

## EFFECT OF TIME OF PLANTING ON GROWTH AND YIELD OF IRRIGATED NENDRAN BANANA

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**Abstract:** Field experiments were conducted at the Regional Agricultural Research Station, Ambalavayal for three years to standardize the best time of planting of irrigated banana var. Nendran (AAB) for maximum growth and yield of quality bunches. Suckers were planted at monthly interval on the first of every month starting from July to December. July to October plantings were equally good for mean bunch weight (7.83, 8.38, 8.10 and 8.20 kg respectively) and were superior to November and December plantings (5.28 and 4.14 kg respectively). November and December plantings recorded minimum value for all the growth and bunch characteristics studied except crop duration. Planting of Nendran beyond October enhances the crop duration.

**Key words:** Nendran banana, pooled mean, time of planting.

### INTRODUCTION

Wayanad, a high range district of Kerala State of India, lies between 11° 26' and 11° 59' north latitudes and 76° 26' and 75° 46' east longitudes. It is situated at an altitude of 900 - 1200 m above mean sea level and enjoys a mild sub-tropical climate. The district receives an annual rainfall of 3000 mm. The hilly terrain is crisscrossed by numerous streams and valleys thus forming a unique ecosystem. Commercial cultivation of banana in Wayanad has been very much limited till recent past. However, banana cultivation has become very extensive in the district due to changes in the climate and the high returns from the crop and presently it occupies an area of 2790 ha (Anon., 1998). Nendran banana is usually planted as a rainfed crop during August-September. Only limited studies have been conducted in Wayanad to find out the optimum time of planting of irrigated banana. The present study was undertaken to standardize the best time of planting for irrigated banana var. Nendran for maximum growth and yield of quality bunches under the agro-climatic conditions of Wayanad.

### MATERIALS AND METHODS

Field experiments were conducted at the Regional Agricultural Research Station, Ambalavayal (974 m above MSL) for three years (1989-90, 1990-91 and 1993-94) to standardize the time of planting of irrigated banana. The experiment was laid out in randomized block design with five replications, six treat-

ments and four plants per treatment. Three to four month old sword suckers weighing 2 kg each were collected from the farmers' fields and planted at monthly interval on the first of every month starting from July to December. The crop was raised by giving irrigation and following uniform cultural and manurial practices as per the recommendations of the Kerala Agricultural University (KAU, 1996). Observations on growth parameters, yield and duration were recorded following the standard procedures.

### RESULTS AND DISCUSSION

Mean values of growth and bunch characteristics of Nendran banana for individual years and their pooled mean are presented in Tables 1, 2 & 3. Plant height showed significant difference during 1989-90 and 1990-91. August planting recorded the maximum height (252 cm) during 1989-90, which was on par with July and September plantings. During 1990-91, the maximum plant height was recorded in October planted plots (242 cm) and was on par with those planted in September, July and August. The treatments did not show any significant difference with respect to plant height during 1993-94 and in the analysis of the pooled data. However, July planting recorded the maximum plant height during 1993-94 (265 cm) and also in the pooled mean (251 cm). The time of planting showed significant variation with respect to plant girth during 1989-90 and 1990-91. August, July and October (59.4 cm, 57.5 cm and 56.6 cm respectively) plantings were on par and superior to other

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Table 1. Plant height, girth and D-leaf area of Nendran banana as influenced by the time of planting

Month of planting	Plant height, cm				Plant girth, cm				D-leaf area, m <sup>2</sup>			
	1989-90	1990-91	1993-94	Pooled mean	1989-90	1990-91	1993-94	Pooled mean	1989-90	1990-91	1993-94	Pooled mean
July	248	239	265	251	57.5	55.0	50.9	54.6	1.17	1.15	1.21	1.18
August	252	233	256	247	59.4	53.5	53.3	56.1	1.19	1.17	1.11	1.16
September	237	240	240	239	54.4	51.0	46.5	51.5	1.19	1.19	0.99	1.12
October	230	242	241	238	56.6	56.0	46.6	53.9	1.20	1.20	1.05	1.14
November	209	211	232	218	49.0	53.0	58.4	47.6	0.96	0.95	1.09	1.00
December	200	192	237	205	39.4	40.0	40.2	41.0	0.91	0.88	1.05	0.95
F test	**	**	NS	NS	**	**	NS	NS	**	**	NS	NS
CD (0.01)	14	20	-	-	4.2	4.4	-	-	0.05	0.08	-	-
Tr x Yr Interaction				NS				NS				NS
CD (0.05)				-				-				-

