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# RESULTS OF TEN-YEAR PHENOLOGICAL OBSERVATIONS PERFORMED ON THE TREES AND SHRUBS OF THE KÓRNIK ARBORETUM

(Wyniki dziesięcioletnich obserwacji fenologicznych nad drzewami i krzewami w Arboretum Kórnickim)

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# 1. Introduction

Long-term observations of the periodical changes which occur every year in the vegetative and generative development of plants are the starting point for methodical investigations on the cultivation of trees and shrubs of foreign origin. Therefore, a knowledge of the seasonal rhythm of vegetation is very important, since it reflects the biological properties of species and the environmental conditions.

The introduction for wider cultivation of ornamental and economically useful trees and shrubs adapted to other climatic conditions requires an exhaustive knowledge of their phenology. For specialists in dendrology it is important to establish the approximate date of such developmental stages or phenophases as leaf bud opening, foliation, change of leaf color, shedding of leaves, flowering and fructification [3]. The phenological observations analyzed in confrontation with the weather conditions in the particular years are one of the methods of determining the ecological requirements of trees and shrubs as related to the sums of heat, precipitation and light.

Long-term phenological investigations in this country were advocated by Łastowski [19–21] who devoted a number of special publications to methodical problems in this field. Of high merit were also the phenological investigations of Szafer [31–33] who stressed their importance in plant geography and ecology.

Precise phenological observations of introduced trees and shrubs, based on uniform methods coordinated with our studies were performed in the collections of the Botanical Garden of the A. Mickiewicz University in Poznań [4, 22].

In 1966 the elaboration of the observation material accumulated in the Kórnik Arboretum over the ten-year period 1953–1962 was undertaken. This period seems to be sufficiently representative of the variability of the local climate within the range of the climatic station at Kórnik.

The task we set ourselves consisted in:

(1) recognition of the major phenological-developmental groups of trees and shrubs characterized by a specific rhythm of vital manifestations in the annual cycle;

(2) establishment of the relation which may occur between a definite vegetation rhythm, and provenience [28], the history of the geographical spread of the plant [8] and the systematic apurtenance of the trees and shrubs, as well as between the rhythm of their vegetation and various weather conditions and the adaptive ability.

The phenological-developmental tree and shrub groups were established on analysis of the phenological spectra (Fig. 5) and the diagrams presenting a synthesis of the observation results. In the classification, mainly the phenological regularity in trees and shrubs (occurrence of definite phenophases always in the same seasons) and the length of the period of vegetative activity, flowering and fruit development were taken into account.

It is believed that analysis of the results of phenological observations over many years on a large number of trees and shrubs cultivated in the Kórnik Arboretum will throw some light on the course of some developmental phases of these plants, many of which have been transferred to the Arboretum from quite different climatic conditions. It will also allow to study the phenological regularity and plasticity of various plant species.

The present study is also an attempt at explanation of the varying development rhythm of trees and shrubs and their different adaptation ability. Further methodological phenological investigations based on the observations of trees and shrubs originating from the region of the natural range of these plants may contribute to the establishment of a definite trend in further investigations on acclimatization, instead of the so far reigning accidental introduction practices.

The authors would like here to thank Dr. M. Giertych for assistance in the statistical elaboration of the observations. They are also indebted to Mr. L. Hłyń

for preparing part of the phenological spectra and materials for analysis of the results of observation.

#### tested and a statistic tested 2. Methods

As material for the study served a profuse material obtained in the course of ten-year phenological observations performed on chosen trees and shrubs of many species, mostly of foreign origin, in the Kórnik Arboretum. The dates of periodical developmental changes in plants, that is phenophases, were recorded according to the scheme of the phenological record card given below. The observations included 295 species of trees and shrubs, 122 of which, mostly originating from various geopraphical regions of the temperate zone and growing natively in various ecological conditions, were subjected to detailed analysis. Over this ten-year period the findings were recorded by several observers, therefore in some cases certain inexactitudes in the phenological dates are not excluded, caused by the more or less subjective evaluation of the beginning of certain phenophases. It may, however, be assumed that long-term observations ensure a correct final synthesis of the results.

The phenological record is intended for observation of single tree and shrub specimens representing particular species or their varieties. It contains the following lits of the more important phenological events and information on the criteria for establishing the beginning and end (eventually full development) of a given phenophase.

# A. Leaves a painteeing anterend out A. Leaves attend is inclosed out to zizvisin

(1) Opening of leaf buds (onset of growth), about 5-10 buds show green leaves in the gaps between the opening scales. In trees and shrubs with scaleless buds their marked swelling is visible.

(2) Spreading of leaf blades — about 5-10 young leaves have horizontally spread leaf blades.

(3) Beginning of autumnal change of color — first normal healthy leaves begin to change their color.

(4) Color of leaves completely changed.

(5) Beginning of leaf shedding — first normal healthy leaves either changed in color or not are shed.

(6) End of leaf shedding — most leaves have fallen off.

# B. Flowers

(1) Beginning of florescence — appearance of first 5-10 completely opened female flowers or male pollen-bearing catkins.

(2) End of florescence — appearance of the last female flowers or pollenshedding male catkins.

#### C. Shoots

(1) Beginning of growth — on several apical shoots leaf buds open (like  $A_1$ ).

(2) End of growth — majority of shoots have formed apical buds.

#### D. Fruits

(1) Beginning of fruit ripening — first fruits (5–10) normally developed and healthy take on a characteristic hue, cease to be hard (loosening of parenchymal tissues) or show other features indicating the beginning of ripening.

(2) End of fruit ripening — last unripe fruits acquire the characteristics of ripening, then the fruits drop or else they dehisce and dispersal of seeds occurs.

Of no small importance for elucidation of the seasonal rhythmicity in plants is the recording of injury caused by precocious and late ground frosts and by frost in winter. The data concerning the hardiness of trees and shrubs of the various species investigated are listed in the publication of W. Bugała and H. Chylarecki [5].

Phenological observations were recorded the year round at least two to three times weekly.

The observation scheme described above makes possible the collection of materials concerning: the time of foliation, flowering, fruiting and growth of various trees and shrubs, that is floristic phenology. Besides, long-term observations were recorded in the field of bioclimatic phenology. The development of indicator plants chosen according to Łastowski, mostly of native origin, allows the detection of the influence of various weather combinations in the particular years on the course of the vital processes in the trees and shrubs. It is only against the background of the changing rhythm of development of the indicator plants which serve as a kind of measuring instrument for the local climate, that the seasonal development of other plants can be analyzed. The meaning of the apparance of the indicator plants consists mainly in that, under the same environmental conditions, they demonstrate the joint action of numerous climatic factors on plant development [20, 23].

According to the time of florescence, of fruit ripening, change of color and shedding of the leaves of the indicator plants, nine phenological seasons have been distinguished in the year. It was assumed after Łastowski [21] that the following events in the development of the trees and shrubs may be considered as indices (owing to the lack of other observations, only one indicator species served for determination of some of the phenophases).

(1) Early spring — beginning of florescence: Corylus avellana, Tussilago farfara.

(2) Beginning of spring — beginning of flowering: Acer platanoides, Betula verrucosa.

(3) Spring — beginning of florescence: Syringa vulgaris, Aesculus hippocastanum.

3

(4) Early summer: beginning of florescence of Robinia pseudoacacia.

(5) Summer: beginning of florescence of Tilia cordata.

(6) Early fall: beginning of fruiting of Sambucus nigra.

(7) "Golden" fall: beginning of yellowing of leaves: Tilia cordata, Acer platanoides, Aesculus hippocastanum.

(8) Late fall: beginning of leaf shedding: Tilia cordata, Acer platanoides, Aesculus hippocastanum.

(9) Winter: its beginning is marked by a mean air temperature below 0°C, lasting for several days.

As the duration of the phenological seasons in the course of the period of investigations is assumed the mean value obtained from the dates of the above mentioned events in the development of the indicator plants or, if certain observations are lacking, the date of florescence and fruiting of one indicator species (early summer, summer, early fall).

The tables listing the dates of the phenophases which resulted from observations of many years served for the preparation of a graphical presentation (spectrum) of the phenological record. In the authors' opinion, the seasonal life cycle of the trees and shrubs under study shown in the diagrams will allow to distinguish the most characteristic phenological-developmental groups, and to find relations between the combination of climatic factors and the seasonal changes in the life cycle of the plants.

The phenological spectrum has the shape of an elongated polygon (Fig. 1). The points plotted on the polygon denote the dates of opening of leaf buds (I), of spreading of leaf blades (2), of beginning of leaf color change (3) and full color change (4), beginning (5) of and end (6) of leaf shedding, showing the course of the vegetative cycle. The phase of flowering presented as a segment of the horizontal line and the phenophase of fruiting, the duration of which is marked by a row of black dots represent the generative cycle. The system of plotting the phenological spectrum is a simplification of the method used by Szennikow [34, 35]. This was indispensable, because, in the period 1950–1960, the scheme of phenological observations did not include some detailed observations necessary for presenting exactly the course of vegetation of the plants.

The instruction prepared in 1961 concerning the phenological records for trees and shrubs introduces the missing phenophases. It was elaborated in consultation with the scientists concerned from the Department of Geography and Systematics of Plants, A. Mickiewicz University, Poznań.

The seasonal course of vegetation of plants growing during the ten-year period investigated on the same sites, is largely dependent, beside a number of soil factors described by Kowalkowski and Prusinkiewicz [16], on the varying local climatic conditions. Particularly important here is the sum of heat, the extremal air temperature values, the amount and distribution of precipitation and the length of the

vegetation period. Therefore, much attention is devoted to the characterization of the climate of the area on which the trees were introduced. The general description of the climate was based on the Gaussen-Walter climatic diagrams [39] which in the first place supply information on the type of weather, favorable or unfavorable conditions for plant vegetation (hot as well as dry and wet periods), they



Fig. 1. Pattern of phenological spectrum. I — beginning of leaf bud opening, 2 — beginning of leaf blade spreading, 3 — beginning of change of color of leaves, 4 — end of change of color of leaves, 5 — beginning of leaf shedding, 6 — end of leaf shedding, 7 — beginning of flowering, 8 — end of flowering, 9 — beginning of fruit ripening, 10 — full ripeness of fruits, 11 — end of fruit ripening and beginning of their dissemination; a — period of vegetative activity, b — period of rest. Interrupted vertical lines denote time of duration of phenological seasons.

also give a clear picture of the water balance. The weather conditions arranged according to the successive years (climatogram) show the influence of certain climatic factors in these years on the phenophases.

The method of the Gaussen-Walter climatograms consists in plotting in a system of coordinates curves of mean monthly precipitation and of mean monthly temperatures in a 1:2 ratio (10°C corresponds to 20 mm precipitation). This ratio results from the limiting values of the hydrothermic coefficient (0.67 and 1.0), which makes possible the distinction between climatic conditions characteristic for steppe, forest-steppe and forest.

According to the authors of this method, the part of the year when the precipitation curve runs above the temperature curve is a moist period, and the part where the precipitation curve is below the temperature curve corresponds to a

3\*

period of drought. The vertical dimension of the surface formed between the two curves indicates the degree of moisture (dryness) of the climate, and the horizontal dimension shows the duration of these conditions. The ratio of these surfaces expresses the moisture grade of the climate.

A period of drought as defined by Gaussen, is visible when the diagram represents a steppe or desert region. On the forest-steppe areas there may occur a dry spell visualized on some of the diagrams by the depressed precipitation curve plotted in a 1:3 scale.

The left side of the diagrams gives figures indicating the mean minimum of the coldest month and the absolute temperature minimum. The mean annual temperature and the mean annual sum of precipitation are given above the diagram.

The characteristic of the climate of the ranges of occurrence of the tree and shrub species studied is based on the climatic classification of the world by Alisov [1] and adopted in the particular elaborations of Z. Czeppe, J. Flis and R. Mochnacki [6]. In the discussion of the ranges of tree and shrub species, the regional classification of Asia was used after Neef [24], and of China after Olszewski [38].

Some of the phenological observations were subjected to statistical analysis, among these belong the duration of vegetative activity of trees and shrubs from the onset of elongation growth to the end of leaf shedding, the duration of flowering and the dates of leaf bud opening, of leaf shedding and of beginning of flowering. The dates of the beginning and end of all phenophases were for the purpose of analysis expressed as the number of days elapsed from the first of January of each year.

In the diagram in Fig. 2 the arithmetic means of the duration of vegetative activity are plotted for the period 1953–1962 for the particular species together with the extreme values in this period, denoted by the varying length of the horizontal lines. The arithmetic means and extreme values of the duration of florescence are presented similarly (Fig. 4a). On the remaining diagrams (Figs 3a, b, 4b) the dates of leaf bud opening, leaf shedding, and beginning of flowering and the mean dates for the phenophases are separately plotted as segments of various length for the chosen species in the particular years of the ten-year period.

A number of supplementary compilations have been made of the species according to the duration of vegetative activity, flowering and fruit development. They were necessary for the study of the influence of weather conditions on the vegetation rhythm of these plants (Tables 8 and 9).

# 3. Characteristic of Climatic Conditions in the Period 1953-1962

The mean monthly temperature values, sums of precipitation for the particular months (Fig. 5) and the data concerning other more important climatic factors (Tables 1-4) shown in the diagrams underwent distinct variations in the period under study.



https://rcin.org.pl Fig. 2. Period of the vegetative activity of trees and shrubs (means calculated for the years 1953-1962 and extremal values). Fig. 2. Period of the vegetative activity of trees and sharks (means calculated for the years 1953-1962, and extremal values).

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Comparison of the weather conditions indicates two severe winters in 1953/1954 and 1955/1956, the latter showing features of a steppe-desert type winter, that is considerable and long lasting temperature falls with little snow and strong winds. The successive mild winters of 1956/1957, 1957/1958 and 1958/1959 were close to the Atlantic type, with low frost, frequent rain or drizzle and a considerable cloudiness. The years 1953 and 1959 with a long vegetation period, a higher than mean average sum of heat, and the cold summers of 1956 and 1958 with relatively short vegetation periods should be noted. Significant for analysis of the seasonal rhythm in plants are the years 1953, 1954 and 1959 with long spells of dry and half-dry weather. For plant development the spring drought of 1959 was most disfavorable. These years had at the same time very long vegetation periods. It should be added that in 1957 ground frosts caused much damage, the last one was recorded as late as May 30 and the first on September 26. The longest period without frost occurred in 1961 when the last ground frost was recorded on April 10 and the first in autumn on November 19.

Years	Jan.	Feb.	March	Apr.	May	June	July	Aug.	Sept	Oct.	Nov.	Dec.	Annual mean
1953	-3.8	-4.4	-0.9	2.4	7.0	11.9	13.4	10.6	8.6	5.3	0.1	-1.9	4.0
1954	-9.3	-12.9	-0.5	0.6	6.3	12.0	12.2	11.4	10.0	5.4	-0.7	0.3	2.9
1955	-6.1	-6.7	-4.6	0.9	5.4	8.5	12.7	12.9	9.9	4.2	0.2	-1.0	3.0
1956	-2.7	-15.6	-2.5	1.3	7.0	10.6	11.8	11.0	8.0	4.5	-2.6	-2.0	2.4
1957	-3.2	0.2	-0.3	1.6	4.1	10.1	14.2	11.4	7.4	4.4	1.4	-3.6	4.0
1958	-5.1	-2.8	-4.0	1.1	9.0	9.1	13.1	11.5	8.7	6.0	1.6	-1.5	3.9
1959	-3.3	-5.5	0.7	3.1	5.9	9.8	15.0	13.2	5.9	2.2	-0.6	-2.3	3.7
1960	-4.4	-6.8	-1.1	2.1	7.2	10.9	12.0	12.3	8.0	5.7	1.7	-0.2	4.0
1961	-6.8	0.0	2.3	4.7	6.6	12.0	11.5	12.0	9.5	6.8	1.3	-7.0	4.4
1962	-1.5	-3.2	-3.7	5.6	6.1	9.4	10.1	12.5	8.2	4.1	2.0	-6.3	3.6

Distribution of Monthly Means of the Daily Minimal Temperatures over the Years 1953-1962

Minimal diurnal temperatures for Poznań 3.6°C Minimal monthly temperatures for Poznań – 16.6°C

A short characteristic of the weather conditions in the particular years of the ten-year period is given below. It may contribute to the elucidation of the influence of certain climatic factors on the rhythm of the seasonal development of trees and shrubs. Only those climatic factors which, in the authors' opinion, are most important for plant vegetation are taken into account here.

#### Year 1953

It was a warm and dry year. Noteworthy is the early spring, temperatures distinctly exceeding the mean in April, June and July, a cool August and long spells of dry weather in spring and in the fall. The drought was severest in October.

Table 1

2 sldaT mostison of the weather conditions indicates two severe winters in

Distribution of the Monthly Absolute Minimal Temperatures over the Years 1953-1962

Years	Jan.	Feb.	March	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual mean
1953	-11.2	-21.7	-12.5	-5.3	-3.6	4.5	9.4	5.6	2.1	-0.6	-10.0	-9.2	-21.7
1954	-21.6	-25.0	-2.6	-3.4	-1.4	5.7	7.7	6.4	1.2	-1.1	-8.7	-4.6	-25.0
1955	-16.2	-16.7	-15.0	-1.7	-1.0	3.4	9.0	9.5	3.4	0.7	-5.3	-7.7	-16.7
1956	-22.5	-26.8	-7.8	-4.1	1.4	4.9	3.8	7.5	1.5	-6.8	-11.2	-13.6	-26.8
1957	-15.3	-4.9	-5.4	-5.4	-1.3	5.2	9.7	7.1	-0.2	-1.6	-7.2	-15.1	-15.3
1958	-12.6	-12.4	-15.3	-4.4	1.8	0.2	6.9	8.0	1.4	-1.1	-4.1	-8.2	-15.3
1959	-12.7	-16.4	-4.0	-2.0	1.2	3.8	9.4	6.0	-1.5	-3.1	-6.9	-12.8	-16.4
1960	-16.5	-18.0	-9.3	-4.1	0.4	7.8	6.6	7.1	1.5	-0.9	-2.8	-4.4	-18.0
1961	-21.4	-4.0	-5.9	-0.5	2.3	6.0	7.5	8.1	3.2	1.7	-6.7	-23.6	-20.4
1962	-13.1	-12.8	-13.3	-0.4	-2.0	3.5	5.0	7.2	2.2	-1.8	-2.4	-18.4	-13.3

Table 3

Distribution of the Monthly Means of the Air Moisture Deficit in the Years 1954-1962

Years	Jan.	Feb.	March	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov	Dec.	Annual mean
1954	0.8	0.7	1.3	2.3	5.5	7.7	4.1	5.7	5.0	2.9	1.1	0.9	3.2
1955	0.8	1.3	1.3	2.7	5.2	4.9	5.1	6.4	3.7	1.8	0.9	0.9	2.9
1956	1.2	0.5	1.6	1.9	6.0	5.4	7.4	5.2	4.1	2.3	1.0	0.9	3.1
1957	0.8	1.2	2.5	3.7	5.4	8.1	6.3	4.6	2.9	2.1	1.8	1.0	3.4
1958	1.1	1.6	1.5	2.2	4.6	4.4	5.7	4.5	3.6	1.6	0.7	0.9	2.7
1959	1.2	1.0	2.4	4.6	6.7	8.6	8.3	7.0	5.3	4.2	1.1	0.6	4.3
1960	0.6	0.8	1.6	2.8	6.3	6.8	5.1	5.4	4.2	1.7	1.1	0.9	3.1
1961	0.7	0.9	2.4	4.0	3.3	6.8	5.5	4.3	5.1	2.8	2.8	1-50	3.3
1962	1.2	1.0	1.3	4.4	3.1	7.0	5.5	5.7	3.4	1.8	0.8	0.5	3.0

Distribution of Monthly Totals of Insolation in the Years 1954-1962

Table 4

Years	Jan.	Feb.	March	Apr.	May	June	· July	Aug.	Sept.	Oct.	Nov	Dec.	Annual total
1954	63.5	101.2	97.8	136.4	266.5	253.0	140.0	245.9	177.4	131.7	64.5	14.5	1566.4
1955	49.3	86.6	146.2	84.4	207.5	213.6	211.1	240.8	174.5	119.3	46.1	19.0	1598.4
1956	46.1	80.8	152.6	90.7	230.7	182.2	249.4	193.7	210.8	109.4	51.2	55.1	1652.7
1957	42.7	61.6	172.4	174.3	227.7	273.8	187.2	205.8	124.8	99.1	42.1	25.1	1636.6
1958	69.9	76.9	78.9	82.3	202.8	217.1	255.7	204.2	183.3	94.9	26.3	35.7	1528.0
1959	39.5	60.4	159.7	187.3	278.7	250.7	200.8	233.1	225.5	150.3	52.0	9.0	1847.0
1960	33.8	108.8	165.0	143.9	247.4	204.9	120.9	162.4	160.3	66.6	44.7	30.5	1489.2
1961	95.5	60.0	73.7	208.4	110.4	260.4	122.9	135.0	204.0	122.9	27.8	22.7	1443.7
1962	46.7	32.4	132.8	134.9	122.2	245.8	201.7	139.8	138.8	104.1	39.4	21.4	1360.0
1963	72.9	51.9	142.0	162.8	210.7	235.3	252.8	157.8	150.4	78.9	36.4	41.7	1593.6

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18. Lonicera xylosteum			4		0.450 p.m.
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22. Berberis koreana 23. Prunus padus	A CONTRACTOR OF A		L_L_		al al faith and a
24. Pterostyrax hispida					
25. Berberis vulgaris					
26. Viburnum lentago					TRACTOR
28. Corylopsis platypetala	and the second				
29. Kerria japonica					
30. Hydrangea radiata				1111 1	Ш
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59. Forsythia ovata	and a state of the second	Sample Meller	and the second		
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74. Carpinus japonica	and the second	at not	1		
75. Acer platanoides					
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81. Acer palmatum 82. Hydrangea Sargentiana		-	L	<u> </u>	
83. Hamamelis mollis	A. A.				I III REALING
84. Rhus trilobata	u.	and I'm		L II 111	
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87. Cladrastis tinctoria					
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93. Acer pseudoplatanus		44.00	12.5	L	1.11.11
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96. Evodia Daniellii			A CONTRACT OF		
97. Magnolia salicifolia		- thereast	L	1111	Li sepatoni
98. Wistaria floribunda 99. Acer monspessulanum	- 4-d-	الم المساح			<u> </u>



Fig. 3a. Bud opening. Mean dates of this phenological phase in various years from 1953-1962.

Months	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.
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10. Acer Ginnala		Lill	Ē		modification man	ancase S. (W
11. Vitis amurensis	1. 1. I	<u>un tra</u>	H.		and the second se	and the second
13. Acer tataricum					TRUCK BASER OF TR	Finder Alt
14. Cornus rugosa	and and the first of the second		H		antreast to the	
16. Prunus padus	and the first of				an martine and	proved at a se
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18. Acer pseudopiatanus 19. Tilia mongolica	Julian Starten				this way an	Solution fait
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21. Aesculus pavia 22. Juglans Sieboldiana	A State State State	<u>u. lu</u>	LU I		and the second	
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34. Magnolia acuminata 35. Cladrastis tinctoria	S. M. Marchel	<u>i II</u>			substantion and	Contraction of the second
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37. Aesculus hippocastanum	I A ALL	<u>II i</u>			in the second	Server St.
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40. Tilia cordata	<	Lim				
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43. Prunus subhirtella	a participant	1	u i		trialities are	ades III (Electro
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56. Aesculus turbinata		L			and best in .	St. Corna
57. Magnolia tripetala 58. Gleditsia triacanthos	A COLUMN STATE	Ļ			nundione	and the second second
59. Rhus sylvestris	- Anna Martine			11	steam in	Parm 1 . Se
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62. Zelkowa serrata	1 the 10		i il i		Ester	ment In
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66. Hydrangea Sargentiana					and south and the	
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86. Platanus acerifolia 87. Forsythia europaea		L				
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96. Forsythia Giraldiana 97. Wistaria floribunda	- Change			H.	Destable and	Samuela Te
98. Halesia tetraptera	a state of the sta	A State of the second		L .	a (for granta	ration of the
99. Viburnum fragrans	- Carrier		<u> </u>		tan go kan amar. Brodene	a wak dai





Fig. 3b. Leaf fall. Mean dates of end of leaf fall and dates of this phenological phase for various years from 1953–1962. https://rcin.org.pl Beside the negative water balance (annual sum of precipitation 382.3 mm, i.e. one of the lowest in the 1953–1962 period), and the precipitation distribution unfavorable to plant vegetation (culmination in July), wide diurnal temperature amplitudes were noted, and in April and May severe ground frosts which also disturbed the development of trees and shrubs. In the winter of 1952/1953 frost was not particularly heavy or long lasting.

#### Year 1954

After a very dry and rather cold winter (mean minimal temperature in February  $-12^{\circ}$ C, absolute minimum  $-25^{\circ}$ C), the spring was rather cold, and in April and May recurrence of winter was observed, it did not, however, cause major damage. June was very warm and dry, July was cool and in August and September a long period of drought set in. Its unfavorable influence was somewhat attenuated owing to the preceding profuse rainfall in April and July. A factor unpropitious for many trees and shrubs of foreign origin was in this year the short vegetation period.

#### Year 1955

The weather conditions in this year were characterized by relatively light frost, a long-lying snow cover and a rather uniform distribution of precipitation. Among unfavorable factors long-lasting chills in spring and summer should be noted (mean temperatures in March and June lower than in the remaining years of the 10-year period) and a short vegetation period.

#### Year 1956

As one of the most unpropitious climatic factors should be mentioned in this year the period of heavy frost which started at the end of January and lasted all through February (mean minimum of the coldest month  $-15.6^{\circ}$ C, absolute minimum  $-26.8^{\circ}$ C, 10 days with minimal temperature below  $-20^{\circ}$ C). The noxious effect was particularly strong since the cold spell occurred after a warm December with abundant precipitation and a warm January, without any snow cover and with strong east winds.

The cold early spring and cool summer with a good deal of precipitation made possible regeneration of the trees and shrubs damaged by frost. In May and July, after much rainfall, spells of dry weather occurred. The vegetation period was one of the shortest in the ten years 1953–1962. Insolation was very high (652.7 hrs).

#### Year 1957

This year was characterized by a very mild winter 1956/1957 of Atlantic type (mean minimal temperature of the coldest month  $-3.6^{\circ}$ C). Early spring was very precocious, the mean temperatures of February and March greatly exceeded the average ones. May, August and September were cool. In April and September there occurred spells of dry weather. They were, however, preceded by profuse rainfall, the culmination of which fell to February and July. The annual sum of precipitation (519 mm) shows that this year, besides 1961, may be considered as one of the moistest. Another factor prompting plant development was the long vegetation period and the high annual sum of insolation. On the whole, the weather conditions in 1957 with a mild winter and wet summer were favorable to plant development. Nevertheless, late and severe ground frosts (the last on May 30) and the early ground frosts in the fall (the first on September 26) injured some of the trees and shrubs. The period without frost (118 days) was the shortest in the entire 10-year period.

#### Year 1958

The absence of severe frost in the mild winter 1957/1958 (mean minimal temperature of the coldest month  $-5.1^{\circ}$ C) with frequent precipitation, spring without a period of drought and a distribution of precipitation more favorable than in other years prompted vegetation. The diagrams indicate a very cold spring (mean temperatures of March, April and the first half of June much lower than the average) which shortened the vegetation period, nevertheless the very warm month of May with profuse precipitation seems to have somewhat compensated these unfavorable influences. As shown by the dates of the particular events for the indicator plants, the phenological summer period was very short, probably owing to the insufficient precipitation and the maximal amount of insolation (255.7 hrs) in July. The fall was relatively warm and moist. Finally the long period without frost (177 days) contributed to good plant development. Noteworthy were also the small diurnal air temperature amplitudes in March and April.

#### Year 1959

The winter of 1958/1959 like those of 1956/1957 and 1957/1958 was of Atlantic type. Only February was cold and dry, with vehement winds. On the whole, the year 1959 was extremely dry with a higher than average sum of heat and the highest insolation in the period 1953/1962 amounting to 1847 hrs, its maximum falling to July. The spring was dry and warm, March and April had high mean temperatures. Summer was wet and hot with mean temperatures of July and August above the average. The fall was dry and cool. The vegetation period and the period

Days	0 25	50	75	100	125 150	200	. Mannis
Days 1. Carpinus japonica 2. Fagus orientalis 3. Carpinus orientalis 4. Jugians cinerea 5. Jugians mandshurica 6. Jugians mandshurica 6. Jugians mandshurica 7. Fagus grandifolia 8. Pterocarya fraxinifolia 9. Jugians Sieboldiana 10. Carpinus betulus 11. Fagus sylvatica 12. Platanus acerifolia 13. Carya cordiformis 14. Prunus serotina 15. Carya laciniosa 16. Cercidiphyllum japonicum 17. Phellodendron amurense 18. Schisandra chinensis 19. Acer monspessulanum 20. Rhus sylvestris 21. Cornus kousa 22. Cladrastis tinctoria 23. Acer rubrum 24. Acer saccharinum 25. Sorbus aucuparia 26. Prunus padus 27. Tilia cordata 28. Vitis amurensis 29. Gleditsia triacanthos 30. Acer Ginnala 31. Tilia americana 32. Magnolia tripetala 33. Morus alba 34. Lonicera xylosteum 35. Tilla tomentosa 36. Robinia pseudoacacia 37. Magnolia salicifolia 38. Lonicera corulea 39. Acer nikoense 40. Vitis vulpina 41. Viburnum Carlesii 42. Acer platanoides 43. Elaeagnus angustifolia 44. Ailanthus glandulosus 45. Prunus fruticosa 46. Tilia mongolica 47. Forsythia Giradiana 48. Elaeagnus multiflora		50	75	100	125 150		
<ol> <li>49. Cornus Hemsleyi</li> <li>50. Lonicera Maximowiczii</li> <li>51. Tilia tuan</li> <li>52. Prunus subhirtella</li> <li>53. Magnolia kobus borealis</li> <li>54. Viburnum lantana</li> <li>55. Magnolia acuminata</li> <li>56. Forsythia ovata</li> <li>57. Lonicera iberica</li> <li>58. Cornus rugosa</li> <li>59. Sorbus americana</li> <li>60. Rhus trilobata</li> </ol>							
<ul> <li>60. Rhus trilobata</li> <li>61. Berberis vulgaris</li> <li>62. Acer pseudoplatanus</li> <li>63. Forsythia europaea</li> <li>64. Maclura pomifera</li> <li>65. Cotoneaster obscura</li> <li>66. Berberis koreana</li> <li>67. Tilia platyphyllos</li> <li>68. Acer tataricum</li> <li>69. Corylopsis platypetala</li> <li>70. Tilla Maximowicziana</li> <li>71. Lonicera alpigena</li> <li>72. Viburnum lentago</li> <li>73. Lindera aestivalis</li> <li>74. Viburnum fragrans</li> <li>75. Viburnum tomentosum</li> <li>76. Viburnum sargenti</li> <li>77. Acer circinatum</li> <li>78. Ribes aureum</li> <li>79. Pterostyrax hispida</li> <li>80. Ribes alpinum</li> <li>81. Castanea sativa</li> <li>82. Aesculus turbinata</li> <li>83. Aesculus hippocastanum</li> <li>84. Lonicera tatarica</li> <li>85. Halesia tetraptera</li> <li>86. Evonymus europaea</li> <li>87. Cotoneaster racemiflora</li> <li>88. Lonicera tatarica</li> <li>89. Cotoneaster horizontalis</li> <li>90. Wistaria sinensis</li> <li>91. Evonymus latifolia</li> <li>92. Cornus amomum</li> <li>93. Cornus garvilora</li> <li>94. Sorbaria sorbifolia</li> <li>95. Cornus officinalis</li> <li>96. Aesculus parviflora</li> <li>97. Evonymus lata</li> <li>98. Evonymus verucosa</li> <li>99. Ribes longeracemosum</li> <li>100. Aesculus pavia</li> <li>101. Liriodendron tulipifera</li> <li>102. Hydrangea Sargentiana</li> <li>104. Lonicera thibetica</li> <li>105. Hydrangea sationa</li> <li>106. Hydrangea radiata</li> <li>107. Cornus stolonifera</li> <li>108. Evodia Daniellii</li> <li>109. Kerria japonica</li> <li>111. Cornus alba</li> </ul>							
	<ul> <li>UUUS</li> <li>Carpinus orientalis</li> <li>Carpinus orientalis</li> <li>Jugians cinerea</li> <li>Jugians cinerea</li> <li>Jugians mandshurica</li> <li>Jugians sigra</li> <li>Fagus grandifolia</li> <li>Perocarya fraxinifolia</li> <li>Carpinus betulus</li> <li>I. Fagus sylvatica</li> <li>Petutanus accrifolia</li> <li>Carya cordiformis</li> <li>Armus serotina</li> <li>Carya laciniosa</li> <li>Cercidiphyllum japonicum</li> <li>T. Phellodendron amurense</li> <li>Schisandra chlinensis</li> <li>Acer mospessulanum</li> <li>Cornus kousa</li> <li>Cerums kousa</li> <li>Sorbus aucuparia</li> <li>Sorbus aucuparia</li> <li>Cerums padus</li> <li>Tilia cordata</li> <li>Yitis amurensis</li> <li>Gelditsia triacanthos</li> <li>Acer Ginnala</li> <li>Tilia cordata</li> <li>Magnolia stipetala</li> <li>Morus alba</li> <li>Lonicera aylosteum</li> <li>Sorbus audoacacia</li> <li>Magnolia sulcifolia</li> <li>Lonicera coerula</li> <li>Acer nikoense</li> <li>Vitis vulpina</li> <li>Vitius glandiosus</li> <li>Prunus fruticosa</li> <li>Forsythia Giraldiana</li> <li>Eleaegnus multiflora</li> <li>Sorbus americana</li> <li>Magnolia kobus borealis</li> <li>Viburnum lantana</li> <li>Magnolia kobus borealis</li> <li>Kibea alpinum</li> <li>Cornus Hemsleyi</li> <li>Lonicera albienia</li> <li>Berberls vulgaris</li> <li>Cotoneaster obscura</li> <li>Erosythia europaea</li> <li>Kubea alpinum</li> <li>Costoneaster obscura</li> <li>Erosythia europaea</li> <li>Kubea alpinum</li> <li>Cornus rugosa</li> <li>Sorbus americana<th>UUUS     U       1. 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Tila tomentosa       36. Acer takonnolea       37. Forsytha corrulea       39. Acer miscolopiatamus       30. Acer Ginoachisa    <t< th=""><th>UQUS         UQUS         UQUS         UQUS           1. Carpins sipenical         1           2. Fayus orientalis         1           4. Juglans cherea         1           5. Juglans misina         1           1. Carpins orientalis         1           5. Juglans misina         1           1. Fares synahlolis         1           1. Fares synahlolis         1           1. Carpa conformin         1           1. Fares synahlolis         1           1. Carpa conformin         1           1. Carpa conformin         1           1. Carpa conformin         1           1. Carpa conformin         1           1. Corna konsa         1&lt;</th><th>UUUS         U         2.0         U         V           1. Corplus (spende         1         1         1           2. Fague schedule         1         1         1           3. 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Forsytha corrulea       39. Acer miscolopiatamus       30. Acer Ginoachisa <t< th=""><th>UQUS         UQUS         UQUS         UQUS           1. Carpins sipenical         1           2. Fayus orientalis         1           4. Juglans cherea         1           5. Juglans misina         1           1. Carpins orientalis         1           5. Juglans misina         1           1. Fares synahlolis         1           1. Fares synahlolis         1           1. Carpa conformin         1           1. Fares synahlolis         1           1. Carpa conformin         1           1. Carpa conformin         1           1. Carpa conformin         1           1. Carpa conformin         1           1. Corna konsa         1&lt;</th><th>UUUS         U         2.0         U         V           1. Corplus (spende         1         1         1           2. Fague schedule         1         1         1           3. Vision cherea         1         1         1           3. 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Fig. 4a. Length of flowering period of trees and shrubs. Means calculated for the years 1953-1962 and extremal

values. https://rcin.org.pl

Months	Jan.	Feb.	March	Apr.	May	June	July	Aug.	Sept.	Oct.
1. Hamamelis mollis		1				i.		L. Corvina An		
2. Acer saccharinum 3. Cornus officinalis			LLL			L.L	alara	2. Pagata articles		14
4. Cornus mas						A STATE	1	a rogioni com	1201	
5. Viburnum fragrans 6. Forsythia Giraldiana	a search and		ш	1111			Contendo	Angland manual		
7. Forsythia ovata		100000					allel	T. Forway strands		and the second
8. Acer rubrum 9. Lonicera coerulea		1 2 2			i	L. M.	Transfel	9. Augura Steele	1.1.1.1.1.1.1	
10. Magnolia salicifolia	a server		_			THE LE	(Lap	of therein the	1.12	
12. Cercidiphyllum japonicum		111-200					state	TTA REPART AT		
13. Prunus subhirtella 14. Ribes alpinum					<u> </u>		time ti	11. Catha and 11.		
15. Magnolia kobus borealis							10.11	15. Corris Institute	No. of the	
16. Forsythia europaea 17. Acer platanoides				LU_1111		1 miles	and a state of the	T. Phellodanshou		
18. Carpinus betulus							- Aller and a second	13. Schlagender ob		
20. Ribes aureum		1.00		4.11	1	the set		the Right spiritual		
21. Carpinus japonica 22. Acer circinatum						and the second		11 Corrars Korrow		
23. Prunus padus								service with di		
25. Carpinus orientalis		2400		L.				stanting watered .25		
26. Fagus orientalis 27. Prunus fruticosa			1000	L		a line	1 Charles	A Phanin public		
28. Viburnum Carlesii								converses that , 25	. The second	
29. Acer monspessulanum 30. Elacagnus angustifolia			1000	U_L		-	building a	the steel Grands	Sector Sector	Sec. Sec.
31. Lonicera alpigena								instruments High It		
33. Fagus sylvatica						1		while same Mr. 12	1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1	
34. Ribes longeracemosum 35. Cornus stolonifera						0.1.1	and a state of the	the Louisian agent		
36. Evonymus alata	-	12 4.0.19					(and the	in Robins press	Street Street	
38. Wistaria sinensis						-	-	time invited to be	C. Par Star	
39. Aesculus hippocastanum 40. Halesia tetraptera				_		lune		in Party willing and		
41. Acer nikoënse							- Host	11 Wheenam Can		
42. Kerria japonica 43. Lonicera xylosteum				L			atolian	12. Area planarold		
44. Platanus acerifolia							pinalab	and internal state	12210763	
45. Lonicera tatarica 46. Juglans Sieboldiana								diversity which the		
47. Juglans cinerea 48. Acer pseudoplatanus						( internet)	Lancita I	A Annengana man		
49. Evonymus latifolia				L		The	-	P. Carptel Franci		
50. Aesculus turbinata 51. Calycanthus floridus						i unitaria di seconda d	1. Sectore	This party		
52. Fagus grandifolia								data const to		
54. Sorbus americana				L .				A Free server from		
55. Pterocarya fraxinifolia 56. Sorbus aucuparia					шици			tere shirters in		
57. Viburnum lentago	The second			L			-	In all produces to the		
58. Evonymus verrucosa 59. Berberis vulgaris								Contrast and the P		
60. Berberis koreana 61. Schisandra chinensis					ш			Disking and a constant		
62. Juglans mandshurica		1.000		L			The survey	A shew passed in	1. 1. 2 M R.	
63. Lonicera Maximowiczii 64. Viburnum prunifolium							-	6. Machine ponts		
65. Lonicera Maackii 66. Acer tataricum	1				LL_L hi	-	-	<ol> <li>Gorenemics all a Steeler famou</li> </ol>		
67. Carya laciniosa										
68. Cotoneaster horizontalis 69. Viburnum tomentosum			2		<u>un chu</u>	1	alastara			
70. Viburnum Sargenti 71. Cornus, stolonitera		11630		Children and	U.U.U. 1 1	Ľ.	Autority of		14. 5. 1. 2. 1	
72. Magnolia acuminata				-		L.	01			
73. Cornus alba 74. Evonymus europaea						1 11			-	
75. Carya cordiformis					ii	LΨ	artistics 1100			
77. Acer Ginnala	1000									
78. Juglans nigra 79. Morus alba						نب	100			
80. Magnolia tripetala						1				
81. Prunus serotina 82. Cornus amomum		a an	0.000	L	<u> </u>					
83. Pterostyrax hispida 84. Robinia pseudoacacia						Mii III	ntinula.no			
85. Hydrangea petiolaris					L	نىپىل				
86. Phellodendron amurense 87. Rhus trilobata			man and a	10 N N 1 1 1			and the second			
88. Cornus rugosa						1 11 11				
90. Vitis amurensis					4	سنا				
91. Vitis vulpina 92. Lonicera iberica					L		-			
93. Liriodendron tulipifera					-	ببلب		and strends of		
94. Elaeagnus angustijolia 95. Gleditsia triacanthos			1.1.1.1.1.				-	S. Cornes officin		
96. Maclura pomifera 97. Corrus kousa	12. 4. 3.						and a second	inter sufficient		
98. Cotoneaster obscura					1000		andar	the American A . Co	States and	
99. Cladrastis tinctoria 100. Tilia platyphyllos								inter tomash of		
101. Rhus sylvestris					-		ii iii eestaata	I. Editedenting		
102. Tilia cordata 103. Tilia Maximowicziana						<u> </u>		1. Hydrotzen fan	1	
104. Sorbaria sorbifolia 105. Tilia americana						L		M. Louisty (Miles		
106. Ailanthus glandulosus				L				in mension in		
107. Tilia mongolica 108. Tilia tuan							шц	Manual attends		
109. Hydrangea radiata						-		And		
111. Tilia tomentosa		-		1		and the second		L. Comus alba		
112. Hydrangea Sargentiana 113. Evodia Daniellii						and the second s			LU LU	
114 Hamamelis virginiana	-								L iii	11.1.1

without trost were rather long. Most harmful to the vegetation of trees and shrubs was the winter-spring drought lasting from March to June. The abundant precipitation in July and August attenuated in some extent the unfavorable effect of the second period of still greater drought in the fall (Fig. 5).

#### Year 1960

The winter of this year was particularly mild, with moderate frost of short duration (mean minimal temperature of coldest month  $-6.8^{\circ}$ , absolute annual minimum  $-18^{\circ}$ C) alternating with warmer periods and profuse snowfall, rain and drizzle. The snow cover lay on the ground from Jan. 20 to Feb. 20. In May a dry spell was unfavorable to the plants. The Atlantic type of weather was most pronounced in the summer months which were cool, cloudy and rainy. With the exception of May and September which were dry, the other months had sufficient rainfall. The mean temperatures of November and December were higher than the average so that the vegetation period was prolonged.

#### Year 1961

This year abounded in precipitation, spring was very early and warm (mean temperature of February, March and April highest in the 10-year period).

In the winter of 1960/1961 severe frost occurred only in mid January (mean minimal temperature of the coldest month -6.8 °C, absolute minimum -20.4 °C). In December, February and March relatively high air temperatures were noted with frequent snow- and rainfall or drizzle — features of an Atlantic type winter.

Precipitation was very high in this year (694.3 mm), spring was very warm (mean temperatures of February, March and April highest for the 10-year period). May and the summer months were very cool, and the fall warmer than the average. Moreover this year had the longest vegetation period in the years 1953/1962. Plant growth was prompted by the high temperatures and profuse precipitation in the spring months.

The longest time interval without frost amounting to 226 days in the 10-year period (last ground frost on April 10 and first on Nov. 19) was also favorable to the course of the development cycle.

#### Year 1962

A prominent feature of the weather conditions was the long lasting, not very severe but windy winter of 1961/1962. The highest frost was recorded in December, at the turn of January and February and in March. The vegetation period was exceptionally cold. Only April was very warm, whereas the mean temperatures of all the summer and autumn months were lower than the average. Thus, the sum of heat available to the plants in this period was very low. Its amount is shown on

the climatic diagram as approximately the surface area between the temperature curve and the line at 5°C. Precipitation was frequent in winter, and its maximum fell to May and August. In April it was insufficient as well as in June when a spell of dry weather occurred. Another unfavorable factor for plant vegetation was the lowest insolation (1360.0 hrs) in the 10-year period.

# 4. Analysis of the Phenological Seasons Over a Ten-Year Period and Their Relations with the Seasonal Rhythm of Vegetation of Trees and Shrubs

On the climatic diagrams and phenological spectra of the particular species it is clearly seen that the dates marking the beginning of the nine phenological seasons varied widely in the period 1953–1962 (Fig. 5). The greatest deviations were noted as regards the beginning of spring, and early fall (up to 47 days), early spring (up to 37 days), whereas the dates of the beginning of golden and late fall varied very little (Table 5). The duration of summer and early fall also varied. Most constant proved to be the duration of golden fall (deviations 10–20 days). The date of early spring and beginning of spring depends on the character of the preceding winter, after a mild winter of Atlantic type, the events marking the beginning of early spring (flowering of *Corylus avellana* and *Tussilago farfara*) occurred very early, mostly in the first days of February, and the beginning of spring (flowering of *Acer platanoides* and *Betula verucosa*) was recorded around mid April (1957, 1958, 1959, 1961, 1962).

The wide differences in the duration of the phenological summer seem to be related to the course of temperature and the sum of precipitation and insolation in the vegetation period. As seen, on the climatic diagrams (Fig. 5), cold and moist spring and summer months with low insolation caused a considerable delay in the occurrence of early fall (1960, 1961, 1962).

The results of phenological observations of many years (Table 6) prove that the seasonal rhythm of development of trees and shrubs of foreign origin is frequently closely connected with the phenological seasons in this country.

The times of bud opening, foliation, flowering and fruiting and also of change of color and shedding of leaves are determined by the internal rhythmicity of the plants, resulting from their genetic properties and the influence of the environment.

In the following species analysis of the development cycle of the trees and shrubs in the period 1953–1962 demonstrated an almost regular coincidence of the flowering phenophase with the period of early spring: Acer rubrum, Acer saccharinum, Cornus mas, Viburnum fragrans, Cornus officinalis, Corylopsis platypetala (starts flowering), Forsythia Giraldiana (starts flowering), Forsythia ovata.

