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SHORT COMMUN ICATION

Spathe Initiation and Bunch Characteristics in Date Palm cultivars under arid condition

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The date palm (*Phoenix dactylifera* L.) is one of the important and potential fruit crop of arid irrigated regions of India. It is being grown in the states of Gujarat and Rajasthan. Recently, its plantation has been successfully done in the dry areas of Tamil Nadu. It requires almost rain free conditions during the fruiting season particularly at the time of fruit ripening because of spoilage of fruits due to rains. Such conditions are partially or completely met in the Thar desert especially in Western districts of Rajasthan (Bikaner, Jaisalmer and Barmer) and parts of Kacchh district of Gujarat. It is very hardy tree and is high tolerance to salt, $EC_e \times 10^3 =$ 18. The demand and consumption of date palm fruits in India of all three types *viz.*, table dates, soft dates and dry dates is high but the production is very less. Farmers have not yet commercialized date palm cultivation mainly due to lack of information regarding suitable cultivars for the region. The performance of date palm cultivars was therefore, studied under the Bikaner agro-climatic conditions.

Eight date palm (*Phoenix dactylifera* L.) cultivars grown at an orchard in Date palm Research Centre, SKRAU, Bikaner were used in this investigation. Eight date palm cultivars were included *viz.* Halawy, Barhee, Zahidi, Khadrawy, Khuneizi, Khalas, Shamran and Nagal for study. The trees were about 30 years age old. Three replications (two trees in each replication) were selected from each cultivar. Period of spathe initiation, colour turning stage and full doka stage were recorded. For bunch characteristics viz., length of bunch, length of bunch stalk, number of strands, number of berries per strand and length of strand during the first week of February to Last week of August, 2011-12. All bunch characteristics were based on 10 samples per tree.

Spathe initiation and fruit ripening (colour turning and doka stage)

The data presented in Table 1 give the detailed information of spathe initiation timings of different date palm cultivars. During both the years, the spathe initiation started almost at the same time (month of February) in cultivars, *viz*. Khuneizi, Halawy, Khadrawy and Shamran and in remaining cultivars, *viz*. Barhee, Zahidi and Khalas, the spathe emerged in month of March. According to Chandra *et al*. (1990), the earliest spathe initiation occurred in Khadrawy and very late in cv. Barhee. Similarly, Chandra and Chaudhary (1990) also reported the similar findings but the timings were somewhat late compared to present findings. It has been reported that it varies from year to year even at a particular location and cultivars (Chandra *et al.*, 1990).

The details of attaining initiation of *doka* in fruits of different cultivars under study have been presented in Table 2. In first year, colour turning stage (initiation of *doka*) was attained in the month of June-July. The cultivars Nagal, Khuneizi and Halawy attained this stage between 10-15th June, whereas, the cultivars Zahidi, Khadrawy and Khalas attained it in last week of June (20-27 June) and cultivars Shamran and Barhee in first week of July. Similar trend was observed during second year.

The details of attaining full *doka* in fruits of different cultivars under study have been given in Table 2. During first year (2011), the full *doka* stage of fruits was attained earliest in cv. Nagal (30 June) followed by Halawy (2 July), Khuneizi (7 July), Zahidi (14 July) and Khalas (21 July). Barhee fruits reached at this stage at the last (2 August). During second year (2012), almost similar trend was observed. Similar findings were observed by Chandra *et al.* (1990) and Dahiya *et al.* (2001). Chandra *et al.* (1990) reported that *doka* was formed earliest in Halawy. These stages may vary due to cultivars and location. It may also change from year to year due to climatic changes (Chandra *et al.*, 1990).

Bunch characteristics

The average bunch length varied from 33.75 cm in Nagal to 71.19 cm in Barhee. The length of bunch stalk was between 30.81 cm in Nagal and 60.44 cm in Barhee. The number of strands per bunch was in 60.08 in Barhee followed by 43.50 in cultivar in Khuneizi and minimum in 32.67 in Khadrawy. The number of berries

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per strand was maximum of 18.70 in Barhee, 16.31 in Zahidi and 14.04 in Khadrawy and minimum of 9.45 in Nagal whereas the average length of strand varied from 11.01 cm in Khalas, 11.65 cm in Khalas to 17.96 cm in Zahidi (Table 3.).

