



ISSN (E): 2277- 7695

ISSN (P): 2349-8242

NAAS Rating: 5.03

TPI 2019; 8(6): 427-429

© 2019 TPI

www.thepharmajournal.com

Received: 16-04-2019

Accepted: 18-05-2019

G Chandrashekhar

Department of Plantation Crops
and Processing, Uttar Banga
Krishi Viswavidyalaya
Pundibari, Coochbehar, West
Bengal, India

Himadri Bhattacharjee

Department of Plantation Crops
and Processing, Uttar Banga
Krishi Viswavidyalaya
Pundibari, Coochbehar, West
Bengal, India

Growth and yield characters of arecanut (*Areca catechu* L.) In Terai zone of West Bengal

G Chandrashekhar and Himadri Bhattacharjee

Abstract

This experiment was conducted at Horticultural Instructional Farm of Uttar Banga Krishi Viswavidyalaya, Pundibari. In total experiment seven plots, three plots with Mohitnagar and one each with Mangala, Sreemangala, Sumangala and Kahikuchi were selected. Various growth and yield parameters of arecanut observed. Average plant height was observed in maximum 5.6 m in Mohitnagar (Model-III) and Sumangala (Model-VI), number of leaves in the crown was observed 10 in variety Kahikuchi, length of leaf was recorded to be 147.90 cm in case of Kahikuchi, breadth of leaf maximum 184.1 cm in Sreemangala in Model-I, girth at collar observed at 30 cm from ground level was found to be maximum of 81.4 cm in case of Kahikuchi (Model-VII), number of scar marks from ground level was observed to be maximum 51.4 in case of Mohitnagar (Model-V), number of bunches recorded maximum 3.6 in var. Mohitnagar (Model-I, II and III), total number of fruits per plant was observed 348 in Mohitnagar (Model-V), fruit length was observed maximum 7.0 cm in Mohitnagar (Model-IV), fruit breadth was observed maximum 6.9 cm in Mohitnagar (Model-IV), fresh weight of fruit husk was observed maximum 37.40 g in Mohitnagar (Model-III), Average fresh weight of individual fruit kernel was observed in maximum 17.2 g in Mangala (Model-II), fresh weight of whole fruit was observed in maximum of 53.10 g in Sumangala (Model-VI), Fresh husk to kernel ratio was observed to be maximum of 0.52 in var. Mohitnagar (Model-IV) and Kahikuchi (Model-VII), maximum husk dry weight was observed to be 8.60 g in variety Sumangala (Model-VI), dry weight of Kernel was observed in maximum 8.30 g in Mohitnagar (Model-III), dry weight of whole fruit was observed in maximum of 15.90 g in Sumangala (Model-VI), Dry husk to kernel ratio was observed in maximum of 1.1 in var. Mangala (Model-II) and Mohitnagar (Model-III), length of kernel also observe in maximum 3.10 cm in Mohitnagar (Model-V). Average diameter of kernel (nut) was observed to be maximum 2.90 cm in case of Mohitnagar (Model-V).

Keywords: Arecanut, growth and yield

Introduction

Arecanut palm (*Areca catechu* L.) belongs to family Palmae. It is one of the most important commercial crops in the South East Asia as common masticatory. In various mythological scripts of Hinduism- Vedic literature in Rig-Veda and Buddhism it has been mentioned. In the background of Buddha statue also we can find inflorescence of arecanut palm. It is important for socio-religious point of view. It has the quality of supplying stimulation to nervous system, increasing secretion of saliva in mouth which aids digestive system, removes bad odour from mouth. Ancient Ayurvedists used arecanut for some of its medicinal qualities for manufacturing aphrodisiac medicines, for skin diseases, diabetes, blood pressure, leprosy, fever, leucoria, urinary stones, rheumatism, intestinal worms, seminal weakness, Jaundice, gastritis, hyper-acidity etc. by blending with other herbs. In West Bengal, arecanut cultivation is mainly restricted to North Bengal, but due to fluctuation of price, people are losing interest in arecanut cultivation. Arecanut is a perennial crop and it can produce fruits up to 40 to 50 years. Arecanut is also used as appetizer, carminative, manufacturing soap, chewing gums, dyes, chocolates, toothpaste, cosmetics, after-shave lotion, and ulcer cleaning tincture. In native medicines also various parts of areca palm bark, roots, leaf sheath, Juice of tender, raw and dried nuts, flowers were used for different purposes. It is most important plantation crop in whole of South East Asia including India. Horticulture crops particularly fruit and plantation crops have self-sustainable system where solar energy can be harvested at different heights, soil resources are used efficiently and can increase cropping intensities. This modern approach is boon to small and marginal farmers who are major stakeholders in Indian Agriculture/ Horticulture system in present and future days.