The above enumerated trees and shrubs flowering very early, long before the development of leaves, originate from various geographical regions, i.e. the Atlantic part of North America (*Acer rubrum, Acer saccharinum*), from central Europe (*Cornus mas*), from Japan and Korea (*Cornus officinalis, Forsythia ovata*) and from



\*1. Aesculus turbinata

\*2. Berberis koreana

\*3. Cornus alba

\*4. Cornus Hemsleyi

- \*5. Lonicera coerulea
- \*6. Prunus subhirtella
- \*7. Ribes aureum
- \*8. Sorbaria sorbifolia

\*1. Aesculus turbinata \*2. Ailanthus glandulosa

\*4. Juglans Sieboldiana

\*6. Prunus subhirtella

\*7. Tilia americana

\*3. Cornus rugosa

- 1955 7.5% 436,6 mm 0 6 8 123 (5) (4) 120 80 40 105 70 35 90 60 30 75 50 25 60 40 20 45 30 15 30 20 10 15 10 5 Feb. Mar. Apr. May June July Aug. Sept. Oct. Nov. Dec. 5 Jan. 6.7°C -10 ... 1 . . 1111 ...... 1111 1 1 . . . 1 . . . . 1 1 1 .... 1 1 .... 11 1 . 1 J. 1 1 11 1 1 1 1 1 1 1 1 1
- 1. Acer saccharinum
- \*2. Aesculus turbinata
- \*3. Berberis koreana
- 4. Calycanthus floridus
- \*5. Cornus alba
- \*6. Cornus Hemsleyi
- \*7. Cornus stolonifera
- 8. Cotoneaster horizontalis
- \*9. Cotoneaster obscura
- \*10. Cotoneaster racemiflora
  - 11. Hamamelis mollis
- \*12. Hydrangea xanthoneura
- 13. Kolkwitzia amabilis
- 14. Lonicera thibetica
- 15. Prunus subhirtella
- \*16. Ribes aureum
- \*17. Sorbaria sorbifolia
- 18. Viburnum fragrans
- 19. Acer palmatum
- 20. Gymnocladus canadensis
- 21. Lindera aestivalis
- \*22. Liriodendron tulipifera
- 23. Pterostyrax hispida



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			5- 10-	Jan. Feb. -3.6 °C -15.3 °C	Mar.	Apr:	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
*1.	Aesculus turbinata			1	4	-			4  1				1	4
*2.	Berberis koreana					1					000		0	i' li
*3.	Cornus alba					-		1				1	-	1
*4.	Cornus Hemsleyi		-		1						Vi		-	
*5.	Cotoneaster obscura		-					-			I STATE		<u>यतत्वला</u> त	1
*6.	Cotoneaster racemiflora		10					1	1					1
*7.	Evonymus latifolia		-			-					0 0 0 0 1		1	1
8.	Hydrangea petiolaris		1			-			4		-		1	 
9.	Hydrangea radiata				-					1 1			i Dars	
*10.	Liriodendron tulipifera				1	1						None I		
*11.	Lonicera coerulea								li	1.10	-	1	-	1
*12.	Magnolia kobus var. borealis		-									600.	D	1
13.	Prunus subhirtella				-	-		••	1		1	Ville	Lange of	
*14.	Ribes aureum				-				•	• • •	1.1.1.1	-	Illinois	
15.	Viburnum Sargentii							<u>.</u>	l <u>;</u>				000=	1
16.	Calycanthus floridus		1		1	-			1	-100	-			
17.	Corylopsis platypetala				-	-				1	THAT		L'inner	
18.	Acer palmatum								4	(1909)	in main	Vir		1
19.	Gymnocladus canadensis					and an	1	1			-			
20.	Kerria japonica								1	1	etals.		l Hannon	1
21.	Rhus sylvestris				1		1		1 21		-	Vin		1
*22.	Vitis amurensis			THI			1		<u>.</u>		0000			long_

		120 80 40- 105 70 35- 90 60 30 75 50 25- 60 40 20- 45 30 15- 30 20 10-	1958	0	03	95	6		mm
		15 10 5-			<u> </u>				
		5-	Jan. Feb. - 5.1°C	Mar: Ap	r: May Ju	ine July	Aug. Se,	of. Oct. No.	. Dec. !
1.	Acer rubrum	10-	- 15.3°C		·····				
2.	Acer tataricum		1.011						
*3.	Aesculus turbinata			- Solar				••••	
*4.	Berberis koreana								True
*5.	Cornus alba	T	1			• •			
*6.	Cornus Hemsleyi					····	••		
*7.	Cornus stolonifera						885000		
8.	Cotoneaster horizontalis								PIB 10 21-11
*9.	Halesia tetraptera								
*10.	Hydrangea xanthoneura						· · · · · · ·	THE REAL OF	
11.	Juglans nigra				1 1 1		· · · · · ·	111	
*12.	Liriodendron tulipifera							· • • • •	•
*13.	Lonicera coerulea					****			
*14.	Lonicera Maackii								1
*15.	Magnolia kobus var. borealis						1 1	1	
16.	Magnolia salicifolia						1 1		
17.	Prunus subhirtella				=		I I		
*18.	Ribes aureum				<u> </u>	1	   	100000000000000000000000000000000000000	
19.	Sorbus americana			1			0 0 0 0		1
20	Vihurnum sargentii								1
21	Acer palmatum					1	1 010		1
22	Gymnocladus canadensis				11			1111	
23	Kerria japonica	- dal				1	1		
24	Lindona acativel's				111				
24.	Linaera aestivalis	The	1	1		1			1
25.	Pterostyrax hispida	E		/				BURNET	58



\*1. Aesculus turbinata

\*2. Berberis koreana

\*3. Cornus alba

\*4. Cornus stolonifera

5. Cotoneaster horizontalis

\*6. Cotoneaster obscura

\*7. Cotoneaster racemiflora

\*8. Hydrangea xanthoneura

\*9. Liriodendron tulipifera

\*10. Lonicera coerulea

11. Prunus subhirtella

\*12. Ribes aureum

13. Viburnum Sargentii

14. Calycanthus floridus

15. Lonicera thibetica

\*16. Sorbaria sorbifolia

17. Acer palmatum

18. Gymnocladus canadensis

19. Lindera aestivalis

20. Pterostyrax hispida





\*1. Berberis koreana

11.10

- 2. Calycanthus floridus
- 3. Corylopsis platypetala
- \*4. Cornus amomum
- 5. Cornus officinalis
- \*6. Cotoneaster racemiflora
- 7. Cotoneaster horizontalis
- \*8. Lonicera coerulea
- 9. Lonicera iberica
- \*10. Lonicera Maackii
- 11. Lonicera Maximowiczii
- 12. Morus alba
- 13. Prunus subhirtella
- 14. Viburnum Sargenti
- \*15. Viburnum lantana
- 16. Acer palmatum
- 17. Evodia Daniellii
- 18. Lindera aestivalis
- \*19. Vitis amurensis
- \*20. Vitis vulpina

		135 120 105 90 75 60 45 30 15	90 80 70 60 50 40 30 20 10	45- 40- 35- 25- 20- 15- 5- 5-	1962 Jan. Feb. -37°C	① Mar.		3 y y Jun	a July	3	Z. © © Sept. 0.	2°C 477	4.2 mm
4.4				10-	-18.4 °C								1
*1.	Berberis koreana					1		1	1				1
2.	Calycanthus floridus					1							1
3.	Cotoneaster horizontalis							1	1				1
*4.	Liriodendron tulipifera					180			1				1
*5.	Lonicera alpigena					1		1	1			-	1
*6.	Lonicera coerulea						11	1	•••••	1			1
*7.	Magnolia acuminata					1	! !!		11	1		27	1!
8.	Morus alba											-	11
9.	Prunus subhirtella								11	1			1!
10.	Ribes alpinum					-		····· 11		••		100000	1
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12.	Sorbus aucuparia			A	<u>,                                     </u>						· · · · ·	× 1	1
13.	Viburnum Sargenti			Ante			11		·····				11
*14.	Viburnum lantana								· · · · ·		•••	1 1 1	
15.	Acer palmatum			21					11	1			1
16.	Elaeagnus angustifolia			And.	<u> </u>					1	ligeoco de la constante de la	1111111111	
17.	Gymnocladus canadensis			-		1		1				1	
18.	Lindera aestivalis			201				-				L.L.	1
19.	Rhus sylvestris			ANR		1		1		1			-
20.	Viburnum Carlesii									1		 	1

Fig. 5. Phenological spectra for selected species of trees and shrubs against the weather conditions presented by the method of Gaussen-Walter diagrams [39] for the period 1953-1962. The species denoted by asterisks are characterized in the Kórnik Arboretum by a high adaptive ability. The phenological seasons are denoted by numbers from 1 to 8. (Explanations to phenological spectra and climate diagram on p. 35).

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ιa	$\boldsymbol{U}$	C.	2

	Date of Onset for the Phenological Seasons in the Years 1953-1962														
	1954	1955	1956	1957	1958	1959	1960	1961	1962						
1. Early spring	April 2	April 1	April 2	Feb. 27	Feb. 28	March 10	March 20	March 2	March 2						
of the spring	May 3	May 2	May 2	April 17	May 4	April 17	April 22	April 8	April 20						
3. Spring 4. Farly	May 18	May 19	May 21	May 15	May 19	May 3	May 14	April 29	May 6						
summer	June 8	June 16	June 6	June 8	June 6	May 22	June 1	May 30	June 10						
5. Summer	July 3	July 10	July 10	July 1	July 9	June 22	July 5	June 23	July 10						
6. Early fall	Aug. 20	July 21	Aug. 7	Aug. 16	July 23	July 20	Sept. 4	Sept. 27	Sept. 9						
7. Golden fall	Oct. 7	Oct. 10	Sept. 29	Sept. 29	Oct. 6	Sept. 22	Sept. 25	Oct. 3	Sept. 23						
8. Late fall	Oct. 14	Oct. 19	Oct. 15	Oct. 8	Oct. 14	Oct. 4	Oct. 16	Oct. 8	Sept. 24						
9. Winter	Nov. 23	Dec. 3	Nov. 18	Dec. 1	Dec. 11	Nov. 29	Dec. 17	Nov. 25	Dec. 6						

Table 6

The Dates of the Phenological Stages for Selected Species

	-Moy B	-10-10-	01-2-	Leaves	001-10	041 30	Flowers		Fruits			
Species	Opening of buds	Opening of blades	Beginning of change of coloration	Maxima change of coloration	Beginning of fall	End of fall	Beginning of flowering	End of flowering	Beginning of ripening	Full ripeness	Beginning of fall	Remarks
1 1001	2	3	4	5	6	7	8	9	10	11	12	13
Acer circinatum Pursh.	Nov. 4	Apr. 30 May 9 May 9	047, 19 041, 19	Oct. 19 Oct. 19 Oct. 20	(Qct. 35 (Oct. 19 (Oct. 22	Qur.23 Oct. 25 Nov. 1	Apr. 29 May 13 Mar. 29	May 22 May 6 May 16			-	no (futiting) no (futiting)
1953 1954	March 25 May 5	Apr. 11 May 8	Sept. 19 Oct. 2	Oct. 17 Oct. 10	Oct. 9 Oct. 8	Oct. 29 Oct. 20	Apr. 20 May 10	Apr. 30 June 3	Sept. 3	 Oct. 11	Oct. 20	no fruiting
1955 1956	Apr. 29 May 2	May. 2 May 9	Oct. 1 Sept. 20	Oct. 20 Oct. 14	Oct. 20 Oct. 8	Nov. 3 Oct. 24	May 10 May 15	June 6 June 5	Sept. 20 Sept. 18	Oct. 3 Oct. 4	Oct. 22 Oct. 23	no (unital) no (unital)
1957 1958 1959	Apr. 10 Apr. 30	Apr. 23 May 11	Sept. 6 Sept. 12	Oct. 7 Oct. 4	Oct. 5 Sept. 30	Oct. 14 Oct. 25	Apr. 27 May 14	May 20 June 1	Aug. 26 Aug. 30	-	Oct. 20 Oct. 24	An Danking
1959 1960 1961	Apr. 2 Apr. 6 Apr. 6	Apr. 24 May 4 Apr. 12	Sept. 4 Sept. 14	Oct. 8 Oct. 26	Oct. 6 Oct. 18	Nov. 8 Nov. 10	Apr. 25 May 7 Apr. 18	May 15 May 24 May 6	Sept. 10 Sept. 5 Sept. 21	Oct. 2	Oct. /*	
1962	Apr. 3	Apr. 20	Sept. 20	<u>64:</u> 41	Sept. 20 Sept. 17	Oct. 26	Apr. 24	May 18		Oct. 15	-	
Acer Ginnala Maxim.	NIK B	Mar 23	Bha. 36	Oct. 22	()a: 11	10ce: 3.8	-	-	1.5.	-		
1953 1954	Apr. 1 May 3	Apr. 6 May 8	Sept. 19 Sept. 24	Oct. 17 Oct. 7	Sept. 28 Sept. 26	Oct. 20 Oct. 12	May 20 June 3	May 27 June 19	Aug. 24 Aug. 30	Sept. 10 Sept. 19	Sept. 20 Sept. 22	
1955 1956	May 1 May 4	May 5 May 10	Oct. 8 Sept. 29	Oct. 20 Oct. 14	Oct. 10 Oct. 4	Nov. 2 Oct. 24	June 8 May 30	June 24 June 16	Sept. 8 Sept. 10	Sept. 19 Sept. 20	Sept. 19 Sept. 22	no forming
1957 1958	Apr. 4 May 2	Apr. 20 May 10	Oct. 5 Oct. 6	Oct. 12 Oct. 15	Oct. 7 Oct. 12	Oct. 19 Nov. 3	May 23 May 27	June 10 June 14	T	<u>–</u>	TO	no fruiting no fruiting

1	1957	2	3	0.4	5	6	007	8	9	10	11	12	Do 13 mil
	1050	Ang 3	Apr 10	Sept 18	Oct 14	Oct 12	Oct 22	May 30	June 16	Sept. 10	Sept. 30	Sept. 22	no flowering
	1939	Apr. 5	Apr. 10	Sept. 10	000. 14	000. 12	000. 22	June 8	Puese 24	Sand S	and the	Sept. 10	and fruiting
	1960	Apr 12	May 5	Sept. 18	Oct. 20	Oct. 7	Oct. 28		history	NUC 24	200-10	act - so	no flowering
	1700	1101.12	induj o	popular	Ger. 12	1		1.	Men 25		1912		and fruiting
	1961	Apr. 6	Apr. 15	Oct. 7	Oct. 22	Oct. 15	Oct. 27	-	-	_	-		no flowering
	1701	pii o	p-i								inst.	1	and fruiting
	1962	Apr. 7	Apr. 23	Sept. 11	Oct. 13	Sept. 19	Oct. 18	Apt. 24	144647718	141.742	00015	-	no flowering
		Vba' e i	Apr. 12	Sopt. 20		Sept. 28.	09, 26	Apr. 18	WINY R	Sept. 21		1	and fruiting
Acer mons	spessu-	VES BEE	May 4 1	Sept. 14	080626	0911487	Nov. 160	May 7	May 24	Sept.3.d)	19	1. 7.1	1992
lanum L.	1020	Apr. 2	ybc st	26br. H.	050.8	Occ. 6	Nov. 8	Apr. 25-	May 15	-Sob1-10	071 5	Con No.	a share to
	1953	Apr. 14	Apr. 20	Oct. 9	Oct. 22	Oct. 20	Nov. 2	Apr. 20	All and	100-100	Tard	00-000	no fruiting,
		10	Apr. 23	Sent. 6	Oct 1	Oct. 5	09 14	Apr. 27	Man 20	Ans 26		04 50	flowers froze
	1954	May 12	May 18	Sept. 30	Oct. 26	Oct. 5	Nov. 2	May 14	May 26	Sept. 3	Oct. 11	Nov. 4	rd 20
	1955	May 7	May 10	Oct. 28	Nov. 2	Oct. 28	Nov. 19	May 12	May 28				no fruiting
	1956	May 13	May 15	Oct. 18	Oct. 24	Oct. 20	Oct. 31	May 15	May 30	Aug. 28	Oct. 17	Nov. 15	
	1957	Apr. 30	May 10	Oct. 7	Oct. 14	Oct. 14	Oct. 29	Apr. 29	May 18	Jul -	-	= 10	no fruiting
	1958	May 12	May 17	Sept. 29	Oct. 18	Oct. 25	Nov. 28	May 13	May 22			-	no fruiting
	1959	Apr. 26	Apr. 30	Oct. 10	Oct. 19	Oct. 19	Oct. 28	Apr. 29	May 6		-	-	no fruiting
	1960	May 4	May 9	Oct. 18	Oct. 20	Oct. 22	Nov. 3	May 8	May 16	Aug. 12			~ .
	1961	Apr. 14	Apr. 18	Oct. 7	Oct. 25	Oct. 15	Nov. 11	d <del>8,</del> 0	-	CO <del>lde</del> (9			no flowering
		Nev. 23	Das	housen	01. 75	Dec. L	T De.		12. 127 Jan	124	and the second	1	and fruiting
	1962	Apr. 23	Apr. 25	Sept. 19	Sept. 30	Oct. 10	Nov. 2	TRANSTOR	THE REAL PROPERTY	Tratana and		1991	no flowering
		- prost	01	contraint	OL -	OL.	R.	-	GI	al	Fineness	01	and fruiting
Acer niko	ense	- Burning	obcomt	61	chunge	acheuna	100	Barango	DUT	Runnigh	Full	Schoone	Remarks
Maxim.				and the second	Muzima	0 . 17	0.00	1	11 10		1.00		a consisting of
	1953	Apr. 16	Apr. 23	Oct. 6	-	Oct. 17	Oct. 29	Apr. 26	May 12			No. 16	no iruitimg
	1954	May 8	May 10	Oct. 5	Oct. 15	Oct. 10	Oct. 20	May 12	May 29	Aug. 30	Oct. 11	Nov. 15	
	1955	May 7	May 10	Oct. 3	Oct. 20	Oct. 20	INOV. 3	May 15	June o	Sept. 20		Oct. 25	
	1956	May 9	May 14	Sept. 20	Oct. 14	Oct. 4	Oct. 1/	Iviay 20	June 8	Sept. 18	_	001. 28	15010 0

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1	1621	2	3	4	5	6	7	8	9	10	11	12	13
deer rubru	1957	Apr. 29	May 3	Sept. 20	Oct. 7	Oct. 5	Oct. 19	May 11	May 25	Aug. 30	_	Oct. 25	
	1958	May 10	May 14	Sept. 21	Oct. 20	Oct. 12	Oct. 30	May 17	May 27	Sept. 18	04-30	Oct. 28	no traiting
	1959	Apr. 25	May 1	Oct. 4	Oct. 14	Oct. 14	Nov. 2	May 6	May 20	Sept. 16	Oct. 8	Oct. 17*	no initrate
	1960	May 9	May 13	Oct. 22	Oct. 30	Oct. 26	Nov. 10	May 15	May 24	Sept. 20	-	-	no footing
	1961	Apr. 18	Apr. 25	Sept. 26	Oct. 20	Sept. 30	Oct. 26	May 10	May 19	-	Sept. 21	0000	and Environment
	1962	Apr. 25	Apr. 28	Sept. 3	Oct. 13	Oct. 8	Oct. 19	May 16	June 4	-		-	TAN Indition
Acer palm	atum	What I	West 13	Suc la		Sept 30	84 5	10 ANK	<b>小服。</b> 是一	and se	-	04: 52	The post
Thunb.		May 4	Notes a	2000 32	and the second	Stpl. 26	097 32	May 16	1006 7		and a		no training
	1953	Apr. 11	Apr. 18	Sept. 19	Oct. 17	Oct. 20	Oct. 29	W112 22	1040-2	V06-30	Sept. 20	000 53	no flowering
	1953	NOT THE	ybe 30	2019		Sept. 15	Oct. IT	YAL: 20	May 26	WIR 34	Sept. 19	Oct. 7	and fruiting
	1954	May 8	May 12	Sept. 24	Oct. 5	Oct. 10	Oct. 30		-	_			no flowering
					1 Stands				1 martin				and fruiting
	1955	May 4	May 7	Oct. 1	Oct. 15	Oct. 28	Nov. 3	-12	12 22	-	Oct 27	po <u>r</u> er i	no flowering
		No. CO	And 25	000 1	Oct. 16	001.9	661.26	Yar IA	VE B	Not all a			and fruiting
	1956	May 8	May 14	Sept. 20	Oct. 17	Oct. 18	Oct. 28	-	112-13	0977	1000-1	-	no flowering
		The state	Cost 24	195E 8	Get. 26	82.15	Nov 2	YEL M	A Charles	Mar In		315- 30	and fruiting
	1957	Apr. 25	Apr. 30	Sept. 30	Oct. 7	Oct. 10	Oct. 19			Seat 23	-	NOC 20	no flowering
		ADL 33	11. 8	125	124 19		Mark 2	The seal	NEW 19-1				and fruiting
	1958	May 2	May 11	Sept. 17	Oct. 4	Oct. 18	Dec. 2	-	1-3	09-0-0		New 24	no flowering
	-			and in 1	1. And the second								and fruiting
	1959	Apr. 10	Apr. 27	Sept. 16	Oct. 8	Oct. 19	Nov. 14	in the second	TATES THE	A	and the	manin da	no flowering
					0.11	0.00	NT 14	30 32	UDA TO	ache in i	10000 190	005 320	and fruiting
	1960	Apr. 20	May 9	Sept. 21	Oct. 16	Oct. 20	Nov. 14	NET-26	100-18	1000		1000 - 100 -	no flowering
	10.01		1. 17	0.10	0.1.01	0-1 11	No.	June 2	1.000 18	Oet, 11.1	04, 2	Diox 23	and fruiting
	1961	Apr. 14	Apr. 17	Oct. 2	Oct. 24	Oct. 11	Nov. 4	1000	Sun T		Selve Ne		and fruiting
	1063	A 12	A	Cont 17	Oct 1	Oct 7	Nov 1	and all	2002			100	no flowering
	1902	Apr. 12	Apr. 24	Sept. 17	001. 4	001. /	1407. 1	No. St. Col	A CENTER OF	21.47			and fruiting
		Apr. 4	Ass. Ar	Detra 14	inder an	and the second	and the	MINO. 16	and a			Talland	und muning

1 (895	2	3	4	5	6	7	8 .	9	10	11	12	13
Acer platano- ides L.	where the	ydar, 19	(dearright)	0== 5+	()=1 11	Star. 3	-	-	-	-		and Spatial
1953	Apr. 2	Apr. 16	Sept. 19	Oct. 16	Sept. 28	Oct. 30	Apr. 9	Apr. 26	Sept. 10	Sept. 26	Oct. 15	Car (formation
1954	May 6	May 9	Oct. 5	Oct. 20	Oct. 15	Nov. 12	May 5	May 22	Oct. 5	Oct. 15	Oct. 20	and fourthing
1955	May 1	May 3	Oct. 12	Nov. 10	Oct. 20	Nov. 17	-	-	-	-	-	no flowering and fruiting
1956	May 6	May 9	Sept. 24	Oct. 25	Oct. 18	Oct. 31	May 6	May 18	Oct. 4	-	Nov. 28	the Summer
1957	Apr. 24	Apr. 29	Oct. 5	Oct. 19	Oct. 10	Nov. 5	Apr. 20	May 10	-	-	-	no fruiting
1958	May 6	May 10	Oct. 8	Oct. 30	Oct. 16	Nov. 15	May 8	May 18	Sept. 23	-	Nov. 20	l no Dowering
1959	Apr. 22	Apr. 27	Oct. 8	Oct. 26	Oct. 14	Nov. 6	Apr. 14	Apr. 28	-	-	-	no fruiting
1960	May 3	May 7	Oct. 12	Oct. 28	Oct. 20	Nov. 7	Apr. 26	May 15	Oct. 2	Nov. 7	-	mo Beweißte
1961	Apr. 15	Apr. 20	Oct. 7	Oct. 16	Oct. 9	Oct. 26	Apr. 12	Apr. 25	-	-	-	no fruiting
1962	Apr. 15	Apr. 22	Sept. 25	Oct. 17	Sept. 29	Nov. 7	Apr. 22	AMay 4		Oct. 27	Nov. 6	no flowering
Acer pseudo-	Nors 2	Note 10	COL CAR	200.2	1.1.1.1.1.1.1	1000 12						and finiting
platanus L.	1. May 83	May 12	Sept. 104	1 Sec. 34	10 cm 10	045 30	-May 12				Second 22	no flowering
1953	Apr. 1	Apr. 20	Sept. 8	OT TH	Sept. 15	Oct. 17	Apr. 30	May 26	Aug. 24	Sept. 19	Oct. 7	and finding
1954	May 14	May 17	Sept. 15	001.13	Sept. 28	Oct. 28	May 25	June 5	Aug. 30	Sept. 20	Oct. 22	- as Hornpole
1955	May 4	May 9	Sept. 26	0 <u>001</u> 19	Sept. 26	Oct. 25	May 16	June 3	-	-	-	no fruiting
1956	May 8	May 13	Sept. 18		Sept. 20	Oct. 24	May 20	June 8	Sept. 26	-	Oct. 25	
1957	May 5	May 9	Sept. 26	_	Sept. 26	Oct. 19	May 15	June 12	-	-	-	no fruiting
1958	May 10	May 13	Oct. 8	-	Oct. 12	Nov. 10	May 16	May 30	Sept. 26	-	Oct. 28	Course providents
1959	May 1	May 5	Sept. 10		Oct. 4	Oct. 26	May 11	May 23	-	1	-	no fruiting
1960	May 7	May 10	Sept. 10		Sept. 20	Oct. 28	May 15	June 10	Sept. 28	-	-	and hadding
1961	Apr. 14	Apr. 20	Oct. 5	Oct. 13	Oct. 7	Nov. 3	May 16	May 23	_	04		no fruiting
1962	Apr. 22	Apr. 23	Sept. 17	Oct. 15	Sept. 21	Oct. 24	May 10	June 6	_	Oct. 27	09_38	
Acer rubrum L.	1942	( 現代, 45	K18, 60	Oct	0.088, 47	CRC, DO	P. MILA CO.		A		04.25	Do fraising
1953	Apr. 11	Apr. 20	Sept. 8	Sept. 19	Sept. 15	Oct. 10	March 28	Apr. 14	May 20	June 3	June 10	
1954	May 9	May 12	Oct. 5	Oct. 15	Oct. 5	Oct. 18	Apr. 20	May 6	May 26	June 11	June 17	13
1955	May 3	May 7	Oct. 10	Oct. 25	Oct. 20	Nov. 2	Apr. 29	May 4	June 20	-	Aug. 15	o (contrinen

1	2	3	4	5	6	7	8	9	10	11	12	13
1956	May 10	May 14	Oct. 6	Oct. 17	Oct. 14	Oct. 24	Apr. 27	May 10	June 30	_	July 20	padojasop
1957	Apr. 27	Apr. 30	Sept. 28	Oct. 7	Oct. 10	Oct. 19	Apr. 2	Apr. 10	Sec. 19	Segge 30	0_0	no fruiting
1958	May 8	May 13	Oct. 4	Oct. 15	Oct. 12	Oct. 30	Apr. 27	May 10	June 10	POT I	July 15	
1959	Apr. 24	Apr. 29	Sept. 15	Oct. 2	Sept.28	Oct. 8	March 28	Apr. 9	OC1	00000	0.000013	no fruiting
1960	May 4	May 9	Sept. 16	Oct. 20	Oct. 12	Oct. 26	Apr. 14	Apr. 20	June 4	=	POT ?!	no Fruiting
1961	Apr. 13	Apr. 18	Oct. 5	Oct. 17	Oct. 11	Oct. 27	March 23	Apr. 14		-	Se <u>nt</u> 30	no fruiting
1962	Apr. 18	Apr. 21	Oct. 18	Oct. 23	Oct. 22	Oct. 25	Apr. 16	Apr. 22	May 28	_	1 200 1	very poor
			Septers and	140788, 300	CONSL. DE	once 70	1000	Victo 10	Serie 20		BET 9	fruiting
Acer saccha-			eren av		Capital Ch	100000.00	A BRING S	WEIGHT AND				- no fraitine
rinum L.			AUX. 28	000.0	Sebr St	ARE 20	CONV -	Jaco J	Sept. 20			
1953	Apr. 4	Apr. 14	Sept. 28	Oct. 17	Oct. 6	Oct. 21	March 23			-	-	flowers froze
1954	May 8	May 10	Oct. 5	Oct. 27	Oct. 17	Nov. 28	March 31	Apr. 12	May 23	June 10	June 15	and the second
1955	May 1	May 4	Oct. 10	Oct. 30	Oct. 12	Nov. 17	Apr. 3	Apr. 13	June 3	-	June 25	
1956	May 3	May 9	Oct. 8	Oct. 24	Oct. 10	Nov. 22	Apr. 4	Apr. 18	petit on	-	-	no fruiting
1957	Apr. 25	Apr. 29	Oct. 7	000	Oct. 10	Nov. 12	March 22	Apr. 4	200	-		no fruiting
1958	May 6	May 11	Oct. 4	000	Oct. 18	Nov. 26	Apr. 5	Apr. 29	polar -	-		no fruiting
1959	Apr. 22	Apr. 27	Sept. 23	Inter 180	Oct. 8	Nov. 8	March 18	March 24	May 10	-	May 30	
1960	Apr. 27	May 6	Aug. 23	Oct. 28	Oct. 22	NON 38	March 26	Apr. 2	and the set	-	001 10	no fruiting
1961	Apr. 15	Apr. 20	Oct. 7	Oct. 17	Oct. 11	1000 20	March 7	March 20	-	00000	000 130	no fruiting
1962	Apr. 16	Apr. 22	Oct. 11	Oct. 22	Oct. 17	Nov. 5	Apr. 8	Apr. 22	-	-	-	no fruiting
Acer tataricum L.	Apr 14		Da. s	000 18	Oct. 9	Dire. 10	Apr. 30	helay 30		Sept. 26		
1953	March 25	Apr. 10	Sept. 19	Oct. 17	Sept. 28	Oct. 22	May 12	May 28	Aug. 24	Sept. 10	Nov. 20	
1954	Apr. 30	May 6	Sept. 28	Oct. 23	Oct. 2	Oct. 29	May 26	June 14	Aug. 30	Sept. 15	Nov. 18	
1955	May 1	May 3	Oct. 10	Oct. 17	Oct. 15	Nov. 2	June 2	June 18	Oct. 3	Oct. 23	Nov. 29	no fruition
1956	May 2	May 9	Sept. 26	Oct. 16	Oct. 4	Oct. 22	May 30	June 17	Sept. 5	Sept. 24	Nov. 18	no flowering
1957	Apr. 6	Apr. 24	Sept. 26	Oct. 10	Oct. 8	Oct. 14	May 20	June 8	Aug. 20		Nov. 20	- med franking
1958	May 2	May 10	Sept. 18	Oct. 20	Sept. 27	Oct. 28	May 27	June 16	Aug. 26	0.11.30	Nov. 20	43
1959	Apr. 4	Apr. 20	Sept. 14	Oct. 10	Oct. 4	Oct. 22	May 10	June 9	-	-		no fruiting
							1.5				1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	

1 1958	2	3 10	4	005 30	6	7	8	9	10	11	12	13
1960 1961 1962	Apr. 12 Apr. 4 Apr. 12	May 4 Apr. 8 Apr. 22	Sept. 14 Sept. 20 Sept. 14	Oct. 18 Oct. 20 Sept. 27	Sept. 26 Oct. 2 Sept. 24	Nov. 3 Oct. 24 Oct. 18	May 22 May 16 May 26	June 12 May 27 June 16	Aug. 22	Sept. 20 Sept. 15	968 <u>7.</u> 18 740 <u>7.</u> 29 7407.18	no fruiting
Aesculus hippo-	Willief 25	MEMO	Sele 219	109 30	SEA 198	1973. 22	Willy 42	潮烈。如	CALL See	Selfer 1 20	049: 290	
castanum L.	Maria		1001 12	Nev. 10	0di. 29	PIOY. 19						no flowering
1953	March 30	Apr. 4	Sept. 15	Oct. 22	Oct. 6	Nov. 2	May 2	May 25	- 1	-	-	no fruiting
1954	Apr. 30	May 3	Oct. 5	Oct. 10	Oct. 15	Nov. 5	May 19	June 11	Sept. 25	Oct. 10	Oct. 15	UO LUITORE
1955	Apr. 28	May 1	Oct. 10	Oct. 27	Oct. 22	Nov. 2	May 17	June 8	Sept. 26	-	Oct. 13	Do marma
1956	Apr. 26	May 3	Sept. 28	Oct. 18	Oct. 18	Oct. 28	May 21	June 10	Sept. 24	-	Oct. 6	a building
1957	Apr. 5	Apr. 10	Oct. 5	Oct. 12	Oct. 10	Oct. 26	May 12	June 5	Sept. 20	-	Oct. 10	Summer of
1958	Apr. 26	May 2	Oct. 8	Oct. 18	Oct. 16	Nov. 5	May 19	June 2	Sept. 22	No-7	Oct. 12	Rentification
1959	Apr. 5	Apr. 15	Sept. 16	20-5	Oct. 4	Nov. 6	May 9	May 23	Sept. 20		Oct. 12	DO HOURS
1960	Apr. 12	Apr. 26	Sept. 20	Nov. 7	Oct. 16	Distre Va	May 12	June 8	a come	00-27	Oct. 18	and the state of t
1961	Apr. 4	Apr. 7	Oct. 2	Oct. 13	Oct. 9	Nov. 3	Apr. 24	May 31	Sept. 10	100 200	Sept. 17	
1962	Apr. 13	Apr. 16	Sept. 22	Oct. 17	Oct. 5	Nov. 5	May 8	June 6	Sept. 25	-	-	
Aesculus par-	Arx 1		Sept. S		Sept. 15		Apr. Ma	11/20		Der State	1 20	Carrow Carro
viflora Walt.	May 14		Sept. 15		Sept 18		May 23	fuere 1	A. 12	1. Mar 1. Mar 1	1962 32	
1953	Apr. 1	Apr. 16	Sept. 30	Oct. 26	Oct. 17	Nov. 6	July 6	Aug. 30	-		-	no fruiting
1954	May 4	May 9	Oct. 6	Oct. 26	Oct. 18	Nov. 12	July 17	Aug. 10	1000	-	0.00	no fruiting
1955	Apr. 30	May 3	Oct. 20	Qua 23	Oct. 25	Nov. 17	July 28	Aug. 22	Oct. 25	-	Nov. 2	Alex heat
1956	May 5	May 9	Oct. 14		Oct. 22	Nov. 8	July 30	Aug. 30	-	-	00230	no fruiting
1957	Apr. 3	Apr. 27	Oct. 7	Ord 20	Oct. 12	Nov. 11	July 12	Aug. 3	Partie d		-	no fruiting
1958	Apr. 29	May 11	Sept. 26		Oct. 16	Oct. 21	July 23	Aug. 26	Sept. If	-	-	no fruiting
1959	Apr. 8	Apr. 25	Oct. 8	-	Oct. 16	Oct. 30	July 16	Aug. 12	Oct. 4		Oct. 25*	and the second
1960	Apr. 20	May 9	Sept. 6	Oct. 28	Oct. 22	Nov. 7	July 20	Aug. 22	-	Øx⊒27.,	-	fruits not
	May 10		Det 4 1		1914 13				Hune 30		166 20	developed
1961	Apr. 6	Apr. 14	Oct. 7	Oct. 25	Oct. 9	Oct. 29	July 15	Aug. 5	- ( <u> </u>			fruits not
	Maps		Oats		0085				ME025	Judd D.	1000517	developed
1962	Apr. 15	Apr. 22	Sept. 27	Oct. 23	Oct. 9	Nov, 2	July 29	Aug. 20	Dur <u>m</u> 20		Table	no fruiting

1 1020	2		4	5	6	7	8	9	10	11	12	13	
Aesculus pavia L.	Apr. 28	WED 1	Aug. 30	The second	Aller The		May 14	Mpy 26	1042 50	-		- The second second	
1953	Apr. 3	Apr. 9	Sept. 19	Oct. 17	Oct. 2	Oct. 22	May 4	June 10	Sept. 19	Sept. 30	Oct. 6	Constanting of the	
1954	May 1	May 4	Sept. 17	Oc.t 17	Oct. 6	Oct. 27	May 24	June 19	Sept. 30	Oct. 4		12301-24	
1955	Apr. 30	May 2	Sept. 28	Oct. 25	Oct. 10	Nov. 2	May 25	June 28	Oct. 1	Oct. 10	Oct. 13	March States	
1956	May 6	May 8	Sept. 13	Oct. 14	Sept. 28	Oct. 24	May 31	June 18	Oct. 1		Oct. 9	No months	
1957	Apr. 12	Apr. 18	Sept. 4	Oct. 12	Oct. 5	Oct. 19	May 18	June 14	Sept. 24	Sept. 8	Sept. 30	A State	
1958	May 2	May 7	Oct. 4	Oct. 18	Oct. 10	Oct. 25	May 24	June 18	Sept. 24	Sept. 28	Oct. 11		
1959	Apr. 8	Apr. 15	Sept. 8	Oct. 16	Oct. 6	Oct. 26	May 10	June 10	Sept. 26	000-1	Oct. 9	and for distance	
1960	Apr. 17	Apr. 26	Sept. 15	Oct. 16	Oct. 7	Nov. 3	May 18	June 13	Sept. 28	Sept. 22	001-34	The Desident	
1961	March 25	Apr. 3	Aug. 28	Oct. 9	Sept. 28	Oct. 25	May 4	June 3	Sept. 30	Aug. 29	Oct_8	and mailton	
1962	Apr. 16	Apr. 18	Aug. 25	Seot. 17	Sept. 11	Oct. 30	May 16	June 20	A02. 30	Oct. 8	1004- 9	for the lot	
Aesculus turbi-	19129 33	Apr. 28	Out 6	04, 22	04.22	Dec. 12	June 2	1100 22	Sept. 7	Sept. 20	Sapt. 29	imat	
nata Bl.	Apr. 26	May 1	Aug. 30'	F BO	QE G	091,28	WEA 12.	Turne 4	NOS. 14	In The	NOTE YO		
1953	March 31	Apr. 12	Oct. 12	Oct. 22	Oct. 17	Nov. 16	May 16	May 26		-	-	flowers froze	
1954	May 4	May 7	Oct. 12	Oct. 30	Oct. 20	Nov. 18	May 22	June 12	Sept. 24	Sept. 27	Sept. 29	no fruction	
1955	Apr. 30	May 3	Oct. 15	Oct. 28	Oct. 28	Nov. 12	May 20	June 11	Sept. 29	111-10-1	Oct. 5		
1956	May 5	May 7	Sept. 27	Oct. 22	Oct. 22	Oct. 31	May 25	June 8	Sept. 20		Oct. 2		
1957	Apr. 17	Apr. 24	Sept. 26	Oct. 12	Oct. 12	Oct. 26	May 16	May 31	Sept. 18	-	Oct. 2		
1958	May 5	May 9	Oct. 2	Oct. 25	Oct. 20	Nov. 18	May 22	June 16	Sept. 15	-	Oct. 5		
1959	Apr. 2	Apr. 16	Oct. 10	Oct. 19	Oct. 19	Oct. 26	May 6	May 26	Sept. 15	-	Sept. 30		
1960	Apr. 19	Apr. 27	Oct. 12	Oct. 28	Oct. 26	Nov. 5	May 16	May 30	Sept. 20		Od 6		
1961	Apr. 11	Apr. 13	Oct. 5	Oct. 18	Oct. 9	Nov. 10	Apr. 30	May 30	00-01	Sept. 26	NETRI		
1962	Apr. 13	Apr. 18	Sept. 13	Oct. 22	Oct. 9	Nov. 5	May 10	June 14	-	Oct. 3	-		
Ailanthus glan-	Max 16	Marc. 22	Oct. 12-	and the second	Oas He	Oct 26+	The second			-			
dulosa Desf.	The second	1	1.18	and the	Const Ser	Sec. St.	Sec. 7	1100 12	Der a				
1953	May 20	May 26	Oct. 20	OT IL	Oct. 22	Nov. 6	Act; 24	AUT. 21	-	=	-	no flowering and fruiting	
1954	May 16	May 24	Oct. 8	Oct. 20	Oct. 15	Oct. 23	July 3	July 20	Sept. 12	Oct. 30	Dec. 18	no Barrison	
1955	May 17	May 25	Oct. 15	0.0	Oct. 28	Nov. 2	July 7	July 20	Oct. 28	-	Nov. 10		
1	Raid	2	3	4	5	6	7	8	9	10	0.1100	12	13
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1	1956	May 24	May 30	Sept. 28	00-11	Oct. 26	Oct. 31	Magenza	1000	ANER	Sep <u>ar</u> 20	=	no flowering
		A.M. 2.	APR.							to a lot	Same in	a starting	and fruiting
1	1957	May 16	May 22	Oct. 12	and the	Oct. 17	Oct. 26	100	1090 14	-	ener a	-	no flowering
No scholer, which		1000 12	ache 12	Der -	10002 10	and the	2001 10		and an		07 1000	in mark	and fruiting
Carting and the	1958	May 18	May 26	Sept. 24		Sept. 30	Nov. 18	July 10	July 25	Oct. 28	-	_	and succession
1	1959	May 6	May 11	Oct. 8		Oct. 10	Oct. 26	July 6	July 22	Sept. 28	Oct. 19	ashress.	THO IS A REAL OF THE REAL OF T
1	1960	May 16	May 22	Oct. 12	-	Oct. 22	Nov. 7	July 18	Aug. 2	Oct. 20	-	-	
1	1961	Apr. 23	May 1	Oct. 5	Oct. 23	Oct. 27	Nov. 17	July 4	July 18	Sept. 22	-		
1	1962	Apr. 27	May 16	Sept. 13	1000 ( DD	Sept. 25	Nov. 21	1000	Surge at	100	-	09. 10	no flowering and fruiting
Berberis kord	eana	N445 290	福田入田.	1081 82	(0)5( 138	1000 52	38941 33		ange giv	ALC: NO	1	1995, 22 I	
Palib.	Dest	MIR SIM	14497.15	3061 18	044-30	(691-50)	3894 63		100000 200	1994 31	5601. 27	129	
1	1953	Apr. 4	Apr. 7	Aug. 26	Sept. 20	Oct. 11	Oct. 26	May 12	May 26		-	205-18	no fruiting
marg BJ, 1	1954	Apr. 26	May 1	Aug. 30	Oct. 2	Oct. 12	Oct. 28	May 25	June 4	Aug. 14	_	Ser-17	
discular fall	1955	Apr. 22	Apr. 28	Oct. 6	Oct. 28	Oct. 22	Dec. 12	June 3	June 22	Sept. 7	Sept. 20	Sept. 29	
1	1956	Apr. 30	May 5	Sept. 20	Oct. 17	Oct. 5	Jan. 1	May 30	June 20	Aug. 30	Sept. 14	Nov. 6	
Million Wall	1957	March 16	March 28	Sept. 12	Oct. 3	Sept. 30	Nov. 13	May 20	June 3	Aug. 2	Aug. 29	Oct. 8	
1	1958	Apr. 4	Apr. 28	Sept. 12	Oct. 25	Oct. 23	Dec. 8	May 29	June 24	Aug. 20	Sept. 22	Oct. 24	no fracting
1	1959	March 25	Apr. 6	Sept. 20	Oct. 19	Oct. 8	Oct. 28	May 10	June 2	Aug. 20	Oct. 4	Nov. 4	no initiag
1	1960	Apr. 11	Apr. 20	Aug. 10	Oct. 10	Oct. 5	Nov. 10	May 21	June 6	Aug. 20	Sept. 28	NOT BE	
1	1961	March 12	March 22	Sept. 3	Oct. 22	Sept. 18	Nov. 20	May 1	May 31	Aug. 27	Sept. 8	06 <u>11</u> 30	no fruiting
1	1962	Apr. 7	Apr. 11	Sept. 15	Oct. 23	Oct. 19	Oct. 31	May 30	June 17	Aug. 27	_	Oct. 18*	to failing
Berberis	1992	ARE 30	MIPA D	Sep. 28	040.25	10%* (()7	009473	May 125	Acres 31	0511	054 10	Oct. 13	no froiting
vulgaris L.	ner	MPRA S	ANTE .	California (	1044 11	1000 10	1241 31		1000 10	159/11/130	008.1	Out: 25*	
1	1953	Apr. 2	Apr. 7	Aug. 24	Oct. 14	Oct. 12	002.35	May 10	May 20	Aug. 16	Sept. 10	Oct. 2	theits not
Anycular part	1954	Apr. 28	May 4	Aug. 30	_	_		May 14	May 28	July 20	_	_	developed.
1	1955	Apr. 14	Apr. 28	Oct. 10	100-10	Nov. 17	Dec. 14	May 30	June 29	Sept. 5	Oct. 5	Oct. 28	fruits unripe
1	1956	Apr. 27	May 5	Oct. 7		Oct. 15	Dec. 28	June 29	July 8	Aug. 23	Sept. 17	+3	developed
1	1957	March 29	Apr. 8	Oct. 2	Nov. 2	Oct. 6	Nov. 29	May 11	June 5	July 30	Sept. 7	Oct. 8	pontration a

1 100	2	3	4	5	6	7	7	8	9	10	11	13
1958	Apr. 9	May 4	Sept. 12	00.24	Oct. 21	Jan. 1	May 28	June 8	Aug. 28	_	Oct. 25	
1959	March 20	Apr. 2	Oct. 19	0-18	Oct. 26	Nov. 17	May 8	May 24	Aug. 28	Oct. 26	Nov. 20	no ficencian
1960	Apr. 10	Apr. 17	Sept. 17	101-10	Oct. 5	Nov. 29	May 19	June 6	Aug. 22	Sept. 27	Nor-28	Ward Scotting
1961	March 8	March 18	Sept. 21	ON:HS	Oct. 14	Nov. 30	May 2	May 25	Aug. 20	00-10	Oct. 14	
1962	Apr. 7	March 14	Sept. 19	Sept. 2	Sept. 21	Nov. 13	May 21	June 12	Aug. 28	-	-	no fruiters
Calycanthus		Abov 11			C				Carro Mi			
floridus L.		Ster 15		and in		10mm 74			acpr. ou		NOT OF	- no. training
1953	Apr. 7	Apr. 18	Sept. 16	Oct. 12	Oct. 14	-	May 2	May 29	-	-	-	no fruiting
1954	May 7	May 9	Sept. 20	Oct. 20	-		May 20	June 14	-		- 1	no fruiting
1955	May 6	May 11	Oct. 7	Oct. 29	Oct. 27	Dec. 3	May 15	Oct. 20	-	-	-	no fruiting
1956	May 6	May 12	Sept. 24	Oct .18	Oct. 13	Nov. 30	May 28	Aug. 2		Nov. 6	Nov. 13	injured by frost
1957	Apr. 2	Apr. 8	Sept. 21	Oct. 16	Oct. 20	Nov. 4	May 22	Aug. 5		Oct. 29	Nov. 27	no flowenes
1958	June 3	May 7	Sept. 29	00128	Oct. 4	Nov. 14	May 21	Aug. 26	Oct. 12	-	Nov. 7	and creating
1959	Apr. 3	Apr. 22	Oct. 4	Nov. 3	Oct. 30	Nov. 17	May 8	July 12	1000 L	-	0020	no fruiting
1960	Apr. 13	May 5	Aug. 20	Oct. 23	Sept. 27	Nov. 17	May 17	Aug. 2	Aug. 18	-	_	
1961	Apr. 1	Apr. 15	Sept. 12	Oct. 23	Sept. 25	Nov. 19	May 5	June 20			-	no fruiting
1962	Apr. 16	Apr. 22	Sept. 23	Oct. 26	Oct. 20	Nov. 26	May 16	Aug. 17	-		-	no fruiting
Carpinus be-	May I		Od. 25	Nov III	Now 3	122580 00	There of	ALC: NO	100 - 10	anter en	Stran C.	and manying
tulus L.	May E		09.24	Participant of the second	10m 28	1000 38	and a start	10.00	7.00 30	and the		THE REAL PROPERTY AND
1953	March 27	Apr. 8	Sept. 18	Oct. 22	Sept. 26	Oct. 27	Apr. 13	Apr. 20	Aug. 20	Sept. 8	Oct. 6	firtuita countra
1954	Apr. 22	May 4	Oct. 2	Nov. 4	Oct. 8	Nov. 10	May 7	May 13	Oct. 2	Oct. 25	Nov. 8	
1955	Apr. 29	May 3	Oct. 12	Oct. 28	Oct. 20	Nov. 12	May 34	June 3	Sept. 30	=	-	no flowering and fruiting
1956	Apr. 30	May 7	Sept. 24	Oct. 20	Oct. 8	Oct. 31	May 7	May 13	Oct. 8	-	Nov. 25	The Manual and
1957	Apr. 3	Apr. 18	Sept. 6	Oct. 12	Oct. 5	Oct. 19	Apr. 24	Apr. 27	-	1 = 1		no fruiting
1958	Apr. 29	Apr. 8	Sept. 20	Oct. 25	Oct. 18	Nov. 3	May 8	May 12	Oct. 8		Nov. 20	
1959	Apr. 2	Apr. 15	Sept. 20	Oct. 12	Oct. 4	Oct. 20	Apr. 15	Apr. 24	-	-	-	no fruiting
1960	Apr. 12	Apr. 28	Sept. 8	Oct. 18	Oct. 7	Oct. 26	May 4	May 9	Sept. 20	-		0.(000010.000)

1 1020	2	3	4	5	6	7	8	9	10	11	12	13
1961 1962	March 28 Apr. 15	Apr. 6 Apr. 18	Sept. 25 Sept. 11	Oct. 15 Oct. 20	Oct. 9 Sept. 21	Nov. 10 Nov. 21	Apr. 8	Apr. 17	00 8		M <u>04.</u> 25	no fruiting no flowering and fruiting
Carpinus ja-	Adam - Sta	Mare	Sec. 15	Oct. 28	Oct. 30	120x-13			Ter T	aur sa	Nov. 6	and Rawall
ponica Bl.	Monthly	1000	and the		Sec. 2				She to	and a state	001 0	C1
1953	Apr. 4	Apr. 15	Oct. 12	Oct. 22	Oct. 20	Nov. 16	Apr. 17			-		flowers froze
1954	May 6	May 8	Oct. 23	Nov. 3	Oct. 28	Nov. 28	May 9	May 12	Aug. 30	Sept. 28	Oct. 25	
1955	May 1	May 5	Oct. 25	Nov. 12	Nov. 2	Nov. 29	May 9	May 14	Oct. 20	-	Nov. 5	<b>C1</b>
1956	May 15	May 18	Oct. 24	Oct. 31	Oct. 28	Nov. 25	West 2	Julia 30	-	-		and fruiting
1957	Apr. 7	Apr. 27	Oct. 10	Oct. 29	Oct. 17	Nov. 12	10100 15	100.37	AUR. 18	1 -	-	no flowering
	Lamor S	1000 33	arter an						0 . 10	-	NT 0 07	and fruiting
1958	May 6	May 14	Sept. 19	Oct. 25	Oct. 2	Nov. 21	May 10	May 14	Oct. 12	001 5	Nov. 27	A Real Property lines
1959	Apr. 9	Apr. 20	Sept. 28	Oct. 19	Oct. 16	Nov. 12	Apr. 26	Apr. 29	Sept. 25	- 20	Oct. 1/*	( puper )
1960	Apr. 21	May 9	Oct. 5	Oct. 28	Oct. 22	Nov. 7	May 4	Sept. 30	Sept.	Sept. 30	Oct. 21	C1
1961	Apr. 9	Apr. 13	Oct. 7	Oct. 20	Oct. 10	Nov. 22	調査員	NE B	Antes 2	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	Dec. 3	and fruiting
1962	Apr. 15	Apr. 21	Sept. 1	Oct. 22	Oct. 14	Oct. 28	Apr. 22	Apr. 30	Aug 20	Sept. 29	1900-24	no fraiting
Carpinus orien- talis Mill.	March 25	Apr. 20	Acre 10	0d. 10	Cer an	Active Providence	Thy R	Jame 6	Acg - 70	Sept. 28		
1953	Apr. 16	May 4	Sept. 15	24	Sept. 26	Oct. 22	Apr. 25	Apr. 30	V 14 38		0000	no fruiting
1954	May 15	May 19	Sept. 27	Oct. 15	Oct. 30	Nov. 18	May 11	May 22	Oct. 13	Oct. 20	Nov. 28	
1955	May 5	May 15	Oct. 10	Nov. 10	Oct. 20	Nov. 12	May 12	May 17	Oct. 20	Nov. 17	Nov. 28	
1956	May 17	May 23	Sept. 27	Oct. 18	Oct. 14	Oct. 26	May 20	May 26	Oct. 12	10/2-34	Nov. 25	1.1.1
- 1957	May 5	May 14	Oct. 8		Oct. 10	Nov. 19	Apr. 29	May 9	Oct. 10	-	Nov. 27	
1958	May 13	May 18	Sept. 12		Oct. 18	Nov. 21	May 12	May 17	Oct. 12	-	Nov. 28	Contractor
1959	Apr. 19	May 4	Sept. 16	Oct. 22	Oct. 6	Nov. 4	Apr. 25	Apr. 28	Oct. 16	Nov. 4	Nov. 4*	13
1960	May 9	May 17	Sept. 20	Oct. 28	Oct. 22 https:/	Nov. 7	May 10	May 17	Oct. 22		Nov. 7	

