

APPLE (*Malus domestica* 'Idared')

Powdery mildew; *Podosphaera leucotricha*
Scab; *Venturia inaequalis*
Cedar-apple rust; *Gymnosporangium juniperi-virginianae*
Brooks fruit spot; *Mycosphaerella pomi*
Sooty blotch; disease complex
Flayspeck; *Zygothiala jamaicensis*
Bitter rot; *Colletotrichum* spp.
White rot; *Botryosphaeria dothidea*
Fruit finish

K. S. Yoder, A. E. Cochran II,
W. S. Royston, Jr., S. W. Kilmer,
A.G.F. Engelman, A. Kowalski,
and J.K. Repass
Virginia Tech Agr. Res. & Ext. Center
595 Laurel Grove Road
Winchester, VA 22602

Management of powdery mildew and other diseases on Idared apple, 2016.

Sixteen treatments involving experimental and registered combinations were directed at control of powdery mildew and other early season diseases in an area where SI and QoI fungicide effectiveness has been declining. The test was established as four randomized blocks on 35-yr-old trees using single-tree replications with border rows between treatment 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: 30 Mar (TC, tight cluster), 13 Apr (P-BI, pink-bloom), 20 Apr (BI, bloom), 4 May (PF, petal fall), 1C-8C (1st-8th covers): 16 May, 27 May, 10 Jun, 23 Jun, 7 Jul, 20 Jul, 2 Aug, 17 Aug. Maintenance materials applied to the entire test block with the same equipment included: Altacor, Asana XL, Assail, BioCover, Beleaf, Belt, Calypso, Danitol, Delegate, Imidan, Intrepid, and Lannate LV. Inoculum over each Idared test tree included cedar rust galls and wild blackberry canes with the sooty blotch and flayspeck fungi and bitter rot mummies placed 23 May. Other diseases developed from inoculum naturally present in the test area. Foliar data represent averages of counts of ten terminal shoots per tree 7 Jun. Apparent suppressive effect on appearance of primary mildew was rated on six primary mildew shoots per tree, 8 Jun using a scale of 1-10 (1= none; 10= excellent effect). Post-harvest fruit counts are means of 25-fruit samples picked from each of four single-tree reps 20 Sep, first rated 21 Sep and then rated for rots on 4 Oct after 14 days' ambient temperature incubation 65-87°F (mean 72.4°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 there were 21 dry weather "mildew infection days" from 16 Mar until 5 May, resulting 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 infected with mildew. Alternating Topguard with Merivon (Trt #1) had a strong suppressive effect on primary mildew development and good control of secondary infection of leaves and fruit, but two other treatments also gave excellent secondary control of mildew: #15 (Sercadis) and #16 (Merivon). Primary mildew control by Torino was not so good, but the higher rate of Torino (#4) gave good control of secondary mildew incidence and percent leaf area infected. GWN-10511 (#5) was significantly less effective than the equivalent rate of Torino. Rhyme (#6) and Topguard (#7) gave comparable mildew control at equal active ingredient rates. Treatments involving Aprovia (#8 and 9) were among the weakest for mildew control in this test. Early season dry weather resulted in a delay of the first scab infection period until 22 Apr and, in spite of having frequent wetting events in May, scab pressure was low on leaves and fruit in this test, and all treatments gave adequate control of fruit scab (Table 3). Cedar-apple rust pressure was moderate to light and all treatments with Topguard in a rotational sequence gave excellent control (Table 2). Generally, mancozeb (Koverall) also gave some protection under these conditions, as did Aprovia (#8 and 9). An exception for rust suppression occurred in Treatment #15 where Sercadis + Koverall had significantly more rust than Sercadis + Captan (#14). The unidentified "leaf spots" shown in Table 2 were likely related to partially inhibited rust lesions, but did not have any orange coloration to clearly identify them as such. Summer disease pressures were moderate in this test. The 250-hr accumulated wetting hour threshold for sooty blotch/flayspeck (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 3), with most treatments giving adequate SBFS control. Control of post-storage rots (mostly, bitter rot, white rot, and some *Alternaria*). No treatments significantly increased russet compare to non-treated fruit, and several treatments significantly reduced opalescence (#6, 10, 11, and 12 (Table 4).

