



LIVAE

No 124
ENGLISH ED.
NOVEMBER 2017

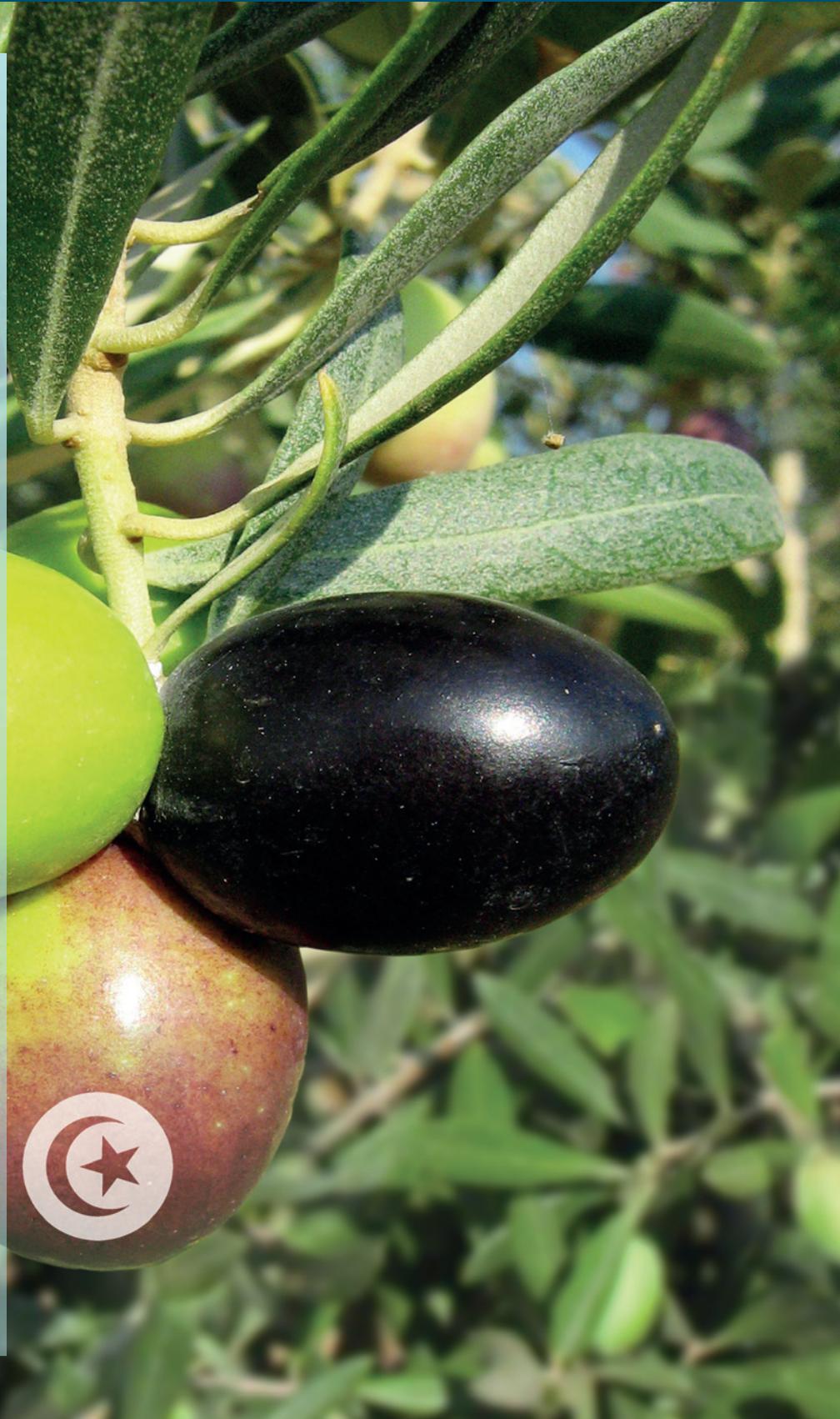
OFFICIAL JOURNAL OF THE INTERNATIONAL OLIVE COUNCIL

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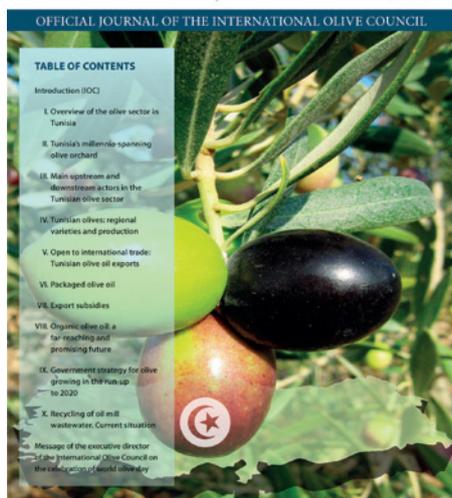


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OLIVAE

Official Journal of the International Olive Council

Published in Arabic, English, French, Italian, Spanish.

Peer reviewed journal

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ISSN: 0255-996X

Registration: M-18626-1984

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Introduction (IOC)

It is my pleasure to present OLIVÆ Issue No 124, a special edition that has been made possible thanks to the generous support offered by Tunisia.

In particular, the support of the *Office National de l'Huile* of Tunisia (whose President represents Tunisia as Head of Delegation at the Council), and the experts that this institution has gathered together for the preparation of Issue No 124, have been essential in bringing it to fruition.

Their contribution has given us access to wide-ranging information on the whole Tunisian olive growing sector, from Tunisia's production to its presence on the international market, illustrating its export protection measures, government policy on olive growing in the run-up to 2020, and technological innovations.

Issue No 124 offers the reader first-hand information on the main upstream and downstream actors in the Tunisian olive sector, its entry on the international market, its export subsidy policies, the far-reaching and promising future of Tunisian organic olive oil, and the progress achieved in the area of oil mill water recycling.

The issue is brought to a close by the Declaration made on the occasion of World Olive Day, a special event of essential importance for all the actors in the world of olive oil, celebrated in 2017 at IOC headquarters in Madrid.

Abdellatif Ghedira
Executive Director

I. Overview of the olive sector in Tunisia

Tunisia is the southern Mediterranean country, outside the European Union, best known for olive growing and the exportation of olive oil.

Olive growing is Tunisia's main agricultural activity and plays a very important socio-economic role. The crop is deeply rooted in the traditions of Tunisia, where focus is placed on the production and consumption of olive oil and olive growing contributes to the revenues of 309 000 farmers. Accordingly, olive growing constitutes the main activity of 60% of agricultural workers, employed throughout the olive sector (mechanisation, pruning, picking, transportation, grinding, storage, sale, etc.), and is the direct or indirect source of livelihood of more than a million people, generating 34 million work days a year, which accounts for more than 20% of agricultural sector employment.

A. Key sectoral figures

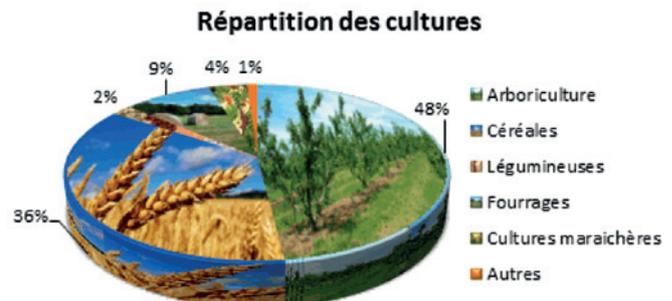
1. More than 309 000 producers, which is 65% of all agricultural workers.
2. More than 1 750 oil mills, 15 refining units, 14 olive-pomace oil extraction units and more than 35 modern bottling factories, constitute the agro-industrial sector of this branch of activity.
3. More than 200 private traders and exporters, together with the National Olive Oil Board, export an average of 140 000 t a year of an average annual production of 175 000 t (80%).
4. The support and supervisory structures of the sector are the Ministry of Agriculture, the Regional Commissariat for Agricultural Develop-

ment, research institutes, as well as a dynamic sector under the Tunisian Agriculture and Fisheries Union (UTAP) and the Tunisian Industry, Trade and Crafts Union (UTICA).

B. The main components of the sector

1. Production

The Tunisian olive orchard is spread over approximately one third of the country's crop area, constituting 1.68 million hectares of olive plantations.



Ninety-five per cent of olive growing is rain fed in varying climatic conditions. Olive tree numbers in Tunisia are estimated at approximately 60 million (30% in the north, 45% in the centre and 25% in the south). Olive trees are mostly found in single-crop plantations, although they can also be found in combination with other fruit trees.

Despite the modernisation of the sector, namely due to the spread of intensive and super-intensive crops, olive production remains below its real potential.

Tunisian olive production fluctuates considerably from one year to the next, due to the phenomenon of the alternate bearing of olive trees and extremely unpredictable climatic conditions. The production of olives for olive oil over the period 2010/11 – 2015/16 is estimated at approximately 706 500 t per year, for 142 000 t of oil. The south provides 50% of olive production, compared to 29% in the centre and 21% in the north. Furthermore, the oil content of the olives produced in the south is slightly higher than in other regions. The south contributes 55% of total olive oil production,



compared to 27% in the centre and 18% in the north of the country.

The average density of orchards is of 100 to 150 trees per hectare in irrigated orchards. In orchards with a heavy rainfall used for the production of olive oil, density is of 40 trees per hectare. In the case of olive trees for table olives, orchard density varies between 200 trees per hectare under irrigation and 100 trees per hectare in rain-fed orchards.

Generally speaking, there are some 100 olive trees/ha in the north, 60 trees/ha in the centre and 20 trees/ha in the south. At the moment, more than 2000 ha of orchards are under super-intensive farming and produce an average of 7 to 8 tonnes per hectare.

Average output in Tunisia is generally considered to be below potential. It is estimated that the north and the centre could triple, and the south double, its production. Average output (olives/ha) varies significantly depending on the region and rainfall. According to estimates, olive orchards for oil have an output of 600 kg/ha to 900 kg/ha, while output for table olives is of 1 400 kg/ha.

Aside from the steady growth in crop area, great efforts have been made to modernise the sector, in particular with a view to highlighting the organoleptic properties of Tunisian varieties. The *Chétoui* variety, for example, is known for its high polyphenol content.

Plentiful harvests, on a par with those in the main producer countries, have established Tunisia as an important player in the global olive sector.