1 1020	2 30	3	4	5	6	7	8	9	10	12	11	13
1961	Apr. 7	Apr. 9	Oct. 7	Oct. 24	Oct. 9	Oct. 27	_	_	1	_	_	and frainns
1962	Apr. 15	Apr. 19	Sept. 1	Oct. 22	Oct. 11	Oct. 29	Apr. 22	Apr. 29	-	Sept. 29	-	no flowering and fruiting
Carya cordi-	YOU'T	ybar 8	) Sept. 19	04 50	Sept. 26	Oct. 27	1				-	to gaserio
formis K. Koch	Apr. 4	Apr. 20	Sent. 18		001.2	Oca 20	the second					and Paraman
1953	Apr. 14	Apr. 26	Sept. 19	Sept. 27	Sept. 19	Oct. 2	May 15	May 25			_	and Fraitfala
1954	May 6	May 11	Sept. 29	Oct. 2	Sept. 30	Oct. 19	May 26	June 5	Sept. 30		Nov. 22	no fruiting
1955	May 5	May 15	Oct. 10	Oct. 18	Oct. 12	Oct. 25	282000	17012-38	_	-	-	and annual
1956	May 8	May 17	Sept. 24	Oct. 6	Oct. 4	Oct. 16	June 11	June 16	Oct. 2	-	Nov. 7	no flowering
	Vbc 50	Wb1 50	Sept. 15	Oct. 19	OPT R	May. 10	June 18	JULY 26		-		and fruiting
1957	May 1	May 12	Sept. 26	Oct. 5	Oct. 5	Oct. 12	γn <u></u> ∔ 10	100-25	-	-	-	no flowering and fruiting
1958	May 10	May 17	Sept. 30	Oct. 8	Oct. 10	Oct. 18	June 2	June 12	Sept. 30	-	Nov. 22	no flowering and fruiting
1959	Apr. 16	May 4	Sept. 18	Oct. 10	Oct. 4	Oct. 18	June 2	June 14	Sept. 25	-	Oct. 23	To ronglin
1960	Apr. 29	May 12	Sept. 28	Oct. 20	Oct. 18	Oct. 28	June 8	June 16	Oct. 7	-	Nov. 3	and the second
1961	Apr. 8	Apr. 22	Sept. 28	Oct. 15	Oct. 7	Oct. 25	May 13	May 19	Oct. 26		_	Dra prophose
1962	Apr. 13	Apr. 24	Sept. 17	Sept. 23	Sept. 23	Oct. 17	June-20	Janmon	-			no flowering
	Sam 18	Anabu 198	Corar63e	061 39	0000165	NOIDANTS					100	and fruiting
Carya laciniosa			14 200 1							1.1.1.1.1.1	( <b>.</b>	and foulties
Loud.	Apr. 12	May 5	Sept. 9		Oct. 20	Nov. 3	12-1					of Bowsies
1953	Apr. 1	Apr. 24	Sept. 28	Oct. 17	Oct. 17	Nov. 16	May 12	May 22	-		-	fruits eaten
	ASPLA IS	ARTIN	S. 10-3	Oral 12	Oct 13	Sept.	1000 051	-713- IV		AND ALL		by squirrels
1954	May 8	May 12	Oct. 6	Oct. 26	Oct. 26	Nov. 22	May 24	June 5	Sept. 30		.041 38	fruits eaten by squirrels
1955	May 8	May 11	Oct. 13	Nov. 2	Nov. 2	Nov. 26	May 23	June 3	Sept. 30		Oct. 25	and draukons
1956	May 13	May 16	Oct. 8	Oct. 24	Oct. 26	Nov. 20	June 2	June 8	Oct. 8		Oct. 28	and accountly
1957	May 5	May 17	Oct. 8	Oct. 19	Oct. 19	Nov. 30	May 29	June 8	Sept. 30	Arrest the	Oct. 23	Part In the second
1958	May 12	May 17	Oct. 16	Oct. 28	Nov. 3	Dec. 20	June 8	June 18	Sept. 28	Aug 7,28	Oct. 22	e (socialities

1 182	2	3	4	5	6	7 10	8	9	10	11	12	13
194	9 Apr. 28	May 4	Sept. 28	Oct. 19	Oct. 19	Nov. 18	May 16	May 5	Sett 30		OFT THE	no fruiting
196	May 8	May 12	Oct. 7	Oct. 28	Oct. 20	_	May 28	June 9	July 11	-	Oct. 28	ov poulerales
196	1 Apr. 17	Apr. 21	Oct. 6	Oct. 11	Oct. 15	Nov. 10	May 7	May 12	Sept. 30	Oct. 3	-	Service services
196	2 Apr. 18	Apr. 28	Sept. 22	Oct. 15	Oct. 13	Nov. 11	May 18	May 30	-	Oct. 21	-	inne cales
Castanaa sativ		X器、港口	Ser. 158	82.24	122 18 1	Nov. 18	AGE MAN	1000 44				Clowers inter
Mill	May 6	May 8	Oct. 23	Nov. 1	Gen, 28	Nov. 28	Nug 2	Mag 12	Aug. 30	Supt. 38	Oct. 75	
104	3 Apr 4	Apr. 18	Oct. 26	Oct. 26	Oct. 22	Nov. 12	State_9	Max-14	1910	-	Nov_S_	no flowering
15.	J ripri i	Tipit to		9.51 51	Carly 23	our is	15		-	-		and fruiting
194	A May 7	May 10	Oct. 5	000-12	Oct. 10	041-22	July 3	July 20	001-50		-	no fruiting
194	5 May 1	May 4	Oct. 8	Nov. 12	Oct. 20	Nov. 20	July 10	July 30	Oct. 10	-	Oct. 25	no Revening
194	6 May 8	May 13	Oct. 14	Oct. 25	Oct. 18	Oct. 30	110-5	1000 14	Sept-25.	-	0-23	no flowering
				Carl 25	Cea, 2	Nov, 31	Star 19	ORAY AND	Cont 12		North	and fruiting
194	7 Apr. 30	May 4	Oct. 5	Oct. 19	Oct. 12	Oct. 29	400-20	gan	201-20	-	Grant 35	no flowering
17.	,			04. 28	0:4. 21	Neve 7	2657 6	Sept. 20	1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1	Sept. 80	Oct. 77	and fruiting
194	8 May 6	May 10	Oct. 14	Oct. 28	Oct. 18	Nov. 15	July 10	July 25	-	-	-	no fruiting
194	9 Apr. 20	Apr. 26	Sept. 15	Oct. 19	Oct. 6	Nov. 10	June 18	July 26	-	-	-	no fruiting
196	0 Apr. 29	May 9	Sept. 16	Oct. 20	Oct. 12	Nov. 7	June 28	July 26	Dat-2	1940 - 20 V	NOR C	no fruiting
196	1 Apr. 12	Apr. 18	Oct. 5	Oct. 14	Oct. 7	Oct. 25	June 26	July 18	-	-	-	no fruiting
190	62 Apr. 19	Apr. 22	Sept. 17	Oct. 13	Sept. 27	Oct. 30	July 17	June 5	35bi-30	-	Nov. 22	no fruiting
Cercidiphyllum	1 18 LA	you te	20br 10	Sept. 27	2sb(* 13	QCF IZ	10ay 15	Mary 33		1		nin fruiting
iaponicum Sie	b.				No. and	2	ACT IN	1000 12	100 10	Chiefe State 1	1000	
19:	3 Apr. 1	Apr. 8	Sept. 19	Oct. 20	Sept. 26	Oct. 27			-	-	-	no flowering
10.0	T				(3-4 13-1)		Sec. 20				New and	and fruiting
19:	54 Apr. 12	Apr. 30	Sept. 28	Oct. 12	Sept. 30	Oct. 18	Ve-P		UT. SA		No.	no flowering and fruiting
19	5 May 1	May 2	Oct. 10	Oct. 28	Oct. 13	Nov. 2	Apr. 26	May 9	Sept. 29		Oct. 27	
19:	6 Apr. 30	May 2	Sept. 24	Oct. 22	Oct. 8	Oct. 28	Apr. 28	May 14	Sept. 30	<u>1</u>	Nov. 9	13
19:	57 March 27	Apr. 9	Sept. 26	Oct. 12	https://	ren 21	g.Br. 4	Apr. 9	-	-	-	no fruiting

	1	2	3	4	5	6	7	8	9	10	11	12	13
	1958	Apr. 29	May 6	Sept. 12	Oct. 20	Oct. 16	Nov. 5	and a	And a second	1 200 <u>2 - 50-</u>	Ver le		no flowering
	1959	Apr. 2	Apr. 9	Sept. 15	Oct. 14	Oct. 15	Oct. 26	Wen_rt	1000 3	<u>68_10</u>	Var Ia	Sept. 21	and fruiting no flowering
	1960	Apr. 4	Apr. 20	Sept. 18	041 33	Oct. 2	Oct. 20	May 23	3mme 13	=	July 26	-	and fruiting no flowering
	1961	Apr. 5	Apr. 8	Oct. 2	Oct. 17	Oct. 12	Oct. 27	Apr. 17	May 4	Oct. 25	Milk-10	=	and fruiting
	1962	Apr. 5	Apr. 17	Sept. 13	Oct. 18	Sept. 24	Oct. 29	Apr. 27	May 2	_	Sept. 17		no fruiting
Cladrast ctoria	<i>is tin-</i>	34549 2	May J	Sept. 16 Sect. 23	0= 31	Odr. 2	Dec. 4 Nev. 45	June 3 Mex. 16	June 13	Sept. 10 Sept. 3	-	Sept. 291 Sept. 144	
cionia	1953	May 18	May 23	Sept. 15	Oct. 26	Oct. 17	Nov. 16	Ney 31	100 13	Sept. 20 Sept. 19	Oct. 3 Oct. 12	04 <u>1</u> 33 -041 18	no flowering
	1954	May 6	May 11	Sept. 18	Oct. 26	Oct. 26	Nov. 18	June 14	June 27	Sept. 18	-	Oct6	no fruiting
	1955	May 3	May 8	Sept. 22	Oct. 25	Oct. 10	Nov. 3	June 30	July 10	1092	-	-	no fruiting
	1956	May 7	May 11	Sept. 10	Oct. 22	Oct. 4	Oct. 28	June 14	June 30	-	-	-	no fruiting
	1957	May 3	May 14	Sept. 6	Oct. 10	Sept. 26	Oct. 21	300-10	101772	=	-	-	no flowering
	1958	May 6	May 17	Sept. 10		Sept. 17	Oct. 28	June 20	June 30		-	-	no fruiting
	1959	Apr. 10	Apr. 29	Oct. 6	000	Oct. 16	Nov. 4	Mar 10	1000 13	-	July 26	-	no flowering
		Car 12	Ann I	Can See	001.24	Cast - 18	New 21	Alay 18	June 6	July 3	July 2		and fruiting
	1960	Apr. 12	May 5	Sept. 9	-	Oct. 20	Nov. 3	SALAS 12	2000	and and	-	oc line	no flowering
	10/1	A	A	Sant 20		Sept. 30	Sont 1	May 28	Sume 19	1072-14	yntr g	Oct. 10	and fruiting
	1961	Apr. 4	Apr. 19	Sept. 30		Sept. 23	Sept. 1	1480. 5W	8000 BH	AUR. 3		Oct. 23	and fruiting
	1962	Apr. 9	Apr. 20	Sept. 6	Oct. 11	Sept. 18	Oct. 21	Oct. 21	Hor e	1490. 16 1990. 19	Avent: 38 Sector 5	Nor, 1	no flowering
Cornus a	lba L.	Alley Inc.	Arra di	1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.	104		1.2502 S	Apr. 11	A STATE	AND AL	Sept. 16	OCL 28	and manning
	1953	March 28	Apr. 9	Sept. 2	Sept. 18	Oct. 1	Oct. 24	May 22	July 14	Aug. 14	Aug. 26	Sept. 6	no ultima
	1954	Apr. 26	May 4	Sept. 4	-	Oct. 3	Oct. 26	June 2	June 16	Aug. 18	Aug. 28	-	a terminan

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Tab	le 6 (	continued	)

								1 1214/09 14	A CANAL AND	I WHA JS		
1 1893	2	3.0	4	5	6	0°7 St	8	9	10	Auli 26	12	13
1955	Apr. 29	May 3	Oct. 1	Oct. 15	Oct. 5	Nov. 11	June 5	Oct. 6	July 18	_	Oct. 13	and fruiting
1956	Apr. 30	May 6	Sept. 18	Oct. 12	Sept. 30	Dec. 20	June 1	Sept. 3	July 10	Aug. 28	Nov. 1	no flomerica
1957	March 18	Apr. 11	Sept. 10	000.01	Sept. 23	Nov. 11	May 28	Oct. 23	Aug. 3	Cet 3	Oct. 23	and finiting
1958	May 3	May 8	Sept. 3	OE IS	Sept. 30	Oct. 4	May 28	June 19	July 14	Aug. 6	Oct. 10	no flouren
1959	Apr. 4	Apr. 14	Sept. 28	_	Oct. 16	Nov. 12	May 15	June 10	June 30	-	July 30	and Proting
1960	Apr. 19	May 6	Aug. 12	Oct. 25	Oct. 21	Nov. 2	May 29	June 10	July 22	Sept. 3	-	no flowerin
1961	March 18	March 30	Aug. 30	-	Sept. 18	Oct. 27	May 18	June 6	July 3	July 7		and fraiting
1962	Apr. 17	Apr. 19	Sept. 17	Oct. 15	Oct. 9	Oct. 30	May 30	June 13		July 26	-	THO HOUTER
Cornus amomum	May T	May 10	Oct 3		Sept. 17	Carl DR	First 7	1484 20	13-160			and fruiting
1953	Apr. 7	Apr. 9	Sept. 28	Oct. 10	Oct. 16	Nov. 14	June: 14	June 30	( art 10	- F	CTT 25	no flowering and fruiting
1954	May 10	May 12	Sept. 30	Oct. 10	Oct. 12	Nov. 3	May 23	June 2	July 7		-	no fruitine
1955	Apr. 30	May 4	Oct. 5	Nov. 14	Oct. 27	Nov. 19	July 20	Aug. 8	Sept. 18	-	Oct. 6	my (empose
1956	Apr. 30	May 5	Sept. 30		Oct. 18	Dec. 22	Nay 31	June 17	Sept. 20	Oct. 3	Oct. 19	sett feltiling
1957	Apr. 1	Apr. 11	Sept. 25	Oct. 18	Oct. 8	Oct. 20	July 4	Aug. 30	Sept. 19	Oct. 12	Oct. 22	- Hower and a
1958	May 2	May 9	Sept. 16	Oct. 24	Oct. 8	Dec. 4	June 3	June 13	Sept. 10	-	Sept. 29*	The Treating
1959	March 26	Apr. 18	Sept. 23	and a start	Oct. 8	Nov. 15	May 16	July 18	Sept. 3	-	Sept. 14*	no Postant
1960	Apr. 16	Apr. 21	Sept. 11	Control 1800	Sept. 25	Nov. 7	May 31	June 13	July 3	Sept. 17	-	and entimities
1961	March 12	March 29	Sept. 17	Oct. 17	Oct. 23	Nov. 10	May 15	June 3	July 1	July 10	-	
1962	Apr. 12	Apr. 17	Sept. 23	Oct. 22	Oct. 3	Nov. 15	May 23	June 12	-	July 26		
Cornus Hemsleyi	And a	Arres 000	Contra 18		04 3	1 194 20			1.	1		
Schn. et Wang.	where a		and it is	Sec. Se	0004 20	000 80	Contraction of the	Ser Sell	1 3	111 25 1	1-3-1	
1953	Apr. 7	Apr. 10	Oct. 6	Oct. 15	Oct. 20	Nov. 18	May 16	June 2	July 20	Aug. 19	Sept. 21	
1954	Apr. 29	May 3	Oct. 4	-	0000 10		June 3	June 14	Aug. 2		-	
1955	Apr. 29	May 2	Oct. 12	Oct. 31	Oct. 25	Nov. 29	June 14	June 24	July 20	Aug. 16	Aug. 22	and toulday
1956	Apr. 27	May 6	Sept. 25	-	Oct. 8	Dec. 10	June 4	June 18	July 26	Aug. 2	Aug. 8	
1957	Apr. 2	Apr. 7	Sept. 20	Sept. 23	Oct. 5	Nov. 13	May 31	May 10	Aug. 28	Aug. 10	144 9	13
1958	May 2	May 6	Sept. 19	Nov. 5	liftps:/	VPCIn 80	May 31	June 27	Aug. 20	-	Aug. 6*	6 (communed

1	1961	2	3	4	5	6	7	8	9	10	11	12	13
	1959	March 25	Apr. 10	Oct. 8	000.8	Oct. 19	Nov. 20	May 18	June 9	July 11	_	July 30*	
	1960	NAT	Apr. 20	Aug. 22	Nov. 2	Sept. 27	Nov. 21	May 31	June 17	June 28	AWS. 22	Aug. 22*	111 J. 1988 1
	1961	Apr. 20	May 9	Sept. 16	Oct. 31	Oct. 23	Nov. 23	May 16	June 6	July 17	x	1.000-2	1.1.5-1-1
	1962	March 10	March 26	Oct. 5	Oct. 23	Oct. 24	Nov. 11	June 4	June 14	181 - 18	July 31	Solit 2	
Cornus k	ousa	thay 30	1448 2		64 72	Que 18	20% 19	June 21	100 10	18 200	Aug. 24	Vill' SE	Clerki Spillingth
Hance		7137 2	Mary 21		C-10	0# 1	04,20	Tune 6	1000 30	197 13	Aug. 10.	Aug. 25	
	1953	Apr. 8	Apr. 15	Sept. 4	Sept. 20	Oct. 2	Oct. 26	-		1000 76	-	-	no flowering
		Aprich 34	Apr. 91		087 10	001 38	04 20			Lines 25	E	NE	and fruiting
	1954	May 3	May 8	Sept. 8	Sept. 20	Sept. 30	Oct. 18			State 50	-	31000 2004	no flowering
		Apr. 8	377. 16	COL: S				A PARTY AND	There IT	Tube 22			and fruiting
	1955	May 1	May 6	Over 1	Oct. 13	Oct. 10	Nov. 4	Kota S.	NOT 20	I INTE	060-3	99-71	no flowering
		Manul 122	Anualis	1.Sopt. 25	Nov. I	04.25	Nov. 12	March II	ADC. 15	Apr. 15		QQ: LE	and fruiting
	1956	Apr. 30	May 7	Sept. 18	134000 41	Oct. 10	Nov. 11	Antes :	Mag 3	Sept. 19	000-22		no flowering
		March 26	Apr. 24	005, 8	Oct. 28	Oct. 28	Nov. 15	March 16	Apr. 14	Sept. 10		Oct. 7*	and fruiting
	1957	Apr. 1	Apr. 12	Sept. 10	Nov. 4	Oct. 4	Oct. 28	June 12	July 3	Sept. 14	-	Nov. 19	no fruiting
	1958	Apr. 30	May 10	Sept. 12	Oct. 8	Sept. 21	Nov. 12	June 17	July 10	Sept. 15	Oct. 20	-	no fruiting
	1959	Apr. 6	Apr. 14	Sept. 9	Oct. 16	Oct. 8	Nov. 20	July 16	July 2	Sept. 26	000-15	Nov: 6	no fruiting
	1960	Apr. 16	May 5	Aug. 5	Oct. 15	Sept. 23	Oct. 29	June 28	July 11	Sept. 20	004-3	Oct. 13	no fruiting
	1961	March 14	March 31	QCT_15	Sept. 5	Aug. 31	Oct. 12	March 30	1911-16	NOR IS:	-	0.00 25	no flowering
		Apr. 19	Apr. 24	Sept. 2	Sept. 18	Sept. 28	04. 26	March 23	Apr. 14	Aug. 4	Sept. 10		and fruiting
	1962	Apr. 12	Apr. 18	Oct. 3	Oct. 24	Oct. 7	Nov. 7	-	-	-	-	-	no flowering
		and and a second	200 10	Sand 32	Nor 2	Rist &	Nov 20		the second		-		and fruiting
Cornus n	nas L.	ADC 11	Apc. 21	000.5	1112	Oct. 21	Nov. 21	Apr. 6	Apr. 27	Aug. 27		Sept. 6	and frotisti
	1953	Apr. 14	Apr. 18	Sept. 28	-	Sep <del>ii.</del> 29	Nov. 2	March 24	Apr. 10	Add. 22	000 23		
	1954	May 11	May 13	Sept. 18	Oct-30	0-290	(MOV. 974	March 31	May 9	Aug. 10	Aug. 26	-	no frating
	1955	May 7	May 13	Oct. 3	Oct. 16	Oct. 30	Nov. 18	Apr. 27	May 5	Aug. 20	Sept. 5	Sept. 29	as imiting
	1956	May 7	May 16	Oct. 3	Oct. 21	Oct. 6	Dec. 2	Apr. 17	May 7	Aug. 30	Sept. 16	Oct. 28*	
	1957	Apr. 1	Apr. 20	Sept. 24	Oct. 28	Oct. 4	Nov. 11	March 19	Apr. 19	10-	17	13	no fruiting
	1958	Apr. 30	May 10	Sept. 19		Oct. 9	Nov. 23	Apr. 16	May 9	Aug. 18	Sept. 20		mining

1 102	2	3	4	5	6	7	8	9	10	11	12	13
1050	Apr 3	Apr 25	Sent 22	See 12	Oct. 26	Nov. 12	March 18	Apr. 20	July 28	2001 10	Aug. 18*	
1960	Apr. 14	May 10	Sept. 17	Oct. 30	Oct. 29	Nov. 9	Apr. 11	May 5	Aug. 15	Sept. 20		
1961	March 22	March 26	Sept. 23		Sept. 29	Nov. 20	March 8	Apr. 11	Aug. 22		001_23	
1962	Apr. 11	Apr. 21	Oct. 5	i Den	Oct. 21	Nov. 21	Apr. 6	Apr. 27	Aug. 27	Ang. 6	Sept. 6	
Cornus officinalis	1.1.1.1	p	Sept. 28	_	041.16	Nov. 12	15	Fine 10			July 30	Stating Junices
Sieh et Zucc.	981- R	100 18		84 33	8at 31	3 EE - E	Max 28	June 10	1112.32	Sept. 3		no llowering
1953	Apr. 19	Apr. 24	Sept. 2	Sept. 18	Sept. 28	Oct. 26	March 23	Apr. 14	Aug. 4	Sept. 10	_	and freiting
1954	May 12	May 14	Oct. 12	Oct. 4	Oct. 12	8913	March 30	May 4	Aug. 12	100_20	-	DO LICHICSON
1955	Apr. 20	May 9	Oct. 8	Oct. 23	Oct. 22	Nov. 14	Apr. 20	May 4	Sept. 20	Oct. 9	Oct. 13	no fruiting
1956	May 5	May 16	Sept. 17	Oct. 9	Oct. 10	Dec. 30	Apr. 16	May 7	Sept. 26	Oct. 15	Nov. 6	no fruiting
1957	March 30	Apr. 25	Oct. 2	Oct. 16	Oct. 8	Oct. 29	March 16	Apr. 18	Sept. 15	Oct. 20	_	98 (Billiano
1958	May 3	May 9	Sept. 12	Nov. 4	Oct. 29	Nov. 18	Apr. 14	May 7	Sept. 14		Nov. 19	po fraithe
1959	March 26	Apr. 24	Oct. 8	Oct. 20	Oct. 28	Nov. 15	March 16	Apr. 14	Sept. 10	-	Oct. 7*	
1960	Apr. 26	May 6	Aug. 18	Nov. 4	Oct. 22	Nov. 29	Apr. 4	May 3	Sept. 19	Oct. 22	00_0	
1961	March 22	Apr. 8	Sept. 25	Nov. 1	Oct. 25	Nov. 12	March 11	Apr. 15	Apr. 15	-	Oct. 16	
1962	March 29	Apr. 21	Oct. 1	022-12	Oct. 21	Nov. 12	Apr. 5	Apr. 21	_	Oct. 3	Oct. 27	
Cornus rugosa	Max 4 26	Ant P		2507 50	Stor 30	Bar ik	Mag 16		Supt. In		Smpl. 14*	
1953	Apr. 7	Apr. 9	Sept. 28	Oct. 10	Oct. 28	Oct. 20	May II Mas 11	June 3	Alex 3	Sept. 17		no flowering and fruiting
1954	May 6	May 21	Sept. 30	Oct. 10	Oct. 4	Oct. 20	June 6	June 30	July 12	Aug. 10	Aug. 25	
1955	Apr. 30	May 5	Oct. 3	Oct. 15	Oct. 19	Nov. 14	June 27	July 10	Aug. 18	Aug. 24	Aug. 28	
1956	May 1	May 3	Sept. 19	Oct. 3	Sept. 28	Nov. 30	June 10	June 24	Aug. 18	Aug. 26	Sept. 3	
1957	Apr. 3	Apr. 10	Sept. 14	Oct. 8	Sept. 21	Oct. 18	June 7	June 21	July 29	and the second		
1958	May 1	May 8	Sept. 12	Sept. 20	Sept. 9	Oct. 21	June 20	July 1	Aug. 10	Aug. 22	Aug. 22*	
1959	Apr. 14	Apr. 22	Sept. 8	Oct. 8	Sept. 28	Nov. 5	May 10	June 20	July 27	-	Aug. 6*	
1960	Apr. 18	Apr. 23	Aug. 10	Sept. 24	Sept. 24	Oct. 8	June 18	June 29	Aug. 15			
1961	March 15	Apr. 9	Aug. 8	Sept. 27	Sept. 23	Oct. 11	June 10	June 18	Aug. 8	11		
1962	Apr. 14	Apr. 19	Aug. 29	Sept. 17	Septo 5.	/OCT1130	June 24		Aug. 15	Aug. 23	Aug. 30	

1 1828	2	3	4	5	6	7	8	9	10	11	12	13
Cornus stolo- nifera Michx.	Kgr P	Martine 23 Apr. 14	255 S	74 Nov. 11	53 19	KC. 4.	N. II	1005	You ye	200 12		and fruiting teat shedding
1953	Apr. 4	Apr. 16	Sept. 28	Oct. 16	Oct. 18	Nov. 2	May 15	June 4	July 16	July 23	Aug. 2	no flowering
1954	May 2	May 7	Oct. 3	Oct. 20	Oct. 16	Nov. 2	May 20	June 9	Aug. 22	0-13	08735	211-3
1955	May 1	May 3	Oct. 6	Oct. 26	Oct. 24	Nov. 5	June 3	Oct. 1	July 20	Sept. 5	Sept. 12	and fraition
1956	May 3	May 8	Sept. 22	Oct. 17	Oct. 1	Dec. 11	May 28	July 18	July 12	July 2	Oct. 9	no Gowerin
1957	March 30	Apr. 11	Sept. 17	Oct. 15	Sept. 28	Nov. 3	May 16	Aug. 29	June 26	Sept. 2	-	and fruiting
1958	May 3	May 8	Sept. 16	10991_026	Oct. 10	Nov. 5	June 28	Aug. 20	June 25	Aut 16	Nov. 5	no Bowering
1959	Apr. 8	Apr. 16	Oct. 8	-	Oct. 16	Oct. 28	May 11	June 6	June 20	Aug. 14	July 10*	200 200
1960	Apr. 18	May 5	Sept. 19	Oct. 24	Oct. 7	Nov. 2	May 18	June 12	July 22	1000	- File_ 22	
1961	March 12	March 31	Sept. 15	00_23	Oct. 7	Oct. 29	May 12	June 3	July 3	Sept_ 10	July 8	
1962	Apr. 16	Apr. 19	Oct. 9	Oct. 17	Oct. 11	Oct. 24	June 3	June 13	V15 50	-	July 27	no conting
Corvionsis	Water 1	(Block 1)	281 53	04.27	84 16		Ver La	1000 2	Ville So	2005 10	Aug. 13*	
nlatypetala	VBC	QBP 18	04: 1.	64 6	12 3.68	MOX SO	1000 6.	Time II	Que 55	Sopt. 29	Aug. av	NE DESI
Rehd et Wile	Matter 30		Seale C.	04118	104 10	Dec. 27	With N	inte is	100.51	69.8	MON' 30	
Rend. et wils.				0.11	0 1 10	100 3		4	1/100 33	201 10	Dec. 12	The second second
1953	May 12	May 28	Sept. 2	Oct. 14	Oct. 10		Apr. 2	Apr. 14	-	_		no faulting
1954	May 18	May 21	Sept. 4			T 1 00	Apr. 21	May 12		-	0.4. 25	no iruiting
1955	May 3	May 6	Oct. 28	Nov. 7	Oct. 30	Feb. 29	Apr. 30	May 16	Sept. 25	-	Oct. 25	no floruonin
1956	X6V. 33	W167 38	Sept. 25	000-31	060 30	DIRE IN	June 15	11112-10	Sept. 3	Sopt. 14	090 18	no Howering
	100 10				0	21	Mary 22	June 3	July 12			and fruiting
1957	March 4	Apr. 19	Sept. 23	Nov. 2	Oct. 6	Nov. 29	2004 25	TRUE DA	June 29	Sept. 14	100	no nowering
10.50			a	1	0.1.0	N 20	4	Mar. 12	Ort 6	Oct 22		and fruiting
1958	Apr. 28	May 9	Sept. 19	_	Oct. 9	Nov. 30	Apr. 22	May 12	Oct. 6	Oct. 23	_	ma Consistina
1959	March 15	Apr. 20	Oct. 8	-	Oct. 19	Nov. 25	Apr. 1	Apr. 2/	_	_	_	no fruiting
1960	March 5	May 4	Aug. 18	Oct. 25	Oct. 4	Nov. 24	Apr. 16	May 10	-	-	-	no iruiting
1961	March 8	Apr. 4	Aug. 5	Oct. 16	Aug. 31	Nov. 28	March 22	Apr. 14	Oct. 6	Oct. 15		and foulation
1962	Apr. 10	Apr. 20	Sept. 5	-	Oct. 11	Nov. 13	Apr. 18	Apr. 28	10	++	17	fruiting

				a sugar and	A second second	-						1 ISOMALIS
1 1962	VD2 10	V03 30	4 2	5	0.6 11	NO7 13	V <sup>6</sup> 8 18	9	10	11	12	AGE 13 00
Cotoneaster	Marcat 2	May 4	Aag. 18	04. 25	-Opr -1	Nov. 24	APE' 16	delay 10	1.107 28		100 184	no fruiting
horizontalis Decne	Apr., 28 March 15	Via 30		(Ja. 30	097 a	1884, 30 18864, 25	W.961-25	May 12 Mpr. 27	ANE 15	097.30	-	no fruiting
1953	Apr. 4	Apr. 7	Aug. 29	Oct. 10	000-21	New Ta	May 6	June 1	June 29	Sept. 14	Sept. 6	and fruiting
1954	Apr. 16	Apr. 22					May 22	June 3	July 12	_	-	Summa pue
1955	Apr. 22	Apr. 28	Oct. 7	Oct. 27	Oct. 30	Dec. 14	June 15	July 10	Sept. 3	Sept. 14	Oct. 18	no nosem
1956	May 30	June 18	Oct - 58	設計	Oct. 3	Nov. 12	vb. 30	May 16	Sept. 125		Oct. 25	no flowering and fruiting
1957	March 30	Apr 8	June 25	Nov. 11	Oct. 1	Novill	June 3	June 21	Sap		Get	no fruiting
1958	Apr 12	Apr 20	Oct 10	1000 M	Oct. 14	Jan. 2	June 3	July 1	June 29	Sept. 10	Dec. 12	
1959	March 20	March 26	Sept 6	Oct. 19	Oct. 16	Dec. 27	May 14	June 14	July 20	Oct. 8	Nov. 30	
blatype lata 1960	Apr 11	Apr. 19	Oct 3	Oct. 13	Nov. 2	Nov. 29	June 6	June 17	Aug. 22	Sept. 29	NOV. 12	
Contrologia 1961	March 12	March 17	Sent 23	Oct. 27	Oct. 30	Nov_15	May 15	June 9	Aug. 2	Sept. 19	Oct. 7	
1962	Apr 7	Apr. 18	Sept. 25	Oct. 22	Sept. 23	Nov. 26	May 8	June 17	Aug. 20	0.1_22	Oct. 6	1
Catanatan	Aunch-1	Average of	Sept. 2	Note	Too.	N81. 13	Anna S	1006 3	352		ANIA	
Cotoneaster	Niewehr 20	Ann. 3		67 30	Sec. 7	Bar S	21122 12	1 5000 15	3017 22	100	Color ar	-
obscura Rend.	sobe o	. VDL' 10			OCT 10	Oct. 28	MUN TI	10000 0	Sellie 20		1012 10.	
et wils.	1000 2	G GERY	20br 10	0	-OCT 10	108 2	3000 38	V08 50	30BC 25	-	MOV. 5	no flowaring
1953	Apr. 4	Apr. 9	Sept. 14	Oct. 6	Sehringe	800-9	WIRA 10	VIE SA	30Hg 20	Sept. 2	_	no nowering
1005	TATES	WISH D	pebri az		60° do	10001 11	ST KEW	3018 12	20 AIDC	3012 3.	001 3.	and fruiting
1954	Apr. 18	Apr. 26	Sept. 16	Oct. 31	Oct. 20	200-2	- Sinte	OFT.	100 30	Sopt.	Sept. 12	and fruiting
1955	Apr. 26	May 2	Oct. 30	Qct. 20	Oct. 19	Dec. 10	July 1	July 24	Sept. 22	Oct. 13	Oct. 15	und manning
1956	May 1	May 6		1001 18	81 290	Nov. 18	Nev 35	1000	3014 18	1.3017 23	Aug. 2	no flowering
mjera Mucht	intag i	intuj o			Desi. 21			1.5.1	100 10	Aug 22	Aug. 234	and fruiting
Column 210 1957	Feb. 15	March 22	Oct. 2	Nov. 11	Oct. 30	Feb. 12	Apr. 26	Aug. 3	Aug. 15*	-	A.0+ 64	leaf shedding in 1958
1958	March 20	May 4	Sept. 20	-	Nov. 10	i octil	June 28	July 14	Sept. 19	H	Nov. 2	13
1959	March 25	Apr. 8	Oct. 6		hetp36//	ren. Br	June 15	June 25	Sept. 10	700-27	Oct. 16*	e (compuned)

1 1970	2 30	3	4	5	6	7	8	9	10	11	12	13
1960	Apr. 7	Apr. 14	Aug. 22		Oct. 17	Nov. 30	June 14	July 18	Sept. 3	Oct. 17		no lionecul
1961	March 11	March 21	Sept. 23		Nov. 7		June 7	June 30	Sept. 24	Oct. 26		Sminu pon
1962	Apr. 13	Apr. 17	Oct. 5	Oct. 30	Oct. 11	Nov. 20	June 17	-	-	Oct. 6	-	no flowbridg
Cotoneaster												and fruiting
racemiflora	opr. ie	New In	DED. 19		100-14	Nov. 24		-			1000	no Llowering
K. Koch	Apr. 18	Apr. 27	Sept. 15	Nov. 5	Sept. 23	Dec. 26	June 2	June 14				nor, fraitings
1953	March 25	March 30	Sept. 9	Sept. 26	Oct. 16		May 4	May 20	July 4	Aug. 16*	-	no fraitingra
1954	Apr. 16	Apr. 24	Sept. 12	-			May 26	June 4	July 12	Aug. 14	_	and namedy
1955	Apr. 4	Apr. 28	Oct. 11	Oct. 31	Oct. 28	Nov. 18	May 20	June 15	July 20	Aug. 5	Aug 22	no training
1956	Apr. 12	Apr. 28	Sept. 24	Oct. 23	Oct. 20	Dec. 12	May 29	June 8	July 15	Sept. 10	Sent 23	no nomeona
1957	Feb. 16	March 19	Sept. 22	Oct. 10	Oct. 5	Nov. 4	Apr. 29	May 31	_			no fruiting
1958	March 28	Apr. 16	Oct. 6	Nov. 3	Oct. 18	300-11	May 17	June 23	July 1	_	Ano 13*	no maning
1959	March 23	Apr. 10	Oct. 12	Oct. 20	Oct. 16	Oct. 30	May 5	May 22	June 28	_	Ang 10	sary much lit-
1960	Apr. 8	Apr. 18	Sept. 17	Oct. 28	Sept. 25	Nov. 2	May 20	June 3	July 20	Aug. 24		no inviting
1961	March 7	March 15	Sept. 30		Oct. 17	Nov. 3	May 3	May 24	July 7	Aug. 2		no fraiting
1962	Apr. 2	Apr. 13	Sept. 24	=	Oct. 7	Nov. 5	Apr. 12	June 6		Aug. 9	-	oo (autoos
Elaeagnus angu-	KLAD R.	Talina 11	-	1000	100 25	No		-				age realing
stifolia L.	Low T	Nov-In-	1 me					1000		2 A		no finistory
1953	Apr. 1	Apr. 16	- Bene 29	_	Oct 26	Nov 18	Sec. 1	0		-	and the second s	no flowering
1967	- pri i		of ridge	_	000.20	1101. 10	Bran !	00-12				and fruiting
1954	May 6	May 10	Sec. 18		Oct 26	Nov 18	Tune 16	June 26				and fruiting
1955	May 1	May 2	Sept 16	1202.100	Sent 2	Nov 20	June 10	June 20		_		no flowering
1,00	1,100 1	intra 2	Sept. 10	Nov. 2	Dopt. 2	1101. 20	Aug 0	-			_	no nowering
1956	May 7	May 9	aine	Nem 7	Oct 28	Nov 24	Tune 10	July 8	-		_	and fruiting
1957	Apr 8	Apr 16	Dellar Ven		Oct. 10	Nov. 30	June 19	July o			_	no flamming
1757	rapr. 0		0 1 20	1 1 1 1 1	000. 19	1107. 50						and fruiting
1958	May 6	May 10	Sent 23		Oct. 28	Dec 30			-			and fruiting
1950	inaj o	may 10	Sept. 25	4	001. 20	Da. 50	44.4		10	A STORE	12	no nowering
				1							2 01510	and trutting

1	1958	2	3 10	4	5	6	7 30	8	9	10	11	12	13
	1959	Apr. 10	Apr. 22	Sept. 20	_	Oct. 28	Nov. 30	June 4	June 20	_	_	-	no fruiting
	1960	Apr. 19	May 4	-	-	Nov. 7	Nov. 34	June 19	1012-8	-	-	-	no flowering and fruiting
	1961	Apr. 5	Apr. 11	Oct. 17	Nov. 10	Sept. 2	Dec. 5	-	=		-	-	no flowering
		9. 6894	226-10		Oct-10	041-26	Nov: 18	1996 4G	- Junie 26	June 29	Sept: 14		and fruiting
	1962	Apr. 12	Apr. 20	Sept. 20	-	Oct. 7	Nov. 21		Sures S	102-12	-	-	no flowering
		YHK 12	<b>WHX: 20</b>		Oct. 27	040, 35	1210A' (38	Jum-15	July 10	Sept. 2	Sopt-14	000.34	and fruiting
Elaeagnus multiflora		May 30	hose 18			Oct. 3	Nov. 12	1.		1.77		T	and houting
Thunb.		March 30	Apr. 8.		Nov. 11	Se. 1	unit a	Lines I.	5.005	1	with a		an Finding
	1953	Apr. 4	Apr. 7	Oct. 6	-	Nov. 6	10-24	May 4	May 20	1500	200	100-12	no fruiting
	1954	May 2	May 6	Oct. 9	00-12	10-12		May 28	June 12	-	Contra to	NC-30	no fruiting
	1955	Apr. 29	May 2	Oct. 7	142-13	Nov. 30	-3	June 2	June 19		Sep <u>-</u> 27	YAT TO	no fruiting
	1956	-			NoT:	88-18 861-18	Nov. 25	June 2	June 11	105 6	300 <u>2</u> 10	805 2134	jured by frost
	1957	Apr. 2	Apr. 17	Sept. 22	Nov. 15	Oct. 14	Nov. 4	May 20	June 4	-			no fruiting
	1958	Apr. 30	May 3	Sept. 12	Dec. 2	Nov. 13	Dec. 20	May 28	June 2	Aug. 1		Aug. 25*	
	1959	Apr. 1	Apr. 3	Sept. 15	Oct. 31	Oct. 8	Nov. 25	May 7	May 30	July 26	-	Aug. 7*	
	1960	Apr. 15	Apr. 21	Aug. 15	Nov. 4	Sept. 25	Nov. 24	May 22	June 6	-	Aug. 18	-	in Planta and
	1961	March 20	March 27	Sept. 2	Beet, che	Sept. 18	_	May 8	May 21		100 100	-	no fruiting
	1962	Apr. 18	Apr. 27	Sept. 15	Nov. 5	Sept. 23	Dec. 26	June 2	June 14	-	-	-	no fruiting
Eucomia u des Oliv.	ulmoi-	A01. 15	A.94. 34	sept. 16	1268. 31	00. 20		-					and failting
	1953	Apr. 5	Apr. 18	Oct. 15	0000000	Oct. 20	100 50	1910-11	100230	Mgpl_	O-LE	_	no flowering
	19.59	in pri te	p-1	2007 33	100	L' KON	NOT	Pand 1	Juno 30	Sect. 24	Oct. 25		and fruiting
	1954	May 2	May 6	1000-35	_	092-13	102 30	10000 14	1/12 18	Sept. 1	050-11	-	no flowering
		Fail IS		(206, 2	PROV. 11	Qct. 30	121 13	Apr. 28	Asile 1	Aug. Dr			and fruiting
	1955	Apr. 30	May 11	Oct. 27	2	Nov. 22	Dec. 10	Fund 24	Bull That		1	No <sup>10</sup> 2	no flowering and fruiting
-	\$154	March 25	April 1	and the		https://	Ircin or	a pl		South the		13046	J (COBINING)

1	1956	2	3	4	5	6	7	8	9	10	11	12	13
	1956	May 11	May 22	20-1	-	Oct. 19	Nov. 23	10-2	Jure 12		-	-	no flowering
	1057	1 10		0.110	E.	0.10		See. 2	1700 er	July. 28	Aug. 19	Sept. 10	and fruiting
	1957	Apr. 18	May 5	Oct. 16	-	Oct, 12	Nov. 27	Mat 23	June 8	Apr. 18	Sent. 21	-	no flowering
	1958	Apr 16	May 12	Sent 15	Oct. 28	Oct 22	Nov 24	Apr. 28	May 25		Aug. 24		and fruiting
	1750	Ap1, 10	Iviay 12	Sept. 15		001. 22	1400. 24	10029-30	June 16	Aug: 37	Sept: 12	000012	no flowering
	1959	March 28	Apr. 25	Sept. 15	Oct. 25	Oct. 6	Nov. 6	May 18	June 12	Sept. 2		001 2	no flowering
		Apr. 12	p ==	bopti it	Nov. 4	000.0	1.01. 0	May 23	June 15	Sapt. 3			and fruiting
	1960	Apr. 17	May 11	Aug. 10	Oct. 29	Sept. 25	Nov. 22	May 14	May 20	Yor 19	_	002.8*	no fruiting
	1961	March 19	Apr. 15	Sept. 11	Nov. 7	Sept. 17	Nov. 26	_	_	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	Sent. 20	109 11.	no flowering
		San- 21	Aller C.	Et 32	83.11	Salt.	State 10	Allen Sta	1		2401 33	04 30	and fruiting
	1962	Apr. 17	Apr. 22	Sept. 3	Oct. 26	Sept. 22	Nov. 21	-	-	A	Sect. 17	0.0	no flowering
-	1	White and	000.5	Seen in	Out: No	84: 23	Ona 25		Treate an	Setter 284	sen2	00-16	and fruiting
Evodia Da	iniel-	Autor Bal	A Starter	Conter True	000 10	000: 40	1000	1420A 23	Anno 16	WINE 10	5408 58	Server 27	
III Hems	1052	Apr 30	May 18	Oct 2	OEL 10	Oct 16	Nov 21	May 11	June 12	Ang. 30		Oct. 9	na flamating
	1955	Apr. 50	Iviay 10	001. 2	Sept. 29	Oct. 10	NOV. 21	Mary 23	June 18	Aur IS	Ser 2		no flowering
	1954	May 8	May 13	Oct 18	Octor Or	Oct 25	Nov 28	Aug 27	Oct 16	VIELA	10000	pohes o	no fruiting
	1955	May 5	May 14	Oct. 15	Sent st	Oct. 28	Nov. 3	Sept 3	Oct. 28	Apr-28	Ser-1	WINE SP	no fruiting
	1956	May 10	May 17	Sept. 29	_	Oct. 16	Nov. 31	Sept. 3	Oct. 21	Sept. 19	_	Supri 25	no mannag
	1957	Apr. 30	May 14	Sept. 8	- 1	Oct. 10	Nov. 5	Sept. 1	Oct. 12	V08: 30		001-1	no fruiting
	1958	May 10	May 17	Sept. 18	-	Oct. 28	Nov. 28	Aug. 30	Oct. 12	Yn2 30	Sopre 15	Sept. 19-	no fruiting
	1959	Apr. 20	Apr. 30	Oct. 8	Oct. 26	Oct. 8	Nov. 2	Aug. 30	Oct. 4	1972-30	Aug. 24	Sopr. 9	no fruiting
	1960	Apr. 30	May 9	Oct. 7	Nov. 7	Oct. 28	Nov. 26	Aug. 9	140.00 28	Aug. 30	Supt. 10	Sept. 14*	no fruiting
	1961	Apr. 14	Apr. 18	Oct. 9	Nov. 7	Oct. 15	Nov. 22	Aug. 20	Oct. 10	2012-13	Septer 20	0000016	no fruiting
-	1962	Apr. 19	May 4	Oct. 9	20-12	Oct. 11	Nov. 21	Aug. 20	Oct. 19	0-1-0	-		
Evonymus	ala-	Stov 3	10.0	0.0	Dec 17	000.17	0-148	No. of	June 2				
ta Sieb.	1052	1		1	00228	0.11	Der		14.01	10	1	12	
	1953	Apr. 2	Apr. 5	Aug. 28		Oct. 16	_	May 2	May 21	Aug. 18	Aug. 26	(NOR)	

In Siely	2	3	4	5	6	7	8	9	10	11	12	13
Enderstand	1	Mary 2	Aug 20	Oct 12	Oct 10	Oct 18	May 14	May 26	-			po fruiting
1954	Apr. 20	May 2	Aug. 30	Oct. 12	Sont 26	Oct. 16	May 18	June 15	Sept 13	Sent 20	Oct 16	no muning
1955	Apr. 30	May 4	Sept. 24	Sont 27	Sept. 20	Oct. 15	May 26	June 28	Aug 30	Sept. 20	Sent 14*	
1956	May 5	May 9	Sept. 15	Sept. 27	Sept. 25	Oct. 2	May 7	June 7	Tuly 30	Δ110 24	Sept. 14	
1957	March 24	Apr. 1	Sept. 2	Vie de	Oct 6	Oct. 22	May 17	June 16	Aug 26	Sept 15	Sept. 19*	We uniones
1958	Apr. 20	May 2	Sept. 10	-	Sont 23	Oct. 10	Apr 28	May 30	Aug. 20	Sept. 15	Oct 4	too "Lenning"
1939	Apr 12	Apr. 3	Sept. 10		Oct 2	Oct. 11	May 12	Tune 9	Sept 19		Sent 25	and insides
1960	Apr. 12 March 10	Apr. 27 Martah 22	Aug. 15	Aug 8	Aug 30	Sent 21	Apr 23	June	- Sopt. 15		Aug 26	Buthull on
1961	And 2	Apr 16	Aug 28	Aug. o Sant 23	Nov 3	Nov 11	May 6	Tune 3	A110 9		Sent 6	DO LUMINE
1902	Apr. 5	Apr. 10	Aug. 20	Sept. 25	NOV. J	1101. 11	iviay o	June J	Trug. 5		Sept. 0	and froming
Evonymus eu- ropaea L.	918C 30	900 12	64.5	-	Bar. 10	Now 21	May-4	Mars 12		. =	i H	06 Nonicial
1953	March 29	Apr. 3	Sept. 28	Oct. 16	Oct. 10	Oct. 30	May 18	June 4	Aug. 16	Aug. 29		
1954	Apr. 30	May 3	Sept. 23	Oct. 26	Oct. 12	Nov. 2	June 2	Aug. 20	Aug. 14	Aug. 26	-	
1955	Apr. 9	May 1	Oct. 27		Oct. 31	Nov. 20	June 15	June 29	-	-	-	no fruiting
1956	Apr. 23	May 3	Oct. 3		Oct. 8	Dec. 3	June 4	June 20	-		-	no fruiting
1957	March 9	Apr. 2	Sept. 25	Oct. 21	Oct. 2	Nov. 10	May 25	June 4	Aug. 3	Sept. 28	Oct. 29	
1958	Apr. 4	May 4	Sept. 19		Oct. 24	Nov. 20	May 30	June 2	Aug. 19	Sept. 29	Oct. 11*	Bunnui Ol
1959	March 24	Apr. 8	Sept. 20	Nov. 4	Oct. 8	Nov. 17	May 18	June 14	Aug. 19	1 - 19	Oct. 8*	
1960	Apr. 12	Apr. 21	Aug. 22	Nov. 4	Sept. 25	Nov. 12	May 23	June 15	Sept. 3	-	-	
1961	March 12	March 22	Aug. 27	Oct. 25	Sept. 18	Oct. 30	May 18	June 12	Sept. 2		Oct. 5	and titlings
1962	Apr. 4	Apr. 15	Sept. 20	-	Oct. 26	Nov. 10	May 30	=	=	=	Oct. 15	no flowering
Evonymus la-											1	and fruiting
tifolia Scop.	1965 18 1	April 38	000: 16	07	(jet: 18	Nov. 27			Line	-		Do Howera
1953	Apr. 5	Apr. 18	Sept. 2	_	_	_	May 6	June 4	July 28	Aug. 19	Sept. 10	and finiting
1954	Apr. 28	May 2	Sept. 4	-	0000-13	NOV. 23	May 22	June 12			-	no fruiting
1955	May 1	May 6	Sept. 30	Oct. 10	Oct. 2	Oct. 28	May 28	June 18	Aug. 26	Sept. 18	Sept. 27	and prompte
1956	May 3	May 8	Sept. 27	Oct. 19	Oct. 16	Nov. 12	May 30	June 13	Sept. 2	Sept. 17	Sept. 19*	op rigerones
1957	March 28	Apr. 20	Sept. 5	Oct. 4	Sept. 30	Oct. 16	May 13	June 3	Aug. 2	Sept. 10	Oct. 2	

