

Inflorescence and nut characters of some coconut cultivars and hybrids grown in West Bengal

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Abstract

Inflorescence, nut characters and productivity of seven cultivars and three hybrids of coconut grown in West Bengal were investigated. Most of the cultivars and hybrids exhibited distinct variations in their yield, inflorescence, and nut characters. D x T, T x D and WCT performed relatively good with respect to nut production per annum. While considering the yield influencing variables, viz., number of spikelets with female flowers, number of spikelets per spadix and number of nuts per spadix, cv. Local Tall was most prominent followed by D x T and MDY x WCT. Largest fruit with highest water content was produced by cv. Local Tall, closely followed by S.S. Green and Andaman Ordinary. However, cv. Andaman Ordinary and S.S. Green were poor yielder under this agro-climatic condition.

Key words: Coconut, cultivars, hybrids, inflorescence, nut, morphological characters.

Introduction

Coconut (*Cocos nucifera* Linn.) is a multipurpose crop of commercial importance. In West Bengal, coconut is grown in the districts of 24 Parganas (North and South), Midnapur, Howrah, Hooghly and Nadia, which are the main centers of production (Chattopadhyay and Mitra, 1993). The estimated area occupied by coconut in West Bengal is about 19.8 thousand hectare with a production of 238.5 million nuts per annum (Anon, 1991). West Bengal being situated in the tropical humid region is suitable for coconut cultivation on commercial scale. However, it is still a crop of homestead garden and tender nuts are mainly used as refreshing drink. Hence, there is an immense need to popularize its commercial cultivation by identifying cultivars and hybrids suitable for manufacturing various industrial products such as coconut oil, coconut milk, coconut cream, desiccated coconut, shell charcoal, coir and coir products etc. Information on yield potentiality and nut characters of various cultivars and hybrids grown particularly in West Bengal will help growers to select suitable cultivars to meet the demand of local market as well as the demand of coconut based industries. Therefore, the present study was carried out to study the production potentialities and morphological characters of nut and inflorescence of some coconut cultivars and hybrids grown in West Bengal.

Materials and methods

The investigation was carried out at the Horticultural Research Station, Mondouri of Bidhan Chandra Krishi Viswavidyalaya, Mohanpur, Nadia, West Bengal. Inflorescence, nut characters and productivity of seven cultivars viz., Local Tall, Laccadive Micro, West Coast Tall (WCT), Straight Settlement Green (SS Green), Philippines Ordinary, Andaman Ordinary and Laccadive Ordinary and three hybrids viz., Malayan Dwarf Yellow x West Coast Tall (MDY x WCT), D x T (Malayan Dwarf Orange x West Coast Tall) and T x D (West Coast Tall x Malayan Dwarf Orange) were studied. The plants were fifteen years old and

spaced at 7 m apart. The trial was laid out in a randomized block design with four replications. Inflorescence characters such as number of spadix, number of spikelets/spadix, number of female flowers etc. were recorded. Yield and morphological characters of nut viz., length and diameter of fruit, weight and thickness of nut, kernel, husk, water content etc. were also studied. Analysis of variance was performed according to Panse and Sukhatme (1985). The yield attributing characters that account for the majority of variability was determined following principal component analysis (Dillon and Goldstein, 1984).

Results and discussion

It is evident from Table 1 that among all the cultivars and hybrids evaluated, D x T, T x D and West Coast Tall performed well with respect to annual nut production. D x T produced highest number of spadix per plant (9.2), number of female flowers per spadix (102.0) and yield (161.9 nuts per palm per annum). Vijayaraghavan *et al.* (1993) and Harries (1974) also reported the excellent performance of D x T in their respective studies. Besides that T x D and West Coast Tall also exhibited good yield in this region by producing 90.2 and 80.4 nuts per palm per annum, respectively. In the present study, Local Tall and MDY x WCT produced fairly good number of nut per annum. However, Andaman Ordinary, SS Green, Laccadive Ordinary and Laccadive Micro did not perform well in this agro-climatic condition. The higher number of nuts per palm produced by D x T might be due to higher number of spadix and female flower per spadix. Although SS Green produced good number of spadix per palm but lesser number of female flowers per spadix drastically affected nut production. The poor nut production of Andaman Ordinary may be due to lower number of spadix and spikelets per palm.

The results of principal component analysis for yield attributing characters of coconut cultivars and hybrids are presented in Table 2. Retaining those components having Eigen values greater than one, it was found that three components accounted for more than

Table 1. Morphological characters of inflorescence and yield of different coconut cultivars and hybrids

Cultivars/ Hybrids	No. of spadix/ plant/ year	No. of spikelets/ spadix	No. of spikelets with flower	No. of spikelets without female	No. of female flowers/ spikelet	No. of females/ spadix	No. of nuts/ spadix	Yield (nuts/ plant/ year)
Laccadive Micro	8.3	38.3	25.7	12.7	6.7	42.0	5.7	47.3
Laccadive Ordinary	8.0	37.0	15.3	21.7	14.7	70.6	4.8	38.4
Andaman Ordinary	6.0	38.7	19.3	19.3	10.6	71.3	3.6	21.6
Philippines Ordinary	8.2	39.3	25.7	13.6	3.7	31.7	7.1	58.2
Local Tall	8.0	45.3	42.0	3.3	10.0	79.0	7.9	63.2
West Coast Tall (WCT)	8.2	40.0	33.0	7.0	9.0	43.3	9.8	80.4
SS Green	8.5	43.0	27.0	16.0	8.3	42.0	2.7	23.0
MDY x WCT	8.3	46.3	26.0	20.3	3.0	28.3	9.8	74.7
D x T	9.2	40.3	29.0	11.3	11.7	102.0	17.6	161.9
T x D	8.9	37.3	18.7	18.6	11.0	44.3	10.3	90.7
C.D. ($p = 0.05$)	NS	5.7	6.7	11.1	3.9	6.9	4.8	13.7