2. Processing

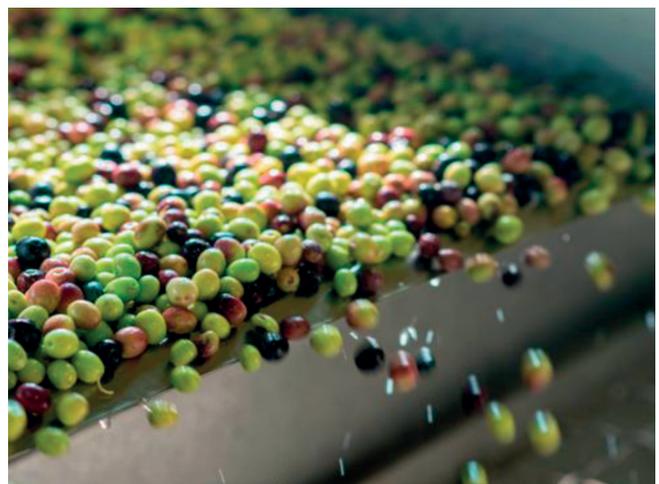
More than 1 750 olive mills, 15 refining units, 14 olive-pomace oil extraction units and 35 bottling facto-

ries make up the industrial branch of this sector. Olive oil production moves an industrial fabric of 1 707 oil mills with a theoretical olive grinding capacity of 43 680 t/ 8 hrs/day, distributed geographically as follows: 18 % in the north (Tunis, Manouba, Aryanah, Ben Arous, Bizerta, Beja, Jendouba, El Kef, Siliana, Zaghouan, Nabeul); 28 % in the Sahel (Sousse, Monastir, Mahdia); 33 % in the region of Sfax; 15 % in the centre and the south-west: (Kairouan, Kasserine, Gafsa, Sidi Bouzid); and 6 % the south-east (Medenine, Gabès, Tataouine).



Over the last decade, the processing sector has witnessed the introduction of modern oil mills and the progressive decommissioning of the traditional ones. As a result, grinding capacity has gone from 8 000 t/day in 1986 to more than 40 000 t/day in recent years. Despite the modernisation of the sector, greater efforts are still needed, given that 35% of mills are traditional.

Nevertheless, the modernisation of the sector, together with the optimisation of farming practices, has ushered in an improvement in the quality and quantity of production. More than two thirds of Tunisian production falls into the superior quality category (according to the trade standard of the International Olive Council (IOC) for the





classification of olive oil). Farmers and olive oil producers adopt good practices for the storage of olives, namely:

- Avoiding picking olives in humid conditions;
- Carefully washing olives collected from the ground as soon as possible;
- Avoiding mixing olives of different varieties and degrees of maturity;
- Separating healthy olives from damaged or heavily bruised olives;
- Placing the olives in crates, because the pulp tissues are softened and the oil-rich cells are damaged by the lacerations and compression that result from bagging;
- Transporting harvested olives to the oil mill on the day of picking, as soon as possible, to avoid hydrolytic, lipolytic or oxidation processes, which deteriorate the quality of the oil obtained and are promoted by stacking olives and poor ventilation.

The transformation of the sector has also led to the creation of refineries, the number of which has increased from 10 to 14 in recent years. The low demand for refined olive oil, however, means that the refineries are mainly used for other vegetable oils.

Oil mills, for their part, are often under-used, particu-

larly in years of low production. While this is aggravated by the seasonal nature of production, it should be noted that, even in years of good harvests, the presses rarely operate more than 90 days a year.

3. Consumption

The olive oil produced in Tunisia is fed back into the domestic market, where consumption currently stands between 30 000 and 40 000 t per year. It is difficult to provide a more precise estimate due to variability in practices and in the channels for sale and purchase. The local market is characterised by personal consumption and the direct supply of olive mills or the use of informal circuits. It should however be noted that the consumption of olive oil has fallen by 26.19% over the last two decades, as a result of:

- The increase in the price of olive oil, which is becoming unaffordable for a large section of the Tunisian population, the average price exceeding 8 Tunisian dinars per litre.
- The development of the trade of vegetable oils (sunflower and maize), for which local refining and packaging were encouraged in the mid-2000s to step down State intervention in the soybean oil market.

The graph below tracks the consumption of olive oil in thousands of tonnes over the last 13 crop years.

4. Trade

The first export agreements were signed with the EU in the 1980s. Since then, the EU market has become Tunisia's traditional client for olive oil, accounting for more than 80% of exports. In the 1980s, Italy was Tunisia's first European client. Tunisian sales to Italy stood at an average of 58.2% of total

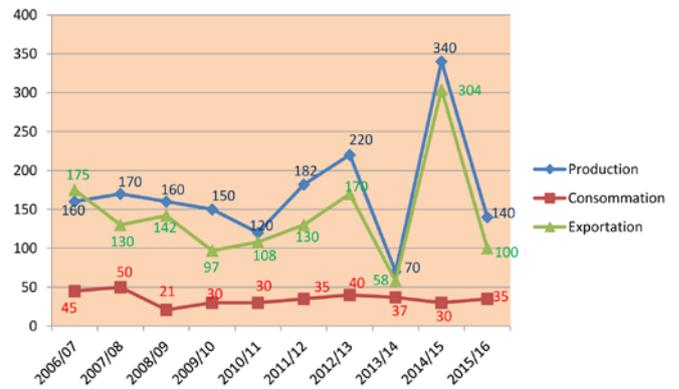


exports for the same period. The second European client was France. The two markets, France and Italy, had different demands. Italy essentially imported lampante olive oil for its refineries, while France imported good-quality oil for direct consumption. Today, the European Union is still the main market for Tunisian olive oil, but other destinations have been added. Apart from the traditional destinations of Italy and France, Spain and Portugal have become new European destinations. Furthermore, a robust market has been established in the United States, where 52% of the olive oil consumed comes from Tunisia. Countries in South America, Sub-Saharan Africa, Northern Africa, the Middle East, Gulf States, Asia and Australia have also bought into Tunisian olive oil in recent years. As a result, Tunisia is currently exporting olive oil to five continents.



Summing up the above, the graph below tracks the development of production, consumption and exports (in thousands of tonnes) of Tunisian olive oil over the last decade.

Comparison of tunisian production, consumption and exportation over the last decade



II. Tunisia's millennia-spanning olive orchard



Over the millennia, olive trees have shaped the landscapes, history, culture and gastronomy of the Mediterranean basin, which continues to be the heart of olive oil production and trade. Olive growing is synonymous with the ancient and recent history of its people. While the Mediterranean is seen as the cradle of our civilisation, the olive tree has also been part of our culture. For thousands of years, olive oil has played an important role in all the main civilisations that have prospered in the Mediterranean and in Tunisia. Despite its rich history in the region of the Mediterranean basin, the olive tree was brought to Tunisia from the Middle East by the Phoenicians, who founded Carthage. Many Mediterranean civilisations such as the Phoenicians, Greeks, Carthaginians, Romans and Arabs, have taken up this baton throughout history in a tradition passed on from father to son, transmitting the knowhow of olive growing.



Tunisia has thus inherited 2000 years of knowhow in olive growing and “an orchard *par excellence*” with plantations spread over large part of the national territory, from the Island of Cyraunis (Kerkena), Byzacena (Cap Bon), Hadrumetum (Sousse) to the steppes of Kasserine and the south, around Zarzis and the Island of Djerba.

At the time of the Carthaginians, the tradition of olive growing had started to spread as a result of the benefits offered to peasants that set up small olive orchards. The Romans continued to develop this crop, intensifying the irrigation of the lands, which typically had a very low rainfall, and inventing the oil extraction technique. Evidence of this is seen in archaeological excavations in Sbeitla and El Jem, in the many Roman mosaics discovered in Sousse and collections of archaeological and ethnographic objects, and tools indicating the importance of olive oil in everyday life and people's lifestyle throughout Tunisian history.

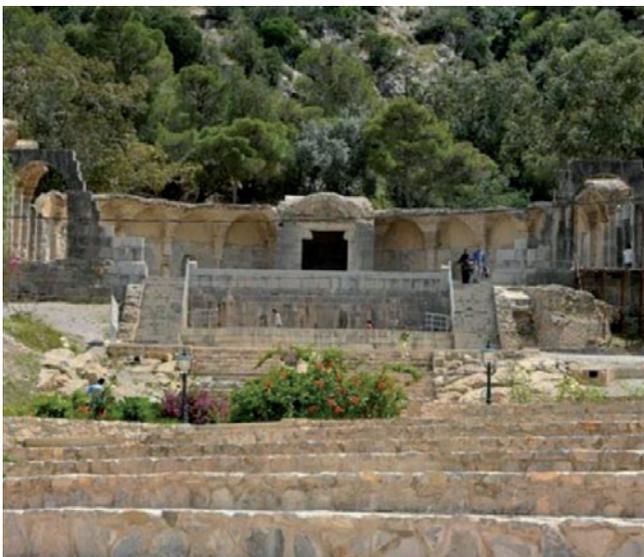




One can still admire the spectacular remains of the Temple of Water, supplying Carthage and irrigating farmland via aqueducts over a distance of 132 km to Zaghouan. Later, Andalusian Arabs settled in Tunisia in answer to incentives offered to them at the time to purchase farms and grow olive trees.

Furthermore, due to its importance in the daily life of people in Antiquity, a burgeoning trade grew up around olive oil, providing a source of wealth for all the civilisations that shaped Tunisian history.

Over the course of history, the inhabitants of the countries on either side of the Mediterranean have benefitted from this crop and all it has to offer. Aside from olive oil, they have also used olive branches for wood, the calorie-rich olive pomace for cattle fodder and certain types of wastewater as a biological fertiliser on sandy soils (Tunisia has been the site of a number of experiments in this regard).



According to a number of historians, olive growing in North Africa – or in the four countries of the Maghreb region (Morocco, Algeria, Tunisia and Libya) – has been through various stages, namely:

1. The Roman period, when plantations were a factor in settlement. Orchards and presses are found throughout Tunisia.
2. The middle ages and the modern and contemporary period (20 and 21st centuries).

The historian El Yaquoubi described how olive trees dominated in the region of Sfax (9th century) but that in the 11th century degradation was observed in planted areas. In the colonial period, certain regions such as the Tunisian Sahel, the high plains in the north, Beja, Siliana, the Kairouannais, Sidi Bouzid and the Zarzis peninsula were replanted. The greatest extension of olive growing in Tunisia was however seen during the Roman period, with some of the gnarly old olive trees found in the north (Cap Bon) and in the south (particularly in Djerba) dating from that period.



Tahar Ghalia, the curator at the Bardo Museum, indicates that olive growing and pressing techniques in Tunisia date back to the ancestral know-how of the Phoenicians. Herodotus writes about the olive trees on the Kerkennah islands, and the discovery of the Roman villa of Wadi Arremel in Zriba (Zaghouan) provides concrete evidence of the importance of this crop. On the basis of cistern sizes, it has been calculated that the estate was probably spread over some 100 000 ha. Archaeological remains show that the lever pressing method was used and they point to the country's strong historical links with olive oil.

This millenary orchard has not however been allowed to become archaic and Tunisia has made and continues making efforts to develop the olive sector in line with the models of major European producers throughout the process, in research, public institutions, with public and private producers, and olive oil manufacturers and exporters, thereby shaping the Tunisian label.

