

# Date production support: Namibia

## ABSTRACT

Namibia is an arid country with one of the world's harshest climates and very low agricultural potential. The country suffers from crippling and persistent drought and has limited irrigation water and irrigated land available. Large areas of the country are classified as desert environment, with climatic and soil conditions unsuited to crop production. Development under such conditions presents a formidable challenge.

Since the beginning of the twentieth century, date palms have been growing in dry areas of Namibia next to riverbeds where groundwater is found close to the surface, a demonstration that the climate is suited to date palm propagation and production. Date palms are grown in five districts of the country where water quality and soil conditions are suitable.

Although the date palm has the potential to foster agricultural development and improve the nutritional status of the population, several key factors have limited full-scale exploitation. Local technical knowledge was non-existent and dates were not produced for commercial purposes. The date fruit that was produced under natural conditions was locally consumed and no dates were channelled into any formal markets. Practices such as burning date palm leaves hampered fruit production and threatened the survival of palms. The existing date palms were not normally irrigated and survived only if their root system was within reach of groundwater. Date palms originated from seeds planted by settlers earlier in the twentieth century and no systematic selection was made of production characteristics of local female clones for further propagation.

For some years, the Government of Namibia has set establishment of a date production industry high among its priorities. In 1993, a consultant from the Food and Agriculture Organization of the United Nations (FAO) studied the technical situation of date palm cultivation and investigated the potential for its expansion, with positive results. Although the government was unable to secure foreign funding for a subsequent project proposal, it nevertheless decided to fund the project out of its own resources.

The basic aims of the project, the Date Production Support Programme, are to transfer to local Namibian experts and farmers knowledge about date palm propagation, production and protection and to support the establishment of

commercial plantations in the country. The programme, which started in June 1995, supports and coordinates the activities of all components involved with date palm cultivation. Activities include:

- support for government-established plantations to prove the viability of date production in Namibia and serve as a nucleus for further development;
- support for private-sector entrepreneurs with potential evaluation, project planning and implementation;
- support for local date palm tissue culture laboratories to ensure the availability of selected varieties at reasonable prices;
- training of Namibians through study tours and formal courses and an annual training course for farmers and technicians;
- establishment of a gene bank with the best selected varieties available;
- a local evaluation and selection programme for future multiplication;
- research on such key aspects as water requirements, pollination and intercropping.

The immediate target beneficiaries are the government and private-sector date growers and settler farmers who produce, retail and export date products. Local date fruit consumers and the Muslim community in neighbouring countries also share considerable benefits resulting from the expected increase in dates available in the region.

Among the notable achievements recorded so far has been control of desertification in various areas of the country resulting from the creation of date palm plantations, which has helped create microenvironments. Erosion by wind and water has decreased and soil fertility has increased. Countries in the subregion have expressed interest in date production and support for these countries has been provided by a Namibian team.

Namibia has a real opportunity to compete on the international market in future as a major commercial date producer in the southern hemisphere. Since the country is out of season compared to all other major date producing countries, Namibia will be able to produce and supply dates to all major markets during the traditional off-season. The lack of major diseases and pests and the fact that no chemicals are used – the dates are natural/organic products – add value to Namibian dates.

If Namibia is to target higher-priced markets in Europe and the Middle East, however, modern processing **and** packing facilities need to be established. Further recommendations to foster sustained growth of the industry include the establishment of an International Date Palm Symposium and an International Date Information Network. Namibia's newly established gene bank has been identified as having value for other date-producing countries.

The innovative experience of planning, developing and implementing a crop production programme in one of the world's harshest climates is an exemplary model for possible replication elsewhere. Palm cultivation has helped to improve nutritional status, generate income, diversify agricultural production and prevent/reverse desertification. It has made an important contribution to development of the drier western and southern regions of the country, allowing settlement of landless peasants and reducing the existing gap between communal and commercial farming.

Such has been the success of the Date Production Support Programme that initial steps have already been taken to initiate a southern African regional project based on the Namibian experience.

## INTRODUCTION

Namibia is a vast country with a total land area of 824 295 km<sup>2</sup> inhabited by only 1.7 million people of different races and ethnic groups, of whom about 10 percent live in the capital, Windhoek, and 70 percent in communal areas.

The agricultural sector's disappointing contribution to the gross domestic product (GDP) – an average of 10 percent in 1980-88 – contrasts with its role as the dominant employer and source of occupation for the population. Estimates in 1991 indicated that total employment was 394 341, of whom 187 119 were employed in agriculture, or approximately 47 percent of the economically active population.

The country is arid, with very low agricultural potential. Extensive stock farming forms the largest component, with limited agronomic activities based on low-value food crops. The climate of Namibia is harsh and irrigation water and irrigable land are very limited. Large areas of Namibia are classified as desert environment with climatic and soil conditions not conducive to crop production. Development under such conditions is a challenge.

