

## **GROWTH AND YIELD PERFORMANCE OF ARECANUT VARIETIES IN MALNAD REGION OF KARNATAKA**

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### **ABSTRACT**

A comparative yield trial involving five high yielding varieties of arecanut viz., Mangala, Sumangala, Sreemangala, Mohitnagar and Thirthahalli local was laid out at Thirthahalli to identify suitable variety for cultivation in the Malnad (hills) region of Karnataka. Mangala registered significantly lower height with high percentage of flowering palms. Mangala performed better than other varieties with highest yields in the initial years of bearing closely followed by Thirthahalli local while Sreemangala recorded comparatively lower yields.

Key words: Arecanut, Chali yield, Comparative yield trial

### **INTRODUCTION**

The Arecanut (*Areca catechu*) is one of the major cash crops cultivated on an area of 88,400 ha in Karnataka and the production under this crop is 128.30 tonnes chali (Suseendra babu, 1997). The major arecanut growing districts in the state are Dakshina Kannada, Udupi, Tumkur, Shimoga, Uttara Kannada, Chikmagalur and Chitradurga contributing to 75 per cent of the total area under arecanut in the state (Appaiah, 1985). The present productivity of arecanut is 1180 kgs ripenuts/year/ha and there is still scope to increase yields by growing high yielding varieties. Besides being a highly cross pollinated and heterogeneous population, the arecanut varieties need to be tested for different locations to identify location specific varieties since their performance over locations is highly inconsistent. With this perspective, the present experiment was initiated with the objective to

identify suitable high yielding arecanut variety for Malnad region of Karnataka.

### **MATERIALS AND METHODS**

The comparative evaluation of high yielding varieties released by Central Plantation Crops Research Institute, Regional Station, Vittal is in progress at Agriculture Research Station at Thirthahalli since 1988. The experimental area, which represents Malnad area of Karnataka is located at an elevation of 1200 m with an annual average rainfall of 2000 mm. The experiment was laid out in Randomised Block Design with five treatments replicated five times. The treatments are Mangala, Sumangala, Sreemangala, Mohitnagar and Thirthahalli (local variety as check).

The Areca seedlings were planted during October 1988 with an inter plant and inter row distance of 2.7m x 2.7 m. Each plot consists of 8 palms. The observations were recorded on

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growth and yield parameters viz., palm height (m), diameter of the stem at 30 cms above ground level (cm), number of leaves produced/palm, number of nodes formed/palm, internodal length (cm), flowering percentage, weight of ripe nuts per palm (kg/palm) and weight of chali (dehusked nuts - kg/palm) for four years from 1994-95 to 1997-98.

## RESULTS AND DISCUSSION

### Growth parameters

Among the varieties, Mangala recorded significantly lower height (2.17m) compared to Mohitnagar (3.75m). The variety Mohitnagar grew tallest compared to other varieties at the 5th year of planting (Table 1). Similar observation was reported by Salvi *et al.*, (1985) where in Mangala attained significantly lower height compared to Mohitnagar in Konkan region of Maharashtra. This indicates that the semital character of Mangala is expressed irrespective of different agro-climatic conditions.

The girth of the stem and number of leaves produced in individual palm at the 5th year of planting in different varieties did not vary significantly. However, girth at 30 cms from ground level varied from 12.60 cm in

Mohitnagar to 14.24 cms in Sreemangala.

Likewise, number of nodes formed per palm and internodal length were almost same among varieties. None of the varieties was found to be significantly superior with respect to these two characters. The internodal length was shortest in Mangala (11.8 cm) which might have rendered the palm its typical semital nature. The lowest height and short internodal length observed in Mangala confirmed its semital nature even at higher elevations. However, the internodal length was more in the variety Mohitnagar (15.2 cm) making it the tallest variety.

From the data on growth parameters, Mohitnagar appears to be vigorous in terms of taller palms, more number of nodes per palm and large internode length while Sreemangala was vigorous with more diameter and leaves per palm.