Table 2. Bunch weight, No. of fingers per bunch and weight of finger of Nendran banana as influenced by the time of planting

Month of planting	Bunch weight (kg)				No. of fingers per bunch				Weight of finger (g)			
	1989-90	1990-91	1993-94	Pooled mean	1989-90	1990-91	1993-94	Pooled mean	1989-90	1990-91	1993-94	Pooled mean
July	8.10	6.20	9.17	7.83	51.4	42.3	54.6	49.1	157.4	146.6	225.1	176.4
August	8.96	6.98	9.19	8.38	53.0	41.4	49.0	47.8	170.0	169.4	234.8	191.4
September	9.95	7.60	6.74	8.10	55.0	44.0	43.3	47.4	181.4	174.0	168.3	174.6
October	9.38	7.20	8.03	8.20	53.4	42.1	40.3	45.6	176.6	171.0	191.4	179.7
November	5.60	4.28	5.94	5.28	38.6	37.6	37.2	37.8	144.8	114.2	187.4	148.8
December	3.68	3.80	4.93	4.14	28.6	34.2	29.8	30.9	129.4	111.4	190.3	143.7
F test	**	**	**	**	**	**	**	**	**	**	*	NS
CD (0.05)	0.86	1.14	1.56	1.10	3.4	3.8	12.3	5.3	22.0	33.5	41.4	-
Tr x Yr Interaction				*				NS				*
CD (0.05)				1.34				-				28.5

treatments during 1989-90. During 1990-91, October planting recorded the maximum plant girth (56.0 cm) and was on par with July (55.0 cm), August (53.5 cm) and November (53.0 cm) plantings. There was no significant difference among the treatments with respect to plant girth during 1993-94 and in the pooled mean. However, November planting recorded the maximum plant girth during 1993-94. In the pooled data, August planting recorded the maximum plant girth (56.1 cm) and December planting the minimum value (41.0 cm). The treatments showed significant difference with

respect to D-leaf area only during 1989-90 and 1990-91. October planting recorded maximum leaf area (1.20 m<sup>2</sup>) and was on par with August (1.19 m<sup>2</sup>), September (1.19 m<sup>2</sup>) and July (1.17 m<sup>2</sup>) plantings during 1989-90. December planting recorded the minimum D-leaf area (0.91 m<sup>2</sup>). Similar trend was observed during 1990-91 also. October planting recorded maximum D-leaf area (1.20 m<sup>2</sup>) whereas December planting recorded the minimum value (0.88 m<sup>2</sup>). Though the treatments did not show any significant difference during 1993-94 and in the pooled data, July planting

Table 3. No. of hands per bunch and crop duration of Nendran banana as influenced by the time of planting

Month of planting	No. of hands per bunch				Crop duration, days			
	1989-90	1990-91	1993-94	Pooled mean	1989-90	1990-91	1993-94	Pooled mean
July	5.3	4.2	5.4	5.0	423	454	434	437
August	5.4	4.3	5.2	5.0	428	458	436	441
September	5.6	5.0	5.2	5.2	419	450	434	434
October	5.0	4.8	4.6	4.8	400	435	431	422
November	3.7	4.0	4.5	4.1	434	471	449	452
December	3.2	3.6	4.0	3.6	456	491	462	464
F test	**	**	**	**	**	**	**	NS
CD (0.01)	0.5	0.6	0.8	0.8	22	15	16	-
Tr x Yr Interaction				**				NS
CD (0.01)				1.5				-

recorded maximum value for this character. The time of planting showed significant difference with respect to bunch weight during all the three years and also in the pooled mean. During 1989-90 and 1990-91, September planting recorded the maximum bunch weight, which was on par with October planting in 1989-90 and with October and August plantings in 1990-91. July, August and October plantings were on par and superior to other treatments with respect to bunch weight during 1993-94 whereas in the pooled analysis, July, August, September and October plantings were on par and superior to November and December plantings. Bunch weight was influenced by time of planting x year interaction.

