Tree of Life

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The Global Date Economy

In its report on the global Date market, published in October 2017, the research firm Technavio observed that "*the market is rapidly changing because of changing demands, preferences, and spending patterns of the consumer*". The report singled out an increase in health-consciousness amongst consumers, as a trend impacting positively on demand for Dates, along with increasing levels of consumer wealth. The report also noted that the global Date market is highly fragmented and that suppliers need to increase their focus on consumer preferences and market reach. That the producer sector is overwhelmingly dominated by unsophisticated smallholder farmers, often located in isolated regions with poor logistics and highly diverse planting materials, has concentrated the addition of value amongst the processors and distributors of Dates and Date products. ACA's desk research indicates that while the global Date economy is still largely informal, there is growing sophistication amongst at least some of the producer nations, with at least three producer countries practising Tissue Culture propagation of superior planting materials, and a growing focus on the tastes and demands of a buoyant international market for Dates and Date products.

A Largely Internal Economy

FAO data for the 2017 year indicates that nearly 8.2 million metric tonnes of Dates were produced across 39 countries. Diverse data sources including FAOSTAT indicate that less than 15% of the global crop finds its way on to international markets, implying that 85% of annual production is consumed within the producer countries. FAOSTAT data for 2016 indicates that only 14% of the global crop went for export: some 1.13 million metric tonnes of Dates were exported for a combined value of US$1.24 billion, representing an average value of US$1,100 per tonne of imported Dates. The data in the Table 1 for the top ten exporting nations, reveal strong differences between the exporting countries: the largest producer Egypt, and 3rd largest producer Algeria, exported between 2.2% and 3.0% of their respective 2016 crops only. Fourth placed producer, Saudi Arabia exported 10.8% in 2016 and the second largest producer Iran, exported 12.6%, all below the global average of 16%. However, Israel is revealed as a re-exporter of imported Dates and the UAE emerges as one of the most sophisticated of the Date economies with more than 41% of the national crop going for export.

Table 1

FAOSTAT DATA 2016	Export Dates (MT)	National Production (MT)	Exports as % National Crop
United Arab Emirates	275,863	669,631	41.2%
Pakistan	163,177	487,386	33.5%
Iraq	150,000	615,211	24.4%
Iran (Islamic Republic of)	138,844	1,103,685	12.6%
Tunisia	113,794	241,000	47.2%
Israel	86,890	43,200	201.1%
Saudi Arabia	75,441	696,834	10.8%
Egypt	34,561	1,549,260	2.2%
Algeria	31,109	1,029,596	3.0%
Oman	15,700	355,332	4.4%
Top Ten Exporters	**1,085,379**	**6,791,135**	**16.0%**

Source: FAOSTAT 2016 / ACA

Compared with the Indonesia palm oil sector for example, which exports up to 84% of the national production, the Date producing countries, in aggregate, export only a small percentage of their annual Date crop.

FAO data also suggest that just 9 countries consume some 85% of the annual Date crop, of which 8 are within the top 10 producer countries, but India, which is not a leading producer, represents the largest single importer nation. Demand from importing countries must vie with strong domestic consumption within the producer countries, wherein Dates are an important component of traditional diets and customary practices.

Table 2

Indonesian Palm Oil Production and Export Statistics:	2008	2009	2010	2011	2012	2013	2014	2015	2016
Production (million tons)	19.2	19.4	21.8	23.5	26.5	30.0	31.5	32.5	32.0
Export (million tons)	15.1	17.1	17.1	17.6	18.2	22.4	21.7	26.4	27.0
Exports as % of National Production	78.6%	88.1%	78.4%	74.9%	68.7%	74.7%	68.9%	81.2%	84.4%

Sources: Indonesian Palm Oil Producers Association (Gapki) & Indonesian Ministry of Agriculture

Globalisation in trade, travel and migration is thought to have driven strong growth in the export trade of Dates, indicated below at 14% during the period 2012-2016. The market research company Technavio published a report on the global Date market in October 2017 at which time it postulated that the global Date market would grow at a CAGR of more than 7% from 2017-2021. In its analysis of the different distribution channels, Technavio reviewed the presence of Dates in hypermarkets, supermarkets, convenience stores, and food & drink specialist stores, concluding that in 2016 more than 52% of the retail trade in Dates occurred in hypermarkets and supermarkets. Manjunath Reddy, a lead analyst at Technavio for food research noted that "*There has been an increase in organized retail, particularly in developing countries. The penetration of modern retail chains in the ASEAN countries such as Indonesia, Thailand, Malaysia, and the Philippines increased to more than 16% in 2014. This channel offers a wide range of products to consumers under one roof*."

Across the value chain, from growers to processors, distributors, retailers and consumers, there is rising interest in Dates and a growing focus on the international Date economy amongst regional and international agribusiness value chain operators and investors.

Estimating a US$ market value for the annual production of Dates is something of a challenge as much of the Date economy within the producer countries, is informal. Remote producer communities, poor logistics and the wide diversity of Date varieties cultivated (perhaps in the region of 3,000 distinct varieties) means that not all the Date crop is either suitable for export, intended for export, or able to be exported; some of the crop is used for animal feed. While the weighted average import price per metric tonne was US$1,100 in 2016, the two lead importing nations (India and UAE representing 50% of the global import trade) paid an average price of $585 per metric tonne, implying that local producer prices could be in the range of $200-300 per metric tonne.

While the export trade was worth $1.24 billion in 2016, it may be assumed that the internal markets across the producer countries generated a combined value of perhaps $1.75bn, for a combined annual trade in Dates of circa US$3 billion. A higher value is perhaps achievable for the global production in Dates, but this would require a focus on cultivating such popular export varieties as Medjool, Deglet Noor, Bahri and Mazafati, improved logistics to increase the proportion of fresh Dates exported, and greater value addition in the form of processing and packaging. The 2017 Technavio report postulates that some 59% of the export market in Dates may be represented by the Medjool variety.

