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Performance of Date Palm Varieties in Nangarhar, Afghanistan

ABSTRACT

This study was designed to observe performance of six, improved date palm (*Phoenix dactylifera* L.) varieties in Afghanistan. A research field of 10,000 transplants from the United Arab Emirates was established in Nangarhar province to observe date palm adaptation to the province's climate and environment. The results proved positive with 93% of the transplants demonstrating adaptation to the environment in the first year with normal growth and expansion of new leaves.

Key words: Date palm, adaption, transplant, Nangarhar

INTRODUCTION

The date palm, *Phoenix dactylifera* L. is one of the most economically important perennial plants in arid areas of the Middle-East and North Africa where it is widely planted for food and commercial

purposes (A. Othmani et al. 2009). In such conditions, the date palm not only provides high nutritive value and key food source, but it also creates job opportunities for laborers particularly in rural areas (Sarfraz Hassan et al. 2006). Utilization and industrialization of dates continue to increase. World agricultural industry production of dates has increased from 1.8 million metric tons in 1961 to 5.4 million metric tons of fruit in 2001, with an estimated annual expansion rate of 5% (Botes and Zaid 2002).

The Nangarhar province of Afghanistan, where the field trial was conducted, has a sub-tropical climate with mild winters and hot summers. A broad range of agricultural crops are currently cultivated in Nangarhar province's main river basin, including citrus and olive trees (David-Mansfield 2006). Date palm is minimally cultivated in Nangarhar, but represents a high potential crop that can be used to

reduce food and economic security in the region. Date palms grow well in the hot, dry climate common to this area of Afghanistan.

MATERIALS AND METHODS

Plant materials

Afghanistan's Ministry of Agriculture, Irrigation and Livestock received 10,000 young healthy transplants grown from tissue culture, with well developed roots and shoots of six varieties such as Khlass, Barihee, Fard white, Abou Maan, Nabt Sef and Khissab from the United Arab Emirates. The Canal State Research Farm of Western province of Nangarhar was selected as an ideal site for planting transplants considering its suitable climatic condition for growing tropical fruit. The transplants were kept at an appropriate temperature between 20°C to 40°C in greenhouse until the field was prepared for planting. Some transplants were infected with fungal disease under greenhouse conditions, and treated with a 3gr./liter dose of Mancozeb, fungicide.

The transplants were planted in January 2010 on a square system in an area of 4000 m² in clay loam soil (pH 7.5 to 8.4) and with pit size of 50cm x 50cm x 50cm. Since date palm is a unisexual plant and pollination is absolutely essential, male transplants were planted with the ratio of 1 male to 7 female tree to increase yield. Irrigation was scheduled once in week and manure and chemical fertilizer were applied at the rate of 80 gram urea, 100 gram DAP and 2 kilo gram manure per tree.

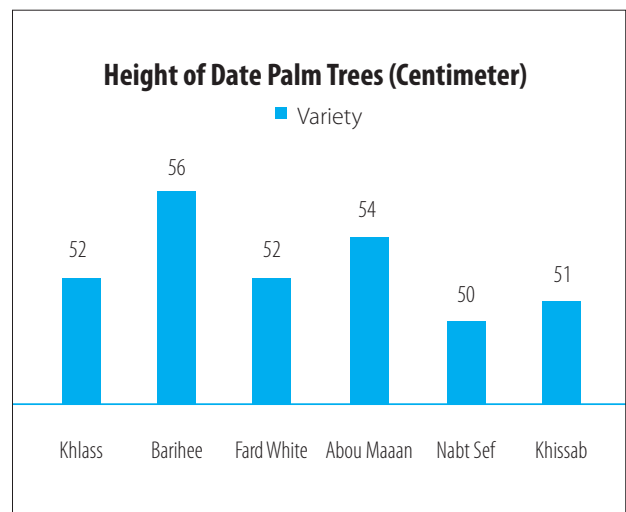
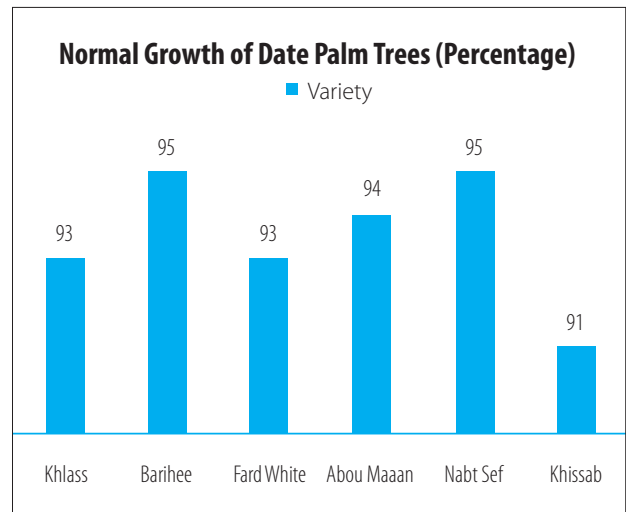
RESULTS AND DISCUSSION

The data for the performance of six date palm varieties was collected at the research field after one year of observation. Each variety of date palm trees was measured for its normal growth, height and adaptation. Although date trees can tolerate harsh climatic conditions during the first year, special attention to irrigation is needed to achieve a higher survival rate. There was no advisor factor to affect the normal growth of the trees. All six varieties (figure1) demonstrate good adaptation to Nangarhar's climate. The average adaptation of the six varieties is 93% while varieties such as Barihee and Nabt Sef demonstrated the highest percentage of normal growth at 95%.

Figure 1 .The percentage of normal growth and **Figure 2**. Height of date palm trees measured development of 6 varieties of date palm trees in centimeter. in Nangarhar research farm.

CONCLUSION

The most important result of this study was the observation of adaptation of date palm trees to Afghanistan's varied climate. Afghanistan has the potential to further expand date palm tree cultivation to areas of similar climates, such as western Helmand and Farah provinces. In addition to sharing similar climates with each other, Nangarhar, Helmand and Farah provinces also share similar



climate and environmental conditions with neighboring Iran and Pakistan. Iran and Pakistan represent two of the top five date producing countries in the world. Given the study's findings, continued growth and adaptation will encourage more planting for both domestic consumption and commercial purposes.

Acknowledgement

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