



Evaluation of Coconut Germplasm in the Konkan Region of Maharashtra State

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Regional Coconut Research Station, Bhatye (Ratnagiri).

(All India Co-ordinated Research Project on Palms)

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Abstract

Fifteen genotypes of coconut planted in 1958 were evaluated for yield attributes under irrigated condition at the Regional Coconut Research Station, Bhatye, Ratnagiri (M.S.) representing sandy soil of Konkan region of Maharashtra State. So far one variety viz. Pratap has been released and two varieties viz. Laccadive Ordinary and Philippines Ordinary and one hybrid T x D have been recommended for cultivation in the Konkan region of Maharashtra State. The performance of these varieties and hybrids has been evaluated in this paper.

Introduction

In the Konkan region of Maharashtra State the coconut is grown as main irrigated horticultural crop. The agro climatic conditions of the region are very congenial for its cultivation. The total area under coconut cultivation in Maharashtra State is about 15100 ha with production of 264.5 million nuts during 1996-97 (Singh *et al* 1999). Since 1990 the Government of Maharashtra has launched the Employment Guarantee Scheme for horticultural crops which includes coconut. The area under coconut which was 19390 ha in 1990 increased to 27708 ha during 1999-2000. In India, Maharashtra state ranks first in coconut productivity with 20622 nuts/ha. Over a period of 15 years (i.e. from 1983 - 84 to 1997-98) the productivity of coconut has increased from 40 nuts/palm to 80 nuts/palm in the State.

There is a wide scope to increase the yield of coconut by maintaining proper spacing, management practices such as

irrigation & fertilizer applications, intercropping and varietal improvement.

Materials and Methods

The Regional Coconut Research Station, Bhatye, Ratnagiri, Maharashtra was established in July 1955 by then Indian Central Coconut Committee and the same was attached to all India Co-ordinated Research Project on Palms since 1972. The main objective of the project is to evaluate exotic and indigenous cultivars of coconut available in the country along with the local one.

The exotic and indigenous cultivars collected from CPCRI Kasaragod have been planted in germplasm block of RCRS, Bhatye (Ratnagiri) during 1958, 1979 and 1995.

In the Konkan region of Maharashtra State most of the established coconut plantations are of tall cultivar, West Coast Tall (WCT). The Banawali, tall

cultivar is mostly cultivated in Sindhudurg district of Maharashtra. Its fruits are smaller in size as compared to the WCT. The Banawali being a tall growing cultivar of coconut, is highly cross-pollinated and therefore, lots of variations are noticed in colour, size, shape and yield. Considering these factors five typical local Banawali types were collected from Aronda village, Vengurle Tal., Sindhudurg Dist. (Maharashtra), in 1958 and included in the coconut germplasm of this Station. The details of the germplasm are given below.

All the cultivars were planted in the groups under uniform management. The soil type is coastal sandy soil. The palms were given uniform recommended dose of fertilizers and maintained under irrigated condition.

The first set of 4 exotic, 4 indigenous, 5 local and one hybrid planted in 1958 have been evaluated for their attributes

Table 1. Information of germplasm

Cultivars	No. of cultivars	Year of planting	Source
Exotic	4	1958	CPCRI, Kasaragod
	10	1979	CPCRI, Kasaragod
	1	1995	CRS, Ambajipeta
Indigenous	4	1958	CPCRI, Kasaragod
	6	1979	CPCRI, Kasaragod
	1	1995	CRS, Ambajipeta
Local	5	1958	Konkan region
Hybrid	1	1958	CPCRI, Kasaragod
Total	32		

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and morphological characters. On the basis of critical evaluation, so far one cultivar was released and two cultivars and one hybrid were recommended for general cultivation in Konkan region of Maharashtra.

Results and Discussion

After evaluating the cultivars and one hybrids on the basis of yield in terms of number of nuts, copra and oil per palm per year and per hectare, the three tall cultivars viz. Laccadive Ordinary (1985), Banawali Green Round (1987), Philippines Ordinary (1995) and one hybrid T x D (WCT x COD) (1989) have been recommended for cultivation in Konkan region of Maharashtra. Out of

these, the cultivars, Banawali Green Round has been released in the name of 'Pratap'.

The yield in terms of number of nuts, copra and oil per palm per year and per hectare of these varieties are presented in Table 2 and 3.

As regards the mean yield of last 22 years (1978 - 2000) Laccadive ordinary produced the highest yield of 147 nuts/palm/year followed by Pratap (141 nuts), T x D (130 nuts) and Philippines Ordinary (105 nuts). These varieties produced 66.3%, 59.4%, 47.7% and 19.2% more yield in terms of nuts respectively over WCT.