III. Main upstream and downstream actors in the Tunisian olive sector

1. Upstream

A. Research



Institution of Agricultural Research and Higher Education

The Institution of Agricultural Research and Higher Education (IRESA) is a public administrative body holding legal personality and financial autonomy.



The Institution's mission

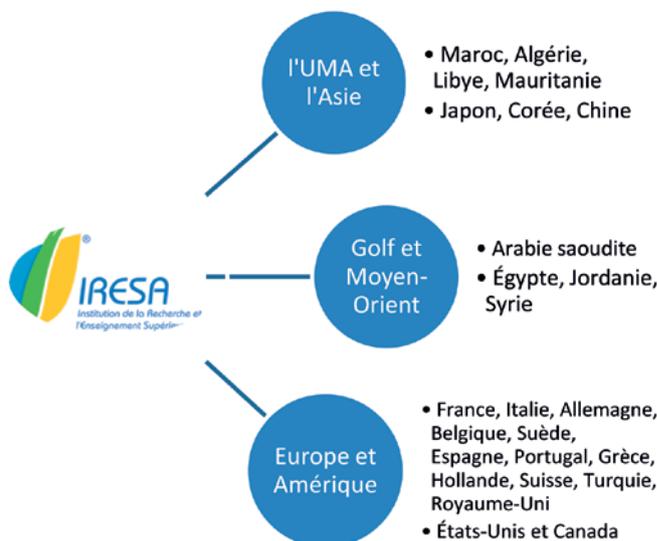
IRESA has a mandate to:

- Promote agricultural research as part of the general government policy in this area, while ensuring the liaison between the establishments for agricultural research and higher education and the popularisation of agricultural methods for producers;

- Draw up agricultural research plans and the budgets required to carry them out, follow up on the implementation of those programmes and provide assessment, while providing coordination and ensuring the usefulness of the establishments for research and higher education to the agricultural sector;
- Ensure that the establishments of agricultural research and higher education are at the service of agricultural production and development.

Bilateral ties and multilateral cooperation

IRESA maintains important bilateral ties with countries of the Arab Maghreb Union (AMU), the Middle East, the Gulf, Europe, America and Asia.



As part of multilateral cooperation, IRESA participates in various projects and research programmes under the umbrella of research and development programmes financed by the European Union in collaboration with scientific teams both north and south of the Mediterranean.

Participation in research programmes

IRESA participates in various regional and inter-regional research and development programmes in collaboration with international organisations such as:

CIHEAM: International Centre for Advanced Mediterranean Agronomic Studies

ACSAD: Arab Center for the Studies of Arid Zones and Dry Lands

AOAD: Arab Organization for Agricultural Development

FAO: Food and Agriculture Organization of the United Nations

IAEA: International Atomic Energy Agency

ICARDA: International Center for Agricultural Research in the Dry Areas

IFAD: International Fund for Agricultural Development

AUF: *Agence universitaire de la Francophonie* (University Agency of the French-speaking World)

AFD: *Agence Française de Développement* (French Development Agency)

Bioversity: Bioversity International

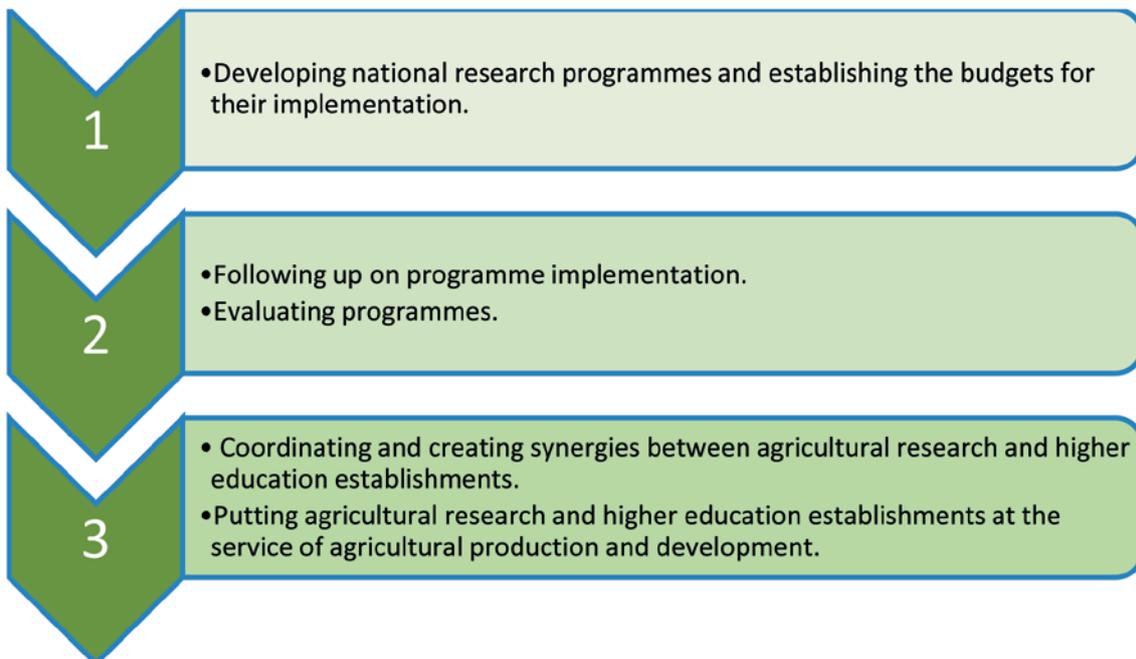
AAEA: Agricultural & Applied Economics Association

IRD: *Institut de recherche pour le développement* (French Research Institute for Development)

IOC: International Olive Council

Research missions

In research, IRESA has the following missions:



Olive Tree Institute

The Olive Tree Institute is an administrative public establishment under the authority of the Ministry of Agriculture, attached to IRESA.



Mission and activities of the Institute

It is a research institute specialised in olive growing, olive oil technology and fruit tree crops, with a mission

to undertake research, studies and experiments to develop and promote the olive oil and fruit tree sector in

semi-arid areas from an agronomic, technological and economic point of view. It is also charged with:

Organising and conducting research to improve national production and productivity of the olive growing sector and of fruit tree growing in semi-arid areas, while ensuring the protection and preservation of natural resources.

Conducting technical and economic studies concerning the two above areas.

Contributing to the fine-tuning of development strategies for olive growing at the national level and for fruit tree growing in semi-arid areas, and plans for the development and promotion of these two sectors.

Ensuring collaboration with the relevant departments of the Ministry of Agriculture and professional bodies, the dissemination and the publication of the results of research and the vulgarisation and demonstration of state-of-the-art techniques.

Generally speaking, its main areas of work are research, training, vulgarisation and participation in development.

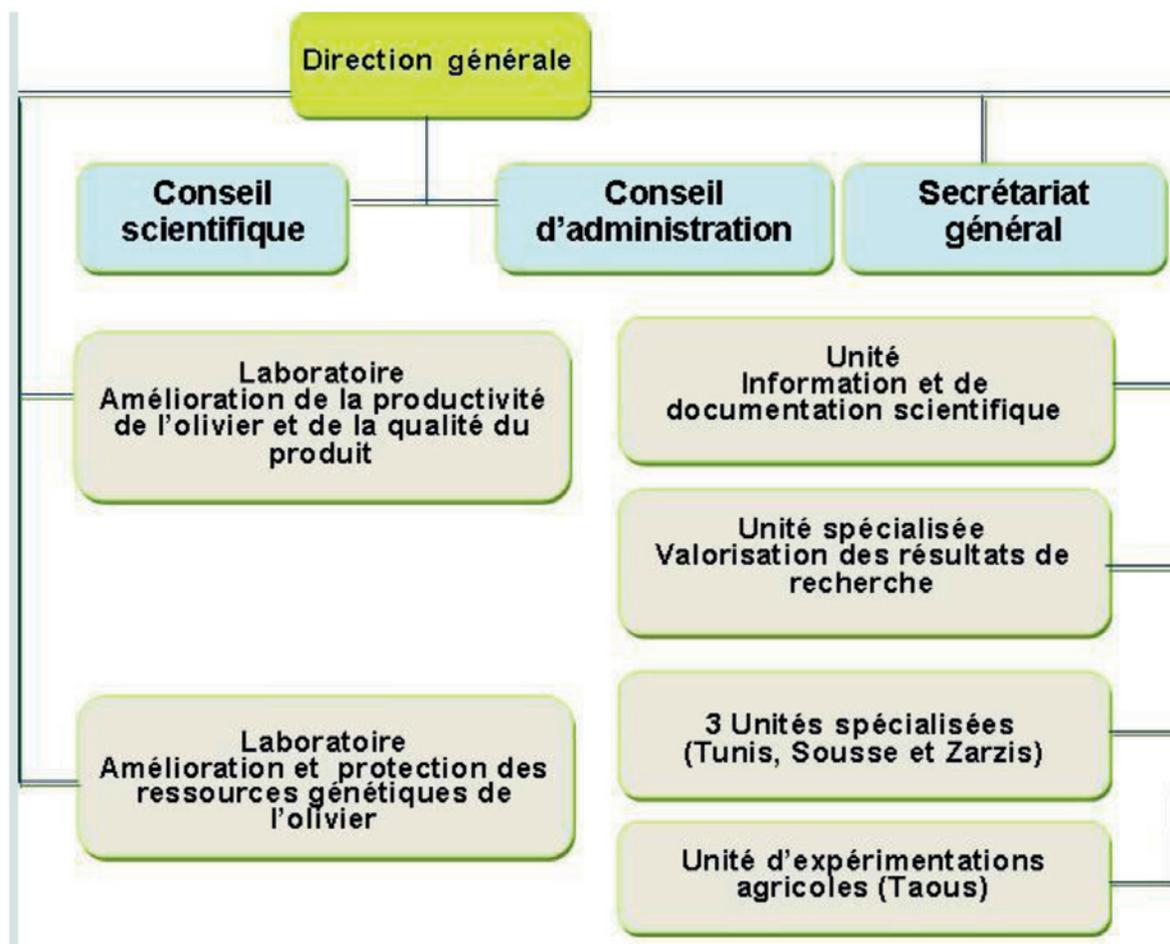
Structure

The institute is made up of a headquarters, an annex and an agricultural research department in Sfax. It also has regional centres in Tunis, Sousse and Zarzis.

