

APPLE (*Malus domestica* 'Golden Delicious', 'Idared')
Scab; *Venturia inaequalis*
Powdery mildew; *Podosphaera leucotricha*
Cedar-apple rust; *Gymnosporangium juniperi-virginianae*
Quince rust; *Gymnosporangium clavipes*
Sooty blotch; disease complex
Flyspeck; *Zygothiala jamaicensis*
Brooks spot; *Mycosphaerella pomi*
Rots (unspecified)
Bitter rot; *Colletotrichum* spp.
White rot; *Botryosphaeria dothidea*
Alternaria rot; *Alternaria* spp.

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Disease control by experimental and registered fungicide schedules on Golden Delicious and Idared apples, 2016.

Fifteen experimental or registered combination treatment schedules were compared on two-tree sets of 16-yr-old trees. The test was conducted in a randomized block design with four replicates separated by non-treated border rows. Test rows had been non-treated border rows in 2015, which allowed mildew inoculum pressure to stabilize on 2016 test trees. Fungicide treatments were applied to both sides of the tree on each indicated application date with a Swanson Model DA-400 airblast sprayer at 100 gal/A as follows: 10 Apr (App. # 1, Golden Delicious open cluster-king bloom; Idared 10% bloom; York, pink); 20 Apr (App. # 2, bloom); 2 May (App. # 3, PF, petal fall); Apps. #4-11: (1C-8C, 1st-8th covers): 14 May, 25 May, 10 Jun, 24 Jun, 7 Jul, 20 Jul, 2 Aug, 18 Aug. Inoculum placed over each Golden Delicious test tree 24 May included cedar rust galls, wild blackberry canes with the sooty blotch and flyspeck fungi, and bitter rot mummies. Other diseases developed from inoculum naturally present in the test area, including cedar-apple rust inoculum from red cedars in the vicinity. Maintenance sprays, applied to the entire test block included Admire Pro, Altacor, Assail, Asana XL, BioCover, Belt, Beleaf, Calypso, Danitol, Delegate, FireLine, Imidan, Intrepid, and Lannate LV. Foliar data are from counts of ten shoots per replicate tree: 8 Jun (Golden Delicious) and 21 Jun (Idared), and fruit data represent postharvest counts of 25 fruit per replicate tree. Idared fruit were sampled 20 Sep, placed in cold storage until 13 Oct, moved to ambient temperatures (65-82°F, mean 69.9°F) and rated 19 Oct and 31 Oct. Golden Delicious fruit were sampled 27 Sep, and held in ambient temperatures (64-82°F, mean 69.8°F) and rated 4 Oct and 17 Oct. Percentage data were converted by the square root arcsin transformation for statistical analysis.

Early season dry weather resulted in a delay of the first scab infection period until 22 Apr, two days after the first application at bloom. However, after this delayed start, there were 13 infection periods in 15 days from 28 Apr-12 May, and 23 infection periods through 31 May. Under these conditions, scab pressure was moderate, but scab resistance to SI and QoI fungicides has been present in the test area for several years, and this probably impacted the effectiveness of Treatments #1, 2 and 15 (Table 1). GWN-10411 gave excellent scab control on leaves and fruit at the highest rate (#5). KFD-222-01 (#11) did not effectively control scab on leaves, but gave some suppression on fruit. Zn-Phite (#12 & 13) gave good scab control and showed a significant rate response. ProPhyt (#14) gave excellent scab suppression under these conditions. 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 moderately heavy infection of non-treated trees (Table 1). Treatments #1 and 2 were probably also affected by mildew resistance to the SI fungicides. Although GWN-10411 did not show a strong suppressive effect on primary mildew, it gave excellent control of secondary infection on leaves, with a significant rate effect (#5). Viathon suppressed scab and mildew infection on Idared leaves and fruit, scab on Golden Delicious fruit, and mildew on Golden Delicious leaves. Rally (#1 & 2) and Viathon (#15) gave excellent control under heavy cedar-apple rust and light quince rust pressure (Table 2). Rust control with GWN-10411 was somewhat erratic. Zn-Phite did not control rusts. The 250-hr accumulated wetting hour threshold for sooty blotch/flyspeck (SBFS) activity, accumulating from 14 May, was reached 21 Jun (after the 3rd cover application), and this resulted in strong SBFS test conditions (Table 3). Under these conditions, nearly all treatments gave significant SBFS suppression. Commercial standards, Manzate, Merivon and Captan + Ziram (#1, 2 & 15) performing as expected. SBFS control with GWN-10411 was erratic at the higher rate. All treatments gave significant control of Brooks spot under moderate disease pressure (Table 4). Merivon + Manzate/Captan + Ziram gave superior rot control. Several treatments significantly reduced russetting or opalescence of Golden Delicious and Idared (Table 5); Zn-Phite (#12) significantly increased russetting and opalescence of Golden Delicious and Idared.

