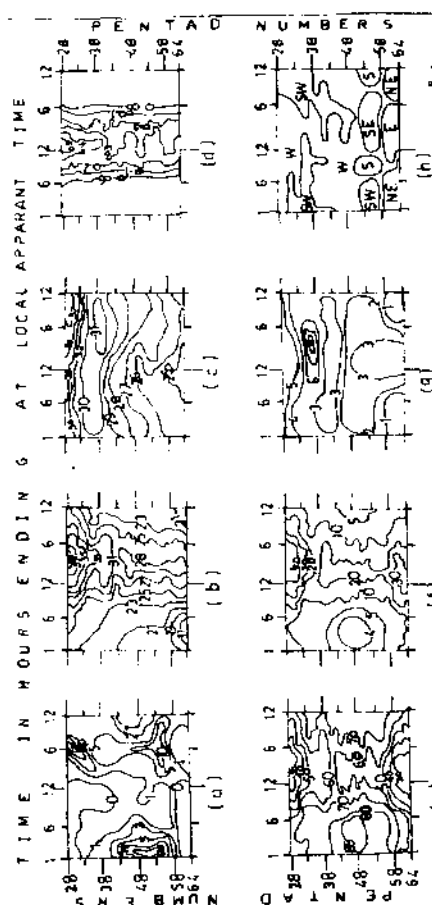


A Study on Micro Climatic Profiles in Relation to Cropping Period at Bijapur

An attempt was made to study important microclimate during 1998 crop growing period and south-west monsoon season in particular, as the maximum number of crop-weather aberrations occur during the summer monsoon season alone (Ramaswamy, 1968). The hourly means of meteorological variables namely total rainfall, air and soil temperatures, insolation, relative humidity and wind speed and direction are down loaded from the data logger connected to an automated weather station (Manufactured by Delta - T Devices Limited, Cambridge, England) installed in the middle of the agro-meteorological observatory at Regional Research Station, Bijapur (19° 79' N, 75° 43' E, 576 M.S.L). The weather sensors other than rain gauge and soil thermometer (20 cms depth) are situated at a height of 2 m above the ground. Pentadal averages of hourly weather data beginning from 28 pentad (16-20 May) ending to 64 pentad (12-16 November) have been computed for each individual weather elements selected for the study and their diurnal distribution patterns are analysed through isographic charts method.

The 24 hourly isohyets, air temperature isotherms, soil temperature isotherms, isopleths of photosynthetically active radiation (PAR), isohygric lines, isopleths of vapour pressure deficit (VPD), isotachs and isogons drawn with corresponding intervals marked on the lines are shown in figures 1 (a-h), respectively for the cropping period under study. The hourly PAR is enumerated as 50% of insolation (Monteith, 1973) sensor reading while the hourly VPD is computed making use of psychrometric equations and hygrometric tables. The 24 hourly hodographs and thermohygrograms drawn monthwise within the summer monsoon season alone are depicted in figures 2 (a-b), respectively.

The 24 hourly isohyetal pattern (Fig. 1a) indicated zero rainfall from 8 am to 1 pm during



Figs 1. (a-h) a) Isohyets (mm), b) Isotherms (air temperature in °C), c) Isotherms (soil temperature in °C), d) Isohygric lines (%), e) Isohygric lines (%), f) Isohygric lines (%), g) Isohygric lines (%), h) Isohygric lines (%).

28-32 and 60-64 pentads. The first highest peak rainfall is centered around 29-30 pentads at evening time (4-8 pm) while the second highest peak occurred around 46-52 pentad at night hours (1-3 am). The longest hourly wet spell of 19 hrs is noticed from 5 pm (57 pentad) to 11 am (58 pentad) in October month, while the highest rainfall intensity of 34.4 mm/hr occurred during 32 pentad around 6 pm (Fig. 1a). The effect of wind direction on rainfall (Fig. 1a & 1h) clearly pointed out that the backing wind shear from westerly to south-westerly direction is accompanied with heavier rainfall than in the case of veering shift of the wind. The hourly

isotherms of air temperature (Fig. 1b) revealed that the diurnal temperatures ranges have varied from 14°C (28-30 pentad) to less than 10°C (35-60 pentad) during the period under study. The hourly isotherms of soil temperature (Fig. 1c) are nearly equithermal throughout the period with a diurnal range of not more than 3°C and a time lag of about 3-6 hrs is noticed at maximum temperature epoch of both soil and air temperatures (Fig. 1c & b).

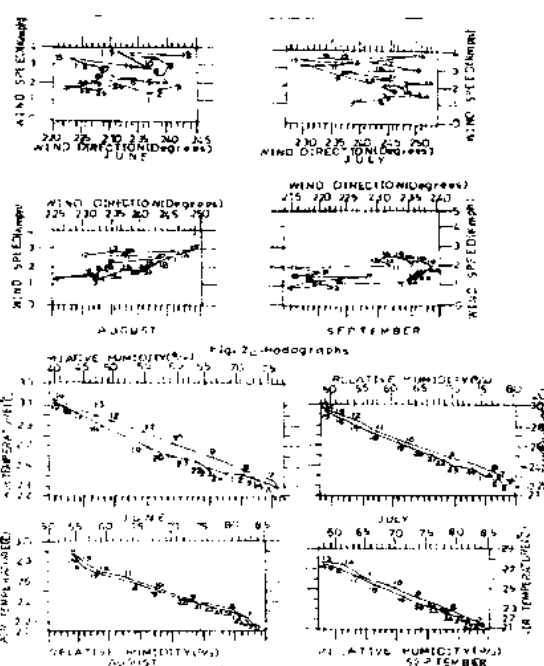
The 24 hourly isopleths of PAR (Fig. 1d) specify that maximum has recorded around noon (with a time lag of nearly 2 hrs compared to isotherms of air temperature in fig. 1b during 29-33 pentads) which later very much decreased during most part of the day time throughout the period under study. The highest hazardous relative humidity (>85%) is noticed during the period 46-52 pentads in the early morning hours of 3 to 7 am (Fig. 1e). The 24 hourly isopleths of VPD (Fig. 1f) are depicting inverse relationship with those of isohyric lines (Fig. 1e). The diurnal pattern of hourly isotachs (Fig. 1g) and isogons (Fig. 1h) points out that major period under study was experienced light westerly surface winds (248 - 292°) except for a brief period of 2 pentads (37 & 38) when moderate south-westerly surface wind (203-247°) prevailed from noon to 6 pm which incidentally coincided with the period of onset of the north-east monsoon.

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Figs 2b. Thermohygrograms

The hourly hodographs signify that high speed westerly winds from noon to midnight accompanied by low speed south-westerly winds from midnight to noon hours have prevailed during summer monsoon period except June month (Fig. 2a). The hourly thermohygrograms showed higher relative humidity coupled with lower air temperatures have occurred for more number of night time hours during August and September months (Fig. 2b).

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