

APPLE (*Malus domestica* ‘Stayman Winesap’, ‘Idared’, ‘Granny Smith’) Scab; *Venturia inaequalis*
Powdery mildew; *Podosphaera leucotricha*
Cedar-apple rust; *Gymnosporangium juniperi-virginianae*
Brooks fruit spot; *Mycosphaerella pomi*
Sooty blotch; disease complex
Flyspeck; *Zygothiala jamaicensis*
Bitter rot; *Colletotrichum* spp.
White rot; *Botryosphaeria dothidea*
Alternaria rot; *Alternaria* spp.

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Comparison of mixed fungicide schedules for broad spectrum disease control on Stayman, Idared, and Granny Smith apples, 2016.

Nine combination treatments were tested on 30-yr-old trees in an area where scab and mildew fungus resistance to SI fungicides has been present since 2004. The test was conducted in a randomized block design with four replicates of three-tree sets separated by non-treated border rows. Treatment rows had been used as non-treated border rows in 2015 to stabilize mildew inoculum pressure for 2016. Tree-row-volume was determined to require a 400 gal/A dilute base for adequate coverage. Fungicide treatments were applied to both sides of the tree on each application date with a Swanson Model DA-400 airblast sprayer at 100 gal/A as follows: 17 Apr (P-BI, pink-bloom); 27 Apr (BI-PF, petal fall); 7 May (PF); 1C-8C (1st-8th covers): 18 May, 31 May, 14 Jun, 25 Jun, 8 Jul, 22 Jul, 2 Aug, 17 Aug. Maintenance materials applied to the entire test block with the same equipment included: Altacor, Assail, Asana XL, BioCover, Beleaf, Belt, Danitol, Delegate, Imidan, and Lannate LV. Inoculum, placed over each Idared test tree 26 Apr, included cedar rust galls, wild blackberry canes with the sooty blotch and flyspeck fungi, and bitter rot mummies 16 May. Other diseases developed from inoculum naturally present in the test area. Foliar data represent averages of counts of ten terminal shoots per tree 17 Jun (Idared), 21 Jul (Stayman) or 27 Jul (Granny Smith). Post-harvest fruit counts are means of 25-fruit samples picked from each replicate tree. Idared was sampled 15 Sep and held in cold storage until the first rating 20 Sep, then rated again for rots 5 Oct, after 15 days at 65-87°F (mean 72.2°F). Stayman was sampled 5 Oct, first rated 12 Oct, then rated again for rots 24 Oct, after 19 days at 64-82°F (mean 70.0°F). Granny Smith was sampled 4 Oct, first rated 7 Oct, then rated again for rots 21 Oct, after 19 days at 64-82°F (mean 70.0°F) Percentage data were converted by the square root arcsin transformation for statistical analysis.

