

Performance of Ber (*Ziziphus mauritiana* Lamk) Cultivars Under Arid Conditions

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Abstract Performance of twenty cultivars of *ber* was evaluated for three years for yield potential and fruit quality under arid conditions. The wide variability was observed in growth, yield and fruit quality. The Gola Gurgaon produced the highest fruit yield among all cultivars, followed by Banarasi pewandi, Jhajjar special and Gola. The cultivars Gola and Gola Gurgaon were found to be early ripening whereas Umran was late ripening and possessed large fruits of good quality and attractive appearance.

Key Words Ber, Cultivar, Arid conditions

In recent past, *ber* (*Ziziphus mauritiana* Lamk) has become an important commercial fruit crop in arid and semi-arid regions of Gujarat, because of its drought tolerance and better remunerative returns. The area under its cultivation is still increasing. During hot summer months due to its dormant conditions, it does not require any irrigation when most other fruit crops would need it maximum. In view of this, performance of twenty *ber* cultivars was tested for yield potential and fruit quality under arid conditions.

Materials and Methods

The present investigation was carried out at Regional Research Station, GAU, Sardarkrushinagar. Twenty *ber* cultivars (Table 1) were planted at 6x6 m in randomised block design with 4 replications in 1984. Observations on growth, fruit set, fruit retention, maturity time, yield and quality parameters were recorded for 3 years from 1987-88 onwards. TSS was measured by hand refractometer. Acidity, reducing sugars, non reducing sugars and ascorbic acid content were estimated by the methods described in AOAC (1975).

Results and Discussion

The trees of cv. BS-75-3 had attained a maximum height of 330 cm while the minimum of 150 cm was observed in Sandhur Natural. Banarasi pewandi recorded the highest stem girth followed by Kaithli, BS-75-3 and Shamber (Table 1). The differences in fruit set and fruit retention were

found significant among different *ber* cultivars. The fruit set was maximum in Mehrun (27.05%) which was closely followed by Badami and Gola Gurgaon while it was lowest in BS-75-3 and Jhajjar special. The fruit retention varied from 36.94% in Mundia Murhara to 66.50% in Gola Gurgaon.

The earliest maturity of fruits (last week of December) was observed in cultivars Gola, Mehrun, Kakrola Gola and Gola Gurgaon whereas late maturity (3rd and 4th week of January) was recorded in Kaithli, Umran, BS-75-3 and Glori. The maturity time of other cultivars was found between first and second week of January. Similar findings were also reported by Pareek and Vashishtha (1986) in western Rajasthan.

The average yield per tree ranged from 10.24 to 66.92 kg (Table 1). The Gola Gurgaon produced consistently maximum fruit yield in all three years followed by Banarasi pewandi, Jhajjar special, Gola, Kaithli and Umran, while the remaining cultivars proved to be poor yielders under arid conditions. Godara *et al.* (1980) and Tomar and Singh (1987) have also observed similar yield variations in *ber* cultivars.

There were significant differences in fruit weight which varied from 4.6g in Mehrun to 30.9g in Umran (Table 2). The maximum pulp/stone ratio was observed in Umran and minimum in Mehrun. Similar results were also reported by Bisla *et al.* (1980). Maximum TSS was recorded in Illaichi (21.71%) and was at par with Mehrun, Chuhara and Umran. The highest acidity was found in Mehrun and lowest in Umran. The highest reducing