International cooperation

In its research and projects, the Institute works with a number of international bodies including:

- International Atomic Energy Agency (IAEA)
- International Olive Council
- Common Fund for Commodities
- International Centre for Advanced Mediterranean Agronomic Studies (CIHEAM)
- University of Cordoba, Spain
- University of Porto, Portugal
- Aula Dei Research Centre-EEAD-CSIC, Spain
- Zaidin Research Centre of the Spanish National Research Council
- University of Perugia, Italy
- Olive Growing and Industry Research Centre, Italy
- Department of food standardisation and quality of the *Instituto de la Grasa*, Spain
- Andalusian Institute of Agricultural Research and Training (IFAPA), Spain
- Walloon Agricultural Research Centre, Belgium
- University of KwaZulu-Natal in Pietermaritzburg, South Africa
- Faculty of Agricultural and Food Sciences of the University of Manitoba, Canada
- Institute for Biological Control of Darmstadt, Germany
- University of Geisenheim, Germany
- Faculty of Pharmacy of the University of Barcelona, Spain
- Saint Gerome Faculty of Sciences of Aix-Marseille University, France
- University of Borj Bouararidj, Algeria



- Laboratory of Ecology, Systematics and Evolution –Paris Sud University, France
- Research Centre for Olive Growing and Industry (CRA-OLI), Italy
- Aix-Marseille University, France
- National Institute for Agricultural Research of Montpellier, France

B. Framework and development

National Olive Oil Board

The National Olive Oil Board (ONH) was founded in 1962 as a public industrial and trade body. Under Decree Law No 7013 of 16 October 1970, its legal status changed to a public sectoral body in the area of industry and trade under the tutelage of the **Ministry of Agriculture, Water Resources and Fisheries**.

Mandate of the ONH

The olive oil sector, as a strategic component of Tunisian agriculture and the national economy, is coordinated by the ONH, which is responsible for:



- Providing guidance and support for olive growers with a view to improving productivity;
- Encouraging the promotion of olive oil quality and trade through the integration of professionals in scientific and technological progress;
- Ensuring the development and the promotion of exports of olive oil in coordination with all the actors in the sector;
- Analysing samples of products for export;
- Regulating the domestic market using the appropriate mechanisms, in coordination with the private operators and professional and administrative structures concerned;
- Importing vegetable oils;

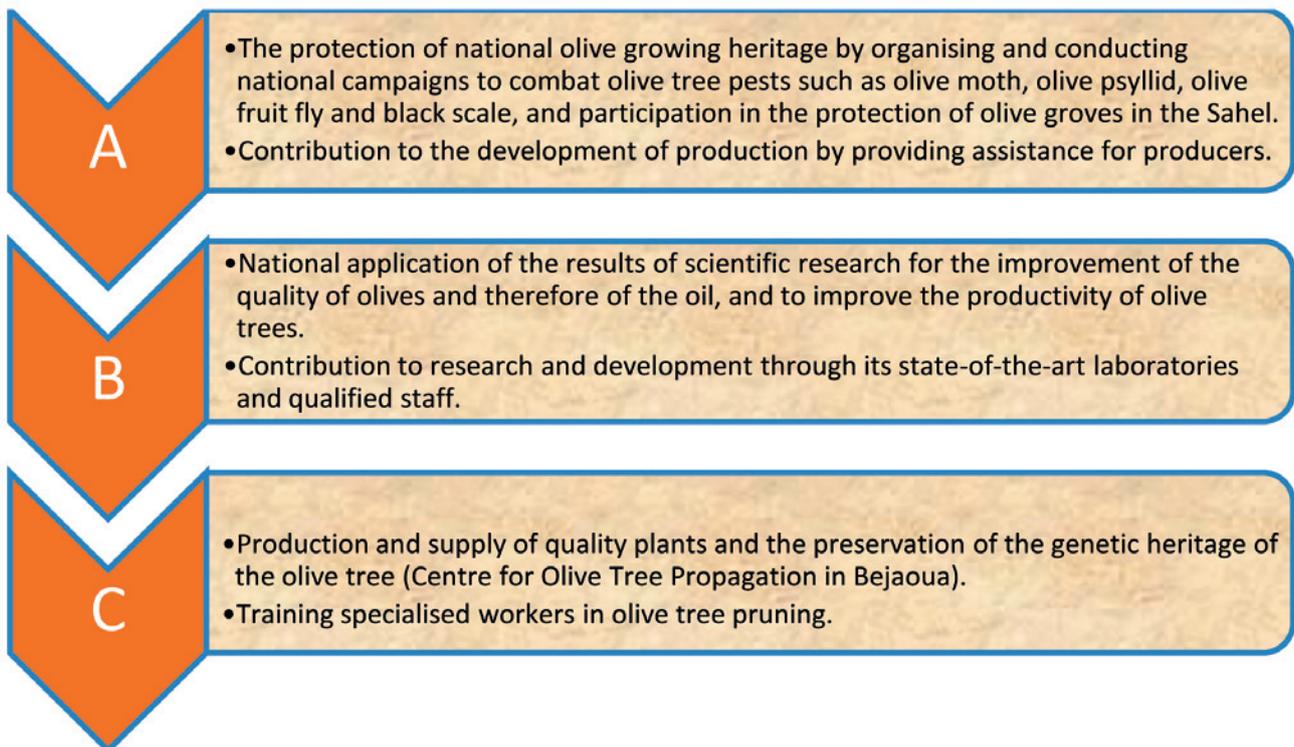
- Coordinating the various participants at all levels in the olive sector using a sectoral approach, encouraging olive growers, olive oil producers and exporters to collaborate towards an improved development and promotion of Tunisian olive oil;
- Facilitating consultation among professionals and the authorities to define the priority objectives of the sector;
- Collecting, analysing, disseminating and archiving information, and setting up a data bank on the sector, as well as undertaking relevant studies with a view to developing the domestic and export markets;
- Protecting national olive growing heritage through the organisation and implementation of national

campaigns to fight against pests affecting olive trees;

- Training specialised workers in olive pruning;
- Applying the results of scientific research at the national level for the improvement of quality and productivity;
- Assisting producers by encouraging them to use nitrogen-based fertilisers and mechanical tools.

Action

The ONH continues to support the efforts of the State towards the protection of the olive growing sector on the one hand, and the assistance of farmers on the other. ONH action mainly includes:





Standardisation and quality control

Olive oil, as a high-quality food product, has a very elaborate regulatory framework. The ONH, in collaboration with national bodies such as the National Standardisation and Industrial Property Institute (INNORPI), inspects the quality of oils produced in Tunisia, applying both national and international quality standards and the guarantee label, thereby contributing to transparency in the world olive oil market and safeguarding the interests of consumers wherever they may be.

All exported Tunisian olive oils are systematically analysed to check their authenticity and their compliance with the applicable international standards. Moreover, in order to safeguard the reputation of Tunisian olive oil, the ONH pursues a quality approach based on:

- Recognised laboratories, certified and accredited by the International Olive Council, equipped with high-tech equipment;
- A large number of engineers and highly-qualified and specialised technicians in the analysis of fatty matter;
- A tasting panel with training and experience of the most recent methods of organoleptic assessment established by the International Olive Council;
- Continuous physico-chemical and organoleptic assessment to identify the quality and the defects of olive oil and thereby select good quality virgin olive oils.

Agricultural Investment Promotion Agency



The Agricultural Investment Promotion Agency (APIA) is a non-administrative public establishment created in 1983, with the main mission of promoting

private investment in agriculture, fisheries and associated areas, and in primary processing activities in agricultural and fishery projects.

What are its missions?

APIA serves farmers, fishermen, young promoters and Tunisian and foreign investors namely through:

- Awarding financial and tax benefits under Investment Act No 2016-71, for promoters of projects in the areas of agriculture, fishing, services linked to these sectors and the primary processing of agricultural and fishing products;
- Identifying investment opportunities and project initiatives to be promoted by private and foreign Tunisian operators, thereby contributing to the fulfilment of national objectives for the agricultural sector;
- Assisting promoters in creating their investment dossiers and providing supervision and assistance during the project implementation phase;
- Training young agricultural promoters and providing supervision and assistance as they identify, study and conduct their projects in business nurseries and specific training programmes;
- Linking Tunisian operators with their foreign counterparts to promote partnership projects and trade;
- Organising events, seminars, information days and partnership meetings;

- Participating in both national and foreign trade fairs;
- Operating the quality network established in the different branches of the sector in collaboration with sectoral groups and the ONH. The Agency is directed by a Director General.

Resources

APIA has various means of accomplishing its missions, including: an investor relations office in Tunis (central management), to welcome, guide and assist promoters, a regional department in each governorship (24 departments), where various flagship departments have seen considerable growth and have posted unprecedented performances, namely for olive oil; central and regional award committees; teams of specialists for the evaluation of investment operations; the organisation of events and training for young promoters and providing assistance for the promotion of high-quality Tunisian products.

Tunisian Union of Agriculture and Fisheries

A Tunisian agricultural union, which represents the professionals of the primary sector of the country and was founded in 1949 as the General Union of Tunisian Farmers (UGAT), then becoming the National Union of Tunisian Farmers (UNAT) in 1955, before adopting its current name in 1995. Its headquarters are located in Tunis and it has regional offices in all the country's governorates.



Objectives

Its objectives are:



- The representation and defense of the interests of farmers and fishermen;
- The improvement of their economic and social situation;



- Contribution to training and awareness raising activities and assistance for farmers;
- Liaison with the relevant authorities to facilitate investment and funding for agricultural projects;



- Contribution to the design and development of national plans and other implementation and follow-up activities;



Preparation of studies and experiments for the development and modernisation of the agricultural sector.

2. Downstream

A. Producers

Production is divided between the public and the private sector. The public sector is represented by the Public Land Office and the private sector is represented by the Associations for the Promotion

of Agricultural Development (SMVDA) and private farmers.

