

- Stein, H. 1958. An analysis of a case of hybrid vigour in the castor bean plant. *Plant Breed. Abstr.*, 29: 2382.
- Varisai Muhammad, S., N. R. Chandrasekaran, K. Navakodi and B. Karunakara Shetty. 1965. Preliminary studies on the general combining ability of certain inbred types of castor. *Madras agric. J.*, 52: 452 (Abstr.)
- , and M. Stephen Dorairaj. 1967. Inheritance studies in *Ricinus Communis* L. - II. Number of nodes upto the main inflorescences. *Ibid.*, 54: 648-50.
- Zimmerman, L. H. and D. L. Van Horn. 1953. Performance of castor inbred lines and their hybrid combinations with Nebraska-145-4. *Plant Breed. Abstr.*, 24: 943.

<https://doi.org/10.29321/MAJ.10.A03580>

## A Critical Study on the Comparative Performance of Dwarf Cavendish and Robusta in the Palar Basin of North Arcot District in Tamil Nadu

by

C. M. BHAKTHAVATHSALU<sup>1</sup>, P. MANICKAVASAGAM<sup>2</sup>, S. SATHIAMOORTHY<sup>4</sup>, and T. T. KALIAPERUMAL<sup>1</sup>

**Introduction:** In banana the leading clones in world trade are Gros Michel, Lacatan, Robusta, Dwarf Cavendish and to lesser extent Lady's Finger (Virupakshi) in Australia. Of bananas entering the export trade, about 63% is Gros Michel and 35% is Cavendish bananas. In recent years, the area under Gros Michel has gone down considerably due to its susceptibility to Panama disease. The clone Gros Michel is now tending to be replaced by Cavendish clones, especially Robusta due to its immunity to Panama disease. Cavendish clones, especially Dwarf Cavendish are being cultivated in Tamil Nadu for a long time. A high yielding mutant of Dwarf Cavendish known as Robusta was spotted and developed by the Central Banana Research Station, Aduthurai. In view of our export prospects of Robusta this clone was selected for popularisation in the Dwarf Cavendish belt of North Arcot situated in the Palar basin. The Comparative performance of these two clones are presented in the paper.

**Materials and Methods:** A total number of ten representative gardens were selected in the Dwarf Cavendish belt of Palar Basin in North Arcot District of Tamil Nadu. Fifty suckers in each of Robusta and Dwarf Cavendish were planted in adjacent plots in two main planting seasons January and August, commencing from January, 1966. The studies were conducted in three seasons viz. January, 1966, August, 1966 and January, 1967. Both the clones were grown under identical conditions. The manurial schedule and other cultural operations adopted also were similar.

---

1. Banana Research Officer. 2, 3 & 4. Research Assistants, Central Banana Research Station, Aduthurai.

A comparative account of these two clones is furnished in Table

TABLE 1. *Comparison of the two clones*

Characters	CLONES	
	Robusta	Dwarf Cavendish
Height of plant	210-250 cm	140-170 cm
Weight of bunch	25 kg	15 kg
No. of fingers per bunch	180-200	100-120
Yield per hectare	62 tonnes	37 tonnes
Suitability to ratoon crop	Amenable to ratoon	Not profitable
Susceptibility to choke	Not affected by choke	Susceptible to choke
Annual sucker production per plant	5	3

The yield data for the three seasons were analysed statistically and the results are summarised in Table 2.

In general, the productivity was low in all the centres due to adverse climatic conditions. In spite of this Robusta has performed better than Dwarf Cavendish.

TABLE 2. *Mean Bunch Weight*

January, 66 planting			August, 66 planting			January, 67 planting		
Robusta	Dwarf Cavendish	S.E.	Robusta	Dwarf Cavendish	S.E.	Robusta	Dwarf Cavendish	S.E.
16.7	14.6	0.64	20.0	15.9	0.46	19.6	14.3	0.60
16.6	14.7	0.44	20.2	15.9	0.50	15.4	12.9	0.58
13.6	10.6	0.29	17.6	14.6	0.52	16.1	11.4	0.59
15.6	13.5	0.35	20.7	15.5	0.51	18.7	14.4	0.44
16.2	14.4	0.34	17.9	15.4	0.30	12.7	9.3	0.60
13.1	12.2	0.50 NS	12.2	13.2	1.79 NS	20.5	14.2	0.69
13.2	13.1	0.35 NS	17.8	14.3	0.66	15.5	14.2	0.38
			15.6	13.5	0.48	15.6	14.2	0.52
			14.7	14.7	—	18.0	15.3	0.63

NS: Not significant.

