

Rainfall characterization and crop planning of scarcity Zone (Zone-II) for Maharashtra state

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Received : 22.03.2012; Revised : 15.06.2012; Accepted : 03.08.2012

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■ **ABSTRACT** : The daily rainfall data of 30 years (1972-2002) of different 20 rain gauges stations form the scarcity zone of Maharashtra were collected considered for analysis. Weekly actual rainfall was considered for calculating Moisture Availability Index (MAI). The wet and dry spells were calculated by Markov Chain model. The onset and withdrawal of monsoon were decided by weekly rainfall frequency distribution method. It is suggested to grow grasses and dry land horticulture viz, custard apple, pomegranate etc. on shallow soil in addition to present cropping pattern. Similarly in medium and deep soils in *Kharif* season sunflower, pearl millet + pigeonpea, castor, groundnut etc. were suggested. In *Rabi* sunflower, safflower, *Rabi* sorghum, gram, etc. were suggested with the provision of supplemental irrigations. Fodder sorghum in *Kharif* and safflower in *Rabi*, pearl millet in *Kharif* and gram in *Rabi*, black gram in *Kharif* and *Rabi* sorghum in *Rabi*, greengram in *Kharif* and sunflower in *Rabi*, cowpea for fodder in *Kharif* and sunflower in *Rabi* were suggested.

■ **KEY WORDS** : Rainfall characterization, Moisture Availability Index (MAI), Cropping system

■ **HOW TO CITE THIS PAPER** : Chinchorkar, S.S., Sayyad, F.G., Patel, G.R., Patel, S.K. and Yaduvanshi, B.K. (2012). Rainfall characterization and crop planning of scarcity Zone (Zone-II) for Maharashtra state. *Internat. J. Agric. Engg.*, 5(2) : 127-132.

Advanced farm technology has a great potential to increase crop production. Climate is an important factor in decision making for crop planning, especially in dry land areas. Crop production in rainfed areas is risk prone to erratic behaviour of rainfall. The main reason for very low and highly unstable yields in these areas is the availability of adequate soil moisture during active growth period of the crops. Onset, progress, intensity, temporal and spatial distribution of monsoon rains decides the fate of dry land agriculture. The distribution of rainfall is the matter of more serious concern than the total amount of rainfall.

The farmers have adopted their farming system by experience of generations without proper knowledge of agro-climatic conditions, effective cropping pattern and importance of scheduling of irrigation. Hence, study of rainfall characteristics is very important in general and drought prone areas. This includes mean rainfall, its deviation and variability, withdrawal of monsoon, the duration, and frequency with their interaction with crop and soil so that this resources can be put to more efficient use in agricultural planning.

The cropping patterns are basically dependent on MAI. Hargreaves (1971) defined MAI is the ratio of assured rainfall

expected at 75 per cent probability level and estimated potential evapotranspiration for the concerned period. Bhishnoi (1980) has defined MAI as

$$MAI = \frac{AE}{PE}$$

where MAI = Moisture Adequacy Index, AE= Actual evapotranspiration, PE= Potential evapotranspiration

For crop planning knowledge of rainfall variability and MAI with the soil type of particular area is necessary. MAI is the prime factor for crop planning, especially in the tropics where it varies both in time and space. MAI were worked out on the basis of average monthly rainfall (Raman and Murthy, 1971) and crop planning was done. If there are dry spells in between, causing crop failure the monthly MAI at different risk levels for agricultural planning of majority of season's crops, the weekly MAI values will be more suitable.

■ METHODOLOGY

The meteorological data for scarcity zone of Maharashtra state were collected and rainfall variability, potential evapotranspiration (PET), Moisture Availability Index