Conidia from the causal pathogen of mildew were present 16 Mar, and 21 dry weather “mildew infection days” from 16 Mar until 5 May resulted in moderate infection of non-treated trees (Table 1). Under these conditions, all treatments gave significant control of percent leaves and/or percent leaf area and percent fruit infected with mildew. Treatments #1-5 had parallel schedules of five different SDHI products + Manzate alternated with Inspire Super + Manzate in the first seven applications. Luna Sensation/Inspire Super (Trt #2) had the fewest leaves infected on all the cultivars. Among treatments #1-5, Aprovia/Inspire Super (Trt #4) was least effective for control of mildew on leaves. Treatments #6-8, carried through 4th cover spray, gave adequate control of mildew on foliage, but had the most mildew on fruit. Control of mildew on Idared fruit by KFD-218-01 was significantly improved by tank-mixing with KFD-285-01. The first scab infection period did not occur until 22 Apr (bloom); however, after this delayed start, there were 13 infection periods that occurred in 15 days from 28 Apr-12 May, and 23 infection periods through 31 May. Under these conditions, scab incidence was moderate to heavy on Stayman and Granny Smith leaves and fruit, but lighter on Idared (Table 2). SI fungicide resistance has been present in the area and this was confirmed by poor scab control by Procure (#8). Aprovia + Manzate/Inspire Super + Manzate (#4) gave excellent scab control on leaves and fruit. A continuous schedule of Luna Tranquility through 4th cover (#9) was less effective for scab control on Stayman and Granny Smith leaves and fruit than an alternating schedule of Luna Tranquility + Manzate/Inspire Super + Manzate (#3). Cedar-apple rust pressure was moderate to light on Idared leaves and fruit, and all treatments gave adequate control under these conditions (Table 3). The 250-hr accumulated wetting hour threshold for sooty blotch/flyspeck (SBFS) activity, accumulating from 14 May, was reached as early as 5 Jun (before the 3rd cover application), and this resulted in strong SBFS test conditions (Table 8). All treatments received Captan + Ziram in the late cover applications, but there were significant differences in control related to what had been applied as early as the 4th cover. SDHI products + Manzate alternated with Inspire Super + Manzate in the early applications (#1-5) gave good to excellent SBFS control under heavy pressure on Stayman and Granny Smith, while Procure (#8), KFD-218-01 (#6 & 7), and Luna Tranquility were weaker. The postharvest rot