

These data come from a long-term study (still in progress as of 2008) of the phenology and abundance of *Delphinium barbeyi*. Metadata for this study reside on the web site of the RMBL: www.rmbll.org, and will be posted to the individual plots (e.g., Wet Meadow Plot #1, WM1) are 2x2m, and are visited every other day to collect data. These data have been used in the following publications

Inouye, D. W., M. A. Morales, and G. J. Dodge. 2002. Variation in timing and abundance of *Delphinium barbeyi* in a meadow. *Journal of Ecology* 90: 1033-1043.
 Inouye, D. W. 2008. Effects of climate change on phenology, frost damage, and floral abundance of *Delphinium barbeyi* in a meadow. *Journal of Ecology* 96: 1033-1043.

EM and VR plots are in a meadow about 150 m from the WM and W-M plots, so there may be some frost damage. Some years there are late frosts that can kill the flower buds (sometimes all of them are aborted); I use a numbering system on dates is that May 1 is day 1, May 2 is day 2, June 1 is day 32, etc.

plot ID	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982
	Date of first flow									
WM 1	90	75						84		
WM 2	90	81	84		69	92	84	86		92
WM 3	86	71	95		72	86	84	84	68	95
WM 5	70	71	84			88	82	78	64	84
W-M 1	66	65	78		67	81	75	73	62	79
W-M 2	86	88	?			90	84	84	73	92
W-M 3	78	83	95		84	94	86	86	68	100
W-M 5	71	91				96	84	84	68	90
EM 1	70	73	81		67	78	75	73	68	82
EM 2	70	65	81		69	83	78	75	64	79
VR 1							86	84	64	90
VR 2		73	78		61	74	75	69	58	79

GP 1 GP plots = greenhouse plots, established in 1985, covered with plastic cover in 1986
 GP 2

N	10	11	8		7	10	11	12	10	11
mean	77.7	76.0	84.5		69.9	86.2	81.2	80.0	65.7	87.5
s.d.	9.4	8.7	6.9		7.1	7.2	4.5	6.0	4.2	7.2
c.v.	12.1	11.4	8.1		10.1	8.3	5.6	7.5	6.3	8.3

WM and INT plots only (Wet Meadow and Willow-Meadow Interface plots)

N	8	8	5	0	4	7	7	8	6	7
mean	79.6	78.1	87.2		73.0	89.6	82.7	82.4	67.2	90.3
s.d.	9.7	9.1	7.5		7.6	5.1	3.6	4.5	3.8	6.9
c.v.	12.1	11.6	8.6		10.4	5.7	4.3	5.5	5.7	7.7

EM and VR plots only (Erythronium Meadow and Veratrum Removal plots)

N	2	3	3		3	3	4	4	4	4
mean	70.0	70.3	80.0		65.7	78.3	78.5	75.3	63.5	82.5
s.d.	0.0	4.6	1.7		4.2	4.5	5.2	6.3	4.1	5.2
c.v.	0.0	6.6	2.2		6.3	5.8	6.6	8.4	6.5	6.3

If the same peak number of flowers occurred on multiple days, the first date is shown
Date of peak nu

WM 1	8/16	no data						8/2		
WM 2	no data	7/14	8/12	7/13	8/9	8/1	8/2		8/8	
WM 3	no data	no data	no data	6/17	8/9	8/11	8/2	7/12	8/5	
WM 5	no data	no data	probably 8/6/75		8/9	7/28	7/25	7/3	7/27	
W-M 1	no data	no data	8/3	7/18	7/29	7/30	7/23	7/7	7/29	
W-M 2	no data	no data	8/24		8/4	7/30	7/29	7/18	8/3	
W-M 3	no data	no data	8/9	7/29	8/9	8/5	8/2	7/9	8/16	
W-M 5	no data	no data			8/7	7/30	7/22	7/7	8/5	
EM 1	no data	no data	8/3	7/18	7/25	8/1	7/31	7/12	8/3	
EM 2	3/10	no data	no data	7/18	8/4	8/5	7/31	7/16	8/5	
VR 1						8/1	7/29	7/7	8/10	
VR 2		no data	7/20	7/8	7/25	7/21	7/25	7/3	7/23	

GP 1 GP plots = greenhouse plots, established in 1985, covered with plastic cover in 1986
 GP 2

N	2	1	6	7	10	11	12	10	11
mean	5/28	7/14	8/6	7/13	8/3	7/31	7/28	7/9	8/3
s.d.	112.4		11.6	13.1	6.2	5.3	4.1	5.1	6.7
c.v.									

WM and INT plots only (Wet Meadow and Willow-Meadow Interface plots)

N	1	1	4	0	4	7	7	8	6	7
mean	8/16	7/14	8/12	#DIV/0!	7/11	8/6	8/1	7/28	7/9	8/4
s.d.			8.8		17.8	4.2	4.9	4.9	5.2	6.6
c.v.										

EM and VR plots only (Erythronium Meadow and Veratrum Removal plots)

N	1	0	2	3	3	4	4	4	4
mean	3/10		7/27	7/14	7/28	7/30	7/29	7/9	8/2
s.d.			9.9	5.8	5.8	6.4	2.8	5.7	7.6
c.v.									

