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THE NATIONAL ATLAS OF CANADA 5th EDITION

# CANADA — GROWING DEGREE-DAYS

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Des exemplaires de cette carte sont disponibles en français.



Scale 1:7 500 000 or one centimetre equals 75 kilometres

75 0 75 150 225 300 375 450 kilometres

Lambert Conformal Conic Projection Standard Parallels 49°N and 77°N.
Modified Polyconic Projection North of Latitude 80°.

## GROWING DEGREE-DAYS

The growing degree-day concept utilizes a system of accumulated temperatures to assess the suitability of temperature conditions for plant growth. For plant growth to occur, a certain base or threshold temperature must be reached. This base temperature varies for each plant species and, in fact, varies throughout the life of a plant according to plant growth stage. For general use, a metric base value of 5°C has been established by the Atmospheric Environment Service, Environment Canada and endorsed by the Canadian Committee on Agrometeorology. In accordance with this standard, annual normal growing degree-day values used for this map were obtained by accumulating differences between 5°C and the mean daily temperature for every day of the year when the mean temperature is above 5°C. *Each degree Celsius above 5°C is considered as one degree-day.* Temperature normals used for these calculations are based on the climatological recording period of 1941-1970.

Uses of the growing degree-day concept range from the scheduling of planting and harvesting of crops, and the prediction of various plant growth stages, to the identification of crop species ranges.

Although temperature is the most important variable affecting crop response, the influence of other environmental factors on plant growth potential should also be recognized. The intensity and duration of light and the incidence of frost, for example, are critical to plant growth. Other important variables are: moisture availability, topography (relief, aspect, slope), and soil.

**Annual Normal Degree-Days above 5°C**

250 500 750 1 000 1 250 1 500 1 750 2 000 2 250 2 500

• Climatological recording station

Note
Annual growing degree-day accumulations were derived for 1 200 climatological stations from 1941-1970 mean daily temperature normals. Because of the constraints on isarithmic interpolation imposed by the uneven and often sparse distribution of recording stations, the climatological recording station network can be used as an index of isoline reliability. Isolines are most representative in areas of uniform flat terrain. Significant local deviations from the pattern indicated should be expected as terrain irregularity increases. Abrupt changes in climatic characteristics occur in mountainous regions in response to significant variations of elevation, aspect and slope, within short distances. In areas of mountainous terrain, isolines are representative of valley conditions only. A discontinuous line symbol is used over water bodies to indicate approximate values.

This map was prepared in association with the Canadian Climate Centre, Atmospheric Environment Service, Environment Canada. Research by R.A. Treidl, Canadian Climate Centre and S.A. Kelly and D.M. Chapman, Geographical Research Division.
Cartography by the Cartography and Toponymy Division.

Sources:
Edey, S.N. 1977: *Growing Degree-Days and Crop Production in Canada.* Publication 1635. Ottawa: Agriculture Canada, Chemistry and Biology Research Institute, Agrometeorology Research and Service.
Treidl, R.A. 1976: Metric Conversion of *Growing Degree-Day Normals.* CDS # 1-76. Downsview, Ontario: Environment Canada, Atmospheric Environment Service.
———— 1978: Annual Degree-Days above 5°C. Unpublished map. Scale 1:5 000 000. Downsview, Ontario: Environment Canada, Atmospheric Environment Service, Canadian Climate Centre.
———— ed 1978: *Handbook on Agricultural and Forest Meteorology/Manuel de la météorologie agricole et forestière.* Toronto: Fisheries and Environment Canada, Atmospheric Environment Service.