1	1962	VD2 51	V 3 5	4	15 0	5	006 5	007 2	8	9	10	11	12	00 13
	1958	Apr. 17	May 3	Sept.	5	odi. 20	Sept. 20	Nov. 8	May 22	June 17	Sept. 5	Sept. 16	Sept. 19	no liewering
	1959	Apr. 4	Apr. 15	Sept.	14		Oct. 4	Nov. 10	May 6	June 2	_	_	_	no fruiting
	1960	Apr. 12	May 1	Aug.	10	191-73	Oct. 20	Nov. 10	May 23	June 8	Aug. 18	Sept. 23	-	NS ERACHT
	1961	March 25	Apr. 9	Aug. 2	28 C	ct. 28	Sept. 24	Nov. 11	Apr. 28	May 25	-	Aug. 24	-	HINDH ERE
	1962	Apr. 2	Apr. 20	Sept.	3	19 <del>1  </del> ]	1 82 30	Oct. 14	May 14	June 16	Aug. 27	Sept. 12	-	H9 U9MALID
Evonymus	ver-	Mis I	1. 3464 3	Ost. 1			Oct. 15	Nov. 2	May 70	May 18		and and a	1 martin	T. BIALFUR
rucosa Sc	cop.	May 8	- Killer -	Sid.	11		68.41	Diff. 3s	May 12	May 24	=	1.77		no nevering
	1953	March 30	Apr. 6	Aug. 2	26 S	ept. 10	Oct. 6	Oct. 28	May 14	June 14	June 24	-	_	and fruiting
	1954	May 2	May 6	Sept. 2	2 5	ept. 30	Oct. 2	May 30	May 24	June 5	Aug. 17	_	_	no l'iowerina
	1955	Apr. 27	May 4	Oct. 3	0	ct. 18	Oct. 8	Nov. 10	June 2	June 28	Aug. 20	_	Sept. 1	and maine
	1956	Apr. 17	May 6	Sept. 1	19 0	ct. 17	Oct. 12	Nov. 21	May 30	June 25	Aug. 29	Sept. 17	Oct. 18	NULL ADDRESS
	1957	March 24	Apr. 8	Sept. 2	2 0	ct. 8	Oct. 2	Oct. 24	May 18	June 23	July 28	Aug. 24	Oct. 16	TO HOMETHE
	1958	Apr. 17	May 6	Oct. 2	0	ct. 12	Oct. 4	Nov. 20	May 27	June 26	Aug. 26	Sept. 18	Sept 27	TUG.ILITIDUR
	1959	March 25	Apr. 14	Sept. 1	0 0	ct. 10	Sept. 23	Oct. 22	May 11	June 12	Aug. 20	_	Oct. 9	DO LIQUELIOS
	1960	Apr. 11	May 1	Aug. 1	9 S	ept. 29	Sept. 25	Oct. 27	May 23	June 18	Aug. 15	Sept. 22	_	and training
	1961	March 25	Apr. 9	Aug. 2	8 0	ct. 18	Sept. 24	Nov. 11	Apr. 28	May 25	_	Aug. 24	-	NG UOMELINE
	1962	Apr. 2	Apr. 17	Aug. 3	0 S	ept. 23	Sept. 29	Oct. 19	May 21	June 25	Aug. 28	Sept. 3	_	no fruiting
Fogus ara	ndi-													no nong
folia Ehr	h	Apr. 8		B Oct. 1			Oct. 17	1 Nov. 20	Apr. 29	May 8		-		to fridley
Joint Lin	1052	Ann 10	May 2	Ont 6	0		0-4 20	N. 16	May 3	May 17	Aug. 28	1000		and fruitnes
	1933	Apr. 10	May 2	Oct. 6	0	ct. 22	Oct. 20	Nov. 16			-			no flowering
	1954	May 10	May 12	Oct 10		ot 27	Oct 20	Nov 16	Mary 14	Mar. 20	Jung. 25			and fruiting
	1955	May 7	May 12	Oct. 14		ci. 21	Oct. 20	Nov. 10	May 14	May 20	0-1 10	-	-	no fruiting
	1956	May 10	May 15	Oct. 14		ct 24	Oct. 20	Dot 31	May 17	June 8 May 26	Oct. 10	Oct. 20	Oct. 26	a good proceeding
	1957	May 3	May 12	Oct. 8	0	ct 17	Oct. 17	Oct. 31	May 20	June 2	001. 4	Oct. 12	Oct. 24	na fauitin-
	1958	May 10	May 15	Sept 2	2 0	ct. 28	Oct. 25	Dec. 2	May 17	May 21	10	12	15	No iruiting
internet				Seber 7	- 0		500. 25	200, 2	may 17	May 21	10	-11	10	fruiting
	1900	Apr. 28	Daty 4	i bene			Care Ca		brad a		Long Sol		THOID	nunng

to pert	1053	2	3	4	5	6	7	8	9	10	11	12	13
Fronyourt	1000			1	1								
	1954	Apr. 26	May 2	Aug. 30	Oct. 12	Oct. 10	Oct. 18	May 14	May 26	-	-	-	no fruiting
	1955	Apr. 30	May 4	Sept. 24	Oct. 2	Sept. 26	Oct. 15	May 18	June 15	Sept. 13	Sept. 20	Oct. 16	no junitine
	1956	May 5	May 9	Sept. 15	Sept. 27	Sept. 23	Oct. 5	May 26	June 28	Aug. 30	Sept. 10	Sept. 14*	no-fruition.
	1957	March 24	Apr. 1	Sept. 2	Oor:36	Sept. 18	Oct. 2	May 7	June 7	July 30	Aug. 24	Sept. 9	en telente
	1958	Apr. 20	May 2	Sept. 10	-	Oct. 6	Oct. 22	May 17	June 16	Aug. 26	Sept. 15	Sept. 19*	and frusters
	1959	March 23	Apr. 3	Sept. 10	-	Sept. 23	Oct. 19	Apr. 28	May 30	Aug. 20	-	Oct. 4	no feultos
	1960	Apr. 12	Apr. 27	Aug. 15	-	Oct. 2	Oct. 11	May 12	June 9	Sept. 19	-	Sept. 25	atter transfer
	1961	March 10	March 23	July 25	Aug. 8	Aug. 30	Sept. 21	Apr. 23	Oct. 28	=	-	Aug. 26	no fruiting
	1962	Apr. 3	Apr. 16	Aug. 28	Sept. 23	Nov. 3	Nov. 11	May 6	June 3	Aug. 9		Sept. 6	no fruiting
Evonvmus	eu-					124	and the second		1.1.1.1.1.1.1	18 S	1.1.1.1.1.1		and fraiting
ropaea L.	1023	VDC 30		04 1	-	Oct. 16	Nov. 21	N:119-4	NIN-R				the Howers
	1953	March 29	Apr. 3	Sept. 28	Oct. 16	Oct. 10	Oct. 30	May 18	June 4	Aug. 16	Aug. 29	_	no fontine
	1954	Apr. 30	May 3	Sept. 23	Oct. 26	Oct. 12	Nov. 2	June 2	Aug. 20	Aug. 14	Aug. 26	_	www.www.chuig
	1955	Apr. 9	May 1	Oct. 27	_	Oct. 31	Nov. 20	June 15	June 29	-		-	no fruiting
	1956	Apr. 23	May 3	Oct. 3	-36	Oct. 8	Dec. 3	June 4	June 20				no fruiting
	1957	March 9	Apr. 2	Sept. 25	Oct. 21	Oct. 2	Nov. 10	May 25	June 4	Aug. 3	Sept. 28	Oct. 29	
	1958	Apr. 4	May 4	Sept. 19	New 3	Oct. 24	Nov. 20	May 30	June 2	Aug. 19	Sept. 29	Oct. 11*	no flowersts
	1959	March 24	Apr. 8	Sept. 20	Nov. 4	Oct. 8	Nov. 17	May 18	June 14	Aug. 19	-	Oct. 8*	no fraiting
	1960	Apr. 12	Apr. 21	Aug. 22	Nov. 4	Sept. 25	Nov. 12	May 23	June 15	Sept. 3	-	_	
	1961	March 12	March 22	Aug. 27	Oct. 25	Sept. 18	Oct. 30	May 18	June 12	Sept. 2		Oct. 5	
	1962	Apr. 4	Apr. 15	Sept. 20		Oct. 26	Nov. 10	May 30	-	-	- 1	Oct. 15	
Evonymus	la-	And the	May 12	Carrie 15	1.	04 33	Mon 94						
tifolia Sco	op.	star in	dent is	- 041: 16	10-12 V	0ct: 18	MON- 37	a start a	-	44	17:20		
	1953	Apr. 5	Apr. 18	Sept. 2	_			May 6	June 4	July 28	Aug. 19	Sept. 10	
	1954	Apr. 28	May 2	Sept. 4	_	Oct 13	MON 23	May 22	June 12	-		_	no fruiting
	1955	May 1	May 6	Sept. 30	Oct. 10	Oct. 2	Oct. 28	May 28	June 18	Aug. 26	Sept. 18	Sept. 27	and indiana
	1956	May 3	May 8	Sept. 27	Oct. 19	Oct. 16	Nov. 12	May 30	June 13	Sept. 2	Sept. 17	Sept. 19*	
	1957	March 28	Apr. 20	Sept. 5	Oct. 4	Sept. 30	Oct. 16	May 13	June 3	Aug. 2	Sept. 10	Oct. 2	

1	1962	VD2 31	V03 33	2413	0.5 18	0:6 5	007 31	8	9	10	11	12	13
	1958	Apr. 17	May 3	Sept. 5	Oct. 20	Sept. 20	Nov. 8	May 22	June 17	Sept. 5	Sept. 16	Sept. 19	no Dowering
	1959	Apr. 4	Apr. 15	Sept. 14	-	Oct. 4	Nov. 10	May 6	June 2	-	-	-	no fruiting
	1960	Apr. 12	May 1	Aug. 10	83. 19	Oct. 20	Nov. 10	May 23	June 8	Aug. 18	Sept. 23	-	RS SECOND
	1961	March 25	Apr. 9	Aug. 28	Oct. 28	Sept. 24	Nov. 11	Apr. 28	May 25	-	Aug. 24		ANA MURINA
	1962	Apr. 2	Apr. 20	Sept. 3	1 83 19	182-10	Oct. 14	May 14	June 16	Aug. 27	Sept. 12	-	Rd Fillweith
Evonymus	ver-			256. 24	02.251	03.14	New 3	1. NO. 10	- Mixe 18				and Fulling
rucosa Sc	op.	Allas a		1 5.31. 31	No. 19	1974 93	12.5	May 14	May 24	F			The Changer
	1953	March 30	Apr. 6	Aug. 26	Sept. 10	Oct. 6	Oct. 28	May 14	June 14	June 24	-	-	HE SEMELEN
	1954	May 2	May 6	Sept. 2	Sept. 30	Oct. 2	-	May 24	June 5	Aug. 17	-	-	ano morang
	1955	Apr. 27	May 4	Oct. 3	Oct. 18	Oct. 8	Nov. 10	June 2	June 28	Aug. 20	-	Sept. 1	IIO LION CUID
	1956	Apr. 17	May 6	Sept. 19	Oct. 17	Oct. 12	Nov. 21	May 30	June 25	Aug. 29	Sept. 17	Oct. 18	and manage
	1957	March 24	Apr. 8	Sept. 2	Oct. 8	Oct. 2	Oct. 24	May 18	June 23	July 28	Aug. 24	Oct. 16	VO HOMELDE
	1958	Apr. 17	May 6	Oct. 2	Oct. 12	Oct. 4	Nov. 20	May 27	June 26	Aug. 26	Sept. 18	Sept. 27	and rememe
	1959	March 25	Apr. 14	Sept. 10	Oct. 10	Sept. 23	Oct. 22	May 11	June 12	Aug. 20	-	Oct. 9	AU BBwering
	1960	Apr. 11	May 1	Aug. 19	Sept. 29	Sept. 25	Oct. 27	May 23	June 18	Aug. 15	Sept. 22	_	and the training
	1961	March 25	Apr. 9	Aug. 28	Oct. 18	Sept. 24	Nov. 11	Apr. 28	May 25	-	Aug. 24	-	
	1962	Apr. 2	Apr. 17	Aug. 30	Sept. 23	Sept. 29	Oct. 19	May 21	June 25	Aug. 28	Sept. 3	-	no fruiting
Fagus gran	ndi-			1.5.1	12 2	12.2	the second	1.2	store a				
folia Ehrl	h.	APR A		Der o		0- 00		Adam of	Lecu 15	A			
	1953	Apr. 10	May 2	Oct. 6	Oct. 22	Oct. 20	Nov. 16	-		-	-	-	no flowering
				1 mar 14	100 22	Des IN	200 24	May 12	May 2d	Aug. 25			and fruiting
	1954	May 10	May 12	Oct. 10	Oct. 27	Oct. 20	Nov. 16	May 14	May 20	-	-	-	no fruiting
	1955	May 7	May 12	Oct. 15	0.000 25.	Oct. 25	Nov. 5	May 28	June 8	Oct. 10	Oct. 20	Oct. 26	
	1956	May 10	May 15	Oct. 14	Oct. 24	Oct. 20	Oct. 31	May 17	May 26	Oct. 4	Oct. 12	Oct. 24	
	1957	May 3	May 12	Oct. 8	Oct. 17	Oct. 17	Oct. 26	May 20	June 2				no fruiting
1	1958	May 10	May 15	Sept. 22	Oct. 28	Oct. 25	Dec. 2	May 17	May 21	-10	-11	+5	very poor
	1989	Apr. 28	May 6	Sept. 18	Cve. 28	Get 12		May 9	May 15	And the		1 1 1 1	fruiting

1	1028	2	3	4	5	6	De 7	8	9	10	11	12	13
	1959	Apr. 28	May 4	Oct. 8	Oct. 20	Oct. 17	Oct. 30	May 5	May 8	Qui a	con is	04251	no fruiting
	1960	Apr. 25	May 6	Oct. 6	Oct. 25	Oct. 20	Nov. 31	May 10	May 14	Aug. 9	040-20	00-26	
	1961	Apr. 23	Apr. 29	02-0	Oct. 25	Oct. 5	Oct. 31	-	125-2	-	-	-	no flowering
								Salara T	1 mar 1	1.1.1	And the	Card II	and fruiting
	1962	Apr. 22	Apr. 26	Sept. 24	Oct. 21	Oct. 14	Nov. 3	-	-	-		S	no flowering
		122				Carl Th	100 15	1000	3000 10	Any 20	1900	a ser a d	and fruiting
Lotten Lann			1			1012	1.000	Mary 12	Tanka II	Sept. 19		Sent 25	
Fagus japa	onica	Manager					Section 121	stern Th	1000-22	wright-	pober 3	Aust 26	Bo (L/mmill
Maxim.			3		Same and	Salar Sa	Since 14	White to	Aunte des	Ann 9	walk- Se	Sepa- 6	c1 .
	1953	Apr. 10	Apr. 18	Oct. 2	Oct. 17	Oct. 6	Nov. 16				pehr re	-	no flowering
		Ass. 11	1000	Aug 19	Speed 20	Same 25	04 24	2000 33			0000	nor s	and fruiting
	1954	May 8	May 10	Oct. 10	Oct. 27	Oct. 10	Nov. 22	PRP - 11				combust and	no nowering
		Approach	Non S	1000 Sta	097-13	0.5		Pres 32			10 10 10	03	and flowering
	1955	May 6	May 8	Oct. 15	Nov. 3	Oct. 28	Nov. 20			11-10		00-10	no nowering
		gin ba	SALE OF	2017 10	02073	04 0		25an 30	Juna 25	Abg. 29	Seol. 17	052.13	no flowering
	1956	May 8	May 13	Oct. 18	Oct. 27	Oct. 24	Nov. 22	1000	100-00	Yns 10		Sana	and fruiting
	1202				0.000	0.10	N 20	1000 53	1005 2-	Real Party	Section 1	-	no flowering
	1957	Apr. 30	May 3	Oct. 7	Oct. 23	Oct. 12	Nov. 30	ALT LE	Tune 14	June 24		0.0	and fruiting
					NT 0	0.1 00	Dec 2	May 25	Sugar Th	Same 3		_	no flowering
	1958	May 8	May 12	Sept. 14	Nov. 3	Oct. 28	Dec. 2	264.34	June 12	Sunt 2		Dou S	and fruiting
	1050	1 20	A 27	Sant 10	Oct 10	Oct 8	0200 100	302.70	jour je	VIEL SI	Sept. 12	Den X	no flowerin
	1959	Apr. 20	Apr. 27	Sept. 10	001. 19	000. 0	LADAT TT	Apr. 28	Mar 25		AUE. 24		and fruiting
	1060	Ann 22	May 6	Sant 28	Oct 25	Oct 18	Nov 7	VINA 33	100 8	VOE 18	Sept. 23	-	no flowerin
	1900	Apr. 25	Way 0	Sept. 20	001. 25	000.10	1101.1	May 6	June 2	-		12 14	and fruiting
	1061	Apr 15	Apr 10	Oct 6	Oct 20	Zop1 20	Oct. 27	NPL ST	194112 12	2451-17	12001-16	19905-18	no flowering
	1901	Арг. 15	Apr. 19	000.0	000. 20	1			1000		-		and fruiting
	1962	Apr 21	Apr 22	Sent 17	Oct 19	Oct. 2	Oct. 31	-			+	-	no flowerin
	1902	ripi. 21	ripi. 22	Sept. 17	500. 15	500. 2		NLPY 10	1000 13	-		CHECK	and fruiting
		March 28	Apr. 20	Sept. S	Oct 4	Sopt. 30	Cost. Date	10000 13	30220 3	1740g. Z.	1.000	1 1000 1000	clo (commo

1		2	3 10	2014	5	6	7	8	9	10	11	12	00 13 mm
Fagus orie Lipsky	entalis	Milled Ye	Xpr. 94	Sept. 423	Nov. II	BEL M	Nov. 15	KSEAK	NEW B			Oci. 20	and Iruinag
Foresthia	1953	Apr. 16	Apr. 18	Oct. 2	Oct. 10	Oct. 6	Oct. 29	-	-	_	-	-	no flowering
		Apr. 29	May 8	04, 30	-	0.4. 25	Nov. 18	Apr. 27	May 4	Sept. 25	1	04, 22	and fruiting
	1954	Apr. 27	May 4	Oct. 10	Oct. 27	Oct. 10	Oct. 16	May 8	May 15	-	-	_	no fruiting
	1955	May 1	May 3	Oct. 8	Oct. 25	Oct. 15	Nov. 2	May 10	May 18		-	-	no fruiting
	1956	May 4	May 7	Sept. 24	Oct. 17	Oct. 13	Oct. 28	May 12	May 24	0.7	100-00		no fruiting
	1957	Apr. 26	Apr. 29	Sept. 26	Oct. 10	Oct. 5	Oct. 19	May 7	May 12		_	_	very poor
		405.5	Ac. 13	Sept: 25	One for	Oct. 18	S North A	A Cornel Party					fruiting
	1958	May 2	May 6	Sept. 15	Oct. 18	Oct. 10	Nov. 4	May 10	May 17	_	-	042.29	very poor
		Ant. A.	Anc 20	Otto 61	0a. 17	85.1	Bay B	Charles -	Apr. 21		-		fruiting
	1959	Apr. 16	Apr. 24	Sept. 10	Oct. 12	Oct. 6	Nov. 12	Apr. 27	Apr. 30	_	_	-	no fruiting
	1960	Apr. 19	Apr. 25	Sept. 20	Oct. 14	Oct. 10	Nov. 3	May 6	May 10	-	_	-	no fruiting
	1961	Apr. 13	Apr. 17	Sept. 30	Oct. 20	Oct. 8	Oct. 26	Apr. 25	Apr. 28	Sept. 27		Ploy. 6.	very poor
		1144	Aux 1	Sent Ly	Nov. 2	82.50	Nov. 23	YPE D	Nen II	-		mu me	fruiting
	1962	Apr. 18	Apr. 21	Sept. 13	Oct. 13	Sept. 27	Oct. 29	Apr. 25	Apr. 30	_	_	_	very poor
		and the second	Plan 1	Oct e	Nov. 10	Nov. 8	Dec. 20	May 2	May 18	Oct. 1.	04.15	Oct. 31	fruiting
Fagus sylv	a-	Alan 10	May 15				5 7 1	May 7	May 48	and the second s	_		
tica L.		1. 25	May 2	Sent So	Oct. 20	63. 3	001.20	You ?	X.07. 21	Aug. 24	Nosi 21	Kali in	Mark about days
	1953	Apr. 8	Apr. 23	Oct. 6	Oct. 26	Oct. 17	Nov. 20	Apr. 29	May 8	_	_	_	no fruiting
	1954	Apr. 27	May 4	Oct. 4	Nov. 3	Oct. 25	Nov. 28	May 8	May 17	Aug. 28	No. 22	Nov. 4	an internet
	1955	May 1	May 4	Oct. 8	Nov. 3	Oct. 20	Nov. 25	June 18.	3-1-12		_		no fruiting
	1956	May 6	May 8	Oct. 14	Oct. 22	Oct. 18	Nov. 24	May 12	May 24	Aug. 25	_	Nov. 12	and manual
	1957	Apr. 28	May 2	Sept. 26	Oct. 17	Oct. 5	Dec. 7	Rotal Inc.	10000	1 10			no flowering
		May 10	May 18	Oct. 10		04.12	Oct 20	James 1.5	June 26				and fruiting
	1958	May 5	May 8	Oct. 8	Oct. 28	Oct. 12	Dec. 10	May 12	May 18	Aug. 28		Oct. 30	the (particular)
	1959	Apr. 26	Apr. 29	Sept. 8	Oci. 30	Oct. 8	Nov. 30						no flowering
	1960	Maj 13		018 12	N. 2 V		24	Jone 10	Second Second	10	- 11	15	and fruiting
	1960	Apr. 28	May 4	Sept. 28	Oct. 28	Oct. 12	-	May 9	May 13	Aug. 30		Oct. 26	

1	2	3	4	5	6	7	8	9	10	11	12	13 13
1961	Apr. 15	Apr. 17	Sept. 29	Oct. 19	Oct. 8	Dec. 2	1002-15	11-11	WOE: 58	-	04-20	no flowering
	35. 31	1	00 5	Gen 25-1	The St.	Skey, St.	Mar 10	May 14	Also A	Sugar Pres		and fruiting
1962	Apr. 22	Apr. 23	Sept. 21	Oct. 24	Sept. 27	Nov. 10			-	-	-	no flowering
	Mar 6	May S	Oct. 14	Oct. 22	Oct. 18	N69, 34	May 12	May 24	Aug. 25		Nov. 12	and fruiting
Forsythia eu-	NEA HO	Mary af	1991. 34	8194 33 V	09, 20	Filey, 25						So waanne
ropaea	Are. 37	May 4	Ool. 4.	Nov. 3	04.25	Moy. 28	May 8	May 17	Aug. 28		Nov. 4	and fruiting
Deg. et Bald.	Acc. 8	Apr. 23	096.6	Oct. 25	Oct. 17	Nov. 20	Apr. 29	Mag 8	1.172.1			no fruiting
1953	Apr. 16	Apr. 20	Oct. 6	-	Oct. 12	-	Apr. 7	Apr. 21	Aug. 24	-	-	
1954	May 10	May 15	-	-	-	_	May 7	May 18	-	-	-	
1955	May 1	May 3	Oct. 6	Nov. 10	Nov. 8	Dec. 20	May 2	May 18	Oct. 1	Oct. 15	Oct. 31	(huitingereat
1956	May 1	May 6	Oct. 14	000 13	Oct. 30	Nov. 28	May 7	May 27	-	-	-	no fruiting
1957	Apr. 8	Apr. 12	Oct. 8	Nov. 2	Sept. 28	Nov. 23	Apr. 11	May 11	-	-	-	no fruiting
1958	Apr. 16	May 6	Sept. 16	061.20	Nov. 4	Nov. 27	May 7	May 20	Sept. 27		Nov. 6*	A Charles
1959	March 25	Apr. 20	Sept. 23	Con Int	Oct. 16	Nov. 20	Apr. 10	May 6	-		-	no fruiting
1960	Apr. 18	May 5	Oct. 24	Nov. 4	Nov. 4	Nov. 21	May 3	May 19	-	-	=	no fruiting
1961	March 16	Apr. 5	-	Oct. 17	Oct. 7	Nov. 23	Apr. 7	Apr. 27	-	-	-	Constraints and
1962	Apr. 7	Apr. 17	Sept. 24	Oct. 26	Oct. 9	Nov. 16	Apr. 27	MONTON .	-	-	Oct. 29	Very oppie
Formuthia Cinal	when the	See - Se	the second			3.4						unch ubroat
diano Lingelsh	2022 1		autor the	ale is	cont in	001 W	ward in	WINA Se				no mentil
anuna Lingeisii.	1 10	4 17	1001 0	nec m	There is	Line an	March 21	Apr 13			_	no fruiting
1953	Apr. 13	Apr. 17	LOPE IN	ADD TH	007 30	001 10	May 6	May 22			_	no fruiting
1954	Apr. 10	Apr. 12	Oct 20		Oct 28	Nov 18	Apr 27	May 4	Sept 26	_	Oct. 22	and Brunning
1955	Apr. 29	May 8	Oct. 30	ACC IN	Oct. 6	Nov. 12				_	_	no flowering
1956	May 2	May o	001. 4	CHOICE AND	000.0	1107. 12					1.1.1.1.1.1	and fruiting
1957	March 19	Apr. 8	Oct. 4	Nov. 11	Oct. 14	0-0	March 20	Apr. 10	-		_	no fruiting
1958	Apr. 30	May 5	Sept. 14		Oct. 4	Dec. 15	Apr. 21	May 8				no fruiting
1959	Apr. 3	Apr. 10	Sept. 15	0-2-10	Oct. 16	Nov. 22	March 18	Apr. 13	TO		13	no fruiting
1960	Apr. 15	May 2	Aug. 15		Oct. 28	Nov. 20	Apr. 13	May 5		Aug. 15		and freihing
	- P-1										1 5010	a (contribution)

1 1329	2	3 10	4	1205 15	6	2307 5	8 10	9	2010	11	12 5	13
1961	March 26	Apr 6	Sept 18	Nov 5	Oct 28	Nov 21	March 17	Apr 8	-06-183		N:-1218	very poor
1023	Water 20	Apr. 0	Sept. 10	090 39	000.20	1404. 21	IVLATON 17	Apr. 0	Ang. 12			fruiting
1962	Apr. 10	Apr. 14	Sept. 23	0-21	Oct. 7	Nov. 15	Apr. 14	Apr. 25	1	0-1	Oct. 20	very poor
	March 2	Apr. 18	Oct. 8		Oct. 19	Nov. 20	Lar 6	p =-	Ord A	LAGE !!		fruiting
Forsythia ovata	Max joi		Alini Ast	Ght. 914	deturt sa	Abov 214	Mag 12	Jones 1	A 1000 22	Som 20		UO HOMELINE
Nakai	March 8		Sent 1	Oct. 18	Sept. 18	Nov 17	Ame. 30	May 26		and the second second		Samuel Louise
1953	Apr. 7	Apr. 9	Sept. 15	Sept. 28	Oct. 6	Nov. 3	March 29	Apr. 18	Tours.	D=3		no fruiting
1954	May 11	May 14	Sept. 18	-	-	-	Apr. 17	May 9	-		-	no fruiting
1955	Apr. 25	May 3	Oct. 10	Oct. 31	Nov. 2	Nov. 19	Apr. 28	May 8	Oct. 6	Oct. 22	Oct. 30	DO HOMSLING
1956	May 3	May 7	Oct. 2	Nov. 12	Oct. 27	Dec. 11	Apr. 24	May 8	-	-		no fruiting
1957	Apr. 5	Apr. 13	Sept. 25	Oct: 8	Oct. 18	Nov. 5	March 17	Apr. 8				no fruiting
1958	May 5	May 11	Oct. 7	Nov. 17	Oct. 2	Dec. 3	Apr. 28	May 13	00015	-	Nov. 2.	no fruiting
1959	Apr. 4	Apr. 20	Oct. 4	0kt+131	Oct. 8	Oct. 19	March 27	Apr. 18		-		no fruiting
1960	Apr. 17	May 1	Aug. 22	Nov. 4	Nov. 1	Nov. 3	-	-		-	-	no flowering
	1911. 15	st soll	8001: 50	Oct. 10	0a: 21	Oct. 19	Sur-16	March 25	Auto 24	-210		and fruiting
1961	March 13	March 23	Sept. 14	Oct. 14	Oct. 25	No.v 5	March 17	Apr. 5	OUT. 6	-	OGT BER	no fruiting
1962	Apr. 14	Apr. 17	Sept. 17	0000019	Oct. 9	Oct. 29	Apr. 17	Apr. 25	00-6	-	Oct. 30*	very poor
	Apr. 22	Mars &	Sept. 19	Nev. 1	Get. 25		Jan 8	Mirch 3	Aug. 18	Oct. 23		fruiting
Gleditsia	Maxcipe	the post	0001 320	Oer 54	Grant. Stri	Move 2	Tim-1	Maren 23		Oct-16		no flowering
triacanthos L.	Apr. 174	Apr. 28	Oct. S	Nov. 11	New 3	1400 32	Jan: 15	15. 6			No. 18	and fraining
1953	Apr. 27	May 4	Sept. 26	Oct. 20	Sept. 26	Oct. 29	June 2	June 18	Oct. 20	Nov. 21	Feb. 12	leaf shedding
-Reduction 1953	May 12	3487 16	Sopt. 15	Oct. 10	Sept. 30	000 34	penk le		-			in 1954
1954	May 14	May 24	Oct. 15	-	Oct. 15	Nov. 16	June 15	June 26	Oct. 23	Nov. 22	-	
1955	May 15	May 25	Oct. 15	-	Oct. 25	Nov. 17	June 28	July 12	Oct. 28	-	Feb. 26	leaf shedding
		May 9	Sept. 19	Sauk. 2.			(AS) [2]	2-14-24				in 1956
1956	May 18	May 25	Oct. 8		Oct. 16	Oct. 31	June 15	July 5	Oct. 26	_	2005-14	house period
1957	May 10	May 18	Oct. 10	Oct. 20	Oct. 12	Oct. 29	June 15	June 26	-			no fruiting
1958	May 17	May 24	Oct. 18		Oct. 20	Nov. 22	June 20	July 8				no fruiting
1959	May 8	May 14	Oct. 8	Oct. 22	Oct. 16	Nov. 4	June 4	June 20	10	11	10	no fruiting
1960	May 13	May 18	Oct. 12	Nov. 3	Oct. 28	12077	June 10	June 24	Not at	S. T	Fapic	no fruiting

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1 a	U.		commucu	
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											Table	6 (continued)
1	2	3	4	5	6	7	8	9	10	11	12	13
1961	Apr. 23	May 4	Oct. 7	0-20	Oct. 19	Nov. 12	June 16	June 22	_	-	=	poor fruiting
1962	Apr. 22	May 8	Oct. 5	Oct. 27	Oct. 5	Nov. 16	June 20	June 28	0.00	—	-	poor fruiting
Gymnocladus canadensis Lam.	May 15	Mar 35	0/1 12		04' 52	54PA- 11	June 25	2012 15	01 58		Feb. 28	
1953	May 12	May 16	Sept. 15	Oct. 10	Sept. 30	Oct. 17	May 16	-	_		-	no fruiting
1954	May 20	May 26	Oct. 2	Oct. 15	Oct. 10	Oct. 18	Nor F	197 14	25-39	NETT	Pd-12	no flowering and fruiting
1955	May 25	June 7	Oct. 3	Oct. 25	Oct. 20	Nov. 2	-	May 18	00.1	0a. 15	OR. 31	no flowering and fruiting
1956	May 20	May 29	Sept. 27	Oct. 14	Oct. 8	Oct. 24	14	3	-	=	00-30-	no flowering and fruiting
1957	May 15	May 25	Sept. 20	Oct. 10	Oct. 5	Oct. 19			-	-	=	no flowering and fruiting
1958	May 22	May 28	Sept. 28	Oct. 12	Oct. 6	Oct. 20	-	1	-	-	-	no flowering and fruiting
1959	May 7	May 13	Sept. 14	Oct. 8	Sept. 28	Oct. 26	Monophis What se	yter g pan a	-	-	-	no flowering and fruiting
1960	May 16	May 26	Sept. 14	Oct. 12	Oct. 4	Oct. 28	yb <del>, 5</del> 2	997-79 1987-90	0/0	62 <sup></sup> 50	05-20	no flowering and fruiting
1961	Apr. 29	May 9	Sept. 20	Sep <u>1.</u> 25	Sept. 26	Oct. 17	KEET-8.38	MAN HA		-	=	no flowering and fruiting
1962 Halesia tet-	May 16	May 24	Sept. 23	Oct. 8	Sept. 29	Oct. 31	-	-	=	=	=	no flowering and fruiting
raptera Ellis.	VIALARS	MPS 24	Sept. 23	Nov. 11	OF A	DIOV. 13	Mainte	XPY 78	=	-	Oct. 20	Astronomic and
1953	Ap1. 23	Apr. 28	Oct. 6	Oct. 20	Oct. 26	Nov. 4	May 4	May 22	Aug. 12	-	-	APHRE ing
1954	Apr. 30	May 2	Oct. 8	Oct. 18	Oct. 22	Nov. 3	May 16	June 3	Aug. 30	-	-	Allen Britte
1955	Apr. 28	May 9	Oct. 10	Oct. 31	Oct. 10	Dec. 6	May 24	June 17	Oct. 13	- to -	Nov. 18	
1956	May 4	May 19	Sept. 27	Nov. 12	Sept. 30	Jan. 2	May 26	Jane 11	Sept. 19	++	Nov. 12	L'ALL

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1	1916	2	3	8 4 55	5	6	D07 50	8	9 58	0100	11	12	13
	1957	Apr. 18	Apr. 29	Sept. 24	Oct. 24	Sept. 25	Nov. 29	May 1	June 3	DVIDE20		Nov-24	
	1958	Apr. 16	May 9	Oct. 6	Oct. 21	Oct. 20	Nov. 30	May 21	June 10	Nov. 4	Dec. 3	Con and a	Buttering our
	1959	March 26	Apr. 18	Oct. 8	Del. 30	Oct. 19	Nov. 20	May 6	May 24	Oct. 4	Del. 18	_	
	1960	Apr. 11	May 9	Sept. 17	Oct. 24	Sept. 27	Nov. 14	May 12	June 4	Aug. 22	Sept. 29		1 Stars
	1961	March 8	Apr. 15	Sept. 2	Oct. 18	Sept. 18	Nov. 17	Apr. 30	May 26		00,20		1
	1962	Apr. 16	Apr. 23	Sept. 11	Oct. 24	Sept. 21	Nov. 21	May 8	June 7	-	Dec. 3	001-334	
Hamamelis	s mol-	March 3	March 27	Sept. 29	Oct. 11	007 32	Nov. H	May 23	June 5	091 2		"	
lis Oliv.		N20258 +	Siay 25	Sept. 25	Oct. 29	045.30	JUDE 1	June 6	3012 38	Aug. 13			100 120
	1953	Apr. 16	Apr. 28	Sept. 28	Oct. 12	-	Nov. 2	Feb. 24	March 20		_	-	no fruiting
	1954	May 11	May 14	-	-	-	-	March 6	Apr. 14	-	-	-	no fruiting
	1955	May 7	May 16	Nov. 6	Nov. 17	Nov. 15	Nov. 10	Jan. 28	Apr. 14	Oct. 15	-	Nov. 2	no faiting
	1956	May 18	May 24	Oct. 29	Nov. 14	Nov. 4	130-13	Jan. 11	Sup <u>r.</u> 5	Sopt, 25			most flowers
	1957	Apr. 16	May 3	Oct. 16	Nov. 11	Oct. 30	Dog 18	Jan. 16	March 25	Aug. 24		NOT 20M	no flowering
	1958	May 7	May 10	Sept. 29	Nov. 20	Oct. 6	NON-50	Jan. 20	March 25	Oct. 6	Des. 28	Oct 24*	1
	1959	Apr. 20	Apr. 30	Oct. 19	Nov. 3	Oct. 30	Nov. 25	Jan. 2	March 2–9	Oct. 6		Oct. 6*	the second second
	1960	Apr. 22	May 8	Sept. 19	Nov. 1	Oct. 25	-	Jan. 8	March 3	Aug. 18	Oct. 23	SON	
	1961	March 23	Apr. 30	Aug. 28	Nov. 7	Sept. 15	-	Jan. 5	March 23	_	Oct. 16	-	Supply Supply
	1962	Apr. 17	Apr. 28	Oct. 5	Nov. 11	Nov. 5	Nov. 27	Jan. 15	Apr. 6	-	-	Nov. 8*	Do Gowering
Hamamelis											6		
virginiana	L.	1 10	1 . 10			E / 194							
	1953	Apr. 16	Apr. 18	1100 200	new Id		-	-	Oct. 20	-	_	-	
	1954	May 14	May 18			Sept. 20	Oct. 4	Oct. 2		-	-		ay (runnig
	1955	May 2	May 9	Sept. 19	Oct. /	Oct. 5	Oct. 28	Oct. 12	Nov. 24	-		09-584	
	1956	May 13	May 13	Sept. 16	Sept. 30	Sept. 24	Nov. 13	Sept. 27	Oct. 21	Sept. 29		Oct. 18	and Fruiting
	1957	Apr. 20	Apr. 29	Nov. 12	Oct. 5	Sept. 17	Oct. 18	Sept. 25	Nov. 2			100 mm	no flowering
	1958	May 8	May 12	Sept. 10		Sept. 19	Oct. 28	Sept. 12	Dec. 4				no fruiting
	1959	Apr. 20	Apr. 26	Sept. 4	-	Sept. 23	Oct. 19	Oct. 4	Dec. 12	T	17	2.00	no fruiting
	1960	-	May 4	Aug. 15	Oct. 3	Sept. 25	Oct. 19	Oct. 6	-	Aug. 22	Sept. 29	-	

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Tr-1	- 1	- 1	C 1	0000		(Loc)
Iau	D.	le	) (	con	unu	lea)

. 1	1959	2	3	4	5	6	007 18	0.8	9	10	11	12	13
	1961	March 18	Apr. 14	Sept. 8	Sept. 21	Oct. 27	Nov. 6	56 <del>70</del> , 23	140 <u>-</u> - 35-	-	-	-	no flowering
		May 13	M89 13	Sept. 46	Sept. 30	Serv. St	1986 13	Sept. 29	091.34	Sont, 29	1/2	0 1 004	and fruiting
	1962	Apr. 12	Apr. 21	Sept. 15	Oct. 11	Sept. 25	Oct. 24	Sept. 30	Nov. 20	-	_	Oct. 29*	
Hydrangea	pe-	when in	when to		1	Gonte au			1000 50			_	
tiolaris		Stev 12.	Mary Sky		Sec. 14.	Seens, 781	1990 19	Asian IS.					
S. et Z.		Adapt The			1996. 18	tool ala	Cana Di	in the second	Contraction Sec.		1.4-1-1		
	1953	March 19	Apr. 2	Apr. 2	Sept. 28	Oct. 18	Oct. 22	100-12	yter e	_	_	1940 <u>) -</u> 8e	no flowering
		Murch 23	160 30.	Vac 38	June 1	Supt. 15		guir 2	March 23	-	04-16	+	and fruiting
	1954	Apr. 20	Apr. 28	Oct. 2	DRUG I	002-52	_	May 22	June 4	Aug. 29	007.23	-	
	1954	Apr. 20	Apr. 28	Oct. 2	11/11/1	012 30	3/011 52	May 22	June 4	Aug. 29	-	0°1-0±	
	1955	Apr. 25	Apr. 30	Oct. 20	Nov. 5	Nov. 2	Nov. 29	June 20	July 30	Nov. 16	-	Dec. 2	
	1956	Apr. 24	May 3	Oct. 16	Nov. 18	Oct. 26	Dec. 18	Jan. 16	March 25	WILE SH	-	-	no flowering
													and fruiting
	1957	March 26	Apr. 7	Oct. 4	Oct. 22	Oct. 14	Nov. 13	June 7	Sept. 5	-	-	-	no fruiting
	1958	Apr. 9	Apr. 30	Oct. 5	New D	Oct. 22	Nov. 30	June 16	June 30	09-12	-	17-3	no fruiting
	1959	<u>31</u>	With the	-	-	-	-	March 6	- 14	-	-	-	no observa
		Aur, 16		Seat. 28	Qc1 13		Nov. 3	Fab. 24	March 20				tions
	1960	Apr. 6	May 25	Sept. 25	Oct. 29	Oct. 20	Nov. 5	June 6	July 28	Aug. 13	-	-	and the design
	1961	March 3	March 27	Sept. 29	Oct. 11	Oct. 25	Nov. 11	May 23	June 5	Oct. 5	-		The Concerning
	1962	March 30	Apr. 16	Oct. 19	000-34	Oct. 22	Nov. 8	June 17	July 5	-		Oct. 23*	and fraiting
Hydrangea	ra-	Starch's		Sept. 1	89.18	Seatt 18	1 Secola	your 10	Same Se	Unity an	2010 12		and Champerson
diata Wa	ld.	You It		-Sent 17	OHE DA	Cont 12	2004. 20	MARKY O	12102 54	1001 W	and su		and fronting
	10.50	Manual Se		0	0.1.10	0.4.00	Nov 20	Tune 24	Luly 20	unit a	instant a		no fruiting
	1953	Apr. /	Apr. 9	Oct. 2	Oct. 10	Oct. 20	Nov. 20	June 24	July 20	Ang			no maning
	1954	May 2	May 6	0 at 7	Nov 5	Nov 2	Coo 6	Aug 30	Oct 31	Nov 2		Nov 14	
	1955	Apr. 2/	May 4	Sont 22	1404. 2	Oct 14	Dec. 20	Aug 1	Aug 25	Oct 30		Nov. 13	k
	1950	March 6	May /	Sept. 22	Oct 20	Oct. 14	Nov 18	July 8	Oct 8	000. 50	141		
	1957	March 0	Apr. 1	Sept. 17	001. 20	https://	rcin or	anl	000.0	Proper 12		1306	n (countine)

1	2	3	24	2015 30	2016 10	7 50	8	9	10	11	12	13
1958	Apr. 11	May 3	Oct. 2	201	Oct. 12	Dec. 3	July 27	July 26	Oct. 20	_	Nov. 8*	IP GOMEN
1959	March 25	Apr. 10	Oct. 8	Sept. 30	Oct. 28	Nov. 28	July 10	Aug. 30	Sept. 25	Oct. 28	Nov. 12	HO WINNER
1960	Apr. 6	Apr. 18	Sept 17	Oct. 30	Oct. 5	Nov. 24	June 29	July 19	Aug. 28.	Oct. 18	Sep <del>il.</del> 25	feelds cares
1961	March 10	March 27	Sept. 27	Oct. 23	Oct. 14	Nov. 21	July 14	Aug. 7	Nov. 4	-	-	abd fraiting
1962	Apr. 1	Apr. 17	Oct. 8	Oct. 26	Oct. 26	Nov. 23	July 29	Sept. 3	-	Oct. 26	-	199 MONIEVER
Hydrangea Sar- gentiana Rehd.	Apr. 16	Apr. 22	Bept. 1	-	Sept. 14	Sept. 25	May 26	May 30				ao talint
1953	May 24	June 16	500-12	2-12	Oct. 20	Nov. 7	Aug. 10	Aug. 14	Seal 11	1000-11	100	
1954	May 22	May 24		1 5 - 50	1 1	0-2	Aug. 16	Sept. 20	Sel <u>i</u>	00		Rating on
1955	May 4	May 9	Oct. 18	1 Com 14	Oct. 20	Nov. 3	July 30	Aug. 30	Oct. 24	-	Nov. 10	HARDING THE
1956	May 2	May 7	Oct. 14	-	Oct. 11	Nov. 21	July 30	Sept. 4	Oct. 1	-	Nov. 13*	and boot
1957	Apr. 28	May 2	Oct. 5	24-12	Oct. 8	Nov. 7	July 25	Aug. 20	Sept. 25	-	-	CO IMPORTS
1958	Apr. 23	May 3	Sept. 18	Oct. 3	Sept. 20	Nov. 19	July 28	Aug. 29	Oct. 12		Nov. 20*	
1959	March 25	Apr. 13	1952 40	1937 24	Oct. 18	Nov. 25	July 17	Sept. 6	Oct. 4	Oct. 28	Nov. 8	sug tound
1960	Apr. 14	May 4	Oct. 5	24-75	Oct. 8	Nov. 7	July 23	Sept. 20	OCT 12	Oct. 13	N 92	NO INMELNE
1961	March 27	Apr. 10	Oct. 15	2-2	Oct. 23	Oct. 26	July 20	10000	007-5	-	Nov. 3	
1962	Apr. 17	Apr. 24	Oct. 21	12-2	Oct. 23	Nov. 19	Aug. 11	Li Luter Ta	2011 20	-	00-54	very poor
	1000		007 5	015' 51		140.5 3	17 6900	1000 200	other te	OCC 19	ner te	fruiting
Hvdrangea	1.1.1			Con an		and a second		1.11.1.20				and ironan
xanthoneura Diels.	XPE %		88. Ja	1985.14	85. 99	001.38		=			=	HE LOWER
1953	Apr. 2	Apr. 9	Aug. 26	Oct. 14	Oct. 6	00- 32	June 4	July 16		-	13/14- 34	no fruiting
1954	I States 1	ALL &	V= 53	00-3	Non al	CI-	14 min 13	100-18	-	-	1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1	
1955	Apr. 25	May 5	Oct. 14	Oct. 28	Oct. 25	Nov. 30	June 25	July 22	Oct. 20	0000-10	Nov. 8	
1956	Apr. 22	May 3	Sept. 18	Oct. 10	Sept. 30	Dec. 29	June 8	July 30	Oct. 11	004-30	Nov. 13	the thisten
1957	March 5	Apr. 6	Sept. 12	Oct. 6	Sept. 24	Oct. 22				-		no flowering
	1	1					100 -		10	13	13	and fruiting
1958	Feb. 14	May 3	Sep. 9	Oct. 6	Sept. 16	Nov. 16	June 24	July 12	Sept. 27	Oct. 11	Nov. 8	

1	1050	2	3	4	5	6	7	8	9	10	11	12	ang 13 mar
	1959	March 25	Apr. 13	Sept. 10	Oct. 28	Sept. 23	Nov. 19	June 9	July 1	Sept. 25	Oct. 30	Nov. 28	
	1960	Apr. 8	May 2	Aug. 18	041_38	Sept. 27	Oct. 8	June 7	July 28	00-30	Oct. 10	1000 8	
	1961	March 11	Apr. 8	Aug. 27	Oct. 2	Aug. 31	Oct. 14	May 19	July 18	_	_	Nov. 3*	
	1962	Apr. 2	Apr. 18	Sept. 27	Oct. 3	Oct. 1	Oct. 26	June 22	July 12	-		Nov. 7*	sutinui ou
Juglans cin	erea L.												
	1953	Apr. 8	Apr. 18	Sept. 19	Oct. 17	Oct. 6	Oct. 26	—	-	—	-	-	no flowering and fruiting
	1954	May 6	May 10	Oct. 2	Oct. 27	Oct. 25	Nov. 5	May 21	May 30	Sept. 22	Oct. 18	Oct. 24	
	1955	May 1	May 9	Oct. 10	Oct. 28	Oct. 25	Nov. 3	May 22	May 29	Sept. 30	_	Oct. 24	and Board
	1956	May 8	May 14	Sept. 24	Oct. 18	Oct. 8	Oct. 28	May 30	June 2	Oct. 2	_	Oct. 29	
	1957	May 3	May 12	Sept. 8	Oct. 10	Oct. 12	Oct. 21	1117-34	245 34		00-13	25.2	no flowering and fruiting
	1958	May 7	May 13	Sept. 19	Oct. 27	Oct. 18	Nov. 15	May 26	June 2	Sept. 20		Oct. 25	no floright
	1959	Apr. 9	Apr. 24	Sept. 15	Oct. 19	Oct. 4	Oct. 30	May 6	May 10	000	-	_	no fruiting
	1960	Apr. 28	May 9	Sept. 28	-	Oct. 7	Nov. 3	May 17	May 22	007	-	5405-13.	very poor fruiting
	1961	Apr. 7	Apr. 14	Sept. 21	Oct. 18	Oct. 11	Oct. 25	Apr. 26	May 3	-	-	_	no fruiting
	1962	Apr. 18	Apr. 22	Sept. 15	Oct. 16	Oct. 7	Nov. 7	May 13	May 20	-	-	Oct. 10	Boas
Juglans mandshur	ica	March		5 Sept. 29	00, 11 00, 11	Cica, 25	New. 11	Star 23	A Dista Alta	, Aug. 13 (1993, 31)			
Maxim.		A MARICE S		1 - 12					1.449 2	1			
	1953	Apr. 9	Apr. 16	Sept. 8	Sept. 15	Sept. 15	Sept. 22	105-30 106 TR	Sept-3		00-30	-	no flowering and fruiting
	1954	May 6	May 8	Sept. 10	Sept. 20	Sept. 24	Oct. 2	June 2	June 8	Aug. 28	Sept. 18	Sept. 25	
	1955	May 2	May 8	Sept. 14	Sept. 30	Sept. 28	Oct. 6	June 2	June 9	2014-53	001-38	10-15	no fruiting
	1956	May 8	May 14	Aug. 29	Sept. 10	Sept. 3	Sept. 20	201-32	100-31	Nov. 2	-	201-2. Nov 14	no flowering and fruiting
	1957	May 3	May 12	Sept. 4	Sept. 20	Sept. 16	Sept. 26	1	August 25	-0 <del>10</del> -00	IT	NH-S	no flowering
Marine and			in the second			https:/	Ircin ou	anl		the second		N TON	Louis of the second second

