

ASSESSMENT OF SEEDLINGS PROPAGATED BY DIFFERENT EXOTIC
DATES PALM SEED UNDER CLIMATIC CONDITION OF DISTRICT KECH
AT TURBAT, BALOCHISTAN, PAKISTAN

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Abstract

The experiment was conducted at Directorate Agriculture Research (Dates) Kech at Turbat, Balochistan, Pakistan during year 2016. To evaluate Ajwa, Amber, Deglet noor and Medjool under climatic condition of superior date palms from seedlings plantation and aim of this study to develop of new early date palm cultivars. This investigate was laid out in Randomized Complete Block Design (RCBD) with four replication each replicate consist of five date a seedling at plant to plant and row to row distance of 20 ft² and same culture practices was done in each treatment. Observation were noted on plant height (cm), stem girth (cm), number of leaves, yield per plant (kg) number of bunches per plant, number of fruits/ strand flesh Fruit weight (g) yield per acre (kg) and male/female ratio. Average data collected from five years the maximum plant height was recorded in Degletnoor seedlings 322.50 cm followed by Amber 283.75 cm. The minimum growth performance was observed in Ajwa and Medjool seedlings 267.50 cm and 247.50 cm. The maximum were reported in deglet noor, Amber and Ajwa 68.00 cm, 64.00 and 63 in respect, minimum stem thickness observed in Medjool and more number of leaves was count 35.00 in Degletnour as to compare Ajwa, Medjool and Amber (32, 30 and 28) this diversity was due to inherent characters of seeds genotype. The Table No. 2 revealed that the maximum number of bunches were produced in Medjool (9.00) as compare to other propagated seedling 6.25, 6.00 and 6.00 respectively. More number of fruit per strand was counted in Medjool 30.25 followed by Degletnour and Ajwa 30.00 and 29.75 minimum numbers was observed in Amber 24.50 per propagated seedling. Concern single fruit mass more was recorded in Amber 9.25g and less fruit mass find in Ajwa 5.00g followed by Degletnour 3.25g and Medjool 2.75g respectively. Highest yield per date tree and yield / acre was noted in Medjool 64.25kg/date palm and 463.75kg/acre and lowest were observed in amber 39.25kg followed by ajwa 32.50kg and Deglet noor 32.25kg/date palm and Degle nour 413.75kg, followed by Amber 411.50kg and Ajwa 360.50kg/acre respectively. Our

data obtained in Table 3, revealed that Medjool was produce more number of 70 % male and less number of female 30 % as compared with other treatments, degletnoor also produce number of male and female 65 % and 35% followed by Amber 55% appeared male and Ajwa appeared as equal number of male female and there is no huge difference between each other, it means in our study showed that the equal number of male and female 50 percent were produced in the following selected seedling. The Degletnoor and Amber showed good growth performance and Medjool was produced high yield and also increased number of female in same seedling as compare to other exotic date palm seedlings. It can be concluded from the study that propagated through date seeds in main way and most effective for developing of new quantitative and qualitative germplasm date palm cultivars.

Introduction

Dates palm (*Phoenix dactylifera*. L) Has economic importance throughout human's history. Date palm of family Arecaceae is a monocotyledonous, diploid, perennial, dioecious, primitive fruit crop of the world, adapted to the arid environments. In many parts of the world, Dates are considered to be the main food and income resource that plays a vital role in the economy, society and environment. Dates are used as a food source, in a number of ways. From the ancient time most of the people who travelled in deserted area around the world carries dates with them as a high-energy food source and are cheap to produce and preserve, and are also very rich in nutrition. Dates can grow in arid and hot climate, and are relatively tolerant of saline and limy soils. Date palm plantations are spread in the areas where the groundwater is shallow (15 feet). The average temperature for Date palms growth ranges between 12.7°C to 27.5°C, but can tolerate up to 50 °C and sustaining short cold spells up to - 5°C. The optimal temperature of Date palm from pollination to fruit ripening ranges from average temperature 21°C to 27 °C. Date palm is considered as a significant component of farming systems in many arid and semi-arid regions around the world and is suitable for both small and large scale farming (A.MKhushk *et al.* 2009). The differences between cultivars or strains of date palm may be due to either cytological difference between them (Al-Salih and Al-Sheikh Hassain, 1980) or to the more-genotypes that produced from seeds (Al-Doss *et al.*, 2001).

