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Development of Date palm Cultivation and its Role in Sustainability of Agriculture in Oman

Abstract

Date palm cultivation is one of the most important agricultural activities in Oman. The date palm is considered as the first important crop in Oman with perspective to number, widespread, integrated ecological and agricultural system. It occupies about 84.9% of the total fruit area and about 49.3% of the total agricultural land, not only the domestic demand is met, but significant surplus for export is generated. Tremendous development has occurred in the production and the distribution of date palm during the last three decades. Date palm trees occupied around 84500 feddan (35000 ha), and includes more than eight million trees.

Since the 70's, the Ministry of Agriculture has attempted to improve the production of date palm through agricultural research, extension programs and financial support, sustaining various aspects including

establishment of tissue culture laboratories with the main objective of providing date palm transplant (offshoots) and preservation of natural resources. Part of the overall support gene bank which is to maintain the most elite Omani date palm. The total production of dates has increased from 173000 ton in year 1993 to 298000 ton in 2001. Environmental constrains such as the limited water resources and the wave of drought that affected the Sultanate in 2002 and 2003 has led to a decline in the date production to 219772 ton. Yet in 2004-2005 and until 2008 the production of dates has increased to go up to 265000 ton. The development in date production is due to many factors; one of the most important factors is the implementation of new technological methods, including fertilization, insect control, Integrated Pest Management (IPM) and disease as well as put in action a strategy for long term development of date palm in Oman.

Introduction

Date palm tree (phoenix dactylifera) of old trees can be short-lived to about 100 years and more. usually start fruiting after 3-4 years of planting, up to the top of palm production in the second decade of life after (10-15) years of cultivation, depending on the variety and service operations and environmental conditions surrounding the contribution far and continue the same rate to 50 years old.

Palm tree has depth radical, and root length up to 10 meters, which helps to bear the drought, salinity and contribute the maintenance of the soil from erosion, because of the features mentioned above the palm tree plays a very important historic role in the Arabian Peninsula, Iraq and some other Arab countries. It is one of the most important economic trees in the hot and dry climate. Also, palm tree is one of the great symbols of the early civilization of Mesopotamia and the Nile Valley. There are differences in the views of historians to clarify the original home of the palm one opinion shows that palm is home to the Arabian Gulf and then transferred to Iraq some four thousand years BC, where the code of Hammurabi devoted a number of articles for the protection of date palm cultivation, as mentioned in all divine books stated in the Koran as well as in the Hadith.

Date palm is considered the first and most crop in the Sultanate of Oman, more widespread, and agricultural eco-system integrated with great importance in the life of the Omani people throughout the ages as well as wealth and time affecting the fabric of Omani in all the words and touches people's live directly and indirectly. And make great efforts, especially by the Ministry of Agriculture to maximize economic returns and social and environmental impacts of palm trees.



Date palm cultivation has expanded and accompanied by technical and scientific progress which ridiculed all its possibilities to find everything new service the agricultural sector and the general and date palm in particular.

Agricultural Land and Production of Food crops for the Sultanate of Oman from 2000 (Base years) to 2008:

The results of detailed soil surveys carried out by the Ministry of Agriculture and Fisheries indicated the presence of more than 2.3 million hectares of arable land in the Sultanate. However, the size of the cultivated area is in fact 61,536 hectares of which 42,921 hectares are with perennial crops and 18615 hectares are with annual crops. Seasonal fruit crops occupy the first rank of the total cultivated area in Oman with 37000 hectares of which 35471 hectares of which 10735 hectares are with field crops under crop rotation and sequence which would raise cropping intensity to the extent of 120% (Table 1).

Date Palm Production

Figures 1 and 2 show the total production of date in Oman for the period from 1994 to 2008 and the index of date production (base year 1994=100).

The production of date was increased

from 173 thousand tons in 1994 to 281,298 thousand tons in 1999, 2000 and 2001, respectively. However, there was a decrease in date production in 2002 and 2003 due to successive drought spells and inaccessibility and lack of rains. But, productivity in Oman gradual increased year after year until it reached in 2008 to 267 thousand tons. The index of date productions was 154 thousand tons. So, the increased in date production was 54 over year 1994. Despite the decline in cultivated area has been improved the productivity per palm. This improvement was due to several factors as discussed later.

From Table 2, Al-Batina region is considered the leading in 111.4 thousand tons, representing date production reached 41.7% of the total output of Sultanate. Followed by Al-Dakhilya (20.42%), Al-Sarqiyah (18.32%), Al-Dhahira and Buraimi (13.26%) and Other region is the highest with average productivity per palm (57.22Kg) followed by AL-Dhahira (49.29Kg) and Al-Batina (39.35Kg).

