

## “Certification of Authenticity and Development of a Promotion Network olive products in the across border GREECE – ITALY area”

### “AUTHENTIC-OLIVE-NET”

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## D3.2 Authenticity Certification Standard & Good Farming Procedures

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## 1. Brief Presentation of the Project and its objectives

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### Description of the project

The project “Certification of Authenticity and Development of a Promotion Network olive products in the across border GREECE-ITALY area” is funded by the Interreg V-A Greece-Italy 2014-2020 Programme with a total budget of 875.000,00 EUR.

Chamber of Commerce of Preveza leads the project partnership, composed of the Region of Western Greece, the Hellenic Agricultural Organization “DEMETER”, the Assoproli Bari agricultural cooperative society and the Chamber of Commerce of Foggia. The overall objective of AUTHENTIC-OLIVE-NET is to establish an Innovation Network in the Olive sector in order to develop and offer to local olive oil companies innovative & global authenticity certification methods, tools, structures, and services. In detail, the project aims at development of common structures and procedures to certify the authenticity of olive products in programme area. Moreover, project contributes to promote and encourage the cooperation – networking among companies in the olive sector, Chambers, Research Institutes, and Regional Competent Authorities. Finally, within the Project innovative ICT tools to improve the competitiveness and extroversion of the olive sector companies will be developed.

The project lasts 24 months, from February 28, 2019 to February 28, 2021.

### Objectives

The overall objective of the “AUTHENTIC-OLIVE-NET” project is to establish an Innovation Network in the Olive Sector between Chambers, SMEs’ Associations, Research Institutes & Regional Authorities, in order to develop & offer to local olive oil companies innovative & global authenticity certification methods, tools, structures, and services. These support services will promote qualitative and commercial differentiation of local olive products by achieving competitive advantage and recognition of their commercial added value added, in order to improve their entrance in new markets and trade networks. This overall objective is further analyzed in the following sub objectives:

- Development of common structures and procedures to certify the authenticity of olive products, in programme area.
- Promotion and encouragement of cooperation - networking of companies in the olive sector, Chambers, Research Institutes, and Regional Competent Authorities (Departments of Rural Development),
- Implementation of innovative ICT tools to improve the competitiveness and extroversion of the olive sector companies.

## 2. What does Authenticity mean?

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### 2.1 The Certification Procedure in Italy

#### Introduction

Voluntary product certification arises from the need to position, enhance and differentiate food products on market. New market needs and trends have pushed companies in food sector towards the search for tools capable of guaranteeing to consumer quality, safety and reliability of their own products.

This requirement can be satisfied by combining compliance with current legislation on hygiene and health safety of agri-food products, an added value to the product offered by the Company to consumer and able to meet their needs. In fact, in recent years consumer has developed a remarkable sensitivity, attention and culture towards typical, traditional foods prepared and obtained in compliance with the prerogatives imposed by the legislation in terms of quality, safety and low environmental impact.

Certification system provides, in any case, the affixing of a seal: a quality sign, in the case of "voluntary certification". The seal testifies: 1) product meets requirements applicable; 2) Certification Body that authorized its affixing is skilled for the purpose.

The certification activity is carried out through technical procedures, commonly called certification schemes.

#### References for the quality of the agricultural sector

**MANDATORY SCOPE:** it is represented by all the Italian and European legislation that establishes the general principles that must be respected by the Companies in order to guarantee consumers a safe product from the point of view of hygiene, health and nutritional characteristics (legislation on labeling, Legislative Decree No. 61/2010, EC Reg. 607/2009, hygiene package, etc.). Olive oil sector is particularly regulated so that fraud against consumer can be limited. Each olive oil bottle label must be compliant to cogent rules.

**REGULATED SCOPE:** it is represented by European regulations that protect the production of certain geographical areas, or obtained in respect of traditional one's production techniques and/or using traditional raw materials (PDO, PGI, TSG). According to those rules, any other geographical indication (written or graphic) on the label is prohibited.

**VOLUNTARY SCOPE:** Voluntary certification is based on normative references elaborated by standardization bodies with the consent of all interested parties (ISO, BRC, IFS, etc) or by norms elaborated by the companies that autonomously determine the definition of product quality standards applicable for the foods produced by them (private technical regulations).