Correspondence

G Chandrashekhar

Department of Plantation Crops
and Processing, Uttar Banga
Krishi Viswavidyalaya
Pundibari, Coochbehar, West
Bengal, India

Materials and methods

This experiment was conducted at Horticultural Instructional Farm of Uttar Banga Krishi Viswavidyalaya, Pundibari, Cooch Behar, West Bengal. The area lies under Terai agro-climatic zone of West Bengal. Geographically the farm is situated at 26°19'86" N latitude and 89°23'53" E longitude measured with GPS (Garmin-72). Altitude of the area is 43 m above mean sea level. The topography of the land was medium high in situation endowed with good drainage facility. The soil is sandy loam in nature and coarse textured having medium water holding capacity. The composite soil samples from the entire experimental field were collected from different depths and analyzed before planting of the crop. The experimental site is of six years old. Spacing followed for arecanut was 2.7 m x 2.7 m, respectively and remained same under all treatment combinations. The package of practices recommended for the young arecanut was accordingly followed (Bhat and Leela, 1968) [1]. Crops were supplied with recommended fertilizers and other operations were carried out as and when required.

Results and discussion

The present investigation, seven plots of arecanut palm planted during 2008-'09 were selected. In total experiment seven plots, three plots with Mohitnagar and one each with Mangala, Sreemangala, Sumangala and Kahikuchi were selected. Various growth and yield parameters of arecanut observed have been shown in Table 1 and 2. Average plant height was observed to be maximum (5.60 m) in variety Sumangala (Model-VI) and Mohitnagar (Model-III) followed by Mohitnagar grown in Model-IV and Model-V (5.50 m). Ray *et al.*, (2008) [3] observed various agro techniques like plant height, internodal length at 30 cm above ground, leaf length, number of leaflets, leaflet length and breadth, leaf sheath length and lowest girth at 30 cm above ground and finally they were found the cultivars, *i.e.* Mangala, Sumangala and Sreemangala, released for the coastal track of South India did not perform well in the region, which may be due to non-acclimatization of the cultivars to the new environment. Leaf characters revealed that average number of leaf in the crown was observed to be 10 in variety Kahikuchi (Model-VII) closely followed by Sumangala (9.8), Mohitnagar (9.4) and Mangala (8.8). Average length of leaf was recorded to be 147.9 cm in case of Kahikuchi, followed by 147.8 cm in case of Mohitnagar (Model-IV). The other three varieties average leaves length of five plants were recorded to be 146.5 cm in Mangala 146.0 cm in Sumangala, 142.7 cm in case of Sreemangala and 136.9 cm in case of Mohitnagar grown in Model-III. Average breadth of leaves of five palms per model revealed that it was maximum 184.1 cm in Sreemangala in Model-I and minimum 127.2 cm in Mohitnagar (Model-III). For rest of the varieties, average breadth of leaves were 173.5 cm in var. Kahikuchi (Model-VII), 158.8 cm var. Mangala (Model-II) 138.3 cm in case of Sumangala (Model-VI) 136.7 cm, and 131.5 cm in case of Mohitnagar (Model-V and Model-IV) respectively. Average girth at collar observed at 30 cm from ground level was found to be maximum of 81.4 cm in case of Kahikuchi (Model-VII) and minimum 52.8 cm in case of Sreemangala in Model-I. For other varieties, namely Mangala (Model-II) Mohitnagar (Model III), Sumangala (Model-VI), Mohitnagar (Model-IV and V) were observed to be 64.7 cm, 68.0 cm, 66.3 cm, 60.2 cm and 60.9 cm respectively. Average number of scar marks from ground level was observed to be maximum 51.4 in case of