Table 1. Powdery mildew.

Treatment and rate /A	Timing ^x	Primary mildew effect ^y	Mildew infection			
			% leaves	% leaf area	% fruit	% fruit area
0 Non-treated control	---	1.3 g	43 j ^z	11 i	57e	10e
1 Topguard 1.04SC 13 fl oz + Koverall 75DF 3 lb Merivon 4.18SC 5 fl oz + Induce 8 fl oz /100 gal Captan 80WDG 30 oz + Ziram 76DF 3 lb	#1,3,5,7 #2,4,6,8 5C-8C	6.7 a	6 bc	2 b-d	11 a-c	1 a-c
2 Torino 0.85SC 5 fl oz + Koverall 75DF 3 lb + Induce 8 fl oz/100 gal Captan 80WDG 30 oz + Ziram 76DF 3 lb	TC-4C 5C-8C	3.2 ef	16 ef	3 d-g	16 a-c	2 a-d
3 Torino 0.85SC 6.5 fl oz + Koverall 75DF 3 lb + Induce 8 fl oz/100 gal Captan 80WDG 30 oz + Ziram 76DF 3 lb	TC-4C 5C-8C	2.6 f	18 e-h	3 d-f	17 b-d	2 a-d
4 Torino 0.85SC 8 fl oz + Koverall 75DF 3 lb + Induce 8 fl oz/100 gal Captan 80WDG 30 oz + Ziram 76DF 3 lb	TC-4C 5C-8C	3.2 f	9 cd	2 b-d	17 a-c	2 a-d
5 GWN-10511 8 fl oz + Koverall 75DF 3 lb + Induce 8 fl oz/100 gal Captan 80WDG 30 oz + Ziram 76DF 3 lb	TC-4C 5C-8C	3.1 f	27 hi	4 e-g	24cd	3 cd
6 Rhyme 2.08SC 6.5 fl oz+ Koverall 75DF 3 lb Aprovia 0.83EC 5.5 fl oz+ Koverall 75DF 3 lb Captan 80WDG 30 oz + Ziram 76DF 3 lb	#1,3,5,7 #2,4,6,8 5C-8C	4.7 cd	25 gh	4 fg	17bc	2 a-d
7 Topguard 1.04SC 13 fl oz + Koverall 75DF 3 lb Aprovia 0.83EC 5.5 fl oz+ Koverall 75DF 3 lb Captan 80WDG 30 oz + Ziram 76DF 3 lb	#1,3,5,7 #2,4,6,8 5C-8C	5.0 b-d	24 f-h	3 e-g	8ab	1 ab
8 Aprovia 0.83EC 5 fl oz Captan 80WDG 30 oz + Ziram 76DF 3 lb	TC-4C 5C-8C	3.4 ef	35 ij	7 h	19b-d	2 b-d
9 Aprovia 0.83EC 5 fl oz (applied at 100 gpa, 2 apps.) Aprovia 0.83EC 5 fl oz (applied at 200 gpa, 2 apps.) Aprovia 0.83EC 5 fl oz (applied at 300 gpa, 4 apps.) Captan 80WDG 30 oz + Ziram 76DF 3 lb oz (at 100 gpa)	TC-P BI-PF 1C-4C 5C-8C	3.6 ef	35 ij	4 g	17b-d	2 a-d
10 Luna Sensation 5 fl oz + Koverall 3 lb + Induce 8 fl oz Topguard 1.04SC 13 fl oz + Koverall 75DF 3 lb Indar 2F 8 fl oz + Koverall 75DF 3 lb Indar 2F 8 fl oz + Captan 80WDG 30 oz Luna Sensation 500SC 5 fl oz + Captan 80WDG 30 oz Serenade Optimum 26.2WP 1 lb	#1,3 #2,4,5 #6 (2C) 3C-4C 5C-6C 7C-8C	5.5 bc	13 de	2 cd	16 a-c	2 a-d
11 Luna Tranquility 4.16SC 11.2 fl oz + Koverall 75DF 3 lb Topguard 1.04SC 13 fl oz + Koverall 75DF 3 lb Indar 2F 8 fl oz + Koverall 75DF 3 lb Indar 2F 8 fl oz + Captan 80WDG 30 oz Luna Sensation 500SC 5 fl oz + Captan 80WDG 30 oz Serenade Optimum 26.2WP 1 lb	#1,3 #2,4,5 #6 (2C) 3C-4C 5C-6C 7C-8C	6.0 ab	17 ef	3 d-f	17 b-d	2 b-d
12 Luna Tranquility 11.2 fl oz + Koverall 3 lb + Induce 8 fl oz Topguard 1.04SC 13 fl oz + Koverall 75DF 3 lb Indar 2F 8 fl oz + Koverall 75DF 3 lb Indar 2F 8 fl oz + Captan 80WDG 30 oz Luna Sensation 500SC 5 fl oz + Captan 80WDG 30 oz Serenade Optimum 26.2WP 1 lb	#1,3 #2,4,5 #6 (2C) 3C-4C 5C-6C 7C-8C	5.2 b-d	18 e-g	2 de	34d	4 d
13 Luna Tranquility 11.2 fl oz + Koverall 3 lb + Induce 8 fl oz Serenade Optimum 26.2WP 1 lb + ProPhyt 4.2L 2 qt Topguard 1.04SC 13 fl oz + Koverall 75DF 3 lb Indar 2F 8 fl oz + Koverall 75DF 3 lb Indar 2F 8 fl oz + Captan 80WDG 30 oz Luna Sensation 500SC 5 fl oz + Captan 80WDG 30 oz Serenade Optimum 26.2WP 1 lb	#1,3 #2,4 #5 #6 (2C) 3C-4C 5C-6C 7C-8C	5.3 b-d	20 e-h	3 e-g	19 b-d	3 cd
14 Sercadis 2.47SC 3.5 fl oz + Captan 80WDG 2 lb Sercadis 3.5 fl oz + Captan 80WDG 2 lb + Silwet 114 ml	#1-4 #5-8C	5.0 b-d	6 bc	1 a-c	8ab	1 ab
15 Sercadis 2.47SC 3.5 fl oz + Koverall 75DF 3 lb Sercadis 3.5 fl oz + Koverall 75DF 3 lb + Silwet 114 ml	#1-4 #5-8C	4.3 de	4 ab	1 ab	15 a-c	2 a-d
16 Merivon 4.18SC 4 fl oz + Captan 80WDG 2 lb Merivon 4 fl oz + Captan 80WDG 2 lb + Silwet 114 ml	#1-5 #5-8C	5.8 a-c	1 a	<1 a	6a	1 a

