PERSONNEL
Manager – Stephan Helfer
Coordinator – Geoffrey Harper
Monitors – Janette Latta, Clare Morter, GH

Royal Botanic Garden Edinburgh
PHENOLOGY – DAILY PROJECT
Geoffrey Harper & Stephan Helfer

R.B.G.E. DAILY PHENOLOGY PROJECT		[taxaffds06.xls 21.viii.06]					
c.106 taxa in FFD order							
This brief summary is mainly for publicity and to show taxa needing monitoring each week.							
Abbreviations: discont(inued); FFD - first-flowering date							
earliest	taxon	FFD (calendar/Julian date) in					notes
FFD		2002	2003	2004	2005	2006	
7.i/ 7	*Eranthis hyemalis*	2.ii/ 33	26.i/ 26	11.i/ 11	7.i/ 7	19.i/ 19	9 days/yr **earlier** except '06
10.i/ 10	*Hepatica nobilis*	………	………	20.i/ 20	10.i/ 10	6.ii/ 37	erratic; sometimes autumn
11.i/ 11	*Galanthus nivalis*	27.i/ 27	20.i/ 20	11.i/ 11	14.i/ 14	17.i/ 17	earlier, then later
13.i/ 13	*Leucojum vernum*	30.i/ 30	23.i/ 23	20.i/ 20	13.i/ 13	22.i/ 22	6 days/yr **earlier** except '06
14.i/ 14	*Helleborus viridus*	3.ii/ 34	22.i/ 22	14.i/ 14	19.i/ 19	3.ii/ 34	earlier, then later
19.i/ 19	*Lathyrus vernus* var *albus*	16.ii/ 47	1.ii/ 32	19.i/ 19	2.iii/ 61	25.ii/ 56	erratic
19.i/ 19	*Draba aizoides*	27.i/ 27	4.iii/ 63	3.iii/ 62	20.i/ 20	19.i/ 19	earliest; erratic
20.i/ 20	*Petasites albus*	7.ii/ 38	6.ii/ 37	1.ii/ 32	20.i/ 20	25.ii/ 56	6 days/yr earlier except '06
20.i/ 20	*Scilla siberica*	5.iii/ 64	21.ii/ 52	20.i/ 20	28.i/ 28	13.ii/ 44	earlier, then later
21.i/ 21	*Ranunculus ficaria* 'Brazen Hussy'	15.ii/ 46	6.ii/ 37	3.ii/ 34	15.ii/ 46	21.i/ 21	earliest so far
23.i/ 23	*Galanthus plicatus*	5.ii/ 36	23.i/ 23	1.ii/ 32	31.i/ 31	3.ii/ 34	
25.i/ 25	*Daphne mezereum* (Q02)	6.ii/ 37	5.iii/ 64	25.i/ 25	19.iii/ 78	28.iii/ 87	erratic
27.i/ 27	*Prunus cerasifera*	28.ii/ 59	28.ii/ 59	8.ii/ 39	27.i/ 27	23.ii/ 54	11 days/yr **earlier** except '06
30.i/ 30	*Pulmonaria angustifolia*	……….	……….	30.i/ 30	2.ii/ 33	6.ii/ 37	getting **later**
30.i/ 30	*Trachystemon orientalis*	……….	………	30.i/ 30	30.i/ 30	10.ii/ 41	
1.ii/ 32	*Alnus glutinosa*	13.ii/ 44	1.ii/ 32	9.ii/ 40	7.ii/ 38	10.ii/ 41	narrow range
3.ii/ 34	*Scilla bifolia*	24.ii/ 55	28.ii/ 59	10.ii/ 41	3.ii/ 34	20.ii/ 51	7 days/yr **earlier** except '06
3.ii/ 34	*Anemone blanda*	4.iii/ 63	16.ii/ 47	9.ii/ 40	3.ii/ 34	………..	discontinued
6.ii/ 37	*Prunus tomentosa*	……..	10.iii/ 69	23.ii/ 54	6.ii/ 37	[dead]	16 days/yr **earlier** until '05
7.ii/ 38	*Narcissus pseudonarcissus*	22.ii/ 53	1.iii/ 60	11.ii/ 42	7.ii/ 38	26.ii/ 57	erratic
9.ii/ 40	*Ribes sang.* 'Albidum' (standard)	13.ii/ 44	3.iii/ 62	9.ii/ 40	18.ii/ 42	11.iii/ 70	erratic
9.ii/ 40	*Crocus vernus*	………..	……….	18.ii/ 49	9.ii/ 40	17.ii/ 48	erratic
10.ii/ 41	*Caltha palustris* (W07)	………	26.iii/ 85	c.10.ii/ c.41	6.iv/ 96	22.iv/ 112	erratic
16.ii/ 47	*Lathyrus vernus* (except *albus*)	16.ii/ 47	25.iii/ 84	15.iii/ 75	19.iii/ 78	26.iii/ 85	erratic
21.ii/ 52	*Leucojum aestivum*	………	………	………	………	21.ii/ 52	new taxon