Table 1. Scab and mildew.

Treatment and rate/acre	App. number or timing ^x	Scab, % lvs. or fruit inf.				Idared Primary mildew rating ^y	Mildew, % lvs., lf. area or fruit inf.				
		Idared		Golden Delicious			Idared			G. Delicious	
		leaves	fruit	leaves	fruit		leaves	area	fruit	leaves	area
0 Non-treated control	---	17f ^z	25 d	21 gh	63 e	2.1 e	57i	23i	26f	45i	8i
1 Rally 40WSP 5 oz + Manzate 75DF 3 lb Captan 80WDG 30 oz + Ziram 76DF 3 lb	Pk-3C 4C-8C	16f	10 bc	24 h	3 ab	4.9 b	36 e-g	8 e-h	3 a-d	21 e-g	3 e-h
2 Merivon 5.5 fl oz + Manzate Pro-Stick 75DF 3 lb Rally 40WSP 5 oz + Manzate 75DF 3 lb Captan 80WDG 30 oz + Ziram 76DF 3 lb	#1,3,5 #2,4,6 #7-8C	14 ef	3 a	21 gh	1 a	6.1 a	13 c	3 a-d	0 a	4 ab	1 bc
3 GWN-10411 20SC 2 fl oz	Pk-8C	8 c-e	7 a-c	6 bc	9 bc	3.7 c	14 bc	2 a-c	4 a-d	8 bc	1 cd
4 GWN-10411 20SC 3 fl oz	Pk-8C	4 a-c	4 a-c	3 ab	0 a	3.4 cd	12 a-c	2 a-c	7 b-e	5 b	1 bc
5 GWN-10411 20SC 4 fl oz	Pk-8C	2 a	2 a	2 a	1 a	3.7 c	6 a	1 a	4 b-e	2 a	1 a
6 GWN-10411 20SC 4 fl oz + Manzate 75DF 3 lb GWN-10411 4 fl oz + Captan 30 oz + Ziram 3 lb	Pk-3C 4C-8C	2 ab	1 a	2 a	1 a	3.7 c	5 ab	2 ab	4 a-d	2 a	1 ab
7 Penncozeb 75DF 4.5 lb	Pk-8C	8 c-e	5 a-c	11 c-e	1 a	3.6 c	24 de	4 b-e	2 a-c	18 d-f	2 d-f
8 Manzate Pro-Stick 75DF 4.5 lb	Pk-8C	8 c-e	1 a	15 e-g	0 a	3.1 cd	39 e-g	9 f-h	6 c-e	26 f-h	3 f-h
9 Ziram 76DF 4.5 lb	Pk-8C	11 d-f	7 a-c	16 fg	2 a	2.8 de	34 ef	5 d-f	1 ab	28 gh	3 f-h
10 Captan 80WDG 4.2 lb	Pk-8C	6 b-d	1 a	12 d-f	1 a	3.5 cd	48 g-i	10 h	1 ab	32 h	4 h
11 KFD-222-01 75DF 4.5 lb	Pk-8C	13 ef	3 ab	19 f-h	31 d	3.0 cd	52 hi	10 gh	2 a-c	29 gh	4 gh
12 Zn-Phite 2 gal	Pk-8C	4 ab	1 a	4 ab	1 a	3.4 cd	30 d-f	4 c-f	7 de	15 de	2 d-f
13 Zn-Phite 76.8 fl oz	Pk-8C	4 a-c	10 c	8 cd	8 c	3.5 cd	38 f-h	6 e-h	12 e	20 d-g	2 d-g
14 ProPhyt 4.2L 2 qt	Pk-8C	4 a-c	2 a	9 cd	2 a	3.7 c	31 d-f	6 e-g	4 a-e	19 d-f	2 c-e
15 Viathon 4.08SC 4 pt Captan 80WDG 3.5 lb + ProPhyt 4.2L 4 pt Merivon 5.5 fl oz + Captan 80 WDG 30 oz	Pk-3C 4C 5C-8C	6 b-d	3 ab	18 f-h	13 c	5.4 ab	20 cd	3 a-d	4 a-e	12 cd	2 c-e