Since independence in 1990, the focus of government policy in the agricultural sector has been to increase and diversify crop production, with the goal of improving the country's food-sufficiency ratio. The diversification strategy for agricultural production involves the determination of which crops and fruit trees resist or tolerate drought and which perform best under irrigation.

Development can only be possible through increased productivity, the use of modern production **technology, efficient irrigation systems** and exploitation of semi-arid areas, in which most available water is found at sites where the date palm is almost the only crop that can be grown.

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<sup>3\*</sup> 1991 estimate.

Over the past eight years, substantial investments of approximately 10 million Namibian dollars have been made in irrigation projects and in date palm production.

Date palms are grown in five districts – Karibib, Swakopmund, Damaraland, Mariental and Keetmanshoop – where water quality, soil and climate are suitable for date palm cultivation.

The Ministry of Agriculture, Water and Rural Development, the Namibia Development Corporation (NDC) and private-sector date growers are convinced of date production potential and are striving to establish date plantations and promote a date production industry in Namibia.

### **Potential benefit of date palm to Namibian agriculture**

The development of a date industry in Namibia has already produced the following benefits:

- high nutritional value;
- crop diversification;
- development in drier areas of the country;
- job creation possibilities;
- foreign exchange earnings;
- control of desertification.

### **High nutritional value**

Dates have many advantages such as nutritional value, laxative power, exotism and originality and they are a source of energy. In addition to a small quantity of protein and fibre, they contain several essential minerals and vitamins. Dates have above-average amounts of iron and vitamin B7 and are a particularly good source of potassium. Their energy is in the form of invert sugars.

### **Crop diversification**

Date palm is well adapted to the harsh climatic conditions of desert areas of Namibia. In fact, it can grow where other plant species would be marginal at best. It also provides protection for other ~~f r u~~ trees and undercrops such as alfalfa, cereals and vegetables from the harshness of the climate.

### **Development in drier areas of the country**

Date palm, as mentioned above, is considered the main foundation upon which life is initiated and sustained. It will make possible the settlement of landless peasants, provide job opportunities and increase farmers' incomes.

### **Job creation possibilities**

Under a fully mechanized date industry, as in Israel or the United States of America, an average of seven working days are needed annually per tonne of dates produced. This calculation is based only on field activities and does not include packaging or processing. In other words, these countries need approximately 80 working days/year/hectare. In the Namibian date cultivation sector, which is based purely on the labour force, approximately 170 working days/year/hectare is a safe estimate.

To highlight the importance of job creation in the date palm sector, the date plantation at Naute can be cited as an example, where maintenance of 100ha of date cultivation requires 17 000 working days per year.

### **Foreign exchange earnings**

The Israeli model, which is similar to that being established by Namibia, ensures an annual income of US\$37 800 from one hectare of Medjool dates. About 60 percent of Israel's production, or 9 300 tonnes, is traditionally exported to Europe for a value of US\$30 million.

A market potential study of the Namibian date industry has shown a potential production of approximately 24 000 tonnes/year, estimated as follows:

- consumption in Namibia and the Republic of South Africa: 8 000 tonnes;
- consumption in the Muslim community in neighbouring countries during the religious month of Ramadan: 6 000 tonnes;
- export potential to Europe: 10 000 tonnes.

If only half of this estimated value, some 5 000 tonnes, is exported at the current international price of US\$3 per kg, exchange earnings would amount to around US\$15 million per year.

Namibia's total date production will not be notable in relation to world production, but might be significant in the export market. It is estimated that by 2000, the NDC will have approximately 170 ha of high-quality dates. By 2006, this 170 ha will be producing about 1 000 tonnes for export at a value of US\$3 million. This represents 0.35 percent of world exports in relation to 1994 statistics.

For the industry to be sustainable, Namibia needs to maximize sales revenue by targeting European and possibly Middle Eastern markets. The trade statistics of France show that there is a market for dates during the off-season. Through careful planning and market integration, Namibia should be successful in entering a developing and lucrative market in Europe.

A decline in productivity of the industry in traditional date-growing areas over the last decade resulting from political, socio-economic and technical

constraints has created opportunities for other underexploited production areas of the world, including southern Africa.

Namibian consumers will not absorb a large percentage of local date produce. If production is properly managed, however, and targeted at the high-value export market in Europe, returns on investment will be positive. Once established, the date industry will be a valuable alternative crop in the drier western and southern areas of Namibia.

#### **Control of desertification**

Date palm plantations established in various desert areas of Namibia are creating microenvironments and contributing to the control of desertification in the country. Wind and water erosion have decreased and soil fertility has increased.

