

**Table 1.** Coefficient of multiple determination ( $R^2$ ) and 'F' test for square root, three halves, quadratic and Cobb-Douglas functions for finger millet in two seasons.

Season	Particulars	Equation			
		Square root	Three halves	Quadratic	Cobb-Douglas
Rabi, 1985-1986	Coefficient of multiple determination ( $R^2$ )	0.8578	0.8700	0.8760	0.8613
	'F' test	Sig.	Sig.	Sig.	Sig.
Kharif, 1986	Coefficient of multiple determination ( $R^2$ )	0.9300	0.9300	0.9350	NA
	'F' test	Sig.	Sig.	Sig.	

Sig. = Significant at 5% level  
 NA = Not analysed in kharif, 1986.

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## EFFECT OF TIME OF SOWING ON THE YIELD OF RAINFED WHEAT VARIETIES

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### ABSTRACT

The experiment on promising wheat varieties was conducted under three dates of sowing at the Department of Agronomy, Tamil Nadu Agricultural University, Coimbatore on a clay loam soil for five years from 1982-1983 to 1986-1987 under rainfed conditions. The sowing of rainfed wheat during October 8th to 14th proved to be the optimum time of sowing for all the years. Among the varieties HI 617, NI 5439, AKW 65-1 proved better under early sowing (October 8th to 14th). Varieties PBN 22-28, DWR 59 and AKW 65-1 gave more grain yield under normal sowing (October 22nd to 28th). Under later sown conditions, (November 5th to 11th) varieties PBN 22-28, NI 5439, DWR 94 and MACS 1967 were better than others.

**KEYWORDS :** Sowing Dates, Yield, Rainfed Wheat.

The time of sowing of rainfed wheat which has a marked influence on the grain yield of wheat, varied widely over the wheat growing areas in India. The best time to sow wheat are when the mean daily temperatures have dropped to 25°C and this happens in the second half of October in most parts of India (FAI, 1985; Singh 1986). To obtain best yields, the recommended, normal time of sowing of rainfed wheat is in second fortnight of October. Seed germination and crop stand pose a big problem under rainfed conditions due to the withdrawal of south west monsoon by the end of September in most parts of India (Sharma *et al.* 1981). This problem can be easily overcome in Tamil Nadu due to the onset of north east monsoon during third week of October. Hence proper time of sowing is essential to capitalize the north east monsoon rains for getting maximum grain yield. But the wheat varieties react differently to the prevailing weather conditions even in their earlier growth period. Hence, experiments were conducted to find out the optimum time of sowing for rainfed wheat and the varieties suitable for different dates of sowing under All India Coordinated wheat Improvement Project.

## MATERIALS AND METHODS

Field experiments comprising of three sowing dates viz., October 8 to 14th (Early), October 22nd to 28th (Normal) and November 5th to 11th (Late) with different varieties were conducted for five years from 1982-1983 to 1986-1987 at Department of Agronomy, Tamil Nadu Agricultural University, Coimbatore with the object to find out the optimum time of sowing for rainfed wheat and the wheat varieties suitable for early, normal and late sowings. The trial was laid out in a split plot design with three replications with dates of sowing in the main plots and the varieties in the subplots. The soil was clay loam which was low, medium and high in available N, P&K respectively. A fertilizer dose of 40 N+20 P<sub>2</sub>O<sub>5</sub> kg.ha<sup>-1</sup>, was applied before sowing. All the other cultural practices were done as per recommendation.

## RESULTS AND DISCUSSION

The data presented in Table 2 for overall effects of dates of sowing on wheat grain yield showed that sowing of rainfed wheat between October 8th and 14th produced significantly more grain yield over other two dates of sowing in all the years except 1986-1987. During the year 1984-1985, late sown crop completely failed and did not produce any grain. This may be due to the poor rains during early growth period for late sown crop. Though the late sown crop received 200.6 mm during the entire growth period, the rain during the first twenty five days where the crown root initiation (CRI) falls was only 17.5 mm (Table 1). Cheema *et al.* (1973) reported that the CRI stage is the most critical one among all the six critical stages for moisture in wheat. The low yields under early and normal sown crops and failure of late sown crop during the year 1986-1987 was due to the poor performance of north east monsoon, which would have resulted in severe moisture stress at flowering stage which is most important next to CRI stage. Niclos *et al.* (1985) reported that the water deficit during early grain development resulted in less grain weight at maturity as a result of reduction in cell division and starch accumulation.

In the first year (1982-1983), varieties HI 617 and NI 5439 performed better under early sowing whereas PBN 22-28 produced more grain yield under normal and late sowings. During second year (1983-1984), NI 5439 significantly produced more grain yield over other varieties under early and late sowings. However, the variety DWR 59 recorded more grain yield under normal sowing. During third year (1984-1985), AKW 65-1 produced highest grain yield over other varieties in early and normal sowings. In the fourth year (1985-1986), NI 5439 produced the highest grain yield under early sowing whereas under normal sowing, AKW 65-1 proved better. The varieties DWR 94 and MACS 1967 gave more grain yield under late sowing.