Mohitnagar (Model-V) and minimum 43.0 in case of var. Kahikuchi (Model-VII). Number of scar marks was observed to be 45, 46.4, 46.2 and 44.6 in Sreemangala (Model-I), Mohitnagar (Model-III), Sumangala (Model-VI) and Mohitnagar (Model-IV), respectively. Various yield parameters of all the five varieties of arecanut was recorded in Table 2. Average number of bunches per plant recorded to be observed to be maximum (3.6) in var. Mohitnagar (Model-III, IV and V). Total number fruits for plant noticed in maximum 348 in Mohitnagar (Model-V) and minimum was recorded in Sreemangala (Model-I). Sane *et al.*, (2002) [4] reported the length of fruit of 6.21 cm in case Mangala, 6.65 cm in Mohitnagar, 6.77 in case of Sumangala and 7.28 cm in case of Sreemangala. Average length of fruit was observed to be 7.0 cm in Mohitnagar (Model-IV) followed by 6.9 cm in case of Mohitnagar (Model-III) and minimum was found to be 5.5 cm in case of Sreemangala (Model-I). Average breadth of fruit was observed to be 6.9 cm in Mohitnagar (Model-IV) followed by 6.7 cm in case of Mohitnagar (Model-III), 6.6 cm Kahikuchi (Model-VII), 6.4 cm Mohitnagar (Model-V) 5.3 cm Sreemangala (Model-I), 5.0 cm Sumangala (Model-VI), and minimum was found to be 4.6 cm in case of Mangala (Model-II). Average fresh weight of fruit husk was observed to be maximum (37.40 g) in case of Mohitnagar (Model-III) and minimum (30.10 g) in case of Kahikuchi Model-VII (Table 4.04). For other varieties, namely Mangala in Model-II, Sreemangala in Model I, Sumangala in Model-VI and Mohitnagar in both Model-IV and V were observed to be 33.40 g, 31.90 g, 35.70 g, 32.10 g and 34.30 g respectively. Average fresh weight of individual fruit kernel was observed to be maximum (17.2 g) in case of Mangala (Model-II) and minimum (13.30 g) in case of Sreemangala (Model-I). Fresh weight of kernel was observed to be 16.80 g, and in case of Mohitnagar in Model-IV and V, 15.70 g, in Mohitnagar (Model-III) and Kahikuchi (Model-VII), 15.50 g, in Sumangala Model-VI respectively. Average maximum husk dry weight was observed to be 8.60 g in variety Sumangala Model-VI, while it was minimum 6.40 g in case of Mangala in Model-II. For rest of the varieties average fruit husk dry weight were 7.70 g in Kahikuchi (Model-VII), 7.20 g in variety Sreemangala (Model-I), 7.50 g in case of Mohitnagar (Model-III), 7.8 g Mohitnagar (Model-IV) and 7.3 g in case of Mohitnagar (Model-V). Average dry weight of chali was observed to be maximum (8.30 g) in case of Mohitnagar (Model-III) and minimum 6.90 g in case of Sreemangala (Model-I). Average dry weight was observed to be 7.10 g, 8.20 g, 7.10 g, 7.80 g and 7.90 g in Mangala (Model-II), Mohitnagar (Model-V) Sumangala (Model-VI), Kahikuchi (Model-VII) and Mohitnagar (Model-IV) respectively. Average dry weight of whole fruit was observed to be maximum of 15.90 g in Sumangala (Model-VI) and minimum 13.50 g in case of Mangala in Model-II. Dry weights of fruits observed in other three varieties were 15.80 g, 15.50 g, 14.10 g in cases of Mohitnagar (Model-III and Model-IV), Mohitnagar (Model-V), Kahikuchi (Model-VII) and Sreemangala (Model-I) respectively, Hegde and Sulikeri (2004) [4] also reported significant differences for mean yields of arecanut, with the highest yield in the cropping system consisting of arecanut + pepper + cardamom (3.07 kg chali/palm). Fresh weight of kernel to husk ratio was observed to be maximum of 0.52 in Mohitnagar (Model-IV), Kahikuchi (Model-VII) and minimum 0.42 in case of Mohitnagar (Model-III) and Sreemangala (Model-I). Fresh weight of husk to kernel ratio observed in other varieties were 0.51,

0.49 and 0.43 in cases of Mohitnagar (Model-V), Mangala (Model-II) and Sumangala (Model-VI) respectively. Average chali to husk ratio was observed to be maximum of 1.10 in case of var. Mangala (Model-II), var. Mohitnagar (Model-V), and minimum (0.80) in case of var. Sumangala (Model-VI). Sane *et al.*, (2002) ^[4] recovery of whole nut was more in case of Mangala (14.87 %), minimum 12.67 % in case of Sumangala. Sujatha and Ravi Bhat (2013) reported that nutrition treatments registered significantly higher kernel yield (2508-3176 kg/ha) than control (1721 kg/ha). The increased yield of arecanut from chemical fertilizers (73-85%) was more pronounced when compared to vermicompost (48-59%) and integrated treatments (46-63%) over control.