#### **Other important advantages**

It is probable that, in the near future, Namibia will be the only commercial date producer in the southern hemisphere. Being out of season compared to northern countries, Namibia will have a great advantage on the international market.

Namibia is being recognized as a country that produces dates free of the major diseases and pests commonly found in other date-growing areas of the world. This healthy status of the Namibian date industry will strengthen the country's position on the international market and put Namibia on the map of date-producing countries.

#### **Developmental results**

Date growing in Namibia is a challenging activity with a bright future because of the crop's long-term nature. It is not the miracle plant but neither is it a mirage. Many challenges are ahead but none seem insurmountable. Success will surprise the world and create a new and modern agricultural Namibia.

The establishment of a date production industry in Namibia will result in income regeneration, foreign exchange earnings, work and investment opportunities and desertification control. It will make possible the settlement of landless peasants and reduce the existing gap between communal and commercial farming.

The date industry, once established, will contribute to enhancing the role of agriculture as the dominant employer and occupation. At a national level, GDP will be improved. The Date Production Support Programme is designed to provide technical and scientific skills by establishing a date industry, modern propagation and production techniques and personnel training.

## PRE-INNOVATION

Date palms were planted by German settlers around 1900. The palms were planted in dry areas of Namibia next to riverbeds where groundwater was found close to the surface. All these palms originated from date seeds and their production characteristics vary considerably in terms of quality and quantity.

Date palms have been growing in these locations for more than 90 years and it is clear that the climate is suited to date palm propagation and production. Vegetative growth at desired levels, flowering, pollination, fruit set and natural maturing of date fruits have been obtained. No major pests or diseases are found on date palms in Namibia.

However, the situation was characterized by the following factors:

**Limited technical knowledge.** Local technical knowledge regarding modern date propagation, protection and production was virtually non-existent. Dates were not produced for commercial purposes and no effort was made to acquire knowledge or conduct any research on date palm cultivation.

Activities in most cases were limited to harvesting dates after nature had taken its course through the normal cycle. Some common practices, such as burning date palm leaves, were detrimental to fruit production and the survival of palms.

**Areas of date palm growth.** Date palms were found in natural growths next to *dry* riverbeds where groundwater levels were close to the surface. No organized plantations were found where proper cultural techniques were practised. The date palms were, in most cases, not even irrigated and their survival depended on the existence of groundwater within reach of their root system.

**Seed origin.** The date palms originated from seeds planted by early settlers in Namibia. Of these, 50 percent of the palms were males and 50 percent were females, with huge variations in the production characteristics of female palms. No selection was made of the production characteristics of local female clones for further propagation.

**Local consumption.** The few tonnes of dates that were produced under natural conditions in rural areas were consumed locally and no dates were channelled into any formal markets.

## INTRODUCING INNOVATION

The NDC, as agent of the Government of Namibia, requested **FAO** to investigate the potential of date production in Namibia. An **FAO** consultant made a study of the potential during 1993, with positive results. A project proposal was drawn up and efforts were made to secure foreign funding for the project. These efforts were, however, unsuccessful and the Government of Namibia decided *to* fund the project out of its own resources, because of its importance *to* Namibia.

The basic aims of the project are to transfer knowledge of date palm propagation, production and protection to local Namibian experts and farmers and to support the establishment of commercial plantations in Namibia. The Date Production Support Programme provides support for, and coordinates activities of, all components involved in date palm cultivation. The programme can thus be regarded as an umbrella programme that oversees and supports date palm-related activities. Support goes to the following components/aspects:

#### **Date production projects**

The NDC and the Ministry of Agriculture, Water and Rural Development have initiated the establishment of date production units to investigate adaptation and viability and to serve as nucleus development units.

##### **Naute date project**

- 20 ha planted with selected varieties to determine their adaptation and production under local conditions;
- 20 ha planted with Medjool and BouFeggouss date varieties;
- 40 ha in the process of planning and development for establishment of Medjool and Barhee varieties. The plantation will be completed in early 2000.

##### **Eersbegin date project**

- 19 ha planted with local clones with a possibility of partial replacement by intercropping with the Medjool variety;
- 5 ha planted with selected date varieties.

##### **Aussenkehr date project**

- 10 ha planted with selected date varieties.

#### **Date palm research**

Practical on-farm research is being conducted to clarify certain issues that will influence the viability of date palm production in Namibia. The following list highlights some of the activities being carried out locally:

- climatological adaptation of selected varieties tested in different climatic zones at Naute, Eersbegin, Aussenkehr and Hardap;
- fruit quality and quantity survey on local clones to identify those that could be propagated in future; these clones have been in Namibia for many years and their adaptation to Namibian conditions is beyond doubt;
- water requirements of date palm at the Naute project;
- pollination and fruit thinning experiments at the Eersbegin project;
- processing and packaging of fruit for local and export markets;
- field testing of the Medjool variety originating from different sources and plant material originating from two sources of organogenesis tissue culture

material, two of somatic embryogenesis tissue culture material and two of Medjool offshoots.