If the same peak number of inflorescences occurred on multiple days, the first date is shown
Date of peak nu

WM 1	no data	7/30						8/2		
WM 2	8/2	7/14	8/22	7/13	8/4	8/3	8/2		8/8	
WM 3	no data	7/25	8/12	6/15	8/9	8/14	7/29	7/16	8/8	
WM 5	7/29	7/22	8/6		8/9	8/3	7/31	7/7	7/29	
W-M 1	7/25	no data	7/23	7/18	8/2	7/30	7/25	7/12	7/23	
W-M 2	7/29	no data	8/24		8/4	7/30	7/29	7/18	8/3	
W-M 3	no data	8/1	8/6	8/3	8/4	8/7	7/23	7/9	8/8	
W-M 5	7/29	7/27			only 1 pl	8/5	7/30	7/7	8/5	
EM 1	7/29	7/30	8/3	7/18	7/30	8/1	7/31	7/14	8/8	

EM 2	no data	7/20	8/9	7/18	7/31	8/3	7/31	7/16	8/5
VR 1						8/5	7/31	7/7	8/10
VR 2		7/30	7/20	7/8	7/22	8/1	7/25	7/7	7/31

GP 1 GP plots = greenhouse plots, established in 1985, covered with plastic cover in 1986
 GP 2

N	6	9	9	7	9	11	12	10	11
mean	7/29	7/25	8/7	7/13	8/2	8/3	7/29	7/11	8/4
s.d.	2.5	5.9	11.8	14.9	5.5	4.2	3.3	4.4	5.5
c.v.									

WM and INT plots only (Wet Meadow and Willow-Meadow Interface plots)

N	5	6	6	0	4	6	7	8	6	7
mean	7/29	7/25	8/10	#DIV/0!	7/12	8/5	8/4	7/29	7/11	8/3
s.d.	2.8	6.4	11.8		20.4	2.9	5.2	3.6	4.7	6.1
c.v.										

EM and VR plots only (Erythronium Meadow and Veratrum Removal plots)

N	1	3	3	3	3	4	4	4	4
mean	7/29	7/26	7/31	7/14	7/27	8/2	7/29	7/11	8/5
s.d.	#DIV/0!	5.8	10.3	5.8	4.9	1.9	3.0	4.7	4.3
c.v.									

Peak number of flowers

	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982
WM 1	27	41						21		
WM 2	9	?	24	?	8	37	170	246		48
WM 3	?	?	?	27	34	185	384	443	51	23
WM 5	?	?	?	?		100	296	203	15	35
W-M 1	?	58	65	?	28	109	64	86	60	52
W-M 2	?	?	3	?		85	177	147	21	16
W-M 3	?	?	36	?	42	46	79	66	19	26
W-M 5	?	34		?		11	81	106	18	73
EM 1	?	?	189	?	96	129	246	318	86	195
EM 2	44	?	?	?	46	87	253	378	21	313
VR 1							20	34	21	19
VR 2		12	35	?	141	254	121	237	62	302

GP 1 GP plots = greenhouse plots, established in 1985, covered with plastic cover in 1986
 GP 2

N	3	4	6	1	7	10	11	12	10	11
sum	80	145	352	27	395	1043	1891	2285	374	1102
mean	26.7	36.3	58.7	27.0	56.4	104.3	171.9	190.4	37.4	100.2
s d	17.5	19.1	66.9		46.0	72.2	112.6	137.9	25.1	114.1

c.v.	65.6	52.6	114.1	81.5	69.2	65.5	72.4	67.2	113.9
sum without EM, VR plots	VR2 was bulldozed 10/84; so was EM2								
	112	573	1251	1318	184	273			

Note: late frost in 1975 killed most buds

WM and INT plots only (Wet Meadow and Willow-Meadow Interface plots)

N	2	3	4	4	7	7	8	6	7
sum	36	133	128	112	573	1251	1318	184	273
mean	18.0	44.3	32.0	28.0	81.9	178.7	164.8	30.7	39.0
s.d.	12.7	12.3	25.9	14.5	57.8	121.5	134.1	19.5	19.9
c.v.	70.7	27.8	80.9	51.8	70.6	68.0	81.4	63.7	51.0

WM Plots only

N	2	1	1	2	3	3	4	2	3
sum	36	41	24	42	322	850	913	66	106
mean	18	41	24	21	107.33	283.33	228.25	33	35.333
s.d.	12.73			18.38	74.27	107.56	173.23	25.46	12.50
c.v.	70.71			87.55	69.20	37.96	75.89	77.14	35.39

EM and VR plots only (Erythronium Meadow and Veratrum Removal plots)

N		1	2	3	3	4	4	4	4
sum		12	224	283	470	640	967	190	829
mean		12.0	112.0	94.3	156.7	160.0	241.8	47.5	207.3
s.d.			108.89	47.522	86.87	111.3	150.07	32.13	136.32
c.v.			97.2	50.4	55.4	69.6	62.1	67.6	65.8

Peak number of

WM 1	2	9					3		
WM 2	1	20	5	?	?	5	16	25	9
WM 3	13	23	25	3	5	22	31	37	4
WM 5	26	23	39	?		14	26	20	3
W-M 1	8	9	7	?	6	12	9	13	10
W-M 2	4	8	2	?		10	15	13	5
W-M 3	2	7	4	5	5	4	10	7	3
W-M 5	14	4		?		1	9	8	1
EM 1	7	27	24	?	9	11	17	22	11
EM 2	1	57	44	?	7	11	27	37	6
VR 1							2	3	3
VR 2		3	2	?	7	6	17	34	7