^z Mean separation by Waller-Duncan K-ratio t-test (p=0.05). Four reps; 10 shoots per tree rated 7 Jun, or harvest counts of 25 fruit per tree rated 21 Sep.

^y Suppressive effect rated on six primary mildew shoots/tree 8 Jun, scale: 1-10 (1= none; 10= excellent effect).

^x Treatment dates: 30 Mar (TC), 13 Apr (P-BI), 20 Apr (BI), 4 May (PF), 1C-8C (1st-8th cvrs): 16 May, 27 May, 10 Jun, 23 Jun, 7 Jul, 20 Jul, 2 Aug, 17 Aug.

Table 2. Cedar-apple rust and “leaf spots”.

Treatment and rate/A	Timing ^x	Cedar-apple rust		“Leaf spots” ^y	
		% lvs infected	lesions / leaf	% leaves infected	lesions / leaf
0 Non-treated control	---	13 cd ^z	0.9 c-e	6 a-d	0.3 ab
1 Topguard 1.04SC 13 fl oz + Koverall 75DF 3 lb Merivon 4.18SC 5 fl oz + Induce 8 fl oz /100 gal Captan 80WDG 30 oz + Ziram 76DF 3 lb	#1,3,5,7 #2,4,6,8 5C-8C	1 a	<0.1 a	5 a-d	0.1 a
2 Torino 0.85SC 5 fl oz + Koverall 75DF 3 lb + Induce 8 fl oz/100 gal Captan 80WDG 30 oz + Ziram 76DF 3 lb	TC-4C 5C-8C	2 a	<0.1 a	11 cd	0.8 bc
3 Torino 0.85SC 6.5 fl oz + Koverall 75DF 3 lb + Induce 8 fl oz/100 gal Captan 80WDG 30 oz + Ziram 76DF 3 lb	TC-4C 5C-8C	7 bc	0.8 b-e	12 d	1.0 c
4 Torino 0.85SC 8 fl oz + Koverall 75DF 3 lb + Induce 8 fl oz/100 gal Captan 80WDG 30 oz + Ziram 76DF 3 lb	TC-4C 5C-8C	8 bc	1.0 de	6 a-d	0.4 ab
5 GWN-10511 8 fl oz + Koverall 75DF 3 lb + Induce 8 fl oz/100 gal Captan 80WDG 30 oz + Ziram 76DF 3 lb	TC-4C 5C-8C	5 b	0.3 a-e	6 a-d	0.2 a
6 Rhyme 2.08SC 6.5 fl oz+ Koverall 75DF 3 lb Aprovia 0.83EC 5.5 fl oz+ Koverall 75DF 3 lb Captan 80WDG 30 oz + Ziram 76DF 3 lb	#1,3,5,7 #2,4,6,8 5C-8C	<1 a	<0.1 a	5 a-d	0.1 a
7 Topguard 1.04SC 13 fl oz + Koverall 75DF 3 lb Aprovia 0.83EC 5.5 fl oz+ Koverall 75DF 3 lb Captan 80WDG 30 oz + Ziram 76DF 3 lb	#1,3,5,7 #2,4,6,8 5C-8C	<1 a	<0.1 a	4 a-d	0.1 a
8 Aprovia 0.83EC 5 fl oz Captan 80WDG 30 oz + Ziram 76DF 3 lb	TC-4C 5C-8C	2 a	0.1 a	10 b-d	0.2 a