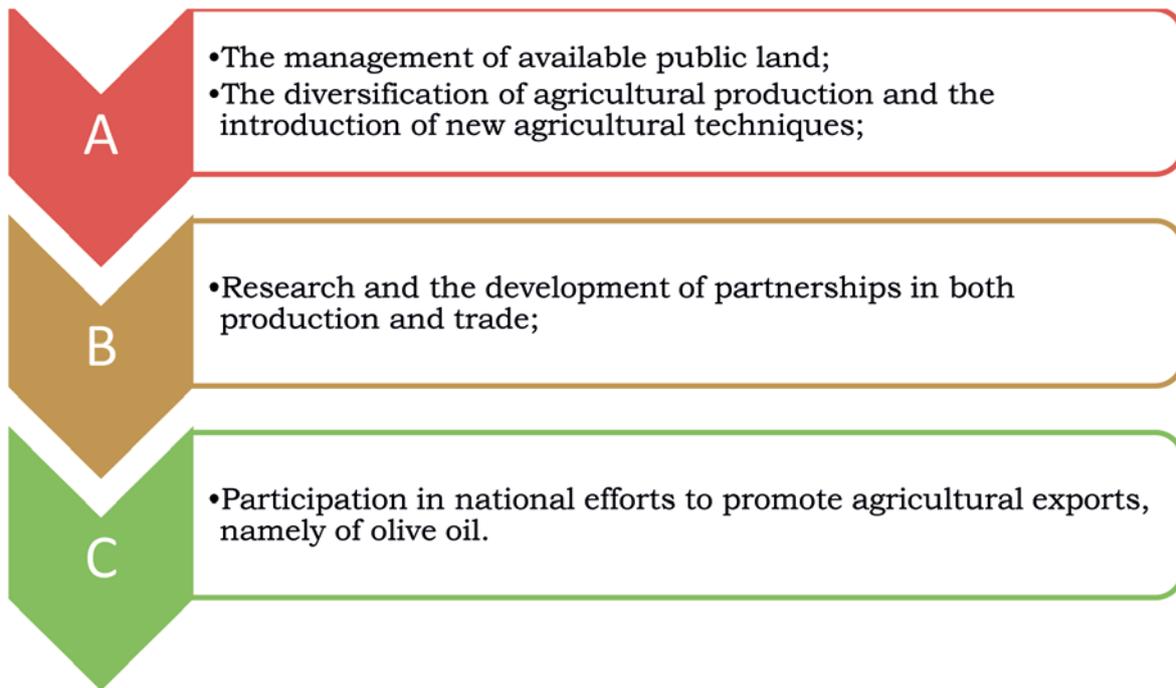
1. The public sector: Public Land Office

The Public Land Office is a public enterprise that was created in 1961 to manage an area of 156 000 ha, distributed over 30 collective agricultural domains (*agro-combinats*) and agro-industrial units.



Missions

The missions assigned to the Public Land Office focus on four areas:



	Rain-fed (ha)	Irrigation	Total
NORTH	3009	66	3075
SAHEL	1814		1814
SFAX	40969	17	40986
CENTRE	11856	527	12383
SOUTH	66365	610	66975
TOTAL TUNISIA	124013	1220	125233

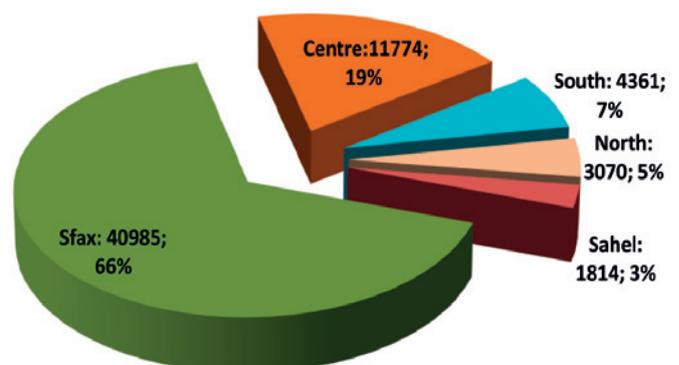
Olive orchard distribution

The olive growing area covers 97 563 ha, 62 721 ha of which are used to grow olive trees. Over the last five years, the annual olive oil production average has varied between 3 000 and 7 000 tonnes.

Across the Tunisian territory, the Public Land Office deals with a wealth and diversity of production potential, comprising large-scale farms (17 794 ha), vegetable crops (186 ha), fruit tree crops (66 563 ha) of which 94% (62 261 ha) are olive trees, and tracks and forests (70 641 ha).

The table below shows the distribution of public land used for olive growing between the different collective agricultural domains managed by the Public Land Office:

Public land managed by the Public Land Office is therefore distributed among the regions as follows:



Irrigated land accounts for only 2% of public land.

2. The private sector

Associations for the Promotion of Agricultural Development

Purpose

The development of public agricultural land, since its nationalisation in 1964, was exclusively the domain of the Public Land Office and the *Unités Coopératives de Production Agricole* (Cooperative Agricultural Production Units), often becoming simple traditional and marginal farms.

However, since the beginning of the 1980s, in order to improve the performance of public agricultural land, modernise its production systems, and reinforce its contribution to food security, the creation of employment and the promotion of the exportation of products, the State decided to create the Associations for the Promotion of Agricultural Development to reduce pressure on the Public Land Office by letting these lands to the Associations, which were funded by development banks such as *Banque National de Développement Agricole* (BNDA, now BNA), *Banque Tuniso-Koweïtienne* (BTKD, now BTK), *Banque Tunisienne des Emirates* (BTEI, now BTE), *Qatar National Bank Tunisia* (BTQI), *Banque de Développement Economique de Tunisie* (BDET), *Société Tuniso-Saoudienne d'Investissement et de Développement* (STUSID), the Arab Authority for Agricultural Investment and Development, etc.

These associations were created on the basis of the cooperative units of agricultural production groups, often set up as “megaprojects” with considerable investments, particularly promoting dairy cow rearing, sheep rearing for meat, cereals and fruit tree crops.

Operation

They exploit and manage public land through leasing agreements across various governorates. They are the practical managers of a considerable natural heritage: large farms that were recovered from the European colonisers after a fraught national revolution. After the bitter experience of collectivisation that followed independence, various management formulas were attempted (Cooperative Production Units, collective agricultural domains, pilot farms, public farms, etc.), however the State considered the Associations to be “the best management formula” to optimise the use of land, attract private investment, draw on large-scale

self funding, introduce technical innovations and apply the results of research. This sought to achieve food security and export any surplus. Certain Associations even received large irrigated areas to make use of water channelled by the State at a high cost. In short, the State provided these Associations with the tools to become not only the breadbasket of Tunisia but also an example for others and the true motors of agriculture.

Among these Associations, some have stood out over the years for their successful management and for acquiring substantial expertise. They benefitted from their own funding and the use of state-of-the-art technology. They impacted their respective regions and modernised the rural environment. They also opened their doors to display their achievements, investments and harvests, results and performance, proving that they have become “the flower of our agriculture”, providing a basis from which to face the challenges of globalisation.



Private farmers: numbers and distribution

- Some 309 000 producers, accounting for 60% of farmers, derive all or part of their revenues from olive growing. Over the last two crop years, 2015/16 and 2016/17, the contribution of these farmers to





national production stood at 35% in the north of the county, 10% in the Sahel, 33% in the centre, 10% in Sfax and 8% in the south. The remaining 4% are the contribution of the public lands used for olive growing.

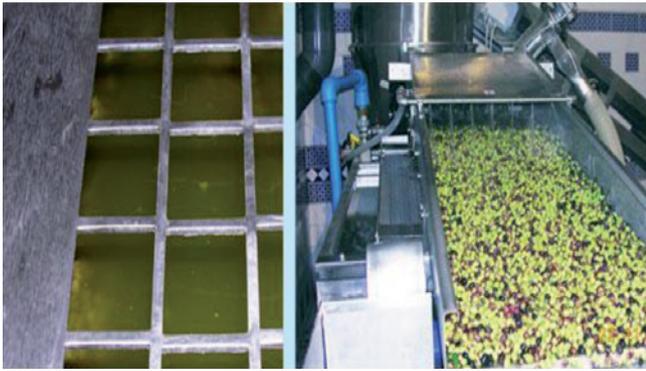
If the distribution of oil mills throughout the territory is compared to distribution according to production, the number of oil mills in certain governorates is not in proportion with production. This derives from the management of production support structures and measures to encourage investment to open new oil mills.

B. Olive oil producers: Numbers and distribution

There are 1 679 oil mills distributed throughout the country, as indicated in the map below:



This large number of oil mills also explains the large proportion of high quality oil at the production level given that the amount of time that olives are stored between harvest and grinding is becoming increasingly shorter, not exceeding 24 hours in most cases.

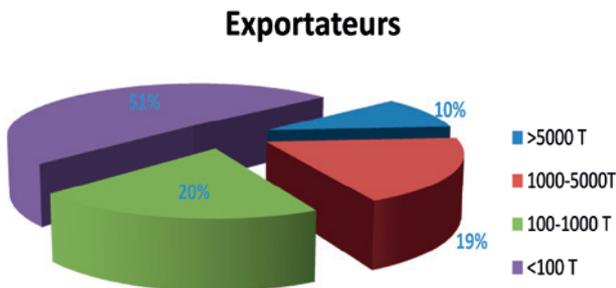


C. Exporters: numbers and distribution



Approximately one hundred operators export olive oil from Tunisia on the international market, to Latin America, North America, Australia, Asia, Europe, Africa, Gulf countries and the Middle East.

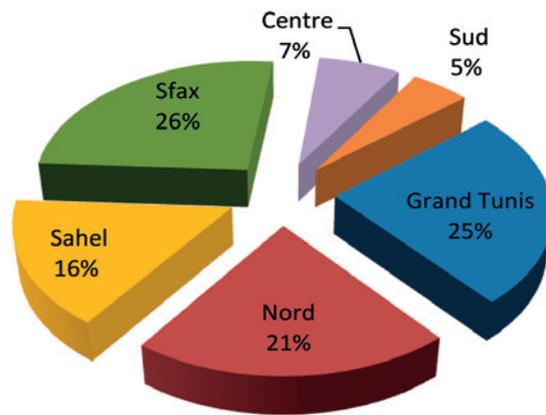
How are exporters distributed according to export volume?



- Among exporters, 10% export annual quantities exceeding 5 000 t and account for 70% of exports and 69% of export revenues.
- Around 19% of exporters move annual quantities of 1 000 to 5 000 t and account for 25% of exports and 26% of export revenues.

- Twenty per cent of exporters export annual quantities of 1 000 to 100 t and account for 4% of exports and export revenue.
- Lastly, 51% of exporters deal in amounts of less than 100 t and account for 1% of exports and revenue.

Regional distribution of exporters



Most olive oil exporters are found in the region of Sfax. This is due to the vast olive plantations in this region and the large number of oil mills found there (342).

The region of Greater Tunis comes in second place with 25% of exporters, due to the large number of export companies in the capital.

The north comes in third place with 21% of exports being an agricultural region *par excellence* with a considerable potential for growth.

IV. Tunisian olives: regional varieties and production

The olive tree belongs to the botanical order of the *Ligustrales*, and the family of the *Oleaceae*. This family includes a large number of species found all over the globe.

The species grown around the Mediterranean is the *Olea europaea*, which includes the wild olive tree (*Olea oleaster*) and the cultivated olive tree (*Olea europaea sativa*).



Olive trees are found in all regions in Tunisia, from the north to the south and from east to west. In the north and in certain areas of the centre, olive trees are cultivated together with other annual crops (cereals or fruit trees such as citrus fruit trees, grapevine or almond trees), while in the south they are grown in single-crop farming.

1. Main Tunisian varieties

Tunisia has a rich varietal heritage due to its geographical situation, at the crossroads of various civilisations and trade routes between the East, Africa and Europe.

However, two varieties, the Chemlali and Chetoui, are the main varieties cultivated in Tunisia.

