

Recording Flowering Times

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ACCURATE records of flowering can serve many useful purposes, and careful observation of flowering behaviour is a good introduction both to plant physiology and to flower biology. It will be of interest to note whether a species flowers earlier or later as a response to climate, to what extent male and female flowers of the same species open together when the flowers are on separate individuals, what chances there are of hybridism through interfertile species flowering simultaneously and how flowering is affected by situation, etc.

Flowering records can show the beekeeper the seasonal availability to bees of desirable or undesirable pollen and nectar sources, or the allergist when hayfever sufferers may be exposed to local concentrations of different pollens, or the plant breeder when precautions are necessary against "accidental" pollination. The scheme to be described was proposed some years ago when Botany Division, D.S.I.R., began a survey of atmospheric pollen. Since then it has been given a thorough trial and has proved readily workable and useful. As the original text is now being given with but little alteration the examples included by way of illustration are drawn from observations made at the time (about ten years ago) when the method was first proposed.

Plan of Survey. To simply list the species seen in flower or fruit in the course of an excursion furnishes data of only limited usefulness. It is of some service as an aid to listing the species likely to be found in flower in a given month, but it has several shortcomings. It does not give sufficiently definite information as to when flowering of a species actually begins or ends, nor does it reveal differences in flowering times due to locality or habitat, but what is perhaps the most serious defect is that so many species are encountered in flower that the attempt to record them is soon abandoned. It is so easy to note a species seen in passing, though not a particularly important one, that lists grow rapidly to a point where the labour of copying them out and collecting results is out of proportion to the scientific value of the information yielded, and the project fails for want of a plan.

What is indicated, then, as the very first step is to restrict the survey to territory which can be visited regularly and at sufficiently short intervals without encroaching too much on time that may be required for other projects. The vicinity of the home or some spot which one normally frequents should provide enough material for a sound beginning, and if a number of individuals were to tackle each a small area in this way a large number of species could be covered and many interesting comparisons could be made. A separate list should be kept for each area studied and the species previously recorded in

flower should be checked at each visit. A difference of fully a week has been observed in the flowering of pohutukawa (*Metrosideros excelsa*) in the Brooklyn-Mornington area of Wellington and in the city itself. Unless records are kept separately the length of the flowering season is increased by differences in flowering times in different localities. Also, if the previous list is not checked over, then, when collating results one cannot be sure whether the species was seen and was not in flower, or whether it was in flower but was not noted.

Preparations. Having selected the area or areas to be studied, then the next step is to prepare a list of species to be checked at each visit. For this purpose a specially prepared notebook might be used, the pages being provided with an alphabetical index system so that the appropriate name can readily be found and the record made in the field. Enough space should follow the name for a number of columns with the date at the head of each, so that with a notebook of pocket shape the names are perhaps best written the long way of the page. The date might be entered as 1st, 2nd, 3rd week, etc., or the actual date of observation. The selection of species which are to be kept under observation will have been governed by a number of factors, but it is well, however, to fully appreciate that a detailed record of a few species is likely to be more useful than a less complete account of a large number.

Method of recording. In evolving a suitable method of recording, circumstances such as the following had to be considered:

- (a) A few stray flowers may be seen either before or after the main flowering season; e.g., *Escallonia* spp., occasional flowers seen weeks after main flowering had finished.
- (b) Occasional or individual plants in full flower before or after the general flowering of the species; e.g. (i) Cocksfoot (*Dactylis glomerata*), often seen in full flower in February, though as a species its flowering season was long past; (ii) gorse (*Ulex europaeus*), occasional plants in full flower (early in February) while bulk of the species still in bud.
- (c) By contrast with these, prairie grass (*Bromus catharticus*) may in certain years flower very sparingly even at the height of its season.
- (d) An individual plant may be seen fully in fruit at the same time as other individuals of the species are just coming into flower.

These examples show the difficulties which may arise when interpreting the records made by other people, perhaps in different localities. Some means should be provided for indicating whether full or partial flowering refers to the individual plant or the species.

Though detailed observations pertaining to the behaviour of a given species are always worth placing on record, yet when planning a general attack on the question of local phenology it is well to envis-

age ways in which the information to be gathered is likely to be of service. The observations may cover pollen production and nectar flow, fruit setting and seed dispersal. It will often be useful to record a species as in full bud as this may afford a clearer indication of the approximate date of first flowering.

Symbols for recording. Symbols which readily suggest themselves are:

B—Bud

P—Pollen or pollination (hence serves for female flowers also)

N—Nectar, if any observations are to be recorded

F—Fruit (setting)

S—Seed, *i.e.*, shedding or dispersal of fruit or seed

Any of these might be used in the following way:

P—Flowers—individual plants with a few flowers

P—Individual plants in full flower

PP—The species as a whole partly in flower (in this locality)

PP—The species fully in flower

The record for a particular species might read somewhat as follows:

Feb.				Mar.				Apr.		
1	2	3	4	1	2	3	4	1	3	3
<u>BB</u>	P	PP	<u>PP</u>	<u>PP</u>	<u>PP</u>	<u>PP</u>	PP	PF	FF	

For the sake of simplicity the observations are imagined to have been so spaced as to represent the first, second, third and fourth quarters of each month. The species is shown to have begun flowering in the second week of February, to have been in full flower during the first half of March and to have finished flowering during the first week in April. This illustrates the use of the symbols rather than the degree of precision to be aimed at. It is important to show, as has been done in this case, that an observation was made in the first week in February and no flowers were seen. The end of the flowering season should also be made apparent—if no fruit is set a suitable mark could be made to show that an observation was made and there were no longer flowers open.