Average length of kernel also observed to be maximum 3.10 cm in Mohitnagar (Model-V) and minimum 2.1 cm in Sreemangala (Model-I). For other varieties kernel length were 3.0 cm, 2.9 cm, 2.9 cm, 2.7 cm in cases and 2.5 cm of Mohitnagar (Model-IV), Sumangala (Model-VI), Mangala (Model-II), Mohitnagar (Model-III) and Kahikuchi (Model-VII), respectively. Average breadth of kernel (nut) was observed to be maximum 2.90 cm in case of Mohitnagar (Model-V) minimum (2.5 cm) Sreemangala (Model-I), and Mangala (Model-II), followed by 2.8 cm Mohitnagar (Model-IV), 2.7 cm Kahikuchi (Model-VII). 2.6 cm in var. Sumangala (Model-VI) and 2.6 cm in Mohitnagar (Model-III).

Table 1: Observations on various growth parameters of Arecanut

Variety	Grown in model	Plant height (m)	Leaf			Girth at collar (30 cm from ground level)	Number of scar marks from ground level
			Number in the crown	Length (cm)	Breadth (cm)		
Sreemangala	Model-I	4.82	8.6	142.7	184.1	52.8	45.0
Mangala	Model-II	5.10	8.8	146.5	158.8	64.7	46.4
Mohitnagar	Model-III	5.60	9.2	146.0	127.2	68.0	46.4
Mohitnagar	Model-IV	5.50	9.4	147.8	136.7	60.2	44.6
Mohitnagar	Model-V	5.50	8.4	145.3	135.1	60.9	51.4
Sumangala	Model-VI	5.60	9.8	146.6	138.3	66.3	46.2
Kahikuchi	Model-VII	5.10	10.0	147.9	173.5	81.4	43.0

Table 2: Observations on yield and fruit characters of Arecanut

Variety	Grown in model	Number of bunch per plant	Total number of fruits per plant	Fruit characters										Nut characters	
				Length (cm)	Breadth (cm)	Fresh weight per fruit (g)				Dry weight per fruit (g)				Length (cm)	Diameter (cm)
						Husk	Kernel	Total	Husk: Kernel	Husk	Kernel	Total	Husk: Kernel		
Sreemangala	Model-I	3	255	5.5	5.3	31.9	13.3	45.2	0.42	7.2	6.9	14.1	1.0	2.1	2.5
Mangala	Model-II	3.2	312	4.8	4.6	33.4	17.2	50.6	0.51	6.4	7.1	13.5	1.1	2.9	2.5
Mohitnagar	Model-III	3.6	340	6.9	6.7	37.4	15.7	53.1	0.42	7.5	8.3	15.8	1.1	2.7	2.6
Mohitnagar	Model-IV	3.6	333	7.0	6.9	32.1	16.8	48.9	0.52	7.8	7.9	15.8	1.0	3.0	2.8
Mohitnagar	Model-V	3.6	348	6.8	6.4	34.3	16.8	51.1	0.49	7.3	8.2	15.5	1.1	3.1	2.9
Sumangala	Model-VI	3.2	298	5.7	5.0	35.7	15.5	51.2	0.43	8.6	7.1	15.9	0.8	2.9	2.6
Kahikuchi	Model-VII	3	325	6.4	6.6	30.1	15.7	45.8	0.52	7.7	7.8	15.5	1.0	2.5	2.7

References

1. Bhat KS, Leela M. Cultural requirement of arecanut. Indian Farming. 1968; 18(4):8-9.
2. Hegde NK, Sulikerik GS. Mixed and multi-storeyed cropping in an arecanut (*Areca catechu* L.) plantation in India. Tropical Agriculture. 2004; 81(4):236-40.
3. Ray AK, Borah AS, Ananda KS, Maheswarappa HP. Performance of different varieties of arecanut in Assam. Journal of Plantation Crops. 2008; 36(1):73-74.
4. Sane A, Ananda KS, Kumar SN, Sannamarappa S, Ramanujam B. Yield performance of arecanut (*Areca catechu* L.) varieties in maidan region of Karnataka. Journal of Plantation Crops. 2002; 30(1):22-26.