IJIRR

International Journal of Information Research and Review
Vol. 1, Issue, 10, pp. 133-134, October, 2014

Full Length ResearchArticle

CONSERVATION AND PERFORMANCE OF SOME BAEL (*AEGLE MARMELOS* CORREA) GENOTYPES UNDER RAIN-FED ECOSYSTEM OF EASTERN INDIA

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ARTICLE INFO

Article History:
Received 05th July, 2014
Received in revised form
13th August, 2014
Accepted 24th September, 2014
Published online 30th October, 2014

Keywords:
Bael, Physico-Chemical Property,
Rainfed Eco-System

ABSTRACT

Nine commercial bael genotypes of 10 years age were evaluated at research center Ranchi under ICAR Research Complex for Eastern Region, Patna during 2008-09. Out of these six genotypes viz. Pant Sujata, Pant Aparna, Pant Urbashi, Barabanki Collection, Begusarai Collection and HABL-1 brought forth commercial fruiting. The maximum fruit weight of 1.2 kg was recorded in case of Pant Aparna in both the years and which was par with Pant Urbashi. The genotypes Pant Sujata and Pant Urbashi accounted for the maximum pulp weight during 2008 and 2009, respectively. In both the years the genotypes, Pant Urbashi exhibited the maximum skull weight. The minimum fruit weight and seed number were found in case of HABL-1. On the other hand genotypes, Barabanki Collection had the maximum seed numbers in both the years. Regarding fruit quality attributes, the genotype HABL-1 recorded the maximum T.S.S. of 37.0^0B and 39.0^0B in 2008 and 2009, respectively. In 2008, the genotype Pant Urbashi showed the maximum total sugar content of 12.14 per cent but Pant Sujata had the highest total sugar content (14.3 percent) in 2009.The genotypes Pant Shibani, Deoria Collection and Godda Collection did not produce flowers till 2008. The climate of this region is sub-humid and subtropical. The bael is growing here without irrigation but life saving irrigation is provided to young or adult bearing plant if needed during May –June.

INTRODUCTION

Bael fruit (*Aegle marmelos* Correa.) belongs to the family Rutaceae is lesser-known fruit famous for its medicinal value. It is a native of South East Asia and is widely distributed throughout the subtropics and tropics. It is grown throughout Indian peninsula and in dry hilly places reaching western Himalayas to the altitude of 4000 ft. Ripe bael fruit has a demand for therapeutic use. Drinks are prepared during summer for its soothing and cooling effect. Besides, it is a good source of vitamins, minerals, alkaloids and steroids. No organized orchards have been found in India. Keeping this point in view the present investigation has been done at ICAR-RCER, RC Ranchi to sort out suitable biotypes for further crop improvement programme and for commercial cultivation of bael under eastern plateau and hill region.

MATERIALS AND METHODS

The experiment was conducted at ICAR Research Complex for Eastern Region, Research Center, and Ranchi during 2008-09. This area is situated 620 m above mean sea level (msl) and at 23^0 25'N latitude and 85^0 20' East longitude experiencing an average annual rainfall of 110-140 cm. Here bael is cultivated under rainfed ecosystem. No irrigation is provided but life saving irrigation of 1-2 spells may be provided during May – June at an one month intervals to establish young plants at their initial establishment as well as mature plants for flowering and fruiting. The climate is sub-humid and subtropical type. High humidity (78.14%-84.14 %) and low evaporation rate is experienced after June and continues up to onset of winter (Singh, 1999). Soil is acidic and pH range from 5.0-6.5, which is ideal for bael cultivation. The important genotypes for evaluation were Pant Sujata, Pant Aparna, Pant Urbashi, Barabanki Collection, Begusarai Collection HABL-1, Pant Shibani, Deoria Collection and Godda Collection. The experiment was laid out in randomized block design with four replications and each cultivar represented one treatment. Fruit botanical descriptions were measured by standard methods. Titratable acidity was estimated by titrating the fruit extract with 0.1 N NaOH using phenolphthalein as an indicator and expressed as percent citric acid equivalent. Reducing and total sugar was estimated by Lane and Eynon method (Ranganna, 1977).

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Table1. Physical parameters of bael genotypes during 2008

Treatments	Fruit weight (Kg)	Polar diameter (cm)	Equatorial diameter (cm)	Skull weight (gm)	Skull thickness (cm)	Pulp weight (gm)	Seed number	Seed weight (cm)
Pant Sujata	1.242	11.48	10.55	141.5	0.23	1076.0	137.0	24.5
Pant Aparna	1.201	11.45	12.04	144.0	0.30	997.5	104.3	32.0
Barabanki Collection	0.998	12.43	12.83	163.2	0.23	806.0	144.5	30.5
Begusarai Collection	0.949	13.13	11.94	155.0	0.16	766.2	94.2	28.0
Pant Urbashi	1.166	12.70	14.33	197.5	0.17	937.9	86.5	30.3
HABL-1	0.954	10.43	10.25	123.5	0.29	814.5	59.0	18.5
CD at 5%	0.1008	0.461	0.284	15.70	0.036	18.34	2.47	6.49