GP 1 GP plots = greenhouse plots, established in 1985, covered with plastic cover in 1986
GP 2

N	12	12	11	10	11	11	12	10	11
sum	78	190	152	39	96	179	222	53	105
mean	6.5	15.8	13.8	3.9	8.7	16.3	18.5	5.3	9.5
s.d.	8.0	15.7	16.5	1.5	6.0	8.8	12.7	3.2	8.5
c.v.	122.6	98.9	119.7	38.9	68.6	54.2	68.5	61.0	88.9

WM and INT plots only (Wet Meadow and Willow-Meadow Interface plots)

N	8	8	6	3	7	7	8	6	7
sum	70	103	82	16	68	116	126	26	40
mean	8.8	12.9	13.7	5.3	9.7	16.6	15.8	4.3	5.7
s.d.	8.6	7.8	15.0	0.6	7.1	8.7	11.1	3.1	3.0
c.v.	98.3	60.4	109.5	10.8	73.4	52.7	70.8	71.0	52.2

EM and VR plots only (Erythronium Meadow and Veratrum Removal plots)

N	2	3	3	3	3	4	4	4	4
sum	8	87	70	23	28	63	96	27	65
mean	4.0	29.0	23.3	7.7	9.3	15.8	24.0	6.8	16.3
s.d.	4.2	27.1	21.0	1.2	2.9	10.3	15.4	3.3	11.3
c.v.	106.1	93.3	90.0	15.1	30.9	65.4	64.3	48.9	69.7

Length of flower

WM 1	28	25					11		
WM 2	24	19	31	6	18	32	28		21
WM 3	>32	43	22	19	29	32	27	19	20
WM 5	48	29	33		29	42	25	10	9
W-M 1	>36	27	31	29	21	29	22	23	32
W-M 2	>32	12	4		15	32	23	9	11
W-M 3	13	39	14	17	16	30	17	21	11
W-M 5	29	14			9	25	11	3	13
EM 1	>32	39	36	24	32	41	34	17	33
EM 2	>32	45	40	19	22	38	32	16	36
VR 1						12	11	12	17
VR 2		26	31	30	31	29	32	20	36

GP 1 GP plots = greenhouse plots, established in 1985, covered with plastic cover in 1986

GP 2

N	5	11	9	7	10	11	12	10	11
mean	28.40	28.91	26.89	20.57	22.20	31.09	22.75	15.00	21.73
s.d.	12.66	11.38	11.49	8.18	7.81	8.24	8.51	6.32	10.65
c.v.	44.6	39.4	42.7	39.8	35.2	26.5	37.4	42.2	49.0

WM and INT plots only (Wet Meadow and Willow-Meadow Interface plots)

N	8	8	6	4	7	7	8	6	7
mean	28.4	26.0	22.5	17.8	19.6	31.7	20.5	14.2	16.7
s.d.	12.7	11.1	11.6	9.4	7.4	5.2	6.8	8.0	8.2
c.v.	44.6	42.6	51.4	53.1	37.8	16.4	33.0	56.2	48.9

EM and VR plots only (Erythronium Meadow and Veratrum Removal plots)

N		3	3	3	3	4	4	4	4
mean		36.7	35.7	24.3	28.3	30.0	27.3	16.3	30.5
s.d.		9.7	4.5	5.5	5.5	13.0	10.9	3.3	9.1

c.v.	26.5	12.6		22.6	19.4	43.5	39.9	20.3	29.9
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Total Snowfall in Gothic (cm)

	1025	985	471	1381	1346	1538	646	1095	
Snowpack Depth on 30 April (cm)	111.1	154.9	80	0	138.4	129.5	169	0	124.5

ance of flowering at the Rocky Mountain Biological Laboratory by David W. Inouye
 e Digital Repository at the University of Maryland.
 ount all flowers of all species

owering by *Delphinium barbeyi* Huth (Ranunculaceae): the roles of snowpack, frost, and La Niña, in the
 ice of montane wildflowers. Ecology 89(2): 353-362

re justification for analyzing the two groups of plots separately, as I have for some of the summ
 I've indicated this in a few places

	1983	1984	1985	1986	1987	frost 1988	1989	1990	1991	1992	1993
vering								no data for 1990			
		86		81			66		79	88	87
	93	93		79	69	69			85	81	99
	86	90	77	76	71		74		87	66	89
	93	90		76					83		91
	78	81	64	69	60	63	64		71	62	80
	91	86		79	71						
	93	86	75	83	71	69					
	88	88	75	76	69	72	74		77	72 aborted	
	81	83	70	67	67	65	66		74	68	91
	81	83		96					83	74	80
	86	93	70	69	57		62		74	68	83
	76	75	70	79	64		68		74	64	87
			frost	heat		frost			79	76	87
						78			87	76	83
	11	12	7	12	9	5	7		10	9	9
	86.0	86.2	71.6	77.5	66.6	67.6	67.7		78.7	71.4	87.4
	6.2	5.2	4.4	7.7	5.2	3.6	4.7		5.5	8.4	6.0
	7.3	6.0	6.2	9.9	7.7	5.3	6.9		7.0	11.8	6.9
	7	8	4	8	6	4	4		6	5	5
	88.9	87.5	72.8	77.4	68.5	68.3	69.5		80.3	73.8	89.2
	5.5	3.6	5.9	4.2	4.3	3.8	5.3		5.9	10.7	6.9
	6.2	4.1	8.1	5.5	6.2	5.5	7.6		7.3	14.5	7.7
	4	4	3	4	3	1	3		4	4	4
	81.0	83.5	70.0	77.8	62.7	65.0	65.3		76.3	68.5	85.3
	4.1	7.4	0.0	13.3	5.1		3.1		4.5	4.1	4.8
	5.0	8.8	0.0	17.0	8.2		4.7		5.9	6.0	5.6