^z Mean separation by Waller-Duncan K-ratio t-test (p=0.05). Four reps, 10 shoots/tree rated 8 Jun (G. Delicious) or 21 Jun (Idared), or harvest counts of 25 fruit per tree picked 20 Sep (Idared) or 27 Sep (Golden Delicious).

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

^x Treatment dates: 10 Apr (App. # 1, Golden Delicious open cluster-king bloom; Idared 10% bloom; York, pink); 20 Apr (App. # 2, bloom); 2 May (App. # 3, PF, petal fall); Apps. #4-11 (1C-8C, 1st-8th covers): 14 May, 25 May, 10 Jun, 24 Jun, 7 Jul, 20 Jul, 2 Aug, 18 Aug.

Table 2. Cedar-apple rust and quince rust.

Treatment and rate/acre	Timing/ App. number ^y	Cedar-apple rust, % infected			Quince rust	
		Idared		Golden Del.	% fruit infected	
		leaves	fruit	leaves	Idared	G. Del.
0 Non-treated control	---	36 f ^z	1 ab	48 g	5 b-d	14 d
1 Rally 40WSP 5 oz + Manzate Pro-Stick 75DF 3 lb Captan 80WDG 30 oz + Ziram 76DF 3 lb	Pk-3C 4C-8C	<1 a	0 a	<1 a	0 a	0 a
2 Merivon 4.16SC 5.5 fl oz + Manzate Pro-Stick 75DF 3 lb Rally 40WSP 5 oz + Manzate Pro-Stick 75DF 3 lb Captan 80WDG 30 oz + Ziram 76DF 3 lb	#1,3,5 #2,4,6 #7-8C	0 a	0 a	<1 a	0 a	0 a
3 GWN-10411 20SC 2 fl oz	Pk-8C	2 b	0 a	6 b	5 b-d	0 a
4 GWN-10411 20SC 3 fl oz	Pk-8C	12 d	1 ab	18 cd	11 cd	3 bc
5 GWN-10411 20SC 4 fl oz	Pk-8C	5 bc	3 b	6 b	9 d	0 a
6 GWN-10411 20SC 4 fl oz + Manzate Pro-Stick 75DF 3 lb GWN-10411 4 fl oz + Captan 80WDG 30 oz + Ziram 3 lb	Pk-3C 4C-8C	5 bc	0 a	13 bc	0 a	0 a
7 Penncozeb 75DF 4.5 lb	Pk-8C	18 e	2 ab	30 ef	1 ab	0 a
8 Manzate Pro-Stick 75DF 4.5 lb	Pk-8C	23 e	0 a	25 de	0 a	0 a
9 Ziram 76DF 4.5 lb	Pk-8C	9 cd	0 a	19 cd	0 a	0 a
10 Captan 80WDG 4.2 lb	Pk-8C	12 d	0 a	23 de	0 a	1 ab
11 KFD-222-01 75DF 4.5 lb	Pk-8C	18 e	1 ab	26 de	0 a	1 ab
12 Zn-Phite 2 gal	Pk-8C	34 f	2 ab	47 g	3 a-c	3 b
13 Zn-Phite 76.8 fl oz	Pk-8C	34 f	1 ab	42 g	3 a-c	8 cd
14 ProPhyt 4.2L 2 qt	Pk-8C	24 e	0 a	38 fg	5 b-d	0 a
15 Viathon 4.08SC 4 pt Captan 80WDG 3.5 lb + ProPhyt 4.2L 4 pt Merivon 5.5 fl oz + Captan 80 WDG 30 oz	Pk-3C 4C 5C-8C	0 a	0 a	1 a	0 a	0 a

^z Mean separation by Waller-Duncan K-ratio t-test (p=0.05). Four reps, 10 shoots/tree 8 Jun (G. Delicious) or 21 Jun (Idared), or harvest counts of 25 fruit per tree picked 20 Sep (Idared) or 27 Sep (Golden Delicious).