The reproductive growth as indicated by initiation of spadix started when the palms were 4 years old (Fig. 1). This substantiates the report of Sands (1926), who stated that arecanut flowers in about four years after planting when grown under best conditions. The spadix emergence varied

Table 1. Mean palm height, girth, number of leaves, number of nodes and internode length in the 5th year of planting

Varieties	Height (m)	Girth (cm)	No. of leaves	No. of nodes	Internode length (cm)
Sumangala	2.93	13.76	9.0	24.6	14.2
Sreemangala	2.62	14.24	9.9	21.4	14.7
Mohitnagar	3.75	12.60	9.3	24.9	15.2
Thirthahalli	2.83	14.13	9.4	24.0	13.5
Mangala	2.17	13.29	9.0	20.0	11.8
GM	2.86**	13.60	9.3	23.0	13.9
CD (P=0.05)	0.7	NS	NS	NS	NS

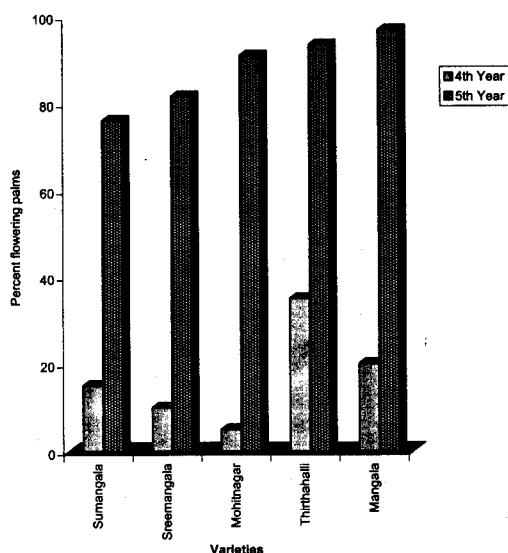


Fig. 1. Mean flowering percentage in the 4th and 5th year of planting.

between 5 per cent (Mohitnagar) to 35 per cent (Thirthahalli) in the 4th year of planting. Thirthahalli local with highest percentage of spadix emergence at 4th year appear to be precocious in bearing. While Mangala had only 20 per cent of its palms putforth spadix. Though Bavappa (1977) reported first flowering in Mangala as early as 3rd year under Coastal region (Hot and humid), the variation in Malnad region (hills region) is possibly due to

differences in agro-climatic conditions, which are bound to influence growth of palms. In the 5th year of planting flowering was almost complete varying from 76 per cent in Sumangala to 96.8 per cent in Mangala. (Fig. 1)

#### Yield parameters

Mean yield from 1994-95 to 1997-98 revealed that Mangala performed better than other varieties with ripe nut yield of 11.27 kg/palm followed by the check Thirthahalli with 9.97 kg/palm (Table 3). Sumangala with 9.27 kg ripenuts/palm and Mohitnagar 9.46 kg ripe nuts/palm were medium yielders while Sreemangala performed comparatively poor with 7.88 kg ripe nuts/palm. The yield of chali, the commercial product of arecanut recorded from 1994-98 indicated that Mangala produced more mean chali (2.82 kg/palm over other varieties).

The mean annual yield of ripenuts during the initial years of bearing are presented in the Table 2. The yield recorded in different varieties in the 7th year of planting in 1994-95 ranged from 1.63 kg to 4.13 kg ripe nuts/palm with Sreemangala recording the lowest and Mangala recording the highest respectively. Mangala registered 158

Table 2. Mean annual yield of ripe nuts during 1994-95, 1995-96, 1996-97 and 1997-98 in five arecanut varieties.

Varieties	1994-95	% increase over check	1995-96	% increase over check	1996-97	% increase over check	1997-98	% increase over check
Sumangala	3.30	106.3	11.14	5.59	10.09	-22.21	12.55	-15.35
Sreemangala	1.63	2.0	9.84	2.46	8.18	-36.93	11.89	-19.93
Mohitnagar	2.31	44.4	9.13	13.46	11.07	-14.65	11.27	-24.11
Mangala	4.13	158.1	8.88	-15.83	12.84	-1.0	19.22	29.42
Thirthahalli	1.60	-	10.55	-	12.97	-	14.85	-
GM	2.60	-	9.91	-	11.03	-	13.96**	-
CD(P=0.05)	NS	-	NS	-	NS	-	01.53	-

Table 3. Mean yield of arecanut varieties (1994-98)

Varieties	Ripe nuts (kg/palm)	Chali yield (kg/palm)	% increase over the check
Sumangla	9.27	2.32	-7.02
Sreemangala	7.89	2.05	-20.86
Mohitnagar	8.46	2.12	-15.15
Mangala	11.27	2.82	13.04
Thirthahalli	9.97	2.49	--
(Check)			

per cent more yield over the check. This result is in accordance with early reports that Mangala yields better even in the initial years of bearing (Bavappa, 1977). Sumangla with 3.3 kgs ripenuts was the second best which is 106.3 per cent increase over the check. Mohitnagar recorded increased yield to the tune of 44.4 per cent while Sreemangala had a marginal increase of only 2 per cent.