here, but there are comments attached to the cell (see red triangle in upper right corner of the s
number of flowers

	8/9		8/1			7/9		8/4	8/1	8/10
8/7	8/11		8/1	7/16	7/17			8/2	7/27	8/15
8/7	8/11	7/19	7/30	7/16		7/15		8/4	7/22	8/4
8/10	8/11		7/22					8/4		8/4
7/30	8/1	7/12	7/15	7/8	7/7	7/7		7/22	7/20	8/4
8/1	8/5		7/26	7/14						
8/7	8/5	7/29	7/30	7/27	7/7					
8/1	8/11	7/14	8/1	7/14	7/10	7/13		7/26	3/12 frosted	
8/10	8/11	7/26	7/26	7/14	7/17	7/19		7/31	7/27	8/4
8/12	8/11		8/9					8/6	7/29	8/4
8/7	8/5	7/19	7/24	7/14		7/17		8/2	7/27	8/10
7/20	8/5	7/21	7/30	7/8		7/11		7/24	7/9	8/4

frost heat frost
7/19 7/22 7/15 8/4
8/2 7/20 8/7

11	12	7	12	9	5	7	0	10	9	9
8/4	8/8	7/20	7/28	7/14	7/11	7/13		7/30	7/6	8/6
6.6	3.6	6.1	6.3	5.5	5.1	4.3		5.2	45.2	4.1

7	8	4	8	6	4	4		6	5	5
8/4	8/8	7/18	7/27	7/15	7/10	7/11		7/30	6/19	8/6
4.2	3.9	7.6	6.1	6.2	4.7	3.7		5.6	60.7	5.0

4	4	3	4	3	1	3	0	4	4	4
8/4	8/8	7/22	7/30	7/12	7/17	7/15		7/31	7/23	8/5
10.5	3.5	3.6	7.1	3.5		4.2		5.4	9.4	3.0

shown here, but there are comments attached to the cell (see red triangle in upper right corner
number of inflorescences

	8/1		8/1			7/9		7/26	8/1	8/7
8/7	8/7		8/4	7/16	7/14			8/2	8/1	8/15
8/7	8/11	7/23	7/28	7/16		7/15		8/2	7/25	8/10
8/7	8/5		7/22					7/29		8/10
7/25	8/1	7/14	7/26	7/8	7/7	7/7		7/22	7/11	8/4
8/7	8/5		7/26	7/14						
8/7	8/7	7/29	8/1	7/27	7/7					
8/7	8/7	7/14	8/1	7/14	7/10	7/13		7/26	7/13 aborted	
8/1	8/11	7/19	7/30	7/18	7/5	7/19		7/31	8/1	8/4

8/12	8/11		8/7					8/2	7/29	8/1
8/7	8/3	7/19	8/4	7/14		7/17		8/2	7/27	8/7
7/30	8/11	7/21	7/30	7/6		7/11		7/18	7/7	8/4

		frost	heat			frost		8/2	7/15	7/30
						7/19		7/31	7/20	8/15

11	12	7	12	9	5	7	0	10	9	9
8/5	8/6	7/19	7/30	7/14	7/8	7/13		7/28	7/22	8/6
5.0	3.8	5.2	4.5	6.0	3.5	4.3		5.3	10.0	4.3

7	8	4	8	6	4	4		6	5	5
8/5	8/5	7/20	7/29	7/15	7/9	7/11		7/28	7/20	8/9
4.9	3.3	7.3	4.3	6.2	3.3	3.7		4.4	10.1	4.1

4	4	3	4	3	1	3	0	4	4	4
8/4	8/9	7/19	8/2	7/12	7/5	7/15		7/28	7/23	8/4
5.9	4.0	1.2	3.9	6.1		4.2		7.2	11.4	2.4

Peak number of flowers

1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993
	29		4			23		23	8	84
52	55		201	101	12			45	24	34
107	131	85	199	28		6		83	73	233
11	262		41					118		246
38	79	76	43	83	9	49		74	20	90
30	109		60	17						
19	49	81	39	26	2					
42	82	49	105	16	3	3		84	11 aborted	
166	407	75	428	127	17	190		357	122	424
322	409		31					128	132	40
6	55	40	148	113	93	82		750	338	620
388	708	26	216	30		9		41	60	163
								57	7	65
						2		35	24	43
11	12	7	12	9	6	7		10	9	9
1181	2375	432	1515	541	136	362		1703	788	1934
107.4	197.9	61.7	126.3	60.1	22.7	51.7		170.3	87.6	214.9
131.8	209.8	23.1	121.0	45.2	34.9	67.3		224.6	104.7	196.2