spectrum included mostly bitter rot, white rot and some Alternaria (Table 5). Generally, the schedules involving SDHI products + Manzate alternated with Inspire Super + Manzate in the first seven applications (#1-5) all gave better rot control than treatments #6-9 which did not have Manzate in the earlier applications. There were some significant fruit finish differences among treatments; all treatment significantly reduced russetting of Granny Smith compared to non-treated fruit (Table 6).

Table 1. Powdery mildew.

Treatment and formulated rate/acre	Timing ^y	% leaves or leaf area or fruit or fruit area infected											
		Stayman		Idared				Granny Smith					
		leaves	area	leaves	area	fruit	area	leaves	area	fruit	area		
0 No fungicide	--	47 d ^z	20 b	41 c	16 c	62 f	9.3 f	52 e	20 e	28 d	3.9 f		
1 Merivon 4.18SC 5.5 fl oz + Manzate 75DF 3 lb	#1,3,5,7	5 ab	1 a	20 ab	3 a	9 b-d	1.1 a-d	10 bc	2 a-c	2 ab	0.2 a		
Inspire Super 2.82EW 12 fl oz + Manzate 75DF 3 lb	#2,4,6												
Captan 80WDG 30 oz + Ziram 76DF 3 lb	5C-8C												
2 Luna Sensation 500SC 5.5 fl oz + Manzate 75DF 3 lb	#1,3,5,7	4 a	1 a	12 a	2 a	6 ab	0.2 ab	4 a	1 a	3 ab	0.3 ab		
Inspire Super 2.82EW 12 fl oz + Manzate 75DF 3 lb	#2,4,6												
Captan 80WDG 30 oz + Ziram 76DF 3 lb	5C-8C												
3 Luna Tranquility 4.16SC 11.2 fl oz + Manzate 3 lb	#1,3,5,7	10 bc	2 a	26 b	4 a	2 a	0.3 a	14 c	3 bc	1 a	0.1 a		
Inspire Super 12 fl oz + Manzate 75DF 3 lb	#2,4,6												
Captan 80WDG 30 oz + Ziram 76DF 3 lb	5C-8C												
4 Aprovia 0.83EC 5.5 fl oz + Manzate 75DF 3 lb	#1,3,5,7	17 c	3 a	41 c	11 b	9 a-c	1.3 a-c	32 d	6 d	8 bc	1.2 b-d		
Inspire Super 2.82EW 12 fl oz + Manzate 75DF 3 lb	#2,4,6												
Captan 80WDG 30 oz + Ziram 76DF 3 lb	5C-8C												
5 Fontelis 1.67SC 1pt + Manzate 75DF 3 lb	#1,3,5,7	9 b	2 a	28 b	4 a	11 b-d	1.2 b-e	26 d	3 c	6 bc	0.9 cd		
Inspire Super 2.82EW 12 fl oz + Manzate 75DF 3 lb	#2,4,6												
Captan 80WDG 30 oz + Ziram 76DF 3 lb	5C-8C												
6 KFD-218-01 4SC 12 fl oz	Pk-4C	8 ab	1 a	15 a	2 a	27 e	3.0 e	10 bc	2 bc	15 c	2.3 ef		
Captan 80WDG 30 oz + Ziram 76DF 3 lb	5C-8C												
7 KFD-218-01 12 fl oz + KFD-285-01 4 fl oz/100gal	Pk-4C	7 ab	1 a	15 a	3 a	12 b-d	1.6 c-e	10 bc	2 bc	14 c	2.3 ef		
Captan 80WDG 30 oz + Ziram 76DF 3 lb	5C-8C												
8 Procure 4SC 12 fl oz	Pk-4C	8 ab	1 a	18 ab	3 a	21 de	2.9 de	10 bc	2 bc	13 c	1.9 de		
Captan 80WDG 30 oz + Ziram 76DF 3 lb	5C-8C												
9 Luna Tranquility 4.16SC 11.2 fl oz	Pk-4C	8 ab	1 a	12 a	2 a	19 c-e	2.3 c-e	6 ab	2 ab	3 ab	0.3 a-c		
Captan 80WDG 30 oz + Ziram 76DF 3 lb	5C-8C												

