4 a	1.4 a-c	0.8 a
2	FireWall 17 1.5 lb + Regulaid 1 pt/100gal	X	--	--	X	72.4 ab	55.4 a	65.4 b	85.8 bc	78.0 b	82.8 cd	1.4 ab	0.8 ab
3	FireWall 17 1.5 lb + Regulaid 1 pt /100 gal Serenade ASO 4 qt Serenade Optimum 20 oz	X -- --	-- X --	-- -- X	X -- --	63.6 ab	37.6 a	50.6 ab	74.2 ab	60.7 ab	67.4 ab	1.7 bc	0.9 a-c
4	FireWall 17 1.5 lb + Regulaid 1 pt /100 gal Fracture 2.12SL 30.4 fl oz	X --	-- X	-- X	X --	74.7 ab	50.7 a	62.8 ab	84.8 bc	73.1 ab	79.1 b-d	1.3 a	0.7 a
5	Fracture 2.12SL 30.4 fl oz + Blossom Protect 20 oz + Buffer Protect 8.75 lb	X	X	X	X	70.5 ab	33.4 a	51.8 ab	81.3 a-c	59.3 ab	70.1 a-c	1.9 cd	1.1 b-d
6	FireWall 17 1.5 lb + Regulaid 1 pt /100 gal Blossom Protect 20 oz + Buffer P. 8.75 lb	X --	-- X	-- X	X --	60.8 ab	42.1 a	51.4 ab	73.1 ab	73.4 ab	73.3 b-d	1.2 a	0.7 a
7	Blossom Protect 20 oz + Buffer P. 8.75 lb	X	X	X	X	62.3 ab	47.5 a	54.9 ab	75.8 a-c	63.4 ab	69.8 ab	1.8 b-d	1.2 cd
8	LifeGard 4.5 oz/100 gal	X	X	X	X	71.7 ab	48.6 a	59.9 ab	87.0 bc	71.9 ab	79.4 b-d	1.3 a	0.8 ab
9	Serenade ASO 4 qt Serenade Optimum 20 oz	X --	X --	-- X	X --	81.9 b	43.4 a	63.3 ab	92.1 c	72.5 ab	82.6 cd	1.7 b-d	1.1 b-d
10	Nu-Cop HB 1 lb	X	X	X	X	71.0 ab	50.2 a	60.5 ab	73.2 ab	68.3 ab	71.0 a-c	3.3 f	1.7 e
11	Kocide 2000 1.4 lb	X	X	X	X	60.1 ab	47.9 a	54.1 ab	76.8 a-c	70.8 ab	73.8 b-d	2.8 e	1.9 e
12	KX-007 50WP 1 lb	X	X	X	X	78.4 ab	48.2 a	63.2 ab	81.1 a-c	75.3 ab	78.3 b-d	3.0 ef	1.9 e
13	Cueva 2 qt + Double Nickel LC 1 qt	X	X	X	X	70.2 ab	49.6 a	60.3 ab	79.2 a-c	73.9 ab	77.0 b-d	2.2 d	1.3 d
14	Regalia Biofungicide 5% 4 qt	X	X	X	X	73.5 ab	48.7 a	61.2 ab	86.7 bc	70.5 ab	78.6 b-d	1.6 a-c	0.9 ab
15	Regalia 4 qt + JMS Stylet-oil 1 gal	X	X	X	X	68.4 ab	50.6 a	59.6 ab	87.1 bc	82.9 b	85.1 d	1.5 a-c	0.8 ab
16	JMS Stylet-oil 1 gal	X	X	X	X	71.8 ab	43.9 a	58.0 ab	84.1 bc	76.0 ab	80.2 b-d	1.4 ab	0.9 ab

[z] Applied airblast at 100 gal / acre as follows: 9 Apr (early bloom, Bl 1, all treatments); 13 Apr (mid-bloom, Bl 2, all treatments except #2); 18 Apr (late bloom, Bl 3, all treatments except #2). 26 Apr (petal fall, PF, all treatments).

[y] Four selected branches per tree, each with about 25 blossom clusters, were inoculated by spraying to wet with a bacterial suspension containing $1X10^6$ *Erwinia amylovora* cells/ml in the evenings of 9 Apr, 13 Apr, and 18 Apr. Trees were not inoculated after the fourth (petal fall) application 26 Apr. Infection data were based on counts of number of blossom clusters present on the inoculated branch at the time of the first inoculation. A cluster was rated as infected if it had at least one blossom with any fire blight symptoms on 24 Apr, and if it had infection into the leaves 4 May.

[x] Fruit finish was rated on 25-fruit harvest samples 25 Aug using a scale of 0-5 (0=perfect finish; 5=severe russet or opalescence).

[w] Mean separation by Waller-Duncan K-ratio t-test (p=0.05).