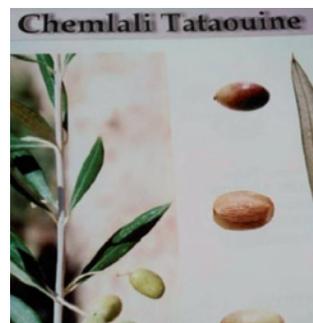
Other so-called secondary varieties are more specific to small regions. Such varieties include the Oueslati, Chemchali, Zalmati, Zarrazi, Gerboui and Sayali varieties.

All these varieties can be used for both olive oil and table olives.

Key facts

• Chemlali

This variety is grown in the warm coastal region and in the low steppes region. Being well adapted to arid



and semi-arid climates, it dominates the olive orchards of the centre and south and accounts for 56% of olive acreage and for 69% of plants. It contributes to up to 81% of national production.

In sensory terms, Chemlali olives produce an oil that is not very sweet, with middling fruitiness, where bitterness predominates over pungency, giving off aromas of almond, tomato, apple and green grass.

The Sfax Chemlali olive in early maturity produces a very fruity oil, with low bitterness and pungency and aromas of green almond, fresh grass and occasionally apple.

At full maturity, the oil sweetens, and its slight fruitiness and green almond aroma is replaced by that of dry almond or marzipan.

The chemical characteristics of the oil of Sfax Chemlali, are as follows:

Composition en acides gras (%)	Acide palmitique	19
	Acide oléique	57
	Acide linoléique	18
Teneur en antioxydants (mg/Kg)	Polyphénols	224
	Tocophérols	286
Teneur en stérols (mg/Kg)	Sitostérol	2027
	Delta5 -avenasterol	270
	Campestérol	61
	Stérols totaux	2478
Stabilité oxydative (à 100°C)	39h	

• Chetoui



Found in the coastal regions, valleys and the high plateaus in the north, this variety covers most of the olive orchards in that region, being cultivated in approximately 12% of olive orchards and accounting for 30% of trees, but only contributing 10% of national production.

It produces a non-congealing fruity oil with an intense aroma of green almond, with a bitter and pungent taste of middling to strong intensity. The intensity of the bitterness decreases as it matures but remains perceptible.

This oil is highly appreciated for its high contents of phenolic and antioxidant compounds.

The average weight of olives is of 2.4 grams and they have a fat content of 24%.

The chemical characteristics of this olive oil are as follows:

Composition en acides gras (%)	Acide palmitique	12
	Acide oléique	66
	Acide linoléique	17
Teneur en antioxydants (mg/Kg)	Polyphénols	325
	Tocophérols	274
Teneur en stérols (mg/Kg)	Sitostérol	1437
	Delta5 -avenasterol	175
	Campestérol	38
	Stérols totaux	1723
Stabilité oxydative (à 100°C)	60h	

• Oueslati



This variety is grown in the Kairouan region. The oil extracted from this variety is well balanced and fruity, with low bitterness and a taste that is reminiscent of almonds.

The average weight of the olive is of 1.6 grams and it has a fat content of 24%.

The chemical characteristics of this olive oil are as follows:

Composition en acides gras (%)	Acide palmitique	11
	Acide oléique	74
	Acide linoléique	11
Teneur en antioxydants (mg/Kg)	Polyphénols	246
	Tocophérols	230
Teneur en stérols (mg/Kg)	Sitostérol	1230
	Delta5 -avenasterol	127
	Campestérol	44
	Stérols totaux	1465
Stabilité oxydative (à 100°C)	59h	

• Zarrazi



Grown in the south, mainly in oases, and with various local variations, this variety, as well as producing excellent table olives, is highly appreciated for its high contents of olive oil, despite its alternate bearing productivity.



In sensory terms, Zarrazi olives in the south give a fruity oil with low bitterness and pungency and a slight sweetness, presenting aromas of fig and sometimes apple and grass.

The chemical characteristic of this oil are as follows:

Composition en acides gras (%)	Acide palmitique	9,8
	Acide oléique	75
	Acide linoléique	11
Teneur en antioxydants (mg/Kg)	Polyphénols	350
	Tocophérols	258
Teneur en stérols (mg/Kg)	Sitostérol	1274
	Delta5 -avenasterol	161
	Campestérol	47
	Stérols totaux	1547
Stabilité oxydative (à 100°C)	70h	

Table olive varieties include the Meski, Sayali, Tounsi, Besbessi, Marsaline, Beldi and Fouji varieties, for

which farming is essentially extensive, harmoniously matching the density of plantations with the annual average rainfall:

- 100 trees/ha in the north where rainfall stands at 400 – 600 mm
- 50 – 60 trees/ha in the centre where rainfall stands at around 300 – 350 mm
- 17 – 20 trees/ha in the south where rainfall stands at 200 – 250 mm.

Plantation density also varies as a result of the farming conditions of the different farms but the average fluctuates between 40 and 100 trees/ha in rain-fed conditions according to the use made of the olive trees (for olive oil or table olives) and is of 240 trees/ha in irrigated conditions.

The age structure of Tunisian olive trees is as follows:

- young plants (1 to 20 years) = 18 %;
- plants in production (20 to 70 years) = 75 %;
- old plants (more than 70 years) = 7%.

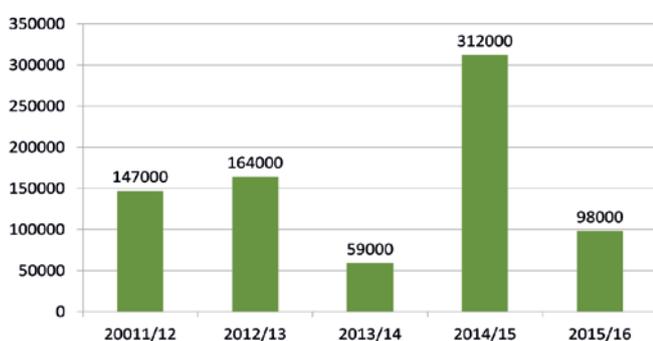
V. Open to international trade: Tunisian olive oil exports

The last five crop years have seen some instability in exports of olive oil. Exports in 2011/12 and 2012/13 were close to general average export levels while in 2013/14 they fell by more than 50% due to a considerable drop in production.

The 2014/15 crop year was exceptional in Tunisia, while Spain and Italy experienced poor production levels, explaining the considerable increase in exports to these two countries.

Exports in 2015/16 are estimated at 100 tonnes, therefore below average, as was to be expected after such an exceptional crop year. The alternate bearing phenomenon is operative in these conditions.

Trend in exports over the last five crop years (Tonnes)



A. Bulk and packaged exports

Packaged olive oil exports have always represented an average of 10% of total exports. The table below indicates the proportion of bulk versus packaged olives over the last five crop years.

Crop year	bulk	packaged	total	% bulk	% packaged
2011/12	135,000	12,000	147,000	92%	8%
2012/13	148,000	16,000	164,000	90%	10%
2013/14	45,000	14,000	59,000	76%	24%
2014/15	293,000	19,000	312,000	94%	6%
2015/16	84,000	14,000	98,000	86%	14%
Average	141,000	15,000	156,000	90%	10%

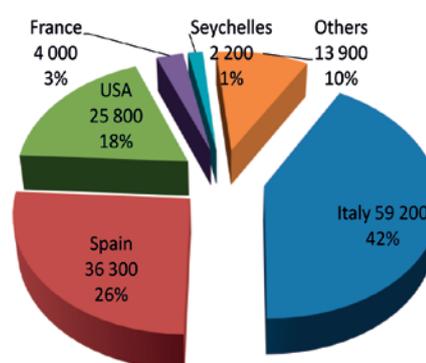
Traditional bulk markets

Italy will always be the first bulk market for Tunisian olive oil, followed by Spain and the USA.

In Seychelles and France, the quantities exported are stable and always below 5000 tonnes.

Proportionately, on the bulk market, Italy is in first place with 42%, Spain is in second place with 26%, followed by the USA with 18%, and France and Seychelles with 3% and 1% respectively.

Average distribution of bulk exports per destination over the last five crop years (tonnes)

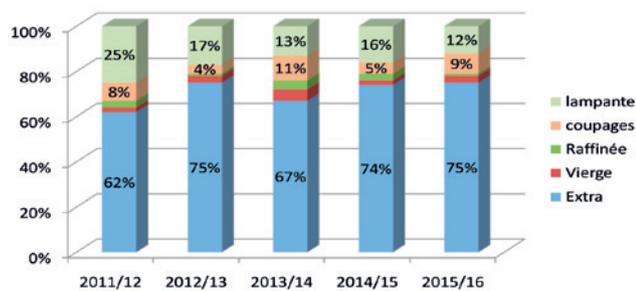


Distribution of bulk market

Tunisian extra virgin olive oil accounts for 85% of its overall production and 70% of its bulk exports.

The lampante category is in second place with an average of 17%.

Distribution of bulk exports by categories



Lampante markets

The main traditional markets for lampante oil are Italy and Spain, followed by the USA and Morocco, with significant variations from one crop year to the next. On the other hand, the exceptional 2014/15 crop year enabled Tunisian exporters to introduce lampante into other markets, such as the United Kingdom with a non-negligible 900 t, and Lebanon with 364 t. France and Turkey made a timid entrance with 44 and 41 tonnes respectively.

	2011/12	2012/13	2013/14	2014/15	2015/16
Australia	84				
Spain	5 819	6 339	2 028	29 683	3 772
Italy	28 265	16 477	3 358	8 276	5 158
USA		1 200	91	4 674	487
Morocco	252	622		3 030	494
Lebanon			445	364	
France				44	
UK				900	150
Turkey				41	

VI. Packaged olive oil

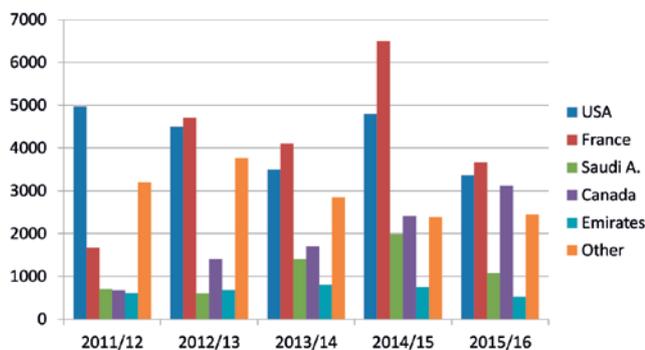
In terms of proportion and quantity, exports of packaged olive oil are still far from the targets set by the FO-PROHOC of 20%. This is due to various factors:

1. Intense competition on the international market;
2. Producer prices for olive oil are becoming increasingly high;
3. In the absence of a production of high-end, good quality packaging, most exporters import packaging, hiking up the prices of bottled oil;
4. The destinations of packaged oil are distant and generate high shipment costs.

