

may last for several weeks, as for example, the winter of 1955-56 when at Edmonton the temperature did not rise above freezing for a period of 84 days (Nov. 10 to Feb. 2). On the other hand, in some winters the southerly flow of Arctic air may be quite weak and air of Pacific origin moves eastward at the surface bringing fine mild weather. There have been winter months when the temperature has averaged 25°F. warmer than normal over a large section of Alberta (February 1931) and there have been winter months when a substantial portion of the western prairies have been 25° or more below normal (February 1936 and January 1950).

Winter temperatures in the lee of the Rockies reflect the warming effect of the "chinook" which occurs from the Northwest Territories to the United States but is most pronounced in southern Alberta with effects noticeable as far east as Regina. Characteristically, the chinook occurs as a westerly or southwesterly wind and is brought about by subsidence east of the western mountain ranges of maritime Polar air from the Pacific. This air is cooled adiabatically at the saturated lapse-rate in its ascent over the mountains but in its descent to the plains it is warmed again adiabatically at the dry lapse-rate which is twice the cooling rate during the ascent. Consequently this air reaches the foothills at a much higher temperature than it had at a corresponding level on the western slopes. The chinook is most striking when it occurs following a cold wave that has been accompanied by snow. The sky clears abruptly and temperatures may rise as much as 60°F. in a relatively short time. The bright sunshine and above freezing temperatures cause the snow to melt rapidly. Extreme temperatures of 61°F. in Calgary, 65°F. at Lethbridge and 66°F. at Medicine Hat in January indicate the warming effect of the chinook in southern Alberta.

Temperatures rise rapidly from winter to summer and fall with equal rapidity to winter. The transition periods are usually confined to April and October. Except in the northernmost portions of the Prairie Provinces, monthly mean temperatures are above 50°F. for the five months May to September. Extreme maximum temperatures have exceeded 100°F. over most of the prairies, and 110°F. in southeastern Saskatchewan and the Red River Valley in Manitoba. The highest recorded temperature for all Canada occurred at Gleichen, Alta., on July 28, 1903, when 115°F. was recorded. On the other hand, temperatures may fall to 32°F. or lower in every month in the north and even in less favoured locations in the southern prairies.

The length of growing season is of particular importance to agriculture in the Prairie Provinces, since throughout the greater part of the grain area the average frost-free period ranges from 80 to 120 days, which is critically close to the minimum required for grain crops to reach maturity. The longest growing season occurs in Alberta between Lethbridge and Medicine Hat—110 to 125 days. Throughout the remainder of the grain area of southern Alberta, the frost-free season slightly exceeds 100 days and farther northward the interval is slightly less, ranging from 80 to 100 days. In the Athabasca Valley the growing season is usually less than 70 days but in the Peace River district the frost-free season exceeds 80 days at most stations.

The South Saskatchewan Valley of Saskatchewan has a growing season in excess of 100 days but throughout the greater part of the Saskatchewan grain area the growing season ranges from 80 to 100 days. The Cypress Hills area is particularly frosty with some stations reporting an average frost-free season less than 60 days, and to the north of the North Saskatchewan River there are fewer than 80 days continuously frost-free. In Manitoba the growing season extends from late May to mid-September over most of the agricultural area with the longest frost-free period (120 days) at Portage la Prairie. In the extreme southeastern section of the province and in the area north of the Assiniboine Valley in the Duck and Riding Mountains the period continuously frost-free is less than 100 days. In the extreme northern sections of Saskatchewan and Manitoba, scattered stations report frost-free periods ranging from 60 to 90 days.

The Prairie Provinces are fortunate in receiving a high average of sunshine for the latitude; the annual totals range from 2,000 to 2,350 hours except in the northeastern and extreme northern portions. July is usually the sunniest month with totals exceeding 300 hours at most stations in Alberta and Saskatchewan and only slightly less in Manitoba.