It is an evergreen plant and can play a vital role in not only soil conservation but also environmental and ecological balance. The number of chromosomes in the date palm is $2n = 36$. It is the food that provides rich nutrition and energy. Owing to high carbohydrates content, the date is rich enough in certain nutrients to provide a good contribute of articulate energy, the date which is full of carbohydrates, hold protein, fats and vitamins etc. According to their fruit moisture content, there are three major types of date palm cultivars e.g. soft, semi-dry and dry cultivars around the world. The date palms were dioeciously female plants produced fruit while male plants produced only pollen. Seed propagated date palms yield approximately equal numbers of male and female offspring. During the early years after reaching sexual maturity, both male and female palms produce basal offshoots, which if left intact grow into mature trees. At some point, perhaps in southern Mesopotamia, an astute farmer discovered that it was possible to separate basal offshoots from a mother palm and transplant them to another location. Priority in implementing this technology would certainly have been given to female palms known to produce large good-quality fruits. Apparently, no historical record exists about the time and place for this important technological break throughout. It was a momentous step for the date palm, nonetheless, giving rise to its vegetative propagation and the ability to carry forward to succeeding generations desirable fruit characteristics (Johnson, 2011).

However, this practice has a negative consequence as well, for over time it has reduced the diversity of the general date germplasm pool. Without sexual reproduction, there are no opportunities for new genotypic combinations to occur. There emerged from these innovations certain types of female and male cultivars (cultivated varieties) recognized to possess desirable characteristics and those palms came to be assigned distinctive names for identification purposes. According to tradition, in what is now southern Iraq, Zahidi was the first named female date cultivar and Khikri the first male (Dowson, 1926). The naming of cultivars proliferated wherever dates were grown from offshoots and in some instances the same cultivar was assigned a different name when cultivated in a new area where a distinct dialect or language was spoken. It has been estimated that there are 3,000 date cultivars in the world (Zaid, 2002), but it is widely suspected that many of the names represent synonyms. Included in this study is a discussion of modern seedling-derived dates propagated by offshoots for research purposes (i.e. germplasm collections) and commercial fruit production. Clear examples of the latter are the American cultivars grown on a small scale in California and Arizona (Hodel and Johnson, 2007). The monsoon rains occur in district Kech before the fruits ripened this is one of the most important problems facing the development and production of dates in district Kech, Balochistan. In this respect, the selection and evaluation of superior date palms from seedlings plantation is the aim of this study development of new early date palm cultivars.

Materials and Methods

The study was conducted during 2014 in Agriculture Research (Dates) Center District Kech at Turbat is located about 25°-24' to 26°-39' north latitudes and from 61°-49' to 64°-31' east longitudes. The elevation of the district ranges between 100 to 1400 meters above sea level is dry and hot. The research is classified under subtropical area. A soil plough layer was collected from agriculture research dates farm kech at

Turbat before adding in to the pots, the soil was air dried ground and passed through 4 mm garden sieve. Ten-kilogram air dried soil was added in pots having a drainage hole at bottom. the experiment was laid out with different four exotic date palm variety and four replications each replication consist of five plants in a complete randomized block design treatments having T₁ = degletnour, T₂ = amber, T₃ = medjool, T₄ = Ajwa. Three healthy and uniform germplasm of each cultivar were sown in each pot at green shade of agriculture research dates station. After ten days' germination, the seedlings were thinned and left one per pot used for further assessment. turbat total number of muslin cloth pots was two hundred. the plants were irrigated as per requirement. After three years' seedlings transplanted into field during mid-October 2017, selected healthy and uniform twenty seedlings of each variety planted in one acre and row to row and plant to plant distance were preferred 20 ft². Observations were collected on vegetation growth and yield performance of seedling date palms that is plant height (cm), stem girth (cm), number of leaves, yield per plant (kg) number of bunches per plant, number of fruits/ strand flesh Fruit weight (g) yield per acre (kg) and male/female ratio. The recorded data was investigated through analysis of variance technique through statistical package Statistix software version 10. However, the significance of the differences between means was checked through LSD with 5% probability level (Steel *et al.*, 1997).

Results and discussions

Plant height, stem girth (cm) and number of leaves/ seedling

The achieve result showed that regarding growth parameters the maximum plant height was recorded in Deglet noor seedlings 322.50 cm followed by Amber 283.75 cm. The minimum growth performance was observed in Ajwa and Medjool seedlings 267.50 cm and 247.50 cm. The maximum trunk grith were reported in deglet noor, Amber and Ajwa 68.00 cm, 64.00 and 63 in respect, minimum stem thickness

observed in Medjool and more number of leaves was count 35.00 in Deglet noor as to compare Ajwa, Medjool and Amber (32, 30 and 28) This diversity was due to inherent characters of seeds genotype (Elhoumaizi *et al.*, 2002). According to statistical analysis of various seedlings have varied there were no major differences with each other.