^z Mean separation by Waller-Duncan K-ratio t-test (p=0.05). Foliar infection rated on 10 shoots 17 Jun (Idared), 21 Jul (Stayman), or 27 Jun (Granny Smith) or harvest counts of 25-fruit samples picked from each of four single-tree reps 15 Sep (Idared), 5 Oct (Stayman), or 4 Oct (Granny Smith). Test rows were used as non-treated border rows in 2015 to stabilize mildew inoculum pressure for 2016.

Treatments applied airblast at 100 gpa to both sides of the row on each application date.

^y Treatment dates: 17 Apr (P-BI, pink-bloom); 27 Apr (BI-PF, petal fall); 7 May (PF); 1C-8C (1st-8th covers): 18 May, 31 May, 14 Jun, 25 Jun, 8 Jul, 22 Jul, 2 Aug, 17 Aug.

Table 2. Scab and Brooks spot control.

Treatment and formulated rate/acre	Timing ^y	Scab, % leaves inf.			Scab, % fruit infected			Brooks spot, % fruit inf.		
		Stay-man	Idared	Granny Smith	Stay-man	Idared	Granny Smith	Stay-man	Idared	Granny Smith
0 No fungicide	--	73 e ^z	17 b	31 d	55 de	24 c	88 e	3 a	26 d	2 a
1 Merivon 4.18SC 5.5 fl oz + Manzate 75DF 3 lb Inspire Super 2.82EW 12 fl oz + Manzate 75DF 3 lb Captan 80WDG 30 oz + Ziram 76DF 3 lb	#1,3,5,7 #2,4,6 5C-8C	14 b	4 a	9 bc	3 ab	1 a	0 a	0 a	0 a	0 a
2 Luna Sensation 500SC 5.5 fl oz + Manzate 75DF 3 lb Inspire Super 2.82EW 12 fl oz + Manzate 75DF 3 lb Captan 80WDG 30 oz + Ziram 76DF 3 lb	#1,3,5,7 #2,4,6 5C-8C	11 ab	2 a	2 a	0 a	0 a	0 a	0 a	0 a	0 a
3 Luna Tranquility 4.16SC 11.2 fl oz + Manzate 3 lb Inspire Super 12 fl oz + Manzate 75DF 3 lb Captan 80WDG 30 oz + Ziram 76DF 3 lb	#1,3,5,7 #2,4,6 5C-8C	9 ab	2 a	2 a	0 a	1 a	2 a	0 a	0 a	0 a
4 Aprovia 0.83EC 5.5 fl oz + Manzate 75DF 3 lb Inspire Super 2.82EW 12 fl oz + Manzate 75DF 3 lb Captan 80WDG 30 oz + Ziram 76DF 3 lb	#1,3,5,7 #2,4,6 5C-8C	6 a	2 a	1 a	0 a	0 a	0 a	0 a	0 a	0 a
5 Fontelis 1.67SC 1pt + Manzate 75DF 3 lb Inspire Super 2.82EW 12 fl oz + Manzate 75DF 3 lb Captan 80WDG 30 oz + Ziram 76DF 3 lb	#1,3,5,7 #2,4,6 5C-8C	14 b	3 a	4 ab	4 b	2 a	3 a	0 a	0 a	0 a
6 KFD-218-01 4SC 12 fl oz Captan 80WDG 30 oz + Ziram 76DF 3 lb	Pk-4C 5C-8C	58 d	17 b	28 d	21 c	25 c	46 cd	1 a	3 b	1 a
7 KFD-218-01 12 fl oz + KFD-285-01 4 fl oz/100gal Captan 80WDG 30 oz + Ziram 76DF 3 lb	Pk-4C 5C-8C	62 d	21 b	31 d	67 e	33 cd	56 d	1 a	11 c	0 a
8 Procure 4SC 12 fl oz Captan 80WDG 30 oz + Ziram 76DF 3 lb	Pk-4C 5C-8C	63 d	25 b	21 d	44 d	36 d	36 c	3 a	7 bc	1 a
9 Luna Tranquility 4.16SC 11.2 fl oz Captan 80WDG 30 oz + Ziram 76DF 3 lb	Pk-4C 5C-8C	31 c	5 a	12 c	14 c	7 b	15 b	0 a	0 a	0 a