9 Aprovia 0.83EC 5 fl oz (applied at 100 gpa, 2 apps.) Aprovia 0.83EC 5 fl oz (applied at 200 gpa, 2 apps.) Aprovia 0.83EC 5 fl oz (applied at 300 gpa, 4 apps.) Captan 80WDG 30 oz + Ziram 76DF 3 lb oz (at 100 gpa)	TC-P BI-PF 1C-4C 5C-8C	1 a	0.1 a	5 a-d	0.1 a
10 Luna Sensation 5 fl oz + Koverall 3 lb + Induce 8 fl oz Topguard 1.04SC 13 fl oz + Koverall 75DF 3 lb Indar 2F 8 fl oz + Koverall 75DF 3 lb Indar 2F 8 fl oz + Captan 80WDG 30 oz Luna Sensation 500SC 5 fl oz + Captan 80WDG 30 oz Serenade Optimum 26.2WP 1 lb	#1,3 #2,4,5 #6 (2C) 3C-4C 5C-6C 7C-8C	<1 a	<0.1 a	4 a-d	0.1 a
11 Luna Tranquility 4.16SC 11.2 fl oz + Koverall 75DF 3 lb Topguard 1.04SC 13 fl oz + Koverall 75DF 3 lb Indar 2F 8 fl oz + Koverall 75DF 3 lb Indar 2F 8 fl oz + Captan 80WDG 30 oz Luna Sensation 500SC 5 fl oz + Captan 80WDG 30 oz Serenade Optimum 26.2WP 1 lb	#1,3 #2,4,5 #6 (2C) 3C-4C 5C-6C 7C-8C	1 a	0.2 a-c	4 ab	0.1 a
12 Luna Tranquility 11.2 fl oz + Koverall 3 lb + Induce 8 fl oz Topguard 1.04SC 13 fl oz + Koverall 75DF 3 lb Indar 2F 8 fl oz + Koverall 75DF 3 lb Indar 2F 8 fl oz + Captan 80WDG 30 oz Luna Sensation 500SC 5 fl oz + Captan 80WDG 30 oz Serenade Optimum 26.2WP 1 lb	#1,3 #2,4,5 #6 (2C) 3C-4C 5C-6C 7C-8C	1 a	<0.1 a	4 a-d	0.1 a
13 Luna Tranquility 11.2 fl oz + Koverall 3 lb + Induce 8 fl oz Serenade Optimum 26.2WP 1 lb + ProPhyt 4.2L 2 qt Topguard 1.04SC 13 fl oz + Koverall 75DF 3 lb Indar 2F 8 fl oz + Koverall 75DF 3 lb Indar 2F 8 fl oz + Captan 80WDG 30 oz Luna Sensation 500SC 5 fl oz + Captan 80WDG 30 oz Serenade Optimum 26.2WP 1 lb	#1,3 #2,4 #5 #6 (2C) 3C-4C 5C-6C 7C-8C	1 a	<0.1 a	2 a	<0.1 a
14 Sercadis 2.47SC 3.5 fl oz + Captan 80WDG 2 lb Sercadis 3.5 fl oz + Captan 80WDG 2 lb + Silwet 114 ml	#1-4 #5-8C	2 a	0.1 ab	3 a-d	0.1 a
15 Sercadis 2.47SC 3.5 fl oz + Koverall 75DF 3 lb Sercadis 3.5 fl oz + Koverall 75DF 3 lb + Silwet 114 ml	#1-4 #5-8C	14 d	1.3 e	6 a-d	0.4 ab
16 Merivon 4.18SC 4 fl oz + Captan 80WDG 2 lb Merivon 4 fl oz + Captan 80WDG 2 lb + Silwet 114 ml	#1-5 #5-8C	<1 a	<0.1 a	3 a-c	0.1 a

