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### STUDY OF GROWING DEGREE DAYS IN KARNATAKA AND ITS SIGNIFICANCE TO THE CROPS

The growing degree days (GDD) or heat unit concept has been used in planning the planting schedules for a regular harvest of canning crops and as one of the factor in delineation of agroclimatic zones for extension of crops to new location. It has been utilized to know the flowering time of parent varieties in cross pollination crops for synchronising the flowering time.

The growing degree days (GDD) or heat unit concept is useful in measuring the duration of different periods like from sowing to flowering, flowering to maturity etc. Stauber *et al.* (1968) used the accumulated maximum daily temperature to estimate the tasseling date of corn. Gilmore and Rogers (1958) applied the heat unit concept to measure the maturity of corn. Ratnam and Kavi (1988) have classified the climate of Karnataka (*rabi* season) using the GDD concept. A similar study for Karnataka for the *kharif* (June to September) season is attempted.

2. The growing degree day (GDD) is given by the equation :

$$GDD = \sum \left[ \frac{T_M + T_m}{2} - T_t \right]$$

where,  $T_M$  and  $T_m$  are the daily maximum and minimum temperatures and  $T_t$  is the threshold or base temperature. The plant will not develop below the base temperature.

The normals of daily maximum and minimum temperature, for the period 1 June 30 September, were collected for all the district headquarters in Karnataka, from the India Meteorological Department. As there was no observatory at Dharwad, Gadag's data were used.

At each station, the base temperature of 10°C was subtracted from the mean daily temperature obtained from the maximum and minimum. This computation was done for all the days from 1 June to 30 September and the GDD were accumulated for the entire *kharif* season. The accumulated GDD values were plotted on Karnataka map and isolines drawn at the steps of 200°C from 1400°C to 1800°C. The State was classified into different zones based on the GDD classes as follows :

Low-1200° to 1400°C; Moderate-1400° to 1600°C;  
Large-1600° to 1800°C & High-1800°C and above.

3. The variation of accumulated GDD in Karnataka (*kharif* season), is shown in Fig. 1. The major part (65.3%) of Karnataka falls under the high category. The entire districts of Bidar, Gulbarga, Bijapur, Raichur, Dharwad, Bellary and Karwar are covered by the high category. The northern parts of Mangalore, Shimoga, Chitradurga, Tumkur and Kolar also belong to this category. Large GDD are found in 26.1% of Karnataka. Belgaum, Bangalore, Mandya, eastern Mysore, southern Tumkur and parts of Mangalore, Chikmagalur, Shimoga and Kolar fall under this category. A narrow strip in Mangalore, Chikmagalur, Hassan and Mysore

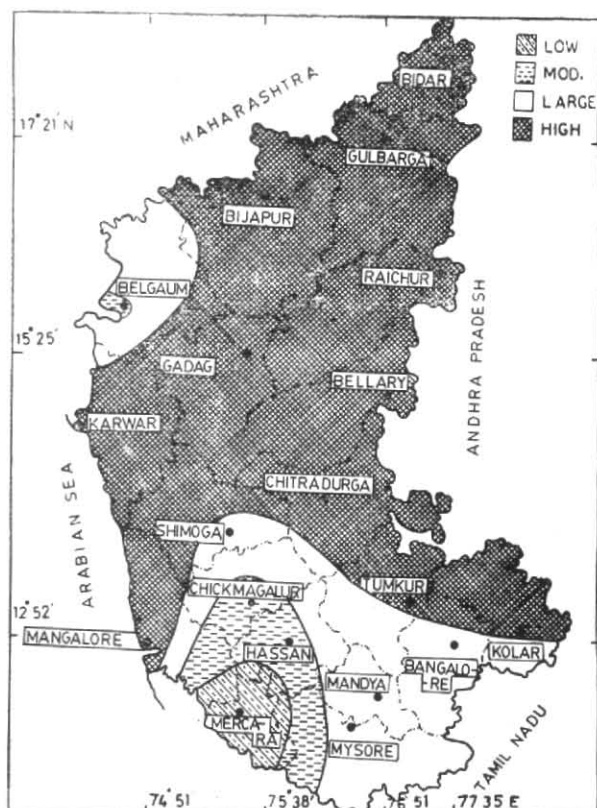


Fig. 1. Accumulated GDD in degree for *kharif* season in Karnataka

have moderate GDD, consisting of 5.8% of the State. The hilly Mercara district belongs to the low category, covering 2.8% of Karnataka.

It is interesting to note that as the magnitude of the GDD decreases the geographical area also decreases. There is an increasing gradient of GDD from the south to north. The geographical coverage of both the low and moderate categories of GDD is less than 10%. Hence, the GDD in *kharif* season are favourable for crop growth in Karnataka.

#### References

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