^zMean separation by Waller-Duncan K-ratio t-test (p=0.05). Foliar infection rated on 10 shoots 17 Jun (Idared), 21 Jul (Stayman), or 27 Jun (Granny Smith) or harvest counts of 25-fruit samples picked from each of four single-tree replications 15 Sep (Idared), 5 Oct (Stayman), or 4 Oct (Granny Smith).

Treatments applied airblast at 100 gpa to both sides of the row on each application date.

^yTreatment dates: 17 Apr (P-BI, pink-bloom); 27 Apr (BI-PF, petal fall); 7 May (PF); 1C-8C (1st-8th covers): 18 May, 31 May, 14 Jun, 25 Jun, 8 Jul, 22 Jul, 2 Aug, 17 Aug.

Table 3. Cedar-apple rust, quince rust, and bitter rot.

Treatment and formulated rate/acre	Timing ^y	Cedar-apple rust, % leaves or lesions/leaf				Harvest counts Idared, % fruit		Harvest counts Bitter rot, % fruit	
		Stayman		Idared		Cedar rust	Quince rust	Ida- red	Gran. Smith
		leaves	les/lf	leaves	les/lf				
0 No fungicide	--	1.2 a ^z	0.1 a	43 c	4.9 b	2 b	6 c	51 c	11 b
1 Merivon 4.18SC 5.5 fl oz + Manzate 75DF 3 lb	#1,3,5,7	0 a	0 a	<1 ab	<0.1 a	0 a	0 a		
Inspire Super 2.82EW 12 fl oz + Manzate 75DF 3 lb	#2,4,6								
Captan 80WDG 30 oz + Ziram 76DF 3 lb	5C-8C							0 a	1 a
2 Luna Sensation 500SC 5.5 fl oz + Manzate 75DF 3 lb	#1,3,5,7	0 a	0 a	<1 ab	<0.1 a	0 a	0 a		
Inspire Super 2.82EW 12 fl oz + Manzate 75DF 3 lb	#2,4,6								
Captan 80WDG 30 oz + Ziram 76DF 3 lb	5C-8C							2 a	1 a
3 Luna Tranquility 4.16SC 11.2 fl oz + Manzate 3 lb	#1,3,5,7	0 a	0 a	<1 ab	<0.1 a	0 a	0 a		
Inspire Super 12 fl oz + Manzate 75DF 3 lb	#2,4,6								
Captan 80WDG 30 oz + Ziram 76DF 3 lb	5C-8C							10 ab	0 a
4 Aprovia 0.83EC 5.5 fl oz + Manzate 75DF 3 lb	#1,3,5,7	0 a	0 a	0 a	0 a	0 a	0 a		
Inspire Super 2.82EW 12 fl oz + Manzate 75DF 3 lb	#2,4,6								
Captan 80WDG 30 oz + Ziram 76DF 3 lb	5C-8C							5 ab	1 a
5 Fontelis 1.67SC 1pt + Manzate 75DF 3 lb	#1,3,5,7	0 a	0 a	1 ab	<0.1 a	0 a	0 a		
Inspire Super 2.82EW 12 fl oz + Manzate 75DF 3 lb	#2,4,6								
Captan 80WDG 30 oz + Ziram 76DF 3 lb	5C-8C							2 a	4 ab
6 KFD-218-01 4SC 12 fl oz	Pk-4C	0 a	0 a	<1 ab	<0.1 a	0 a	0 a		
Captan 80WDG 30 oz + Ziram 76DF 3 lb	5C-8C							7 ab	7 ab
7 KFD-218-01 12 fl oz + KFD-285-01 4 fl oz/100gal	Pk-4C	0 a	0 a	0 a	0 a	0 a	1 b		
Captan 80WDG 30 oz + Ziram 76DF 3 lb	5C-8C							24 b	7 ab
8 Procure 4SC 12 fl oz	Pk-4C	0 a	0 a	0 a	0 a	0 a	0 a		
Captan 80WDG 30 oz + Ziram 76DF 3 lb	5C-8C							5 ab	2 ab
9 Luna Tranquility 4.16SC 11.2 fl oz	Pk-4C	0 a	0 a	2 b	0.1 a	0 a	0 a		
Captan 80WDG 30 oz + Ziram 76DF 3 lb	5C-8C							10 ab	8 ab

^zMean separation by Waller-Duncan K-ratio t-test (p=0.05). Foliar infection rated on 10 shoots 17 Jun (Idared), and 21 Jul (Stayman), or harvest counts of 25-fruit samples from each of four single-tree reps 15 Sep (Idared) and 5 Oct (Stayman).

^yTreatments applied airblast at 100 gpa to both sides of the row on each application date: 17 Apr (P-BI, pink-bloom); 27 Apr (BI-PF, petal fall); 7 May (PF); 1C-8C (1st-8th covers): 18 May, 31 May, 14 Jun, 25 Jun, 8 Jul, 22 Jul, 2 Aug, 17 Aug.

Table 4. Sooty blotch and flyspeck.