Trends in exports of packaged olive oil to traditional markets

The traditional markets for packaged olive oil exports are greater in number and more regular. USA and France are the largest markets with an annual average of approximately 4 000 t. Canada is in third position but the quantities exported there follow a steady upward trend with 667 t in 2011/12, 1 400 t in 2012/13 and 1 700 t in 2013/14, 2 400 t in 2014/15 and 3 100 t in 2015/16.

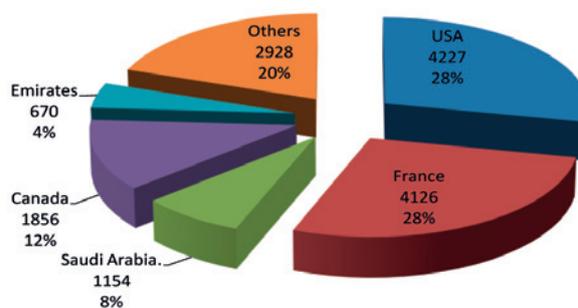
Trends in packaged exports on the traditional markets



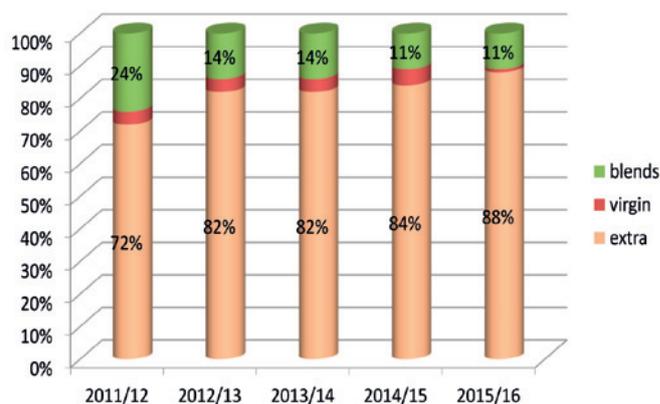
The Gulf countries are among the regular markets where orders are growing slowly due to the flooding

of those markets with Italian and Spanish oil at very high prices, and by lower quality Syrian and Turkish oils. Tunisia needs to position itself between these two ranges with good quality olive oil at a marginally higher price than the lower quality oils. It should be noted that, in the wholesale market, price continues to be the most important factor in purchases in these countries.

Average distribution of packaged exports by destination over the last five crop years (tonnes)



Distribution of packaged exports by quality



Quality

Over the last five crop years, 82% of exports of packaged olive oils are extra virgin olive oil and 15% are blends. The remaining 3% are virgin olive oil.

VII. Export subsidies

Aware of the importance of promoting the export of olive oil, Tunisia opted for a strategy based on initiatives and avant-garde and promising measures. An example of such initiatives are the promotion funds made available to exporters of Tunisian olive oil.

• Fund for the Promotion of Exports (FOPRODEX)

This is a financial support mechanism established by the Tunisian State and managed by the Centre for the Promotion of Exports (CEPEX) for exporters to access the international market.

Its areas of activity are the following:

- Establishment and development of exports within the company by an assessment of the export department and the implementation of a steering plan for exports;
- Recruitment of persons holding higher education diplomas within an export structure;
- External market research and studies on external commercial footprint;
- Private commercial footprint abroad;
- Creation of promotional material and the use of new communication and promotion technologies;
- **Conception of a new product design and/or packaging for exports;**
- Creation of a quality label and its registration abroad;
- Individual participation in specialised fairs abroad (not included in the programme drawn up by the National External Trade Council –CNCE);
- Participation in international calls for tender;
- Invitation to Tunisia of foreign clients;
- Promotion campaigns initiated and carried out by Tunisian businessmen residing abroad;
- **Coverage of collective promotion activities initiated and carried out by professional corporations and international trade associations;**
- **Coverage of part of the freight costs in the transport of Tunisian products on external markets,**

one third of freight if carried by sea and half of freight if those same products are transported by air.

• Fund for the Promotion of Packaged Olive Oil

The Fund for the Promotion of Packaged Olive Oil (FOPROHOC), created in 2006, is fed by the application of a parafiscal tax of 0.5% on the customs value of bulk exports of olive oil. Packtec has been made responsible for its management and its action seeks to establish a culture of performance and galvanise exports.

The main objective of this fund is the promotion of Tunisian olive oil through financing generic promotion programmes for Tunisian olive oil on target markets, but also through the support and assistance of Tunisian companies with a view to developing production of packaged olive oil and promoting exports, on external markets.

Accordingly, the FOPROHOC makes financial and strategic resources available to olive oil exporters, to support them in their exportation transactions, namely through:

- The creation and registration of trademarks;
- Participation in food fairs and the creation of communication material and the prospection of new potential markets;
- The establishment of external trade, distribution and marketing structures;
- The identification of intermediaries in the target markets;
- **The adaptation of packaging to market requirements;**
- The creation of quality labels;
- The production of communication material to raise awareness of companies, their activities and products;
- Referencing packaged olive oil under Tunisian brands in distribution points abroad and all related promotion and trade activities.

VIII. Organic olive oil: a far-reaching and promising future



Tunisian organic farming is on the rise and has reached a level of maturity that would allow it to take up a better international standing and enter new markets, thereby promoting Tunisia as an economic and touristic destination known for its organic crops.

Organic farming is an up-and-coming sector. With land stretching over 500 000 ha, Tunisia is the second country in Africa after Uganda in terms of land used for organic farming. Its annual production is of approximately 450 000 tonnes for all products.

A strategy has been established for the 2020 target five-year plan (2015 – 20) for the development of the organic farming sector. It is based on some twenty branches producing a large variety of products that enable Tunisia to claim that it is the home of organic farming.

There are currently some 3 300 operators in the various branches of organic farming, and Tunisia exports 50 000 tonnes of organic products to 60 destinations every year, for an estimated value of 350 million dinars.

The export of Tunisian organic products has considerably increased over the last ten years, rising from approximately 5 000 tonnes in 2002 to almost 50 000 tonnes in 2016.

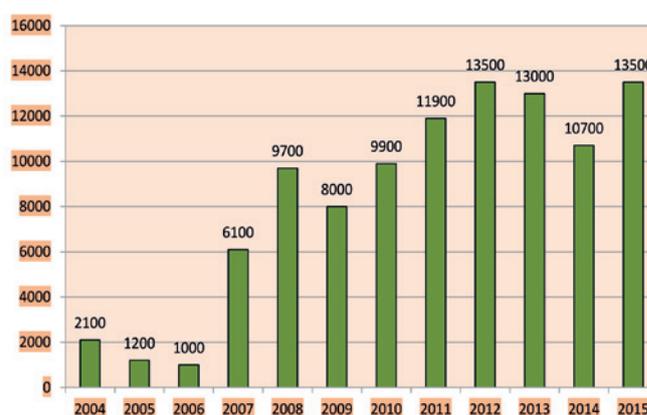
Olive oil continues to dominate the market, for which Tunisia was the first global exporter of organic olive oil in 2015.

In the 2000s there was a worldwide growth in demand for organic products, especially in Europe. This provided Tunisia with the opportunity to bring olive tree crops under organic farming. A national policy has therefore been developed to organise this sector with a view to increasing exports of Tunisian products, which

currently account for only 1% of the global organic market.

Olive growing is the driving force of organic farming in Tunisia, where olive plantations cover some 125 000 ha, or 40% of the total crop area using organic farming practices, thereby allowing Tunisia to position itself as the third country in terms of olive acreage.

Trends in the volumes of organic olive oil exports have behaved as follows:



The actors in the organic farming sector include the Technical Centre for Organic Farming, which plays a central role in supervision, assistance and promotion.

The Technical Centre for Organic Farming

The Technical Centre for Organic Farming (CTAB) was created under Act No 96-04 of 19 January 1996, concerning technical centres in the agricultural sector and the ruling of the Ministry of Agriculture of 2 October 1999, concerning the creation of the CTAB and the approval of its legal status.

Mission:

- Ensuring that the results of research are in line with the real conditions in agriculture;
- Conducting programmes for the application of the results of research;
- Conducting popularisation activities to enable the rapid and effective transfer of technical progress;



- Organising the dissemination of more effective production techniques with a view to ensuring an optimised use of the data and technical knowledge acquired;
- Supporting agricultural development through training, re-training and skill upgrades;
- Providing producers with technical and economic assistance;
- Developing exchanges with institutions with similar or the same national or foreign interests, and with international organisations;
- Conducting studies and collecting scientific and technical information on the sector for dissemination among users;
- Proposing research subjects specific to organic farming to teaching and research establishments;
- Establishing maps setting out the regions that are most favourable for organic farming;
- Working towards the development of techniques specific to the production of organic matter, breeding insects used in biological control and developing specific processing equipment;
- Adapting technical innovations specific to organic farming with a view to generalising their use;
- Participating in the preservation of species and genetic plant heritage.
- Participating in experiments for the standardisation and registrations of organic input (fertiliser, pesticide, etc.) and the update of the list of inputs authorised in organic farming;
- Participating in training young promoters in the organic farming sector and providing assistance for students in various higher agricultural education institutions.

Integrated quality, security and environment certification « QSE » of the CTAB

On 28 February 2013, the CTAB obtained the integrated “QSE” certificate. It is the first public body in

Tunisia to obtain this type of integrated certificate. It includes certification according to the international standard for quality management systems “**ISO9001:2008**” and the British standard **BS OHSAS 18001** “British Standard Occupational Health and Safety Assessment Series”, which is a model occupational health and safety management system.

Verification and certification

In order to certify that a product comes from organic farming, operators must undergo monitoring by a verification and certification body accredited by the Ministry of Agriculture in the area of organic farming according to Act No 99-33 of 5 April 1999, Decree No 2000-409 of 14 February 2000 and Decree No 2012-2819 of 20 November 2012, establishing the conditions for recognition and the procedures for verification and certification.

The accredited verification and certification bodies in Tunisia are:

ECOCERT	Code : TN-BIO- 001
CCPB SRL	Code : TN-BIO- 008
BCS	Code : TN-BIO-003
SUOLOESALUTE	Code : TN-BIO-004
INNORPI	Code : TN-BIO-006

The organic logo



In order to promote organic products nationally and internationally, an optional and free Tunisian logo was created. To use it, the product must be certified by a verification and certification body in accordance with the Tunisian regulations in force.

This logo is awarded following a request from the interested party, using an agreed model and accompanied by the certificate of conformity awarded by the verification body, proving that the product is obtained according to the rules of organic farming, which are deposited

with the relevant department of the regional authority for agricultural development or with the Directorate General for Organic Farming, which proceeds to examine it over a period not exceeding one month following the deposit.

It is important to note that the applicant is required to transmit the labels used, and any draft changes to them, to the Directorate General for Organic Farming of the Ministry of Agriculture.

