



## Rainfall Analysis for Summer Crop Planning in Musilipedu Pilot Village of Yerpedu Mandal of Chittoor District of Andhra Pradesh

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### ABSTRACT

Among the weather elements, rainfall is the most important factor that affects crop production. The annual/ monthly rainfall data for 10 years (1993 - 2002) as recorded in 24 Eastern mandals and 15 years (1988-2002) in Yerpedu mandal (nearest rain gauge for Musilipedu village) were analyzed statistically and coefficient of variation (C.V) was calculated to assess the dependability on rainfall for crop production in early *kharif / kharif* under rainfed situation. The mean annual rainfall for 10 years in Eastern mandals of Chittoor district was 1136 mm of which 458.0 mm and 552.5 mm were received during South-West and North-East monsoon. The C.V value for annual rainfall was 29.1 per cent indicating low variability among the years. The ten years mean rainfall of 24 mandals of Eastern mandals of Chittoor district for May, June, July, August and September was 67.4, 90.7, 99, 133.2 and 135.1 mm, respectively and the C.V values for the same were 87.0, 90.4, 37.6, 40.2 and 43.7 per cent, respectively. The rainfall for the months of May and June was uncertain as C.V values were high. The mean annual rainfall of Yerpedu mandal (nearest rain gauge for Musilipedu village) for 15 years was 1235.6 mm and the C.V of 28.1 per cent for annual rainfall indicating low variability among the years. The C. V values for May and June were 109.8 and 85.5 per cent, respectively, which were higher indicating higher variability. Analysis of rainfall regression equation revealed that there was decreasing trend in annual rainfall in Eastern mandals (1993-2002) and Yerpedu mandals (1998-2002) of Chittoor district. Summer crops like sesamum, greengram or pearl millet can be suggested for May sowing, as requirement of water for these crops is less.

**Key words :** Annual Rainfall, Bajra, Greengram, Sesame, Summer Crops

In Eastern mandals of Chittoor district, rice crop alone is cultivated during *rabi* under tank irrigation, leaving fields fallow in *kharif* season. If tank does not get filled due to failure of North-East monsoon (Oct-Dec), no crop is taken in tank ayacut but left fallow for the rest of the year, except under bore well irrigation. In these circumstances, there is need to encourage farmers to cultivate crops even in *kharif* under rainfed situation. Rainfall analysis is of great help for in crop management practices, contingent crop planning, plant protection measures and other farm operations. Analysis of rainfall was done for Eastern parts of Chittoor district and Yerpedu mandal of Chittoor district to suggest suitable crops for sowing during early *kharif / kharif* under rainfed situation.

### MATERIAL AND METHODS

The monthly and annual rainfall data was collected for 10 years (1993 - 2002) as recorded in 24 eastern mandals of Chittoor district and for 15 years (1988 - 2002) in Yerpedu mandal (nearest rain gauge for Musilipedu pilot village) of Chittoor district.

Coefficient of variation (C.V) and regression equation were worked out for monthly and annual rainfall separately as per Panse and Sukhatme (1985).

### RESULTS AND DISCUSSION

#### Annual rainfall

##### Eastern mandals of Chittoor district

The mean annual rainfall for 10 years (1993 - 2002) in Eastern mandals of Chittoor district was 1136 mm (Table 1) and the decennial rainfall received during South-West and North-East period was 458.0 and 552.5 mm, respectively. The C.V for annual rainfall was 29.1 per cent indicating low variability among years. The rainfall was above normal for five and below for five years under study. The maximum rainfall of 1956.5 mm was recorded in 1996 and the lowest of 753.4 mm was in 1999.

##### Yerpedu mandal of Chittoor district

The mean annual rainfall for 15 years (1988 - 2002) was 1235.6 mm (Table 2) of which 405.1 mm and 710.1 mm were received during South-West and North-East monsoon, respectively. The C.V for

Table 1. Monthly and annual rainfall (mm) of Eastern mandals of Chittoor District from 1993-2002

Year	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	Mean
January	1.2	98.9	1.6	0.0	38.4	0.0	0.5	0.0	10.7	42.6	19.39
February	2.0	4.1	1.5	0.0	0.0	1.8	0.0	47.8	0.0	1.4	5.86
March	0.0	10.9	0.0	1.9	0.8	0.0	0.0	0.0	0.5	0.0	1.41
April	5.2	0.6	4.3	52.9	25.7	6.9	4.4	7.8	103.6	4.7	21.61
May	40.6	227.8	79.7	40.8	39.6	6.7	80.4	87.3	32.3	39.1	67.43
June	33.0	45.1	91.8	324.8	97.3	45.6	52.0	69.4	38.8	109.3	90.71
July	104.1	114.4	183.0	98.6	61.7	131.8	64.2	65.9	107.6	58.2	98.95
August	121.8	152.7	210.6	168.8	74.8	202.0	62.4	177.8	90.2	71.2	133.23
September	190.0	45.3	86.5	250.6	177.1	161.2	73.6	96.2	146.8	123.9	135.12
October	251.6	210.8	225.6	441.4	167.8	134.0	205.1	126.3	39.0	240.6	204.22
November	360.7	216.9	108.9	148.7	433.8	232.0	176.1	105.3	117.6	144.7	204.47
December	149.1	74.2	8.3	427.8	244.4	150.7	34.7	107.9	112.5	37.8	134.74
<b>Total</b>	<b>1259.3</b>	<b>1201.7</b>	<b>1001.8</b>	<b>1956.3</b>	<b>1361.4</b>	<b>1072.7</b>	<b>753.4</b>	<b>891.7</b>	<b>799.6</b>	<b>873.5</b>	