Robusta gave significantly higher yields over that of Dwarf Cavendish in all the three seasons. The clone Robusta yielded bunches weighing 28 kg with 12 hands containing 180 fruits compared to bunches weighing 7 kg with 8 hands containing 120 fruits in Dwarf Cavendish. The mean length and mid-circumference of the fruit of 'Robusta' were 17.0 cm and 14.0 cm respectively as against 13 cm and 10 cm recorded by Dwarf Cavendish. Besides, the bunch characters of Robusta are very important from the commercial point of view and more so in export trade. Robusta has thrown heavier bunches having uniform orientation of fruits in well spaced hands

which are of value in commerce. The cylindrical shape of the bunch renders handling and storage easy with minimum wastage during the process (Plate I). The Dwarf Cavendish bunches are more tapering and the fruits are short, closely packed and project badly from the bunch on account of which they are more susceptible to bruising and wastage in handling and storage (Plate II). Besides, the clone 'Dwarf Cavendish' is often predisposed to 'choke' - an impeded bunch emergence related to adverse conditions of growth, though less susceptible to wind damage because of its short stature. On account of its desirable commercial traits, 'Robusta' has a good reception in the market and fetches a premium price. Robusta gives an additional production of about 25 tonnes/ha over the normal yield of 37 tonnes/ha given by Dwarf Cavendish.

**Discussion :** In international trade, the leading clone Gros Michel is now tending to be replaced by Cavendish clones, especially Robusta because of the susceptibility of Gros Michel to Panama disease and the high immunity of Robusta to this malady. According to Berril (1955) the mutant has to be tested along with its mother to ascertain whether it is superior or inferior. In this study, the mutant, Robusta has been tested in the field in farmer's holdings and the mutant has proved its superiority over Dwarf Cavendish, the established commercial clone of the locality in respect of bunch weight, number of fruits, shape of the bunch etc. In addition, Robusta was observed to be a hardy clone and has performed better than Dwarf Cavendish even under adverse conditions. Bunches of Robusta are cylindrical in shape with well oriented fingers. The first and the last are more or less similar. On the other hand, because of more tapering bunch shape and octopus hands the Dwarf Cavendish is subjected to more wastage.

The boxing system of packing is now proving popular in export trade; hence the shape of bunch may not carry much significance but uniform orientation of the fingers in the hand like that of Robusta will certainly count much when compared to the flayed out fingers of Dwarf Cavendish known as octopus hands.

The specifications prescribed by State Trading Corporation for boxing of Cavendish bananas to be exported to Japan are as follows :

1. No. of fruits per hand : 12 to 20.
2. Arrangement of fruits in the hands : Hands should be compact and octopus hands are disqualified.
3. Length of fruit : Not less than 9" (23 cm)
4. Quality of fruit : Absolutely free from bruising or blemishes.

Judged from the above standard, more than 70% of hands in Robusta bunch satisfy the export specifications whereas in Dwarf Cavendish it may be about 2 hands per bunch (20%). Further, the close Robusta yields an additional profit of Rs. 7,500/- per hectare as detailed in Table 3.

TABLE 3. *Economics of raising Robusta (per hectare)*

	Robusta	Dwarf Cavendish
Yield (tonnes)	62	37
Total cost of cultivation (Rs.)	5,000/-	5,000/-
Total receipts	17,500/-	10,000/-
Net Profit	12,500/-	5,000/-

**Summary and Conclusion:** The performance of the two important Cavendish clones—Robusta and Dwarf Cavendish was studied for three seasons. Robusta fared well in respect of bunch shape, bunch weight, number of fruits, arrangement of fruits in the hands etc. than that of its mother, Dwarf Cavendish. The desirable bunch form of Robusta makes handling and storage easy without much damage to the fruits. Robusta is hardier than Dwarf Cavendish. Robusta satisfies the export specifications of State Trading Corporation for exporting bananas to Japan. By cultivating Robusta an additional production of 25 tonnes per hectare can be obtained over that of Dwarf Cavendish, which accounts for an additional income of Rs. 7500/- per hectare.

**Acknowledgement:** The authors are grateful to the Indian Council of Agricultural Research with whose help the project was initially launched in collaboration with the Government of Tamil Nadu. The valuable help, advice and guidance given by the Horticulturist and Associate Professor of Horticulture, Coimbatore, throughout the period of study are gratefully acknowledged. Our thanks are also due to many enlightened banana growers of the Palar Basin in North Arcot District who willingly offered their lands and help for conducting the trials.

#### REFERENCE

Berril, F. W. 1955. Dwarf and Semi-Dwarf varieties of Banana. *Queensl. agric. J.*, 80: 83-7.