

Environment Canada Imaging Cover Page

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GROWING DEGREE DAYS AS AN INDICATOR OF SPRING

During the past year, papers by Boughner and Kendall⁽¹⁾ and Holmes and Robertson⁽²⁾ have been published on the subject of growing degree days and the growth of vegetation. It has been pointed out that the amount of growth in many plants is roughly proportional to the accumulated excess of the mean daily temperature over a threshold value of 42° F. We are further reminded that temperature is only one of the primary factors controlling the growth of plants, and that water supply, light and soil type are also important. In southern Ontario, however, where the light factor in spring is constant over the area and in most years there is an ample water supply for growth, temperature is usually the most important variable, and the response of vegetation to temperature is usually readily apparent.

Study of the accumulated growing degree day data during April and May in Toronto during recent years has proved to be a very good indicator of the progress of spring. The growing season, i.e., when the mean daily temperature curve crosses the 42° threshold, begins at Toronto, on the average, during the second week of April. The number of growing degrees accumulating in March is usually not significant, but has been substantial on occasion. In June and July, with much higher temperatures, daily accumulations of growing degree days are large and the effect of cold or cool spells is not nearly so evident. However, during the months of April and May, when the average daily temperatures are slowly climbing past and above 42°, the influence of cold spells on vegetation may be markedly represented by growing degree days temperature data.

The attached table shows the average accumulated growing degree days above 42° F at Toronto based on the period 1921 to 1950. The accumulated totals are shown at weekly intervals and at the end of May. During this period since 1921, the two earliest springs were 1945 and 1955, while the most retarded springs were those of 1956 and 1924. The table shows the greatest and least accumulations since 1921 for each date, as well as the weekly accumulations for the past few seasons.

The concept of growing degree days has been found useful in Toronto as an indicator of the earliness or lateness of spring. Different years have been compared readily by this method and a graphical representation is quite effective for display purposes.

REFERENCES:

- (1) Boughner, C.C. and G.R. Kendall,
"Growing Degree Days in Canada", Meteorological Branch
Cir.-3203, TEC.-303, 25 May 1959.
- (2) Holmes, R.M. and G.W. Robertson,
"Heat Units and Crop Growth", Canada Dept. of Agriculture,
Publication 1042, 1959.

ACCUMULATED GROWING DEGREE DAYS ABOVE 42°F AT TORONTO

Week Ending	THIRTY YEAR NORMAL 1921-1950	THIRTY NINE YEAR EXTREMES 1921-1959				GREATEST FOR DATE	LEAST FOR DATE	RECENT SPRINGS			
		TWO EARLY SPRINGS		TWO LATE SPRINGS				1957	1958	1959	1960
		1945	1955	1924	1956						
April 1	20	146	19	0	0	146 in 1945	0 Sv1	20	3	7	5
April 8	34	180	42	14	21	180 in 1945	0 in 1926	20	21	14	13
April 15	54	267	120	20	35	267 in 1945	0 in 1926	20	63	35	46
April 22	84	289	181	20	35	289 in 1945	8 in 1939	101	167	83	
April 29	130	307	248	73	49	307 in 1945	44 in 1926	236	204	131	
May 6	201	328	384	97	84	384 in 1955	84 in 1956	289	235	213	
May 13	272	356	463	163	152	463 in 1955	152 in 1956	409	307	318	
May 20	367	408	574	224	195	574 in 1955	195 in 1956	449	434	383	
May 27	476	515	722	271	269	722 in 1955	269 in 1956	564	513	520	
May 31	551	559	804	329	354	804 in 1955	329 in 1924	630	583	622	