A Traditional and Informal Economy

While Dates are a crop immediately associated with the Middle East, the Date palm *Phoenix dactylifera L* is thought to have originated in the Indus Valley of modern-day Pakistan, spreading into the Middle East with trade during the 6th Century BC. Associated also with desert environments and able to withstand very high temperatures, the Date is still a thirsty palm which explains the success of its cultivation in Egypt along the reaches of the Nile. Egypt alone accounts for nearly 20% of global Date production and remains the world's most efficient producer with an average 32 MT of Dates per hectare, more than double the yield per hectare of next most efficient producer Oman. In fact, in 2017, Egypt's national average yield of 32.1 MT/Ha was 5.3x greater than the global average yield per hectare of 6.1 MT. Like cocoa and coconut production, Date production is overwhelmingly a smallholder crop, with diverse sources indicating that 90% of production derives from smallholder farms. While average yields are relatively low across the smallholder producer sector, opinion is that practical improvements to farm management, pre-harvesting, harvesting and post harvesting practices are possible to boost production levels. In common with cocoa and coconut production, the production of Dates is economically and culturally important to its smallholder producers, supporting in many cases the social fabric and viability of producer communities.

The processing, grading, packaging, marketing and distribution of Dates is commonly carried out by businesses which aggregate the production of diverse smallholders and farmers, for example: the Israeli processing company Hadiklaim, reportedly sells 65% of the Israeli national Date crop. Inevitably therefore, the wealth generated by Date production is concentrated rather more in the middle and downstream end of the value chain than in the upstream smallholder producer segment.

The International Trade in Dates

In 2016, just four countries accounted for 59% of all Date imports: India, UAE, Morocco and Bangladesh. In the period 2012-2016, the International Trade Centre (ITC) recorded that the international trade in Dates increased at an average rate of 14%.[1]

However, when the international trade in Dates is reviewed for the timespan 1996-2016, the increase in the value of the trade outstrips the increase in the volume of the trade: while volumes expanded by 112% to 1.13million metric tonnes, the value of the international trade in Dates increased by 308% to $1.24 billion ($305 million in 1996).

Average values per tonne (all imports) expanded from US$571/MT in 1996, to $1,100/MT in 2016. Lead importer nation India, saw volumes expand by 71% and price per tonne by 2.48x. For UAE, number two importer in both 2016 and 1996, average price per MT increased 2.7x from $208/MT to $556 MT. By contrast, some European importers experienced only marginal movement in prices: French imports were recorded with a 1996 average value of $2,235/MT, yet in 2016 average price evolved at $2,245/MT. Germany was similar: $2,815/MT in 2016 versus $2,526/MT in 1996.

These markedly contrasting data reflect the pattern of pricing for nations importing Dates for processing and then onward selling, and end user markets like Europe and the USA, which both have a pattern of higher per MT prices based on finished and packaged goods for retailing. In this context it is interesting to note that average Price/MT for Canada tops at $3,361/MT in 2016, followed closely by Italy at $3,102/MT ($2,957/MT in 1996). Dry Dates, which dominate the exports of countries such as Pakistan, fetch lower prices than fresh Dates.

1 http://www.intracen.org/news/The-global-trade-in-dates/

Table 3

FAOSTAT Country Imports	2016 MT	% Of Total	US$000	US$ / MT	Country	1996 MT	% Of Total	US$000	US$ / MT
India	350,022	30.9%	211,148	603	India	205,165	38.4%	49,904	243
UAE	213,821	18.9%	118,832	556	UAE	120,000	22.5%	25,000	208
Morocco	69,324	6.1%	96,170	1,387	France	19,981	3.7%	44,649	2,235
Bangladesh	37,340	3.3%	22,440	601	Malaysia	19,919	3.7%	13,437	675
France	33,910	3.0%	76,117	2,245	Pakistan	18,696	3.5%	3,559	190
USA	28,573	2.5%	49,718	1,740	Indonesia	13,936	2.6%	4,688	336
Turkey	26,772	2.4%	36,475	1,362	Bangladesh	12,284	2.3%	3,542	288
Indonesia	23,229	2.1%	32,929	1,418	Syria	10,938	2.0%	5,966	545
Kazakhstan	22,933	2.0%	6,533	285	United Kingdom	8,843	1.7%	14,282	1,615
United Kingdom	19,807	1.8%	55,680	2,811	Sri Lanka	7,989	1.5%	1,547	194
Malaysia	18,271	1.6%	42,197	2,310	Yemen	6,886	1.3%	7,061	1,025
Germany	18,078	1.6%	50,897	2,815	Niger	5,367	1.0%	782	146
Russian Federation	17,312	1.5%	22,119	1,278	China, Hong Kong	5,134	1.0%	8,035	1,565
Jordan	13,948	1.2%	21,073	1,511	Germany	4,931	0.9%	12,458	2,526
Niger	13,089	1.2%	1,853	142	Italy	4,926	0.9%	14,565	2,957
Canada	11,383	1.0%	38,263	3,361	Russian Federation	4,631	0.9%	9,089	1,963
Kuwait	11,239	1.0%	16,316	1,452	Canada	4,445	0.8%	7,373	1,659
Oman	10,557	0.9%	11,296	1,070	USA	4,161	0.8%	5,852	1,406
Italy	9,379	0.8%	29,090	3,102	Australia	3,936	0.7%	4,899	1,245
Australia	8,994	0.8%	13,818	1,536	Jordan	3,667	0.7%	3,058	834
Somalia	8,962	0.8%	9,855	1,100	Taiwan	3,547	0.7%	2,660	750
Leading Importers	**966,943**	**85.5%**	**962,819**		**Leading Importers**	**489,382**	**91.6%**	**242,406**	
% Of Total	**85.5%**		**77.4%**		**% Of Total**	**91.6%**		**79.5%**	
World Total; All Importers	**1,131,078**		**1,244,623**	**1,100**	**World Total**	**533,969**		**304,985**	**571**
% Increase Over Period	**112%**		**308.1%**	**92.7%**					

Source: FAOSTAT/ACA

Over the period 1996-2016 there have been some notable changes in importers, with Morocco emerging as a top 3 importer in 2016, from a bottom tier position in 1996. Turkey also emerges over the period as a top 10 importer, while Syria falls behind. The leading position of India diminishes from 38% of all imports in 1996 to 31% in 2016. Taken together the data confirm that the international trade in Dates has been driven by growth in both volumes and prices, and with only a few exceptions, the leading importer nations appear in the data sets above for both 1996 and 2016. Yemen and Syria, both riven by civil war, drop out. More surprisingly, so too does Pakistan: ranked 5th largest importer in 1996, Pakistan does not appear in the 2016 lead importer data. Again, surprisingly, production of Dates in Pakistan has also declined during the first 17 years of this century, down 14% on national production in 2000 according to FAOSTAT data. Morocco meanwhile appears as both a top 3 importer and a producer of 1.6% of the global crop, after enjoying 75% growth in output since 2000.