1	Take	2	3	4	5	6	7	8	9	10	11	12	13
	1958	May 8	May 13	Sept. 8	Sept. 21	Sept. 12	Oct. 4	May 30	June 8	_	_	_	no fruiting
	1959	Apr. 14	Apr. 24	Sept. 10	Sept. 18	Sept. 15	Sept. 23	May 11	May 15	_	-	-	no fruiting
	1960	Apr. 18	May 3	Sept. 9	Sept. 20	Sept. 18	Sept. 24	May 26	May 30				fruits eaten
	1823		201. 2	04' 38	Nov. 10	Nov. 6			-				by squirrels
	1961	Apr. 3	Apr. 12	Sept. 6	Oct. 20	Sept. 18	Sept. 30	Apr. 27	May 7	_	-		no fruiting
	1962	Apr. 16	Apr. 22	Sept. 1	-	Sept. 14	Sept. 26	May 26	May 30	-	-	-	no fruiting
Juglans nigr	a L.	1	1. 16	Aine ID		Oct. 11	Nov. 24			-	-	-	no Ticonerios
	1953	Apr. 11	Apr. 20	Sept. 19	Oct. 17	Oct. 9	Oct. 27	May 23	May 27	Sept. 17	Sept. 28	Oct. 13	23 WIRE
	1954	May 6	May 10	Sept. 18	Sept. 30	Sept. 27	Oct. 20	June 8	June 16	Sept. 22	Oct. 15	Oct. 20	DP ARRANG
	1955	May 4	May 10	Oct. 10	007-38	Oct. 20	Nov. 2	June 16	June 20	Sept. 22	-	Oct. 30	33 55046
	1956	May 10	May 16	Sept. 29	-	Oct. 18	Oct. 30	June 18	June 25	Sept. 22	-	Oct. 28	AP MARIE
	1957	Apr. 29	May 12	Sept. 26	Oct. 17	Oct. 7	Oct. 26	June 6	June 10	-	_	-	no fruiting
	1958	May 10	May 15	Oct. 16	Oct. 25	Oct. 28	Nov. 15	June 8	June 14	Sept. 17		Oct. 28	beef shoedding
	1959	Apr. 22	May 4	Oct. 4	Oct. 20	Oct. 16	Nov. 6	May 25	June 3	Oct. 2	1 -	Oct. 25	14 1958
	1960	Apr. 29	May 12	Oct. 7	Oct. 26	Oct. 20	Nov. 5	May 30	June 6	Oct. 12	-	Nov. 3	Staff Steading
	1961	Apr. 15	Apr. 19	Oct. 3	Oct. 25	Oct. 7	Nov. 10	Apr. 19	May 25	-	-	Nov. 3*	the Worthky
	1962	Apr. 18	Apr. 22	Sept. 13	Oct. 22	Sept. 23	Nov. 5	Apr. 22	100-12	-	-		very poor
		AB. 26	AR. 20	109F 84	0-78	North 23	Noti	1000 10	NOF 34	1.000	-	1 =	fruiting
Juglans Siel	bol-	YDI L	VEF 12	091-90	da94' 10	Sent 25	Oct. 22	MAR	AND SR	Aux 24	12	. =	no Institute
diana Max	kim.		100 12	2010-10	0-11	Sent 26	Nov. 13	May 6	1 State 2		_		or trailing
	1953	Apr. 11	Apr. 18	Oct. 2	Oct. 17	Oct. 20	Oct. 27	Aner 13	100-10	-	-	-	no flowering
		YEL IR	1. 19. 22	2895 11	NE TO	Sept. 29	1.4191-13	A. 988.	10 Miles		-	091.0	and fruiting
	1954	May 6	May 8	Sept. 18	Sept. 25	Sept. 28	Oct. 22	May 21	May 28	Aug. 28	Sept. 18	Sept. 25	Ho Hannes
	1955	May 2	May 8	Oct. 8	Oct. 25	Oct. 20	Nov. 2	May 23	May 30	Aug. 28	-	Sept. 25	Thursday and
	1956	May 7	May 11	Sept. 29	Oct. 24	Oct. 10	Oct. 29	May 28	June 2	Aug. 25	-	Sept. 25	ASLA BOOL
	1957	May 3	May 16	Sept. 6	Oct. 10	Oct. 10	Oct. 19	May	3427 12	-	-	-	no flowering
									1000			- innerit-	and fruiting
	1958	May 6	May 13	Sept. 12	Oct. 16	Oct. 18	Nov. 3	May 26	June 3	1		0.00	very poor fruiting
		Mary		200	244							- BRIDE	Turing

1	1028	2	3	4	5	6	7	8	9	10	11	12	13
	1959	Apr. 7	Apr. 20	Sept. 28	Oct. 17	Oct. 8	Oct. 28	May 7	May 12			_	no fruiting
	1960	Apr. 14	May 6	Oct. 2	Oct. 20	Oct. 12	Oct. 28	May 19	May 24	14002-32 V	(1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-	20123	very poor
	1960	9425	VISA B	00 8	Q51 32	055 30	Ser 3	1414 33	1999 33	Aas. 28	-	第十1 第二	fruiting
	1961	Apr. 4	Apr. 12	Oct. 2	Oct. 2	2004-38	Oct. 18	Apr. 25	May 2	AUG-25	Scpt. 18	202.28	no fruiting
	1962	Apr. 16	Apr. 22	Sept. 11	Oct. 23	Sept. 29	Nov. 3	May 2	May 14	-	-	Oct. 9	
Kerria japo	onica	Apr. 11	YOU IS	085 50	AGE SA	AST 30	1961 M			E /	- 17	1	
D.C.		1000 0 0 0	and in	and a set				Sector 16	1.1.1.1				
	1953	Apr. 7	Apr. 15	Oct. 6	Nov. 10	-	-	May 6	June 26	Sector	00-38	00-4	no fruiting
	1954	Apr. 26	Apr. 29	Oct. 2		-	36-31	May 18	Aug. 14		-	oc-M	no fruiting
	1955	Apr. 9	May 2	Oct. 3	07-50	Nov. 14	Dec. 20	May 10	July 18	00-	-	00-9	no fruiting
	1956	May 15	May 20	00-	00-32	-	100-10	May 24	June 17	-	-	1402-14	nto Decembra
	1957	March 18	Apr. 4	Sept. 25	Oct. 28	Oct. 13	Jan. 21	Apr. 29	June 6	000-13	-	Not-3	leaf shedding
		116 33	1992 44	055 14	061.24	005 16	1498' 98	MG 25	1846 1	2241 2011	1	98.9	in 1958
	1958	Apr. 5	Apr. 24	Sept. 16	Nov. 5	Oct. 10	Jan. 2	May 13	June 25	Sept- 1	-	0-0-0	leaf shedding
		14.20		544. 26	097 14	05.1 -	0.2.26	19/25 21	RAL IS			No.	in 1959
	1959	March 25	Apr. 16	Sept. 16		Oct. 8	Nov. 26	Apr. 22	May 28		-		no fruiting
	1960	Apr. 15	May 6	Aug. 23	Oct. 28	Sept. 24	Nov. 27	May 16	July 1		-	0-0	no fruiting
	1961	March 12	Apr. 3	Sept. 15	Oct. 27	Sept. 21	199 <del>1-1</del> 9	Apr. 20	June 7				no fruiting
	1962	Apr. 4	Apr. 20	Sept. 7	Oc-D	Oct. 11	Nov. 23	May 30	Aug. 2		30-38		no truiting
Kolkwitzia									1 San San				in ummit
amabilis		Yte: 12		Sento 1		Sent. M.	10000 30	May 25	March 10				and commit-
Graebn.		X98' 3		800E 6	885. 26	1211	1998, 19	Ancies	June -				no flowerin
	1953	Apr. 6	Apr. 8	Oct. 26	Nov. 10	Nov. 6				-			and fruiting
	1998	ADE. 18		See an	20 M	82.4	211 21		APPEND AN				no flowering
	1954	May 4	May 11		100	-	1977 P.	1 10 10 10 10 10 10 10 10 10 10 10 10 10	Some of	-	-	-	and fruiting
	19 CA		364 13		NT	0.1.00	Nov. 22	Tune 22	Tuly 6	Aug 10	Aug 22	Aug 30	and manning
	1955	Apr. 20	May 1	Oct. 5	Nov. 3	Oct. 22	Nov. 23	June 23	July 0	Aug. 10	Aug. 22	Aug. 30	strongly fro
	1956	ME 3	M57 12	Set 4	Sept. 20	Sept. 16	Sejac, 26	0	20		TT .	10	Zen
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		1				https://	rcin.or	g.pl					

1 10.8	2	3	4	005	6	7	8	9	10	11	12	13
1957	March 23	March 30	Oct. 4	Queres .	Oct. 30	Nov. 29	-Mig di	West The	ANDE 19		1000 324	no flowering
	VIC 2	YOR 11	Sort. 28	04	Sept. 24	dat 12	pan f	With 18	Tipe 20	1812 2	1017 13	and fruiting
1958	Apr. 13	Apr. 28	Sept. 8	toa_ta	Nov. 4	Dec. 3	\$01-50	1/10_10	1112-st	Van IV		no flowering
	March 9	March 28	Sept. 6	Sept. 28	0.00. 6	Oct. 28	Apr. 8	Apr. 20		-		and fruiting
1959	March 25	Apr. 1	Sept. 14	-	Oct. 26	Nov. 25	-	-	_	-	-	no flowering
	May 2	New A	Sent 12		1		and in	Mary 10				and fruiting
1960	Apr. 10	Apr. 16	Aug. 10	095.32	Oct. 11	Nov. 24	MEA o	MERA Se	Sente	10 10	Den -	no flowering
1011	WHITCH O	AGIPON 21	8600 3	· = 1 2	Rept. 25	100. 10	VAL: 38	WERT OF	1714 14	Carton 10		and fruiting
1961	March 9	March 22	Sept. 23	Oct. 14	Sept. 24	Nov. 15	1488 11	May 20	1015-11	V00 53		no flowering
10/0	March 23	ybe in	2007 10	MON &		201 11	Apr. 22	May 18	7029 19		1012 29"	and fruiting
1962	Apr. 8	Apr. 18	Aug. 23	E .	Oct. 5	Nov. 15	91 6854	MIR - 80	3016-38	AUE 26	3085 8	no flowering
	MR.CH.18	ANY 5	2001 38	066, 18	OSK BU	MOY. 2	N186 20	14210 22	194 50	Aug. 18	100	and fruiting
Lindera aestiva-	<b>累积</b> , 14	X44: 29	QGU 375	Next2	690 30	Nov. 28	1486 12	MIL BO	XUE A	A08. 22	W/18" 38.	
us nees	Apr 20	May 1	Sant 2	Sant 20	Oct 2	Oct 21	Ann 14	A	2016 151	2012 15	Aug. 2	c
1953	May 18	May 22	Sept. 2 Sept. 16	Oct 16	Oct. 2	001. 21	Apr. 14 May 7	Apr. 24	3(114 50	3014 38	ANE 21	no fruiting
1955	May 5	May 13	Oct 7	Nov 22	Oct. 14	Dec 3	May 5	May 15	2014 13	T	. =	no fruiting
1956	May 5	May 20	Sent 25	Oct 18	Sept 28	Nov 1	May 11	May 27			-	no fruiting
1957	March 28	May 5	Sept. 20	Oct. 12	Sept. 25	Oct. 22	Apr. 6	May 28	A110 24			no muting
1958	Apr. 16	May 13	Sept. 10	Oct. 12	Sept. 26	Nov. 13	May 6	June 2		_	104044 R	no fruiting
1959	March 29	Apr. 30	Sept. 21	Sept. 28	Oct. 8	Nov. 3	Apr. 13	May 10		_	102-10-1	no fruiting
1960	Apr. 12	May 12	Aug. 18	000-18	004-13	Oct. 28	May 14	May 26	000-1	_	-	no fruiting
1961	March 14	Apr. 16	Sept. 23	Oct. 16	Sept. 27	Oct. 25	Apr. 10	Apr. 19	7014-33	_	Mos. 30	np fruiting
1962	Apr. 11	Apr. 23	Sept. 22	Oct. 26	Oct. 3	Nov. 9	May 2	May 19	1-200	-	\$1041 32	no fruiting
Liriodendron	1982 F	941.12		Oct 10	04.5	04- 50	1000 10	2018 15	2618 32	Serol. 15	200 10	
tulipifera L.	Vist e	NOT IT.		09.14	Gar e	000 21	1110° 14	1018 30	Sept. 28	122.00	NOX. 28	as fraibag
1953	Apr. 4	Apr. 11	Sept. 15	Oct. 6	Sept. 30	Oct. 22	June 2	June 29	Sept. 10	-	Nov. 3	
1954	May 1	May 6	Sept. 18	Oct. 4	Oct. 6	Nov. 18	June 22	July 17	Sept. 18	TT -	Oct. 30	
1955	May 1	May 5	Sept. 28	Oct. 17	Oct. 13	Nov. 2	June 20	July 26	Sept. 28		Nov. 25	
	1						the second se			and and and and and		

1	1954	2	3	4	5	6	7	8	9	10	11	12	13
trephotosin )	1956	May 6	May 13	Sept. 24	Oct. 14	Oct. 6	Oct. 27	June 14	July 30	Sept. 28	_	Nov. 28	- Think
	1957	Apr. 3	Apr. 12	Sept. 28	Oct. 10	Oct. 5	Oct. 26	June 10	July 12	Sept. 25	_	Nov. 19	
	1958	Apr. 26	May 8	Sept. 28	Oct. 18	Oct. 8	Nov. 18	June 20	July 23	Oct. 1	-	Nov. 25	
	1959	Apr. 10	Apr. 20	Sept. 4	Oct. 10	Oct. 8	Oct. 26	June 3	June 30	Sept. 23	-	Nov. 30	
	1960	Apr. 22	May 7	Sept. 16	Oct. 18	Oct. 12	Nov. 12	June 8	July 12	Oct. 7	-	-	
	1961	Apr. 8	Apr. 12	Oct. 2	Oct. 19	Oct. 7	Oct. 28	June 6	June 28	-	-	Nov. 10*	
	1962	Apr. 14	Apr. 21	Sept. 3	Oct. 11	Sept. 20	Oct. 30	June 13	July 3	-	-	Nov. 8	
Louicera al	ni	March 28		2007 50	GSC 13m	Sapt. 25	04.33	900° 00	Mary 28	VIII: 51	-	-	
gena I	pi-	MD 2		344 52	04178	Sept. 28	Nov. 1	MEL 16	Mary San	-			
genu L.	1052	14 1. 21		0 1 10	0+ 11	0 1 10	NT 10	1 00		T 1. 10	= 1	-	
	1953	March 31	Apr. 2	Sept. 18	Oct. 14	Oct. 12	Nov. 10	Apr. 26	May 14	July 12	T 1. 00	=	
	1954	Apr. 22	May 4		250 38	095 33	-	May 20	June 4	July 20	July 28		
	1955	Apr. 8	Apr. 23	Oct. 26		-	Nov. 2	May 16	June II	July 12	July 12	Aug. 2	
	1956	Apr. 17	Apr. 29	Oct. 2		Oct. 20	Nov. 28	May 13	May 30	Aug. 1	Aug. 22	Aug. 30	
	1957	March 18	Apr. 9	Sept. 28	Oct. 18	Oct. 8	Mov. 2	May 2	May 22	July 13	Aug. 18	-	
	1958	Apr. 8	Apr. 29	Sept. 14	-	Oct. 19	Nov. 29	May 16	May 30	July 28	Aug. 26	NOV. Z	
	1959	March 23	Apr. 3	Sept. 16	Nov. 4	Oct. 8	Nov. 17	Apr. 22	May 18	Juyl 17	-	July 29*	
	1960	March 3	Apr. 16	Aug. 23	Oct. 14	Sept. 24	Oct. 19	May 11	May 20	July 17	Aug. 23	-	
	1961	March 6	March 21	Sept. 3	-	Sept. 25	Nov. 10	Apr. 20	May 9	July 14		_	
	1962	Apr. 1	Apr. 20	Oct. 2	Oct. 25	Oct. 23	Nov. 11	May 9	May 24	Aug. /	Aug. 16	= *	
Lonicera co	eru-							1					
lea L.	1923	Shareh 25		Sept. 14		041, 26	Nov. 25	1		-	-		
	1953	March 9	March 28	Sept. 6	Sept. 28	Oct. 6	Oct. 28	Apr. 8	Apr. 20		-	-	no fruiting
	1954	Apr. 12	Apr. 22	Sept. 9	-	North	Dec-3	Apr. 20	May 10	July 24	Aug. 17	-	THE CONTRACTOR
	1955	Apr. 5	Apr. 14	Sept. 28	-	-	Oct. 15	May 2	May 16	June 20	July 5	July 13	ALL REALED BY
	1956	Apr. 10	Apr. 16	Sept. 15	Oct. 6	Sept. 20	Nov. 19	May 9	May 22	June 13	-	July 3	no. Tohilitari
	1957	Feb. 7	Feb. 17	Sept. 12	Oct. 2	Sept. 22	Oct. 22	Apr. 3	Apr. 30	June 8	1 1 - 73	June 25*	
	1958	Feb. 13	Apr. 14	Aug. 31	Oct. 9	Oct. 1	Nov. 5	May 2	May 13	June 10	June 20	July 2	Larrought the
	1959	March 20	Apr. 1	Sept. 4	Oct. 8	Oct. 6	Nov. 12	Apr. 10	Apr. 25	May 26	-	June 8*	- Della
											-	T SPIC	So (contrating)

		L INTERPORT	and the state of t										
1	1961	2	3	4	5	6	007	8	9	10	11	12	13
	1960	March 23	Apr. 4	Sept. 9	_	Sept. 23	Oct. 24	Apr. 26	May 13	June 11	_	1012_53	
	1961	March 5	March 7	Aug. 30	Oct. 2	Sept. 21	Oct. 19	Apr. 10	Apr. 18	May 23	June 2	VIII II	_
	1962	March 27	Apr. 6	Sept. 3	Oct. 18	Sept. 17	Oct. 26	Apr. 22	May 4	June 21	YOE'S	July 16*	
Lonicera i	iberica	A Ministry	144. 28	Sept. 29	2	-091°_1 -	98.11	May 29	1000 10	1012 11	Aug. 22	Vn& 30	- no Courselo
Bieb.		Apr. 14	Apt. 23	Sept. 28	-	091 13		May 23	3000 18	345 2	7003 14	VAR 5	
	1953	Apr. 2	Apr. 4	and the state	-	15477-26	000-1	212-31	June 2		_		DO LUNIANS
	1954	May 3	May 6	Sept. 12	Sept. 14	Sept. 22	0	May 4	May 18	Aug. 17	Sept. 4	Sept. 14	Do purcert
	1955	Apr. 26	May 2	Nov. 7	_		Nov. 25	July 2	July 21	Sept. 1	Sept. 10	Oct. 3	and Restord
	1956	May 5	May 9	Nov. 1	-	Nov. 8	Dec. 1	June 25	July 16	Aug. 28	Sept. 20	Oct. 19	fruits fall
		Apr., 24	May 1-	Octo 6	1	No. Pr	Dec. 15	-		0.			down rather
		Apr. 12.)	1401. 16	Aug. 29	and the	Sept. 19	00 10	500e 2	1959 19	11000	2002 22	2	inefficiently
	1957	March 29	Apr. 4	Sept. 24	Super Sty	Oct. 16	9415-2	June 11	July 2	Aug. 2	Nut I	Aug 24	montering
	1958	Apr. 23	May 2	Sept. 8	Dec. 4	Nov. 21	000-10	June 19	July 14	Aug. 20	VOP-18	Sent 19*	
	1959	Apr. 3	Apr. 13	Sept. 23	Nov. 2	Nov. 25	20041-300	June 3	June 23	Aug. 2		Sept. 18*	
	1960	Apr. 10	May 1	Aug. 18	Nov. 20	Oct. 23	Nov. 29	June 12	June 29	Aug. 10	_		
	1961	March 15	Apr. 4	Aug. 31	Sept. 13	Sept. 16	Nov. 28	June 12	June 24	Aug. 8	VAR S	Aug 21	
	1962	Apr. 16	Apr. 23	597.24	Sept. 9	0000	Oct. 18	June 17	1005 13		WOR HU	11ug. 21	no fruiting
Lonicera		1982 19		setter fit		Sept. 30	001 15	anabe a	100.75	1002 30	vol: 10	wn8- 16-	no maning
Maackii		VIII- 52		SPP 13		Bept, 1	No2 23	VIEL 12	TING 2	wrik-	pobr' z	120	
Maxim.		Apr. 2		Sopt. 14	Oct. 3	OCT 0	047 30	WEAL IT	10000 23				
	1953	March 26	Apr. 1	Sept. 16	Oct. 6	- 1	-	-	-	-	-	-	no flowering
	1954	Apr. 20	Apr 26	Sept 12	Sent. 201	CHE IN	(Ref. 26	May 24	Tuno 19	Tuby 14			and fruiting
	1000	y alegalen		Sept. 12	antir to	actor a	100-10	Way 24	June 10	July 14	_		very poor
	1955	Apr 8	Apr 22	Sept 30	Oct 12	Oct 2	Oct 25	Tuno 7	Tuna 25	A	Cart 15	0.1.2	Iruiting
	1956	May 3	May 8	Sept. 22	Oct. 12	Sent 28	Nov 2	June /	June 25	Aug. 2	Sept. 15	Oct. 3	C
	1957	Feb 15	March 19	Sent 18	Oct 2	Sopt. 20	Nov. 2	May 10	June 27	I.1. 20			no fruiting
	1958	Feb 15	Apr 20	Sept. 10	Oct. 2	Oct 7	Nov 20	May 19	June 8	July 29	Aug. 30		
	1950	March 23	Apr 3	Sept. 12	Oct. 10	Sont 22	Nov. 30	May 31	June 15	Aug. 14	Sept. 5		
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the second													

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	1960	March 28	Apr. 10	Aug. 19	Oct. 3	Sept. 13	Oct. 17	May 23	June 9	Aug. 10	Sept. 13	An <u>n</u> ar	the tringing
	1961	March 8	March 12	Aug. 31	Sept. 27	Sept. 2	Oct. 24	May 9	June 1	Aug. 8	Aug. 28	06-11	
	1962	March 30	Apr. 12	Aug. 27	Sept. 26	Sept. 3	Oct. 18	May 10	June 15	_	_	Aug. 10*	Crutchig
Lonicera 1	Maxi-	1 255 20		Scn. 12			and and a second	26 24	THE TA	120 10		and the second	ACCA DODE
mowiczii		1	A	100	Cont. Inc.		Can 122	Acres 2				ALL STREET	and fruiting
Reg.		Multer 26	Yes'IT.	Scot. 16,	05 8.	aller my	in the second						ao Noverin
	1953	Apr. 2	Apr. 4	Sept. 14	Oct. 2	Oct. 6	Oct. 20	May 11	May 27	-		-	no fruiting
	1954	Apr. 21	Apr. 26	Sept. 12	-	-	-	May 18	June 3	Aug.	Sept. 2	-	
	1955	Apr. 14	Apr. 26	Sept. 28	-	Sept. 30	Oct. 12	June 7	June 22	July 26	Aug. 10	Aug. 24	
	1956	Apr. 25	Apr. 30	Sept. 24	Oct. 14	Oct. 9	Oct. 22	June 3	June 10	Aug. 2	Aug. 24	Sept. 3	no insides
	1957	March 18	March 29	Sept. 18	Sept. 11.	Sept. 30	Oct. 14	May 18	June 2	July 25	Aug. 2	21-31	
	1958	Apr. 22	Apr. 30	Sept. 12	Nov. 9	Oct. 8	Nov. 26	May 28	June 16	July 25	10-	Aug. 5*	
	1959	March 26	Apr. 2	Sept. 20	Oct. 8	Oct. 16	Nov. 20	May 10	May 27	July 8	A = 2	July 15*	
	1960	Apr. 10	Apr. 16	Aug. 20	Oct. 6	Oct. 4	Oct. 16	May 22	June 6	July 27	Aug. 18	Sett 19#	
	1961	March 12	March 24	Sept. 3	Sept. 27	Sept. 25	May 5	Oct. 13	May 26	July 7	1. 77 16	Aug. 8	
	1962	Apr. 12	Apr. 16	Aug. 29	-	Sept. 19	Oct. 10	June 2	June 16	12	July 25		intelligiently.
Lonicera t	ta-	hiarch 3	APR DL.	1-1-10	(R.L. 15)	Sugar al	1996 19	May 1		The Carl	1112		down on the
tarica L.		Miles v	MEN-023	19296		X040 83	Http: 13		WID IN	VIII SA	Secto 26	Office 10	freits fall
	1985	Aller 16	1999 20		0.00		0.1.10	· Inter a				anter all	C
	1953	March 28	Apr. 1	Sept. 6	Sept. 14	Sept. 22	Oct. 10	May 4	June 21	No- 17	1000- C	Seatt 14	no fruiting
	1954	Apr. 20	Apr. 27	Sept. 4		Sept. 26	Oct. 4	May 27	June 2	Inter O	T.1. 14	A	no iruiting
	1955	Apr. 14	Apr. 23	Sept. 28	Sept. 28	Oct. 13		May 23	June 18	July 2	July 14	Aug. 2	no fittitios
	1956	Apr. 14	Apr. 28	Sept. 29		Oct. 1	Dec. II	May 29	June 10	July 17	Aug. 22	Aug. 30	and the second
	1957	Feb. 13	March 16		10-10	Sept. 25	Oct. 22	May 10	May 31	June 20	Aug. 2	Aug 11	1.1
	1958	March 29	Apr. 18	Sept. 16	N.	Sept. 19	Dec. 4	May 22	June II	July 15	Aug. 9	Aug. 11	Contract of the
	1959	March 18	Apr. 2	Sept. 14	Oct 2	Oct. 8	Oct. 22	May 5	June 2	June 2/		July 10	
	1960	March 23	Apr. 4	Aug. 22		Oct. 3	Oct. 30	May 10	June 3	June 21	100,20	July 19	
	1961	Feb. 21	March 4	Sept. 8	Oct. 25	Sept. 25	Oct. 29	Apr. 25	Tune 10	June 21	11	July 21*	r 13
	1962	March 30	Apr. 4	Aug. 28	Oct. 9	Sept. 1	Oct. 25	May 9	June 10		-	July 51*	or recurrence

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Louisong thibati	May 13	May 17	Sept. 28	Cost. 22.	1.000 10	Nov. 15	May 26	Jone 18		].		1000000
Lonicera inideti-	O VERDIT	PERMY 152	Sect. 200	0994-129	Obta 10	Opt. 26	Mar 1202	June 15	Serie 20		11-11-13	
<i>ca</i> Bur. et	1 Prefer 122	Math 163	Single 24	Osti 171	NOOC A	0020210	Margaret a	Jump 11	Scott 18		00, 23	TATE OF APPRILITY
1953	March 31	Apr. 2	041 2		04 12	Non S		indiana 18	Deler 10	203- 30	00-10	no flowering
		1.4.01.1.4.0	Contrary	L'andre	1 contract	100000	1		1	1	and the	and fruiting
1954	Apr. 20	Apr. 26	Oct. 4	Ior-15	(SCH-O	00-58	-	-	_	-	-	no flowering
										1		and fruiting
1955	Apr. 8	Apr. 23	0-5	100 22	Oct. 16	Dec. 2	May 24	June 14	July 2	July 18	July 26	too foorting
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	DARSA IAN	ore Approx	061.20	KONE GOS	Q961 228	1/19/1-52	7468712	June 30	QUE 17		Nov. 10	and fruiting
1957	NOLASS	March 12	Sept. 21	Nov. 15	Sept. 28	0/19/12 37/	May 7	July 30	July 3	July 13	-	and foundance
1958	Feb. 15	Apr. 14	Sept. 14	Dec. 4	Oct. 23	0 29	May 17	May 30	July 10	-	July 21*	and trating
1959	March 23	Apr. 1	Sept. 10	000 24	Oct. 4	Nov. 20	Apr. 26	May 22	June 20	_	June 27*	no fiowerias
1960	March 28	Apr. 4	Aug. 18	Nov. 17	Oct. 12	Dec. 2	1.900.300	10494 386	San 2	_	0.000	no flowering
	O L Mars 2	1 and the	100	021, 20	Cont. 15.	1000	1 1 1 1 1 1	1 1 1 1 1 1 1	0000 13	1 -		and fruiting
1961	Feb. 25	March 3	May 27		Aug. 30	10000	Apr. 25	May 24	-	tor a	-	no fruiting
1962	Apr. 2	Apr. 8	Aug. 27	-	Sept. 3	Nov. 23	100- 26	101-18	Sept. 29	-	00	no flowering
	Way 16	May 26	Oct. 10	Oct. 26	Oct. 20	Mov. 22	June 12	Jane 30	-			and fruiting
Lonicera	What 18	19987 18	Sept. 30	Oct. 29	Oct. 17	Mox. 16	June 8	3005 19	-		-	and inciding
xylosteum L.								1				
1953	March 30	Apr. 1	Sept. 10	Sept. 30	Oct. 16	Oct. 26	May 8	May 20	-	-	-	no fruiting
1954	Apr. 24	Apr. 28	Sept. 12	0 0 10	and the second	1000 10-	May 18	May 31	west.		-	no fruiting
1955	Apr. 19	Apr. 26	Oct. 31	000000		Nov. 15	May 24	June 2	Aug. 10	Aug. 27	Sept. 6	in Hostoric
1956	Apr. 22	Apr. 30	Oct. 2	00000	Oct. 11	Dec. 2	May 23	June 5	Aug. 18	Aug. 22	Oct. 10	the tenance
1957	March 10	March 17	Sept. 30	Oct. 29	Oct. 12	Nov. 30	May 9	May 25	June 28	July 13	Sept. 25	A. M. Martin
1958	Apr. 12	Apr. 29	Sept. 12	Nov. 5	Oct. 7	Dec. 10	May 19	June 2	July 24	Sept. 2	T	in Fritter
1959	March 23	Apr. 2	Sept. 14		Oct. 6	Nov. 26	May 4	May 15	July 5		Aug. 2*	
											1 Control of	

1	Lais	2	3	4	5	6	7	8	9	10	11	12	13
	1960	Apr. 8	Apr. 16	Aug. 22	Oct. 28	Sept. 24	Nov. 14	May 21	May 29	July 18	) ) (ik 13	Sept. 25	
	1961	March 7	March 15	Sept. 15	Oct. 30	Oct. 23	Nov. 28	Apr. 25	May 14	July 5	July 13	01 10	
	1962	Apr. 3	Apr. 13	Sept. 7	-	Oct. 7	Nov. 16	May 8	June 4	Aug. 7	Aug. 27	_	
Maclura po fera Schn.	omi-	Marrie 20	Apr. 1	Sefe. 10.	5694° 30	Oct: 16	041.22	Sec. 8	May 20		-		no finition
	1953	Apr. 18	May 18	Sept. 30	Oct. 29	Oct. 17	Nov. 16	June 8	June 19		_	_	no fruiting
	1954	May 16	May 26	Oct. 10	Oct. 26	Oct. 20	Nov. 22	June 12	June 30	_	_		no fruiting
	1955	May 11	May 31	Oct. 8		Oct. 20	Nov. 17	June 26	July 18	Sept. 29	_	Oct. 20*	un sementer
	1956	May 21	May 30	Sept. 27	_	Oct. 16	Nov. 8	June 15	July 14	_	_	_	no fruiting
	1957	May 3	May 19	Oct. 7	-	Oct. 12	Nov. 27	-	-	-	-	-	no flowering
	1958	May 14	May 25	Sept. 22	019/_13	Oct. 18	Dec. 5	June 20	June 30	_			no fruiting
	1959	Apr. 25	May 9	Sept. 20	-	Oct. 8	Nov. 12	-	-	AUR - 10	-	2018 33.	no flowering
	1960	May 7	May 17	Sept. 20	September 20	Oct. 7	Nov. 25	June 14	102.10	102.0	1012-12		no fruiting
	1961	Apr. 17	May 4	Oct. 2	Oct. 29	Oct. 5	Nov. 22	June 12	June 30	_	_	_	no fruiting
	1962	Apr. 23	May 17	Sept. 14	Oct. 26	Oct. 2	Nov. 24	June 30	July 18	-	-	Nov. 2*	no flowerin
Magnolia a minata L.	си-	VDL' S	Apr. 23		-	ocr it	Doc: 2	May 24	Famo 14	3492 3	142.10	July 26	SHUT THREE PLAN
	1953	Apr. 8	Apr. 30	Sept. 30	Oct. 17	Oct. 6	Oct. 29	1.1.7	200	-	-	-	no flowering
	1954	May 9	May 12	Sept. 17	Oct. 5	Oct. 8	Nov. 28	May 26	June 14	Sept 18	Sept 30	Oct. 18	und munning
	1955	May 12	May 16	Oct. 8	Oct. 25	Oct. 15	Nov. 2	June 5	June 18				no fruiting
	1956	May 13	May 16	Sept. 24	Oct. 17	Oct. 4	Oct. 28	May 31	June 11	Sept. 18	_	Oct. 23	
	1957	May 2	May 12	Sept. 20	Oct. 12	Oct. 10	Oct. 26	May 22	June 15	Sept. 20	_	Oct. 18	N. C. S. K. S. S. S.
	1958	May 13	May 17	Sept. 28	Oct. 22	Oct. 10	Nov. 15	May 26	June 18	-	-	-	very poor
		1				Constant 1	1	Anno re	Mana				fruiting
	1959	Apr. 27	May 4	Sept. 15	Oct. 18	Oct. 6	Nov. 2	May 12	June 3				no fruiting
	1					batto or /	train or		1			1.9010	o (countrate)

1	2	3	4	5	6	7 50	8	9	10	11	12	13	
1960	May 7	May 12	Sept. 20	Oct. 20	Oct. 6	Nov. 3	May 23	June 8	Juir 18	2000	1412-10*	no fruiting	
1961	Apr. 22	Apr. 24	Sept. 30	Oct. 17	Oct. 7	Oct. 24	May 19	May 27	Oct. 5	-	7407-22	very poor fruiting	
1962	Apr. 26	Apr. 28	Sept. 3	Oct. 16	Oct. 2	Oct. 31	May 26	June 13	700-12	1712-38	Vn2-10	no fruiting	
Magnolia kobus borealis Sarg	Add as	1223	24	1944 30	St S	State of the	May 24	May, 30 June 18.	July .3 July 10.	Robert .	July 9.	en Donet	
1953	Apr. 20	Apr. 23	Oct. 6	Oct. 22	Ict. 17	Nov. 6	Apf. 8			Plaza La	Them 24	no fruiting	
1954	May 8	May 10	Oct. 12	Oct. 30	Oct. 17	Nov. 12	May 4	May 20	Oct. 10	Oct. 25	Nov 4	no nuning	
1955	May 6	May 9	Oct. 10	Nov. 3	Oct. 25	Nov. 2	May 4	May 20	Oct. 17		Nov. 10	and draining	
1956	May 13	May 16	Oct. 22	Nov. 7	Oct. 20	Nov. 16	May 13	May 28	_			no fruiting	
1957	Apr. 24	Apr. 29	Oct. 7	Oct. 26	Oct. 21	Oct. 29	Apr. 11	May 14	Oct. 8	_	Oct. 30	ano (pudine	
1958	May 11	May 14	Oct. 7	Oct. 23	Oct. 28	Nov. 18	May 8	May 18	Oct. 17	5-06-24	Nov. 3	no routany	
1959	Apr. 18	Apr. 24	Oct. 6	Oct. 19	Oct. 16	Nov. 4	Apr. 14	Apr. 30	Sept. 25	_	Sept. 30*	no freitna	
1960	May 2	May 8	Oct. 7	Oct. 26	Oct. 20	Nov. 3	Apr. 28	May 16	Oct. 18		_	and Inditing	
1961	Apr. 13	Apr. 16	Oct. 11	Oct. 22	Oct. 13	Nov. 3	Apr. 9	Apr. 22	Oct. 17		_	MO GOMESIN	
1962	Apr. 22	Apr. 23	Oct. 14	010 54	Oct. 9	Nov. 2	Apr. 22	May 10	-	Oct. 30	-	Distance of the second	
Magnolia sali-	AND TO	241 15	124-13	100 30	24-32	2005 -1-	mine 24	or stille	Start Stark	Peb_ 18	057-51	full maturit	
cifolia	WORA OF	2122 11	001 3	Oct. 26	07 30	1005' 18	THE S	THERE IN	-			Bo White	
Maxim.	Anay -	Mby 7	Od. 3	SHOP, CR	TOP IS	Sec. 35	May 34.	Juran 10	Sept. 20		Fig. 25	daty salesteed	
1953	Apr. 13	Apr. 16	Oct. 9	Oct. 26	Oct. 22	Nov. 10	Apr. 2	Apr. 16	-			no fruiting	
1954	May 6	May 9	Oct. 12	Oct. 30	Oct. 17	Nov. 12	May 1	May 13	Sept. 18	Sept. 25	Oct. 8	Lan Booking	
1955	May 5	May 7	Oct. 28	Nov. 5	Oct. 28	Nov. 17	May 2	May 11	_	_	_	no fruiting	
1956	May 9	May 13	Ocr. 22	Nov. 3	Oct. 24	Nov. 14	May 5	May 11	001111	1 =		no fruiting	
1957	Apr. 27	Apr. 30	Oct. 12	Oct. 26	Oct. 21	Oct. 31	Apr. 4	Apr. 30				no fruiting	
1958	May 11	May 15	Oct. 30	Nov. 10	Nov. 2	Nov. 18	May 2	May 16	Sept. 20		Oct. 25	fruit droope	
1959	Apr. 18	Apr. 25	Sept. 10	Oct. 22	Oct. 19	Nov. 18	Apr. 3	Apr. 26	10	++	10	no fruiting	
1960	Apr. 26	May 6	Oct. 7	Oct. 18	Oct. 22	Nov. 10	Apr. 18	May 13	Oct. 2				
		1									and the second se		
1	1020	2	3	4 10	5	0.6	7	8	9	10	11	12	13
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	1961	Apr. 12	Apr. 16	Oct. 7	Nov. 3	Oct. 28	Nov. 21	Apr. 10	Apr. 20	Data Ta	-	-	no fruiting
	1962	Apr. 20	Apr. 22	Sept. 18	120122	Oct. 7	Nov. 5	Apr. 19	Apr. 30	Oct. 14	_	-	ao fraitice
Magnolia	tripe-	1.25 APRIL	(-avay!)	182 1961	New 51	0041,261	Mov. 47	Selection 2	Solaw H	Aug-	Ang-State		
tala L.		May 6	Aday 9-	091, 121	UGF 30	000 13	Nov. 13	3620 1 1	24/02 13	Supt. 18	Sopie 25	001 8	
	1953	Apr. 24	May 22	Oct. 2	Oct. 26	Oct. 20	Nov. 16	100-2 1	11 - 16	-	-	-	no flowering
								S	10.000	hance and			and fruiting
	1954	May 6	May 11	Oct. 2	Oct. 26	Oct. 20	Nov. 18	June 8	June 14	-	-	-	no fruiting
	1955	May 7	May 16	Oct. 12	Oct. 28	Oct. 28	Nov. 2	June 4	June 30	Sept. 27	-	Oct. 21	
	1956	May 16	May 20	Oct. 4	Oct. 24	Oct. 22	Oct. 31	June 6	June 16	-		-	no fruiting
	1957	Apr. 29	May 12	Oct. 10	Oct. 27	Oct. 17	Nov. 5	June 8	June 17	-	-	- 1	no fruiting
	1958	May 10	May 17	Sept. 20		Oct. 30	Nov. 21	-	-	-	-	-	no flowering
		And a state	and a second		000 26	(J=1 30)		and a start	Later Ba	the second		patre sal	and fruiting
	1959	Apr. 25	May 4	Sept. 28	Oct. 22	Oct. 8	Nov. 6	May 20	June 12		-	unit a	no fruiting
	1960	Apr. 18	May 8	Sept. 9	Oct. 16	Sept. 20	Oct. 28	May 22	June 10	Sept. 9	Sept. 24	CONT SAL	west franklike
	1961	Apr. 15	Apr. 23	Sept. 30	Nov. 1	Oct. 28	Nov. 11	May 20	May 27	-	-	-	no fruiting
	1962	Apr. 22	Apr. 25	Sept. 29	Oct. 10	Oct. 3	Oct. 29	-	-	-	-	in the	no flowering
					Contraction of	Transition of the	Same - and	Courses in a		CHERT TO	000 10	The second	and fruiting
Morus alb	a L.		alar and		1.00-000		Suma Co	arm o					Summer ou
	1953	Apr. 20	May 18	Oct. 22	Nov. 2	Oct. 29	Nov. 16	-	-	-	-	-	no flowerin
							See Star						and fruiting
	1954	May 15	May 20	Oct. 22	Nov. 2	Oct. 29	Nov. 16	May 24	May 30	July 3	July 7	July 9	and the base
	1955	May 13	May 22	Oct. 25	-	Nov. 2	Nov. 12	June 3	June 18	July 10	July 22	July 26	
	1956	May 23	May 30	Oct. 18	10 = 10	Oct. 14	Nov. 20	June 5	June 10	July 12	July 28	Aug. 10	and freedomen
	1957	May 10	May 17	Oct. 19	Nov. 4	Oct. 17	Nov. 19	May 30	June 14	July 1	-	July 20	from the
	1958	May 17	May 23	Oct. 25	0-13	Nov. 5	Nov. 27	May 28	June 8	July 8	-	July 22	AGLA DODL
	1959	May 4	May 8	Oct. 12	072-301	Oct. 19	Nov. 12	May 19	June 13	June 27	- '	July 10*	no fristine
	1960	May 13	May 17	Oct. 7	-	Nov. 3	-	May 28	June 13	July 18	Aug. 7		
	1961	Apr. 24	May 2	-	Oct. 22	Oct. 4	Nov. 20	May 31	June 15	July 2	July 13	T	13
	1962	Apr. 23	May 16	Sept. 24	Oct. 26	Oct. 11	Nov. 14	June 6	June 23	July 18	July 29	Aug. 20	Color Francisco
						https://	tcin ore	10		1	1		

1 1961	2018	3.4.3	2 4	005 20	2016	007 5	8	9	10	111	12	13
Phellodendron amurense Rupr.	Apr. 12	Apr. 29	Sept. 17	-Oot. 25	Sept, 29	Oct. 30	May 9	May 17	June 25	July 20		
1953	May 2	May 18	Oct. 6	Oct. 22	Oct. 20	Nov. 6	NAR-14	1000 TS	1017-7	-	1412-345	no flowering and fruiting
1954	May 6	May 11	Oct. 12	Oct. 30	Oct. 20	Oct. 9	May 29	June 10	Oct. 20	Nov. 17	Dec. 28	
1955	May 2	May 11	Oct. 20	Oct. 30	Oct. 20	Nov. 2	May 11 11/37-18	June 3 37057-28	June 21 July 2	July 20 July 12	July 27 3 July 20	no flowering and fruiting
1956	May 8	May 16	Oct. 14	Oct. 26	Oct. 20	Oct. 31	June 15	June 28	Oct. 18	Nov. 12	Nov. 24	
1957	May 2	May 12	Oct. 8	Sept. 18	Oct. 10	Oct. 29	June 18	June 24	Oct. 12	-	Nov. 19	no fibling
1958	May 10	May 17	Sept. 23	Oct 26	Sept. 30	Nov. 16	June 18	June 24	Oct. 10		Nov. 25	fruits esten
1959	Apr. 14	Apr. 29	Oct. 12	000-11	Oct. 16	Nov. 4	May 20	June 3	Oct. 2	Nov. 4	Nov. 20	by bisla
1960	Apr. 18	Apr. 27	Oct. 20	Oct. to	Oct. 22	Nov. 7	June 10	June 17	06 Dung	TIMA 15	Dec. 12*	tivuita exten
1961	Apr. 7	Apr. 17	Oct. 18	Oct. 25	100 100	Oct. 28	May 30	June 22	1015 3	100 51	=	no fruiting
1962	Apr. 16	Apr. 21	Oct. 14	Coertis	Oct. 9	Oct. 30	June 14	June 27	101 2001		Oct. 22*	fruits enten
Platanus ace- rifolia Willd.	Apr. 13	May 348	Sopt. 20	04.31	Oct. 11	Mor. 38	May 15	Jeneory	Jane 13	July 18	Aug. 2*	by bieds Course generation
1953	Apr. 20	Apr. 30	Sept. 28	Oct. 29	Oct. 9	Nov. 16	May 11 May 23	May 29	-			no flowering and fruiting
1954	May 10	May 14	Oct. 8	Oct. 30	Oct. 20	Nov. 15	May 24	June 5	Sept. 12	Feb. 18		full maturity in 1955
1955	May 4	May 9	Oct. 3	Nov. 12	Oct. 15	Nov. 20	May 26	June 10	Sept. 20		Feb. 25	fruit dropped in 1956
1956	May 13	May 17	Sept. 27	Oct. 10	Oct. 6	Oct. 31	May-	Mar - 1 Mar - 1	long-	Land The		no flowering and fruiting
1957	Apr. 30	May 8	Oct. 5	Oct. 30	Oct. 7	Nov. 12	May 12	May 24	in martin	100.00 C	hard the	very poor fruiting
1958	May 11	May 16	Sept. 25	Oct. 20	Sept. 29	Dec. 2	May 10	May 18	Sept. 25		Feb. 20	fruit dropped
1959	Apr. 20	Apr. 28	Sept. 23	00.22	Oct. 8	Nov. 18	Apr. 29	May 3	Mantos Martos	11	Zimes	in 1959 no fruiting

1	2	3	4	5	6	7	8	9	10	11	12	13
1960	Apr. 27	May 10	Sept. 20	Nov. 7	Oct. 7	_	May 17	May 22	_	_	-	no fruiting
1961	Apr. 15	Apr. 19	Oct. 3	Oct. 24	Oct. 6	Nov. 26	May 2	May 5	-	-	-	no fruiting
1962	'Apr. 18	Apr. 22	Sept. 14	-	Sept. 29	Nov. 28	May 16	May 30	-	-	-	no fruiting
Durant furticona	110 18	14199 44	Supr. 27	895C 48	194 8	091 31						
Prunus fruticosa												
G. woron		1. 15	G	G	0.4.6	Oct 10	A	May 5	Sept. 20		197 52	no fettiting
1953	Apr. 8	Apr. 15	Sept. 4	Sept. 28	Oct. 6	Oct. 16	Apr. 19	May 24		1.1.1		no fruiting
1954	Apr. 28	May 4	Sept. 8	Sept. 25	Oct. 4	Oct. 10	May 14	Tuno 10	Sur 12	Peb. 18		no fruiting
1955	Apr. 28	May /	Oct. 1	Oct. 10	Oct. 12	Nov 11	May 22	May 20				no fruiting
1956	May 1	May 8	Sept. 25	005 20	Oct. 1	NOV. 11	May 5	June 7				out down
1957	Apr. 2	Apr. 28	Sant 20	1 Topologica	Oct 11	Nov 20	May 15	May 26	Tune 13	Tuly 18	Δ110 2*	cor down
1958	Apr. 13	May 8	Sept. 20	Oct 12	Oct. 11	Oct 27	Apr 22	May 12	June 10	July 10	Tuly 2*	
1939	Apr. 12	Apr. 20	Oct 12	001. 12	Oct. 14	001. 21	May 10	May 21	July 2	July 23	July 2	
1960	Apr. 14 Martah 17	Apr. 2/	Sont 15	0.9	Sont 23	Oct 25	Apr 22	May 8	June 30	July 12		and fronting
1961	And 12	Apr. 9	Oct 3	Oct 17	Oct 7	Oct. 20	May 2	ividy 0		July 23	Dec 134	and furnishing
1962	Apr. 15	Apr. 21	001. 5	001.17	001. 7	001. 20	Ividy 2	-	OUL 2	oury 25	Nov 30	court freiders
Prunus padus L.	Mary 19	May 17	Sept. 23		Sept. 30	Nov. 16	June 18		04 10		Nov 25	
1953	March 31	Apr. 3	Oct. 10	Sept. 18	Oct. 10	Oct. 22	Apr. 20	Apr. 30	-	-	10-10	no fruiting
1954	Apr. 25	May 2	Sept. 22	00-26	Oct. 8	Oct. 18	May 12	May 20	July 16	-	-	and freiting.
1955	Apr. 14	May 2	Oct. 3	Oct. 14	Oct. 5	Oct. 24	May 11	June 3	June 21	July 20	July 27	and Producer
1956	Apr. 23	May 3	Oct. 5	Oct_30	Sept. 30	Nov. 12	May 18	May 28	July 2	July 12	July 20*	
1957	March 11	March 23	Oct. 2	0-30	Sept. 28	Oct. 10	Apr. 25	May 16	June 26	28	1.4.5	Truits dried
	May, 10	May 17	Oct. 19	Nov				11 . 00	T 1. 7		TI OCH	up
1958	Apr. 9	May 3	Sept. 22	Oct. 29	Oct. 10	Nov. 8	May 14	May 22	July /	-	July 26*	
1959	Mag	Sant 1	041.72	-		-		1. 17	T	T.1. 20	July 10*	cut down
1960	Apr. 12	Apr. 20	Sept. 17	Oct. 25	Sept. 29	Oct. 30	May 9	May 17	June 25	July 20	_	another spec
	April 1				~	0 1 07		11.	T	Talar 7		imen taken
1961	March 19	March 31	Sept. 15	Oct. 20	Sept. 19	Oct. 27	Apr. 14	May 6	June 22	July /	Acate	- 13
1962	Apr. 5	Apr. 14	Sept. 5	— h	ttes:3//r	clift.org	. pr. 2/	May 9	July 3	July 23		TO TOULSTORE