^zMean separation by Waller-Duncan K-ratio t-test (p=0.05). Four reps; 10 shoots per tree rated 7 Jun.

^y“Leaf spots” refers to an unidentified symptom; could be inhibited c-a rust, frog-eye leaf spot or leaf injury.

^xApplied airblast at 100 gpa to both sides of the row on each application date as follows: 30 Mar (TC), 13 Apr (P-BI), 20 Apr (BI), 4 May (PF), 1C-8C (1st-8th covers): 16 May, 27 May, 10 Jun, 23 Jun, 7 Jul, 20 Jul, 2 Aug, 17 Aug.

Table 3. Scab and summer diseases.

Treatment and rate /A	Timing ^y	Scab, % lvs inf.	% fruit infected at harvest					
			Scab	Bitter rot	Brooks spot	Sooty blotch	Fly speck	
0 Non-treated control	---	4 c ^z	17b	14e	3bc	65d	43c	
1 Topguard 1.04SC 13 fl oz + Koverall 75DF 3 lb Merivon 4.18SC 5 fl oz + Induce 8 fl oz /100 gal Captan 80WDG 30 oz + Ziram 76DF 3 lb	#1,3,5,7 #2,4,6,8 5C-8C	4 c	1 a		0 a	0 a	2 ab	1 ab
2 Torino 0.85SC 5 fl oz + Koverall 75DF 3 lb + Induce 8 fl oz/100 gal Captan 80WDG 30 oz + Ziram 76DF 3 lb	TC-4C 5C-8C	3 a-c	0 a		1 ab	0 a	2 ab	0 a
3 Torino 0.85SC 6.5 fl oz + Koverall 75DF 3 lb + Induce 8 fl oz/100 gal Captan 80WDG 30 oz + Ziram 76DF 3 lb	TC-4C 5C-8C	2 a-c	0 a		0 a	0 a	1 ab	3 b
4 Torino 0.85SC 8 fl oz + Koverall 75DF 3 lb + Induce 8 fl oz/100 gal Captan 80WDG 30 oz + Ziram 76DF 3 lb	TC-4C 5C-8C	3 c	1 a		0 a	0 a	2 a-c	3 b
5 GWN-10511 8 fl oz + Koverall 75DF 3 lb + Induce 8 fl oz/100 gal Captan 80WDG 30 oz + Ziram 76DF 3 lb	TC-4C 5C-8C	2 a-c	0 a		0 a	0 a	1 ab	0 a
6 Rhyme 2.08SC 6.5 fl oz+ Koverall 75DF 3 lb Aprovia 0.83EC 5.5 fl oz+ Koverall 75DF 3 lb Captan 80WDG 30 oz + Ziram 76DF 3 lb	#1,3,5,7 #2,4,6,8 5C-8C	1 a	0 a		0 a	0 a	3 a-c	0 a
7 Topguard 1.04SC 13 fl oz + Koverall 75DF 3 lb Aprovia 0.83EC 5.5 fl oz+ Koverall 75DF 3 lb Captan 80WDG 30 oz + Ziram 76DF 3 lb	#1,3,5,7 #2,4,6,8 5C-8C	1 ab	1 a		0 a	0 a	1 ab	0 a
8 Aprovia 0.83EC 5 fl oz Captan 80WDG 30 oz + Ziram 76DF 3 lb	TC-4C 5C →	1 a	0 a		0 a	1 ab	7 c	0 a
9 Aprovia 0.83EC 5 fl oz (applied at 100 gpa, 2 apps.) Aprovia 0.83EC 5 fl oz (applied at 200 gpa, 2 apps.) Aprovia 0.83EC 5 fl oz (applied at 300 gpa, 4 apps.) Captan 80WDG 30 oz + Ziram 76DF 3 lb oz (at 100 gpa)	TC-P BI-PF 1C-4C 5C-8C	1 a	0 a		0 a	1 ab	1 ab	0 a