Table 2. Eigen values, explained variance and component loadings

Particulars	Factor 1	Factor 2	Factor 3
Eigen value	2.645	1.999	1.280
Percentage variance	37.787	28.559	18.280
Cumulative variance	37.787	66.346	84.626
No. of spadix/plant/year	0.285	0.106	0.697
No. of spikelets/spadix	0.412	-0.302	-0.172
No. of spikelets with female flower	0.578	-0.037	-0.279
No. of spikelets without female flower	-0.513	-0.117	0.266
No. of female flowers/spikelet	0.181	0.616	-0.170
No. of female flowers/spadix	0.089	0.625	-0.262
No. of nuts/spadix	0.334	0.334	0.488

84 per cent of total component loadings, for the first three factors. The variable loading on component 1 which explains 37 per cent variations revealed that number of spikelets with female flower, number of spikelets per spadix and number of nuts per spadix were yield influencing variables, while number of female flowers per spikelet and number of spikelets without female flowers had opposite effect. Due to these yield impact variables the performance of Local Tall was prominent followed by D x T and MDY x WCT. Component 2 was mostly dominated by number of female flowers per spadix and number of female flowers per spikelet which rendered D x T as prominent followed by Local Tall and Laccadive Ordinary. While explaining another 18 per cent of cumulative variance the hybrids *viz.*, MDY x WCT

and T x D appeared to be prominent due to the positive effect of yield influencing variables such as number of spadix per plant per annum and number of nuts per spadix, however most of the other variables acted as inhibiting factor on these hybrids.

Most of the cultivars and hybrids under study showed distinct variations in their morphological characters of nut (Table 3). Local Tall produced largest nut with maximum water content (413.33 ml). Weight and thickness of kernel was maximum with Philippines Ordinary (306.7 g and 1.76 cm, respectively), closely followed by D x T, SS Green and T x D while Andaman Ordinary and Laccadive Micro recorded lowest kernel weight and thickness. Similarly, thickness of husk was also maximum with Philippines Ordinary (2.86 cm) and minimum with Andaman Ordinary (1.67 cm).

In the present study, it was observed that, although Local Tall produced heavy fruits but the weight and thickness of kernel was not proportionately high. However, water content in Local Tall was found maximum which might have rendered the high fruit weight. Besides that, its nut yield/year was also moderate in this agro climatic condition. Therefore, considering the high water content and moderately good nut production, the cultivar 'Local Tall' may be commercially exploited for production of tender coconut, which is of high demand in this region. Besides that, it can also be utilized for manufacturing concentrates of coconut-water and vinegar that may fetch higher return to the growers.

Table 3. Morphological characters of nut of different coconut cultivars and hybrids

Cultivars/ Hybrids	Length (cm)		Diameter (cm)		Weight (g)		Shell weight (g)	Kernel weight (g)	Kernel thickness (g)	Husk weight (g)	Husk thickness (g)	Volume of water (ml)
	Whole nut	Dehusked nut	Whole nut	Dehusked nut	Whole nut	Dehusked nut						
Laccadive Micro	18.56	11.66	13.56	9.20	1486.7	506.7	116.7	176.7	1.00	1046.7	2.06	168.3
Laccadive Ordinary	20.46	11.36	14.46	10.30	1356.7	596.7	166.7	260.0	1.06	760.0	2.61	138.3
Andaman Ordinary	19.10	10.33	13.76	10.70	1953.3	740.0	193.3	173.3	0.73	1133.3	1.67	311.7
Thilippines Ordinary	22.16	12.43	13.63	10.43	1346.7	773.3	183.3	306.7	1.76	573.3	2.86	216.7
Local Tall	21.70	12.73	17.33	12.53	2040.0	883.3	130.0	260.0	1.03	1123.3	2.30	413.3
WCT	20.50	11.20	14.53	9.70	1306.7	625.7	164.3	238.0	0.93	681.0	2.22	215.7
SS Green	20.30	11.00	13.40	11.30	1966.7	990.0	210.0	266.7	1.16	1003.3	2.32	331.7
7MDY x WCT	17.83	10.30	14.43	11.16	1240.0	616.7	166.7	256.7	1.00	623.3	2.66	181.7
D x T	19.36	10.76	12.73	11.66	1346.7	713.3	223.3	290.0	1.13	1613.3	2.64	175.0
T x D	20.90	12.63	15.40	12.40	1613.3	713.3	183.3	263.3	1.10	900.0	2.30	158.3
C.D. ($p = 0.05$)	0.67	0.70	0.51	0.44	244.0	106.3	38.4	55.9	NS	NS	0.17	82.4

With respect to coconut production, Philippines Ordinary and D x T proved to be the most promising type. Besides that, Philippines Ordinary, MDY x WCT and D x T exhibited appreciable potential for husk production, which is an important raw material for coir producing industries. Thus, by making proper selection of cultivars/hybrids one can not only produce more nuts for domestic uses, but also supply raw materials to various coconut-based industries, thereby increase the scope of popularizing commercial cultivation of coconut in this region.

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