The Philippines Ordinary produced more copra per nut (214 gm.) followed by T x D (182 gm.), WCT (153 gm.), Pratap (151 gm.) and LO (140 gm.). However, maximum copra produced per palm and per ha by T x D hybrid (23.7 kg and 4.1 tonnes), was followed by Philippines Ordinary (22.5 kg and 3.9 tonnes), Pratap (21.4 kg. & 3.7 tonnes) and LO (20.6 kg. & 3.6 tonnes) whereas WCT produced only 13.6 kg. & 2.4 tonnes) respectively.

The T x D recorded 70.8%, Philippines Ordinary 62.5%, Pratap 54.2% and LO recorded 50% more copra yield than WCT.

The oil percentage was highest in Laccadive ordinary (72.2%) followed by T x D (70.82%), Philippines Ordinary (69.60%) and Pratap (68.42%). However the highest oil was produced per palm and per ha by T x D hybrid (16.8 kg. and 2.9 tonnes) followed by Philippines Ordinary (15.7 kg & 2.7 tonnes), Laccadive Ordinary (14.8 kg. & 2.6 tonnes) and Pratap (14.6 kg. & 2.6 tonnes) respectively.

The T x D recorded 70.6%, Philippines Ordinary 58.8% and LO and Pratap recorded 52.9% more oil yield than WCT.

Table 2. Performance of released / recommended cultivars / hybrids. (yield of nuts)

Name of the cultivar/hybrid	Released/recommended year	Cumulative yield of nuts for 22 years	Mean yield of nuts per palm per year	Percentage increase in yield over WCT
Laccadive Ordinary*	1985	3233.56	147	66.3
Banawali Green Round** (Pratap)	1987	3099.56	141	59.4
Philippines Ordinary*	1995	2317.26	105	19.2
T x D (WCT x COD)*	1989	2859.34	130	47.8
WCT*	-	1952.94	89	-

** Released

* Recommended

Table 3. Performance of released / recommended cultivars / hybrids (yield - copra & oil)

Name of the cultivar/hybrid	Yield (copra)				Yield (oil)			Percentage increase over WCT
	wt. of copra per nut (gm)	wt. of copra per palm (kg)	wt. of copra per ha (t)	percentage increase over WCT	Oil %	Oil per palm (kg)	Oil per ha (t)	
Laccadive Ordinary	140.5	20.7	3.6	50	72	14.9	2.6	52.9
Banawali Green Round (Pratap)**	152.0	21.4	3.7	54.2	68.42	14.6	2.6	52.9
Philippines Ordinary	214.0	22.5	3.9	62.5	69.6	15.7	2.7	58.8
T x D (WCT x COD)	182.0	23.7	4.1	70.8	70.82	16.8	2.9	70.6
WCT	154.6	13.7	2.4	-	68.16	9.4	1.7	-

** Released

Performance of Other Coconut Cultivars

The yield data of other cultivars (except the above mentioned cultivars) are presented in Table 4. The F.M.S. recorded the highest mean (for 22 years) yield of 110.30 nuts/palm/year followed by Fiji (108.4 nuts).

The Gangabondam (GB) recorded higher copra per nut (177.6 gm.) followed by New Guinea (168.2 gm.). The Fiji recorded highest copra per palm and per ha. (17.98 kg. & 3.15 tonne) followed by Gangabondam (16.41 kg. & 2.87 tonnes) and the New Guinea (14.97 kg. & 2.62 tonnes) respectively.

Table 4. Yield and yield attributes of different cultivars

Name of the cultivars	Cumulative yield for last 22 years (1978 to 2000)	Mean yield/ palm/ year	Copra			Oil		
			Per nut (gm)	Per palm (kg)	Per ha (t)	Oil (%)	Per palm (kg)	Per ha (t)
F.M.S.	2426.6	110.30	121.6	13.4	2.4	68.70	9.2	1.6
Fiji	2385.0	108.4	165.9	18.0	3.2	70.6	12.7	2.2
Gangabondam	2032.8	92.4	117.6	16.41	2.9	62.3	10.2	1.8
Kappadam	1973.8	89.7	144.0	12.92	2.3	65.4	8.5	1.5
New Guinea	1958.6	89.0	168.2	14.97	2.6	70.6	10.5	1.8
Banawali Types								
Banawali Yellow Round	2642.4	120.1	133.5	16.03	2.8	69.3	11.1	1.9
Banawali Green Long	2520.8	114.6	172.0	19.71	3.6	68.5	13.5	2.4
Banawali Red Round	2294.6	104.3	147.5	15.38	2.7	70.0	10.8	1.9
Banawali Yellow Long	2464.7	112.0	136.7	15.32	2.7	70.0	10.7	1.9