Cultivation & Production

Date palms are cultivated in some 39 countries, covering circa 1.33 million hectares according to FAOSTAT 2017 crop data, but the largest 8 national growers, account for more than 82% of the global cultivated area.

Table 4

FAOSTAT Area Harvested (Hectares)	2000	2017	Period Change (%)
Iraq	110,000	365,908	232.6%
Iran (Islamic Republic of)	184,725	169,793	-8.1%
Algeria	101,820	167,663	64.7%
Saudi Arabia	142,450	108,133	-24.1%
Pakistan	78,590	98,023	24.7%
United Arab Emirates	185,330	65,021	-64.9%
Tunisia	31,610	64,398	103.7%
Morocco	30,400	58,316	91.8%
Top 8 Producers	**864,925**	**1,097,255**	**26.9%**
% Of Global Production Area		**82.5%**	
Egypt	28,982	49,522	70.9%
Sudan (former)	35,000	37,139	6.1%
Libya	24,000	32,620	35.9%
Oman	35,508	24,617	-30.7%
Yemen	22,755	13,960	-38.7%
China, mainland	6,000	13,814	130.2%
Chad	7,323	10,576	44.4%
Mauritania	5,000	9,296	85.9%
Second 8 Producers Total Harvested Area	**164,568**	**191,544**	**16.4%**
% Of Global Production Area		**14.4%**	

Source: FAOSTAT/ACA

Of the 39 listed national producers, 13 as detailed in Table 5, produce 95% of the global crop led by Egypt. Blessed by the waters of the Nile, after thousands of years, Egypt continues to be the largest producer of Dates in the world, but it is reported that the country's orchards are susceptible to damage by weevils. There have been some notable reductions in harvested area in formerly important producer countries including UAE, which remains a leading exporter of Dates. Interestingly, the UAE has been a notable investor in the Egyptian Date economy, as evidence by announcements in February 2018 of UAE investments in planting, processing and exporting Dates and Date products from Egypt. Iraq, unlike the UAE, can be seen to have trebled the area under cultivation for Dates, yet its output has shrunk by one third, most likely a reflection of the conflicts that have afflicted Iraq for much of this century.

Table 5

Production (MT) FAO Data	2000	2017	Change over Period (%)	2017 % of World Crop
Egypt	1,006,710	1,590,414	58.0%	19.5%
Iran (Islamic Republic of)	803,887	1,185,165	47.4%	14.5%
Algeria	365,616	1,058,559	189.5%	13.0%
Saudi Arabia	734,844	754,761	2.7%	9.2%
Iraq	932,000	618,818	-33.6%	7.6%
Pakistan	612,482	524,041	-14.4%	6.4%
United Arab Emirates	757,601	475,286	-37.3%	5.8%
Sudan (former)	332,320	439,355	32.2%	5.4%
Oman	280,030	360,917	28.9%	4.4%
Tunisia	105,000	260,000	147.6%	3.2%
Libya	120,000	174,583	45.5%	2.1%
China, mainland	125,000	162,041	29.6%	2.0%
Morocco	74,000	129,562	75.1%	1.6%
Top Tier Producers Total Volumes	**6,249,490**	**7,733,502**	**23.7%**	94.7%
As % of Global Crop	**97%**	**95%**		

Source: FAOSTAT/ACA

Table 6

Top Producer Countries FAO Data	MT (2017)	Hectares Harvested (2017)	MT/Ha
Egypt	1,590,414	49,522	32.1
Oman	360,917	24,617	14.7
Sudan (former)	439,355	37,139	11.8
China, mainland	162,041	13,814	11.7
United Arab Emirates	475,286	65,021	7.3
Iran (Islamic Republic of)	1,185,165	169,793	7.0
Saudi Arabia	754,761	108,133	7.0
Algeria	1,058,559	167,663	6.3
Libya	174,583	32,620	5.4
Pakistan	524,041	98,023	5.3
Tunisia	260,000	64,398	4.0
Morocco	129,562	58,316	2.2
Iraq	618,818	365,908	1.7
Top Producer Group Sub-Total	**7,733,502**	**1,254,967**	**6.2**
World Total	**8,166,014**	**1,329,973**	**6.1**
Top Producer Group as % World Total	**94.7%**	**94.4%**	

Source: FAOSTAT/ACA

Not only is Egypt the largest producer, according to FAOSTAT Crop data, the country is also the most efficient producer, achieving some 32 metric tonnes of fruit per hectare annually. This is more than 5 times the achieved average global yield. It is interesting to note however,

the strong growth in total production in the countries of the Maghreb region led by Algeria (now 3rd largest producer) and Tunisia. Whereas traditional producers like Oman and Sudan also record respectable Date yields, many of the larger growers, such as Algeria and Iran, achieve yields near the global average and significantly below the Egyptian level.