10 Luna Sensation 5 fl oz + Koverall 3 lb + Induce 8 fl oz Topguard 1.04SC 13 fl oz + Koverall 75DF 3 lb Indar 2F 8 fl oz + Koverall 75DF 3 lb Indar 2F 8 fl oz + Captan 80WDG 30 oz Luna Sensation 500SC 5 fl oz + Captan 80WDG 30 oz Serenade Optimum 26.2WP 1 lb	#1,3 #2,4,5 #6 (2C) 3C-4C 5C-6C 7C-8C	2 a-c	1 a		2 a-c	0 a	1 ab	0 a
11 Luna Tranquility 4.16SC 11.2 fl oz + Koverall 75DF 3 lb Topguard 1.04SC 13 fl oz + Koverall 75DF 3 lb Indar 2F 8 fl oz + Koverall 75DF 3 lb Indar 2F 8 fl oz + Captan 80WDG 30 oz Luna Sensation 500SC 5 fl oz + Captan 80WDG 30 oz Serenade Optimum 26.2WP 1 lb	#1,3 #2,4,5 #6 (2C) 3C-4C 5C-6C 7C-8C	3 c	0 a		4 d	3 c	4 bc	0 a
12 Luna Tranquility 11.2 fl oz + Koverall 3 lb + Induce 8 fl oz Topguard 1.04SC 13 fl oz + Koverall 75DF 3 lb Indar 2F 8 fl oz + Koverall 75DF 3 lb Indar 2F 8 fl oz + Captan 80WDG 30 oz Luna Sensation 500SC 5 fl oz + Captan 80WDG 30 oz Serenade Optimum 26.2WP 1 lb	#1,3 #2,4,5 #6 (2C) 3C-4C 5C-6C 7C-8C	3 bc	1 a		3 cd	0 a	7 c	1 ab
13 Luna Tranquility 11.2 fl oz + Koverall 3 lb + Induce 8 fl oz Serenade Optimum 26.2WP 1 lb + ProPhyt 4.2L 2 qt Topguard 1.04SC 13 fl oz + Koverall 75DF 3 lb Indar 2F 8 fl oz + Koverall 75DF 3 lb Indar 2F 8 fl oz + Captan 80WDG 30 oz Luna Sensation 500SC 5 fl oz + Captan 80WDG 30 oz Serenade Optimum 26.2WP 1 lb	#1,3 #2,4 #5 #6 (2C) 3C-4C 5C-6C 7C-8C	2 a-c	0 a		2 b-d	0 a	5 bc	0 a
14 Sercadis 2.47SC 3.5 fl oz + Captan 80WDG 2 lb Sercadis 3.5 fl oz + Captan 80WDG 2 lb + Silwet 114 ml	#1-4 #5-8C	2 a-c	0 a		0 a	0 a	0 a	2 ab
15 Sercadis 2.47SC 3.5 fl oz + Koverall 75DF 3 lb Sercadis 3.5 fl oz + Koverall 75DF 3 lb + Silwet 114 ml	#1-4 #5-8C	3 bc	0 a		0 a	0 a	0 a	0 a
16 Merivon 4.18SC 4 fl oz + Captan 80WDG 2 lb Merivon 4 fl oz + Captan 80WDG 2 lb + Silwet 114 ml	#1-5 #5-8C	3 c	0 a		0 a	0 a	0 a	0 a

^z Mean separation by Waller-Duncan K-ratio t-test (p=0.05). Four reps; 10 shoots per tree rated 7 Jun, or harvest counts of 25 fruit per tree rated 21 Sep.