In another study at Bikaner, it was reported that maximum number of bunches per palm were recorded in cv. Barhee (*Anon*., 1995). Chandra and Chaudhary (1990) reported maximum average number of bunches in cv. Halawy. In the present study, the maximum length of bunch was recorded in cv. Barhee and minimum in cv. Nagal. It is in conformity to earlier report at Bikaner during the year 1995 (*Anon*., 1995). Earlier study at Bikaner also revealed maximum bunch stalk length in Barhee (*Anon*., 1995 and Chandra and Chaudhary, 1992).

Present findings regarding number of strands are in conformity with the findings of Chandra and Chaudhary (1992) and Chandra *et al.* (1995). In contrast, other Researchers observed higher values of strand length at Bhojka, Bikaner and Abohar (Chandra and Chaudhary, 1992 and *Anon*., 2007). Maximum number of berries per strand were recorded in cv. Barhee and minimum in cv. Nagal. The results are in conformity with earlier findings at Date Palm Research Centre, Bikaner which also mentioned maximum berries per strand in Barhee (*Anon*., 1995).

The bunch parameters varies from cultivars, age and location. The lower values of bunch parameters were may be due to deficit irrigation, application of manures and fertilizers, cultural operations including hoeing and weeding.

Table 1. Spathe initiation of date palm cultivars

S. No.	Cultivars	Spathe initiation			
		2011		2012	
		From	To	From	To
1.	Shamran	28, Feb	19, Mar	07, Mar	04, Apr
2.	Nagal	24, Feb	04, Mar	05, Mar	23, Mar
3.	Khuneizi	26, Feb	17, Feb	12, Mar	08, Apr
4.	Halawy	22, Feb	10, Mar	08, Mar	28, Mar
5.	Barhee	20, Mar	23, Apr	24, Apr	12, May
6.	Zahidi	02, Mar	27, Mar	04, Apr	22, Apr
7.	Khadrawy	25, Feb	23, Apr	05, Mar	29, Mar
8.	Khalas	11, Mar	30, Apr	09, Apr	2, May

Table 2. Fruit ripening of date palm cultivars

S. No.	Cultivars	Colour turning stage		Full *Doka* stage	
		2011	2012	2011	2012
1.	Shamran	01, Jul -05, Jul	25, Jul -30, Jul	17, Jul -22, Jul	10, Aug - 15, Aug
2.	Nagal	10, Jun -22, Jun	15, Jun - 22, Jun	30, Jun -05, Jul	07, Jul -12, Aug
3.	Khuneizi	15, Jun - 29, Jun	30, Jun -05, Jul	07, Jul -12, Jul	18, Jul -16, Aug
4.	Halawy	12, Jun - 27, Jun	28, Jun -03, Jul	02, Jul -09, Jul	12, Jul - 20, Jul
5.	Barhee	07, Jul - 11, Jul	30, Jul -06, Jul	02, Aug -11, Aug	19, Aug -28, Aug
6.	Zahidi	20, Jun -27, Jun	02, Jul -12, Jul	14, Jul -22, Jul	24, Jul - 02, Aug
7.	Khadrawy	25, Jun - 29, Jun	12, Jul -25, Jul	17, Jul -25, Jul	01, Aug -10 Aug
8.	Khalas	27, Jun - 04, Jul	10, Jul -19, Jul	21, Jul -28, Jul	29, Jul -05, Aug

Table 3. Bunch Characteristics of date palm cultivars

S. No.	Cultivars	Length of bunch (cm)	Length of bunch stalk (cm)	Number of strands per bunch	Number of berries per strand	Length of strand (cm)
1.	Shamran	58.33	46.24	40.57	12.10	13.05
2.	Nagal	33.75	30.81	40.42	9.45	12.07
3.	Khuneizi	40.86	35.06	43.50	12.99	17.96
4.	Halawy	51.79	41.79	41.54	13.17	13.75
5.	Barhee	71.19	60.44	60.08	18.70	14.06
6.	Zahidi	62.23	51.99	33.46	16.31	12.58
7.	Khadrawy	44.84	37.31	32.67	14.04	11.01
8.	Khalas	51.97	41.82	38.73	10.36	11.65
	S.Em $\pm$	1.98	1.82	1.52	0.54	0.48
	CD at 5%	5.72	5.27	4.39	1.57	1.37

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