122.8	106.0	37.4	95.9	75.3	154.0	130.1	131.9	119.5	91.3
299	796	291	692	271	26	81	427	136	687
7	8	4	8	6	4	4	6	5	5
299	796	291	692	271	26	81	427	136	687
42.7	99.5	72.8	86.5	45.2	6.5	20.3	71.2	27.2	137.4
31.5	73.4	16.3	75.4	37.0	4.8	21.1	33.2	26.4	95.8
73.9	73.8	22.3	87.2	82.0	73.8	104.2	46.6	97.1	69.7

3	4	1	4	2	1	2	4	3	4
170	477	85	445	129	12	29	269	105	597
56.667	119.25	85	111.25	64.5	12	14.5	67.25	35	149.25
48.17	104.54	#DIV/0!	103.59	51.62		12.02	41.94	33.87	106.32
85.01	87.67	#DIV/0!	93.11	80.03		82.90	62.36	96.76	71.24

4	4	3	4	3	2	3	4	4	4
882	1579	141	823	270	110	281	1276	652	1247
220.5	394.8	47.0	205.8	90.0	55.0	93.7	319.0	163.0	311.8
170.63	267.03	25.239	166.71	52.431	53.74	91.062	316.74	120.94	260.51
77.4	67.6	53.7	81.0	58.3	97.7	97.2	99.3	74.2	83.6

flowering stalks

	3		1			2	2	1	11
6	6		25	14	3		5	3	7
11	9	6	17	5		1	8	5	18
2	19		10				9		28
8	9	11	7	12	2	4	10	2	9
3	14		8	4					
4	6	10	7	3	1				
6	9	4	14	3	1	1	17	3	aborted
17	35	14	50	21	2	18	36	14	35
25	36		2				7	6	3
1	4	5	14	16	10	9	57	30	43
37	49	5	12	2		2	2	3	
							8	2	9
						1	6	4	7
11	12	7	12	9	6	7	10	9	9
120	199	55	167	80	19	37	153	67	154
10.9	16.6	7.9	13.9	8.9	3.2	5.3	15.3	7.4	17.1
11.2	15.1	3.8	13.1	7.0	3.4	6.3	17.7	9.3	14.5
102.9	91.3	48.4	94.3	78.4	108.3	118.5	115.7	124.8	84.9

7	8	4	8	6	4	4	6	5	5
40	75	31	89	41	7	8	51	14	73
5.7	9.4	7.8	11.1	6.8	1.8	2.0	8.5	2.8	14.6
3.1	5.0	3.3	7.4	4.9	1.0	1.4	5.1	1.5	8.6
54.1	53.8	42.6	66.5	71.3	54.7	70.7	59.9	53.0	58.6

4	4	3	4	3	2	3	4	4	3
80	124	24	78	39	12	29	102	53	81
20.0	31.0	8.0	19.5	13.0	6.0	9.7	25.5	13.3	27.0
15.1	19.1	5.2	21.0	9.8	5.7	8.0	25.8	12.1	21.2
75.5	61.6	65.0	107.7	75.8	94.3	83.0	101.2	91.3	78.4

ring period

	18		16			13	23	9	23
12	21		29	22	13		17	16	16
25	24	14	30	18		11	20	31	28
9	20		26				19		24
25	25	27	31	29	23	17	34	27	27
22	22		18	9					
15	28	32	21	31	3				
17	26	13	32	9	2	2	25	10	
32	33	26	41	24	19	25	35	37	44
35	44		12				28	29	22
14	21	21	39	38		19	43	39	41
35	39	23	25	10		7	23	23	
							14	3	20
					5		8	18	34
11	12	7	12	9	5	7	10	9	8
21.91	26.75	22.29	26.67	21.11	12.00	13.43	26.70	24.56	28.13
9.29	8.04	6.92	8.85	10.49	9.38	7.70	8.29	10.96	9.61
42.4	30.0	31.1	33.2	49.7	78.2	57.3	31.0	44.6	34.2

7	8	4	8	6	4	4	6	5	5
17.9	23.0	21.5	25.4	19.7	10.3	10.8	23.0	18.6	23.6
6.3	3.3	9.5	6.2	9.5	9.8	6.3	6.1	10.0	4.7
35.5	14.5	44.0	24.6	48.3	96.0	59.0	26.5	53.6	20.0

4	4	3	4	3	1	3	4	4	3
29.0	34.3	23.3	29.3	24.0	19.0	17.0	32.3	32.0	35.7
10.1	9.9	2.5	13.5	14.0	#DIV/0!	9.2	8.7	7.4	11.9

34.8	28.9	10.8	46.2	58.3	#DIV/0!	53.9	27.0	23.1	33.4
------	------	------	------	------	---------	------	------	------	------

1278	1382	1087	1384	986	925	1095	954	1076	692	1469
------	------	------	------	-----	-----	------	-----	------	-----	------

175	208	118	137	71	71	64	78	127	22	173
-----	-----	-----	-----	----	----	----	----	-----	----	-----

spreadsheet cell) listing the other date(s); these comments aren't displayed in the PDF version (

