

Agroclimatic Classification of Karnataka According to Growing Degree Day Concept-Summer

B P Ratnam and N L Maurya

University of Agricultural Sciences, Dharwad - 580 005 India

The growing degree days (GDD) or heat unit concept is useful in forecasting the harvest dates and also in introducing new crops to a locality. The GDD can be accumulated for the entire life cycle or for different stages of a crop. Otorepec (1983) and Mikkelsen and Olesen (1984) have classified climate using GDD concept in Yugoslavia and Denmark respectively. Ratnam and Kavi (1988, 1991) have classified the climate of Karnataka according to GDD, for both *rabi* (winter) and *kharif* (rainy) seasons. In this paper a similar classification has been attempted for the summer.

The growing degree day (GDD) or heat unit is given by the equation

$$GDD = \sum \frac{T_{max} + T_{min}}{2} - T_b$$

where, T_{max} and T_{min} are the daily maximum and minimum temperatures ($^{\circ}C$) respectively and T_b is the threshold temperature or base temperature ($^{\circ}C$) below which the plant will not develop.

The normals of the daily maximum and minimum temperature of all the district headquarters in Karnataka were collected from the India Meteorological Department. In Dharwad district Madag's Data were used.

The mean daily temperature was computed for each day during the summer (1 February to 31 May) for each station. The base temperature of $10^{\circ}C$ was subtracted from the mean daily temperature to obtain the GDD. The daily GDD values were accumulated for the four month period to get the seasonal GDD. These values were plotted on a Karnataka map and isolines drawn at a step of $200^{\circ}Cd$ from $1600^{\circ}Cd$ to $2200^{\circ}Cd$. The agroclimate was classified based on the GDD intervals, thus : moderate $1400^{\circ}Cd$ to $1600^{\circ}Cd$; large $1600^{\circ}Cd$ to $1800^{\circ}Cd$; high $1800^{\circ}Cd$ to $2000^{\circ}Cd$; very high

$2000^{\circ}Cd$ to $2200^{\circ}Cd$ and severe $2200^{\circ}Cd$ and above.

The study show (Fig 1) that the northeast part of Karnataka (36% of area) comprising Bidar, Gulbarga, Raichur, Bellary and parts of Bijapur, Dharwad and Chitradurga districts fall into severe GDD. Very high GDD are observed in 28% area of Karnataka, covering the coastal region of Karwar (U K) and Mangalore (DK) and parts of Bijapur, Belgam, Dharwad, Shimoga, Chitradurga and Tumkur.

High GDD also occupy an equal area of 28% covering a small area in Beglam district and parts of Mangalore. Chikmagalur, Hassan, Tumkur, Mysore and the entire Mandya, Bangalore and Kolar districts. Large GDD are observed in a small area (9%) in the northwest corner and in south Karnataka. In the hilly district of Coorg (Mercara) moderate GDD condition prevail.

There is a general increasing gradient in the GDD from south to north. In north Karnataka GDD increase from west to east.

References

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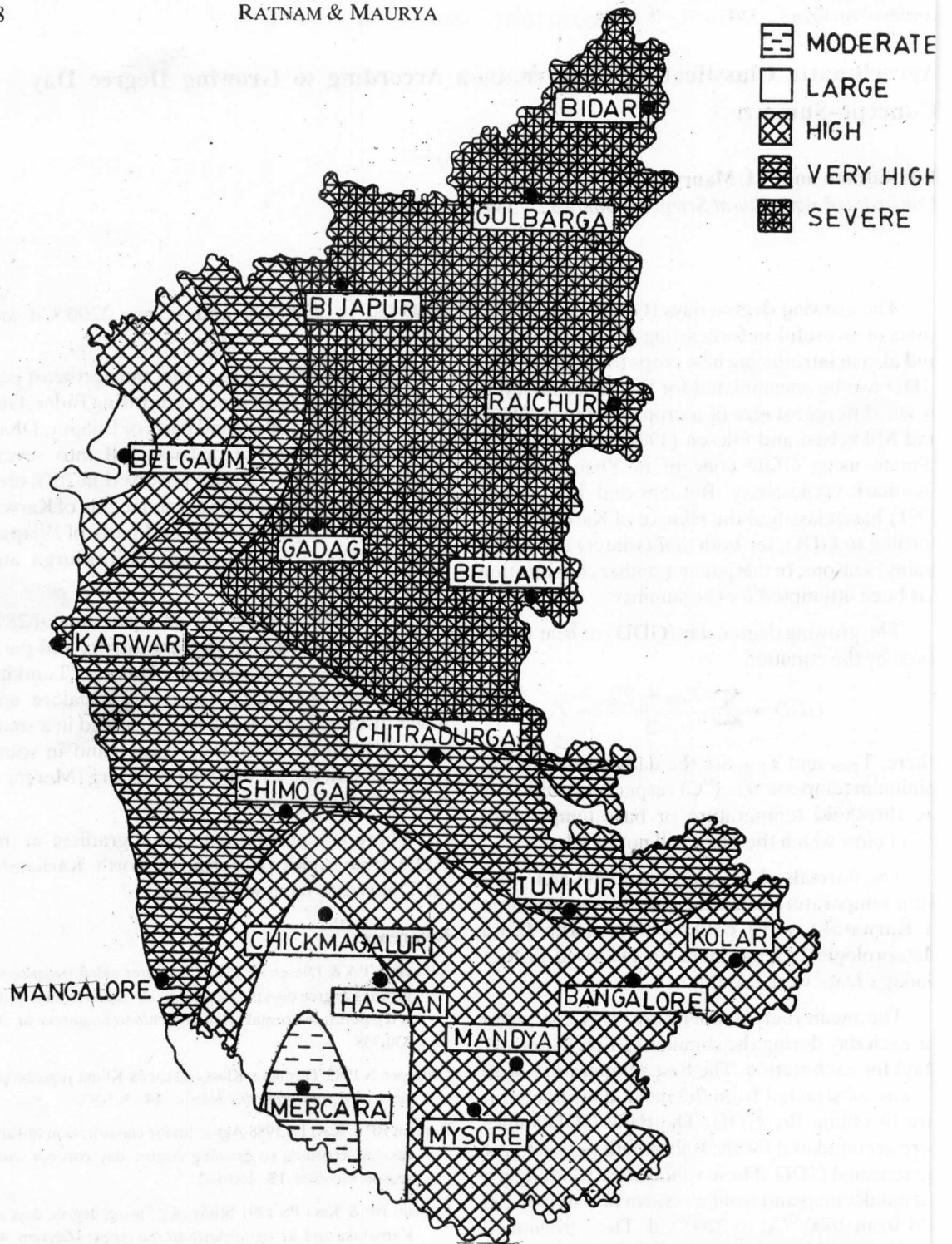


Fig 1 The Agroclimatic classification of Karnataka according to GDD for summer

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