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Growth, Yield and Physico-Chemical Characters of Certain Varie of Ber (*Zizyphus mauritiana* Lamk) Under Dryland Condition

R. S. Chovatia, D. S. Patel, A. T. Patel and G. V. Patel

Regional Research Station, Gujarat Agricultural University, Sardar Krushinagar-385 506

ABSTRACT

Four ber varieties viz., Umran, Gola, Kaithli and Sukavani were compared in respect of g fruit set, fruit drop, yield and quality characters under dryland conditions of North Gujarat fo years. Variety Gola gave the highest fruit yields in all the years with minimum fruit drop. In the s and third years of fruiting Gola was at par with Umran in fruit yield but in the fourth year, the diff was significant. Both Gola and Umran were superior to Kaithli and these three varieties were much yielding than Sukavani (local). Gola was earliest in ripening. Cultivar Umran recorded the highes set whereas Gola registered maximum acidity and ascorbic acid content.

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INTRODUCTION

Importance of ber in arid and semi-arid regions is well recognised because of its wide adaptability, high nutritive value and tolerance to soil salinity moisture stress and wide acceptiability among rural and urban people (Jawanda and Bal, 1981). Therefore, its cultivation on commercial scale is gaining popularity in drought prone areas of the States like Gujarat, Maharashtra, Karnataka and Andhra Pradesh. Choice of a cultivar suitable to a given agroclimatic condition is of paramount importance for successful cultivation of ber. With this object in view a comparative study was carried out at the Regional Research Station, Gujarat Agricultural University, Sardar Krushinagar to find out suitable cultivars for dryland conditions of North Gujarat.

MATERIALS AND METHODS

Four cultivars of ber namely Umran, G Kaithli and Sukavani (local) were compar randomised block design with six replicat Each cultivar consisted of five plants. The stock plants were planted at 8 x 8 m distan 1984 and were subsequently budded by a cultivars in 1985. The fruit bearing st during 1986. However, because of var within plants of each cultivar, and the loc not bear any fruits the results from 19 were considered. The trees received 50 kg yard manure (F.Y.M.) at rootstock plantin lowed by 10, 20, 30, 40 and 50 kg F.Y.M 100-50-50, 200-100-100, 300-150- 150, 200-200 and 500-250-250 N, P_2O_5 and g/plant was applied for the year 1985- 1989-90 respectively. The average rainf

TABLE 1

Mean values of growth parameters, fruit set, fruit drop, physical and chemical characteristics of fruit in defferent varieties of ber (pooled mean of 3 years data).

Sr. No.	*Variety*	*Plant height (cm)*	*Stem girth (cm)*	*Fruit set %*	*Fruit drop %*	*Fruit weight (g)*	*Pulp/stone ratio*	*T.S.S. (%)*	*Acidity (%)*	*Ascorbic acid (mg/100g pulp)*
1.	Umran	251.0	32.0	24.0	49.0	32.2	19.4	17.7	0.34	137.4
2.	Gola	248.0	33.0	20.0	42.5	24.8	16.1	15.5	0.45	159.5
3.	Kaithli	357.0	38.0	17.5	43.1	28.8	24.0	16.2	0.32	146.3
4.	Sukavani	374.0	34.0	13.0	45.5	3.20	3.0	12.3	0.22	70.3
	C. D. at 5%	57.8	N.S.	5.29	N.S.	5.18	3.31	3.31	0.14	34.26

this centre is 625 mm. The observations were recorded on growth characters, fruit set, fruit drop, date of ripening, fruit yield and physico-chemical characters of fruits. A representative samples of 10 fruits was taken for determining average fruit weight and pulp/stone ratio. Total soluble (T.S.S.) were measured with hand refractometer and acidity determined by titrating a known volume of aqeous extract of fruits aganist 0.1 N. NaOH using phenolphthalein as indicator. Ascorbic acid was determined by crushing the fruit pulp in a 3 per cent solution of metaphosphoric acid and titrating it against 2, 6, dichloro indophenol (A.O.A.C., 1970).

