

Table 1 : Influence of spacing on the growth and yield of turmeric CV. Co 1.

Spacing	Plant height (cm)	No. of leaves/plant	No. of tillers/plant	Mother rhizomes per plant		Finger rhizomes per plant		yield/ha	No. of plants/ha	
				Number	Weight (kg)	Number	Weight (kg)			
1	20 X 50 X 15 cm	160.8	16.3	2.1	1.9	0.120	10.1	0.460	38150	2,00,160
2	30 X 50 X 15 cm	147.1	18.6	3.8	2.4	0.160	14.7	0.580	40350	1,83,480
3	40 X 50 X 15 cm	130.6	20.8	4.4	4.1	0.195	16.8	0.630	42350	1,66,800
4	50 X 50 X 15 cm	128.2	25.6	5.2	4.9	0.230	18.3	0.690	48800	1,50,120
CD		6.8**	4.2**	2.4**	2.2**	0.18**	7.2**	0.21**	9120**	

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## RANIFALL BASED CROPPING SYSTEM IN DRY TRACTS OF ARUPPUKOTTAI

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The rainfall data for the years (1950-1974) relating to Aruppukottai Taluk of Ramnad district were analysed for annual, seasonal, monthly and weekly periods and results presented in this paper. The traditional practices now in practice are discussed. Based on the rainfall pattern a suitable cropping system is suggested with minimum risk in order to utilise the rainfall efficiently and raise the income of dry land farmers of the tract.

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The primary source of moisture is the rainfall which is a variable factor for crop production particularly in semi-arid tropics. Based on rainfall analysis, it is possible to change the existing cropping pattern depending upon the soil and socio-economic condition of the farmers. The analysis of rainfall data and the suitable cropping system for coimbatore area are reported by Kulandaivelu *et al.*, (1980).

The rainfall data of Aruppukotta; taluk located in Ramnad district have been taken up for the study. The taluk has a total area of 1.03 lakh ha situated geographically between 9°23' and 9°47' North latitude and 77°57' and 78°56' East longitude with an altitude of 50 m above mean sea level. The climate of this place is semi arid tropics with a mean annual rainfall of 715 mm. A major area is under rainfed crops with cotton, millets, coriander and chillies as mandate crops.

The soil is of *Vertisol* type with a depth of about one meter.

#### MATERIALS AND METHODS

The daily rainfall data for the 25 years (1950-1974) collected from the revenue records were used for the study. The data were analysed statistically for annual, seasonal, monthly and weekly as suggested by Kulandaivelu *et al.*, (1980).

#### RESULTS AND DISCUSSION

The daily rainfall data of Aruppukottai for 25 years period (1950-74) were analysed for annual, monthly and weekly distribution and the results are presented.

##### ANNUAL RAINFALL

The mean annual rainfall of Aruppukottai worked out to 715 mm received in 37 rainy days. The maximum rainfall of 1180 mm was recorded within 37 rainy days during 1960 and the minimum of 412 mm only in 33 days during 1974. Out of 25 years, the rainfall was above normal in six years, and below normal in six years, with the rest of the years with-in normal. The Coefficient of variation was only 27 per cent thus indicating not much of variation in the annual rainfall (Table 1).

##### SEASONAL RAINFALL

The distribution of rainfall in the four seasons with percentage over annual rainfall and the degree of dependability are furnished in Table 2.

Among the seasons; North East Monsoon amounted for maximum rainfall of 49 percent (351 mm) of total, followed by South West Monsoon contributing 28 percent (201 mm) only; while summer season contributed only 18 percent (129 mm) and the rest during winter season. The rains from South West Monsoon

Table 1 Annual Rainfall (mm) — Aruppukottai (1950—74).

Year	R. F.	R. D.	Year	R. F.	R. D.
1950	587	28	1963	1005	47
1951	652	34	1964	715	33
1952	471	35	1965	732	35
1953	704	52	1966	899	48
1954	696	35	1967	694	36
1955	739	35	1968	640	52
1956	498	28	1969	551	29
1957	606	34	1970	669	32
1958	459	32	1971	1077	48
1959	814	45	1972	877	52
1960	1180	37	1973	957	54
1961	528	28	1974	413	33
1962	717	32			

Annual Mean Rainfall 715 mm  
 Rainy days (RD) 37  
 Coefficient of variation 27%

Table 2. Seasonal Rainfall (mm) — Aruppukottai (1950—74)

Season	R. F.	R. D.	C.V. %
Winter (Jan — Feb.)	33	2	139
Summer (Mar. — May)	120	7	59
SW Monsoon (Jun. — Sep.)	202	11	40
NE Monsoon (Oct. — Dec.)	350	17	43
	715	37	27

were more reliable (C. V. 40%) whereas the summer rains were not much dependable (C.V. 59%) (Table 2).

#### MONTHLY RAINFALL

October and November are the months of heaviest rainfall registering 150 and 138 mm respectively followed by September with 73 mm. April and May months received around 50 mm each. The period from August to December could be considered as the best period for growing dry crops because of higher rainfall of more than 60 mm (Table 3).