^y Treatment dates: 10 Apr (App. # 1, Golden Delicious open cluster-king bloom; Idared 10% bloom; York, pink); 20 Apr (App. # 2, bloom); 2 May (App. # 3, PF, petal fall); Apps. #4-11 (1C-8C, 1st-8th covers): 14 May, 25 May, 10 Jun, 24 Jun, 7 Jul, 20 Jul, 2 Aug, 18 Aug.

Table 3. Sooty blotch, flyspeck, and Brooks spot.

Treatment and rate/acre	Timing/ App. number ^y	% fruit infected					
		Idared			Golden Delicious		
		Sooty blotch	Flyspeck	Brooks spot	Sooty blotch	Flyspeck	Brooks spot
0 Non-treated control	---	100 g ^z	100 g	26 f	94 e	99 f	14 c
1 Rally 40WSP 5 oz + Manzate Pro-Stick 75DF 3 lb Captan 80WDG 30 oz + Ziram 76DF 3 lb	Pk-3C 4C-8C	28 e	29 cd	2 a-c	8 a-c	43 d	0 a
2 Merivon 4.16SC 5.5 fl oz + Manzate 75DF 3 lb Rally 40WSP 5 oz + Manzate Pro-Stick 75DF 3 lb Captan 80WDG 30 oz + Ziram 76DF 3 lb	#1,3,5 #2,4,6 #7-8C	0 a	8 a	0 a	0 a	6 ab	0 a
3 GWN-10411 20SC 2 fl oz	Pk-8C	18 c-e	51 e	0 a	15 bc	51 d	0 a
4 GWN-10411 20SC 3 fl oz	Pk-8C	69 f	86 f	5 c-e	62 d	79 e	0 a
5 GWN-10411 20SC 4 fl oz	Pk-8C	82 f	92 f	10 e	82 e	92 ef	1 ab
6 GWN-10411 20SC 4 fl oz + Manzate 75DF 3 lb GWN-10411 4 fl oz + Captan 30 oz + Ziram 3 lb	Pk-3C 4C-8C	2 ab	8 ab	1 ab	4 ab	10 ab	0 a
7 Penncozeb 75DF 4.5 lb	Pk-8C	3 ab	3 a	0 a	0 a	4 ab	0 a
8 Manzate Pro-Stick 75DF 4.5 lb	Pk-8C	7 a-d	2 a	0 a	7 a-c	12 bc	0 a
9 Ziram 76DF 4.5 lb	Pk-8C	18 de	39 c-e	0 a	7 a-c	31 cd	0 a
10 Captan 80WDG 4.2 lb	Pk-8C	8 b-d	23 bc	0 a	1 a	39 d	0 a
11 KFD-222-01 75DF 4.5 lb	Pk-8C	27 e	44 de	1 ab	18 c	47 d	1 ab
12 Zn-Phite 2 gal	Pk-8C	4 a-c	5 a	4 b-d	5 a-c	1 a	1 ab
13 Zn-Phite 76.8 fl oz	Pk-8C	6 a-d	1 a	8 de	13 bc	8 ab	0 a
14 ProPhyt 4.2L 2 qt	Pk-8C	17 c-e	7 a	3 a-d	11 bc	8 ab	2 b
15 Viathon 4.08SC 4 pt Captan 80WDG 3.5 lb + ProPhyt 4.2L 4 pt Merivon 5.5 fl oz + Captan 80 WDG 30 oz	Pk-3C 4C 5C-8C	0 a	1 a	0 a	1 a	3 ab	0 a

^zMean separation by Waller-Duncan K-ratio t-test (p=0.05). Four replications. Harvest counts of 25 fruit per tree picked 20 Sep (Idared) or 27 Sep (Golden Delicious).

^yTreatments dates: 10 Apr (App. # 1, Golden Delicious open cluster-king bloom; Idared 10% bloom; York, pink); 20 Apr (App. # 2, bloom); 2 May (App. # 3, PF, petal fall); Apps. #4-11 (1C-8C, 1st-8th covers): 14 May, 25 May, 10 Jun, 24 Jun, 7 Jul, 20 Jul, 2 Aug, 18 Aug.

Table 4. Post-harvest rots.