The production cycle of the Date palm, between flowering and harvest, lasts from 8 to 10 months. In North Africa for example, from March-April, the fruit of the Deglet Nour palm is green and round. The Date attains its final size during the summer, with a yellow colour and smooth skin. The Date does not mature until autumn, after exposure to the summer heat. Harvesting runs from the second half of September until December for the Deglet Nour variety, with the peak before Christmas. Fresh Dates are collected mature and can only be kept for a few days unless refrigerated, when they can be kept for up to six months. Dates can also be frozen for a greater shelf life. Some Dates can be sun-dried on the palm and then further treated in hot-air ovens in order to reduce their water content from 70% to 20%. Dates may also be coated with glucose syrup, in order to extend their shelf life up to one year.[2]

2 https://www.fruitrop.com/en/Articles-by-subject/Full-country-profile/2016/Tunisian-dates

Leading Producer Countries

Egypt (1)

Egypt is the world leader in Date production and cultivation, producing over 1.5 million tonnes of Dates annually and accounting for nearly 20% of the global crop, but only 3% of world exports. Some 53% of exported Egyptian dates are reportedly imported by Morocco, followed by Indonesia (24%) and Malaysia (15%). The total export value has been reported at some US$42 million.[3] The Ministry of Agriculture for Egypt is reported to have observed that while the country leads the world in total production it accounts for "…only 3% of world [Date] exports".[4]

More recently (26th March, 2018), Egypt's Food Export Council announced that based on Q1 2018 data, Indonesia had become the largest importer of Egyptian Dates followed by Morocco, Malaysia, Bangladesh, Thailand, South Africa, Jordan, Germany, Syria, Singapore, the US, China, Nigeria, Canada, India, the UAE, Turkey, Tanzania, Russia, Lebanon, Mauritius, Belgium, Cameroon, Kenya, Hungary, Cambodia, Kuwait, Seychelles, and Ghana.[5]

On 19th February 2018, the Secretary-General of the Khalifa International Award for Date Palm and Agricultural Innovation Abdul Wahab Zayed announced that the UAE government would implement three projects for the production of Dates in Egypt involving a total investment of some LE 40 million, US$2.3m. The first project will involve the development of the Siwa (Oasis) Date processing plant. The second project will focus on the commissioning of a Date processing plant in the New Valley

3 https://www.worldatlas.com/articles/world-leading-countries-growing-fresh-dates.html

4 13th July 2015 egyptindependent.com

5 https://dailynewsegypt.com/2018/03/26/127-increase-egyptian-date-exports-within-2-months-food-export-council/

governorate requiring an investment of circa US$0.87m. The third project will involve the development of a strategy for making Egypt a hub for planting, processing and exporting dates, the UAE official noted.[6]

Egypt is the world's most efficient producer country, with an average yield of 32.1 MT/Ha in 2017. The area harvested for Dates has increased by 71% this century to more than 49,000 hectares and the volumes produced have expanded by 58% to 1.59 million MT (2017), implying a reduction in average per hectare efficiency from 34.7 MT/Ha in 2000.

Iran (2)

Notwithstanding the importance of the Date economy within Iran, FAOSTAT indicate that the harvested area has declined from nearly 185,000 hectares in 2000, to circa 170,000 hectares in 2017. Conversely, production volumes have increased by 47% over the same period, from some 804,000 MT in 2000, to 1,185,165 MT in 2017. Average yield per hectare evolved at 7.0 MT/Ha in 2017. Iran produced nearly 1.19 million tonnes of Dates in 2017 and accounts for circa 13% of world exports. World Atlas reports that the majority of Iran's date exports go to Asian countries and neighbours. The biggest importers being India (16%), Malaysia (11%) and Russia 9.9%.

The Date orchards of Iran feature over 400 varieties, of which at least 15 varieties are thought to be well represented in international markets. Included within this grouping is the Mazafati Date, described as a large fruit, fleshy and dark purple in colour tending to black. The variety is common in and around the city of Bam in southern eastern Iran, in Saravan, Iranshahr, Sistan and Baluchestan province and in Kerman province. The Mazafati Date is popular in markets including England, Sweden, Norway, Denmark, and Germany, the Gulf states, USA and Canada, and Australasia.

6 https://www.egypttoday.com/Article/3/43251/3-projects-to-be-established-for-dates-production-in-Egypt

Algeria (3)

Table 7

Algeria FAOSTAT Data	2000	2017	Change Over Period
Date Production (MT)	365,616	1,058,559	189.5%
Area Harvested (Hectares)	101,820	167,663	64.7%
Yield per Hectare (MT)	3.6	6.3	75.8%

Source: FAOSTAT/ACA

Algerian production and harvested area, have both increased significantly in the 21st Century. Maghreb Watch reported that the country's 2017 production of 1.05 million tonnes represented an economic value of 332.4 billion dinars (US$2.79 bn) according to figures released by the Ministry of Agriculture, implying a price per tonne of US$2657 similar to the average import prices for the U.K. and Germany. The Ministry data revealed that Algeria produced more than 500,000 tonnes of Deglet Noor Dates for export. According to the report the province of Biskra, 600 km southeast of Algiers remains the most productive Date producing area in the country followed by the province of El Oued, near the border with Tunisia.[7] An annual International Dates Fair is now held in Biskra with representation by producers, processors and distributors. It was reported from the December 2018 Fair that international demand for Dates is rising and this was further reported to have encouraged a number of Algerian producers and processors to invest in packaging and promotion. Algeria remains a smaller exporter at 2-3% of global export volumes.

Saudi Arabia (4)

In 2017 Saudi Arabia produced some 755,000 tonnes of Dates. Despite the cultural significance of Dates in Saudi Arabia, and the highly suitable conditions for the crop in various parts of the country, the cultivated area has shrunk by 24% this century to some 108,000 hectares. World Atlas suggest that Saudi exports of Dates are worth

7 https://maghrebwatch.com/2018/07/31/algerias-dates-production-exceeds-1-mln-tons-2017/

some US$94m. The kingdom is thought to represent around 7% of global exports. According to World Atlas, the primary importers of Saudi Dates are Jordan (19%), Yemen (17%), and Kuwait (15%).

Iraq (5)

Iraqi production has declined by more than one third since the start of this century; in 2017 the country produced a little under 619,000 tonnes of Dates. Iraq accounts for circa 14% of global Date exports. The Iraqi government has been working to rebuild the Date sector as evidenced by a trebling of the planted area since the century began. World Atlas indicates that as much as 79% of Iraqi Date exports are bound for India, with smaller volumes flowing to Egypt and Morocco. Production efficiencies of 1.7 MT/Ha, position Iraq as one of the least efficient producers.