*Pant Shibani, Deoria Collection and Godda Collection did not produce fruits

Table 2. Physical parameters of bael genotypes during 2009

Treatments	Fruit weight (Kg)	Polar diameter (cm)	Equatorial diameter (cm)	Skull weight (gm)	Skull thickness (cm)	Pulp weight (gm)	Seed number	Seed weight (cm)
Pant Sujata	1.077	12.43	12.36	210.0	0.25	837.0	143.2	34.0
Pant Aparna	1.213	12.84	12.16	185.0	0.23	879.0	127.0	21.2
Barabanki Collection	0.858	12.53	11.85	227.0	0.26	522.0	154.5	32.2
Begusarai Collection	0.833	12.80	11.87	160.5	0.14	702.0	83.5	23.5
Pant Urbashi	1.225	13.15	14.35	208.2	0.16	967.2	83.0	30.5
HABL-1	0.684	10.80	10.83	111.0	0.24	513.0	75.2	27.0
CD at 5%	0.072	0.747	0.617	2.20	0.023	14.40	1.96	0.80

* Pant Shibani, Deoria Collection and Godda Collection did not produce fruits

Table 3. Bio-chemical analysis of bael biotypes during 2008-09

Treatments	T.S.S. (^{O}B)		Acidity (%)		Reducing sugar (%)		Total sugar (%)	
	2008	2009	2008	2009	2008	2009	2008	2009
Pant Sujata	34.35	31.60	0.17	0.53	7.25	6.73	11.39	14.30
Pant Aparna	34.00	35.30	0.14	0.33	6.37	7.19	10.87	13.93
Barabanki Collection	31.30	38.75	0.25	0.44	9.52	8.28	10.65	11.45
Begusarai Collection	36.92	35.65	0.31	0.34	9.03	8.21	11.71	11.16
Pant Urbashi	34.35	34.42	0.25	0.27	6.86	7.84	12.14	10.76
HABL-1	37.00	39.00	0.27	0.51	9.33	7.41	10.47	10.18
CD at 5%	0.86	0.78	0.023	0.061	0.174	0.137	0.23	0.33

* Pant Shibani, Deoria Collection and Godda Collection did not produce fruits

RESULTS AND DISCUSSION

A close perusal of the table-1 and table -2 revealed that the bael genotypes Pant Sujata had the maximum fruit weight of 1.24 kg was recorded during 2008 which was at per with Pant Aparna and Pant Urbashi. But during 2009 the genotypes Pant Sujata and Pant Urbashi accounted for the maximum fruit weight of 1.2 kg. The maximum polar diameter (13.15cm) and equatorial diameter (14.35 cm) were found in cultivar Pant Urbashi during 2009. The similar trend was also found in 2008. These findings corroborate the results of Lal (2002) in bael. The genotype Pant Sujata had the maximum pulp weight (1076.0gm) during 2008 but Pant Urbashi recorded the maximum pulp weight (967.2gm) during 2009. In both the years the genotype Pant Urbashi exhibited the maximum skull weight of 197.5 gm and 208.2 gm respectively. The minimum fruit weight of 954.0 gm and 684.0 gm were found in HABL-1 genotype in the year 2008 and 2009, respectively. This genotype also possessed the minimum seed number of 59.0 and 75.2 during 2008 and 2009, respectively. On the other hand genotype Barabanki Collection had the maximum seed numbers in the both years.

Regarding fruit quality attributes, the maximum acidity of 0.53 per cent was found in genotype Pant Sujata during 2009 which was at par with genotype HABL-1 (table -3). The biotypes HABL-1 recorded the maximum T.S.S. of 37.0^{0}B and 39.0^{0}B in 2008 and 2009, respectively. In a different study Rai et *al*. (2002) reported that T.S.S. ranged from 32.6-36.2^{0}B in bael germplasm. This result is in conformity with that of Ram and Sing (2003). In 2008, the genotype Pant Urbashi showed the maximum total sugar content of 12.14 per cent but Pant Sujata had the highest total sugar content (14.3 per cent) in 2009. Similar results have also been reported by Singh and Roy (1984) when they analyzed the baels collected from Varanasi. The genotypes Pant Shibani, Deoria Collection and Godda Collection did not produce flowers in 2008. Scattered and very little flowering were observed of these variety during 2009, though some initial fruit set had been found, however these were lost due to natural fruit drop and drop caused by fruit borer under this ecosystem.

REFERENCES

Lal, G., 2002. Evaluation of bael (*Aegle marmelos* Correa.) germplasm in semi-arid region of Rajasthan. *Current-Agriculture,* 26 (1/2):127-129

Rai, D., Misra,K.K. and Sing V.P. 2002. Analysis of genetic divergence in bael (*Aegle marmelos* Correa.) germplasm. *Prog. Hort*., 34(1): 35-38

Ram, D., and Singh, I. S. 2003. Physico-Chemical studies on bael (*Aegle marmelos* Correa.)fruits. *Prog. Hor.,* 35(2)199-201

Ranganna, S., 1977. Manual of analysis of fruits and vegetables product. pp29-31. Tata McGraw-Hill Publishing Co.Ltd. New Delhi.

Singh, R.N. and Roy, S.K., 1984. The Bael. Indian Council of Agricultural Research. New Delhi.

Singh, H.P., 1999.Horticulture development in tribal areas. *Proc. Nat*. Seminar on Sustainable Horticultural Production in Tribal Regions. July 25-26. Pp 5-18

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