Should the application be accepted, the logo is awarded by a decision of the Ministry of Agriculture, accompanied by a document indicating the position of the logo, its dimensions, colours, shape and all the rules that are to be respected for its use, according to the materials used to this end. This logo is then registered by the Ministry of Agriculture at the National Institute of Standardisation and Intellectual Property.

The 24 organic olive oil exporters are distributed over the regions as follows: 25% in the Sahel, 50% in Sfax, 20% in the north, 4% in the centre and 1% in the

south. Organic producers are spread across the territory as follows:

Governorate	Number
Sahel	41
North	55
Sfax	21
Centre	29
Total	146



IX. Government strategy for olive growing in the run-up to 2020

The 2016 – 2020 national strategy for the olive sector can be summed up in the following five points:

- Production target of 230 000 tonnes of olive oil by 2020.
- Average export target of 170 000 tonnes with an annual domestic consumption of 60 000 tonnes.
- Streamlining the extension towards favourable areas for the plantation of olive trees within a limit of 100 000 ha, of which 20 000 ha are irrigated, in other words 20 000 ha/year of which 5 000 ha are irrigated.
- Continuing efforts and pursue measures to improve the quality of olive oil which have meant that 70% of exports in recent years have been of extra virgin olive oil.
- Continuing to promote Tunisian olive oil exports through the improvement of packaging and the diversification of oils produced in order to reach a rate of 20% of packaged olive oils and 80% of bulk olive oils.

The action plan to implement the olive sector strategy

1. Actions to be taken in relation to production:

- Ensuring better tending of olive trees, especially in the north, which offers favourable climatic conditions and has a high but insufficiently harnessed production potential;
- Ensuring the right conditions for new plantations, especially those established under the project for the extension of olive orchards in the north of Tunisia, with a target of one million plants/year, within agricultural allowances and applying the appropriate techniques;
- Optimising the use of existing genetic resources;
- Implementing the new measures to conduct the programme for the renewal of ageing olive trees in traditional olive growing areas;

- Implementing a supplementary irrigation programme for rain-fed orchards;
- Persevering in the creation of irrigated plantations in appropriate zones;
- Planting 20 000 ha of olive trees in agro-forestry areas in the rural zones of the north and centre of the country as part of the “Project for integrated landscape management in disadvantaged areas”;
- Reinforcing training and vulgarisation programmes in relation to the olive sector;
- Enhancing the competitiveness of production by adopting new plantation models to boost intensification, the use of modern technology and results from scientific research.

2. Actions to be taken in relation to processing and product promotion:

- Mastering good practices in the harvest, transport, storage and grinding of olives;
- Encouraging and promoting the establishment of grinding units in production areas in order to avoid long transportation distances;
- Monitoring the creation and use of quality labels and tracking tools in order to promote Tunisian olive oil and thereby diversify exports;
- Encouraging the packaging of olive oil for both the domestic and the export market.

3. Actions to be taken concerning the organisation of the sector:

- Encouraging the creation of professional structures based on the collective use of resources for production and trade in order to minimise the costs of production and improve the competitiveness of olive oil;
- Creating an information observatory bringing together the whole sector (olive growers, olive oil producers, packers and sales representatives) in order to make information on the sector available to all stakeholders.

X. Recycling of oil mill wastewater. Current situation

Tunisian olive growing, with its 78 million trees over 1.8 million ha, plays essential economic and social role.

Aside from the production of olive oil, the processing industry with its 1700 oil mills, increasing production and the introduction of modern techniques for oil extraction (continuous processes) over the last decade have resulted in the rapid increase in the amount of wastewater produced by olive oil mills. The current volume of wastewater in Tunisia is estimated at more than 800 000 tonnes per year.

This wastewater, which contains high levels of organic and mineral matter, cannot be treated in urban treatment plants and the law prohibits it to be channelled into domestic and industrial evacuation networks (due to the high contents of suspended matter and corrosion from excessive acidity and salinity).

This wastewater is mainly generated during the harvest season, which lasts for an average of 100 days, and is currently not treated or eliminated in any satisfactory way, representing a real risk for the environment, especially for water resources.

There is currently no large scale wastewater treatment or elimination system using modern treatment or elimination procedures. According to Tunisian environmental policy, olive producers are not allowed to spill any wastewater in urban sanitation networks and are required to equip themselves with a storage tank able to store a week's worth of wastewater.

Treatment through natural evaporation, subject to climate conditions, was adopted and large storage tanks were built in large production zones: one in Sfax and another in the town of El Kalaa.

However, despite adhering to the depth prescriptions for the collection tanks, the evaporation is not sufficient. This is explained by the fact that a fine film of oil is formed on the surface of the water, preventing evaporation.

Furthermore, the transport of wastewater from the olive oil mills to the storage tanks requires a large fleet of tankers, which are not always available as the olive grinding period is very concentrated. This operation generates an additional charge that olive producers are not always able to cover.

In addition to these storage and natural evaporation methods, various methods of wastewater recycling and treatment have been attempted in Tunisia for a number of years. These recycling methods have not led to any conclusive results, given that they have not been applied throughout the country and have not been tested on large quantities of wastewater.

Wastewater is a good fertiliser and its re-use in agriculture is an excellent means of recycling.

The method of using wastewater as a fertiliser by spreading it over olive orchards has been tested by the Olive Tree Institute over a period of ten years with satisfactory results. The use of wastewater in olive orchards is beneficial and provides a soil enriching product for sandy terrain poor in organic matter at doses of 50 m³ per hectare.

Following these tests, a large-scale programme was conducted over seven consecutive crop years by the services of the Ministry of Agriculture, involving farmers throughout Tunisia. This programme sought to raise awareness of the utility of wastewater as a fertilizer and the precautions to be taken with it. This programme was conducted under the supervision of the regional agricultural and environmental authorities following an agreement between these two authorities. Specific recommendations for the reuse of wastewater through spreading have been established and concern:

- the protection of subterranean and surface water;
- the study of the terrain;
- variations in the quality of wastewater;
- safety measures for crops;
- soil treatment;
- climate conditions.

Accordingly, in spreading wastewater, the following rules should be applied:

- A maximum dose of 50 m³ should be spread per hectare per year, every other year.
- The land should be ploughed in soon after the wastewater has been spread (two to three days).
- The wastewater should be spread uniformly.

- Surface run-off should be avoided when spreading the wastewater.
- Wastewater should always be used during the rest periods of woody crops (the months of November to February when vegetation is resting for the winter).
- Wastewater should not be allowed to wet leaves (olive leaves for example).
- Wastewater should not be spread and compost should not be used in areas where vulnerable water bodies are used to supply drinking water.

For a rational use of wastewater by spreading, a national regulation was established to define the conditions and the procedures for the management of wastewater from oil mills, with a view to their use in agriculture (Decree No. 2013 –1308 of 26 February 2013). After this stage, a process was established to enable the use of this method to evacuate a large amount of the wastewater produced in Tunisia.



Recycling through spreading on crops

Wastewater is very rich in fertilisers. The average contents of fertilisers on the basis of spreading 50m³/ha/year are the following:

PARAMETERS	UNITS KG/HA	INPUT PER HA
Organic matter	MO	200 to 900
Total nitrogen	N	25 to 100
Phosphorus	P2O5	30 to 100
Potassium	K2O	175 to 550
Magnesium	MgO	7 to 75
Calcium	CaO	7 to 50

On average, 1 m³ of wastewater is produced by pressing 1 to 1.2 tonnes of olives. These variations are often dependent on whether the olives are washed before pressing, and whether water is added to the paste during the pressing. On the basis of an average production of 900 000 tonnes of olives a year over the last decade, average annual production of wastewater is of approximately 1 million m³.

The target for upcoming crop years is to recover through spreading 40% of the wastewater produced, or 400 000 m³ every year, which would correspond to an olive growing area of 8000 ha a year. This target has been set on the basis of the oil mills in rural zones, near olive orchards.

Message of the Executive Director of the International Olive Council on the celebration of World Olive Day

In 1992, the member countries of the International Olive Council (IOC) decided to perpetuate their common cultural heritage by celebrating World Olive Day.

It is a rich and varied heritage stretching back to antiquity, when the olive tree was a symbol of peace, harmony, friendship and glory.

As the tree associated with the ancient Greek goddess Athena, the olive represented strength and victory, wisdom and fidelity, immortality and hope, and wealth and abundance.

In Abrahamic religions, the olive is a sacred tree of peace and reconciliation. It symbolises universal man and its oil is the source of divine light.

From the UN flag with its crown of olive branches encircling the world, to Picasso's famous dove of peace carrying an olive branch, and in countless other works of art, coin engravings and stamps, the olive tree is used to express messages of hope and reassurance.

Now, more than ever, we must remember these symbols and work together to safeguard this heritage and transmit it to future generations.

Olive growing, which began around the Mediterranean more than six thousand years ago, now spans five continents. With approximately one and a half billion olive trees worldwide over more than eleven million hectares, it is a crop that contributes significantly to sustainable economic and social development.

In addition to being a source of revenue for 30 million people, olive growing provides a barrier against desertification, protects against erosion and acts as a carbon sink.

Olive oil is at the heart of the Mediterranean diet, which has been included in the UNESCO intangible cultural heritage list. It has varied aromas and tastes, offering a myriad of gastronomic possibilities, in addition to proven therapeutic properties.

World Olive Day, which is celebrated this year at the headquarters of the IOC and in the member coun-

tries, is an opportunity to present this Organisation, its achievements and its objectives.

The IOC, which represents 94% of producer countries and 71% of consumer countries, has embarked on a new phase with the entry into force of the new International Agreement on Olive Oil and Table Olives, which was negotiated in 2015 at the United Nations Conference on Trade and Development (UNCTAD).

The objectives of this new Agreement respond to a move in the sector towards sustainable development, the consolidation of information sharing on the olive economy, improving knowledge on the benefits of olive products and embracing consumer countries. The documentation and information centre that will be set up next year will be an important contributing factor in this regard.

As of this year, the work of the Organisation is based on a four-year plan that aims to position the IOC as a world forum to discuss matters of concern for the sector, with a view to identifying present and future challenges and determining common policies for implementation.

This four-year plan will provide effective support to member countries in the areas of olive growing and olive oil technology through the transfer of technology, technical assistance and training, conducting studies on matters of common interest and implementing a network for the exchange of phytosanitary information.

The Executive Secretariat of the IOC, which currently works with more than 300 experts and 150 laboratories and tasting panels across member and non-member countries, will continue to support the work of the groups of experts and to strengthen the networks of recognised panels and laboratories in order to equip countries with the tools needed to improve and monitor quality. In so doing, the IOC aspires to develop trade and protect consumers from fraudulent and misleading practices.

Under its economic and promotion portfolio, the Organisation will work to consolidate and disseminate global statistics on the sector, strengthen activities for the promotion of the IOC trade standard and support the celebration of World Olive Day.



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