Pakistan (6)

Pakistan is the only country in South Asia which produces Dates on commercial scale, and is considered to be within the top three fruits for commercial cultivation in the country. While the area harvested has increased by 24.7% in the period 2000-2017, from 78,600 hectares to 98,000 hectares in 2017, production volumes have shrunk by 14.4% to 524,041 MT from 612,482 MT recorded for 2000. Average yield per hectare has fallen from 7.8 MT to 5.3 MT, to sit below the world average of 6.1 MT/Ha. Pakistani Dates become available in July through September. Cultivation occurs in the provinces of Sindh (50% of national production), Baluchistan, Punjab and Khyber Pakhtunkhwa. Sindh is the largest producer province followed by Baluchistan, Punjab and Khyber Pakhtunkhwa.

There are reported to be more than 160 Date varieties cultivated in Pakistan, amongst which are included such popular varieties as: Aseel, Zahidi, Fasli, Maazwati, Dhakki, Kharbalian, Begum Jangi, Dagh, Goakna, Tota, Karwan, Hillavi, Khudrawi and Mozawati Gulistan, Jowansur, Lango, Sabzo, Kharuba, Karbala, and Kupro. The Aseel of Khairpur, Dhakki of D.I.Kkan and Begum Jangi of Mekran are reportedly amongst the best of the varieties found in Pakistan due, apparently, to their exotic taste. These varieties are said to peer well with Deglet Nour and the Zahidi Date. Varieties such as Hillawi, Zahdi, Shakeri, and Basri are noted to be similar to varieties cultivated in Iraq, Iran and the Gulf states.

Dates from Pakistan are exported either as fresh (5% of exports, fresh and pasteurized) or dried (95% of Date exports). Fresh Dates are exported to the USA, Canada, France, Bangladesh, Indonesia, Malaysia, Germany and the UAE, while 90% of dried Dates are exported to India.

The data detailed above were largely sourced from https://www.linkedin.com/pulse/dates-production-pakistan-asia-foods-international/

UAE (7)

The Date economy of the UAE is one of contrast

- it exports a larger percentage (41.2%) of its national crop than the majority of the other producer countries
- it has been targeted as a priority sector for development by government agencies
- it features a national Date palm tissue culture laboratory
- harvested area has shrunk by nearly 65% in the period 2000-2017 (185,330 hectares declining to 65,021 hec tares)
- national production volumes have declined by 37.3% in the period 2000-2017 from 757,601 MT to 475,286 MT
- Average yield per hectare has increased from 4.09 MT/Ha in 2000 to 7.3 MT/Ha in 2017

The UAE is divided into two ecological zones: there is a coastal region with hot, humid summers and warm winters, and a drier inland region. The UAE is thought to produce around 120 different varieties of Dates, including varieties imported from Saudi Arabia, Iraq, Iran and Oman, such as the Khallas, AbouMaan, Hallawi, Khissab, Khenezi, Nabut Saif, Jabiri, Hillali, Lulu, Chichi, Khadraoui, Sakii, Sultana and Barhi varieties.

The government of the UAE has singled out the Date production sector for development and investment. The University of the UAE established the Date Palm Tissue Culture Lab (DPTCL) in 1989. Today, the DPTCL is internationally recognized as an important large-scale propagator of commercial Date palms. The centre produces cultivars with resistance to the fungal Bayoud disease, male lines with superior pollen production, and clones from elite cultivars, or from F1 hybrids from existing selections. The DPTCL asserts that is planting materials have high field survival rates (100%), excellent rooting characteristics and fruit production 4 years from planting (all with the appropriate agronomic regime).[8]

Oman (9)

Date palm is the primary agricultural crop in Oman, and it constitutes 80% of all fruit crops produced and 50% of the total agricultural area in the country. However, in the period 2000-2017 the area harvested has shrunk by nearly 31%, from 35,508 hectares to 24,617 hectares. Production however, has increased from 280,030 MT in 2000, to some 361,000 MT in 2017 for an increase of almost 29%. Average yield per hectare has improved from 7.9 MT/Ha in 2000, to 14.66 MT/Ha in 2017.

There are thought to be more than seven million Date palms and 250 cultivars in cultivation, primarily in the northern region of the country. However, around 70 % of the total Date production is harvested from only 10 cultivars, and a small fraction (4.4%) of the total Date production is exported. Only half of the Date crop produced is used for human consumption, with the other half being utilized primarily for animal feed or considered surplus and discarded. Dates are mainly harvested for fresh fruit consumption; however, alternative uses such as date syrup, date sugar, and other by-products are sold in markets throughout the country. The Dubas bug and the red palm weevil are the dominant biotic factors that affect date quality and yield in Oman. Traditional methods of cultivation, small farm size, available labour resources, and poor postharvest handling and marketing all impact the production of Dates in Oman.

As in the UAE, new plantlets are produced from tissue culture with a primary focus on superior cultivars that are kept, among other cultivars, in the only date palm ex situ gene bank in the interior of Oman. The Oman is working to enhance Date quality by optimizing fruit size and nutritional content. Rapid cultivar selectivity based on molecular techniques for better or improved commercial cultivars, will it is hoped, increase the marketability of Omani Dates.

The Oman is also focusing on employing modern orchard layouts and mechanization of the labour-dependent functions such as irrigation, pruning, pollination, and harvesting in order to improve the profitability and sustainability of the Date production sector. The data for this profile was largely sourced from the publication noted below.

Date Palm Status and Perspective in Oman; Publisher: Springer, Editors: Jameel am Al-Khayri, Shri Mohan Jain, Dennis V Johnson.

Tunisia (10)

Since the start of the 21st Century the harvested area for Dates in Tunisia has increased by 104%, extending to some 64,000 hectares by 2017. Production too has increased over the same time period, by 148% for 260,000 MT, but average yield per hectare remains below the global average at only 4 MT, notwithstanding that the Tunisian government has supported the sector with the development of experimental

8 https://www.uaeu.ac.ae/en/dvcrgs/research/centers/dpdrud/datepalmculture.shtml

plantations. Tunisia exports more than 47% of the national production.