^y Treatment dates: 30 Mar (TC), 13 Apr (P-BI), 20 Apr (BI), 4 May (PF), 1C-8C (1st-8th cvrs): 16 May, 27 May, 10 Jun, 23 Jun, 7 Jul, 20 Jul, 2 Aug, 17 Aug.

Table 4. Postharvest storage rots and fruit finish.

Treatment and rate/A	Timing ^y	% post-storage rots ^z				Fruit finish ^x	
		Any rot	Bitter rot	White rot	Alternaria rot	Russet	Opalescence
0 Non-treated control	---	44f	37e	7c	2a	1.7a	1.3d
1 Topguard 1.04SC 13 fl oz + Koverall 75DF 3 lb Merivon 4.18SC 5 fl oz + Induce 8 fl oz /100 gal Captan 80WDG 30 oz + Ziram 76DF 3 lb	#1,3,5,7 #2,4,6,8 5C-8C	1 ab	1 ab	0 a	0 a	1.5 a	1.0a-d
2 Torino 0.85SC 5 fl oz + Koverall 75DF 3 lb + Induce 8 fl oz/100 gal Captan 80WDG 30 oz + Ziram 76DF 3 lb	TC-4C 5C-8C	8 c-e	5 a-d	3 ab	0 a	1.5 a	0.9a-d
3 Torino 0.85SC 6.5 fl oz + Koverall 75DF 3 lb + Induce 8 fl oz/100 gal Captan 80WDG 30 oz + Ziram 76DF 3 lb	TC-4C 5C-8C	5 a-e	4 a-d	0 a	1 a	1.7 a	1.0a-d
4 Torino 0.85SC 8 fl oz + Koverall 75DF 3 lb + Induce 8 fl oz/100 gal Captan 80WDG 30 oz + Ziram 76DF 3 lb	TC-4C 5C-8C	6 b-e	5 b-d	0 a	1 a	1.6 a	1.1 b-d
5 GWN-10511 8 fl oz + Koverall 75DF 3 lb + Induce 8 fl oz/100 gal Captan 80WDG 30 oz + Ziram 76DF 3 lb	TC-4C 5C-8C	9 c-e	6 b-d	2 ab	2 a	1.6 a	0.8ab
6 Rhyme 2.08SC 6.5 fl oz+ Koverall 75DF 3 lb Aprovia 0.83EC 5.5 fl oz+ Koverall 75DF 3 lb Captan 80WDG 30 oz + Ziram 76DF 3 lb	#1,3,5,7 #2,4,6,8 5C-8C	5 b-e	4 a-d	1 a	0 a	1.4 a	1.0a-d
7 Topguard 1.04SC 13 fl oz + Koverall 75DF 3 lb Aprovia 0.83EC 5.5 fl oz+ Koverall 75DF 3 lb Captan 80WDG 30 oz + Ziram 76DF 3 lb	#1,3,5,7 #2,4,6,8 5C-8C	3 a-d	2 ab	1 a	0 a	1.9 a	0.9a-d
8 Aprovia 0.83EC 5 fl oz Captan 80WDG 30 oz + Ziram 76DF 3 lb	TC-4C 5C →	10 c-e	3 ab	6 bc	2 a	1.6 a	1.2 b-d
9 Aprovia 0.83EC 5 fl oz (applied at 100 gpa, 2 apps.) Aprovia 0.83EC 5 fl oz (applied at 200 gpa, 2 apps.) Aprovia 0.83EC 5 fl oz (applied at 300 gpa, 4 apps.) Captan 80WDG 30 oz + Ziram 76DF 3 lb oz (at 100 gpa)	TC-P BI-PF 1C-4C 5C-8C	13 de	11 cd	0 a	2 a	1.6 a	1.0a-d