1 1821	2	3	4	5	6	7	8	9	10	11	12	13
Prunus serotina	ASIA 180 March 26	SAUX H	105C 4	0421-2	69. 31 Oct. 5	060 28 8484-120	2012 29   June 4	2018 P	Sept 10	ALL N	Nov. 4	ming (contribute
1953	March 30	Apr. 11	Sept. 28	Oct. 26	Oct. 17	Nov. 16	May 21	May 27	Acc. 22	Nov_4		no fruiting
1954	May 3	May 7	Oct. 10	Oct. 27	Oct. 15	Nov. 15	June 8	June 13	=	Oct <u>2</u> 8 Nov. 12	T	fruits eaten by birds
1955	May 1	May 4	Oct. 25	Nov. 12	Nov. 2	Nov. 20	June 13	June 24	-	-	-	fruits eaten by brids
1956	May 4	May 9	Oct. 16	Nov. 15	Oct. 22	Nov. 25	June 5	June 16	-		-	fruits eaten
1957	Apr. 10	Apr. 23	Oct. 12	Oct. 26	Oct. 19	Nov. 12	May 30	June 14		-	-	fruits eaten
1958	May 2	May 12	Sept. 30	Oct. 30	Oct. 22	Nov. 28	June 3	June 16	-		-	fruits eaten
1959	Apr. 2	Apr. 27	Sept. 23	Oct. 22	Oct. 6	Nov. 18	May 20	June 2		-	-	fruits eaten
1960	Apr. 12	Apr. 26	Oct. 7	Oct. 28	Oct. 18	Nov. 7	May 30	June 8	_		-	fruits eaten
1962)	A MARINA	where i	-095 25	001,13	011190	den's	Inder To	Index 30		-		by birds
1961	May 2	May 6	Sopt. 29	000.24	001 18	Oct. 31	RE ANAL	June 10.		-	-	cut down
Prunus subhir- tello Mig	Mpt. 30	May 2	041.3	05 31	Oct. 25	Nov. 22 Nov. 2	May 22	May 29 May 30	0d, 10 0d, 18	Nov. 15	Nov. 18 Nov. 22	Pa. Promise
1953	Apr. 4	Apr. 14	Sept. 19	Oct. 26	Oct. 6	Nov. 10	Apr. 5	Apr. 26	-	-	-	no fruiting
1954	May 6	May 8	Sept. 20	Sept. 30	Oct. 15	Oct. 23	May 6	May 19	June 7	June 10	June 18	ao indisert
1955	May 3	May 7	Oct. 10	Oct. 28	Oct. 28	Nov. 12	May 2	May 17	June 14	June 18	June 22	tent stations
1956	May 5	May 9	Oct. 18	Oct. 28	Oct. 25	Nov. 10	May 8	May 22	June 5	June 10	June 15	a seen as
1957	Apr. 5	Apr. 11	Oct. 5	Oct. 12	Oct. 10	Oct. 29	Apr. 6	May 10	June 3	-	June 12	eta) shoddaag
1958	May 2	May 10	Sept. 18	Oct. 18	Oct. 2	Nov. 3	May 6	May 18	June 5	-	June 18	1924
1959 1960	Apr. 1 Apr. 22	Apr. 16 May 5	Sept. 15 Sept. 28	Oct. 12 Oct. 18	Oct. 10 Oct. 23	Oct. 26 Nov. 3	Apr. 9 Apr. 23	Apr. 29 May 13	May 18 May 30	ĪĪ	June 2	and elling

1 1000	2	3	4	5	6	7	8	9	10	11	12	13
1961	Apr. 25	May 11	Sept. 25	Oct. 23	Oct. 7	Nov. 1	Apr. 7	Apr. 21	May 16	_	June 2	
1962	Apr. 9	Apr. 21	Sept. 8	Oct. 18	Oct. 13	Nov. 3	Apr. 21	Apr. 29	2000 2	June 6	June 13*	
Pterocarya fraxi-			Cont in	CCT 304	000000	THOM: I'V	antra The	THE REAL PROPERTY	1000 14	1000 19	anue 35	
nifolia Spach.	TATION IN	TATAN D	and the	paber on	DOCT 10	001 52	a fand	MIRY IN	griffe 3	00 900 P	June 18	
1953	March 3	Apr. 11	Sept. 28	Oct. 26	Oct. 17	Nov. 10	Apr. 5	Apr. 26	=	-	=	no flowering and fruiting
1954	Apr. 27	May 3	Oct. 5	Nov. 5	Oct. 10	Nov. 22	May 21	May 29	Oct. 10	Nov. 15	Nov. 18	
1955	Apr. 30	May 2	Oct. 3	Oct. 31	Oct. 25	Nov. 2	May 22	May 30	Oct. 18	-	Nov. 22	
1956	May 2	May 6	Sept. 29	Oct. 24	Oct. 18	Oct. 31	May 28	June 10	-	-	-	no fruiting
1957	March 27	Apr. 5	Oct. 5	Oct. 12	Oct. 10	Nov. 5		-	-		-	no flowering
	A Sec. 19		norm	000.05	ner 16	100-3	1000 120	adus a		-		and fruiting
1958	Apr. 12	May 2	Sept. 29	Oct. 25	Oct. 20	Nov. 27	May 22	May 27	-	1.8- 1.8	-	very poor
		A Burr well	-	West +2	der old	Str total	00110- 30	True 312	12 Sent 10	-	1. 7. 20. 21	fruiting
1959	Apr. 10	Apr. 16	Sept. 16	Nov. 4	Oct. 17	Nov. 18	May 2	May 6	-	-		no fruiting
1960	Apr. 4	Apr. 24	Sept. 20	Oct. 28	Oct. 20	Nov. 7	May 15	May 20		2-12	=	no fruiting
1961	Apr. 4	Apr. 11	Oct. 7	Oct. 24	Oct. 27	Nov. 7	-	-	-	-	-	no flowering
	heber to		04' 13	Oct. 26	04: 13	Nov. 12	7123 30	Auna 14	1	and the		and fruiting
1962	Apr. 7	Apr. 16	Sept. 19	500 11	Oct. 15	Nov. 19	May 18		-	-		fruiting
Table	1000 4-2		ostate	1 May 12		2/04 32	Junio 510	1045.19	A Date 18		-	inuting
Pterostyrax	14		04.3	1.0m. 14		Sec. 18	1. May. 51	June 3	I here 21	A App Th	ALT I	In Bridge
hispida	WEALTON		046 31	Mor. 12		12/19/41 50	1999-13/	1 2 File, 5 to	1 107 2	1307.14	112 20	finits enter
Sieb. et Zucc.			Gent 2		Oct 20	CHAL 10	( Apr. 25	May 10	Alme 21	_	_	no flowering
1953	Apr. 5	Apr. 9	Sept. 2	04.27	001. 20	NOV. 15	June 8	June 13				and fruiting
1954	May 4	May 6	Sept. 28	OCT SIN	0951140	14012.15	MELSIN	NA4/51		-	-	no flowering
1055	A	May 4	Oct 7	Nov 6	Oct 24	Nov 20	June 26	July 6	Sept. 19	Oct. 13	Oct. 27	
1955	Apr. 19	May 4	Cont 24	1404. 0	Oct. 24	1407. 20	Tune 17	July 5	Sept. 19	Oct. 20	Oct. 27*	
1956	Apr. 29	May 5	Sept. 24	Oct 28	Oct. 2	Nov 26	May 5	June 7			13	no fruiting
1957	March 12	Apr. 13	Sept. 25	001. 20	http://	noin on	in the state	June /	- July -	1 200 20		

1	1958	2	3	4	5	6	7	8	M39 31	10	10,11,58	2012 50	13
	1958	Apr. 13	May 6	Sept. 9	Oct. 26	Oct. 14	Dec. 1	June 23	July 1	Sept. 8	Oct. 19	Nov. 6*	
	1959	March 26	Apr. 12	Sept. 13	DOM:	Oct. 6	Oct. 28	June 4	July 16	Sept. 10	Oct. 8	Nov. 4	The second second
	1960	1	Apr. 21	Sept. 17	Oct. 25	Sept. 25	Nov. 12	June 11	June 23	Aug. 22	Nov. 4	-	Southern out
	1961	March 13	March 26	Sept. 29	Oct. 27	Oct. 18	Nov. 18	June 6	June 14	1 1 - 72	Oct. 28	-	annin Brown
	1962	Apr. 5	Apr. 11	Sept. 23	-	Oct. 21	Nov. 2	June 18	June 29	-	Nov. 12	-	Inuiting
Rhus sylve	estris				1 . 1. 1								
Sieb. et	Zucc.	March 19	Var II	Sept. 1	(Oct. 15	Sept, 5	shar e	VBC 10	MIR2 13	July 14	2012 33	100 36*	
	1953	May 4	May 25	Sept. 15	Oct. 26	Oct. 6	Nov. 16	VDE-II.	VIN- th	1000-32	-	-	no flowering
		Warph 26	VAL 10	patient in	Oct. 27	Sopt. 37	Nas. 14	APR: 25	1982.130	1012.0		Aug. 19	and fruiting
	1954	May 8	May 19	Sept. 24	Oct. 26	Oct. 10	Nov. 18	June 22	June 30	10000-32	100-18	V12 30.	no fruiting
	1955	May 9	May 17	Oct. 15	201-50	Nov. 2	Nov. 12	June 30	July 20	1000- 50	0.012-20	Vm 1.	no fruiting
	1956	May 16	May 25	Oct. 20	04-19	Oct. 20	Oct. 31	July 12	July 12	102-1	July-25	-	no fruiting
	1957	May 8	May 17	Oct. 10	Oct. 19	Oct. 17	Oct. 29	June 20	June 29	3412-14	VIE-S	W12 32	no fruiting
	1958	May 15	May 20	Sept. 21	Oct. 25	Sept. 29	Nov. 18	June 26	July 7	2012-30	WOR .	VIII 50	no fruiting
	1959	Apr. 25	May 6	Oct. 14		Oct. 26	Nov. 8	June 18	June 27	-	-	-	no fruiting
	1960	May 9	May 17	Sept. 18	Nov. 3	Oct. 28	1 1 1 1 1	June 19	June 30	-	-	-	no fruiting
	1961	Apr. 22	Apr. 25	Oct. 2	Oct. 11	Oct. 8	Nov. 11	June 20	July 8	393-12			no fruiting
	1962	Apr. 24	May 4	Sept. 15	Oct. 6	Oct. 5	Oct. 29	July 6	July 20	-	-		no fruiting
Rhus trilo	bata		and the		1 6 5	1		L seres 1					and fruiting
Nutt.		W14 1a.	VW. 53	2501 2	DET 38	091.3%	1998. 32	-		-	1 -	-	no flowerin
	1953	Apr. 24	Apr. 30	Oct. 6	Oct. 20	Oct. 6		MED 18	June 16	- 1	-	-	no flowering
		Npr. 20	May 12	Aug. 19	1.124	Sept. 25	Nov. 29	May 30	-Juno 14		-	11-	and fruiting
	1954	May 12	May 14	Oct. 4	Oct. 22	1	Control of	July 12	Aug. 2	1 8-1. 10	-	1 1000	no fruiting
	1955	May 3	May 13	Oct. 6	-	Nov. 8	Feb. 29	June 10	June 15	5000	-	1000 10	leaf shedding
			1 1 1 1 1 1 1 1	1 1 1 1 1		10/0	I New 8	about 6	Tuesday St.	Seri 2	-	Der. 21	in 1956
	1956	May 10	May 22	Sept. 29	000-31	Oct. 21	Jan. 30	A DECK N	ITTE N		-	-	leaf shedding
		Damy IN		1		1						-	in 1957
	1957	Apr. 13	May 27	Sept. 18	Oct. 15	Oct. 18	Dec. 23	LITTLE T	Tan 2	STDL 2	TT	175. 3	no flowering
			The second				N.P. Y	State I		Sector 1			and fruiting

1	1953	2	3	4	5	6	7	8	9	10	11	12	13
	1958	May 9	May 16	Sept. 12	Oct. 24	Oct. 18	Dec. 21	_	_		_	_	no flowering
								343			- Trank		and fruiting
	1959	Apr. 25	May 3	Sept. 15	-	Oct. 19	Nov. 26	300-10	11-12	-	-	-	no flowering
		appake 15 th	751 14	046 11	050 350	150	- 100	3:47 12	Mug. 2				and fruiting
	1960	Apr. 20	May 12	Aug. 19	-	Sept. 25	Nov. 29	May 30	June 14	-	-	-	no fruiting
	1961	March 20	Apr. 18	Sept. 5	Oct. 19	Oct. 27	-	May 18	June 16		-	-	no fruiting
	1962	Apr. 19	Apr. 22	Sept. 5	Oct. 28	Oct. 3	Nov. 25	-	-	-	-	-	no flowering
			a second as		Case Sa	1.4.4		-	1000			1.000	and fruiting
Ribes alpi	num L.	164. 58	THE AL	20 1018	041-0	OBS'S REAL	061100	-July 6	140 20			1-	
	1953	March 22	March 30	Oct. 6	Oct. 16	Oct. 20	11000-11	Apr. 18	May 4	July 15	-	-	
	1954	Apr. 23	Apr. 29	2014-121	1/04-31		-	Apr. 19	May 18	-	-	-	very poor
		Vili 32	1100 0	057.14	-	000 30	WON' 8	June 18	June 27		-		fruiting
	1955	Apr. 7	Apr. 23	Oct. 18	Nov. 7	Nov. 3	Nov. 29	May 6	May 17	July 20	Aug. 4	Aug. 20	
	1956	Apr. 11	Apr. 19	Oct. 14	000-130	Oct. 30	Dec. 4	May 7	May 20	July 14	Aug. 2	Aug. 25	
	1957	Feb. 16	March 20	Oct. 2	Oct. 16	Oct. 4	Nov. 29	Apr. 9	May 16	July 4	July 25	-	
	1958	March 12	Apr. 16	Sept. 17	Sept. 26	Sept. 29	Nov. 21	May 5	May 26	June 29	July 30	Aug. 7*	no telebox
	1959	March 20	March 25	Sept. 23	Oct. 4	Oct. 10	Oct. 22	Apr. 15	May 10	June 25	July 18	Aug. 30*	NO TRUEBUS
	1960	March 26	Apr. 10	Sept. 17	Oct. 27	Sept. 27	Nov. 14	Apr. 25	May 17	July 9	-	Aug. 19	and, feature
	1961	Feb. 22	March 15	Aug. 5	Oct. 24	Sept. 1	Nov. 19	Apr. 17	May 4	June 25	-	-	no Towering
	1962	March 19	Apr. 11	Sept. 1	Oct. 15	Sept. 5	Nov. 6	Apr. 19	May 15	July 14	July 23	July 26*	
Ribes auro	eum												
Pursh.		when a		2540 31	-	046 35	HON.S	June 18	June 29		Nov. 12		- de la secto
	1953	March 28	Apr. 1	Oct. 4	Oct. 16	Oct. 20	Nov. 12	Apr. 16	May 11	-	00-38	-	no fruiting
	1954	Apr. 24	Apr. 28	2012-11	004-35	Sept. 25	14-12	Apr. 28	May 14	Aug. 22	No <del>r</del> t 4	-	no fruiting
	1955	Apr. 10	Apr. 22	Oct. 10	Nov. 7	Oct. 29	Dec. 10	May 9	June 13	Aug. 10	Aug. 27	Aug. 31	and Staking
	1956	Apr. 14	Apr. 28	Oct. 1	068-38	Oct. 25	Dec. 14	May 17	May 31	July 17	Aug. 30	Sept. 10	
	1957	March 12	March 26	Sept. 28	Nov. 2	Oct. 7	Nov. 30	Apr. 24	May 20	July 23	Aug. 24	-	
	1958	March 24	Apr. 18	Sept. 1	0 28	Sept. 14	Dec. 2	May 10	May 27	July 26	July 28	Sept. 26	no dillene
	1959	March 21	Apr. 3	Oct. 12		Oct. 19	Nov. 10	Apr. 22	May 19	July 11	July 20	Sept. 18	
						https:/	rcin or	a pl	1			1317.00	of the state of the

1 1000	2	3	8-4-58	5	6	7 10	8	9 58	10	11	12	13
1960	March 28	Apr. 12	Sept. 17	012-4	Oct. 5	Nov. 28	May 9	May 22	July 16		Aug. 19	
1961	March 8	March 18	Sept. 14	Oct. 24	Sept. 25	Nov. 22	Apr. 16	May 7	July 20	Ville. 10	Sept. 24 Sept. 20	very poor fruiting
1962	March 28	Apr. 9	Aug. 29	85-3	Oct. 2	Nov. 8	Apr. 28	May 15	July 22	010	200- 3h	very poor fruiting
Ribes longerace-	<b>Wiles</b> 's	War F.	· 동작- 단	36 TKG	Star E	New Yo	Max 8	And St.	Vite Yo	Aug. M		muning
1953	Apr. 3	Apr. 8	Sept. 4	Oct. 12	Oct. 6	Oct. 22	Apr. 14	May 4		1.112. 30	000.0	
1954	Apr. 30	May 4		2000 13	300m . 33	002 10	May 16	May 30		-	2000	no fruiting
1955	May 2	May 5	Oct. 5	BE K	Oct. 18	Dec. 28	May 18	June 13			Vine SI.	no fruiting
1956	May 3	May 7	Oct. 3		Oct. 21	Nov. 22	May 26	June 8		_		no fruiting
1957	Apr. 2	Apr. 7	Sept. 30	Oct. 6	Oct. 11	Oct. 30	May 9	June 14		_		no fruiting
1958	Apr. 22	Apr. 29	Sept. 18	Oct. 11	Oct. 64	Nov. 14	May 16	June 16		_	_	no fruiting
1959	March 25	Apr. 7	Oct. 10	Oct. 18	Oct. 12	Oct. 16	Apr. 29	June 9				no fruiting
1960	Apr. 12	Apr. 28	Sept. 27	02 <u>1</u> ia	Oct. 6	Nov. 8	May 12	June 10	Viris	VIL 30	Sept. 3+	no fruiting
1961	March 25	Apr. 3	Sept. 27	Oct. 24	Sept. 27	Nov. 19	Apr. 27	June 4	-	-		no fruiting
1962	Apr. 13	Apr. 18	Sept. 7	Oct. 19	Oct. 3	Nov. 3	May 9	June 19	Aug. 22	_	Sept. 15	no fruiting
Robinia pseudo-	1 (78) · 14	YOL 30	04"1	04-11	Sec. 2.	oa. 21	May 26	3und 15	AUE 20	Sept. 13	Sept. 18	and foreing
acacia L.	Vpr. 28	May 3"		OCT L	04 4	041 18	May 18	June 1	June 20	VOE 14	_	
1953	Apr. 25	May 4	Oct. 9		Oct. 26	Nov. 19	-	-	_		_	flowers but
	X\$.3	Xton In	Sept. F	82.3	83. 8	821 28	1					gives no fruit
1954	May 12	May 17	Oct. 22		Oct. 28	Nov. 25	June 8	June 22	Sept. 10		Dec. 15	ARGA IN A CONSTRUCTION
1955	May 7	May 16	Oct. 20		Nov. 2	Nov. 15	June 20	July 6	Sept. 8	_	Dec. 10	
1956	May 15	May 22	Oct. 24		Oct. 28	Nov. 8	June 6	June 20	Sept. 24	-	Dec. 28	
1957	May 10	May 18	Oct. 20	OdE &	Oct. 26	Nov. 19	June 8	June 20	Sector 10	-	Sopt 30	very poor fruiting
1958	May 11	May 18	Oct. 25		Nov. 3	Nov. 28	June 7	June 25	Sept. 20	-	Dec. 30	
1959	Apr. 24	May 6	Oct. 16		Oct. 20	Nov. 8	May 24	June 10	Sept. 15	=	ISPA	0 (000101000

and the second s	a good a give a work	A LAT SA AL	a state white	A	and the second second	a substant of the second		a second of the second second	a set that is a set of the	BULLETIN ALT AND AN	and the second design of the s	
1 1958	2	3 12	09452	5	6	207 38	8	9	10	11	D 1230	13
1960	May 7	May 15	Oct. 20		Oct. 28	4011.13	June 5	June 18		_	_	ACD DOGS
1961	Apr. 16	Apr. 21	Oct. 25	-	Oct. 23	Mov. 20	May 30	June 10	Sept. 24	-	Dec,-28	
1962	Apr. 24	Apr. 27	Oct. 5	-	Oct. 7	Nov. 18	June 10	June 18	Sept. 12		Dec	
Schisandra chi-	1487 12	May IT	Qur. 22		Qcf. 38	Nov. 25	June 8 :	June 22/	Sept. 10		Dec. 15	
nensis Baill.	No. NO	Acres 14	See 1		sant if i	Sand State	and stored	1 1 2				
1953	Apr. 2	Apr. 4	Sept. 2	Sept. 28	Oct. 6	Oct. 20	-	=	-	I	-	no flowering and fruiting
1954	Apr. 28	May 3	Sept. 4	Oct. 1	Oct. 4	Oct. 18	May 18	June 1	June 20	Aug. 14	-	
1955	Apr. 14	Apr. 30	Oct. 1	Oct. 11	Oct. 2	Oct. 28	May 26	June 15	Aug. 20	Sept. 13	Sept. 18	
1956	Apr. 22	May 6	Sept. 17	Sept. 28	Sept. 21	Oct. 17	May 26	June 8	Aug. 22	-	Sept. 15	no fraiting
1957	March 2	Apr. 11	Sept. 5	Sept. 17	Sept. 13	Oct. 14	May 16	June 3	-		-	no fruiting
1958	Apr. 9	Apr. 30	Sept. 15	Oct. 19	Oct. 12	Oct. 26	May 23	May 28	Aug. 12	Aug. 29	Sept. 3*	DO BUNNER
1959	March 24	Apr. 14	Sept. 23	000018	Oct. 14	Nov. 8	NART-29	ame or s	-	-		no flowerin
	Apr. 22	Sec. 29.	18/24/ 18	097 11	Oct.964	16697,33	WITH 12	Alune 16				and fruiting
1960	Apr. 8	Apr. 19	Aug. 19	Oct. 7	Oct. 4	Oct. 28	Nar-9	1.1000-14	-	-	-	no flowerin
	3493 310	1122	Oet" a	Genter The P	OCF ST	1400.222	Miles (26	Tune 8	1			and fruiting
1961	March 10	March 26	Sept. 2	Oct. 8	Sept. 14	Oct. 22	18	Sunc-13	-	-	Aug. 21*	no fridian
1962	May 5	June 16	Sept. 3	Sept. 19	Sept. 22	Oct. 13	May 15	May 30	-	-	Sept. 7*	nn fruitine
Sorbus america-	A. 3	1844 See	Serv. M	COM 712	199	106 02		Whavid				
na Marsh.	March Ch.	NE IL I		Det. Di	Sept. 5			14 01			net ser s	
1953	March 28	Apr. 8	Sept. 28	Oct. 26	Oct. 17	Nov. 10	May 8	May 21	Aug. 10		-	Tri correction
1954	Apr. 14	Apr. 30	Sept. 28	Oct. 6	Oct. 10	Nov. 18	May 26	June 5	July 20	Aug. 30	Sept. 20	C
1955	Apr. 29	May 1	Sept. 21	Oct. 25	Oct. 8	Nov. 20	May 30	June 14	T 1. 00	- 20		no fruiting
1956	Apr. 29	May 2	Oct. 14	Oct. 24	Sept. 24	Nov. 30	May 28	June 28	July 28	Aug. 30	Sept. 24	Ant's boot
1957	Apr. 4	Apr. 13	Oct. 5	Oct. 12	Oct. 12	Nov. 5	May 16	June 3	July 20		Sept. 20	
1958	Apr. 20	May 5	Sept. 12	Oct. 4	Sept. 21	Nov. 26	May 25	June 1	July 25		Aug. 30*	
1959	Apr. 7	Apr. 19	Sept. 16	Oct. 10	Oct. 19	Nov. 6	May 11	May 18	Tule 11		Carriel	
1960	Apr. 10	Apr. 27	Sept. 28	Oct. 26	Oct. 20	Nov. 10	May 1/	May 28	July 11	1000		4.5
1961	March 26	Apr. 9	Oct. 2	Oct. 28	ottos://	rcin or	May 8	May 19	July 18	-	14016	e (contration

1	1961	2	3	4	005 13	6	007 13	8	9	10	11	12	13
Tilla Ma	1962	Apr. 7	Apr. 17	Sept. 11	0.47-25	Sept. 17	Oct. 5	May 16	May 30	July 22	3542 30	3604. 25	
Sorbus au	cupa-									-			fruiting
ria L.	1958	OI KEYA	May 13	Sept. 30	OCI" 18	Oct. 10	Nov. 3	2012 8	July 19	-			very poor
	1953	March 28	Apr. 8	Sept. 19	Oct. 22	Oct. 8	Nov. 16	May 8	May 21	July 10	July 28	Aug. 24	no Thomening
	1954	Apr. 20	May 1	Sept. 10	Sept. 18	Sept. 18	Oct. 15	May 25	June 4	July 17	Aug. 31	Dec. 10	fruits eaten
		Mah 2	Wex W	1001 3	041 35	001 13	(016V-512	DOE SPACE	MH#21.	Eapr. 30	Stel. 15	DE 2	by birds
	1955	Apr. 29	May 1	Sept. 20	Oct. 15	Oct. 1	Nov. 17	June 2	June 8	Aug. 4	Aug. 16	Oct. 8	,
	1956	Apr. 30	May 5	Sept. 18	Oct. 17	Oct. 4	Oct. 31	May 29	June 7	Aug. 10	-	Sept. 23	and fruiting
	1957	Apr. 8	Apr. 17	Sept. 22	Oct. 12	Oct. 5	Oct. 29	May 14	June 5	July 26		Sept. 20	no Rosering
	1958	Apr. 20	May 5	Sept. 10	Sept. 12	Sept. 28	Oct. 18	May 23	June 2	July 26		Aug. 25*	
	1959	Apr. 5	Apr. 10	Sept. 16	Oct. 8	Oct. 8	Nov. 10	May 10	May 20	July 5	Cal-	Aug. 31*	
	1960	Apr. 8	Apr. 25	Sept. 20	Oct. 18	Oct. 20	No=7	May 18	June 4	July 11	0.00	-	and fruiting
	1961	March 28	Apr. 11	Sept. 20	00,224	Sept. 30	Oct. 25	May 7	May 24	July 16	-	=	no flowering
	1962	Apr. 9	Apr. 18	Sept. 13	Oct. 8	Sept. 25	Oct. 22	May 17	June 6	July 26	Sept. 1	Notes	
Sorbaria	sor-	Apr. 17		Aug. 22	Oct. 26	Oct. 10	Nov. 3	<b>Job</b> 11	July 20	Sect. 26	T		
bifolia A	. Br.	Apr. 9		Sept. 14	Oct. 12	Sept. 26	Oct. 19	June 28	July 13	Sept. 10	Oct. 19	Nov. 20	
	1953	Feb. 27	March 24	Aug. 29	Sept. 15	Oct. 2	Oct. 26		-	-	-	-	no flowering
		May 6		Oct. 6	Oct. 22	Od. 30	Nov. 4	The state					and fruiting
	1954	Apr. 6	Apr. 13	Sept. 30	Sept. 20	1985 <del>11,</del> 26	Str-12	192-1	34.7-20		Con Tes	-	no flowering
		AND 2 -		Sept. 28	00er 30	Sobt. 30	-861 38	June 24	Aug (20)	Castin	Octores	134.12.1	and fruiting
	1955	Apr. 9	Apr. 18	Sept. 28	Oct. 12	Oct. 5	Oct. 25	100 16	30-30	Sept. 18	00003	NoV 27	no flowering
		Magy Q	Way 8	Sept. 30	QCP 10	Oct. 15	Oct. 21	THA T	July 23	Sent. 22	Oct. 26	Dor &	and fruiting
	1956	Apr. 9	Apr. 15	Sept. 17		Sept. 29	Nov. 27	July 20	Aug. 17	Aug. 21	-	Sept. 25	and Builting
	1957	Feb. 4	Feb. 15	Sept. 14	Oct. 7	Sept. 29	Oct. 20	July 8	Aug. 5	Aug. 30	-	-	and the second
	1958	March 8	Apr. 6	Sept. 12	10-	Sept. 26	Nov. 2	July 16	Aug. 1	Sept. 12	-	Oct. 3	Contrains
	1959	March 20	March 28	Sept. 8	Oct. 8	Oct. 6	Nov. 4	July 2	Aug. 20	Sept. 10		Sept. 30	
	1960	March 2	March 28	Sept. 4	Sept. 30	Sept. 24	Oct. 8	July 2	July 25	Aug. 18			
	1961	Feb. 21	March 4	Sept. 15	Oct. 5	Oct. 5	Oct. 21	June 18		+0	00,110		no fruiting
	1962	March 24	Apr. 2	Aug. 27	Oct. 7	Oct. 3	Oct. 26	July 17	July 29	Sept. 17	QUE T		o trobuineo
			and and the second									_ L - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 -	the Concentration

1	160	2	3	4	5	6	7	8	9	10	11	12	13
Tilia amer	icana	Match 30	144.23	2061 R	04.8	04 6	5406° 4	Joly 2.	Yel 50	Sept. 10	-	Sept. 30	
L.		Manch 8	YUS Q	Selt. (2)		Salar Se	Silly 2"	196-18	VIG 1	Sept. 12		1091 31	
	1953	Apr. 7	Apr. 10	Sept. 19	parts.	Sept. 26	Oct. 26	101-9	12-2		-		no flowering
	1054				0.1.10							-	and fruiting
	1954	May 5	May 8	Sept. 30	Oct. 10	Oct. 15	Oct. 21	July 7	July 23	Sept. 22	Oct. 26	Dec. 8	and the second
	1955	Apr. 30	May 2	Sept. 27	Oct. 13	Oct. 1	Oct. 28	July 16	July 30	Sept. 18	Oct. 3	Nov. 27	- In a manufacture
	1956	May 5	May 8	Sept. 28	Oct. 20	Sept. 30	Oct. 28	-	-	-	-	-	
	1957	Apr. 6	Apr. 12	Sept. 12	Oct. 5	Sept. 26	Oct. 15	July 3	July 20	10-30	and the second	-	
	1958	May 6	May 10	Oct. 6	Oct. 22	Oct. 10	Nov. 4	- /	ET.P				no flowering and fruiting
	1959	Apr. 9	Apr. 15	Sept. 14	Oct. 12	Sept. 26	Oct. 19	June 28	July 13	Sept. 10	Oct. 19	Nov. 20	
	1960	Apr. 17	Apr. 26	Aug. 22	Oct. 26	Oct. 10	Nov. 3	July 11	July 20	Sept. 26	_	_	
	1961	Apr. 6	Apr. 8	Sept. 22	Oct. 13	Oct. 7	Sept. 19	July 13	July 20	Oct. 17	astar Ind	_	the second
	1962	Apr. 18	Apr. 22	Aug. 25	_	Sept. 25	Oct. 27	_	10-51	101210		_	no flowering
		VIN'S	1	2005 30	.021 12	001 50		WERN THE	1000 4	July 11		4	and fruiting
Tilia corda	ata	960 8	Var 18	25 le	04	041 8:0	10-30	.prai 10	3/103 30	1012		VIII MAN	
Mill.		VIA 30	2006.2	2sbr' 10	Sept. 12	Sept. 28	07 18	May 23	June 2	July 26		YOU SYN	
	1953	Apr. 13	Apr. 20	Sept. 28	Oct. 26	Sept. 26	Nov. 16	10-10	1992 20	3012.30	=	Sept. 23	no flowering
	1954	May 10	May 12	Oct 10	Oct 25	Oct. 10	Nov. 2	July 3	July 23	Oct 2	Oct. 30	Nov. 28	und manag
	1955	May 5	May 7	Oct. 8	Oct. 30	Oct. 13	Nov. 12	July 10	Aug. 1	Sept. 30	Oct. 15	Dec. 5	by bieds
	1956	May 8	May 11	Sept. 29	Oct. 25	Oct. 12	Nov. 8	July 10	July 23	Oct. 12	Y 12 31	Dec. 10	fruits maters
	1957	Apr. 27	Apr. 30	Sept. 26	Oct. 17	Oct. 5	Oct. 26	July 1	July 15	Sept. 26	5112-58	Nov. 25	and the second second
	1958	May 10	May 13	Sept. 30	Oct. 18	Oct. 10	Nov. 3	July 8	July 19		_	_	very poor
				Sept. et									fruiting
	1959	Apr. 24	Apr. 28	Sept. 15	Oct. 26	Oct. 21	Nov. 2	June 20	July 10	Sept. 4	Sept. 30	Nov. 25	
	1960	May 5	May 9	Sept. 20	Oct. 28	Oct. 12	Nov. 3	June 30	July 15	Sepr. 16			
	1961	Apr. 16	Apr. 18	Sept. 30	Oct. 13	Oct. 5	Oct. 19	June 25	July 2	Oct. 2	11	-11	13
	1962	Apr. 22	Apr. 23	Aug. 25	-	Sept. 3	Nov. 2	July 10	July 28	Oct. 7	-		
	1801	and a second	and a second	and the		https://	rein ore	1 pl				12518	6 (contanued

1	2	3	4	5	6	7	8	9	10	11	12	13
Tilia Maximowi-	2123 4	VED2 0	2ebr 30	Nov. 3	Oct. 20	Nov. 12	311/2 18	408 P	Oct. 12	-	1 -	
cziana Shiras	Vb2 18	Vbt St	Post o	04.19	()cr. 4	Man 10	21 401	1017 30	041 38		Mov. 20	2
												fruiting.
1953	Apr. 4	Apr. 17	Oct. 22	Nov. 2	Oct. 26	Nov. 10	302052	6 Stry	-	-	-	no flowering
	Apr. 27	Apr. 30	09" 8	0007 50	041 15	047 38	July 14	249A .30				and fruiting
1954	May 6	May 10	Oct. 8	Oct. 15	Oct. 10	Oct. 26	July 3	July 23	Sept. 30	Oct. 15	Oct. 25	
1955	May 2	May 5	Sept. 28	Oct. 25	Oct. 25	Nov. 12	July 12	July 30	Oct. 1	Oct. 15	Oct. 25	
1956	May 11	May 15	Sept. 28	Oct. 24	Oct. 22	Oct. 31	July 9	July 30	Sept. 28	NOVE 6	Nov. 12	
1957	Apr. 24	Apr. 29	Sept. 26	Oct. 12	Oct. 10	Oct. 19	July 3	July 16	Sept. 30	-	Oct. 30	and froiting
1958	May 10	May 13	Oct. 20	Nov. 3	Oct. 28	Nov. 18	July 8	July 28	Oct. 8	-	Nov. 26	to flowering
1959	Apr. 16	Apr. 24	Sept. 14	Oct. 18	Oct. 12	Oct. 28	June 23	July 11	Sept. 10	Oct. 7	Nov. 12	N 64
1960	Apr. 29	May 9	Sept. 20	Oct. 28	Oct. 26	Nov. 7	July 4	July 26	Sept. 22	Oct. 20	-	
1961	Apr. 14	Apr. 17	Sept. 28	Oct. 24	Oct. 13	Oct. 28	June 25	July 20	Oct. 25		-	
1962	Apr. 21	Apr. 22	Sept. 1		Oct. 18	Nov. 3	July 12	July 24	Oct. 7	-	Nov. 5	
Tilia mongolica	whit we	11112	and the second	00' 19	loor so	EAGA"	1000 18	300 10	Sobr Sa	067 30		
Maxim.	upr a	when to	ushe to	men to	mer an		amo To	Tank T	+ "idae	ner n	500A' 30	
1953	Apr. 4	Apr. 10	Sept. 19	Oct. 17	Sept. 28	Nov. 6	Seren 36	in-in	20/000 200	_	610-1 52	no flowering
	and and	wher' wa	mane n	1001 31	001 00	OCC. TA	1000 50	Service .	2005: 30	-	MON: 30	and fruiting
1954	May 4	May 7	Sept. 24	Oct. 15	Oct. 10	Oct. 20	July 13	July 30	Oct. 5	Oct. 18	Oct. 29	Send about lines
1955	Apr. 30	May 2	Sept. 26	Oct. 15	Oct. 8	Nov. 2	July 24	Aug. 10	Oct. 8	Oct. 25	Oct. 18	In TRACK
1956	May 5	May 9	Sept. 27	Oct. 20	Oct. 4	Oct. 31	July 19	Aug. 4	Oct. 15	OCT-8	Nov. 12	Part Providence
1957	Apr. 5	Apr. 11	Sept. 4	Oct. 7	Oct. 5	Oct. 19	July 12	July 20	_	_	_	no fruiting
1958	May 5	May 9	Sent 30	Oct 18	Oct 6	Oct 22	July 19	Aug 2	_	_		very poor
1,000	inday 5	indug >	Sept. 50	000.10	000.0	000. 22	July 12	1145				fruiting
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1960	Apr 15	Apr 29	Sept 16	Oct 22	Oct 18	Nov 7	Tuly 2	Ang 2	Sept 28			are reversed
1961	Apr 8	Apr 12	Sent 4			Sept 21	Tuly 5	Tuly 20	Dept. 20	Oct 16		and the date
1901	Apr. 0	Apr. 12	Aug 20	Oct 11	Cont 15	Nev. 7	July 3	Aug 0		Oct. 10	D	De Creations
1902	Apr. 18	Apr. 19	Aug. 29	Oct. 11	Sept. 15	INOV. /	July 21	Aug. 8		001. 17	LUCK	2 Company

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1954	May 6	May 9	Sept. 20	Oct. 15	Oct. 10	Oct. 20	June 23	July 17	Sept. 26	Oct. 8	Dec. 8	
1955	May 1	May 3	Sept. 30	Oct. 25	Oct. 13	Nov. 2	June 28	July 27	Sept. 20	Oct. 3	Nov. 17	
1956	May 5	May 8	Sept. 27	Oct. 24	Oct. 18	Nov. 14	June 29	July 14	Sdept. 18	Oct. 4	Nov. 25	
1957	Apr. 24	Apr. 29	Sept. 6	Oct. 12	Oct. 10	Oct. 29	June 20	July 6	Sept. 30	_	Nov. 20	
1958	May 6	May 10	Oct. 10	Oct. 30	Oct. 28	Nov. 18	June 26	July 14	Sept. 30	_	Nov. 25	ab galacigue
1959	Apr. 8	Apr. 10	Sept. 16	Oct. 20	Oct. 14	Oct. 28	June 10	July 1	Sept. 4	Oct. 6	Nov. 20	THE STREET
1960	Apr. 24	May 4	Sept. 20	Oct. 28	Oct. 20	Nov. 7	June 18	July 10	Sept. 29	Oct. 20	-	
1961	Apr. 10	Apr. 14	Aug. 27	Oct. 14	Oct. 7	Nov. 19	June 19	June 27	Oct. 22		UNT 2	
1962	Apr. 18	Apr. 20	Aug. 29		Sept. 22	Nov. 17	June 22	July 10	00-00	Nov. 5	=	
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Moench.		and the	Salar the	1001 10	11000 18	COF 33	1000 33	ant Is	Sept. 10	001	201 15	and the second s
1053	Apr 4	Apr 16	Sent 28	Oct 22	Oct 20	Nov 6	1012 9	2012 38	041.9		MOK 30	no flowering
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1954	May 6	May 9	Oct 10	Oct 30	Oct. 10	Nov. 15	July 20	Aug. 3	Oct. 2	Nov. 6	Dec. 8	
1955	May 2	May 5	Oct. 10		Oct. 25	Nov. 17	July 24	Aug. 10	Oct. 8	Oct. 25	Nov. 20	
1956	May 8	May 13	Sept. 29	6×2-12	Oct. 28	Nov. 22	July 28	Aug. 12	Oct. 12	090_12	Nov. 23	1000
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1     2     3     4     5     6     7     8     9     10     11     12     13       Tilia tuan Szysz.       1953     Åpr. 8     Åpr. 30     Oct. 17     —     Nov. 6     Nov. 21     —     —     —     —     —     mo flowerin and fruiting       1954     May 21     May 24     Oct. 10     —     Oct. 10     Nov. 18     July 13     Aug. 3     Oct. 5     Oct. 20     Dec. 8       1955     May 9     May 11     Oct. 1     —     Nov. 10     Nov. 25     July 19     Aug. 4     Oct. 5     Oct. 20     Dec. 8       1957     May 7     May 10     Oct. 28     —     Oct. 31     Nov. 71     July 20     Sept. 28     —     Oct. 19     Nov. 77     July 10     July 25     Sept. 28     —     Oct. 19     Nov. 78     Oct. 1     —     Nov. 78     —     Oct. 1     —     Nov. 78     —     Oct. 1     —     Nov. 78     —     —     Oct. 11     Nov. 78     =	Allower and Manager		1	1 - Contraction	the state of the s	the list white	- atrack	- bearing to 1	- internetion i wat					
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1954   May 21   May 24   Oct. 10    Oct. 10   Nov. 18   July 13   Aug. 3   Oct. 5   Oct. 20   Dec. 8   Dec. 8     1955   May 9   May 11   Oct. 1    Nov. 10   Nov. 25   July 19   Aug. 4   Oct. 8   Oct. 5   Dec. 8   Dec. 12   Dec. 8   Dec. 12   Dec	Viburnem 7 ga L	1953	Apr. 8	Apr. 30	Oct. 17	E.	Nov. 6	Nov. 21	May 22 May 18	June 12 June 2	Aug. 4 Aug. 18	Sept. 3 Sept. 10	Sept. 15 Sept. 27	no flowering
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1956   Apr. 24   Apr. 26   Oct. 8    Oct. 31   Nov. 18   July 20   Aug. 6   Oct. 10    Dec. 12     1957   May 7   May 11   Oct. 19    Oct. 17   Nov. 30   July 5   July 20   Sept. 28    Oct. 18*     1958   May 10   May 13   Oct. 28    Oct. 19   Nov. 27   July 10   July 25   Sept. 26    Oct. 1     1950   May 10   May 15   Sept. 22    Nov. 6    July 12   July 26		1955	May 9	May 11	Oct. 1	0129	Nov. 10	Nov. 25	July 19	Aug. 4	Oct. 8	Oct. 25	Dec. 8	profuse
1957   May 7   May 11   Oct. 19    Oct. 17   Nov. 30   July 5   July 20   Sept. 28    Oct. 18*     1958   May 10   May 13   Oct. 28    Oct. 30   Nov. 27   July 10   July 25   Sept. 30    Nov. 7*     1959   Apr. 28   May 4   Sept. 16    Oct. 19   Nov. 10   July 3   July 15   Sept. 26    Oct. 1     1960   May 10   May 15   Sept. 22    Nov. 6    July 20   July 22    Nov. 3      1961   Apr. 18   Apr. 24   Oct. 19    Oct. 25   Nov. 17   July 20   July 31    Nov. 3      1962   Apr. 26   Apr. 29   Sept. 1    Sept. 18   Nov. 17   July 20   July 31    Nov. 3      1953   March 16   Apr. 2   Aug. 28   Oct. 25   Oct. 28   Oct. 24    May 15   May 26     no   fruiting   Inferiting   no fruiting   I		1956	Apr. 24	Apr. 26	Oct. 8	KIEL_IK	Oct. 31	Nov. 18	July 20	Aug. 6	Oct. 10	1.1.1	Dec. 12	1.41
1958   May 10   May 13   Oct. 28    Oct. 30   Nov. 27   July 10   July 25   Sept. 30    Nov. 7*     1959   Apr. 28   May 4   Sept. 16    Oct. 19   Nov. 10   July 3   July 15   Sept. 26    Oct. 1     1960   May 10   May 15   Sept. 22    Nov. 6    July 12   July 26         1961   Apr. 26   Apr. 24   Oct. 19    Oct. 25   Nov. 20   July 20   July 21    Nov. 3      1962   Apr. 26   Apr. 27   Aug. 28   Oct. 25   Oct. 28    Apr. 4   May 8     no   fruiting     sii Hemsl.      Oct. 31   Nov. 11   Feb. 29   May 14   June 4     no   fruiting     1955   Apr. 28   May 1   Oct. 3    Oct. 19   March 20   May 19   June 2     no   no fruiting   no		1957	May 7	May 11	Oct. 19	00-17	Oct. 17	Nov. 30	July 5	July 20	Sept. 28	0014	Oct. 18*	10 14 Care
1959   Apr. 28   May 4   Sept. 16    Oct. 19   Nov. 10   July 3   July 15   Sept. 26    Oct. 1     1960   May 10   May 15   Sept. 22    Nov. 6    July 12   July 26          1961   Apr. 18   Apr. 24   Oct. 19    Oct. 25   Nov. 20   June 30   July 22    Nov. 3      1962   Apr. 26   Apr. 29   Sept. 1    Sept. 18   Nov. 17   July 20   July 31    Nov. 3      viburnum Carle-      Sept. 26   Oct. 25   Oct. 28   Oct. 24    May 15   May 8      no fruiting     1953   March 16   Apr. 2   Apr. 30   Sept. 2   Oct. 28   Oct. 24    May 15   May 26     no fruiting     1955   Apr. 28   May 1   Oct. 3    Oct. 19   March 20   May 19   June 2		1958	May 10	May 13	Oct. 28	0a <u>.</u> 7	Oct. 30	Nov. 27	July 10	July 25	Sept. 30	-	Nov. 7*	1
1960   May 10   May 15   Sept. 22   —   Nov. 6   —   July 12   July 26   —   —   —   —   —   —   —   —   Duty 22   —   Nov. 3   —   …		1959	Apr. 28	May 4	Sept. 16	000_10	Oct. 19	Nov. 10	July 3	July 15	Sept. 26	Oct o	Oct. 1	no training
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1962   Apr. 26   Apr. 29   Sept. 1   —   Sept. 18   Nov. 17   July 20   July 31   —   Nov. 17   —     Viburnum Carle- sii Hemsl.       Apr. 2   Aug. 28   Oct. 25   Oct. 28   —   Apr. 24   May 8   —   —   no fruiting     1953   March 16   Apr. 22   Apr. 30   Sept. 2   Oct. 28   Oct. 24   —   May 15   May 26   —   —   —   no fruiting     1955   Apr. 29   May 1   Oct. 9   Oct. 31   Nov. 11   Feb. 29   May 14   June 4   —   —   —   no fruiting     1956   Apr. 28   May 1   Oct. 3   —   Oct. 19   March 20   May 19   June 2   —   —   —   no fruiting     1957   March 25   Apr. 12   Sept. 21   Oct. 22   Oct. 8   Nov. 20   Apr. 29   May 18   —   —   —   no fruiting     1958   Apr. 19   Apr. 29   Sept. 17   —   Oct. 14   Dec. 10   May 16   May 29 <td></td> <td>1961</td> <td>Apr. 18</td> <td>Apr. 24</td> <td>Oct. 19</td> <td></td> <td>Oct. 25</td> <td>Nov. 20</td> <td>June 30</td> <td>July 22</td> <td></td> <td>Nov. 3</td> <td>-</td> <td>Traits esten</td>		1961	Apr. 18	Apr. 24	Oct. 19		Oct. 25	Nov. 20	June 30	July 22		Nov. 3	-	Traits esten
Viburnum Carle- sii Hemsl.   March 16   Apr. 2   Aug. 28   Oct. 25   Oct. 28   —   Apr. 24   May 8   —   —   —   no fruiting no fruiting     1953   March 16   Apr. 22   Apr. 30   Sept. 2   Oct. 28   Oct. 24   —   May 15   May 26   —   —   —   no fruiting     1955   Apr. 29   May 1   Oct. 9   Oct. 31   Nov. 11   Feb. 29   May 14   June 4   —   —   —   no fruiting     1956   Apr. 28   May 1   Oct. 3   —   Oct. 19   March 20   May 19   June 2   —   —   —   no fruiting     1957   March 25   Apr. 12   Sept. 21   Oct. 22   Oct. 48   Nov. 20   Apr. 29   May 18   —   —   —   no fruiting     1958   Apr. 19   Apr. 29   Sept. 17   —   Oct. 14   Dec. 10   May 16   May 29   —   —   —   no fruiting     1958   Apr. 19   Apr. 29   Sept. 17   —   Oct. 28   Nov. 25   Apr. 27   May 12		1962	Apr. 26	Apr. 29	Sept. 1	-	Sept. 18	Nov. 17	July 20	July 31	June-20	Nov. 17		
sii Hemsl.   no   no   no   fuiling     1953   March 16   Apr. 2   Aug. 28   Oct. 25   Oct. 28   —   Apr. 24   May 8   —   —   —   no   fruiting     1954   Apr. 22   Apr. 30   Sept. 2   Oct. 28   Oct. 24   —   May 15   May 26   —   —   —   mo   fruiting     1955   Apr. 29   May 1   Oct. 9   Oct. 31   Nov. 11   Feb. 29   May 14   June 4   —   —   —   no   fruiting     1956   Apr. 28   May 1   Oct. 3   —   Oct. 19   March 20   May 19   June 2   —   —   —   no   fruiting     1957   March 25   Apr. 12   Sept. 21   Oct. 222   Oct. 8   Nov. 20   Apr. 29   May 18   —   —   —   no   fruiting     1958   Apr. 19   Apr. 29   Sept. 17   —   Oct. 30   Oct. 28   Nov. 25   Apr. 27   May 12   —   —   —   no   fruiting     1958	Viburnum (	Carle-	March 15	981: 31	36612 33	OCT 12	994 16 I	100k 32	March 18	YUC 10	Japo 6	1922	June 27"	
1953   March 16   Apr. 2   Aug. 28   Oct. 25   Oct. 28   —   Apr. 24   May 8   —   —   —   no fruiting     1954   Apr. 22   Apr. 30   Sept. 2   Oct. 28   Oct. 24   —   May 15   May 26   —   —   —   no fruiting     1955   Apr. 29   May 1   Oct. 9   Oct. 31   Nov. 11   Feb. 29   May 14   June 4   —   —   —   no fruiting     1956   Apr. 28   May 1   Oct. 3   —   Oct. 19   March 20   May 19   June 2   —   —   —   no fruiting     1957   March 25   Apr. 12   Sept. 21   Oct. 22   Oct. 8   Nov. 20   Apr. 29   May 18   —   —   —   no fruiting     1957   March 20   Apr. 19   Apr. 29   Sept. 17   —   Oct. 14   Dec. 10   May 16   May 29   —   —   —   no fruiting     1958   Apr. 19   Apr. 29   Sept. 17   —   Oct. 28   Nov. 25   Apr. 27   May 12   —   —	sii Hemsl	1958	March 24	Apr. 10	Oct. 14	Nov. 2	041, 19		Apt. 16	May 1	1000	and the second	and the second	no fruitmy
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1956   Apr. 28   May 1   Oct. 3   —   Oct. 19   March 20   May 19   June 2   —   —   —   no fruiting     1957   March 25   Apr. 12   Sept. 21   Oct. 22   Oct. 8   Nov. 20   Apr. 29   May 18   —   —   —   no fruiting     1957   March 25   Apr. 12   Sept. 21   Oct. 22   Oct. 8   Nov. 20   Apr. 29   May 18   —   —   —   no fruiting     1958   Apr. 19   Apr. 29   Sept. 17   —   Oct. 14   Dec. 10   May 16   May 29   —   —   —   no fruiting     1959   March 20   Apr. 1   Oct. 6   Oct. 30   Oct. 28   Nov. 25   Apr. 27   May 12   —   —   —   no fruiting     1960   Apr. 4   Apr. 19   Aug. 19   Oct. 25   Nov. 1   Nov. 16   May 11   May 26   —   —   —   no fruiting     1961   Feb. 28   March 18   Sept. 30   Oct. 28   Oct. 5   Nov. 20   Apr. 21   May 5   —   —				ACA DU			and a	Dave 4 -	1	1 2 m 2 1	1	Tuto as	toto no	in 1956
1956   Apr. 28   May 1   Oct. 3   —   Oct. 19   March 20   May 19   June 2   —   —   —   no fruiting     1957   March 25   Apr. 12   Sept. 21   Oct. 22   Oct. 8   Nov. 20   Apr. 29   May 18   —   —   —   no fruiting     1958   Apr. 19   Apr. 29   Sept. 17   —   Oct. 14   Dec. 10   May 16   May 29   —   —   —   no fruiting     1959   March 20   Apr. 1   Oct. 6   Oct. 30   Oct. 28   Nov. 25   Apr. 27   May 12   —   —   —   no fruiting     1960   Apr. 4   Apr. 19   Aug. 19   Oct. 25   Nov. 1   Nov. 16   May 11   May 26   —   —   —   no fruiting     1961   Feb. 28   March 18   Sept. 30   Oct. 28   Oct. 5   Nov. 20   Apr. 21   May 5   —   —   —   no fruiting     1961   Feb. 28   March 18   Sept. 30   Oct. 28   Oct. 7   Nov. 16   Apr. 30   May 18   —   —			whr to	whr to				11.		ne stew	VII8. 6	VINE TO		no fruiting
1957   March 25   Apr. 12   Sept. 21   Oct. 22   Oct. 8   Nov. 20   Apr. 29   May 18     no fruiting     1958   Apr. 19   Apr. 29   Sept. 17    Oct. 14   Dec. 10   May 16   May 29     no fruiting     1959   March 20   Apr. 1   Oct. 6   Oct. 30   Oct. 28   Nov. 25   Apr. 27   May 12     no fruiting     1960   Apr. 4   Apr. 19   Aug. 19   Oct. 25   Nov. 1   Nov. 16   May 11   May 26     no fruiting     1961   Feb. 28   March 18   Sept. 30   Oct. 28   Oct. 5   Nov. 20   Apr. 21   May 5     no fruiting     1962   Apr. 6   Apr. 15   Sept. 19   Oct. 11   Oct. 7   Nov. 16   Apr. 30   May 18     no fruiting     1962   Apr. 6   Apr. 15   Sept. 19   Oct. 11   Oct. 7   Nov. 16   Apr. 30   May 18      no fruiting		1956	Apr. 28	May 1	Oct. 3		Oct. 19	March 20	May 19	June 2		Oct. 24	007.30	no fruiting
1958     Apr. 19     Apr. 29     Sept. 17     —     Oct. 14     Dec. 10     May 16     May 29     —     —     —     no fruiting       1959     March 20     Apr. 1     Oct. 6     Oct. 30     Oct. 28     Nov. 25     Apr. 27     May 12     —     —     —     no fruiting       1960     Apr. 4     Apr. 19     Aug. 19     Oct. 25     Nov. 1     Nov. 16     May 11     May 26     —     —     —     no fruiting       1961     Feb. 28     March 18     Sept. 30     Oct. 28     Oct. 5     Nov. 20     Apr. 21     May 5     —     —     —     no fruiting       1962     Apr. 6     Apr. 15     Sept. 19     Oct. 11     Oct. 7     Nov. 16     Apr. 30     May 18     —     —     —     no fruiting		1957	March 25	Apr. 12	Sept. 21	Oct. 22	Oct. 8	Nov. 20	Apr. 29	May 18	-	_		no fruiting
1959   March 20   Apr. 1   Oct. 6   Oct. 30   Oct. 28   Nov. 25   Apr. 27   May 12     no fruiting     1960   Apr. 4   Apr. 19   Aug. 19   Oct. 25   Nov. 1   Nov. 16   May 11   May 26     no fruiting     1961   Feb. 28   March 18   Sept. 30   Oct. 28   Oct. 5   Nov. 20   Apr. 21   May 5     no fruiting     1962   Apr. 6   Apr. 15   Sept. 19   Oct. 11   Oct. 7   Nov. 16   Apr. 30   May 18     no fruiting		1958	Apr. 19	Apr. 29	Sept. 17	MOV_4	Oct. 14	Dec. 10	May 16	May 29	-	_	_	no fruiting
1960     Apr. 4     Apr. 19     Aug. 19     Oct. 25     Nov. 1     Nov. 16     May 11     May 26     —     —     —     no fruiting       1961     Feb. 28     March 18     Sept. 30     Oct. 28     Oct. 5     Nov. 10     Apr. 21     May 5     —     —     —     no fruiting       1962     Apr. 6     Apr. 15     Sept. 19     Oct. 11     Oct. 7     Nov. 16     Apr. 30     May 18     —     —     —     —     no fruiting		1959	March 20	Apr. 1	Oct. 6	Oct. 30	Oct. 28	Nov. 25	Apr. 27	May 12	-	_		no fruiting
1961     Feb. 28     March 18     Sept. 30     Oct. 28     Oct. 5     Nov. 20     Apr. 21     May 5     —     —     —     —     —     mo fruiting       1962     Apr. 6     Apr. 15     Sept. 19     Oct. 11     Oct. 7     Nov. 16     Apr. 30     May 18     —     —     —     —     —     no fruiting		1960	Apr. 4	Apr. 19	Aug 19	Oct. 25	Nov. 1	Nov. 16	May 11	May 26				no fruiting
$\begin{array}{c c c c c c c c c c c c c c c c c c c $		1961	Feb 28	March 18	Sent 30	Oct 28	Oct 5	Nov. 20	Apr 21	May 5	2			no fruiting
$\frac{1902}{1902}   Apr. 0   Apr. 15   Sept. 15   Oct. 11   Oct. 7   100V. 10   Apr. 30   May 18   -   -   no fruiting$		1062	Apr 6	Apr 15	Sopt. 10	Oct. 11	Oct. 7	Nov. 16	Apr. 21	Max 19	20		13	no fruiting
		1902	Apr. 0	Арг. 15	Sept. 19	000.11	001. 1	1407. 10	Apr. 30	Iviay 18		-	1 10 10	no iruiting