Table 2. Monthly and annual rainfall (mm) at Yerpedu, Chittoor district from 1988 to 2002

Month	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	Mean
January	16.0	0.0	0.0	11.3	5.7	0.0	3.4	81.3	0.0	86.9	0.0	0.0	0.0	22.3	62.3	19.28
February	0.0	0.0	23.0	0.0	0.0	0.0	12.6	0.0	0.0	0.0	0.0	0.0	93.3	0.0	0.0	8.59
March	25.0	15.0	25.4	0.0	0.0	15.3	0.0	7.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.90
April	14.0	0.0	35.6	0.0	9.8	0.0	0.0	0.0	0.0	67.5	0.0	0.0	16.0	61.2	4.2	13.89
May	44.1	12.4	256.0	14.6	0.0	82.3	9.1	250.6	112.6	97.8	5.7	22.1	86.5	83.2	13.8	72.72
June	24.1	100.6	45.9	197.5	24.0	46.8	25.8	69.4	254.8	42.5	73.4	36.0	73.4	20.0	125.7	77.33
July	197.5	198.9	63.1	138.1	116.8	112.0	80.5	93.7	127.7	21.6	154.2	59.1	37.9	69.9	54.3	101.69
August	164.0	31.2	68.7	320.5	40.1	110.1	99.5	111.1	217.8	45.3	133.9	87.5	117.6	41.3	64.9	110.23
September	171.9	189.1	263.9	22.6	91.4	151.9	25.6	91.9	102.4	158.0	111.7	37.3	72.4	110.4	138.2	115.91
October	105.7	33.2	407.3	358.4	109.1	364.9	265.1	277.4	483.9	150.3	84.6	236.1	198.8	400.1	292.6	251.17
November	320.0	238.2	504.9	546.8	321.4	325.8	327.6	135.6	138.8	655.7	329.3	282.6	200.1	132.2	216.4	311.69
December	135.5	457.4	26.2	26.7	9.2	151.2	77.7	14.8	538.3	267.0	16.5	39.5	230.9	136.3	80.5	147.18
<b>Total</b>	<b>1217.8</b>	<b>1276.0</b>	<b>1720.0</b>	<b>1636.5</b>	<b>727.5</b>	<b>1360.3</b>	<b>926.9</b>	<b>1133.6</b>	<b>1976.3</b>	<b>1592.6</b>	<b>909.3</b>	<b>800.2</b>	<b>1126.9</b>	<b>1076.9</b>	<b>1052.9</b>	

annual rainfall was 28.1 per cent, indicating low variability among the years. The maximum rainfall of 1976.3 mm in 1996 and minimum of 727.5 mm in 1992 were recorded.

Decreasing annual rainfall was also noticed during 15 years (1998-2002) except in the year 1996, when regression equation ( $Y=1424.16-23.57xR^2=0.086$ ) was worked out.

### **Monthly rainfall**

#### **Eastern mandals of Chittoor district**

The decennial monthly rainfall values of 24 mandals of Chittoor district for May, June, July, August and September were 67.4, 90.7, 99.0, 133.2 and 135.1 mm (Table 1), respectively for which the C.V values were 87.0, 90.4, 40.2 and 43.7 per cent, respectively. The rainfall was uncertain for the months May and June as the C.V. values were high.

The slope of the regression equation ( $Y=-26.205+18.354xR^2=0.843$ ) was negative for monthly rainfall of eastern mandals of Chittoor District, indicating the increasing trend of monthly rainfall as evidenced from Tables 1 and 2.

#### **Yerpedu mandal of Chittoor district**

The 15 years mean rainfall values for May, June, July, August and September were 72.7, 77.3, 101.7, 110.2 and 115.9 mm, respectively (Table 2) and the C.V values for the same months were 109.8, 85.5, 51.7, 68.8 and 54.7 per cent, respectively. High C.V. Values in May and June month indicate higher variability.

Increasing trend of rainfall was also noticed with monthly rainfall analysis when analyzed with regression equation ( $Y=-44.732+22.723xR^2=0.720$ )

#### **Recommended crops for early *kharif* / *kharif***

Rainfall data analysis revealed that crops that survive on less water like sesame, green gram and pearl millet could be suggested for early *kharif* / *kharif* under rainfed situation in the tank ayacut eastern parts of Chittoor district in Andhra Pradesh. Further these crops require less cost of cultivation.

#### **LITERATURE CITED**

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