Date palms are cultivated only in the oasis zones in southern Tunisia. It was estimated that the 40,976 Ha registered for Date production in 2013 were mainly concentrated in the oases of the zones around Kébili (58 % of surface area), Tozeur (20 %), Gabès (16 %) and Gafsa (5 %), while approximately 60% to 65 % of the current cultivation area comprises new plantations developed between 2007 and 2011. Under the 11th National Agricultural Development Plan (2007-2011), the creation of an irrigated area of 20 000 ha, as well as private sector investment incentives, led to a surge in Date palm planting for the export sector. Due to resource constraints, and in particular suitable land and the availability of water, the 12th Agricultural Development Plan (2011-2014) focused mainly on the need to improve the productivity of existing plantations.[9] The Deglet Nour variety, which is the main export variety, represents more than 75 % of the country's production. Deglet Nour Dates are sold as natural branched Dates, or loose, after being dried, glucose-coated and then packed. Other varieties traditional to the Tunisian sector include: Allig, Khouat Allig, Kenta, Bisr, Rochdi, Kentichi. It is reported that cultivation of these traditional varieties is declining due to their lower profitability and lower export profile. Commentators note that this trend raises issues such as conserving the Date palm genetic heritage of Tunisia and the risks attaching to a significant dependence on a single variety.

Tunisian Date farms are typically very small at circa 1 hectare each, a result apparently of Tunisian inheritance laws leading to the progressive breakup of farms in the large oases. While only a small percentage of farms are certified organic because of the cost, a significant percentage of palms are thought to be cultivated without pesticides or chemicals. Some producers, such as Societe Beni Ghreb, operate a bio-dynamic form of cultivation.

Leading processors in Tunisia include Groupe Hazoua Palm, and Morchani Dattes. The processors grade the Dates collected from thousands of smallholders, then wash the fruit, coat them with glucose, dry and package for export at weights of 200 grams to 10 kilos. Strict quality control and treatment with glucose ensures that the Dates will have a longer shelf life in the European markets of France, Italy and other countries. Fresh Dates from Tunisia are exported to the Middle East and North Africa. Fresh Dates must be able to be stored for up to 10 months without use of preservatives.

Morocco (13)

During the period 2000-2017, the area harvested for Dates in Morocco has expanded by nearly 92% to now include more than 58,000 hectares. Production volumes have expanded by 75% over the same time period to total nearly 130,000 MT, but average yield per hectare is within the bottom efficiency quartile at 2.2 MT/Ha. Morocco has emerged over the same period as a leading importer of Dates, coming in a distant third position to India and UAE with import volumes of more than 69,000 MT of Dates in 2016, with much of this volume sourced from Egypt.

The desert environment of much of Morocco is well-suited for the production of Dates. A large number of orchards are concentrated on the southern flank of the Atlas Mountains, contiguous with rivers and water points. The south of the country is reported to feature 45 distinct varieties of Date palm. Amongst the varieties cultivated in Morocco, the most popular are the Medjool, Algerian 'stuffed Date', and the Halawi Date. The Draa Valley, in Morocco is known as the "Country of the Dates". The Draa is Morocco's longest river, at 1,100 kilometres. It flows from the High Atlas mountains, initially south-eastward to Tagounite, and from Tagounite mostly westwards to the Atlantic Ocean. The water from the Draa is used to irrigate groves of Date palms and arable farms along the river.

Dates are the dominant fruit for cultivation in the oases of Morocco and

9 . https://www.fruitrop.com/en/Articles-by-subject/Full-country-profile/2016/Tunisian-dates

contribute up to 60% of the income of oasis farmers. The Green Morocco Plan (PMV) designed and monitored by the Ministry of Agriculture and Fisheries (MAPM) gave priority to the cultivation of Dates in the country's oases. Programmes to control diseases, identify best cultivars, research into tissue culture propagation and commercialisation of the sector are all embraced within the plan. Something in the region of 1.5 million young palms propagated by tissue culture methods have been distributed to farmers under the programme.[10]

Israel (16)

With only 4,300 hectares harvested for Dates, Israel is one of the smaller producer nations. With an average yield per hectare of 10.2 MT, Israeli efficiency compares well with the global average yield of 6.1 MT/Ha, but it is only a third of the average yield for Egypt. The country punches 'above its weight' in terms of exports, with FAO data confirming that in 2016 the country exported nearly 87,000 MT of Dates, or 2x national production.

Dates have become an important component of Israel's fruit exports, with Israeli suppliers developing brand name recognition in European export markets in particular. Segment observers note that there has been an important shift in Western markets from the old-fashioned dried Date formats, to fresher, more juicy varieties now available across the seasons. New logistical methods that focus on cooling and rapid distribution are reported to be behind this shift. The Israeli processing business Hadiklaim reportedly sells 65% of the dates produced in Israel, about four-fifths of which are sold abroad, mostly in Europe where Israeli Dates are said to compete successfully against Californian Medjool Dates due to logistical advantage. It is reported however that Israeli Deglet-Noor Dates encounter "tough competition" from cheaper Tunisian and Algerian growers. The increasing volumes of Date imports to Europe, has been attributed to the continent's growing Muslim community. While variety recognition is growing amongst consumers, the growth in private labels amongst supermarket chains across Europe, is also considered to be supportive of demand growth.

USA (17)

The US, Turkey (18) and Israel (16) are similar in scale, with Israel the larger of the three. Dates were introduced to northern Mexico and California by Spanish missionaries in the late 1700s. However, it was not until the turn of the 20th century, when superior cultivars were introduced, that the California industry became established. Cultivars collected from northern Africa and the Middle East were studied by USDA scientists, and later released to growers.

Table 8

Production (MT) FAO Data	2000	2017	Change over Period (%)	% of World Crop
Israel	11,732	43,967	274.8%	0.5%
United States of America	15,785	39,300	149.0%	0.5%
Turkey	12,000	38,535	221.1%	0.5%

Source: FAOSTAT/ACA

Date Palms were introduced to the Coachella Valley of California in the 1890s. Today the harvest area extends to some 2,600 hectares, producing four primary varieties, Deglet-Noor, Medjool, Barhi and Zahidi. Deglet Noor is the major cultivar in California.[11]

10 . Sedra M.H. (2015) Date Palm Status and Perspective in Morocco. In: Al-Khayri J., Jain S., Johnson D. (eds) Date Palm Genetic Resources and Utilization. Springer, Dordrecht

11 http://www.seecalifornia.com/farms/california-dates.html

The Export Nations

The two largest exporters, UAE and Pakistan, while significant producers at 7th and 6th respectively in the world in terms of total output, are both producer countries which have seen declines in output since the start of this century. The data confirm that much of Date production is consumed in country, making exports increasingly lucrative.