Date of peak number of flowers

	some fro some frost damage								some fro	
7/12	8/20	7/21	7/31		frosted	frosted			7/28	7/24
7/10	8/18	7/23	7/25	frosted		frosted				
7/18	8/14	7/21	7/29	7/31	7/28	frosted		7/17	7/28	
7/12	8/14	7/17	7/23	frosted	7/24	frosted			7/22	7/28
7/10	8/12	frosted	7/27	7/16		frosted	frosted	6/29	7/13	6/28
	8/16								only 1	7/26
frosted										
7/12	8/14	7/23	7/31	7/22	7/24	7/17	7/13	7/7	7/30	7/16
7/18	8/20	7/23	7/23	7/26	7/30	7/21	frosted	7/11	7/22	7/24
7/12	8/9	7/13	7/25	7/28	7/24	7/14	7/25	7/9	7/26	7/24
7/8	8/7	7/17	7/21	8/2	7/24	7/14	7/15	7/9	7/15	7/8

8/7 frosted 7/25
7/12

including plots with frosted inflorescences

11	9	9	8	8	6	9	6	6	8	8
7/12	8/13	7/19	7/25	7/26	7/25	7/16	7/17	7/8	7/23	7/18
3.4	4.1	3.7	3.3	6.2	2.7	3.3	6.4	5.9	6.3	10.5

5	5	4	4	2	2	0	0	2	4	4
7/12	8/14	7/20	7/26	7/23	7/26			7/8	7/22	7/19
3.3	2.3	2.5	2.6	10.6	2.8			12.7	7.1	14.1

4	4	4	4	4	4	4	3	4	4	4
7/12	8/12	7/19	7/25	7/27	7/25	7/16	7/17	7/9	7/23	7/18
4.1	5.8	4.9	4.3	4.6	3.0	3.3	6.4	1.6	6.4	7.7

of the spreadsheet cell) listing the other date(s); these comments aren't displayed in the PDF v

Date of peak number of inflorescences

7/8	8/20	7/21	8/2		frosted	frosted		7/30	7/24	
7/5	8/18	7/23	7/27	frosted		frosted				
7/16	8/18	7/21	7/29	7/31	7/28	frosted		7/17	7/26	
7/10	8/14	7/17	7/23	frosted	7/24	frosted			7/22	7/28
7/3	8/12	frosted	7/27	7/16		frosted	frosted	6/29	7/15	7/4
	8/16								only 1	7/26
aborted										
7/12	8/14	7/25	7/29	7/24	7/26	7/12	7/15	7/7	7/26	7/22

7/5	8/20	7/21	7/27	7/28	7/18	7/21 frosted	7/9	7/19	7/20	
7/12	8/9	7/17	7/25	7/20	7/30	7/14	7/13	7/13	7/26	7/28
7/8	8/7	7/15	8/2	7/26	7/20	7/12	7/15	7/7	7/15	7/10

	8/4 frosted	7/25								
7/12										

including plots with frosted inflorescences

11	9	9	8	8	6	9	6	6	8	8
7/8	8/14	7/20	7/27	7/24	7/24	7/14	7/14	7/8	7/22	7/20
4.1	4.3	3.4	3.0	5.5	4.6	4.3	1.2	6.1	5.6	8.8

5	5	4	4	2	2			2	4	4
7/8	8/15	7/20	7/26	7/23	7/26			7/8	7/23	7/20
5.0	2.6	2.5	2.5	10.6	2.8			12.7	6.4	11.1

4	4	4	4	4	4	4	3	4	4	4
7/9	8/12	7/19	7/28	7/24	7/23	7/14	7/14	7/9	7/21	7/20
3.4	5.8	4.4	3.4	3.4	5.5	4.3	1.2	2.8	5.4	7.5

Peak number of flowers

Peak nu

1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
26	174	13	51						90	14
19	36	5	32							
84	96	46	64	12	10			4	51	92
59	177	34	11		6				27	14
22	35		19	7				12	51	42
	3								1	6
192	472	69	141	104	147	53	34	18	126	457
21	43	20	52	56	33	60		154	256	645
112	230	136	193	133	173	191	109	56	391	1394
32	71	36	28	38	26	18	47	27	134	667
	51		17							
30										
9	10	8	9	6	6	4	3	6	9	9
567	1337	359	591	350	395	322	190	271	1127	3331
63.0	133.7	44.9	65.7	58.3	65.8	80.5	63.3	45.2	125.2	370.1
58.3	140.3	41.9	61.2	50.7	74.1	75.9	40.1	56.3	125.1	473.1

92.6	104.9	93.4	93.3	86.9	112.5	94.3	63.3	124.6	99.9	127.8
210	521	98	177	19	16	0	0	16	220	168
5	6	4	5	2	2	0	0	2	5	5
210	521	98	177	19	16	0	0	16	220	168
42.0	86.8	24.5	35.4	9.5	8.0			8.0	44.0	33.6
28.5	75.0	18.8	22.0	3.5	2.8			5.7	33.0	35.4
67.7	86.4	76.9	62.2	37.2	35.4			70.7	75.0	105.3

4	4	4	4	1	2	0	0	1	3	3
188	483	98	158	12	16	0	0	4	168	120
47	120.75	24.5	39.5	12	8			4	56	40
30.21	67.81	18.84	23.10		2.83				31.80	45.03
64.28	56.16	76.90	58.48		35.36				56.78	112.58