Treatment and rate/A	Timing ^y	% fruit or fruit area infected, harvest counts										
		Sooty blotch						Flyspeck				
		Stayman		Idared		Granny Smith		Stayman		Idared		G. Smith
fruit	area	fruit	area	fruit	area	fruit	area	fruit	area	fruit	area	% fruit
0 No fungicide	--	97 c ^z	15 c	85 e	11 e	99 e	15 e	96 c	8 c	78 c	5 c	99 d
1 Merivon 4.18SC 5.5 fl oz + Manzate 75DF 3 lb	#1,3,5,7											
Inspire Super 12 fl oz + Manzate 75DF 3 lb	#2,4,6											
Captan 80WDG 30 oz + Ziram 76DF 3 lb	5C-8C	8 a	<1 a	3 a	<1 ab	3 a	<1 a	1 a	<1 a	0 a	0 a	2 a
2 Luna Sensation 5.5 fl oz + Manzate 75DF 3 lb	#1,3,5,7											
Inspire Super 12 fl oz + Manzate 75DF 3 lb	#2,4,6											
Captan 80WDG 30 oz + Ziram 76DF 3 lb	5C-8C	11 a	<1 a	2 a	<1 a	5 a	<1 a	1 a	<1 a	0 a	0 a	4 a
3 Luna Tranquility 4.16SC 11.2 fl oz + Manzate 3 lb	#1,3,5,7											
Inspire Super 12 fl oz + Manzate 75DF 3 lb	#2,4,6											
Captan 80WDG 30 oz + Ziram 76DF 3 lb	5C-8C	5 a	<1 a	8 a-c	<1 a-c	6 a	<1 a	0 a	0 a	0 a	0 a	0 a
4 Aprovia 0.83EC 5.5 fl oz + Manzate 75DF 3 lb	#1,3,5,7											
Inspire Super 12 fl oz + Manzate 75DF 3 lb	#2,4,6											
Captan 80WDG 30 oz + Ziram 76DF 3 lb	5C-8C	4 a	<1 a	2 a	<1 a	5 a	<1 a	0 a	0 a	0 a	0 a	2 a
5 Fontelis 1.67SC 1pt + Manzate 75DF 3 lb	#1,3,5,7											
Inspire Super 12 fl oz + Manzate 75DF 3 lb	#2,4,6											
Captan 80WDG 30 oz + Ziram 76DF 3 lb	5C-8C	12 a	<1 a	4 ab	<1 ab	6 a	<1 a	3 a	<1 a	0 a	0 a	0 a
6 KFD-218-01 4SC 12 fl oz	Pk-4C											
Captan 80WDG 30 oz + Ziram 76DF 3 lb	5C-8C	61 b	4 b	23 cd	2 cd	33 bc	2 bc	31 b	2 b	8 b	<1 b	18 b
7 KFD-218-01 12 fl oz + KFD-285-01 4 fl oz/100gal	Pk-4C											
Captan 80WDG 30 oz + Ziram 76DF 3 lb	5C-8C	65 b	4 b	36 d	2 d	49 cd	4 cd	44 b	2 b	7 b	<1 b	43 c
8 Procure 4SC 12 fl oz	Pk-4C											
Captan 80WDG 30 oz + Ziram 76DF 3 lb	5C-8C	63 b	4 b	34 d	3 d	62 d	5 d	32 b	2 b	12 b	<1 b	59 c
9 Luna Tranquility 4.16SC 11.2 fl oz	Pk-4C											
Captan 80WDG 30 oz + Ziram 76DF 3 lb	5C-8C	53 b	4 b	22 b-d	2 b-d	17 ab	1 ab	27 b	2 b	0 a	0 a	17 b

^z Mean separation by Waller-Duncan K-ratio t-test (p=0.05). Foliar infection rated on 10 shoots 17 Jun (Idared), 21 Jul (Stayman), or 27 Jun (Granny Smith) or harvest counts of 25-fruit samples picked from replicate trees 15 Sep (Idared), 5 Oct (Stayman), or 4 Oct (Granny Smith). Treatments applied airblast at 100 gpa to both sides of the row on each application date.

^y Treatment dates: 17 Apr (P-BI, pink-bloom); 27 Apr (BI-PF, petal fall); 7 May (PF); 1C-8C (1st-8th covers): 18 May, 31 May, 14 Jun, 25 Jun, 8 Jul, 22 Jul, 2 Aug, 17 Aug.

Table 5. Post-harvest fruit rots.