Number of fingers per bunch varied significantly among the treatments during all the three years and in the pooled mean. During 1989-90, August, September and October plantings were on par and significantly superior to other treatments and in 1990-91, July, August, September and October plantings were on par with each other and superior to November and December plantings. During 1993-94, July planting recorded the maximum number of fingers per bunch, which was on par with August and September plantings. December planting recorded the minimum number of fingers per bunch (29.8). The pooled analysis revealed that July (49.1), August (47.8), September (47.4) and October (45.6) plantings were on par and superior to November and December plantings. The minimum value for this character was re-

corded by December planting (30.9). The time of planting x year interaction was not significant for the number of fingers per bunch.

The weight of fingers showed significant difference among the treatments during all the three years but in the pooled analysis, there was no significant difference for this character. During 1989-90, August, September and October plantings were on par and superior to other treatments whereas in 1990-91, July, August, September and October plantings were on par and superior to November and December plantings. During 1993-94, July and August plantings were on par and superior to other treatments. Though there was no significant difference among the treatments in the pooled analysis, the interaction of time of planting x year was significant for mean weight of fingers.

There was significant variation among the treatments with regard to the number of hands per bunch during all the three years and also in the pooled mean. During 1989-90, September planting recorded the maximum number of hands per bunch (5.6), which was on par with August (5.4) and July (5.3) plantings whereas September (5.0) and October (4.8) plantings were on par and superior to other treatments during 1990-91. During 1993-94, July (5.4), August (5.2), September (5.2) and October (4.6) plantings were on par and superior to November and December plantings. In the pooled analysis, July, August, September and

October plantings were on par and superior to November and December plantings. The time of planting x year interaction was significant with respect to number of hands per bunch.

Crop duration showed significant difference during all the three years. October planting recorded minimum duration and December planting recorded the maximum duration during 1989-90, 1990-91 and 1993-94 respectively. Though there was no significant difference for this character in the pooled analysis, similar trend was observed. October planting recorded the minimum duration whereas December planting recorded the maximum duration.

The maximum bunch weight in July, August, September and October plantings can be attributed to the higher number of fingers per bunch, mean weight of fingers and number of hands per bunch. Studies by Vijayaraghavakumar *et al.* (1984) revealed the direct influence of number of fingers on the yield of banana. Shanmugavelu *et al.* (1987) reported that planting banana during September gave good yields though a bit late in bearing. Kurian *et al.* (1985) also reported strong positive correlation between fruit yield and number of hands, number of fingers, number of functional leaves per plant, girth of stem and total duration of the crop. The lower values for mean bunch weight in November and December planting may be due to the slow growth of the plants during early stages of growth as a result of the severe cold experienced in Wayanad during November and December (minimum temp. 16.7°C and maximum temp. 26.1°C). Shanmugavelu *et al.* (1987) reported that December crop produced poor and ill

filled bunches of banana. The crop duration ranged from 422 to 464 days. The longer duration taken by the crop can be attributed to higher altitude. This is in conformity with the findings of Simmonds (1959) that the time of shooting in banana may be extended to 18 months in sub-tropical latitudes or at high altitudes in tropics from 9-10 months at low altitudes in the tropics.

August-September is the recommended planting season for irrigated banana in Kerala (KAU, 1996). The present study revealed that irrigated banana could be successfully planted from July to October in the high ranges of Wayanad for getting high yields. It also showed that planting beyond October enhances the crop duration considerably.

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