The total number of date palm trees currently has been estimated to around eight million with 700 thousand in grading. So the total 8,700,000 trees with a wide range of a available varieties about 250. The most



important characteristics of these varieties considerable variation in the quality and maturity dates (early, intermediate, late) the difference in productivity and rate of annual growth and resistance to pests and diseases. While FAO (1982) report estimated annual production of Omani dates 50,000 tons and the number of date palm trees was 1 million for the period 1961 to 1978. Currently, the date palm trees are estimated to be higher than before due to introduction of new easier production practices along with new cultivar which has increased in large scale of farming of date palm. The number has increased to 8,700,000 trees.

The estimation of human consumption for date during the year 2008 was 134 thousand tons according to estimated censuses of Oman in the middle of 2008. About 1,958 million people consume 60 kg for every one yearly in the average; while 821 thousand expatriates consume 20 kg for every one yearly. The amount of dates consuming by animals is about 55 thousand tons. The statistics of Ministry of Commerce indicate that the export of date in the last year is about 7 tons (Table 4).

Important constraints in Date palm production

The maximization of date palm productivity in Oman is constrained by several factors that include environmental (biotic and a biotic) and agronomic factors, as mentioned below:

- The limited water resources.
- Low soil fertility.
- Small sized farms.
- Low quality of date palm varieties.
- In experienced labors, who are working at the farm
- Newly emerged pests and diseases
- Soil and water salinity
- High density plantations.
- The work accomplished by Ministry of Agriculture:
- The research activities in date palm were started in 1995 towards:
- Identification of varieties.
- Better management of different dates palm trees varieties in respect to:
- Water requirement
- Irrigation levels
- Water used efficiency

Fertilization requirement

Method of pollination, thinning, advancing maturity and pruning.

To maintain the national heritage through conservation of date palm genetic resources.

Factors that helped the development of date palm in Oman

Love citizen of palm crop generosity of Almighty God be mentioned in the Holly Qoran, and was the reason why the Omani transported across the sea to other markets in Asia and Africa.

Completing the infrastructure needed for agricultural research by establishing two main laboratories:

The tissue culture laboratory in 1992 (Jimah research Station) in Interior Region.

Biotechnology laboratory in 2000 at Rumais.

For the purpose of mass propagation of date palm, establishment of genetic map and characterization of Omani date palm genetic resources.

Date palm research station in Wadi Quriyat was established in 1988 for

the purpose of producing offshoots for replacement and improvement of old varieties. This includes 5000 palm trees, with a distinguished gene bank consist of 167 female varieties and 20 male varieties carefully selected from all regions of the sultanate.

Another gene bank has been created for palm in Al-Sarqiyah region for the same reasons mentioned above.

Development of National Strategy to Promote Date Palm and the Operational Plan of Action:

The scope of this strategy is to maximizing the economic returns, water, social and environmental benefits for cultivation of date palm in the Sultanate at the individual and national level. The most important objectives of this strategy are:

Production of high quality dates suited with nature of consumer as table dates

or manufacturing dates.

Marketing of the production locally and externally throughout the year and finding of appropriate manufacturing.

Maximizing the yield potential of palm tree and reducing of the cost production.

Prevention of disease and pest in the date palm of the post harvest losses.

This strategy has scope to achieve the most of its objectives through implementation within the four main programs:

Development program for the advancement of productivity.

Development program for the advancement of marketing.

Extension program for development date plum.

Development program for the

advancement of research in date palm production.

The first program includes four significant projects:

Project for propagation and dissemination the superior varieties (Replacement and reorganization). The objective of this project is to replace 800 thousand palm trees which have deteriorated in productivity and old table dates by a new and high productivity and quality of table dates.

Project of increased yield potential (Agronomy).

Project of integrated control of Red Palm Weevil.

Project of integrated control of Dubas Bug and other pests.

The second program includes five projects:

Table 1. Area (Faddans*) and Production (tons) of food crops from 2000 (base year) to 2008 Source: MoA, 2009

Year	Crops	Vegetables	Field crops	Forage crops	Fruit crops	Total
2000	Area	15694	14719	42559	100345	173317
	Production	151727	24842	692204	344982	1213755
2005	Area	12267	18192	33101	87884	151444
	Production	119138	26561	539839	307398	992936
2006	Area	11197	18192	34215	87884	151488
	Production	108055	25206	564310	313065	1010635
2007	Area	13207	16952	36515	88255	154930
	Production	130360	25182	608743	311769	1076055
2008	Area	14162	16284	40217	88255	158917
	Production	141073	24572	662503	327628	1155777
% Self sufficiency (Av.)		70%	1%	<85.0%	81%	-

* One Faddan = 4200meter square

Table 2. The most important area of date palm crop cultivation and production in the Sultanate (thousand tons)

Region	Production	Percentage
Al-Batina	111.4	41.7%
Al-Dakhilya	54.5	20.42%
Al_Sarqiyah	48.9	18.32%
Al-Dhahira and Buraimi	35.4	13.26%
Other regions	16.70	6.30%
Total	266.9	100%

Table 3. The most ten important productive cultivars of date in Sultanate.