## **Voluntary scope description**

Voluntary product certification, from a technical point of view, is defined as a formal act with which a Certification Body declares, with reasonable reliability, that a product complies with a specific technical document of reference (technical standard).

Therefore, the voluntary product certification certifies the conformity of the product to certain requirements previously specified and defined in a standard or in a Technical Regulation and that they can concern both the final characteristics of the product and the production method and marketing.

The “*sine qua non*” condition for being able to access the product certification institute is established by the fact that the characteristics of the product communicable to the consumer and therefore certifiable must be verifiable and/or measurable.

## **The objectives**

The reasons that drive a company to request product certification depend on its willingness to inform the consumer about some particular and significant characteristics of the product itself that differentiate it from other products belonging to the same category of products. The voluntary certification of the product, therefore, on the one hand, allows the consumer to know what he is buying, and on the other hand, it constitutes a means for the organization to strengthen its image, improving the characteristics of the product and acquiring consumer confidence.

By summarizing, the company's choice of certifiable product requirements is based on the desire to inform consumers and their customers (catering, large-scale retail trade, etc.) of some particular and significant characteristics that differentiate the product from others of the same category.

In this regard, the possibility of communicating to the consumer is a crucial certification by affixing the conformity seal issued by the certification body on the label.

## **By summarizing**

4 elements are essential, to apply for a certification,

- the Organization (a single company or several companies variously associated) that prepares the Corporate Disciplinary or Technical Regulations;
- the product to be subjected to certification, with the related verifiable and/or characteristics measurable;
- the independence and competent Certification Body (CB);
- the normative document (technical standard)

## **Certifications types (the reporting agent)**

### First party certification

The manufacturing company (or Organization) certifies compliance with the rules. It is a self-certification.

### Second part certification

The declaration is the responsibility of a person external to the production but involved in the enhancement or selection of the product. This is the case of declarations made by a representative body towards members (e.g. protection consortia for collective brands) or by customers.

### Third party certification

The declaration is issued by an entity external to the company production system, with characteristics of independence, impartiality and competence. The rules for these subjects are ISO 17065: 2012 and 17021: 2006. These subjects are subject to verification and controls by an accreditation body.

### Fourth-party certification

The declaration is made by a subject completely unrelated to the corporate system. This is the case of checks carried out by public bodies and administrations.

## **Audit types**

### Internal audit

The internal audit or internal auditing process (IA) is a professional consultancy activity towards an organization for the verification of its procedures. It is carried out by internal staff who operate in a position of functional independence. It is one of the various types of audits that take place in large organizations and is mainly aimed at evaluating and improving the efficiency of the organization.

### Second-party audit

Second-party audits are checks performed by customers against their (potential or actual) suppliers. For this type of audit, large companies can avail themselves of consultancy companies specialized in this business, in addition to their own staff.

### Third-party audit

The third-party audits unlike the second-party audits, which in any case are carried out by subjects external to the audited company, are conducted by certification bodies which at the end of the activity, against a response positive issue a special certificate of conformity.

Types of verification commonly used are commonly the following:

- 1) compliance audit;
- 2) compliance and effectiveness audits;
- 3) assessment of the performance level of the organization (in the quantitative sense of the term).

### **The product specification**

The product specification is a key element in this system, and must include at least:

- The name proposed for registration;
- A description of the product (physical, chemical, microbiological or organoleptic characteristics);
- A description of the production method (including, if appropriate, the raw materials or ingredients);
- Key elements establishing the product's traditional character.

This specification not only represents a valid tool for consumer protection, dictating rules which all producers must strictly comply with, but also defines and regulates the realization methods of a product and the geographical location of the production. The product specification must be approved by the designated Authority and must be observed by every subject involved in the certification process.

### **The control Plan**

Another key element is the Control Plan, based on the product specification and the relevant national rules and regulations; it contains:

- all the key elements characterizing the certification (e.g. the delimitation of the geographical area, the description of production at all stages, packaging requirements, labelling requirements, correct symbol use, breeds and varieties involved, boundaries, methods of harvesting or dealing with raw materials, time limit to transform, materials used in transformation, time during some operations, etc.);
- the Product specification (specific characteristics, raw materials, ingredients, method of preparation)

and describes the official controls (external from an independent body, a "Control Body", often in cooperation with the producers themselves) before placing the product on the market.

The Control Plan is reviewed and approved by the national competent Authority and transmitted to the EU.