4	4	4	4	4	4	4	3	4	4	4
357	816	261	414	331	379	322	190	255	907	3163
89.3	204.0	65.3	103.5	82.8	94.8	80.5	63.3	63.8	226.8	790.8
79.605	196.73	51.39	76.961	43.569	76.142	75.923	40.079	62.313	124.62	413.06
89.2	96.4	78.8	74.4	52.7	80.4	94.3	63.3	97.7	55.0	52.2

Peak number of flowering stalks

Peak nu

4	14	3	7				3 aborted		10	1
2	4	1	3	4 aborted			14 aborted			
9	14	6	6	3	1			1	5	8
10	20	3	2	7 aborte	1	17 aborted			4	2
2	5		4	1		2 aborted		1	6	3
	2								1	1
22	37	6	23	11	17	6	3	3	14	28
2	3	2	4	6	4	8	8 aborte	10	22	44
13	18	10	17	13	23	24	14	9	36	100
4	7	3	3	5	4	2	6	3	18	37
	4		1							
4										
9	10	8	9	8	6	7	5	6	9	9
68	124	34	69	39	50	40	23	27	116	224
7.6	12.4	4.3	7.7	4.9	8.3	5.7	4.6	4.5	12.9	24.9
6.7	10.8	2.9	7.3	4.6	9.3	9.7	5.7	4.0	11.1	32.8
89.3	87.1	68.6	95.4	95.1	112.0	169.1	123.6	88.6	86.0	131.7

5	6	4	5	2	2	0	0	2	5	5
27	59	13	22	4	2	0	0	2	26	15
5.4	9.8	3.3	4.4	2.0	1.0			1.0	5.2	3.0
3.8	7.2	2.1	2.1	1.4	0.0			0.0	3.3	2.9
71.2	72.9	63.4	47.1	70.7	0.0			0.0	62.9	97.2

4	4	4	4	4	4	4	3	4	4	4
41	65	21	47	35	48	40	23	25	90	209
10.3	16.3	5.3	11.8	8.8	12.0	10.0	7.7	6.3	22.5	52.3
9.2	15.2	3.6	9.8	3.9	9.6	9.7	5.7	3.8	9.6	32.5
89.5	93.6	68.5	83.8	44.1	79.6	96.6	74.2	60.4	42.6	62.2

Length of flowering period

Length

20	23	7	11						19	13
20	19	5	23							
17	28	13	21	14	7			7	27	27
14	22	5	9		5				25	21
16	24		23	9				15	18	35

5									7	15
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22	44	26	35	26	26	22	14	15	33	33
18	26	13	27	34	27	21		31	37	44
18	36	28	27	37	35	21	29	25	41	42
18	14		21	16	11	10	18	13	22	35

	19		7							
15										

9	10	7	9	6	6	4	3	6	9	9
18.11	24.10	13.86	21.89	22.67	18.50	18.50	20.33	17.67	25.44	29.44
2.37	10.83	9.60	8.01	11.41	12.42	5.69	7.77	8.73	10.51	11.18
13.1	44.9	69.3	36.6	50.4	67.1	30.7	38.2	49.4	41.3	38.0

5	6	4	5	2	2	0	0	2	5	5
17.4	20.2	7.5	17.4	11.5	6.0			11.0	19.2	22.2
2.6	8.0	3.8	6.8	3.5	1.4			5.7	7.8	9.0
15.0	39.6	50.5	39.3	30.7	23.6			51.4	40.7	40.6

4	4	3	4	4	4	4	3	4	4	4
19.0	30.0	22.3	27.5	28.3	24.8	18.5	20.3	21.0	33.3	38.5
20	130	81	57	94	100	57	78	85	82	53

10.5	43.2	36.5	20.9	33.3	40.5	30.7	38.2	40.4	24.6	13.8
------	------	------	------	------	------	------	------	------	------	------

954	1641	1200	1498	1171	1144	858	928	653	991	1016
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106	189	140	155	106	112	51	56	0	86	56
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2005	2006	2007		N	mean	s.d.	c.v.	earliest
Date of first flowering								
82 frosted	frosted			16	82.3	9.5	11.5	64
				20	84.1	10.3	12.2	66
82	74	74		29	80.5	8.7	10.8	66
97 frosted	frosted			21	81.6	9.4	11.6	64
69	62 frosted			28	70.0	9.5	13.5	54
				11	84.0	7.0	8.3	71
90 frosted				19	85.1	10.1	11.9	68
				16	79.7	8.9	11.2	68
75	62 frosted			32	72.0	7.1	9.9	62
75	56	66		28	74.5	10.0	13.5	56
75	66 frosted			26	73.8	9.7	13.1	57
69	56	54		31	70.6	8.7	12.3	54
				5	84.4	7.8	9.2	76
				5	78.6	6.9	8.7	69
			means:					
9	9	9	9.06	23.1	78.2	9.1	11.6	62.5
79.3	62.7	70.0		75.6				62.7
9.4	6.8	5.7		6.1				
11.9	10.8	8.1		8.0				
5	2	1						
84.0	68.0	74.0			78.7	8.8	11.1	
10.5	8.5							
12.5	12.5							
4	4	1						
73.5	60.0	66.0			72.2	7.6	10.5	
3.0	4.9							
4.1	8.2							

of the file.

