



**Research Paper**

**INFLUENCE OF GROWING MEDIA ON EMERGENCE AND EARLY GROWTH OF DATE PALM (*Phoenix dactylifera*)**

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**Abstract**

An experiment was conducted at nursery unit of Federal College of Horticulture, Dadin-kowa from February to May 2012. The experiment consisted of six treatment replicated three times and laid out in complete randomized design (CRD). Treatment 1 Sawdust (SD),Treatment 2 Sharp Sand (SS),Treatment 3 Top Soil (TS),Treatment 4 Sawdust and Top Soil (SD + TS),Treatment 5 Rice husk (RH),Treatment 6 Rice husk and Top soil (RH + TS) were used as treatments. Result of the trial shows that treatment four (Sawdust + Top soil) exhibited the superior performance on all the parameters measured. However, treatment one (Sawdust) in root number exhibited the highest performance while treatment two (Sharp sand) exhibited inferior performance on all the parameters measured during the period under review.

Key words: Date palm, Sawdust, Sharp sand.

**INTRODUCTION**

Date palm (*Phoenix dactylifera*) is a unique tree bearing fruit which are consumed directly. Dactylifera is a Greek word for finger bearing (Alfred, 2001). It is probably the oldest tree cultivated by man. Date has been cultivated and traded from as early as 5000 BC and were recommended by many cultures in the Arabs world. In spite of the enormous socioeconomic transformation that has taken place in this part of the world, date fruit continues to form an essential component of the daily diet (Hussein, 1970). In the Arabian countries, the value and importance of the date palm tree and its fruits has immense importance. Every house hold feels proud to grow at least one tree in their backyard (Mikki *et al.*, 1986).

The available records indicate that, the plant is not an indigenous to Nigeria because trans-Sahara traders and Muslim pilgrims brought it into the country from North Africa and the Middle East (FAO, 2000).

Sir Walter Raleigh, the great Elizabethan adventurer, is well known to most people in the English speaking world as first recorded that "date becomes a highly merchantable crop of value competing well on the world commodity trade and has this shaped land uses, economies and societies in African countries" (Lawal, 2004). There are over 600 varieties of date guide in worldwide and it is the most interesting and useful of the palm family next to the coconut palm (FAO, 2000).

Most farmers in Nigeria are into cultivation of date palm using different method of breaking seed dormancy in order to induce germination without considering the influence of media to be used. The tree crop is an economic tree of immerge potential for vibrant trade as well as foreign exchange earnings.

However, the hard seed coat of economic trees served as impediment to germination and the media too also has an influence on their germination. It is therefore, decided to carry out the study on different growing media with the objective of finding a reliable medium to be used while planting date palm seeds for early germination and early seedling establishment.

## MATERIALS AND METHODS

### STUDY AREA

The study was conducted at nursery unit of Federal College of Horticulture Dadin-kowa, which is located in North of Sudan Savannah ecological zone. The area lies geographically at 11° 30 and 10°20, elevation 240mm. Temperature range from 24-48°C and an average annual rainfall of 760-1100mm (Kowal and Knabe 1972).

### METHODOLOGY

Treatment 1 Sawdust (SD), Treatment 2 Sharp Sand (SS), Treatment 3 Top Soil (TS), Treatment 4 Sawdust and Top Soil (SD + TS), Treatment 5 Rice husk (RH), Treatment 6 Rice husk and Top soil (RH + TS) were used as treatments. The local date palm seeds were soaked in cool water for twenty four hours, sown in polythene bags at a depth of 3.5cm using complete randomized design (CRD) with six treatments replicated three times. Data were collected on the following parameters, percentage of germination, plant heights at 7WAP, 8WAP, 9WAP, number of leaves, number of roots, and roots length at 13 WAP. Data collected were then subjected to analysis of variance (ANOVA) test.

## RESULT AND DISCUSSION

From the result obtained from this trial, there were significant difference between the six categories of growing media based on early emergence and percentage germination. The findings of this study showed that T4 had the highest percentage of emergence with 87.5% much more than the other media and also emerged earlier than any other media. However, the treatment with lowest percentage of emergence is T2 which was recorded 12.5%. This is due to the fact that only 3 seeds emerged because of the hardness of a seed coat which require adequate amount of moisture to favor germination and poor water holding capacity of the soil nature. This observation has gone in line with Loomis, (1958) who reported "that palm seeds germination media must be well drained, yet have some moisture holding capacity". A pattern of alternate extremes of dryness and wetness is detrimental to palm seeds during germination.