Specific elements of the Control Plan are: rules on identification of producers and other actors of the chain of production, documents concerning internal controls to be made available periodically or at the request of the control body, control procedures (on the producers and other actors of the production chain, on the product, frequency of controls, etc.), traceability, tests and analyses (if required), consequences in case of non-compliance, certified product

identification rules, modules for producers and other actors of the production chain (to join the control system, to use the labels, EU symbols, specific production methods, etc.).

There are two types of consequences of non-compliance.

If the non-compliance with the product specification is assessed through internal controls, there is the obligation to treat the product or modify the production method to comply with the product specification; in this case, relevant documents should be kept and made available. For major violations of the product specification, producers or other actors of the production chain at issue have to produce evidence the product is not commercialized as certified and the national competent authority is informed for sanctions.

If the non-compliance with the product specification is assessed by the control body, this one request to identify and implement a solution to respect the product specification. Also in this case, for major violations of the product specification, measures to exclude the product at issue from the certification system are taken and the national competent authority is informed for sanctions.

### **The Certification Body**

The Certification Body has two main tasks:

- To verify that producers strictly follow all the rules indicated within the production protocols by a team of technical supervisors;
- To evaluate the requirements needed to issue the recognition by a Certifying Committee.

The authorized Certification Bodies are private authorities that should be independent and have no other commercial or consultancy relationships with certified companies.

The Certification Bodies carry out inspections at least annually, checking compliance with specifications and regulations, and taking samples to be analyzed in an accredited laboratory.

Controls are made before placing the product on the market and on market level.

Verification of compliance with the product specification, before placing the product on the market, shall be ensured by: the competent authority or authorities with adequate guarantees of objectivity and impartiality, and/or one or more independent control bodies to which the competent authority has delegated certain control tasks, operating as a product certification body. Very often there is a different competent authority responsible for the controls in the market place than the one responsible for controls linked to verification of compliance with product specification.

Finally, controls on the market are important to protect not only consumers, but producers too, because of the economic damage that could occur in case of, for example, imitations, misuses, evocation, etc..

## 2.2 The Certification Procedure in Greece

### PDO-PGI-TSG PRODUCTS



In 1992 according to the regulation 2081/92, the European Union first adopted the system for the protection of geographical indications and the designations of origin of agricultural products and foodstuffs and according to the regulation 2082/92 the rules on the certificates of specific character for agricultural products and foodstuffs. In 2006 to improve the system, the above regulations have been replaced by regulations (EC) 510/06 and (EC) 509/06 respectively, without changing their scope and feasibility.

By Regulation (EE)1151/2012 of 21 November 2012 on quality schemes for agricultural products and foodstuffs the above mentioned regulations ((EC)509/2006 and (EC)510/2006) are merged into a single legal framework. While in this regulation have been added and other quality schemes such as optional quality terms “mountain product”, “product of island farming” etc.

In accordance with the aforementioned regulations and under the reorientation of the Common Agricultural Policy (CAP), the farmers are encouraged to switch to forms of integrated rural development through the diversification of rural production. Furthermore, it is possible the producers (especially in disadvantaged and remote areas) to promote easily their products with special characteristics, achieving better market prices and thereby improving their income and on the other hand consumers to buy quality products with guarantees for the production, processing and geographic origin.

## **Definitions**

### Designation of origin

'Designation of origin' is a name which identifies a product:

- (a) originating in a specific place, region or, in exceptional cases, a country;
- (b) whose quality or characteristics are essentially or exclusively due to a particular geographical environment with its inherent natural and human factors; and
- (c) the production steps of which all take place in the defined geographical area.

### Geographical indication

'Geographical indication' is a name which identifies a product:

- (a) originating in a specific place, region or country;
- (b) whose given quality, reputation or other characteristic is essentially attributable to its geographical origin; and
- (c) at least one of the production steps of which take place in the defined geographical area

### Traditional Speciality Guaranteed Product

A name shall be eligible for registration as a 'traditional speciality guaranteed' where it describes a specific product or foodstuff that:

- (a) results from a mode of production, processing or composition corresponding to traditional practice for that product or foodstuff; or
- (b) is produced from raw materials or ingredients that are those traditionally used.