RESULTS AND DISCUSSION

Growth Characters

Pooled mean data for three years presented in Table 1 revealed that the plant height of Sukavani and Kaithli were at par and were significantly higher than those of Gola and Umran which showed non-significant differences. The variation in stem girth as well as plant spread in both the direction was not significant.

Fruit-set and Fruit-drop

Variations due to fruit set was found to be significant among the varieties (Table 1). The maximum and minimum fruit set was recorded in 'Umran' (24%) and 'Sukavani' (13 %), respectively. This is in agreement with the results of Singh *et al.* (1983). 'Umran' was at par with Gola in fruit setting and was significantly superior to 'Kaithli' and 'Sukavani'. The four varieties did not differ in respect of fruit drop (Table 1).

Ripening period

The data presented in Table 2 indicated that cultivar 'Gola' ripened earliest (25th December) among all the varieties which was followed by Kaithli (3rd January), and Umran (9th January) under North Gujarat conditions. Similar results were reported by Mann and Pareek (1974). Sukavani ripened about 77 days later than 'Gola'. Cultivar Gola ripened earlier by 9 and 15 days than Kaithli and Umran, respectively. Because of its early ripening gola could fetch higher price in the market.

Fruit yield

A perusal of the results revealed that the variation among varieties in fruit yield was found to be significant in individual year as well as in pooled analysis (Table 2). The year x variety interaction was also found to be significant. Among the varieties, gola produced the highest fruit yield per plant in all the individual years. In the pooled analysis, Gola had distinctly higher fruit yield but it was at par with Umran and Kaithli. On an average Gola yielded 47.63 kg per plant in 19 pickings which show increase of 23.90 and 57.40 per cent yield over Umran and Kaithli, respectively. Gupta (1977) and Anon. (1989) also reported superiority of Gola. The higher fruit yield of Gola seemed to be due to higher number of fruits per tree lower fruit drop. The yield of all the varieties increased with increasing age of the plant, but the rate of increase in the yield of Gola was 100 per cent in second year as compared to first year and 53.8 per cent in third year over second year.

Physical characters

It was evident from Table 1 that significant variations were observed for fruit weight and pulp/stone ratio among the varieties. Umran had the maximum fruit weight of 32.1 g. followed by Kaithli (28.8 g) and Gola (24.8 g) Singh *et al.* (1983) and Sampat kumar and Haribabu (1981) reported similar results. The lowest fruit weight was recorded by Sukavani. The highest and the lowest pulp/stone ratio was observed in Kaithli (24.0) and Sukavani (3.0) respectively. Umran and Gola were at par in this respect.

TABLE 2

Fruit yield (kg/plant) of ber in different years under dryland condition.

Sr. No.	*Variety*	*Date of ripening*	*Years*			*Pooled*
			1987-88	*1988-89*	*1989-90*	
1.	Umran	January-9 to March-8	19.69 (16)	40.40 (13)	55.20 (14)	38.44 (14)
2.	Gola	December-25 to March-3	23.50 (19)	47.04 .(23)	72.35 (17)	47.63 (19)
3.	Kaithli	January-3 to March-4	14.21 (14)	31.60 (17)	44.96 (14)	30.26 .(15)
4.	Kukavani	March-12 to April-9	1.92 (5)	3.56 (7)	5.14 (6)	3.54 (6)
	C .D. at 5%		5.61	13.71	10.51	19.26
	C. D. at 5% for X Y T		—	—	—	9.28

The values in parenthesis are number of pickings per seasons.

Chemical characters

The data presented in Table 1 indicated that Umran exhibited the highest T.S.S. of 17.2 per cent followed by Kaithli. Similar findings were reported by Tomar and Singh (1970) and Sampat Kumar and Haribabu (1987). Umran, Gola and Kaithli were at par in their T.S.S. but these values were significantly higher than that of Sukavani. The differences in acidity and ascorbic acid were found significant. Gola recorded the maximum acidity and ascorbic acid content. It is therefore concluded that among the varieties compared, Gola is superior in fruit yield early ripening and higher ascorbic acid content.

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