Treatment and rate/acre	Timing or App. number ^y	Harvest counts,% fruit inf.		Rot incidence after incubation, % fruit inf.						
		Idared	G. Delicious	Idared (18 days)			G. Delicious (20 days)			
		Bitter rot	Any rot	Any rot	Bitter Rot	White rot	Any rot	Bitter Rot	White Rot	Alter- naria
0 Non-treated control	---	32 f ^z	40 h	60 h	55 f	7 b	54 g	32 f	28 d	0 a
1 Rally 40WSP 5 oz + Manzate 75DF 3 lb Captan 80WDG 30 oz + Ziram 76DF 3 lb	Pk-3C 4C-8C	11 a-e	15 d-g	22 d-g	20 c-e	2 ab	25 c-f	14 c-f	13 bc	2 a
2 Merivon 4.16SC 5.5 fl oz + Manzate 75DF 3 lb Rally 40WSP 5 oz + Manzate 75DF 3 lb Captan 30 oz + Ziram 76DF 3 lb	#1,3,5 #2,4,6 #7-8C	2 a	3 ab	3 a	3 a	0 a	9 ab	3 ab	5 a	1 a
3 GWN-10411 20SC 2 fl oz	Pk-8C	11 b-e	16 d-g	14 b-d	14 bc	0 a	33 d-f	13 b-e	22 cd	0 a
4 GWN-10411 20SC 3 fl oz	Pk-8C	7 a-e	23 e-h	35 g	35 e	1 a	42 fg	18 c-f	29 d	0 a
5 GWN-10411 20SC 4 fl oz	Pk-8C	8 a-e	30 g	27 e-g	25 c-e	2 ab	34 ef	24 ef	12 bc	0 a
6 GWN-10411 20SC 4 fl oz + Manzate 75DF 3 lb GWN-10411 4 fl oz + Captan 30 oz + Ziram 3 lb	Pk-3C 4C-8C	2 a-d	9 b-e	18 c-e	16 b-d	3 ab	21 c-e	7 a-c	13 bc	1 a
7 Penncozeb 75DF 4.5 lb	Pk-8C	1 a	9 a-d	4 ab	3 a	1 a	12 a-c	5 a-c	7 ab	0 a
8 Manzate Pro-Stick 75DF 4.5 lb	Pk-8C	3 a-c	11 b-f	17 c-f	14 b-d	3 ab	22 c-e	9 a-e	14 bc	1 a
9 Ziram 76DF 4.5 lb	Pk-8C	13 de	26 f-h	28 e-g	26 c-e	2 a	31 d-f	8 a-e	23 cd	0 a
10 Captan 80WDG 4.2 lb	Pk-8C	12 c-e	5 a-c	25 d-g	25 c-e	0 a	11 ab	9 a-d	2 a	0 a
11 KFD-222-01 75DF 4.5 lb	Pk-8C	14 d-f	30 gh	26 d-g	26 c-e	0 a	32 d-f	6 a-d	27 d	0 a
12 Zn-Phite 2 gal	Pk-8C	8 a-e	11 b-f	24 d-g	24 c-e	0 a	18 b-d	14 c-f	6 a	0 a
13 Zn-Phite 76.8 fl oz	Pk-8C	8 a-e	5 a-d	29 e-g	27 de	2 ab	23 c-e	18 d-f	5 ab	0 a
14 ProPhyt 4.2L 2 qt	Pk-8C	14 ef	16 c-g	32 fg	31 e	2 ab	26 c-f	20 ef	6 ab	0 a
15 Viathon 4.08SC 4 pt Captan 80WDG 3.5 lb + ProPhyt 4.2L 4 pt Merivon 5.5 fl oz + Captan 80 WDG 30 oz	Pk-3C 4C 5C-8C	2 ab	2 a	7 a-c	5 ab	2 ab	6 a	3 a	3 a	0 a

^zMean separation by Waller-Duncan K-ratio t-test (p=0.05). Four replications; 25 fruit / tree picked 20 Sep (Idared) or 27 Sep (Golden Delicious). Idared placed in cold storage; moved 13 Oct to ambient temperatures (65-82°F, mean 69.9°F) and rated 31 Oct. Golden Delicious moved to ambient temperatures (64-82°F, mean 69.8°F) and rated 17 Oct.