27.ii/ 58	*Aurinia saxatilis*	6.iii/ 65	26.iii/ 85	15.iii/ 75	27.ii/ 58	[no FFD]	(damage to plant)
28.ii/ 59	*Lonicera korolkowii*	8.iv/ 98	6.iv/ 96	30.iii/ 90	13.iii/ 72	28.ii/ 59	9.8 days/yr **earlier**
29.ii/ 60	*Ribes sanguineum* 'Albidum' (mass)	5.iii/ 64	10.iii/ 69	29.ii/ 60	27.ii/ 58	27.iii/ 86	
5.iii/ 64	*Rana temporaria* (first spawn)	9.iii/ 68	5.iii/ 64	16.iii/ 76	16.iii/ 75	26.iii/ 85	getting **later**
5.iii/ 64	*Scopolia carniolica*	5.iii/ 64	9.iii/ 68	7.iii/ 67	17.iii/ 76	30.iii/ 89	getting **later**
5.iii/ 64	*Arabis alpina caucasica* (R23 & R31)	5.iii/ 64	10.iii/ 69	16.iii/ 76	17.iii/ 76	8.iii/ 67	**later** each year except '06
6.iii/ 65	*Tussilago farfara*	6.iii/ 65	6.iii/ 65	14.iii/ 74	16.iii/ 75	7.iv/ 97	8 days/yr **later**
6.iii/ 65	*Oxalis acetosella*	6.iii/ 65	24.iii/ 83	28.iii/ 88	30.iii/ 88	6.iv/ 96	8 days/yr **later**
7.iii/ 66	*Iberis sempervirens*	……….	28.iii/ 87	12.iii/ 72	7.iii/ 66	31.iii/ 90	5 days/yr **earlier** except '06
8.iii/67	*Erythronium dens-canis*	19.iii/ 78	14.iii/ 73	12.iii/ 72	8.iii/67	27.iii/ 86	4 days/yr **earlier** except '06
8.iii/67	*Pulsatilla vulgaris*	………	13.iii/ 72	8.iii/ 68	16.iii/ 75	27.iii/ 86	late in 2006
8.iii/ 68	*Scilla bifolia* 'Alba'	16.iii/ 75	19.iii/ 78	8.iii/ 68	16.iii/ 75	18.iii/ 77	narrow range
8.iii/ 68	*Puschkinia scilloides libanotica*	………	10.iii/ 69	8.iii/ 68	17.iii/ 76	13.iii/ 72	
early iii?	*Chionodoxa luciliae*	………..	……….	……….	……….	……….	
14.iii/ 73	*Chionodoxa forbesii*	………..	……….	……….	……….	14.iii/ 73	
14.iii/ 73	*Primula vulgaris*	25.iii/ 84	25.iii/ 84	19.iii/ 79	14.iii/ 73	2.iv/ 92	4 days/yr **earlier** except '06
17.iii/ 76	*Anemone nemorosa*	25.iii/ 84	20.iii/ 79	26.iii/ 86	17.iii/ 76	31.iii/ 90	
17.iii/ 76	*Ribes sanguineum* (standard)	17.iii/ 76	27.iii/ 86	19.iii/ 79	18.iii/ 77	30.iii/ 89	
19.iii/ 78	*Ribes sanguineum* (mass)	21.iii/ 80	29.iii/ 88	24.iii/ 84	19.iii/ 78	2.iv/ 92	erratic
19.iii/ 78	*Ranunculus ficaria* (D30, 31, 32)	3.iv/ 93	27.iii/ 86	26.iii/ 86	19.iii/ 78	27.iii/ 86	5 days/yr **earlier** except '06
19.iii/ 79	*Adonis vernalis*	(21.iii/ 80)	22.iii/ 81	(19.iii/ 79)	19.iii/ 78	9.iv/ 99	late in 2006
20.iii/ 80	*Fritillaria imperialis*	28.iii/ 87	23.iii/ 82	20.iii/ 80	25.iii/ 84	12.iv/ 102	late in 2006
22.iii/ 81	*Corydalis solida*	29.iii/ 88	25.iii/ 84	25.iii/ 85	22.iii/ 81	31.iii/ 90	3 days/yr **earlier** except '06
24.iii/ 84	*Malus floribunda*	9.iv/ 99	10.iv/ 100	24.iii/ 84	31.iii/ 90	21.iv/ 111	erratic
28.iii/ 87	*Prunus avium*	1.iv/ 91	28.iii/ 87	31.iii/ 91	31.iii/ 90	17.iv/ 107	late in 2006
29.iii/ 89	*Malus sieboldii*	4.iv/ 94	3.iv/ 93	29.iii/ 89	24.iii/ 83	21.iv/ 111	4 days/yr **earlier** except '06
30.iii/ 90	*Fritillaria meleagris*	22.iv/ 112	3.iv/ 93	30.iii/ 90	31.iii/ 90	13.iv/ 103	earlier trend until '05
30.iii/ 90	*Muscari botryoides*	………….	11.iv/ 101	30.iii/ 90	5.iv/ 95	25.iv/ 115	erratic
1.iv/ 91	*Dicentra formosa*	13.iv/ 103	1.iv/ 91	12.iv/ 103	[plt removed]	………..	