#### WEEKLY RAINFALL

The mean weekly rainfall is given in Table 4. The data indicated that the weekly rainfall was more than 10 mm per week from 32nd to 52nd standard week (August - December). From 38th to 49th week (September last week to December first week), the rainfall was more than 20 mm. Nevertheless, the rainfall was still more than 50 mm from 42nd to 44th week (middle of October to first week of November). The optimum period for taking up rainfed sowing is fixed as first week of September.

Table 3. Monthly Rainfall (mm) — Aruppukotti (1950-74)

Month	R. F.	R. D.	C V%
January	19.5	1.2	186
February	13.8	0.6	265
March	18.6	1.0	132
April	57.7	3.0	109
May	52.5	2.8	78
June	24.0	1.4	172
July	4.1	2.2	138
August	63.0	3.8	83
September	73.5	4.0	79
October	150.0	7.6	44
November	137.6	5.7	75
December	63.5	3.4	127

Table 4 Weekly Rainfall (mm) — Aruppukottai (1950-74)

Std week	Dates	R. F.	R. D.	Std week	Dates	R. F.	R. D.
1	January 1-7	3.6	0.3	26	July 25-1	2.1	0.1
2	8-14	8.9	0.5	27	2-8	5.5	0.4
3	15-21	1.1	0.1	28	9-15	8.2	0.4
4	22-28	4.9	0.3	29	16-22	6.1	0.5
5	February 29-4	3.2	0.2	30	23-29	18.2	0.7
6	5-11	—	—	31	August 30-5	8.0	0.7
7	12-18	1.3	0.1	32	6-12	17.3	0.8
8	19-25	10.0	0.4	33	13-19	12.8	0.8
9	March 26-4	5.3	0.2	34	20-26	11.1	0.7
10	5-11	1.5	0.1	35	September 27-2	22.5	1.1
11	12-18	3.9	0.3	36	3-9	11.1	0.6
12	19-25	5.4	0.3	37	10-16	16.5	1.1
13	April 26-1	3.9	0.3	38	17-23	19.6	1.0
14	2-8	19.2	0.9	39	24-30	19.8	1.1
15	9-15	11.3	0.8	40	October 1-7	21.8	1.3
16	16-22	17.2	0.8	41	8-14	20.6	1.5
17	23-29	9.6	0.6	42	15-21	5.1	2.2
18	May 30-6	13.8	0.6	43	22-28	41.3	1.8
19	7-13	9.0	0.5	44	November 29-4	58.0	2.2
20	14-20	12.8	0.7	45	5-11	30.1	1.3
21	21-27	12.9	5.5	46	12-18	18.9	1.0
22	June 28-3	6.5	0.4	47	19-25	30.3	1.3
23	4-10	4.7	0.4	48	December 26-2	21.8	1.1
24	11-17	5.9	0.4	49	3-9	23.1	1.0
25	18-24	6.1	0.4	50	10-16	12.0	1.1
				51	17-23	11.2	0.4
				52	24-31	9.3	0.7

**CROPPING SYSTEM****EXISTING CROPPING SYSTEM :**

In black soil area, cotton crop is sown mixed with pulses on receipt of rains during September-October. When there is early rains in the month of August-September, *Varagu* is mixed with pulses which is the major cropping system. However, if the rains are received late in October-November, coriander or sorghum is grown.

In red soil area, groundnut mixed with pulses will be the predominant crop being grown, when there is sufficient rain during July-August. If the rainfall is delayed, sowing of sorghum or cumbu will be taken up mixed with pulses.

**PROPOSED CROPPING SYSTEM :**

Based on the rainfall distribution, soil type, farmers need and socio-economic conditions of the farmers, the following cropping pattern is suggested to utilise the rainfall efficiently and stabilise the productivity with minimum risk involved in dryland agriculture.

**BLACK SOIL :**

The cropping system suggested may be divided into three categories, viz., early rains, normal rains and late rains.

when there is early rains during the month of August, *varagu* may be sown mixed with red gram or lablab (*Dolichos lablab*). Pulse crop is sown in lines behind the country plough 6'

apart. In the case of normal rains during September-October, cotton may be sown in broad bed furrow with a spacing of 30.90:30 cm between rows. In between two rows of cotton, black gram may be grown with the available space. During the periods of late rains (October or early November), cotton is not the best suited one due to short rainy season. In such case, coriander is broadcasted behind country plough and bengal gram is also sown in lines 6' apart. Depending upon the need, a portion of the land may also be utilised for growing fodder sorghum especially with high seed rate.

**RED SOIL :**

with the receipt of rains during July-August, groundnut may be sown behind the country plough. Also, red gram or lablab or cowpea may also be grown as a mixed crop in lines of 6' to 8' apart. However, when the rains are received during September-October millet like sorghum or cumbu mixed with cowpea or lablab or dew gram is recommended.

In all the cropping system suggested, the improved dryland technology should be adopted from land preparation to harvesting. Following the above cropping system, the farmers would be benefitted with minimum risk involved.

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