### Time of sowing on rainfed wheat varieties

During fifth year (1986-1987), the three varieties tested did not differ among themselves due to the failure of north east monsoon which resulted in very low grain yield. The difference

in performance of varieties might have been due to difference in the moisture extraction pattern among the varieties. Similar findings were reported by Mishra and Nagaraj Rao (1982).

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**Table 1. Rainfall distribution under various dates of sowing (mm)**

Dates of sowing	1982-1983	1983-1984	1984-1985	1985-1986	1986-1987
Early (Oct. 8 to 14th)	311.7 (17.0)	435.1 (280.2)	333.90 (135.5)	203.0 (141.3)	186.4 (85.8)
Normal (Oct. 22nd to 28th)	267.7 (251.5)	372.7 (222.8)	298.1 (201.6)	180.1 (146.2)	167.0 (120.8)
Late (Nov. 5th to 11th)	162.7 (146.5)	164.7 (8.4)	200.6 (17.5)	171.5 (65.6)	12.0 (2.2)

(Figures in the parentheses indicate the rainfall received during first twenty five days under each date of sowing)

Table 2. Effect time of sowing on the yield of rainfed wheat varieties (q ha<sup>-1</sup>).

Variety (V)	Dates of sowing (D)																	
	(1982-1983)			(1983-1984)			(1984-1985)			(1985-1986)			(1986-1987)					
	E	N	L	M	E	N	L	M	E	N	L	M	E	N	L	M		
NI 5439	7.1	2.9	7.2	6.1	6.4	3.6	4.4	4.8	9.9	9.4	9.6	17.9	6.7	5.3	9.9	2.9	4.3	3.6
N 59	6.9	4.1	5.2	4.1	2.8	2.6	3.2	7.4	8.7	8.0	-	-	-	-	-	-	-	-
DWR 43	6.2	3.3	4.0	4.5	3.6	3.1	3.1	3.2	-	-	-	-	-	-	-	-	-	-
HD 2189	-	-	-	-	-	-	-	-	12.3	8.5	10.4	-	-	-	-	-	-	-
MACS 1269	6.3	4.9	5.5	5.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MACS 1967	-	-	-	-	4.8	3.1	2.0	3.3	9.6	9.9	8.8	9.9	5.2	10.0	8.4	-	-	-
DWR 59	5.1	2.5	3.6	3.7	4.4	3.3	3.1	4.3	-	-	-	-	-	-	-	-	-	-
AKW 65-1	-	-	-	-	-	-	-	-	20.2	12.5	16.3	10.3	10.2	7.1	9.2	-	-	-
PBN 22-28	5.3	5.5	8.2	6.4	5.5	4.4	3.4	4.4	-	-	-	-	-	-	-	-	-	-
MACS 1995	-	-	-	-	-	-	-	-	7.7	7.5	7.5	-	-	-	-	-	-	-
HI 617	8.0	3.3	4.4	5.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MACS 1972	-	-	-	-	3.4	3.4	1.0	2.6	-	-	-	-	-	-	-	-	-	-
NI 8272	4.2	4.3	4.4	4.3	6.4	3.6	4.4	4.8	-	-	-	-	-	-	-	-	-	-
MACS 9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AKW 38-5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4.1	3.2	3.6
DWR 94	-	-	-	-	-	-	-	-	-	-	-	7.9	7.2	9.4	9.6	-	-	-
DWR 105	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4.2	3.3	-	3.8
NI 8763	-	-	-	-	-	-	-	-	-	-	-	8.5	3.8	6.5	6.3	-	-	-
MACS 2159	-	-	-	-	-	-	-	-	-	-	-	9.6	6.4	7.3	7.8	-	-	-
DWR 85	-	-	-	-	-	-	-	-	-	-	-	7.5	5.5	9.1	7.4	-	-	-
NI 8668	-	-	-	-	-	-	-	-	-	-	-	7.9	5.0	10.8	7.9	-	-	-
MEAN	6.2	4.0	5.2	-	4.7	3.5	2.8	-	10.9	9.4	-	10.5	6.2	8.2	-	3.8	3.6	-
CD (5%) D	1.14	-	-	-	0.20	-	-	-	0.55	-	-	-	0.87	-	-	0.96	-	-
V	1.18	-	-	-	0.82	-	-	-	1.42	-	-	-	0.82	-	-	0.83	-	-
D at V	2.13	-	-	-	1.42	-	-	-	2.46	-	-	-	1.88	-	-	NS	-	-
V at D	1.59	-	-	-	0.18	-	-	-	1.96	-	-	-	1.44	-	-	NS	-	-
E—Early (Oct.8-14)	-	-	-	-	N-Normal (Oct.22-28)	-	-	-	N—Late (Nov.5-11)	-	-	-	M—Mean	-	-	NS	-	-
	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	NS	-	Not significant