Treatment and rate/A	Timing ^y	% fruit infected, post-storage counts										
		Any rot			Bitter rot			White rot			Alternaria	
		Stay- man	Ida- red	Gran. Smith	Stay- man	Ida- red	Gran. Smith	Stay- man	Ida- red	Gran. Smith	Stay- man	Ida- red
0 No fungicide	--	37 e ^z	76 d	60 g	15 c	67 d	52 f	12 b	11 a	17 d	15 d	3 b
1 Merivon 4.18SC 5.5 fl oz + Manzate 75DF 3 lb	#1,3,5,7											
Inspire Super 12 fl oz + Manzate 75DF 3 lb	#2,4,6											
Captan 80WDG 30 oz + Ziram 76DF 3 lb	5C-8C	3 a	4 a	3 a	0 a	3 a	3 a	0 a	1 a	0 a	3 a-c	0 a
2 Luna Sensation 5.5 fl oz + Manzate 75DF 3 lb	#1,3,5,7											
Inspire Super 12 fl oz + Manzate 75DF 3 lb	#2,4,6											
Captan 80WDG 30 oz + Ziram 76DF 3 lb	5C-8C	9 bc	7 a	8 a-c	4 b	5 ab	6 ab	5 ab	2 a	2 ab	1 ab	0 a
3 Luna Tranquility 4.16SC 11.2 fl oz + Manzate 3 lb	#1,3,5,7											
Inspire Super 12 fl oz + Manzate 75DF 3 lb	#2,4,6											
Captan 80WDG 30 oz + Ziram 76DF 3 lb	5C-8C	17 cd	14 ab	10 ab	9 bc	13 ab	7 a	4 ab	1 a	3 a-c	4 c	0 a
4 Aprovia 0.83EC 5.5 fl oz + Manzate 75DF 3 lb	#1,3,5,7											
Inspire Super 12 fl oz + Manzate 75DF 3 lb	#2,4,6											
Captan 80WDG 30 oz + Ziram 76DF 3 lb	5C-8C	1 a	15 a-c	13 b-d	0 a	12 ab	6 ab	0 a	2 a	7 a-d	1 ab	1 ab
5 Fontelis 1.67SC 1pt + Manzate 75DF 3 lb	#1,3,5,7											
Inspire Super 12 fl oz + Manzate 75DF 3 lb	#2,4,6											
Captan 80WDG 30 oz + Ziram 76DF 3 lb	5C-8C	4 ab	6 a	10 ab	0 a	6 ab	8 a-c	3 ab	0 a	2 ab	0 a	0 a
6 KFD-218-01 4SC 12 fl oz	Pk-4C											
Captan 80WDG 30 oz + Ziram 76DF 3 lb	5C-8C	17 cd	29 bc	24 de	7 bc	22 bc	15 b-d	7 ab	10 a	16 cd	3 a-c	0 a
7 KFD-218-01 12 fl oz + KFD-285-01 4 fl oz/100gal	Pk-4C											
Captan 80WDG 30 oz + Ziram 76DF 3 lb	5C-8C	17 cd	39 c	44 fg	13 bc	37 cd	33 e	1 ab	5 a	14 d	3 bc	0 a
8 Procure 4SC 12 fl oz	Pk-4C											
Captan 80WDG 30 oz + Ziram 76DF 3 lb	5C-8C	27 de	17 a-c	21 c-e	13 c	15 a-c	17 c-e	11 ab	3 a	4 a-c	5 c	0 a
9 Luna Tranquility 4.16SC 11.2 fl oz	Pk-4C											
Captan 80WDG 30 oz + Ziram 76DF 3 lb	5C-8C	11 c	25 a-c	32 ef	6 b	23 a-c	25 de	4 ab	2 a	8 b-d	1 ab	0 a

^zMean separation by Waller-Duncan K-ratio t-test (p=0.05). Post-harvest fruit counts are means of 25-fruit samples picked from each of four single-tree reps. Idared sampled 15 Sep and placed in cold storage; moved 20 Sep to ambient temperatures 65-87°F (mean 72.2°F) and rated for rots after 15 days' incubation. Stayman sampled 5 Oct, first rated 12 Oct, then rated for rots after 19 days incubation at ambient temperatures 64-82°F (mean 70.0°F). Granny Smith sampled 4 Oct, first rated 7 Oct, then rated for rots after 17 days incubation at ambient temperatures 64-82°F (mean 70.0°F).

^yTreatments applied airblast at 100 gpa to both sides of the row on each application date: 17 Apr (P-BI, pink-bloom); 27 Apr (BI-PF, petal fall); 7 May (PF); 1C-8C (1st-8th covers): 18 May, 31 May, 14 Jun, 25 Jun, 8 Jul, 22 Jul, 2 Aug, 17 Aug.

Table 6. Fruit finish effects.