The results (Table 2) obtained on plant height had proved that treatment 4 (T4) topsoil combined with sawdust and Treatment 1 (T1) are the media with highest significant difference than any other media in all comparisons while shorter plants were recorded at Treatment 2 (T2). This observation also gone in line with Morgan, (1999) Schoor *et al.* (1990), Barnard *et al.* (1996) and Pasian (2003) who reported "that topsoil has been observed to be one of the most important requirements of plant growth, in addition to soil water, oxygen and solar radiation, also sawdust as a container media improves water holding capacity and nutrient supply for plant growth compare to other soil-less media combination.

The effect of different growing media on number of leaves of date palm (*Phoenix dactylifera*) at 13 WAP was presented in table 3 the result have indicated that, there was a significant difference among the treatments used for the study treatment 2 (T2) which is Sharp Sand (SS) gave the lowest number of leaves this might be among other reasons the nature of sand in term of water holding capacity.

Table 4 indicated the effect of different growing media on root length of date palm (*Phoenix dactylifera*) at 13 WAP the result showed that treatment 1 (T1) and treatment 5 (T5) gave the longest root while shorter root are produced under control treatment 2 (T2) which is

Sharp Sand (SS) this might also be among other reasons the nature of sand in term of water holding capacity.

Table 1: Germination dynamics of date palm (*Phoenix dactylifera*) as influenced by the different growing media

Treatments Code	Days of Emergence	No. of Seedlings emerged	Percentage of emergence
T <sub>1</sub> (SD)	29	18	75%
T <sub>2</sub> (SS)	31	3	12.5%
T <sub>3</sub> (TS)	27	7	29.1%
T <sub>4</sub> (SD + TS)	25	21	87.5%
T <sub>5</sub> (RH),	28	18	75%
T <sub>6</sub> (RH + TS)	26	19	79.1%
Mean percentage germination		59.7%	

**NB:** Sawdust (SD), Sharp Sand (SS), Top Soil (TS), Sawdust and Top Soil (SD + TS), Rice husk (RH), Rice husk and Top soil (RH + TS)

Table 2: Effect of different growing media on plant height of date palm (*phoenix dactylifera*). Plant Height (cm)

Treatment	7wap	8wap	9wap
T <sub>1</sub> (SD)	15.8a	18.1a	18.87a
T <sub>2</sub> (SS)	0.0d	0.0c	0.0c
T <sub>3</sub> (TS)	8.1c	10.b	11.47b
T <sub>4</sub> (SD + TS)	16.93a	19.03a	19.9a
T <sub>5</sub> (RH),	12.57b	15.1a	16.4a
T <sub>6</sub> (RH + TS)	15.43a	18.07a	19.0a
LSD (P=0.05)	4.09	4.81	4.15

Table 3: Effect of different growing media on number of leaves of date palm (*Phoenix dactylifera*).AT 13 WAS

Treatment	Number of Leaves /Plant
T <sub>1</sub> (SD)	1.33b
T <sub>2</sub> (SS)	0.0c
T <sub>3</sub> (TS)	1.67a
T <sub>4</sub> (SD + TS)	2.0a
T <sub>5</sub> (RH),	2.0a
T <sub>6</sub> (RH + TS)	2.0a
LSD (P=0.05)	0.47

Table 4: Effect of different growing media on root length of date palm (*Phoenix dactylifera*).AT 13 WAS

Treatment	Root Length /Plant
T <sub>1</sub> (SD)	24.13a
T <sub>2</sub> (SS)	0.0d
T <sub>3</sub> (TS)	13.83c
T <sub>4</sub> (SD + TS)	19.73b
T <sub>5</sub> (RH),	23.07a
T <sub>6</sub> (RH + TS)	17.57b
LSD (P=0.05)	3.93

## CONCLUSION

Result of the trial showed that treatment 4 (Top soil + sawdust) exhibits a higher percentage of emergence and germination rate. It also exhibited superior performance in all parameters measured while treatment 2 (sharp sand) exhibited inferior performances on all the parameters measured.

Based on the result obtained from this research work, it could be therefore suggested that farmers, who are in the propagation of date palm, should use a combination medium of top soil and sawdust, because it gives superior performance than the rest of the treatment used for this experiment.

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