10 Luna Sensation 5 fl oz + Koverall 3 lb + Induce 8 fl oz Topguard 1.04SC 13 fl oz + Koverall 75DF 3 lb Indar 2F 8 fl oz + Koverall 75DF 3 lb Indar 2F 8 fl oz + Captan 80WDG 30 oz Luna Sensation 500SC 5 fl oz + Captan 80WDG 30 oz Serenade Optimum 26.2WP 1 lb	#1,3 #2,4,5 #6 (2C) 3C-4C 5C-6C 7C-8C	9 b-e	8 a-d	1 a	0 a	1.3 a	0.7 a
11 Luna Tranquility 4.16SC 11.2 fl oz + Koverall 75DF 3 lb Topguard 1.04SC 13 fl oz + Koverall 75DF 3 lb Indar 2F 8 fl oz + Koverall 75DF 3 lb Indar 2F 8 fl oz + Captan 80WDG 30 oz Luna Sensation 500SC 5 fl oz + Captan 80WDG 30 oz Serenade Optimum 26.2WP 1 lb	#1,3 #2,4,5 #6 (2C) 3C-4C 5C-6C 7C-8C	5 a-e	5 a-d	0 a	0 a	1.5 a	0.9a-c
12 Luna Tranquility 11.2 fl oz + Koverall 3 lb + Induce 8 fl oz Topguard 1.04SC 13 fl oz + Koverall 75DF 3 lb Indar 2F 8 fl oz + Koverall 75DF 3 lb Indar 2F 8 fl oz + Captan 80WDG 30 oz Luna Sensation 500SC 5 fl oz + Captan 80WDG 30 oz Serenade Optimum 26.2WP 1 lb	#1,3 #2,4,5 #6 (2C) 3C-4C 5C-6C 7C-8C	18 e	17 d	0 a	1 a	1.3 a	0.8ab
13 Luna Tranquility 11.2 fl oz + Koverall 3 lb + Induce 8 fl oz Serenade Optimum 26.2WP 1 lb + ProPhyt 4.2L 2 qt Topguard 1.04SC 13 fl oz + Koverall 75DF 3 lb Indar 2F 8 fl oz + Koverall 75DF 3 lb Indar 2F 8 fl oz + Captan 80WDG 30 oz Luna Sensation 500SC 5 fl oz + Captan 80WDG 30 oz Serenade Optimum 26.2WP 1 lb	#1,3 #2,4 #5 #6 (2C) 3C-4C 5C-6C 7C-8C	5 a-e	4 a-d	1 a	0 a	1.6 a	1.2 cd
14 Sercadis 2.47 SC 3.5 fl oz + Captan 80WDG 2 lb Sercadis 3.5 fl oz + Captan 80WDG 2 lb + Silwet 114 ml	#1-4 #5-8C	3 a-c	2 ab	0 a	1 a	1.5 a	0.9a-d
15 Sercadis 2.47 SC 3.5 fl oz + Koverall 75DF 3 lb Sercadis 3.5 fl oz + Koverall 75DF 3 lb + Silwet 114 ml	#1-4 #5-8C	5 a-e	3 a-c	1 a	1 a	1.7 a	1.2 cd
16 Merivon 4.18SC 4 fl oz + Captan 80WDG 2 lb Merivon 4 fl oz + Captan 80WDG 2 lb + Silwet 114 ml	#1-5 #5-8C	0 a	0 a	0 a	0 a	1.7 a	0.9a-d

^z Mean separation by Waller-Duncan K-ratio t-test (p=0.05). Four reps; Means of 25 fruit per replication harvested 21 Sep; rated for fruit finish and then rated for rots 4 Oct after 14 days' ambient temperature at 65-87°F (mean 72.4°F).

^y Treatment dates: 30 Mar (TC), 13 Apr (P-BI), 20 Apr (BI), 4 May (PF), 1C-8C (1st-8th cvrs): 16 May, 27 May, 10 Jun, 23 Jun, 7 Jul, 20 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).