Cultivars	Year 2007	Year 2008
Um Salia	35465	35218
Mabisily	29698	31175
Khasab	27944	27181
Naghal	25069	24944
Faradh	18956	20482
Shahal	12258	12602
Khalas	12134	12658
Khaneizi	1135	11264
Madluki	4896	5152
Barni	4852	5056

Development project of dates packing units.

Development project of the manufacturing dates.

Development project for manufacturing units for the waste of dates.

Palm tourism development project.

project for date products marketing.

The third program includes three projects:

Development of project of quality

control specifications for the products of dates.

Project of replacement the old varieties of date plum trees with new distinguished varieties.

Deployment project for mobilization modern dates.

The fourth program includes eight projects:

Project to study the characterization and evaluation of the Omani varieties and the optimum use them.

Project to determine the factors to help increase date plum tree productivity.

Project of studying the reduction of dates before and after the harvest.

Project of studying the best methods to control pests and diseases.

Project to produce tissue culture for distinguished varieties and study distinctive characteristics of date plum.

Project of food and feed industries of the fruits of palm.

Project to improve the methods of drying, packaging and manufacturing dates.

Project of study the best ways to store dates, pollen grains and Rutabes.

Date palm cultivation has expanded and accompanied by technical and scientific progress which ridiculed all its possibilities to find everything new service the agricultural sector and the general and date palm in particular.

Conclusions

The date palm is considered the most important fruit crop in the Sultanate of Oman and occupying nearly 50% of the cultivated land in Oman, the larger part of which was in Batinah region. At present Oman has more than 8 million date palm trees. There are many constrains in agricultural production in Oman, one of them is water scarcity, and the area which devoted to date palm start decline. Also, the farms are small. However, the Ministry of Agriculture is working to maintain this tree in the top of its priority by conserving its genetic resource, carrying out research as well as building appropriate laboratories and expansion the tissue culture lab to increase its productivity of offshoots to 50,000 or more yearly on order to develop the cultivation of this crop and increase the number of date palm trees between 9 to 10 millions. Also,

there is a tremendous work to control pests and diseases, also to develop an extension service program for Omani date palm growers.

I suggest that the private sector in collaboration with the government to give more attention to develop date palm industry through studying the local, regional and international markets. This will help the international stockholders to enhance the current date palm strategy.

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Exploitation of local production of dates:

Table 4. The exploitation of local production data (thousand tons) in Oman for last two years (2007 and 2008)

Year	Year 2007	Year 2008
Total local production	261	267
Human consumption	132	134
Animal feed	53	55
Export	9	7
Surplus of table dates	30	27
(Surplus (Manufacturing date	37	46

Date palm production in Sultanate of Oman

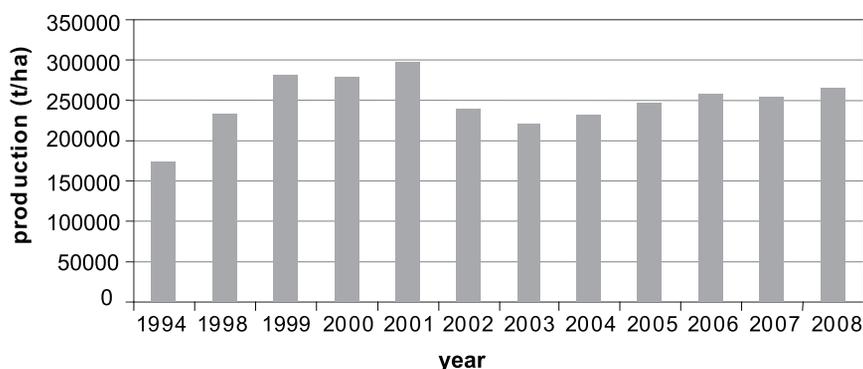


Figure 1. Date Palm Production in Sultanate of Oman from 1994 to 2008.

Index of Date Palm production (Base year 1994= 100)

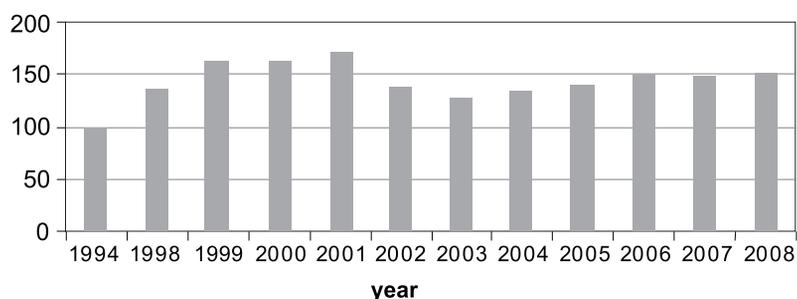


Figure 2. Date Palm Production index from 1994-100 base year.

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