Table 9

FAOSTAT EXPORT DATA 2016	Export Dates MT	Flag Description
United Arab Emirates	275,863	Official data
Pakistan	163,177	Official data
Iraq	150,000	FAO estimate
Iran (Islamic Republic of)	138,844	FAO data based on imputation methodology
Tunisia	113,794	Official data
Israel	86,890	FAO data based on imputation methodology
Saudi Arabia	75,441	FAO data based on imputation methodology
Egypt	34,561	Estimated data using trading partners database
Algeria	31,109	Official data
Oman	15,700	Official data
Top Ten Exporters	**1,085,379**	**93% of Global Exports of 1,163,589 MT**

Source: FAOSTAT/ACA

India is considered to be the single largest importer of Dates. In 2016 the ITC reported that India imported Dates with a value of some $211m. The UAE and Morocco are also key markets, with imports reported to be valued at $119m and $96m respectively. According to ITC's Export Potential Map, the markets with greatest potential for date exports in the MENA region are the UAE and Morocco. The combined untapped import potential is estimated to be worth more $235m. This represents opportunities for Date producing countries such as Egypt, Saudi Arabia and Tunisia, all of which could benefit from zero tariffs under the Greater Arab Free Trade Area agreement.

Breeding & Propagation of Date Palms

As detailed herein, at least three of the important producer nations has developed Tissue Culture centres for the propagation of superior Date palm planting material.

1. The University of the UAE established the Date Palm Tissue Culture Lab (DPTCL) in 1989. Today, the DPTCL is internationally recognized as an important large-scale propagator of commercial Date palms. The centre produces cultivars with resistance to the fungal Bayoud disease, male lines with superior pollen production, and clones from elite cultivars, or from F1 hybrids from existing selections. The DPTCL asserts that is planting materials have high field survival rates (100%), excellent rooting characteristics and fruit production 4 years from planting (all with the appropriate agronomic regime).[12]

2. In the Oman, new plantlets are produced from tissue culture with a primary focus on superior cultivars. The Oman is working to enhance Date quality by optimizing fruit size and nutritional content. Cultivar selectivity is based on molecular techniques for producing improved commercial cultivars.[13]

12 https://www.uaeu.ac.ae/en/dvcrgs/research/centers/dpdrud/datepalmculture.shtml
13 Date Palm Status and Perspective in Oman; Publisher: Springer, Editors: Jameel am

3. In Morocco, programmes to control diseases, identify best cultivars and research into tissue culture propagation are all embraced under the Green Morocco Plan (PMV), which has been designed and monitored by the Ministry of Agriculture and Fisheries (MAPM)

Other agencies noted for their focus on the scientific breeding and propagation of Date palms include:

4. Vitropalm Technology (VPT), a team made up of an agronomy engineer and a biologist who have more than 18 years of experience in the field of Date Palm Tissue Culture. VPT's experience has been acquired at "Estación Phoenix", a research station in Elche, Spain, which has partnered with Elche City Council, the "Generatitat Valenciana", Alicante University, Elche University, the National Institute of Agronomic Research (INRA-France) and the Centre of International Cooperation of Agronomic Research for Development (CIRAD-France).

5. Ace Date Palm Tissue Culture Laboratory (ADPTL), a Department of Biotechnology (DBT), Ministry of Science, India certified Plant Tissue Culture Laboratory. The laboratory focuses on micro-propagation of high value cultivars which are difficult or slow to propagate by conventional plant breeding methods. ADPTL's objectives include the provision of superior planting materials to sustain consistent long-term growth in Date volume and quality.[14]

6. Marionnet GFA has supplied the largest markets in Africa, the Middle East, the Gulf Region and other Date palm-growing regions, either directly to customers, or through agents and distributors. After the Al Wathba Marionnet LLC and its laboratory were established in Abu Dhabi, the entire existing marketing network of Marionnet GFA was transferred to Al Wathba Marionnet LLC.

   a. Today, in addition to supplying quality Date palms in the UAE, Al Wathba Marionnet LLC is also exporting to large-market agents and distributors around the world, including: Kuwait, Jordan, Egypt, Namibia, South Africa, Niger, Palestine, Syria, Yemen, Somalia, Sudan and Thailand.

Popular Date Varieties

There are an estimated 3,000 cultivars of Date palm cultivated around the world. The Medjool is perhaps the best known and the variety is considered to be amongst the highest quality of the Date varieties produced. The Medjool is described as a large, soft Date that stores and ships successfully, hence its strong showing in the export market. Deglet Noor is described as a high yielding, semi-dry cultivar, popular in northern Africa and the major cultivar in California. The Barhi variety, also high yielding, originated in Basra, Iraq. The Barhi is described as unusual, in that is lacks the astringency typical of other dates at the Khalal (middle) stage of development, and can be eaten when crisp and immature, whereas most of the popular cultivars are eaten at later stages of maturity, when dried and brown.

Barhi Dates: Named after the hot Barh wind of Arabia, these Dates are described as medium-sized, thin-skinned fruit with soft, tender flesh and a syrupy flavour. The Bahri (alternative spelling) variety is exported and sold as fresh

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14 http://agritech.tnau.ac.in/bio-tech/biotech_tc_spic_ba.html

produce by Israeli shippers. European markets are small reportedly with the main markets being France, the UK and Spain. The Date is said to integrate fully with fresh fruit.

Deglet Nour Dates: The 'Fingers of Light' Date is described as a semisoft date, with firm flesh and shaded light red to amber. Sometimes referenced as the "queen of all dates", Deglet Nour Dates from Tunisia are described as soft to touch, a translucent light colour, with a mild honey-like taste. The variety has good preservability in cold storage, enabling it to be sold year-round. Deglet Nour Dates are popular in the Maghreb region including in Algeria, Libya, Tunisia, and also in the United States, where the variety is the chief export cultivar. Despite being grown in several Mediterranean countries, the Deglet Nour Dates' origin is disputed between Tunisia and Algeria, with both countries claiming the right to the label "Deglet Nour". Tunisia is the leading producer of Deglet Nour Dates (Wikipedia puts Tunisia's share of Deglet Nour production at 48% of total), followed by Algeria with a share of 20%. These two countries are the leading suppliers of Deglet Nour Dates to the European Union. The Algerian Ministry of Agriculture has sought to reserve the Deglet Nour label to Algerian Dates only. Deglet Nour palms are mainly grown in Algeria (Tolga, Oued Righ), in Tunisia (in the areas of Jérid and Nefzaoua), and in the United States (in California, Arizona and Texas).