1	1961	2	3	4	5	6	7	8	9	10	11	12	13
Viburnum	frag-	March 20	where is	041.6	041 30	- See	1000A-100	Apr. 2)	10000 0000 00002 115				tion (second
rans Bge.	1958	whi ta	yba 30	achar 11		OFT IN	1900 10	-Way 10	WITH THE		_		NO HUNNIE
	1953	March 17	March 28	polar TI	OVER ST	and a !	Labor The	where was					no florenting
						net in	Lange Lange	and and and	Anno n				no Howering
	1954	Apr. 16	Apr. 26				_	Apr. 18	May 30	A110 4	Ang 16		part of flow-
				- C				p	indep 50	1145. 1	1145. 10		ers froze
	1955	Apr. 5	Apr. 20	Oct. 20	Nov. 4	Nov. 4	Dec. 1	Apr. 20	Apr. 30	June 11	July 21	July 28	013 11020
	1956	May 4	May 9	Oct. 7	Nov. 21	Nov. 12	Dec. 23			_	_		no flowering
		A Street Street		Gat- La	i filmen and	And the	1010 10	Same and	inter all				and fruiting
	1957	Feb. 10	March 7	Oct. 2	-	Oct. 16	Nov. 26	March 21	Apr. 12	June 17		_	fruit dropped
	1958	March 24	Apr. 10	Oct. 14	Nov. 2	Oct. 19	-	Apr. 16	May 1		0 00	-	no fruiting
	1959	March 15	Apr. 27	Sept. 23	0.00	Oct. 16	Nov. 25	March 18	Apr. 10	June 6	-	June 27*	
	1960	March 20	Apr. 5	Aug. 23	-	Sept. 30	Nov. 8	Apr. 11	May 5	June 20	July 8	_	
	1961	Feb. 21	Feb. 28	Sept. 21	-	Oct. 9	Nov. 20	March 13	March 28	-	Marie 3	-	fruits eaten
	1960	May 10	May 15	Sept. 22		Nov. 6	-2	July 12	2002 26				by birds
	1962	March 25	Apr. 6	Sept. 7	-	Oct. 3	Nov. 7	Apr. 9	Apr. 19	Supt. 26	-	07-1	no fruiting
Viburnum i	lanta-	19896 10	Aller 13		1998-22	0440 38	NON. 27	300/ 10	3419-25-			1,608" 24	Mar 12 Mar 2016
na L.		Nay 7	Sday 11		22.2	109112	Nov. 30	and a	1614 20			C.S.L. 189-	
	1953	March 23	May 25	Sept. 8	Oct. 16	Oct. 20		Apr. 22	May 4	July 10	_		
	1954	Apr. 20	Apr. 26	Sept. 12	_			May 14	June 14	July 10	Aug. 11		profuse
	10.21	year yr		Gen 19	100		Non 16			0.		1.000 8	fruiting
	1955	Apr. 29	May 1	Oct. 20	-	Oct. 25	Dec. 5	May 22	June 12	Aug. 4	Sept. 3	Sept. 15	
	1956	Apr. 16	May 1	June 20	-	Oct. 12	Jan. 2	May 18	June 2	Aug. 18	Sept. 10	Sept. 27	leaf shedding
	19:09	Apr. 16	Ane: 34	Sent 9			Nov 10	Date 12	1.0. 26			States and	in 1957
	1957	Feb. 18	March 30	July 12	Oct. 23	Oct. 20		May 5	May 21	July 15	Aug. 30	-	
	1958	Apr. 24	May 1	Oct. 10		Oct. 30	Nov. 10	May 19	May 28	Aug. 10	Sept. 20	Oct. 11	A States
	1959	March 20	Apr. 8	Oct. 8	Nov. 4	Oct. 26	Nov. 17	Apr. 30	May 14	July 26	Aug. 13*	Sept. 30	Trenda
	1960	Apr. 4	Apr. 19	Sept. 22	Oct. 10	Sept. 30	Nov. 21	May 14	May 24	Aug. 2	Aug. 24	NT	
		1									1	1	POP COMPLETING

1		2	3	4	5	6	7	8	9	10	11	12	13
	1961	March 3	March 31	Sept. 21	Oct. 27	Nov. 2	Peb. 12	Apr. 27	May 12	July 18	Aug. 21	_	LOLA 19W
	1962	Apr. 8	Apr. 17	Sept. 21	Oct. 20	Oct. 23	Nov. 29	May 6	May 30	Aug. 13	Sept. 10		C.S. BUR
Viburnum	lenta-	March 17		Sept. 21		Oct. 10	Jan. 21	May 21	Jame 10	-			LACIA DOOL
go L.		ybt: 18	May 6	0911	1007 31	Nov. 3	Nov. 29	Jame 2	July 11.		-	Sapt. 17	C bn Sept. 12
	1953	March 20	Apr. 2	Aug. 28	Oct. 16	-	-	May 10	May 29	July 28	Aug. 22	Sept. 10	factored trace
	1954	Apr. 20	May 2	-	Oct. 20	34.07.4.	Date 3	May 22	June 10	July 23	Aug. 16	_	C Dowers w
	1955	Apr. 28	May 1	Oct. 1	Oct. 14	Oct. 6	Dec. 3	Apr. 14	June 23	Sept. 18	Oct. 2	Oct. 13	
	1956	Apr. 17	May 2	Sept. 19	Oct. 7	Sept. 30	Dec. 12	June 1	June 9	Sept. 20	Oct. 4	Oct. 14*	ni frattie
	1957	March 22	Apr. 1	Sept. 14	Oct. 7	Sept. 23	Nov. 3	May 20	June 7	Aug. 29	-	-	
	1958	Apr. 27	May 1	Sept. 21	Oct. 13	Sept. 24	Nov. 28	May 30	June 11	-	Oct. 6	-	
	1959	March 24	Apr. 8	Sept. 16	-	Oct. 6	Dec. 3	May 18	June 2	inter an	instruct and	-	no fruiting
	1960	Apr. 15	Apr. 18	Aug. 23	Oct. 14	Sept. 30	Nov. 24	May 29	June 10	Sept. 17	Sept. 23	-	
	1961	March 12	March 19	Sept. 4	Oct. 20	Sept. 23		May 19	June 5		Sept. 27	-	to flowerca.
	1962	Apr. 4	Apr. 14	Sept. 5	Oct. 13	Sept. 9	Nov. 3	June 4	June 15	1 4 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	Oct. 7	-	and fraiting
Viburnum	pruni-	Marchill	A2105 37		Sent: 28	Sere 23	09.20	次治:18	10182 22	Y 49 30	Sont 18		no failing
folium L	. 1929	Foot M	Aun 12		0.00113	CODE 0	.08, 28	7886 98	現代でおり	1 1 1 2 2	101 PU	1000 28	
	1953	Apr. 2	Apr. 2	Oct. 2	Oct. 18	144-14	09-13	May 6	May 27	June 16	Aug. 20	Aug. 28	no funding
	1954	May 1	May 4	Sept. 30	Oct. 14	081_17	Oct. 20	May 27	1000	Aug- 28.	3 <u>3</u>	Game - 2.1m	no fruiting
	1955	Apr. 13	May 2	Oct. 25	Nov 8	Nov. 15	Jan. 2	June 6	June 21	349-15	eren de	Col_a	leaf shedding
		1205. 26	3424 2			Date:	Nov. 4.	Mill 20	Tunie 14	And 7	Ser. 14		in 1956
			1.1		1.			Sec. 1	La The way				no fruiting
	1956	May 1	May 9	Oct. 6	SAL 30	Nov. 2	Jan. 13	May 31	June 15	-	Oct. 24	Oct. 30	leaf shedding
		APK. 15	Apr. 17		Sept. 17	1000	Ont. 14	Succ. 6	June 21	- 1	-		in 1957
	1957	March 28	Apr. 2	Oct. 2	Nov. 4	Oct. 26	Nov. 29	May 18	June 5	Aug-28	-	-	no fruiting
	1958	Apr. 15	Apr. 29	Sept. 27	Nov. 24	Oct. 11	Jan. 4	May 28	June 11	-	-	-	leaf shedding
		WINICH-D	March 32	25br 331	067 33	0-10	-	May 14	7000 7	Array 1	_	-	in 1959
										1.1.1			no fruiting
	1959	March 25	Apr. 9	Oct. 8		Oct. 28	Dec. 3	May 11	June 9	111	-		no fruiting
	1960	Apr. 5	Apr. 20	Sept. 25	Nov. 1	Oct. 29	Nov. 29	May 24	June 13	Y S			no fruiting

1	1959	2	3	<u>6</u> 4	5	6	7	8	9	10	11	12	13
	1961	March 9	March 22	Sept. 27	Oct. 25		_	May 14	June 7				no fruiting
	1962	Apr. 4	Apr. 17	Oct. 7	Oct. 23	Oct. 19	Oct. 29	May 21	June 13	-		-	no fruiting
Viburnum	Sar-	March 28	Y45.3	046-2	1000° 7	04. 26	Nov. 29	1402 18	June 5			-	
genti Ko	ehne												
	1953	Apr. 1	Apr. 6	00 <u>0</u> 6	_	Nov. 2	Jan. 13	報告子	Marc 13	N= N	99 <u>6</u> -346	04.30	no flowering
	1954	Apr. 26	May 2	Sept. 14	· · · · ·	-	1-1-1	May 20	June 14	Aug. 7	Sept. 14	1-1	und muning
	1955	Apr. 8	Apr. 27	Oct. 1	Oct. 11	Oct. 6	Oct. 30	June 2	June 26	Aug. 28	Sept. 8	Oct. 4	
	1956	May 5	May 11	Sept. 21	Oct. 3	Oct. 4	Nov. 1	May 28	June 26	Aug. 15	Aug. 27	Sept. 27*	no fuluna
	1957	Feb. 8	March 13	Sept. 14	Sept. 21	Sept. 25	Oct. 14	May 22	June 9	Aug. 2	Sept. 19	Nov. 19	Lands Charger
	1958	Feb. 11	Apr. 22	Sept. 17	N-1	Oct. 8	Oct. 21	May 29	June 20	Aug. 28	Sept. 20	Nov. 20	The sparter
	1959	March 24	Apr. 3	Sept. 10	Sept. 28	Sept. 23	Oct. 22	May 18	June 8	Aug. 20	Sept. 16	- 7	
	1960	Apr. 4	Apr. 17	Aug. 20	Sept. 27	- 20	Oct. 8	May 23	June 16	Aug. 10	Sept. 12	_	
	1961	March 3	March 16	Sept. 1	Sept. 27	Sept. 18	Oct. 5	May 8	May 29	Aug. 8	Aug. 30	-	Press Antes
	1962	March 31	Apr. 14	Sept. 2	Sept. 21	Sept. 21	Oct. 11	June 4	June 14	Aug. 24	Sept. 25	-	in the day
Viburnumt	omento-	Same -		53.2	and the	Ser. C.	17715		1.		and a	THE STREET	Tio William
sum Thu	nb.	Carrier and	where		and the	Tachar -	time a	and the	amon 1	and a	Con K		and the second
	1953	March 5	Apr 3	Ang 31	Oct 16	Oct 20	THE IN	May 12	May 24	Tuly 14	mar a	nor in	C. W. C.
	1954	Apr. 30	May 5	Sent 4	Oct. 10		DEC 1	May 27	June 11	July 14	and the	700-15	
	1.20.1		inday o	Sept. 1	000.11		-	integ 21	June II	1000 72	une ra	angest the	(flowers a
		WRITER AL	VUN S	87 'Sny	OCE IP			Way to	Land TA	or and	WAR TS	ache ta	second time
	1955	Apr. 18	May 6	Oct. 1	Oct. 31	Nov. 3	Nov. 29	June 2	July 11	_		Sept. 17	on Sept. 19
		Ane 15		Aune Sa		100 19	1.112	Mary 18	June 2	Aug. 18	Super. 14		very poor
	1303	YDC 8	Apr. 17		OCT 50		1204 38	WITH Q	WW 30	Vat 13	gebr 10	and the	fruiting
	1956	May 6	May 16	20hr 31	000-20	100 30	-	When the	1000-13	10-15	1 30		very few
	1904	Acr. 25	Wan Li	150 14			Nene ID	New 19	May 18	Aug. 10.		Cen 12	leaves, no
	1959	Mageb 20	Ang 8	Octy 8	Nog 4		Negiti	Apg 30	Mag 14	10/10/26	( rup do	Kenty 30	flowering
	1142			1								Y STALL	and mutting

1	800	2	3	4	5	6	7	8	9	10	11	12	13
1	1957	March 19	Apr. 3	Sept. 30	Nov. 27	Oct. 28	Feb. 12	May 16	June 3	-	- Angel a	-	leaf shedding in 1958
	3967	Vactoral	whor 334		Oci. 28	Cent 1	Videy.385						no fruiting
1	1958	March 17	Apr. 30	Sept. 21	-	Oct. 30	Jan. 21	May 21	June 10	-	-	-	leaf shed-
	1070	Apr. 28	May 13		001,28		Nov. 14				-		ding in 1959
all Sweet	1050	March 24	Apr 4		Oct 12	Mov 4	Dec 3	May 13	June 2		_		no fruiting
1	1960	Apr 4	May 10	Sent 25	Oct. 12	Sept 30	Nov 30	June 16		Aug. 5			no maning
1	1961	March 3	March 15	Sept. 23	Oct 25	Oct 27		May 15	June 3				no fruiting
1	1962	March 31	Apr. 14	Sept. 21 Sept. 21	Oct. 20	Oct. 17	Nov. 29	May 28	June 13	Aug. 11	_	_	ing contract
Vitis amuren	sis	P(0) 15											no itiseini
Rupr.	1957	Apr. 21			Oct. 16	Oct. 1					-	1	And Gotting
Dent DC	1953	Apr. 25	Apr. 28	Aug. 26	Sept. 20	Oct. 6	Oct. 26	=	=	=	=	=	no flowering and fruiting
Warmie Hol	1954	May 16	May 20	Sept. 2	1		_	June 10	June 22	_	_	-	no fruiting
1	1955	May 5	May 11	Sept. 30	Oct. 13	Oct. 5	Oct. 28	June 26	July 8	Sept. 26	Oct. 6	Oct. 28	TO CRUTTER
1	1956	May 9	May 22	Sept. 19	Oct. 3	Sept. 21	Oct. 19	June 8	July 1	_	_	-	no fruiting
1	1957	Apr. 29	May 9	Sept. 12	Sept. 30	Sept. 17	Oct. 15	June 10	June 21	Aug. 28	Sept. 21	-	Someril on
1	1958	May 6	May 11	Sept. 13	Oct. 14	Oct. 6	Oct. 24	June 9	June 22	Sept. 15	Oct. 12		Summer par
Mak 1	1959	Apr. 29	May 5	Sept. 28	=	Oct. 4	Nov. 4	=		=	=	=	no flowering and fruiting
1	1960	Apr. 20	May 7	Aug. 19	Sept. 30	Oct. 3	Nov. 1	June 2	June 11	1	_	-	no fruiting
1	1961	Apr. 15	Apr. 17	Aug. 25	Sept. 17	Oct. 2	Oct. 15	June 6	June 21		_	-	no fruiting
1	1962	Apr. 21	Apr. 23	Sept. 17	Sept. 27	Sept. 21	Oct. 20	June 13	June 23	Aug. 28	-	-	and training
Vitis vulpina	L.	and	Level	200 .14	an se	Lister as	10000				· ·	-	bio ritoricaria
1	1953	Apr 27	Apr 29	Oct 12	Oct. 18	Oct. 20			_	_			no flowering
		r.pr. 21	11p1. 23	000. 12	000, 10	000. 20	They be	1	8	10	TI	315	and fruiting
1	1954	May 18	May 21	-				June 8	June 30			-	

.

1	2	3	4	5	6	7	8	9	10	11	3 12	13
1955	May 6	May 14	Oct. 11	Oct. 29	Oct. 24	Dec. 9	_		_	_	_	no flowering
		1.4.1								1		and fruiting
1956	May 11	May 23	Sept. 30	2000-02	Oct. 10	Dec. 28	June 8	June 26	-	-	-	no fruiting
1957	Apr. 20	May 9	Sept. 15	Oct. 25	Sept. 30		June 9	June 25		-	-	no fruiting
1958	Apr. 27	May 14	Sept. 13	Oct. 25	Oct. 12	Dec. 12	June 12	June 24	-	-	-	no fruiting
1959	Apr. 28	May 8	_		Oct. 16	Nov. 12	_	_	_	-	_	no flowering
			and and and	CON IL	Carlos and	1		Antes and	seter try	-	in the second	and fruiting
1960	May 4	May 12	Sept. 25	Oct. 12	Oct. 7	Nov. 16	June 4	June 18			_	no fruiting
1961	Apr 17	Apr 21	Sept. 2	Oct. 15	Sept. 27	Nov. 17	June 7	June 23	_	_	_	no fruiting
1901	Apr. 22	Apr. 24	Sept. 19	Oct. 17	Oct 5	Oct 28	Tune 25	July 9	1911 - 19		1100-12	no fruiting
1902	Apr. 22	Apr. 24	Sept. 17	000.17	000.0	000. 20	June 10	bury -				an granges
Wistaria flori-				1-5-11-5-11-							- 10	and truthag
bunda DC.	11 . 00	T 4	Sant 1	pitter lie	Charles of	6761-52				1.1.7		no flowering
1953	May 28	June 4	Sept. 4				_					and fruiting
1054	Mar 15	May 10	Sent 20						_		_	no flowering
1954	Iviay 15	Way 10	Sept. 20									and fruiting
1055	May 5	May 11	Oct 27	0.0	Oct. 26	Nov. 14	_			_		no flowering
1955	Iviay J	Way II	000. 21			1.0.1.1.			and in			and fruiting
1056	ALL A	Ptra 10	500 35			1000 30	-		_	-		badly injured
1750	March 24	ADC. 4		000 43	Mon 4	a strength a strength a		1				by frost
1957	Apr. 28	May 13	Oct. 5	Oct. 29	Oct. 10	Nov. 14		Joh-	_	-	-12	no flowering
1507			malar an			-		anic to				and fruiting
1958	Apr. 25	May 15	Sept. 17	-	Oct. 1	Nov. 30	-	-	-	-		no flowering
1956		May 10-		-		_		1		1	-	and fruiting
1959	Apr. 16	Apr. 30	Sept. 15	1.000	Oct. 26	Nov. 25	WINTS 10	1000	-	-	-	no flowering
1921	Advert 10		Frent 30	Stow 33					T and a start		141.0	and fruiting
1960	May 2	May 11	Aug. 18	Oct. 30	Oct. 11	Nov. 24	-	-	-	-	1	no flowering
	3		4			-			in the second			and fruiting
					https:/	Ircin or	apl				-	a ferritoria

1	2	3	4	5	6	7	8	9	10	11	12	13
19	61 March 25	Apr. 20	Oct. 12	Oct. 28	Oct. 24	Nov. 20				allon Trans		no flowering
19	52 Apr. 19	Apr. 24	Sept. 26	Oct. 28	Oct. 7	Nov. 25		in a second			in -	no flowering and fruiting
Wistaria sinen sis Sweet.	le colere a	a a a	1	18.2	in in the	ton C	3		1			any and
19	53 Apr. 14	Apr. 18	Sept. 12	Sept. 28	Oct. 16	Sector 12	Apr. 28	May 20	-	_		no fruiting
19	54 May 3	May 6	Sept. 15	-	Oct. 6	Oct. 22	May 18	June 8	-	-	-	no fruiting
19	55 Apr. 30	May 5	Oct. 7	Nov. 5	Oct. 22	Nov. 18	May 19	June 26	-	-		no fruiting
19	56 May 3	May 24	Sept. 30	OUL-SE	Oct. 11	Dec. 3		May 18		-		no flowering and fruiting
19.	57 Apr. 2	Apr. 13	Sept. 22	Oct. 16	Oct. 7	Har C	-	=	-			no flowering and fruiting
19.	58 Apr. 24	May 16	Sept. 17	Nov. 5	Sept. 21	Jan. 4		-				no flowering and fruiting
19	59 Apr. 10	Apr. 26	Sept. 23	-	Oct. 19	Dec. 20	May 6	May 26	-	-	-	no fruiting
19	50 Apr. 20	May 11	Aug. 22	Oct. 22	Oct. 20	Nov. 24	May 15	June 10	· - 2		-	no fruiting
19	51 Apr. 10	Apr. 19	Sept. 13	Nov. 7	Sept. 17	-	May 3	May 18	-	-	-	no fruiting
19	52 Apr. 3	Apr. 17	Oct. 5		18-28	Nov. 25	May 30	June 24	Aug. 10	Aug. 17	-	-11
Zelkowa serra Mak.	ta			No	D R R	10 miles		Tab			LEP	e 6 Continued
19	53 Apr. 11	Apr. 16	Sept. 26	Oct. 22	Oct. 16	Nov. 21	-	11	-	-	-	no flowering and fruiting
19	54 May 8	May 10	Oct. 10	Oct. 26	Oct. 15	Oct. 30	-	-	-	-	-	no flowering and fruiting
19	55 May 2	May 6	Oct. 15	Oct. 28	Oct. 25	Nov. 12	-	-			_	no flowering and fruiting
19	56 May 7	May 12	Oct. 4	Oct. 24	Oct. 20	Nov. 5	9 -	-	-	-	_	no flowering and fruiting

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												Table	e 6 (continued)
1	Laon	2	3	4	5	6	7	8	9	10	11	12	13
	1957	Apr. 24	Apr. 30	Sept. 26	Oct. 19	Oct. 10	Oct. 29		May 26 June 10			E	no flowering
	1958	May 10	May 14	Oct. 6	Nov. 3	Oct. 18	Dec. 12	=	-	_	=	-	no flowering and fruiting
	1959	Apr. 20	Apr. 26	Sept. 12	Oct. 18	Oct. 4	Nov. 6	=	=	=	-	=	no flowering and fruiting
	1960	Apr. 30	May 8	Oct. 10	Oct. 26	Oct. 18		May 12	May 18	-	-	-	no fruiting
	1961	Apr. 6	Apr. 15	Sept. 30	Oct. 23	Oct. 11	Nov. 13	Mark 19	James 26		E	=	no flowering and fruiting
	1962	Apr. 22	Apr. 24	Sept. 22	Oct. 18	Oct. 3	Nov. 15	Apr. 26	May 2	-		-	no fruiting

\* Fruit crop date,

- no observations.

northern China (Forsythia Giraldiana and Viburnum fragrans) and central China (Corylopsis platypetala).

Much more numerous is the group of trees and shrubs for which opening of leaf buds in the early spring is characteristic:

Aesculus hippocastanum Aesculus pavia Carpinus betulus Cornus alba (starts to grow) Cornus amomum (starts to grow) Cornus Hemsleyi (starts to grow) Cotoneaster horizontalis Cotoneaster obscura Cotoneaster racemiflora Eucommia ulmoides Evonymus alata Evonymus europaea Fagus grandifolia Hydrangea petiolaris Hydrangea radiata (starts to grow Hydrangea xanthoneura Kolkwitzia amabilis

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Lonicera alpigena Lonicera thibetica Lonicera xylosteum Lonicera Maximowiczii Magnolia salicifolia Prunus padus Ribes alpinum Ribes aureum Schisandra chinensis Sorbus americana Sorbus aucuparia Tilia tomentosa Viburnum Carlesii Viburnum lantana Viburnum prunifolium Viburnum tomentosum

Among these 35 tree and shrub species, those belonging to the genera Cornus, Cotoneaster, Hydrangea, Lonicera and Viburnum prevail. Many of these species derive from western China (Cotoneaster horizontalis, Contoneaster obscura, Hydrangea xanthoneura, Lonicera thibetica) and central China (Cornus Hemsleyi, Eucommia ulmoides, Hydrangea petiolaris, Kolkwitzia amabilis and Viburnum tomentosum). Noteworthy is also the contribution of trees and shrubs representing the genera Aesculus, Evonymus, Prunus, Ribes and Sorbus. The greatest phenological regularity, that is occurrence of the flowering or bud development phase always in the course of early spring was exhibited in the period 1953-1962 by two Euroasiatic species: Lonicera xylosteum and Prunus padus and one North American species — Ribes aureum. Their common trait is a very extensive area of natural spread and adaptation to a wide ecological amplitude (unfortunately the origin of the bushes growing in Kórnik is not known).

At the beginning of spring every year (in the ten-year period investigated) bursting and opening of leaf buds was observed on such trees as: Acer monspessulanum, Acer nikoense, Acer pseudoplatanus, Carya cordiformis, Carya laciniosa, Castanea sativa, Cercidiphyllum japonicum, Evodia Daniellii, Fagus japonica, Fagus silvatica, Gleditsia triacanthos (starts to grow), Juglans nigra, Maclura pomifera (starts to grow), Magnolia acuminata, Magnolia kobus var. borealis, Rhus silvestris (starts to grow), Robinia pseudoacacia, Tilia cordata, Tilia Maximowicziana.

Most of the above listed species originating from the Atlantic part of North America (Carya cardiformis, Carya lacinicsa, Gleditsia triacanthos, Juglans nigra, Magnolia acuminata, Robinia pseudoacacia) and from Japan (Acer nikoense, Cercidiphyllum japonicum, Magnolia kobus var. borealis) have a high adaptation ability in the climatic conditions of Kórnik. As regards phenological regularity, the species: Juglans nigra, Magnolia kobus var. borealis and Tilia cordata should be mentioned particularly.

In the same phenological season of beginning spring the flowering of the following trees and shrubs was noted: Carpinus betulus, Corylopsis platypetala (end of flowering), Evonymus alata (begins flowering), Fagus orientalis, Lonicera coerulea, Magnolia kobus var. borealis, Prunus fruticosa (begins flowering), Prunus padus (begins flowering), Ribes alpinum, Ribes aureum (begins flowering), Viburnum Carlesii (begins flowering), Vitis amurensis, Zelkowa serrata.

Among the more interesting species, as regards the range of occurrence and decorative qualities, should be mentioned the early flowering shrubs: Lonicera coerulea common on the area of the northern Eurasia hemisphere, classed to the elements of Siberian flora, Evonymus alata with an extensive north Asiatic range and the valuable decorative shrubs originating from the western part of North America (Ribes aureum) and eastern Asia (Viburnum Carlesii, Vitis amurensis and Magnolia kobus var. borealis).

During phenological spring opening of leaf buds was observed exclusively in Gymnocladus canadensis. On the other hand, nearly all the below listed shrubs and trees flowered regularly in this season: Cladrastis tinctoria, Cornus alba (beginning of flowering), Cornus stolonifera (beginning of flowering), Evonymus alata (further flowering), Evonymus europaea (beginning of flowering), Evonymus latifolia (beginning of flowering), Elaeagnus multiflora, Halesia tetraptera Juglans cinerea, Juglans mandshurica, Lonicera Maackii (beginning of flowering), Lonicera xylosteum, Lonicera Maximowiczii (beginning of flowering), Magnolia acuminata (begins flowering), Ribes aureum (end of flowering), Schisandra chinensis, Sorbus americana, Sorbus aucuparia, Viburnum Carlesii (end of flowering), Viburnum lantana, Viburnum prunifolium (begins flowering), Viburnum tomentosum.

As seen, at this time of the year mainly shrubs representing the genera *Evonymus*, *Lonicera*, *Viburnum* and *Cornus*, and trees of the genera *Juglans* and *Sorbus* come into flower. Many of these trees and shrubs are very hardy and noteworthy for their attractive and profuse blossom. This concerns particularly the species: *Halesia tetraptera* from the southeastern part of North America and *Lonicera Maackii* originating from the area of Manchuria and Korea. *Lonicera xylosteum* common on the area of Europe and western Asia up to the Altai, known as early as in the Tertiary is characterized by the greatest phenological regularity as regards the time of growth and of flowering.

Ripening of the fruits of *Prunus subhirtella*, one of the most decorative Japanese cherries, begins in spring.

The concurrence of the phenophase of flowering with the period of early summer was observed in the species: Cornus kousa, Cornus rugosa, Cotoneaster obscura (begins flowering), Gleditsia triacanthos, Hydrangea petiolaris, Hydrangea xanthoneura, Juglans nigra, Liriodendron tulipifera, Maclura pomifera (begins flowering), Magnolia acuminata (end of flowering), Lonicera Maximowiczii (end of flowering), Phellodendron amurense (end of flowering), Pterostyrax hispida, Rhus silvestris (begins flowering), Robinia pseudoacacia, Tilia platyphyllos (begins flowering).

Three species from the southeastern part of North America exhibit a high phenological regularity of this phase: *Gleditsia triacanthos, Liriodendron tulipifera* and *Robinia pseudoacacia* which in the environmental conditions of Poland exhibit a high viability and resistance to low temperatures.

During the same phenological season, that is early summer, in some species ripening of fruits was observed. This concerns: *Lonicera coerulea, Prunus subhirtella* (end of fruiting), *Prunus padus* (begins fructification) and *Vitis vulpina*.

The very short period of fruit growth between the phenophase of flowering and fruiting in *Lonicera coerulea* and *Prunus padus* seems to result from the adaptation of the Euroasiatic species to the low sum of heat in the course of the vegetation period.

The period of phenological summer coincides with the flowering of: Aesculus parviflora, Ailanthus glandulosa, Cotoneaster obscura (end of flowering), Hydrangea radiata (begins flowering), Hydrangea Sargentiana (begins flowering), Maclura pomifera (end of flowering), Rhus sylvestris (end of flowering), Sorbaria sorbifolia, Tilia cordata, Tilia tuan, Tilia americana, Tilia mongolica, Tilia platyphyllos (end of flowering), and Tilia Maximowicziana.

The above named group includes numerous east-Asiatic trees particularly of Chinese provenience such as *Ailanthus glandulosa*, *Cotoneaster obscura*, *Hydrangea Sargentiana*, *Tilia tuan* and *Sorbaria sorbifolia* frequently found in our gardens, the range of which reaches from the Ural Mts. to the Sakhalin and Japan. The latter species is an object of interest because of its ecological plasticity. In the above group the proportion of lindens is rather larger; among them *Tilia cordata* and *Tilia tuan* exhibit a high phenological regularity. Fruit ripening in this period was noted in the species: *Cornus alba* (beginning of ripening), *Lonicera Maackii* (beginning of ripening), *Lonicera thibetica, Morus alba, Ribes alpinum, Ribes aureum* (beginning of ripening), *Sorbus aucuparia* (beginning of ripening).

Early autumn is very often associated with a complete change of color of the foliage and leaf shedding in *Juglans mandshurica* and with the beginning of change of leaf color in the following trees and shrubs: *Cercidiphyllum japonicum, Cornus rugosa, Gymnocladus canadensis*.

Early leaf fall in Juglans mandshurica may be evidence of the adaptation of this tree to the very short vegetation period in its native country. In early fall ripening of the fruits of: Fagus silvatica (beginning of ripening), Pterostyrax hispida (beginning of ripening), Ribes aureum (end of ripening) and Robinia pseudoacacia was most frequently observed in the investigated ten-year period.

Golden fall is the time of change of color of the leaves of the majority of the trees and shrubs observed. In view of the commonness of this phenomenon, there seems to be no point in enumerating the species.

Late fall is characterized by the phenophase of leaf shedding by numerous trees and shrubs. Nearly always in the course of the 10-year period foliage was shed at this time by: Lonicera alpigena, Kolkwitzia amabilis, Maclura pomifera, Magnolia kobus var. borealis, Magnolia salicifolia, Phellodendron amurense, Prunus subhirtella, Pterocarya fraxinifolia and Rhus silestris.

In the same phenological season fruits ripen on: Hydrangea radiata, Magnolia kobus var. borealis, Phellodendron amurense, Fagus silvatica, Pterostyrax hispida, Robinia pseudoacacia.

In winter, the period of vegetative rest for most of the trees and shrubs growing in our geographical region falls to the time of flowering of *Hamamelis mollis* and the end of ripening of the fruits of *Robinia pseudoacacia*.

To sum up this chapter, the observation should be mentioned that numerous trees and shrubs of foreign origin, the vegetation rhythm (phenophases of leaf bud opening and of flowering) of which is distinctly coordinated with the rhythm of the phenological seasons of the year show an excellent adaptation to the conditions of the Kórnik Arboretum environment. This fact should, not, however, be generalized to an affirmation that there is a distinct relation between the phenological regularity in trees and shrubs and their adaptive ability. There exist, namely many trees and shrubs, the vegetation rhythm of which is synchronized with the climatic rhythm, and their degree of adaptation to the environmental conditions is low (*Castanea sativa, Cornus kousa, Elaeagnus angustifolia, Fagus japonica, Pterostyrax hispida, Zelkowa serrata* and others). By this is meant their incomplete cycle of generative development.

## 5. Discussion of Results of Phenological Observations

Analysis of the annual vegetation cycle of a great part of the trees and shrubs of foreign provenience growing in the Kórnik Arboretum consists of two parts.

In the first the species with different seasonal development rhythm are classified according to:

(1) the duration of the period of vegetative activity,

(2) the date of beginning of leaf bud opening and the end of shedding,

(3) the length of the flowering period and the date of the beginning of this phenophase,

(4) the length of the period of fruit growth from setting of primordia to the beginning of ripeness,

(5) the differing generative development cycle (trees and shrubs which flower,

but do not bear fruit; do not flower or bear fruit; flower and fructify; are capable of producing normal seeds).

The large amount of material collected over a period of many years observations of the chosen 122 tree and shrub species made it possible to establish the relation between the seasonal rhythmicity of the vegetation and the provenience of the species (geographical latitude, degree of continentality, altitude above sea level) and between the rhythm of vegetation and the kind of range of occurrence (disjunction, small or wide ecological amplitude).

Particularly interesting seems to be the annual course of vegetation of relict species. Comparison of the phenological spectra of the selected trees and shrubs should also demonstrate certain regularities occurring between the seasonal development and various weather combinations. In many cases, for instance, the influence of low and extreme temperatures, of various sums of heat, of the length of the vegetation season, of the distribution of precipitation and of the negative water balance on the rhythm of the phenophases may be revealed.

The study of the annual development of trees and shrubs of foreign origin cultivated in our conditions and characterized by the greatest or poorest adaptive ability will allow to establish the factors or their combinations which are of major importance in the process of introduction. By adaptive ability is meant here the ability of going through the full vegetation cycle in the course of the year, of bearing of normal seeds, of production of a maximum of organic matter in the given habitat as well as the resistance to low temperatures.

Thus, the second part of the analysis consists in an attempt at elucidation of the rhythm of vegetation of the chosen trees and shrubs. It is not easy to establish the causes which decide whether the given plant in the given environment develops leaves at various times, flowers and sets fruit or does not flower or set fruit. These are, no doubt, complex phenomena which result from the characteristics of the environment and the biological properties of the given plant. In view of this and the risk of mistake, owing to a more or less subjective evaluation of the beginning and end of a phenophase, the phenological spectra of the trees and shrubs with the longest and shortest period of vegetative activity, the longest and shortest period of flowering etc. were investigated and so were other features of their rhythmicity taking into consideration the most extreme time intervals. Moreover, in the graphical synthesis of the results of phenological observations, the mean values for periods of many years were taken into account, therefore the possible errors in the particular years should be of no major importance. It is hoped that owing to such an elaboration of the materials collected for many years, it will be possible to single out from the large number of observations the most characteristic groups of species as regards seasonal rhythmicity and eliminate the less significant characteristics and factors.

## The Course of Seasonal Development of Trees and Shrubs, and Their Provenience

It was assumed conventionally that the beginning of opening of the leaf buds and the state when most leaves have been shed determine the period of vegetative activity of most trees and shrubs. It is more difficult to establish the length of the vegetation period of trees and shrubs, since the border between the period of vegetation and the period of dormancy on the basis of a uniform criterion is not simple to establish in practice (flowering before leef development, ripening of fruit after leaf shedding). As regards evergreen species, they should be treated with certain reservations, since the end of the period of vegetative activity is in this case dependent in the first place on a certain thermic threshold. In mild winters of Atlantic type there occur in evergreen shrubs vital processes which cease only when the diurnal temperature falls below the critical value.

In general, as far as the 122 trees and shrubs under investigation are concerned, the mean duration of vegetative activity was approximately 150–260 days (Fig. 2).

The shortest mean duration of this activity (150-191 days) was noted in successive order in the species: Juglans mandshurica, Gymnocladus canadensis, Carya cordiformis, Acer rubrum, Vitis amurensis, Ailanthus glandulosa, Hamamelis virginiana, Acer nikoense, A. pseudoplatanus, Magnolia acuminata, Gleditsia triacanthos, Viburnum Sargenti, Phellodendron amurense, Tilia cordata, Rhus silvestris, Juglans Sieboldiana, J. nigra, Fagus orientalis, Carpinus orientalis and Tilia mongolica. Is it possible to find any relation between the origin of these trees and their vegetation rhythm? The very short period of vegetative activity in such species as Juglans mandshurica, Vitis amurensis, Acer Ginnala and Phellodendron amurense shows the adaptation of these trees and shrubs to long and severe winter, a cold spring and a short vegetation period in their native land in northeastern Asia. The climate of these regions is characteristically continental, and this explains the hardiness of the trees growing there. The same trait of seasonal rhythmicity was observed in species originating from Japan and China (Acer nikoense, Juglans Sieboldiana, Tilia Maximowicziana, T. mongolica). This seems to be connected with the introduction of plants from temperate and cool zones. It should be added that in north Japan like in the remaining mountainous part of east Asia, a climate with a long severe, frequently dry winter and warm summer months (influence of polar-continental air masses and monsoons) prevails. Some North-American trees have a similar development cycle as for instance: Gymnocladus canadensis, Carya cordiformis, Acer rubrum, Magnolia acuminata, Gleditsia triacanthos, Juglans cinerea, J. nigra and Fagus grandifolia, represented in Kórnik by specimens of probably northern provenience. Their seasonal rhythm developed under the influence of the severe climate of the Laurentian Highlands acting as a reserve of cold air which flows from the regions of the Arctic Sea and Hudson Bay and reaches as far south as the Gulf of Mexico.

Certain connections may also be found between the range of occurrence, or strictly speaking the type of climate within the range of occurrence, and the cyclic development in the group of shrubs characterized by a very long period of vegetative activity (average 225–260 days). To these belong in successive order: Viburnum tomentosum, V. Carlesii, Kerria japonica, Viburnum fragrans, Cotoneaster obscura, Berberis vulgaris, Ribes aureum, R. alpinum, Lonicera thibetica, Hydrangea radiata, Viburnum prunifolium, Kolkwitzia amabilis, Lonicera xylosteum, Rhus trilobata, Corylopsis platypetala, Viburnum lantana, Hydrangea petiolaris, Pterostyrax hispida and Elaeagnus angustifolia. This feature is characteristic of shrubs growing in low geographical latitudes in the regions of western and central China. They occur in the tropical and monsoon zones.

Typically representative of the flora of central China are the species: *Kolkwitzia amabilis* and *Corylopsis platypetala*. Both develop leaf buds very early and shed their leaves very late, they are sensitive to major temperature falls.

Small sums of heat seem to be sufficient in our conditions for shrubs from the extensive areas of Northern Asia, which start vegetation very early, to mention: *Sorbaria sorbifolia, Lonicera coerulea,* some Euroasiatic shrubs such as *Lonicera xylosteum, Elaeagnus angustifolia* and the shrubs growing in the European mountains: *Lonicera alpigena, Ribes alpinum* and *Forsythia europaea.* Noteworthy is also the long period of vegetative activity of *Lonicera thibetica.* It would seem that the above named species adapted themselves in their native country to small amounts of heat in the vegetation season. Owing to this they start growing early in our climatic conditions and lose their leaves late, thus they have a long period of vegetative activity.

These characteristic ecological conditions throw some light on the seasonal rhythm of shrubs brought to this country from Japan, in the northern part of which the climate of the moderate zone prevails with monsoon features (frosty and dry winters), and in the southern part the climate is characteristic of the tropical zone (cool winters, wet summer, mean annual temperature  $15^{\circ}-17^{\circ}$ ). The latter climatic type is also characteristic for the Korean peninsula. Frequently, however, the knowledge of the microclimate of the native land is not sufficient for explaining the vegetation rhythm of plants. More precise data are necessary informing on the extreme temperature values, the water balance, the length of the vegetation period, insolation and other factors connected for instance with the terrain relief and characteristic for a definite geographical region.

Calculation of the mean dates of leaf bud opening and leaf dropping shows a far going connection with the length of the period of vegetative activity of trees and shrubs. Evidence of this is found in the lists of species, in which in the course of the ten-year period bud opening (Fig. 3a) and leaf shedding (Fig. 3b) were earliest and latest observed.