#### **Tissue culture laboratory**

Support for the Tissue Culture Laboratory is regarded as of utmost importance, because the availability of date plant material of selected varieties at affordable prices is the main restrictive factor for private date growers. Support is provided to ensure establishment of an economically viable production unit and initiation of selected varieties for future propagation.

#### **Private date farmers**

The project can only be regarded as successful in the long term if it is taken up by private farmers as an economically viable farming system. Support for private farmers includes planning guidelines and advice on project initiation and technical support through formal training and technical advice on farms during scheduled visits.

#### **Training**

Training of national team members and interested private farmers/entrepreneurs is one of the most important components of the Date Production Support Programme. The training activities are listed below.

**Formal.** Study and training missions for national team members have already been undertaken in Morocco, Tunisia, the **USA**, France, South Africa, the UK and Israel. Four annual international training courses were organized between 1996 and 1999.

**Informal.** Field demonstrations and advice on date propagation, production and protection were implemented and project managers and private farmers benefited from demonstrations and advice. The project team is also conducting extension activities through production of technical leaflets, specialized documents and photographs.

#### **Settlement projects**

One of the main objectives of the Date Production Support Programme is the settlement of landless people. Two projects were investigated where date production is included as a production component. The project proposals were submitted to the government for approval and implementation.

#### **POST-INNOVATION**

The situation changed drastically with the implementation of the project, when

this agricultural component started to receive the attention it deserved. Lack of knowledge and cultural aspects were addressed and changes occurred as listed below.

**Knowledge**

National members of the Date Production Support Programme have benefited from study tours and training. They have acquired a significant increase in knowledge and are now on a level comparable to some of the best areas of the world in which modern date palm cultivation is practised.

**Date palm reaction**

Established local date palm plantations have reacted positively to the introduction of new cultivation techniques. Monitoring and selection of promising local clones is being conducted and future propagation can be envisaged.

**Climatic adaptation**

The climatic situation and the reaction of existing date palms were investigated and it was concluded that viable date production levels could be obtained.

**Viable alternative**

Date palm cultivation is considered a viable alternative agricultural commodity. The prospects are supported by the Government of Namibia and private-sector entrepreneurs.

**Marketing potential**

The marketing potential in Namibia is very promising, because the country is situated in the southern hemisphere, unlike the other major date producing countries. Namibia will thus be able to produce and supply dates to all major markets during the traditional off-season. The lack of major diseases and pests adds value to the Namibian dates. No chemicals are used; the dates are natural/organic products .

**Regional support**

Interest in date production has been expressed by subregional countries and support for these countries is being given by the Namibian team. Technical assistance and formal training are offered to interested parties.

**Other benefits**

Examples of coordinated work between the government, the private sector and

FAO are the successful establishment of date plantations with modern technology and the creation of a date palm tissue culture laboratory producing plants for Namibian farmers.

The programme in general contributes to food security, poverty alleviation, creation of employment, prevention/reversal of desertification and a more balanced diet through the high nutritional value of the dates.

### **LESSONS LEARNED**

The project is in its third year of implementation; direction, management, implementation and projected results are well established at this stage. Some aspects stand out as factors contributing towards the successful implementation of the project.

Very good relations were established at the start of the project between FAO staff and Namibian project staff; these still exist. Project team members from both groups are actively involved with implementation and control aspects. Implementation is jointly planned and executed.

Namibia has already embarked on the establishment of a gene bank. Selected varieties derived from tissue culture material have been imported and introduced at three different locations, enabling the monitoring of climatological adaptation and limiting the risk of major catastrophes that can destroy the plants in a single location. This date plant gene bank can be of benefit to all date-growing countries, since Namibia is free of all major pests and diseases.

It is of vital importance that an International Date Information Network is established. Initial action will be undertaken shortly to determine the needs, contributions, magnitude and host of such a network. At this stage, Namibia seems the most appropriate country.

For the date industry to be sustainable, Namibia needs to maximize sales revenue by targeting the higher-priced markets of Europe and the Middle East. To reach these markets, however, a modern processing and packing facility needs to be established. This packing facility is extremely important for achieving the country's goals in growing, packing and exporting high-quality dates.

As proposed in the project document and highly recommended by different international consultants who have visited the project, the organization of an International Date Palm Symposium would be of great benefit to the Namibian date industry. Such an event would be held during February 2000, the last year of the project, and would bring together officials, scientists, businessmen, laboratory managers and date growers from all over the world.

The initial steps have been taken to initiate a regional project based on the success of the Namibian project.

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