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Performance of some coconut cultivars and hybrids in alluvial plains of West Bengal

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ABSTRACT

Coconut has a long productive period hence, selection of quality materials are of utmost important for increasing the productivity in coconut garden can be increased by improving the genetic potential. An evaluation trial was done under AICRP on Palms at Horticultural Research Station, Mondouri, Bidhan Chandra Krishi Viswavidyalaya, West Bengal to evaluate the performance of seven cultivars of coconut namely - Philipines Ordinary, Laccadive Ordinary, Andaman Ordinary, Laccadive Micro, S S Green, East Coast Tall, West Coast Tall and three hybrids namely COD x WCT, WCT x COD and MYD x WCT during 2004 and 2005.The materials were supplied from CPCRI and planted in 1986 spaced at 7.5 x 7.5 m. in RBD with 3 replication and 4 plants for each treatment. It was observed that the bunch production was maximum in hybrid COD x WCT (9.4 palm^{-1}) followed by Philippines Ordinary (8.4 palm^{-1}). The nut yield per palm was recorded maximum (105.2 palm^{-1}) in Laccadive Micro followed by 92.6 palm^{-1} in COD x WCT. The copra yield was highest in COD x WCT (9.3 kg) followed by Laccadive Ordinary (9.2 kg). The hybrid CODXWCT (Chandrasankara), Lacadive Ordinary, Lacadive Micro and Philipines Ordinary performed better than the other cultivar or hybrids in West Bengal.

Keywords : Coconut, cultivars, hybrids, performance

Improving the genetic potential and increasing the productivity availability of good planting materials would result in improvement and better returns will be an important plank for future strategies in coconut farming. A committee formed by CDD has assessed the seedling requirement at 14 million by 2014 AD and estimated the gap between demand and supply to be of the order of 7 million (Mathew, 2006). India had considerably increased the area under coconut from 71,700 ha in 1960 to 19,35,000 ha in 2004. No doubt the coconut production has considerably increased from 4639 million nuts to 12251 million nuts. However the productivity has shown only a slight increase from 6466 nuts ha^{-1} to 6632 nutsha^{-1} (Rethinam 2007). The strategies for achieving the goal for improving the production and productivity in coconut garden can be achieved by improving the genetic potential of coconut or by suitable cropping system (Ghosh and Bandyopadhyay, 2011). Dearth of quality and good planting material is one of the main problem faced by coconut farmer. Since coconut is a perinial crop which has a very long productive period, selection of right planting materials is of utmost important. A germplasm evaluation trial was conducted to evaluate the performance of indigenous and exotic cultivar of coconut in gangetic plains of West Bengal.

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Among the ten cultivars / hybrids under trial The length of petiole was recorded maximum 195 cm in Philippines Ordinary compared to 148 and 146 cm in WCT x COD and S. S. Green respectively (Table 1). Leaf length recorded maximum (564 cm) in WCT x COD followed by WCT (532 cm) compared with 249 cm in Laccadive Ordinary. The number of leaflets varies between 112 and 242 among the different varieties and hybrids. The length of leaflets was maximum in Local Tall (127 cm) followed by Lacadive Ordinary(121cm) and WCT x COD (117 cm) compared with 96 cm in MYD x WCT.

Data presented in the table 2, revealed that the bunch production was maximum in hybrid COD x WCT (9.4 palm^{-1}) followed by Philippines Ordinary (8.4 palm^{-1}). S.S. Green produced minimum number of bunches (6.1 palm^{-1}).The nut yield per palm was recorded maximum (105.2 palm^{-1}) in Laccadive Micro followed by 92.6 palm^{-1}in COD x WCT while it was lowest in S. S. Green (57.6 palm^{-1}) .The average nut weight showed variation among different cultivars and hybrids (Table 2). The

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average nut weight was recorded maximum in S. S. Green (1882 g) followed by Andaman Ordinary (1855 g). The minimum nut weight was observed in Laccadive Micro (1265 g). It is evident from the data presented in table 2 that the copra yield was highest in Philipines Ordinary (9.4kg palm^{-1}yr^{-1}) followed by COD x WCT (9.3 kg) and Laccadive Ordinary (9.2 kg) as compared to (6.2 kg) in ECT. The oil yield was recorded maximum in Philipines Ordinary (6.3 kg palm^{-1}) followed by COD x WCT (5.8 kg) as compared to (4.2 kg) in ECT.