A great number of species shows an average length of the period of vegetative activity. This is understandable if we consider their provenience from regions with

A List of Trees and Shrubs according to

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## Differences in Generative Development

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48. Fagus grandifolia	18	0	-		0		0			
49. Fagus orientalis	1	10	0	0			0	0		618
50. Fagus sylvatica	0	1	1					-		
51. Forsythia europaea	10	6	515	0	0		0	0		
52. Forsythia Giraldiana	0	01			0	0	0			
53. Forsythia ovata	0	0	00	0	0	0	0	1	0	
54. Gleditsia triacanthos	0	0			0	0	0	0		
55. Gymnocladus canadensis	0	0						0-1		of I
50. Hanesia tetraptera 57. Hamamalis mollis	-	01	01.9							
58 Hamamelis virginiana	0	91	2	0		0			0	
59. Hydrangea petiolaris			2	101		0		0	0	
60. Hydrangea radiata					0	0				
61. Hydrangea Sargentiana	0									
62. Hydrangea xanthoneura	0		10							
63. Juglans cinerea		0			61		0	10	0	
64. Juglans mandshurica	10	Q'	0		61	0	0		0	
65. Juglans nigra	00		þ		0		0			
66. Juglans Sieboldiana	10	010	p a		-		0		0	
67. Kerria Japonica 68. Kollowitzia amabilia	0	0	0	0	0	0	0	0	0	1p
69 Lindera aestivalis	0				010	0		-	-	
70. Liriodendron tulipifera	0	0	0	0	0 0	0	0	0	0	0
71. Lonicera alpigena		-	212							
72. Lonicera coerulea	0	1								P
73. Lonicera iberica										
74. Lonicera Maackii		0		0						
75. Lonicera Maximowiczii	0	0	5 5							
76. Lonicera tatarica	0	0	0							6
11. Lonicera thibetica			0.0							0
18. Lonicera xylosteum	0	-		-			0	10	-	
80 Magnolio acuminata	0	0		0		0		0	0	
81. Magnolia kobus horealis	0	9	0	0	2		0	0		0
82. Magnolia salicifolia	0	0	0	0	0		0			1 Miles
83. Magnolia tripetala	-	0	0	0	0		0		0	P
84. Morus alba		-		-	-			alk!		PIL
85. Pheadendron amurense		1	-	1.11					0	IP
86. Platanus acerifolia	5 0	60					0	0		0

-	No flowering and no fruiting										Flowering and fruiting										Germination power	
53	54	55	56	57	58	59	60	61	62	53	54	55	56	57	58	59	60	61	62	% 01	f healthy eeds	
000	0	0	0	0	0	0	0	000	0	000	0	0000	0000	00000	000 000	0	0000	00000	000	100 100 100 — 10	+ (+) (+) - -	
0.00.00		0	0	0	0	0	0 0	0	0	0	0	0000	0		00	0.0	0	0	0000	80 80 80 80 100	+++++++	
0 0	0	0	0	0000					0	0	0 00 0000	00 00000 00	0 0000 00	00 00	00 0000 00	00 000 0	000000000000	0 0000 0	00000000000	30 80 80 100 100 100 	+ + +   +   + + + + + + + + + + + + +	
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a manual and a second second	Flowering but no fruiting													
Genus and species	53	54	55	56	57	58	59	60	61	62				
87. Prunus fruticosa	0	0	0	0	0				1					
88. Prunus padus	0	191	Pipo		1									
89. Prunus serotina				1	2 20	10	101	10	0	PIO				
90. Prunus subhirtella	0				-		1		1	10				
91. Pterocarya fraxinifolia			K	0			0	0		1 9				
92. Pterostyrax hispida			1 th		0	10			101					
93. Rhus sylvestris		0	0	0	0	0	0	0	0	0				
94. Rhus trilobata		0	0	1				0	0					
95. Ribes alpinum														
96. Ribes aureum	0													
97. Ribes longeracemosum	0	0	0	0	0	0	0	0	0	0				
98. Robinia pseudoacacia		0	11				in the							
99. Schisandra chinensis	d To				0				0					
100. Sorbus americana		all	0						1º	1				
101. Sorbus aucuparia	- del ma	att						14						
102. Sorbaria sorbifolia	100	5							0					
103. Tilia americana	110	0		124	0									
104. Tilia cordata	0	0												
105. Tilia Maximowicziana								1		114				
106. Tilia mongolica	1	all	3-0		0	1								
107. Tilia platyphyllos	1110	0	1th and				1		1.al					
108. Tilia tomentosa					0									
109. Tilla tuan		ot		0	0.0					0				
110. Viburnum Carlésii	0		0	0	0	0	0	0	0	0				
11. Viburnum fragrans	010	01	0 0			0	193			0				
12. Viournum lantana	610	01	010							-				
13. Viburnum lentago	00	0	~			0	0	-	-					
14. Viburnum prunijolium	00	0	0		0	0	0	0	0	0				
15. Viburnum Sargenti		0			-	~				0				
17 Vitis amuransis	10.00	01	1.17	14	0	0	0	0	0					
11. FILLS UTILITENSIS	S		1. 1. 1. 1.	1	11111			0	0					

+ seeds sown in nursery germinate

119. Wistaria floribunda
120. Wistaria sinensis

121. Zelkova serrata

(+) according to reliable information seeds germinate

0

0

0

0

0

0

0

0

- seeds do not germinate in nursery

10	No flowering and no fruiting									Flowering and fruiting										Germ	Germination power	
53	54	55	56	57	58	58	60	61	62	53	54	55	56	57	58	59	60	61	62	% of	% of healthy seeds	
000	0		nis nis this the	0	nų, ca, inu rur	arpi au a, j a, j	nds nds i, C iios iios	0	in the second	i Bi ea, Siei nse	00000	00000	00000	000	000000	00000	000000	0000	00 000	100 100 50 100 50 50 50	(+) + (+) +	
0	een ann 23 B	lito turi din	0	0	0	0	a nhn nhn	has Nca En	0	0	0	00	00	00	00	00	00	00	00	100 100		
000000000000000000000000000000000000000	0			and a second sec	in a second s	a, A o o licit the the cies per	inan O O O O O O O O O O O O O O O O O O	A si			00000 0000000	000000000000000000000000000000000000000	00000	0000	00000 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0	0000 00000	00000 000000			
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vation. The graphs of the phenological spectra of the chosen species made it easies to classify the introduced trees and shrubs into those which: (1) flower almost every year, bear fruitigiving full-normal seeds, (2) flower and fructify at several years intervals and (3) 39 species which in the ten-year period did not set truth once or set fruit, but the seeds were sterile [Table 7].

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intermediate and not extreme types of climate, and the dependence of the seasonal rhythm of plant development on several or many factors.

In the further course of analysis of the results of phenological observations, the trees and shrubs were classified according to the shortest and longest period of flowering. The first group consists almost exclusively of trees. A mean time of flowering calculated from ten years of observations contained within an interval of 4–13 days is characteristic for this group. This group comprises the following species classified according to the duration of flowering: *Carpinus japonica, Fagus orientalis, Carpinus orientalis, Juglans cinerea, J. mandshurica, J. nigra, Fagus grandifolia, Pterocarya fraxinifolia, Juglans Sieboldiana, Carpinus betulus, Fagus silvatica, Platanus acerifolia, Carya cordiformis, C. laciniosa, Prunus serotina, Cercidiphyllum japonicum, Phellodendron amurense, Schisandra chinensis, Acer monspessulanum and Rhus silvestris.* 

The second group consisting mainly of shrubs has a mean time of flowering within 24–73 days. Here belong the species: Calycanthus floridus, Hamamelis mollis, H. virginiana, Cornus alba, Kerria japonica, Evodia Daniellii, Cornus stolonifera, Hydrangea radiata, H. xanthoneura, H. Sargentiana, H. petiolaris, Lonice-ra thibetica, Liriodendron tulipifera, Aesculus pavia, Ribes longeracemosum, Evonymus verrucosa, E. alata, Aesculus parviflora, Cornus officinalis, Sorbaria sorbi-folia.

In the group of shrubs with a long period of flowering, the contribution of species from moderate and tropical climates of eastern Asia is most pronounced (*Hydrangea Sargentiana, Hamamelis mollis*), less numerous are those from North America (*Cornus amomum*). There are also North Asiatic species (*Sorbaria sorbifolia* and *Cornus alba*). It is possible that the strikingly long period of flowering of *Cornus alba* which grows on the extensive ranges of Siberia as far as Manchuria and Korea is connected with its adaptation to various climatic conditions.

Of no small importance for the characteristic of the seasonal rhythmicity of trees and shrubs is also the duration of the period of unripe fruits. It is the shortest (7 weeks) in the species: Acer rubrum, Cornus alba, C. amomum, C. Hemsleyi, Cotoneaster racemiflora, Lonicera coerulea, L. iberica, L. tatarica, Morus alba, Prunus padus and Prunus subhirtella, and longest (4–5 months) in the species Cornus officinalis. In the latter case it is difficult to establish the influence of the climate prevailing within the range of occurrence of these trees and shrubs.

Very important is also the knowledge of the ability of the plant to go through the full generative cycle, what is considered as one of the main indices of viability and of the degree of adaptation to the environmental conditions at the site of cultivation. The graphs of the phenological spectra of the chosen species made it easier to classify the introduced trees and shrubs into those which: (1) flower almost every year, bear fruit giving full normal seeds, (2) flower and fructify at several years intervals and (3) 39 species which in the ten-year period did not set fruit once or set fruit, but the seeds were sterile (Table 7). (1) To the first group of trees and shrubs flowering almost every year and bearing fruit, with a high adaptive ability (setting 50-100% of full and normal seeds) belong:

Acer tataricum Aesculus hippocastanum Aesculus pavia Aesculus turbinata Ailanthus glandulosa Berberis koreana Carpinus orientalis Carya cordiformis Carya laciniosa Cornus alba Cornus amomum Cornus Hemsleyi Cornus mas Cornus officinalis Cornus rugosa Cornus stolonifera Cotoneaster horizontalis Cotoneaster obscura Cotoneaster racemiflora Evonymus alata Evonymus latifolia Halesia tetraptera Hamamelis mollis Hydrangea radiata

Hydrangea Sargentiana Hydrangea xanthoneura Juglans cinerea Juglans nigra Juglans Sieboldiana Lonicera alpigena Lonicera coerulea Lonicera iberica Lonicera Maackii Lonicera Maximowiczii Lonicera tatarica Magnolia kobus var. borealis Phellodendron amurense Prunus serotina Prunus subhirtella Ribes aureum Robinia pseudoacacia Sorbus americana Tilia Maximowicziana Tilia mongolica Tilia tomentosa Viburnum lantana Viburnum Sargenti

(2) The second group of trees and shrubs flowering and fruiting at 2-4-year intervals (setting 50-100% of full and normal fruits), and also characterized by a high adaptation ability comprises:

Carpinus japonica Cercidiphyllum japonicum Forsythia europaea Forsythia Giraldiana Forsythia ovata Gleditsia triacanthos Hamamelis virginiana Lonicera thibetica Maclura pomifera Magnolia acuminata Magnolia salicifolia Magnolia tripetala Platanus acerifolia Pterocarya fraxinifolia Viburnum fragrans

(3) The least numerous is the group of foreign trees and shrubs which in the period 1953–1962 did not flower or bear fruit, and those which flowered and set fruits, but their seeds were uncapable of germination. Here belong:

Acer palmatum Cladrastis tinctoria Cornus kousa Elaeagnus angustifolia Lindera aestivalis 1. Rhus silvestris Rhus trilobata Ribes longeracemosum 1.
Elaeagnus multiflora Evodia Daniellii 1. Fagus japonica Fagus grandiflora 1. Wistaria floribunda Wistaria sinensis Zelkowa serrata

It should be stressed that the impossibility of producing seeds capable of germination may in some trees and shrubs be the result of selfpollination which could occur in species represented in the Kórnik collection by a single specimen (species denoted by the number 1).

An interesting phenomenon should not be omitted here, shown in the phenological spectra of the Asiatic species *Cornus alba* (Siberia, from Manchuria to Korea) and the North-American species: *Cornus stolonifera* (New Foundland, Manitoba, Virginia, Nebraska) and *Calycanthus floridus* (Virginia up to Florida). It is characteristic for these shrubs that in some years the phenophases of flowering and fruiting overlapped on the graphs, that in some single specimens of *Cornus alba*, *C. stolonifera* and *Calycanthus floridus* flowers and ripe fruits could be found at the same time (in summer and early autumn). This property is seldom noted in this country, whereas it is common among trees and shrubs of the tropical zone.

Examination of the phenophases of flowering, fruiting and healthy seed setting in the species classified to the particular groups, and of the climate within the range of their occurrence revealed that to the same groups belong, beside species growing in the cold extremely continental and dry climates of Siberia and western China, trees and shrubs from warm moist climates of the tropical zone. The observation material did not allow more general conclusions.

A full generative cycle is mostly characteristic for plants adapted to the environment. One cannot, however, judge of the adaptation of plants on the basis of agreement between their vegetation rhythm and the combination of climatic factors at the site of introduction. The results of the present observations confirm the opinion of Paczoski [25] who found that in some plants the rhythm of vegetation does not occur in harmony with the changes in weather conditions, although these plants grow well in our conditions, bear normal seeds and propagate by self-seeding. Many trees and shrubs start their vegetation period very early without suffering from ground frost and they set fully normal seeds capable of germination (Lonicera Maackii, Sorbaria sorbifolia, Ribes aureum, Cotoneaster racemiflora etc). In many of these plants the period of fruit ripening is prolonged or leaf shedding occurs very late (Viburnum lantana, Lonicera thibetica, Cotoneaster obscura). These characteristics of the vegetation rhythm of some trees do not exert any disfavorable influence on their viability. It would seem that we are dealing here with a hardiness acquired by heredity; in trees starting vegetation very late hardiness is frequently only apparent [29].

It also appeared that there exist genera, several species of which pass every year or periodically through the complete generative cycle at the site of introduction in the Kórnik Arboretum. Here belong species from the genera: *Cornus, Lonicera*, Evonymus, Tilia, Aesculus, Cotoneaster, Magnolia, Juglans, Hydrangea, Sorbus, Hamamelis and Carpinus. There is reason to believe that the explanation of their adaptive ability should be sought in their phylogenetic development and the history of their geographical spread. The Holarctic, or more precisely Arctic-Tertiary, disjunctions of the ranges of certain species in east Asia and North America suggest a wider ecological amplitude of these trees and shrubs, connected with migration to the south owing to a change of the climate to more severe.

Noteworthy is also the full development cycle and high viability of Ternany relicts (*Forsythia europea, Aesculus hippocastanum*) derived from the refuge in the Balkans.

There exists some relation between the period of maximum vegetative activity and the taxonomic position of the chosen species. As seen from the graph, species from the genera: Juglans, Acer and Tilia exhibit the longest vegetation period, whereas those of the genera Viburnum, Cotoneaster, Ribes, Hydrangea, Lonicera and Cornus the shortest.

Noteworthy is, moreover, the very short period of flowering of the trees representing the genera: *Carpinus, Fagus, Juglans, Carya, Acer* and *Rhus* (4–13 days), whereas shrubs beloging to the genera: *Hamamelis, Cornus, Hydrangea, Aesculus* and *Evonymus* flower much longer (maximum 50 days).

### Vegetation Rhythm of Trees and Shrubs as an Indicator of Their Sensitivity to Changes in Weather Conditions

Interesting conclusions may be drawn from the study of the extreme values of the period of vegetative activity of the trees and shrubs selected, and the extreme dates of the beginning of leaf bud opening, the end of leaf shedding, the period of flowering and the beginning of flowering (Fig. 2–4).

It is interesting that in the 10-year period investigated some species showed a high variability as regards the duration of vegetative activity, for instance from 200 to 356 days (an extreme example of a long vegetative period is *Cotoneaster obscura* in exceptionally favorable conditions) or from 170 to 290 days (*Prunus subhirtella*). Other species under the same local climatic conditions of Kórnik exhibit a considerable stability. The vegetation period lasts for instance 222–238 days (*Elaeagnus angustifolia*). Certain differences in the duration of vegetative activity are obviously connected with different weather combinations and different dates of the beginning of the phenological seasons. But how can the striking differences observed in some species and shown in the graph (Fig. 4) be explained? A small range of variation of the date determining the period of vegetative activity indicates a consistent development rhythm of trees and shrubs resulting from their biological properties. It is characteristic that among the most sensitive plants to various weather combinations are almost exclusively shrubs such as: *Cotoneaster obscura*, *C. racemiflora*, *C. horizontalis*, *Lonicera Maackii*, *L. tatarica*, *L. coerulea*,

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Cornus rugosa, C. alba, Viburnum tomentosum, V. Carlesii, V. Sargenti, V. prunifolium, Hydrangea xanthoneura, H. Sargentiana, Wistaria sinensis, Evonymus alata. Most of them originate from north and central China, some are spread on the enormous expanses of north-eastern Asia (Siberia, Manchuria, Korea) and of North America in the Rocky Mountains Massif, and some in the Caucasus and Japan. It is not clear whether this variable vegetation rhythm of the above named species is connected with their special sensitivity to the changing intensity of some climatic factors or, whether it results from some other biological properties.

As seen from the foregoing list, species exhibiting the highest variability as regards vegetation rhythm, and endowed at the same time with a high adaptive ability occur mainly in the genera: *Cotoneaster*, *Viburnum*, *Lonicera*, *Hydrangea* and *Cornus*.

The species Lonicera thibetica, Elaeagnus angustifolia, Hamamelis mollis, Forsythia europaea and Magnolia kobus var. borealis are characterized by a high stability of the period of their vegetative activity.

If we consider the time of leaf bud opening, it is the shrubs starting growth early that show the highest variability in this phenophase, for instance: Sorbaria sorbifolia, Lonicera coerulea, Viburnum fragrans, Ribes alpinum, Viburnum Sargenti, Lonicera Maackii, Cotoneaster obscura, Corylopsis platypetala, Lindera aestivalis and Hydrangea Sargentiana. The lowest variability in the appearance of leaves characterizes Fagus orientalis and Aesculus hippocastanum. As regards the time of leaf shedding, most sensitive to the influence of the environment proved to be: Tilia americana, Cornus rugosa, Lonicera tatarica, Lonicera xylosteum, Hydrangea xanthoneura, Wistaria sinensis, Rhus trilobata, Cotoneaster obscura, Viburnum prunifolium and V. tomentosum.

Comparison of the varying length of the period of flowering of the trees and shrubs in the period 1953–1962 (Fig. 4a), as determined by the extreme values, shows that the shrub species *Calycanthus floridus* and *Cornus alba* with flowering periods of 25–155 and 12–148 days, respectively, are least stable. A high variability is also exhibited in this respect by: *Cornus stolonifera, Hamamelis mollis,* and *H. virginiana,* some of the *Hydrangea* species such as *Hydrangea radiata, H. petiolaris, H. Sargentiana* as well as *Lonicera thibetica* and *Sorbaria sorbifolia.* Small differences in the period of flowering are noted in the first place in trees: *Ailanthus glandulosa,* 13–17 days, *Juglans nigra,* 14–19 days and *Carpinus japonica,* 3–8 days. Late flowering trees and shrubs mostly show a greater variability of the flowering period.

The date of the beginning of flowering (Fig. 4b) frequently varies widely. This is true particularly of such trees and shrubs as: *Hamamelis mollis*, *Juglans nigra*, *Cornus amomum*, *Pterostyrax hispida*, *Lonicera iberica* and *Rhus trilobata* (up to 60 days). The same date is relatively stable in the species: *Schisandra chinensis*, *Fagus orientalis*, *Cornus alba*, *Morus alba* and *Ailanthus glandulosa* (differences of 12–18 days).

### Influence of Temperature, Precipitation and Insolation on the Vegetation Rhythm of Trees and Shrubs

The differences in the duration of the period of vegetative activity of the more important phenophases of trees and shrubs in the period 1953–1962 in the Arboretum (Figs. 2-4) also show the considerable influence of weather on the seasonal rhythm of vegetation. Evidence of this is found in the phenological spectra of the species with a very long period of vegetation ranging from 7-9 months, and those with a short period of 4-5.5 months (Tables 8-9).

The long term phenological observations thus presented prove that the seasonal development of plants is dependent, beside genetic factors, on the complex of conditions determined by the course of temperature, the sum of precipitation, the amount of insolation and the distribution of these factors.

Nearly each species reacts individually to a given combination of weather conditions in dependence on its ecological requirements. Nonetheless, some conditions exert a favorable influence on growth and reproduction of many species. Thus, it would seem that certain complexes of climatic factors can be characterized separately.

For instance the phenophase of leaf bud opening is connected in numerous trees and shrubs with the course of temperature in February, March and April. In certain species early growth was observed in 1961, that is when these months had the highest sum of temperatures in the 10-year period. In the winter of 1960/61 climatic features of Atlantic type prevailed. Moreover the year 1961 had the longest period without ground frost and the longest vegetation period. In the preceding year summer was cool with little sun, and fall rather warm. The above mentioned conditions caused in 1961 very early growth of trees and shrubs, independent of their provenience and the duration of their vegetative activity (Juglans mandshurica, Gymnocladus canadensis, Carya cordiformis, Vitis amurensis, Ailanthus glandulosa, Hamamelis virginiana, Acer nikoense, Cladrastis tinctoria and others). A similar effect of weather on early leaf bud opening in other shrubs was observed in 1957. It should be mentioned that the winter of 1956/57 was even warmer than that of 1960/61. Oddly enough, however, in 1953 when the early spring months were very warm (February colder than in 1961 and 1957) many trees started growth very early in spite of the long period of spring drought. In the record of trees from this year (Tables 8 and 9) there are more trees with a short period of vegetative activity: Acer Ginnala, A. rubrum, A. pseudoplatanus, Fagus grandifolia, Juglans nigra, Tilia cordata, T. mongolica and T. Maximowicziana.

As regards the duration of the vegetative activity, the observations compiled in 1961, 1959 and particularly in 1957 (Table 8) seem to prove that in these years weather conditions were most favorable for a prolongation of this period. It also appears that the combination of three factors: the annual sum of heat (counting not from 5° but from 0°C), the annual number of hours of sunshine and the annual amount of precipitation. Moreover the influence of the duration and intensity of frost is visible. It is characteristic that the above mentioned factors compensate one another, for instance in 1957 the annual amout of precipitation was

Table 8

#### Trees and Shrubs with a Long Period of Vegetative Activity (over 7 Months) in 1953–1962

1953 — Lonicera coerulea, Prunus serotina, Pterocarya fraxinifolia, Sorbaria sorbifolia, Sorbus americana.

- 1954 There are no trees and shrubs with long period of vegetative activity
- 1955 Berberis koreana, B. vulgaris, Cotoneaster horizontalis, Forsythia europaea, Hamamelis mollis, Kerria japonica, Lonicera thibetica, Ribes alpinum, R. longeracemosum, Viburnum fragrans, V. lentago, V. prunifolium.
- 1956 Acer saccharinum, Berberis koreana, B. vulgaris, Cornus alba, C. amomum, C. officinalis, C. mas, Cotoneaster racemiflora, Halesia tetraptera, Hydrangea petiolaris, H. xanthoneura, Lonicera tatarica, L. thibetica, Rhus trilobata, Ribes alpinum, R. aureum, Viburnum Carlesii, V. fragrans, V. lantana, V. lentago, V. prunifolium, Vitis vulpina.
- 1957 Acer saccharinum, Berberis koreana, B. vulgaris, Cornus mas, C. officinalis, C. alba, C. Hemsleyi, Corylopsis platypetala, Cotoneaster obscura, C. horizontalis, C. racemiflora, Elaeagnus angustifolia, E. multiflora, Evonymus europaea, Forsythia europaea, F. Giraldiana, F. ovata, Hamamelis mollis, Hydrangea petiolaris, H. radiata, H. xanthoneura, Kerria japonica Kolkwitzia amabilis, Liriodendron tulipifera, Lonicera alpigena, L. coerulea, L. Maackii, L. tatarica, L. thibetica, L. xylosteum, Pterostyrax hispida, Rhus trilobata, Ribes alpinum, R. aureum, Sorbaria sorbifolia, Viburnum Carlesii, V. fragrans, V. lantana, V. prunifolium, V. Sargenti, V. tomentosum.
- 1958 Berberis koreana, B. vulgaris, Cotoneaster horizontalis, Elaeagnus angustifolia, E. multiflora, Hydrangea petiolaris, H. radiata, H. xanthoneura, Kerria japonica, Kolkwitzia amabilis, Lonicera alpigena, L. coerulea, Sorbaria sorbifolia, Viburnum Carlesii, V. prunifolium, V. Sargenti, V. tomentosum, Wistaria sinensis.
- 1959 Berberis vulgaris, Cornus amomum, C. Hemsleyi, C. officinalis, Corylopsis platypetala, Cotoneaster horizontalis, C. obscura, Elaeagnus angustifolia, E. multiflora, Evonymus europaea, Forsythia europaea, F. Giraldiana, Halesia tetraptera, Hydrangea Sargentiana, H. xanthoneura, Kerria japonica, Kolkwitzia amabilis, Lonicera alpigena, L. coerulea, L. Maximowiczii, L. thibetica, L. xylosteum, Prunus serotina, Ribes aureum, Viburnum Carlesii, V. fragrans, V. lantana, V. lentago, V. prunifolium, V. tomentosum, Wistaria sinensis.
- 1960 Berberis vulgaris, Corylopsis platypetala, Cotoneaster horizontalis, C. obscura, Hydrangea radiata, Lonicera alpigena, L. iberica, L. thibetica, Ribes alpinum, Viburnum lantana, V. prunifolium, V. tomentosum.
- 1961 Berberis koreana, B. vulgaris, Cornus amomum, C. Hemsleyi, C. mas, C. officinalis, Corylopsis platypetala, Cotoneaster racemiflora, Eucommia ulmoides, Forsythia europaea, F. Giraldiana, F. ovata, Halesia tetraptera, Hydrangea petiolaris, H. radiata, Kolkwitzia amabilis, Lonicera alpigena, L. iberica, L. tatarica, L. xylosteum, Pterostyrax hispida, Ribes alpinum, R. aureum, R. longeracemosum, Sorbaria sorbifolia, Sorbus americana, Viburnum Carlesii, V. fragrans, V. lantana, Wistaria floribunda.
- 1962 Cornus officinalis, Cotoneaster horizontalis, Hydrangea radiata, Kerria japonica, Lonicera thibetica, L. xylosteum, Ribes alpinum, Viburnum lantana, V. tomentosum.

548.7 mm, and the sum of insolation 1636.6 hrs and in 1961 the respective values were 694.3 mm (the highest value in the 10-year period) and 1443.7 hrs (relatively low). It is difficult to explain why in 1959 which was characterized by periods of drought, a long period of vegetative activity was observed in many shrubs. It is possible that in this case the distribution of precipitation was decisive, the main bulk of precipitation falling to July and August. This year had the lowest sum of time the greatest amount of sunshine — 1847.0 hrs. It should be added that the mean annual temperatures in these three years (1957, 1959 and 1961) were among

Table 9

### Trees and Shrubs with a Short Period of Vegetative Activity (up to 5 1/2 Months) in 1953-1962

- 1953 Ailanthus glandulosa, Carya cordiformis, Cotoneaster horizontalis, Gymnocladus canadensis, Hydrangea Sargentiana, Juglans mandshurica.
- 1954 Acer circinatum, A. Ginnala, A. monspessulanum, A. nikoense, A. palmatum, A. pseudoplatanus, Ailanthus glandulosa, Calycanthus floridus, Carya cordiformis, Cornus kousa, C. rugosa, Evonymus verrucosa, Gymnocladus canadensis, Hamamelis virginiana, Juglans mandshurica, J. nigra, J. Sieboldiana, Lindera aestivalis, Lonicera tatarica, Prunus fruticosa, P. subhirtella, Rhus trilobata, Schisandra chinensis, Tilia americana, T. Maximowicziana, T. platyphyllos, Viburnum prunifolium, V. tomentosum, Wistaria sinensis.
- 1955 Acer pseudoplatanus, Ailanthus glandulosa, Carya cordiformis, Elaeagnus angustifolia, Evonymus alata, Gymnocladus canadensis, Juglans mandshurica, Magnolia acuminata.
- 1956 Acer circinatum, A. Ginnala, A. nikoense, A. palmatum, A. psudoplatanus, Aesculus Favia, Ailanthus glandulosa, Cladrastis tinctoria, Cotoneaster horizontalis, Evodia Daniellii, Evonymus alata, Fagus grandifolia, Gymnocladus canadensis, Gleditsia triacanthos, Juglans cinerea, J. mandshurica, J. nigra, J. Sieboldiana, Liriodendron tulipifera, Maclura pomifera, Magnolia acuminata, M. tripetala, Phellodendron amurense, Platanus acerifolia, Rhus silvestris, Tilia Maximowicziana, Viburnum amurensis.
- 1957 Acer nikoense, A. rubrum, A. pseudoplatanus, Ailanthus glandulosa, Carya cordiformis, Cladrastis tinctoria, Fagus grandifolia, F. orientalis, Gleditsia triacanthos, Gymnocladus canadensis, Juglans cinerea, J. mandshurica, J. Sieboldiana, Rhus silvestris, Tilia mongolica, Vittis amurensis.
- 1958 Acer nikoense, A. rubrum, Aesculus pavia, Cornus alba, C. rugosa, Gymnocladus canadensis, Hamamelis virginiana, Juglans mandshurica, Tilia cordata, T. mongolica, Vitis amurensis.
- 1959 Ailanthus glandulosa, Gymnocladus canadensis, Juglans mandshurica.
- 1960 Acer pseudoplatanus, A. rubrum, Ailanthus glandulosa, Cornus rugosa, Gymnocladus canadensis, Juglans mandshurica.
- 1961 Gymnocladus canadensis.
- 1962 Gymnocladus canadensis, Juglans mandshurica, Schisandra chinensis, Tilia mongolica.

the highest, with 1959 as the warmest year. It is possible that species with a long precipitation in the 1953–1962 period, amounting to 346.2 mm, and at the same vegetation cycle recorded in that year are well adapted to the dry climates of northern and eastern Asia.

The greatest number of shrubs with a very long period of vegetative activity (7 to 9 months and more) were recorded in 1957 (Table 9). This list comprises 36 species:

Berberis koreana Berberis vulgaris Cornus alba Cornus Hemsleyi Corylopsis platypetala Cotoneaster obscura Cotoneaster racemiflora Elaeagnus angustifolia Evonymus europaea Forsythia europaea Forsythia Giraldiana Forsythia ovata Hamamelis mollis Hydrangea petiolaris Hydrangea radiata Hydrangea xanthoneura Viburnum prunifolium Viburnum Sargenti

Kerria japonica Kolkwitzia amabilis Liriodendron tulipifera Lonicera coerulea Lonicera thibetica Lonicera Maackii Lonicera tatarica Lonicera xylosteum Pterostyrax hispida Rhus trilobata Ribes alpinum Ribes aureum Sorbaria sorbifolia Viburnum Carlesii Viburnum fragrans Viburnum lantana Viburnum tomentosum

The weather conditions were completely different in the years 1953 and 1954. Study of the phenological spectra shows that these years did not favor optimal development of trees and shrubs. In 1954 characterized by a dry and severe winter, a cold spring and a long-lasting period of severe autumn drought, no species exhibited a long period of vegetative activity (Table 9). In 1953 there were only five such species, probably owing to the long period of spring and autumn drought and the heavy ground frosts in April and May.

The leaf fall phonophase is correlated with the summer and fall temperature. This is confirmed by the very late date of leaf shedding by many trees and shrubs in 1958 which had a cool and short-lasting summer and a relatively warm and moist fall.

Let us now consider the annual course of generative plant development under the influence of various weather conditions. The beginning of flowering of a large part of trees and shrubs is mainly dependent on the temperature of the spring months. Many plants started to flower very early in 1953 in the very warm and rather dry spring period, and so did some in 1959. It is noteworthy that these years, beside high temperatures in early spring, the beginning of spring, spring and early summer were characterized by a long period of dry weather (1953) and drought (1959). Another group of trees and shrubs flowered earliest in 1961. It may be concluded from Walter's climatic diagrams (Fig. 5) that early flowering of the listed trees and shrubs requires, beside a large sum of heat, also profuse rainfall; in the period from January to April 1961, the highest amount of precipitation for the entire 10-year period was recorded. The period of flowering is protracted, it would seem on the basis of the material accumulated, when May is cool, June warm and in July and the end of summer rainfall is abundant. It can also be concluded that a larger sum of heat and of sunshine in the vegetation period usually shortens the phenophases of growth and ripening of fruit.

It should be borne in mind, however, that the seasonal course of plant vegetation, fruiting and bearing of seed are very complex processes including the interaction of the biological properties of the given plant and many edaphic factors of the environment and the local climate.

Moreover, the selected trees and shrubs of foreign provenience react in different ways to various environmental factors, the more so as they are frequently cultivated in this country in different habitat conditions. Therefore it is difficult to find a synthetic answer to this problem.

### 6. Conclusions

(1) The phenophases of growth onset or flowering in many foreign species of trees and shrubs adapted to the conditions of Poland are rather regularly synchronized with the phenological season, these observations cannot, however, be generalized. It would seem, namely, that the adaptation ability of plants is not bound with their phenological regularity.

(2) The tree species with a short period of vegetative activity are adapted to the cool and mostly continental climate of their native country. No such connection with the climate can be established within the range of occurrence of shrubs characterized in the climate of Poland by a long period of vegetative activity.

(3) A great part of the trees and shrubs of foreign provenience (about 70 species) passes in the Kórnik Arboretum through the full cycle of generative development bearing normal seeds capable of germination. It is characteristic that species belonging to the following genera bear viable seeds and at the same time exhibit a high ability of adaptation: Aesculus, Cornus, Cotoneaster, Hydrangea, Juglans, Lonicera and Magnolia.

(4) Some species of foreign origin (e.g. Cotoneaster obscura, Hamamelis mollis, Lonicera coerulea, Sorbaria sorbifolia), in spite of certain discrepancies between their rhythm of vegetation and the rhythmicity of climatic factors, are frost resistant in the conditions of Poland, grow well, flower and fruit every year or periodically and bear seeds capable of germination.

(5) Part of the trees and shrubs investigated shows a stable seasonal rhythm of vegetation, e.g. *Elaeagnus angustifolia*, others, like *Cotoneaster racemiflora*, *Cornus alba*, *Hydrangea xanthoneura* are, on the contrary, sensitive to various weather combinations. Among these tree and shrub species most are adapted to the environmental conditions of this country.

(6) It seems that an elucidation of the adaptive abilities of numerous trees and shrubs of foreign provenience may be found in the history of their geographical spread and in their phylogenetic development.

#### LITERATURE CITED

- Alisov, B. P., "Klimaticheskiye oblasti zarubiezhnykh stran". (Climatic Regions of Foreign Countries), Moskva 1950.
- [2] Alleweldt, G. Der Einfluss von Photoperiode und Temperatur auf Wachstum und Entwicklung von Holzpflanzen unter besonderer Berücksichtigung der Gattung Vitis, Vitis 1957.
- [3] Białobok, S., "Fenologia w ogrodnictwie". (Phenology in Horticulture) Ekologia Polska, Ser. B, Vol. 5, No. 3, 1959, Warszawa.
- [4] Bielawska, A., Czubińska, M., Górska, M., Wolska, K., "Obserwacje fenologiczne nad drzewami i krzewami aklimatyzowanymi w Ogrodzie Botanicznym Uniwersytetu im. Adama Mickiewicza w Poznaniu w latach 1957–1961". (Phenological Observations on Trees and Shrubs Acclimatized in the Botanical Garden of the A. Mickiewicz University in Poznań in the Period 1957–1961) — Prace Komisji Nauk Biologicznych, PTPN, Poznań 1964.
- [5] Bugała, W., Chylarecki, H., "Szkody mrozowe wśród drzew i krzewów Arboretum Kórnickiego wyrządzone w czasie zimy 1955/56". (Damage Due to Frost in the Trees and Shrubs of the Kórnik Arboretum in the Winter of 1955–1956) — Arboretum Kórnickie Vol. 3, 1957–1958.
- [6] Czeppe, Z., Flis, J., Mochnacki, R., "Geografia fizyczna świata". (Physical Geography of the World), PWN, Warszawa 1966.
- [7] Division of Timber Management Research Forest Service Silvics of Forest Trees of the United States, U.S. Department of Agriculture, Washington 1965.
- [8] Gurskii, A. V., "Osnovnye itogi introduktsi drewiesnykh rastenii w SSSR". (Basic Results of Introduction of Woody Plants in the U.S.S.R.), Moskva 1957.
- [9] Harlow, W. M., Harrar, E. S., Textbook of Dendrology, New York, Toronto, London 1950.
- [10] Kaczmarek, C., "Wyniki obserwacji meteorologicznych w Kórniku za lata 1954, 1955 i 1956". (Results of Meteorological Observations in Kórnik in the Years 1954, 1955, 1956) — Arboretum Kórnickie, Vol. 3, 1957–1958.
- [11] Kaczmarek, C., "Wyniki obserwacji meteorologicznych w Kórniku w latach 1957 i 1958". (Results of Meteorological Observations in Kórnik in the Years 1957 and 1958) — Arboretum Kórnickie, Vol. 4, 1959.
- [12] Kaczmarek, C., "Wyniki obserwacji meteorologicznych w Kórniku w roku 1959". (Results of Meteorological Observations in Kórnik in 1959) — Arboretum Kórnickie, Vol. 5, 1960.
- [13] Kaczmarek, C., "Wyniki obserwacji meteorologicznych w Kórniku w roku 1960". (Results of Meteorological Observations in Kórnik in 1960) — Arboretum Kórnickie, Vol. 6, 1961.
- [14] Kaczmarek, C., "Wyniki obserwacji meteorologicznych w Kórniku w 1961–1962". (Results of Meteorological Observations in Kórnik in 1961–1962) — Arboretum Kórnickie, Vol. 8, 1963.

- [15] Kalesnik, S., "Geografia fizyczna ogólna". (General Physical Geography), PWN, Warszawa, 1962.
- [16] Kowalkowski, A., Prusinkiewicz, Z., "Gleby Arboretum Kórnickiego". (The Soils of the Kórnik Arboretum) — Arboretum Kórnickie Vol. 4, 1959.
- [17] Krotoska, T., "Pory roku w życiu roślin". (The Seasons in the Life of Plants) PTPN Poznań 1958.
- [18] Krotoska, T., "Obserwacje fenologiczne w Querceto-Carpinetum Medioeuropaeum. Tx. 1936 i w Querceto-Potentilletum Albae Libbert 1933 w Wielkopolskim Parku Narodowym". (Phenological Observations in Querceto-Carpinetum Medioeuropaeum. Tx. 1936 and in Querceto-Potentilletum Albae Libbert 1933 in the Wielkopolska Province National Park) — Prace monograficzne PTPN nad przyrodą wielkopolskiego Parku Narodowego pod Poznaniem. Vol. 3, No. 6, 1961.
- [19] Łastowski, W., "Masowe obserwacje fenologiczne, ich zadania i wykonanie". (Mass Phenological Observations, Their Aim and Execution) — Rocznik Nauk Rolniczych, Vol. 51, 1948, Poznań.
- [20] Łastowski, W., "O systematycznych badaniach ekologicznofenologicznych w kraju". (On
  Systematic Country-Wide Ecological-Phenological Investigations) PTPN Reports for I and II quarters Poznań 1948.
- [21] Łastowski, W., "Podział roku na fenologiczne sezony". (Division of the Year into Phenological Seasons) — Prace Komisji Nauk Rolniczych i Leśnych, PTPN, Vol. 9, No. 4, Poznań 1951.
- [22] Łukasiewicz, A., "Rytmika rozwojowa bylin". (The Development Rhythm of Perennial Plants) — Prace Komisji Nauk Biologicznych PTPN, Poznań 1967.
- [23] Motyka, J., "Ekologia roślin". (Plant Ecology), Warszawa 1962.
- [24] Neef, E., "Kraje i morza pozaeuropejskie". (Extraeuropean Countries and Seas), 1959.
- [25] Paczoski, J., "Dzieła wybrane". (Selected Works), Warszawa 1951.
- [26] Paczoski, J., "Dynamika uszkodzeń mrozowych naszych drzew owocowych". (Dynamics of Frost Injury in the Fruit Trees of Poland) — PTPN, Poznań 1952.
- [27] Rehder, A., Manual of Cultivated Trees and Shrubs, New York 1954.
- [28] Scharfetter, R., Biographien von Pflanzensippen, Wien 1953.
- [29] Scheumann Werner, Untersuchungen über die Variabilität der Frostfestigkeit einiger Waldbaumarten als Grundlage für Entwicklung rascharbeitender Auslesemethoden, Manuscript, 1962.
- [30] Schmucker, T., Silvae orbis, Berlin, Wahnsee 1942.
- [31] Szafer, W., "O fenologicznych porach roku w Polsce". (On the Phenological Seasons in Poland) — Kosmos 47, 1922.
- [32] Szafer, W., "Zarys geografii roślin". (Outline Geography of Plants), Warszawa 1949.
- [33] Szafer, W., "Szata roślinna Polski". (The Vegetal Cover of Poland), Warszawa 1959.
- [34] Szennikow, A. P., Phänologische spektra der Pflanzengesellschaften. Abderhaldens Handb. d. Biolog. Arbeitsmethoden, Abt. XI, 6, Berlin 1932.
- [35] Szennikow, A. P., "Ekologia roślin". (Plant Ecology), Warszawa 1952.
- [36] Sznelle, F., Pflanzen-Phänologie, Leipzig 1955.
- [37] Vaartaja, O., Evidence of Photoperiodic Ecotypes in Trees, Ecol. Monogr. 29, 1959.
- [38] Zierhoffer, A., "Geografia powszechna". (General Geography), Vol. 4, PWN, Warszawa 1967.
- [39] Walter, H., Die Klimadiagramme als Mittel zur Beurteilung der Klimaverhältnisse f. ökologische, wegetationskundliche und landwirtschaftliche Zwecke — Berichte der Deutschen Botanischen Gesellschaft, 1955.

Translated by Maria Radziwiłł

#### SUMMARY

(1) Several years of observations on the seasonal development of exotic trees and shrubs constitute a starting point for methodical studies on acclimatization. For these reasons the authors have taken up the task of compiling the phenological observations on trees and shrubs of class *Angiospermae* which were made in the Kórnik Arboretum in 1953–1962. The aim of the study was:

(a) to draw up the most important groups of trees and shrubs on the basis of their phenological and developmental characteristics and differing in their seasonal growth rhythms;

(b) to determine the connections which may occur between the growth rhythms and the origin, of the trees and shrubs growing in Kórnik under various weather conditions.

It is generally believed that information about the seasonal growth rhythms of trees and shrubs of various adaptability will help in the selection of factors that have the greatest importance in species introduction. When drawing up groups the phenological stability of the trees and shrubs, the length of the period of vegetative activity, flowering, the dates of shoot growth and flowering onset and the varieties in the cycle of generative development, have all been taken into consideration.

(2) The phenological observations were made from January to December of each year, on 295 trees and shrubs growing in the collections of the Kórnik Arboretum. For the purpose of this report 122 species were selected, coming from various geographical regions, primarily from the temperate zone. The dates of periodic changes in the plant vegetation that is the phenophases were recorded according to the pattern presented below. The course of vegetative development in trees and shrubs was described by the dates of: (1) leaf bud opening, (2) leaf blade opening, (3) onset of autumnal color changes, (4) peak of autumn colors development, (5) onset of leaf fall, (6) end of leaf fall.

The course of generative development of the trees and shrubs were described by the dates of: (1) onset of flowering, (2) end of flowering, (3) onset of fruit ripening, (4) end of fruit ripening, which is followed by fruit fall or seed discharge.

A necessary supplement of the above observations concerning floristic phenology was provided by several years of observations on the bioclimatic phenology which depends on the recording of certain fixed phenophases of indicator species according to Łastowski's method [21]. The selected indicator species act as an instrument for the measurement of the local climate. The mean dates of certain observations served to split the vegetative period into eight phenological seasons, the length of which fluctuated to a certain extent from year to year.

A compilation of phenological dates in tables permitted to draw up phenological spectra according to the simplified method of Szennikow [34].

(3) The seasonal development of trees and shrubs growing in the Kórnik Arboretum is to a large extent dependent on the fluctuating conditions of the climate. A general description of the climate in 1953–1962 was prepared on the basis of the diagram method of Gaussen-Walter, which provides information about the occurrence of periods favorable or unfavorrable to the growth of plants. Detailed graphs of daily temperature extremes and precipitation were drawn. On these graphs the lengths of the phenological seasons and the weather conditions according to Paczowski's [25] schemes were superimposed.

(4) Among the trees and shrubs characterized by the greatest phenological stability the following species should be mentioned: Lonicera xylosteum, Magnolia kobus var. borealis, Gleditsia triacanthos, Liriodendron tulipifera, Juglans nigra, Prunus padus, Ribes aureum, Tilia cordata, Tilia tuan and Robinia pseudoacacia.

The growth rhythms, particularly the phenophases of shoot growth and flowering of many exotic trees adapted to our conditions, are synchronized with the phenological season. It is not possible, however, to generalize these observations and to speak of a definite connection between trees and srubs phenologically stable and their adaptability.

(5) The period of vegetative activity is measured from the date of bud opening to the date of leaf fall (in evergreen species the end of this period is determined by the attainment of a certain low temperature). The period as well as time of flowering was calculated as an average over ten years.

The shortest period of vegetative activity (150-190 days) is characteristic primarily of the following trees: Juglans mandshurica, Gymnocladus canadensis, Carya cordiformis, Acer rubrum, Vitis amurensis, Ailanthus glandulosa, Hamamelis virginiana, Acer nikoense, Magnolia acuminata, Phellodendron amurense. It is possible to notice an adaptation to a cool, generally continental climate of their sites of origin (region of northeastern Asia, particularly Manchuria and the region of North America around the Great Lakes).

Among the shrubs with a very long period of vegetative activity (225-260 days) such species can be included as: Viburnum tomentosum, V. fragrans, Kerria japonica, Cotoneaster obscura, Berberis vulgaris, Ribes aureum, R. alpinum, Lonicera thibetica, Hydrangea radiata, Kolkwitzia amabilis, Lonicera xylosteum, Rhus trilobata, Corylopsis platypetala, Viburnum lantana, Hydrangea petiolaris. This characteristic does not appear to have any relation with the geographic distribution of these species (the climatic region), since in the group there are species from low latitudes characterized by warm and moist climates in Central and Western China as well as from the cold climates of North Asia and mountain regions.

(6) A group of species characterized by a very short flowering period (4 to 13 days) comprises: Carpinus japonica, C. orientalis, Fagus orientalis, F. grandifolia, Juglans cinerea, J. nigra, J. Sieboldiana, Pterocarya fraxinifolia, Platanus acerifolia, and Carya cordiformis. In this group notably a large number of tree species can be found from the temperate climatic region from the families Betulaceae, Fagaceae and Juglandaceae.

The following groups of species are characterized by the longest flowering period (24-73 days): Calycanthus floridus, Hamamelis mollis, H. virginiana, Cornus alba, Kerria japonica, Evodia Danielli, Cornus stolonifera, Hydrangea radiata, H. xanthoneura, H. Sargentiana. These are almost exclusively shrubs, coming from the temperate and subtropical climatic regions.

(7) It is worth noting that a large number of trees and shrubs of exotic origin (70) complete their full generative cycle in our conditions and yield healthy germinable seede (Table 8). It is characteristic that there are genera having a few or several species completely adapted to the site conditions in the Kórnik Arboretum. These genera are: Cornus, Lonicera, Evonymus, Tilia, Aesculus, Cotoneaster, Magnolia, Juglans, Hydrangea, Prunus, Sorbus, Hamamelis, and Carpinus. It appears that the reasons for the adaptability of several species of trees and shrubs can be found in the history of their geographic distribution.

(8) Some trees and shrubs of exotic origin (Cotoneaster obscura, Lonicera Maackii, L. coerulea, Pterocarya fraxinifolia, Sorbaria sorbifolia), in spite of certain maladjustments between their growth rhythm and rhythm of the climate in our cultivation conditions are characterized by frost resistance, grow well, flower annually or periodically and fruit, yielding seeds capable of germination.

(9) In many species significant differences were found over the years 1953-1962 during the vegetative activity, for example from 200 to 360 days in *Cotoneaster obscura* or from 170 to 290 days in *Prunus subhirtella*, while other species coming from the same regions of natural occurrence were characterized by stability in respect to this character. Among other species reacting most strongly to changes in the weather conditions there are almost exclusively shrubs. These are: *Cotoneaster racemiflora*, *C. horizontalis*, *L. tatarica*, *C. rugosa*, *Cornus alba*, *Viburnum tomentosum*, *V. Carlesii*, *Hydrangea xantoneura*, *H. Sargentiana*, *Evonymus alatu* and others. It needs to be pointed out here that many exotic species adapted to our conditions are characterized by considerable plasticity with respect to various weather patterns.

(10) In the length of the flowering period the most variable species over the years 1953-1962 are: Calycanthus floridus (flowering time from 12 to 148 days), Cornus stolonifera, Hamamelis mollis, H. virginiana, Lonicera thibetica and some of the Hydrangeas. Very stable in the duration of flowering time from year to year were: Ailanthus glandulosa (from 13 to 16 days) and Juglans nigra (14 to 19 days).

(11) The differences in the weather conditions from year to year were found to have the greatest effect on the phenophases bud bursting, leaf fall and on the duration of the period of vegetative activity.

Mean temperatures of February, March and April determine the onset of bud bursting in trees and shrubs, while the annual total warmth, hours of insolation and precipitation determine the duration of the vegetative period.