Treatment and rate/A	Timing ^y	Fruit finish ratings (0-5) ^x					
		Russet			Opalescence		
		Stayman	Idared	G. Smith.	Stayman	Idared	G. Smith.
0 No fungicide	--	1.4 a ^z	1.5 a	1.4 e	0.8 a	1.3 b	1.4 d
1 Merivon 4.18SC 5.5 fl oz + Manzate 75DF 3 lb Inspire Super 2.82EW 12 fl oz + Manzate 75DF 3 lb Captan 80WDG 30 oz + Ziram 76DF 3 lb	#1,3,5,7 #2,4,6 5C-8C	1.7 a	1.8 a	0.5 a	1.1 a	0.9 ab	0.5 ab
2 Luna Sensation 500SC 5.5 fl oz + Manzate 75DF 3 lb Inspire Super 2.82EW 12 fl oz + Manzate 75DF 3 lb Captan 80WDG 30 oz + Ziram 76DF 3 lb	#1,3,5,7 #2,4,6 5C-8C	1.8 a	1.7 a	0.6 a-c	1.0 a	1.0 ab	0.4 a
3 Luna Tranquility 4.16SC 11.2 fl oz + Manzate 3 lb Inspire Super 12 fl oz + Manzate 75DF 3 lb Captan 80WDG 30 oz + Ziram 76DF 3 lb	#1,3,5,7 #2,4,6 5C-8C	1.7 a	1.6 a	0.6 ab	1.0 a	0.8 a	0.5 a-c
4 Aprovia 0.83EC 5.5 fl oz + Manzate 75DF 3 lb Inspire Super 2.82EW 12 fl oz + Manzate 75DF 3 lb Captan 80WDG 30 oz + Ziram 76DF 3 lb	#1,3,5,7 #2,4,6 5C-8C	1.8 a	1.8 a	0.7 a-d	0.9 a	0.9 ab	0.6 a-c
5 Fontelis 1.67SC 1pt + Manzate 75DF 3 lb Inspire Super 2.82EW 12 fl oz + Manzate 75DF 3 lb Captan 80WDG 30 oz + Ziram 76DF 3 lb	#1,3,5,7 #2,4,6 5C-8C	1.7 a	1.6 a	0.5 a	1.1 a	0.8 a	0.5 a-c
6 KFD-218-01 4SC 12 fl oz Captan 80WDG 30 oz + Ziram 76DF 3 lb	Pk-4C 5C-8C	1.7 a	1.6 a	0.8 a-d	0.7 a	1.0 ab	0.8 bc
7 KFD-218-01 12 fl oz + KFD-285-01 4 fl oz/100gal Captan 80WDG 30 oz + Ziram 76DF 3 lb	Pk-4C 5C-8C	1.9 a	1.7 a	1.0 d	1.0 a	1.1 ab	1.2 d
8 Procure 4SC 12 fl oz Captan 80WDG 30 oz + Ziram 76DF 3 lb	Pk-4C 5C-8C	1.8 a	1.7 a	0.9 cd	0.8 a	1.1 ab	0.8 c
9 Luna Tranquility 4.16SC 11.2 fl oz Captan 80WDG 30 oz + Ziram 76DF 3 lb	Pk-4C 5C-8C	1.7 a	1.8 a	0.9 b-d	0.9 a	1.1 ab	0.8 bc

^z Mean separation by Waller-Duncan K-ratio t-test (p=0.05). Harvest counts of 25-fruit samples picked from each of four single-tree replications 15 Sep (Idared), 5 Oct (Stayman), or 4 Oct (Granny Smith).

^y Treatments applied airblast at 100 gpa to both sides of the row on each application date. 17 Apr (P-BI, pink-bloom); 27 Apr (BI-PF, petal fall); 7 May (PF); 1C-8C (1st-8th covers): 18 May, 31 May, 14 Jun, 25 Jun, 8 Jul, 22 Jul, 2 Aug, 17 Aug.

^x Fruit finish rated on a scale of 0-5 (0=perfect finish; 5=severe opalescence or russet, presumed not to be mildew).