Part of a chart summarizing first-flowering dates of all monitored taxa, used as a guide to taxa requiring monitoring.

The **Daily Project** was started in 1850 by James McNab, the Curator (above). He continued recording first-flowering dates until 1878. The project was then continued by John Sadler and Robert Lindsay until 1895, when publication of dates ceased.

Twenty taxa were monitored to begin with, but by 1875 the list had been expanded to 40.

On the left is shown part of the list of current monitored taxa.

REASONS FOR SELECTING TAXA FOR MONITORING

- studied at RBGE in the 19th century;
- studied by Fred Last at Longniddry;
- studied by Fitter *et al.* (1995);
- included in the UK Phenology Network;
- included in the 'Kew 100' project;
- Scottish and other British native plants;
- genera with early (spring) and late (summer, autumn) flowering species;
- families of particular interest to RBGE (eg Rosaceae, Ericaceae).

AIMS OF THE DAILY PROJECT

- establishment of correlations between first-flowering dates and meteorological parameters, especially mean temperatures of preceding months, 10-day periods, fortnights, &c;
- description of functional groups of flowering plants in relation to climate change;
- survey of wide diversity of species in order to assign them to the functional groups;
- investigate mechanisms controlling flowering behaviour;
- predict responses of un-monitored species to climate change.

MULTIPLE ACCESSIONS APPROACH

The basis of the study is the individual plant (organism phenology), as opposed to large populations (population phenology). In the case of herbs, the basic unit is a small patch, usually of several or many plants.

Several accessions of each taxon are monitored where possible, in different parts of the Garden, with a view to assessing intra-taxon consistency and variation, and also to safeguard against loss or damage to individual accessions. The diagrams below illustrate the consistency obtained within taxa.

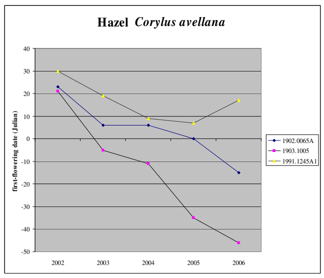
Corylus avellana

All three bushes are flowering earlier each year. The only exception is the latest flowering specimen, which has presumably reacted to the cold spell in early spring 2006.

Catkins are first visible to the naked eye in late July, but begin development considerably earlier.

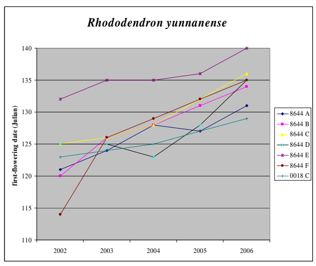
The earliest flowering bush now has catkins open before the leaves fall (see photo left).

Hazel shows 'mediterranean-type' flowering phenology.



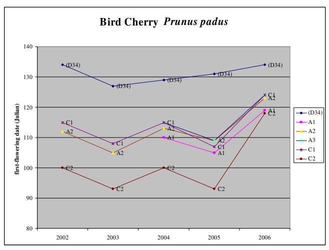
Rhododendron yunnanense

All the individual bushes in this 'mini-population' are showing a trend to later flowering. It is possible that such a pattern is the result of ageing, and it would be desirable to make observations on plants of different ages.



Prunus padus

This is another 'mini-population' (which has been increased to 10 plants for monitoring in 2007 and later).

All plants appear to show a 'W'-shaped pattern, with the exception of the 2005 first-flowering date in the latest flowering plant.

Data from future years should show whether this pattern reflects a 24-month cycle.