As regards the oil percentage, the highest oil percentage was obtained from Fiji (70.6%) followed by New Guinea (70%), F.M.S (68.7%) and GB

(62.3%). The highest oil per palm and per ha. was recorded by Fiji variety (12.7 kg. & 2.2 tonnes) followed by New Guinea (10.5 kg. & 1.8 tonnes), GB (10.2 kg. & 1.8 tonnes).

Among the four Banawali types, Banawali Yellow Round (BYR) produced maximum mean nut yield for 22 years (120.1 nuts) followed by Banawali Green Long (BGL) (114.6 nuts.) However the maximum copra per nut, per palm and per ha. was produced by Banawali Green Long (BGL) (114.6 nuts.) However the maximum copra per nut, per palm and per ha. were produced by Banawali Green Long (BGL), 172 g, 19.71 kg. & 3.6 tonnes respectively.

The highest oil percentage was observed in Banawali Red Round (70%) and Banawali Yellow Long (70%). However highest production of oil per palm and per ha. was recorded by cultivar Banawali Green Long (BGL) 13.5 kg. & 2.4 respectively.

Table 5. Morphological characters of the recommended / release cultivars and hybrids

Characters	W.C.T.*	LO*	Pratap**	T x D**	Philippines* Ordinary
No. of leaves on the crown	28-35	30-35	29-34	28-30	35-37
No. of leaf scars of 1 m. length	17-20	14-16	14-16	14-22	24-32
Length of petiole (cm)	89-109	130	140	118-124	111-120
Length of let bearing portion (cm.)	319-388	398	392	308-324	332-381
No. of leaf lets (cm)	319-388	228	238	292-342	202-230
Length of leaf lets (cm)	100-120	136	141	121-149	114-149
Breadth of leaf lets (cm)	5-7	6-8	6-9	4.5-5.5	6-7
Length of inflorescences (cm)	86-108	108-181	74-100	85-98	90-125
No. of spike lets	29-35	31-39	20-46	17-55	29-34
No. of female flowers	12-29	23-44	20-41	10-28	8-36
No. of bunches	11-15	12-14	12-14	12-16	10-15
Fruit shape	Round oblong with prominent ridges	Oblong with prominent ridges	Round with ridge	Oblong	Round
Wt. of husk (gm.)	305.94	405.05	317.92	440.18	377.80
Wt. of shell (gm.)	146.58	128.48	130.99	153.07	205.94
Wt. of meat (gm)	248.42	202.88	244.03	308.38	393.16

** Released

* Recommended

- Conclusion**
1. The cultivar Banawali Green Round was released in the name of 'Pratap'. Two cultivars viz. Laccadive ordinary, Philippines ordinary and one hybrid T x D (WCT x COB) have been recommended for cultivation in Konkan region of Maharashtra State.
 2. All the released / recommended cultivar/variety recorded higher yield in terms of number of nuts, copra and oil per ha than WCT (i.e. 19.2 to 66.3%, 50 to 70.8% and 52.9 to 70.6% respectively).
 3. The highest nut yield in the term of number of nuts was recorded by the tall cultivar, Laccadive ordinary (147/nuts/palm/year).
 4. The highest copra per nut was recorded in the cultivar Philippines Ordinary (214 gm)



However, the highest copra per palm and per ha was recorded in the hybrid variety T x D.

The highest oil percentage was recorded in the tall cultivar Laccadive ordinary (72%). However, oil per palm and per ha. were maximum in the hybrid variety T x D (16.8 kg. & 2.9 tonnes respectively).

In another set of cultivars, F.M.S. recorded the highest mean yield in terms of number of nuts (110.30). However copra and oil per palm and per hectare were recorded highest by Fiji, 18.0 kg., 3.2 tonnes and 12.7 kg. and 2.2 tonnes. respectively.

Among the Banawali types 'Banawali Yellow Round'

recorded highest yield in terms of number of nuts (120.1). However 'Banawali Green Long' recorded highest copra per palm (19.71 kg) and per hectare 3.6 tonnes). and also the oil per palm (13.5 kg.) and per hectare (2.4 tonnes).

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