Dissimilarity is able to occur in different seedlings because of genetic crisis, mismanagement practices, and climatic conditions and other factors of the studied location as before supposed by (Morton, 1987), current finding of (Rashid *et al.*, 2023).

Table No. 1. Growth performance recorded on different seedlings propagated through exotic date seeds

Variety	Height (cm)	Stem girth (cm)	No. of leaves
Deglet noor	322.50a	68.00a	35.50a
Amber	283.75ab	63.50a	28.25ab
Ajwa	267.50ab	64.00a	32.75bc
Medjool	247.50 b	57.25b	30.00c
S.E±	29.629	2.5062	1.5138
LSD 0.05%	67.025	5.6695	3.4245

Seedling yield potential:

The Table No. 2 revealed that the maximum number of bunches were produced in Medjool (9.00) as compare to other propagated seedling 6.25, 6.00 and 6.00 respectively. More number of fruit per strand was counted in Medjool 30.25 followed by Degletnour and Ajwa 30.00 and 29.75 minimum numbers was observed in Amber 24.50 per propagated seedling. Concern single fruit mass more was recorded in Amber 9.25g and less fruit mass find in Ajwa 5.00g followed by Degletnour 3.25g and Medjool 2.75g respectively. Highest yield per date tree and yield / acre was noted in Medjool 64.25kg/date palm and 463.75kg/acre and lowest were observed in amber 39.25kg followed by ajwa 32.50kg and Deglet noor 32.25kg/date palm and Deglet noor 413.75kg, followed by Amber 411.50kg and Ajwa 360.50kg/acre respectively. Yield decreased due

to more number of male date palm developed in each treatment. According to statistically analyze that all parameters of treatments show no significant difference among each other and also have variation may be involved due to environmental impact. Our findings about all parameters of treatment are in the different line with the findings of Metwally (1999), Elsafy *et al.* (2015) and El-Salhy *et al.* (2016). Our consequences are also in the various appearances with the findings of Fakhry (1969), El-Kosary (2009), Bashir *et al.* (2014) and Bakr *et al.* (2016). The results concerning fruit weight is in the same stripe with the findings of different researchers Hussein *et al.* (2001), Sakr *et al.* (2010), Haseeb *et al.* (2014), Soliman *et al.* (2016) and Abd-El Hamed *et al.* (2017).

Table No. 2. Yield observations of seedlings propagated through different exotic date seeds

Variety	Number of bunches	Number of fruit/strands	Fruit weight (g)	Yield/plant (kg)	Yield/acre (kg)
Deglet noor	6.00b	30.00a	3.25bc	32.25b	413.75b
Amber	6.25b	24.50b	9.25a	39.25b	411.50b
Ajwa	6.00b	29.75a	5.00b	32.50b	360.50c
Medjool	9.00a	30.25a	2.75c	64.25a	463.75a
S.E±	0.9592	1.9185	0.8354	4.6521	14.120

LSD 0.05%	2.1699	4.3399	1.8898	10.524	31.942
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Number of male and female per observation:

Our data obtained in Table 3, revealed that Medjool was produce more number of 70 % male and less number of female 30 % as compared with other treatments, degletnoor also produce number of male and female 65 % and 35% followed by Amber 55% appeared male and Ajwa appeared as equal number of male female and there is no huge difference between each other, it means in our study showed that the

equal number of male and female 50 percent were produced in the following selected seedling. Our research closely related to other finding and article that is seed propagated date palms yield approximately equal numbers of male and female offspring. During the early years after reaching sexual maturity, both male and female palms produce basal offshoots (D. V. Johnson et al. 2013).

Table no. 3. Observations regarding sex ratio produced from seedlings

Variety	Male %	Female %
Deglet noor	65	35
Amber	55	45
Ajwa	50	50
Medjool	30	70
Overall %	50	50

Conclusions

According to statistical analysis here was no significant difference between all studied four date palm cultivars for vegetative growth and yield performance under climatic conditions of District Kech. The Deglet noor and Amber showed good growth performance and Medjool was producing high yield and also increased number of female in same seedling as compare to other exotic date palm seedlings. It can be concluded from the study that propagated through date seeds in main way and most effective for developing of new quantitative and qualitative germplasm dates cultivars.

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