Table 1 *Plant growth and yield attributes (Mean of three years)*

Cultivar	Plant height (cm)	Stem girth (cm)	Fruit set (%)	Fruit retention (%)	Time of maturity	Fruit yield kg plant ⁻¹
Mundia Murhara	180	28.8	12.95	36.94	3rd week of January	35.64
Kaithli	201	32.2	18.05	45.47	3rd week of January	40.79
Umran	173	27.0	21.77	48.77	3rd week of January	37.46
Gola	175	25.6	14.61	51.61	4th week of December	41.29
Mundia	178	28.2	16.41	53.04	2nd week of January	18.29
Jhajjar Special	308	31.7	11.77	48.31	2nd week of January	45.12
Mehrun	165	16.3	27.05	58.13	4th week of December	10.72
Sanaur-1	183	22.6	13.45	51.11	1st week of January	22.33
Shamber	245	31.0	13.32	47.73	2nd week of January	33.17
Sandhur Narnaul	150	20.6	14.93	39.32	4th week of December	12.46
Banarsi Pewandi	215	33.8	14.78	54.32	2nd week of January	53.92
Safeda Rohtaki	179	24.2	18.40	50.96	2nd week of January	21.11
Glori	195	29.1	14.14	47.68	4th week of January	29.06
Kakrola Gola	228	30.1	19.40	59.15	4th week of December	32.33
Chhuhara	183	16.8	16.48	55.71	4th week of December	13.68
Illaichi	231	25.9	19.86	66.50	1st week of January	14.08
Gola Gurgaon	260	29.9	24.61	46.30	4th week of December	66.92
BS-75-3	330	31.8	10.59	45.31	4th week of January	34.12
Vikas	258	30.3	18.73	63.15	4th week of January	10.24
Badami	216	27.7	25.04	58.93	2nd week of January	17.93
CD at 5%	65.3	9.3	8.29	14.68		18.47

sugars (6.03 %) and non reducing sugars (11.42 %) were recorded in Gola Gurgaon and Mundia,

Table 2 Quality attributes of ber fruits (Mean of three years)

Cultivar	Fruit weight (g)	Pulp/stone ratio	TSS (%)	Acidity (%)	Reducing sugars (%)	Non reducing sugars (%)	Ascorbic acid (mg 100g ⁻¹)
Mundia Murhara	26.5	21.6	14.6	0.48	3.48	8.56	206.5
Kaithli	24.2	21.1	14.6	0.39	3.75	8.72	190.8
Umran	30.9	24.7	18.8	0.30	3.55	9.85	142.5
Gola	24.2	22.1	17.6	0.35	5.09	9.60	188.0
Mundia	18.9	16.5	16.9	0.35	4.88	11.42	161.4
Jhajjar Special	24.6	21.5	14.4	0.36	3.77	9.74	88.9
Mehrun	4.6	6.5	19.6	0.54	4.56	8.85	174.0
Sanaur-1	18.5	12.7	16.5	0.41	4.12	9.96	139.0
Shamber	22.0	23.6	14.4	0.41	4.36	7.08	164.7
Sandhur Narnaul	23.7	17.9	15.7	0.36	4.16	11.30	109.3
Banarsi Pewandi	25.5	21.8	14.8	0.33	4.49	7.45	134.2
Safeda Rohtaki	12.3	7.7	17.9	0.39	3.83	9.70	97.9
Glori	17.6	15.4	16.8	0.38	3.59	10.13	89.2
Kakrola Gola	20.7	18.7	17.4	0.46	5.46	8.00	139.3
Chhuhara	13.4	15.4	19.5	0.36	3.25	10.30	119.6
Illaichi	9.0	10.8	21.7	0.41	3.72	10.08	86.4
Gola Gurgaon	25.7	18.4	14.7	0.42	6.03	9.30	176.8
BS-75-3	17.7	17.1	16.2	0.48	5.53	9.41	90.6
Vikas	6.6	7.4	16.9	0.43	3.85	8.33	81.9
Badami	7.1	9.9	17.8	0.43	3.48	10.18	128.0
CD at 5%	4.87	3.6	3.64	0.08	0.91	2.61	28.54

respectively. Ascorbic acid content varied from 81.9 mg 100g⁻¹ in Vikas to 206.5mg 100g⁻¹ in Mundia Murhara.

On the basis of fruit yield and its physico chemical characters Gola Gurgaon and Umran were found promising under arid conditions.

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