Coconut improvement is a difficult and time consuming process mainly because of its long gestation period, large area, complex resources required for experimentation and the low seed multiplication ratio. The Indian coconut cultivars population is comprised of enormous variability occurred over the years of

Table 1: Vegetative characters of different coconut cultivars and hybrids

Cultivars and hybrids	Petiole length (cm)	Leaf length (cm)	No. of leaflets	Length of leaflets (cm)
East Coast Tall	157	437	203	127
Andaman Ordinary	189	368	112	103
Laccadive Ordinary	171	249	116	121
Laccadive Micro	173	403	183	114
Philippines Ordinary	195	412	129	117
S.S. Green	146	457	198	101
West Coast Tall	157	532	217	103
COD x WCT	158	436	198	108
WCT x COD	148	564	242	117
MYD x WCT	144	378	207	96
SEm (±)	**2.062**	**6.069**	**1.330**	**1.330**
LSD(0.05)	**6.128**	**18.031**	**3.951**	**3.951**

Table 2: Yield and yield parameter of different coconut cultivars and hybrids

Cultivars and hybrids	No. of bunches palm^{-1}	No. of nut palm^{-1}	Nut weight(g)	Copra palm^{-1} yr^{-1}(kg)	Oil palm^{-1}yr^{-1} (kg)
East Coast Tall	6.8	58.9	1710	6.2	4.2
Andaman Ordinary	7.7	78.5	1855	8.5	5.7
Laccadive Ordinary	7.8	84.7	1418	9.2	5.8
Laccadive Micro	7.4	105.2	1265	7.9	4.8
Philippines Ordinary	8.4	81.3	1456	9.4	6.3
S.S. Green	6.1	57.6	1882	7.2	4.7
West Coast Tall	6.8	61.7	1372	6.9	4.6
COD x WCT	9.4	92.6	1342	9.3	5.8
WCT x COD	8.1	76.4	1432	8.6	5.3
MYD x WCT	7.9	59.2	1428	6.7	4.1
SEm (±)	**0.097**	**1.463**	**22.094**	**0.116**	**0.074**
LSD(0.05)	**0.290**	**4.347**	**65.638**	**0.346**	**0.220**

Table 3: Tender nut quality of different coconut varieties and hybrids

Cultivars and hybrids	Volume of water (ml)	pH	TSS (^{0}brix)	Total sugar (g100ml^{-1})	Reducing sugar (g100ml^{-1})
East Coast Tall	264.1	4.82	5.7	5.13	4.7
Andaman Ordinary	245.2	4.73	5.3	4.27	4.01
Laccadive Ordinary	265.1	4.66	6.1	5.15	4.53
Laccadive Micro	238.2	4.91	5.4	4.21	4.00
Philippines Ordinary	305.2	5.10	6.2	5.32	4.67
S.S. Green	245.8	4.94	5.7	4.21	3.98
West Coast Tall	245.4	4.92	5.2	4.92	4.06
COD x WCT	268.2	5.10	5.4	4.81	4.25
WCT x COD	260.4	4.58	5.6	4.91	4.37
MYD x WCT	255.4	4.67	5.5	4.75	4.21
SEm (±)	**2.682**	**0.042**	**0.057**	**0.048**	**0.044**
LSD(0.05)	**7.969**	**0.124**	**0.172**	**0.144**	**0.132**

cultivation. Improvement in yield potential so far achieved in coconut has been through conventional breeding methods like selection and hybridization. It is well established that the performance of the cultivar in a locality, is a function of its genotype and environment. Therefore, the performance will vary under different agro-climatic situations

The quality and acceptability of tender coconut water is governed by the maturity of the nuts, variety, agro-climatic conditions and agronomic practices. Maximum volume of water was observed in case of Philipines Ordinary (305.2 ml) followed by COD x WCT (268.2 ml). Maximum pH (5.1) of tender nut water was also observed in COD x WCT. The tender nut water of Philipines Ordinary exhibited the highest TSS (6.2^0 brix) and total sugar (5.32 g100 ml^{-1}). These results are in good agreement with Ganesamurti *et al. (*2002) and Mali *et al.,* (1994). Considering the important physico-chemical parameters, the cultivars Philipines Ordinary, Lacadive Ordinary and hybrid COD x WCT were found to have appreciable amount of tender nut water and sugar during the 7^{th} month after fruit set and may be suggested for tender nut purpose and considering the yield parameters like bunches and nut, copra and oil yield $palm^{-1}$of these coconut cultivars/hybrid were found best for copra or oil yield.

Evaluation of coconut hybrids for their suitability as tender nut was undertaken by Apshara *et al.* (2007). Physical, bio-chemical, organoleptic characters and mineral composition of tender coconuts of six released hybrids COD x WCT (Chandrasankara), LCT x COD (Chandralaksha), LCT x GBGD (Lakshaganga), WCT x COD (Kerasankara), WCT x GBGD (Keraganga), WCT x MYD (Kerasree) were studied with COD (Chowghat Orange Dwarf) as control. Fruits were harvested at three different stages of maturity. Quantity and quality of tender nut water and meat differed significantly among the hybrids and between the stages of maturity. The tender nuts of hybrids COD x WCT and LCT x COD weighed less but have more volume of water. TSS and pH were the maximum in the same hybrids. Total sugars, reducing sugars and amino acid contents were more in COD x WCT and LCT x COD. Minerals, such as potassium and sodium were at optimal levels in the same hybrids. Organoleptic evaluation showed that the hybrids Chandrasankara and Chandralaksha were the best for tender nut purpose as both of them ranked good for taste of water and meat at the age of 7 months during summer season. The fruit quality parameters of different cultivars of guava have been resulted significant variation in TSS, acidity, total sugar and ascorbic acid content among the cultivars. Ghosh *et. al,(*2013).

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