Date of peak number of flowers

most damage

7/31 frosted frosted

7/29 7/19 7/17

8/5 frosted frosted

7/23 7/9 frosted

7/31 frosted

8/2 7/15 frosted

7/25 7/17 7/11

7/23 7/17 7/11

7/19 7/7 frosted

9 9 9

7/27 7/14 7/13

5.6 4.9 3.5

5 2 1

7/30 7/14 7/17

4.7 7.1

4 4 2

7/25 7/14 7/11

5.9 4.8 0.0

version of the file.

Date of peak number of inflorescences

7/31 frosted frosted

7/29 7/17 7/19

8/5 frosted frosted

7/21 7/5 frosted

7/31 frosted

7/29 7/17 frosted

7/27	7/17	7/11
7/29	7/15	7/9
7/23	7/5 frosted	

9	9	9
7/28	7/12	11/12
4.4	6.0	216.5

5	2	1
7/29	7/11	7/19
5.5	8.5	

4	4	2
7/27	7/13	7/10
2.8	5.7	1.4

umber of flowers

including only years with flowering (i.e., no 0's)

2005	2006	2007	N	mean	s.d.	c.v.	minimum
38 frosted	frosted		16	41.6	42.9	103.1	4
			19	60.9	69.2	113.5	5
108	53	12	28	97.3	107.0	110.0	4
2 frosted	frosted		18	92.1	99.9	108.5	2
37	12 frosted		27	48.9	28.0	57.2	7
			10	66.5	60.8	91.5	3
10 frosted			17	32.4	25.8	79.9	1
			15	47.9	37.5	78.4	3
431	75 frosted		30	196.4	144.5	73.6	17
638	52	65	26	165.3	183.9	111.2	20
712	34	48	28	223.3	307.3	137.6	6
526	112 frosted		30	152.2	190.6	125.2	9
			5	39.4	25.7	65.3	7
			5	26.8	15.5	57.9	2
means:							
9	6	3	22.0	102.1	108.1	99.2	6.8
2502	338	125	896.1				
278.0	56.3	41.7	100.0				
294.8	34.5	27.1	100.7				

106.1 61.2 64.9 93.7

195 65 12

5 2 1
 195 65 12
 39.0 32.5 12.0
 41.8 29.0
 107.1 89.2

3 1 1
 148 53 12
 49.333 53 12
 53.90
 109.26

4 4 2
 2307 273 113
 576.8 68.3 56.5
 123.64 33.649 12.021
 21.4 49.3 21.3

umber of flowering stalks

N mean s.d. c.v. minimum

7	frosted	16	5.0	4.1	82.3	1
		19	8.4	7.7	92.0	1
7	4 2	31	10.1	9.2	90.4	1
1	2 frosted stalks	21	12.8	11.2	87.4	1
5	3 4 frosted stalks	28	6.7	3.6	53.6	1
		12	7.3	4.8	66.8	1
1	2 frosted	20	4.3	2.8	65.4	1
		16	6.4	5.1	80.6	1
35	8 22 frosted stalks	32	18.7	11.8	63.2	2
53	9 12	28	17.0	17.1	100.6	1
71	5 5	28	19.9	23.2	116.6	1
39	14 31 frosted stalks	29	12.2	13.7	112.4	2
		5	4.8	3.6	74.2	1
		5	4.4	2.3	52.3	1

means:

9	7	8	23.3	10.7	9.5	84.3	1.2
219	43	19	98.8				
24.3	6.1	2.4	10.2				
26.0	4.1	5.1	9.8				
106.7	66.3	216.1	97.7				

5	2	1
21	7	2
4.2	3.5	2.0
3.0	0.7	
72.2	20.2	

4	4	2
198	36	17
49.5	9.0	8.5
16.3	3.7	4.9
32.9	41.6	58.2

of flowering period

	N	mean	s.d.	c.v.	shortest
20	16	17.4	6.2	35.7	7
	20	19.6	7.3	37.4	5
26	11	21.4	8.4	39.4	7
2	21	20.3	12.2	60.2	2
31	27	24.6	6.6	26.8	9
	11	16.1	8.2	50.7	4
14	19	18.4	9.7	53.1	3
	16	15.0	9.7	64.7	2
35	21	29.8	8.3	27.9	14
33	29	28.5	9.9	34.7	11
41	17	27.8	11.0	39.6	11
37	25	23.6	9.0	38.0	7
	5	12.6	7.4	59.0	3
	5	16.0	11.3	70.8	5
means:					
9	6	22.7	21.9	8.9	42.3
26.56	19.33	15.00			6.8
12.52	6.98	6.93			
47.2	36.1	46.2			

5	2	1
18.6	12.0	11.0
11.3	1.4	
60.5	11.8	

4	4	2
36.5	23.0	17.0
3.4	5.2	8.5

9.4 22.5 49.9

1210 981 873

117 64 3

latest

104

104

99

99

99

92

106

96

91

99

93

91

96

87

97.8

97.7

maximum

174

246

443

296

109

177

81

106

472

645

1394

708

65

43

404.3

maximum

14

25

37

39

13

15

10

17

50

57

100

49

9

7

35.5

longest

28

32

43

48

35

32

39

32

44

45

43

39

20

34

38.3

