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MAXIMUM TEMPERATURE PROBABILITIES AT FAISALABAD

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Each system of prediction has its own sphere of application and associated set of advantages and disadvantages. Since the atmosphere is basically a turbulent fluid, its future state in not predictable beyond about three weeks although certain mean and persistent states may be predicted with some accuracy. Thus the statistical treatment of past climatic and other dependentdata is assential to estimate the probabilities of future weather states. Every agricultural undertaking has some economic risk depending on the chance of poor or unfavourable weather. Risk assessment is one of the soundest bases for determining the practicability of certain agricultural operations.

Temperature has a direct effect on the growth rates of plants and high temperatures above the optimum for growth, result in reduced growth rates and more serious are the damaging effects at critical stages of development. In a number of crops, high temperatures immediately after flowering may interfere with pollination and this will decrease yields. However, low humidities generally associated with days of high temperature are also known to reduce pollen viability.

High temperatures also have direct effects on livestock. Cattle are known to suffer loss of appetite and decreased feed intake and bulls subjected to temperature stress exhibit seminal degradation (Rosenthal and Hammer, 1979). In most of these cases, the farmer must take preventive measures as little can be done when the heatwave occurs. With crops it is necessary to adjust the time of planting and the variety used so that the risk of encountering a heatwave at the critical stage of development is kept at an acceptable level.

The maximum temperature data for the period 1944 to 1983 were collected at the meteorological observatory of the University of Agriculture, Faisalabad. The frequency distributions for decade mean maximum temperatures were prepared and the probabilities calculated therefrom (W M.O., 1981).

Table 1 gives the decade mean maximum temperatures for a particular

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Table 1. Weather risk assessment

Decade	Decade mean maximum temperature (C°) for a given risk (Faisalabad)						
	Lowest observed	Percentage risk 90	70	50	30	10	Highest observed
Jan.----I	13.2	17.1	17.9	19.1	20.9	21.2	22.7
" II	15.7	17.5	18 3	19.3	19.9	21.4	23.5
" III	13.8	16.2	18.1	19.4	20.2	21.8	24.1
Feb.--- I	14.9	17.2	16.8	19.7	21.2	23.5	26.2
" II	17.8	18.2	20.7	22.0	23.6	25.4	27.2
" III	18.9	20.5	22.5	24.0	25.1	27.0	29.1
Mar.----I	16.9	22.0	23.5	25.5	26.1	27.8	32.9
" II	22.5	23.5	24.7	26.5	27.7	29.8	32.5
" III	23.5	24.4	27.1	28.0	31.0	32.0	32.6
Apr.----I	24.9	27.5	30.0	30.9	31.8	34.6	37.5
" II	24.1	29.9	32.3	33.5	35.4	37.9	45.2
" III	30.5	31.0	35.0	36.0	38.2	40.1	40.6
May.----I	31.6	34.0	36.6	37.9	39.4	42.1	42.9
" II	30.8	34.0	36.2	38.2	39.7	42.3	43.8
" III	35.1	35.8	38.7	39.8	41.4	43.9	45.6
Jun.----I	36.3	38.0	40.1	41.1	42.3	43.3	44.8
" II	35.2	37.5	40.2	41.2	41.9	42.8	44.6
" III	35.1	37.8	30.3	40.6	41.7	43.1	45.0
Jul.----I	33.8	36.1	37.4	38.4	30.5	41.5	43.0
" II	33.6	34.9	36.2	37.2	38.7	39.9	41.3
" III	32.3	34.1	35.3	36.3	37.2	38.7	40.4
Aug.----I	32.2	34.2	36.1	36.6	37.3	38.5	40.4
" II	32.5	33.5	35.2	36.3	37.0	37.7	38.9
" III	32.1	33.3	35.0	35.7	36.7	37.9	40.1
Sep.----I	31.3	33.4	34.5	36.1	37.6	38.2	39.8
" II	33.0	33.9	35.1	36.3	36.8	38.1	39.0
" III	29.8	33.0	34.6	35.3	36.5	37.3	45.2
Oct.----I	29.8	32.3	34.2	35.1	35.5	36.6	38.2
" II	30.3	31.1	32.8	33.6	34.5	35.5	36.9
" III	27.9	29.1	30.7	31.6	32.3	33.2	35.6
Nov.----I	25.0	26.8	28.9	29.5	30 3	31.7	33.1
" II	23.9	25.5	26.7	27.2	27.8	29.1	30.1
" III	20.4	22.0	24.2	25.0	25.6	26.6	27.5
Dec.----I	19.1	20.1	21.9	23.1	24.2	25.1	26.6
" II	17.6	18.7	20.4	21.7	22.4	23.2	26.4
" III	15.0	17.4	18.9	20.2	21.0	21.9	22.9

risk for each decade of the year. The lowest and highest decade mean maximum temperatures observed to date for each decade are also given. For example, there is 30% chance (or risk) that in the decade beginning March 1, the decade mean maximum temperature will be 26.1 °C or higher. The highest and and lowest decade mean maximum temperatures observed to date for that decade are 32.9 °C and 16.9 °C, respectively.

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