^yTreatment dates: 10 Apr (App. # 1, Golden Delicious open cluster-king bloom; Idared 10% bloom; York, pink); 20 Apr (App. # 2, bloom); 2 May (App. # 3, PF, petal fall); Apps. #4-11 (1C-8C, 1st-8th cover): 14 May, 25 May, 10 Jun, 24 Jun, 7 Jul, 20 Jul, 2 Aug, 18 Aug.

Table 5. Fruit finish.

Treatment and rate/acre	Timing/ App. number ^x	Fruit finish rating (0-5) or USDA grade for russet ^y			
		Russet rating (0-5)		Fancy/X-Fancy	Opalescence
		Idared	Golden Delicious	Golden Delicious	Idared
0 Non-treated control	---	2.2 bc ^z	3.7 ef	28 d-f	1.6 de
1 Rally 40WSP 5 oz + Manzate Pro-Stick 75DF 3 lb Captan 80WDG 30 oz + Ziram 76DF 3 lb	Pk-3C 4C-8C	1.5 a	2.2 a-c	69 ab	0.9 a
2 Merivon 4.16SC 5.5 fl oz + Manzate 75DF 3 lb Rally 40WSP 5 oz + Manzate Pro-Stick 75DF 3 lb Captan 80WDG 30 oz + Ziram 76DF 3 lb	#1,3,5 #2,4,6 #7-8C	1.5 a	1.8 ab	79 a	0.9 a
3 GWN-10411 20SC 2 fl oz	Pk-8C	1.7 ab	1.9 a-c	76 a	1.2 a-d
4 GWN-10411 20SC 3 fl oz	Pk-8C	1.8 ab	3.7 ef	18 e-g	1.2 a-d
5 GWN-10411 20SC 4 fl oz	Pk-8C	1.8 ab	3.1 de	36 c-e	1.2 a-d
6 GWN-10411 20SC 4 fl oz + Manzate Pro-Stick 75DF 3 lb GWN-10411 4 fl oz + Captan 80WDG 30 oz + Ziram 3 lb	Pk-3C 4C-8C	1.4 a	1.7 a	86 a	0.9 a
7 Penncozeb 75DF 4.5 lb	Pk-8C	1.7 ab	2.5 b-d	64 a-c	1.0 a
8 Manzate Pro-Stick 75DF 4.5 lb	Pk-8C	1.7 ab	3.2 de	33 de	0.9 a
9 Ziram 76DF 4.5 lb	Pk-8C	1.9 ab	2.8 b-d	62 a-c	1.6 de
10 Captan 80WDG 4.2 lb	Pk-8C	1.9 ab	2.1 a-c	77 a	1.5 c-e
11 KFD-222-01 75DF 4.5 lb	Pk-8C	1.4 a	2.7 cd	43 b-d	1.2 a-d
12 Zn-Phite 2 gal	Pk-8C	3.8 d	4.6 g	3 g	1.8 e
13 Zn-Phite 76.8 fl oz	Pk-8C	2.7 c	4.4 fg	8 fg	1.5 b-e
14 ProPhyt 4.2L 2 qt	Pk-8C	1.7 ab	3.5 e	28 de	1.2 a-c
15 Viathon 4.08SC 4 pt Captan 80WDG 3.5 lb + ProPhyt 4.2L 4 pt Merivon 5.5 fl oz + Captan 80 WDG 30 oz	Pk-3C 4C 5C-8C	1.7 ab	2.7 cd	64 a-c	1.0 ab

^z Mean separation by Waller-Duncan K-ratio t-test (p=0.05). Four replications, Harvest counts of 25 fruit per tree picked 20 Sep (Idared) or 27 Sep (Golden Delicious).

^y Fruit finish rated on a scale of 0-5 (0=perfect finish; 5=severe russet or opalescence). USDA Extra-fancy and fancy grades after downgrading by russet presumed not to be caused by mildew.

^x Treatment dates: 10 Apr (App. # 1, Golden Delicious open cluster-king bloom; Idared 10% bloom; York, pink); 20 Apr (App. # 2, bloom); 2 May (App. # 3, PF, petal fall); Apps. #4-11 (1C-8C, 1st-8th covers): 14 May, 25 May, 10 Jun, 24 Jun, 7 Jul, 20 Jul, 2 Aug, 18 Aug.