At 8th year of bearing 1995-96, nut yield ranged between 8.88 kg (mangala)

to 11.14 kg/palm (Sumangala). In contrast to the previous year, Mangala recorded lowest yield. Similar observation was reported by Thangaraj *et al.*, (1980) who got low yields in the succeeding year with high yeild during the previous year in Mangala. This trend may be due to alternate bearing habit of the variety (Rekha *et al.*, 1991). All the varieties registered decrease in yield over the check except Sumangla which recorded a marginal increase of 5.59 per cent over the check.

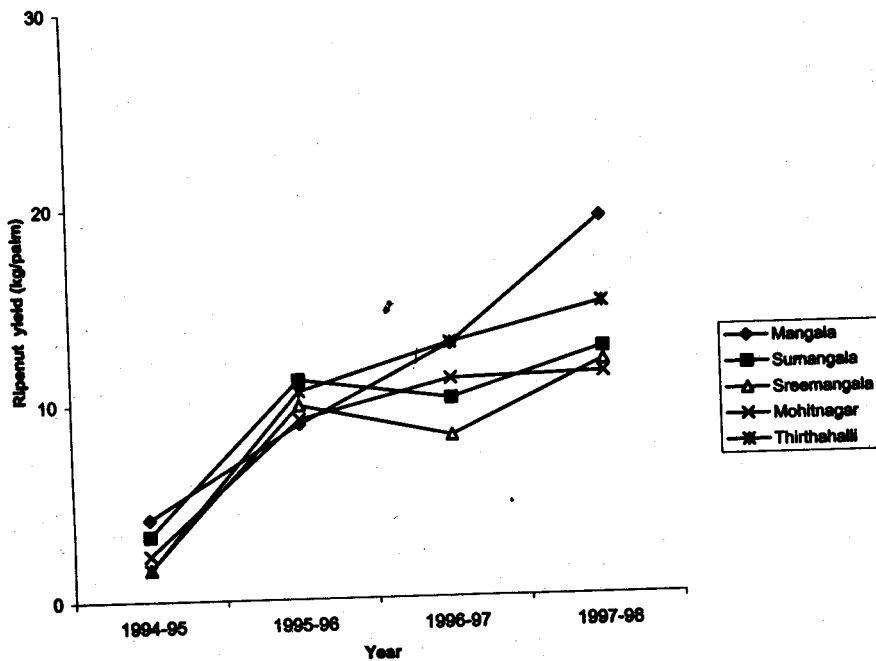


Fig. 2. Consistency in yield performance of arecanut varieties over the years (1994-98).

In 1996-97, the yields ranged from 8.18 kg to 12.97 kg ripe nuts/palm for Sreemangala and Thirthahalli respectively. Mangala was equally good with 12.84 kg ripe nut/palm with all the varieties registering decreased yield over the check. In 1997-98 *i.e.*, 10th year of planting Mangala recorded the highest yield with 19.22 kgs ripe nuts/palm closely followed by Thirthahalli, which produced 14.85 kgs ripenuts/palm/year. Consistency in the performance of arecanut varieties with respect to ripenut yield/palm showed that Mangala exhibited linear trend giving consistently high ripenut yield per palm over the years (Fig.2). The performance of the variety Mangala was

found to be better than other released varieties in the initial four years of bearing. Atleast 8-10 years yield data after stabilization is required to suggest/recommend a variety to a particular climatic condition.

The present study on growth and yield parameters of five high yieldings varieties of arecanut under Malnad region indicates that among the varieties evaluated, the performance of Mangala was better with high yields of initial as well as cumulative in the initial years of bearing. Mangala exhibited precocity in flowering and early linear trend in yield even under high altitude of Malnad region.

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