Halawy Dates are described as soft, thick-fleshed fruit with a flavour of caramel and very sweet, shaded yellow to amber.

Hayani Dates - In Israel, the Hayani Date is referenced as the "Fresh All Year-Round Date". Immediately after harvesting Hayani Dates are frozen, both pitted and unpitted. The Dates are described as having a fibrous texture and a high sugar content, making them highly suitable for processing and export. Hayani Dates are reported to have excellent texture, taste and storage properties, and they are said to be quite distinct from other varieties, and are sometimes referred to as a fruit in their own right. **Khadrawy Dates** are considered to be very similar to Halawy Dates, soft with a caramel-like flavour and very sweet.

Medjool Dates, are amongst the best-known varieties in the European export markets. Described as semisoft Dates, sweet, moist, meaty, and firm-textured. According to a report by the FAO, a specific quality standard does not exist for the Medjool. It normally has its best degree of maturity and full flavour when it turns dark brown, almost black, and soft to the touch. The variety is described as awkward to process. Under open-air storage conditions, Medjools are considered to sweeten more rapidly during the drying process than Deglet Nour Dates.

Mazafati Dates described as a large fruit, fleshy and dark purple in colour tending to black.

Thoory Dates are described as being dry, with firm skin and chewy flesh.

Zahidi Dates are a semisoft variety considered by some to be a 'noble' Date. It is described as having a large pitt and crunchy fibrous flesh. The Zahidi is often processed for sliced Date products and for Date sugar.

A Shared History

The story of the Date Palm *(Phoenix dactilyfera)* is inextricably linked to the history of Mankind. The Date palm is one of the oldest crops cultivated by man – archaeologists have found evidence of its production 8,000 years ago in Neolithic sites in Syria and Egypt, and its prominence in Middle Eastern culture is still widely to be observed. Stone Age drawings of Date palms found near modern day Salalah in the Dhofar region of Oman, indicate that the Shara people, (considered to be the first Arabs) were cultivating Dates as early as 5,000 BC.

The earliest evidence of Date Palm cultivation was during the Eridu period (circa 5,400 BC) in Lower Mesopotamia. Eridu, the southern most of a conglomeration of Sumerian cities that grew around temples and located 12 km southwest of Ur, is considered by many archaeologists to be the earliest city in southern Mesopotamia, and is possibly the earliest city to have existed. Date seeds were also found in the third millennium BC in the 'Royal Cemetery" at Ur [15]. Biblical references suggest that the Queen of Sheba took Dates with her when in the first Millennium BC she journeyed to Jerusalem to meet King Solomon. Dates were widely traded at that time by camel caravans heading to Petra and beyond to the Mediterranean coast at Ghaza and across the Empty Quarter to the Arabian Gulf at Bahrain. There is evidence of settlements along the Frankincense route, that grew various crops including Dates.

Origins

According to Geoff Sanderson[16] *"The Date Palm is recorded in ancient history extending over an area from the Indus Valley (now Pakistan) to Mesopotamia (now Iraq), the Nile Valley, Southern Persia, Eastern Mediterranean and the Horn of Africa. Historic records however, tend to describe the fruit without being able to say whether it is derived from a plant of cultivation or from a wild plant…References to the Date in the Nile Valley and Tigris/Euphrates valleys suggest it was a plant of cultivation along with other early developments in agriculture as it was found in an area where agriculture had been practised for 5 millennia. Such a wide distribution implies that Phoenix dactylifera either evolved as a plant covering quite extensive geographic, soil and climatic conditions, which is unlikely, or it spread with the help of man after originating in a more limited geographic region. I support the theory of the Date being of Indus Valley origin (Geoffrey Bibby, "Looking for Dilmun"). Phoenix dactilyfera most likely grew wild in the Indus Valley as a natural hybrid of P.sylvestris where it was appreciated as a wild fruit and probably cultivated as early as the 6th millennia BC." Sanderson speculates that "Dates…were brought from the Indus Valley to trade with the Sabaeans and Shara of Southern Arabia from the beginning of trade for Frankincense".*

In Culture

While the Date Palm and its fruit were revered in several ancient cultures, evidence suggests that it was, and still is, the Arab culture which held the crop in the greatest esteem. Dates are frequently eaten to ceremoniously break-fast during Ramadan. The Prophet Mohammed is reported to have consecrated the fruit, with Dates reported to be the Prophet's favourite food. Researchers note that in the Koran, the Date is described as 'God's Bounty'. Sanderson observes that in Islamic tradition, a Date tree was said to be the 'Tree of Life' in the Garden of Eden, and that the Virgin Mary sheltered beneath Date palms, and took nourishment from their fruit during her pregnancy with the Christ child.

15 Ellison et al. 1978: 171-2
16 http://www.enhg.org/alain/geoff/date.htm

Phoenix dactylifera L

According to C. T. Chao, C & R. Krueger, Robert. (2007). The Date Palm *(Phoenix dactylifera L.)*: Overview of Biology, Uses, and Cultivation. HortScience. 42, "*the Date palm is one of the oldest fruit crops grown in the arid regions of the Arabian Peninsula, North Africa, and the Middle East. The Date palm is a diploid, perennial, dioecious, and monocotyledonous plant adapted to arid environments… Thousands of date palm cultivars and selections exist in different date-growing countries… The long life cycle, long period of juvenility, and dioecism of date palms make breeding challenging"*. The botanical name of the Date palm, *Phoenix dactylifera L.*, is presumed to derive from a Phoenician name "phoenix", which means date palm, and "dactylifera" derived from a Greek word "daktulos" meaning a finger, illustrating the fruit's form (Linné, 1734). Date palms grow in areas that have continual groundwater and hot and dry conditions during the timeframe after pollination up to harvesting.