## **Competent Authorities for official controls**

In Greece, since 1.6.2006, EL.G.O. DEMETER (former AGROCERT), has been authorized to grant certification to enterprises, to carry out controls in cooperation with the Directorates of the Rural Development of the Prefectures, to ensure compliance with the specifications, to certify the products in question as well as to keep a register of the enterprises approved for the usage of PDO and PGI indications.

## **Aims of EU quality schemes**

EU quality policy aims at protecting the names of specific products to promote their unique characteristics, linked to their geographical origin as well as traditional know-how.

Product names can be granted with a 'geographical indication' (GI) if they have a specific link to the place where they are made. The GI recognition enables consumers to trust and distinguish quality products while also helping producers to market their products better.

Recognised as intellectual property, geographical indications play an increasingly important role in trade negotiations between the EU and other countries.

Other EU quality schemes emphasise the traditional production process or products made in difficult natural areas such as mountains or islands.

### **How products are protected**

As part of the EU's system of IPRs, names of products registered as GIs are legally protected against imitation and misuse within the EU and in non-EU countries where a specific protection agreement has been signed.

For all quality schemes, each EU countries competent national authorities take the necessary measures to protect the registered names within their territory. They should also prevent and stop the unlawful production or marketing of products using such a name.

### **The Greek Mark**

The Greek Mark certifies the origin of products and services produced in Greece. It is an official Trademark of the Greek State and is awarded based on the Award Regulations, separately for each category of products and services.

The olive products to which the Greek Mark can be awarded are the following:

- "Extra Virgin Olive Oil" as referred to in Annex VII, Part VIII, Regulation 1308/2013.
- "Virgin Olive Oil" as referred to in Annex VII, Part VIII, Regulation 1308/2013.

Awarding Body of Greek Mark to Olive Products is by Greek law the Hellenic Agricultural Organization "DEMETER".

### **Standards of Greek mark**

1. The olive fruit used for production of Extra Virgin and Virgin Olive Oils are produced on agricultural holdings that must be located within Greece.
2. The olive pressing units, i.e. olive mills, (headquarters and facilities) have to be based in Greece.
3. The storage and marketing businesses (premises and facilities, e.g. reservoirs) of non-prepackaged Extra Virgin and Virgin Olive Oils have to be based in Greece
4. The standardization and packaging businesses (headquarters and facilities) of Extra Virgin and Virgin Olive Oils have to be based in Greece.
5. The production process of the Extra Virgin and Virgin Olive Oils under inspection must allow the Hellenic Agricultural Organization "DEMETER" to be able to run its conformity checks about the products traceability, which ensures:
  - a. the Greek origin of the olive fruit,

- b. the continuity of traceability during any intermediary production processes carried out by the producers and any partner businesses involved
- c. the unique identity of the final products.

## ***2.3 The Authenticity concept for Authentic-Olive-Net (AON)***

### **Introduction**

Authenticity concerns what is authentic, genuine, that is, which is not false or falsified and which can prove or impose itself as true.

The concept of "authenticity" has a subjective and an objective connotation. In order to objectify the concept of "authenticity" the EU has prepared PDO and PGI certifications.

European Union assigns great value on PDO and PGI food products protection. UE wants to protect consumers by guaranteeing the authenticity and reliability of the product. Furthermore UE wants to protect producers, providing them with a valid tool to certify that their products and production processes comply with high quality and procedural standards. A further purpose of the PDO and PGI certifications is to identify and promote the best products by obtaining a competitive advantage on the market and safeguarding them from unfair competition practices.

In the olive oil sector, Italy has further developed rules to protect the consumer such as the rules on labeling and the imposition of the national computerized production register (SIAN).

The set of European and Italian standards imposes limits on what the Authentic-Olive-Net (AON) project can communicate to the consumer through labels and brands/seals.

Before reaching a definition of authenticity within the Authentic-Olive-Net project, it is useful to consider the existing rules.

### **Existing rules**

#### **Sales denomination and origin**

Articles 2 and 17 of Reg. (EU) n. 1169/2011

Articles 4 and 4 ter of the Reg. (EU) n. 29/2012

Annex VII, part VIII of Reg. (EU) n. 1308/2013

Article 4 of the Italian Agriculture Ministerial Decree of 10 November 2009

Article 3 of EU Reg. no. 29/2012

The **sales denominations**, which can be used for the respective oil categories, are as follows:

- a) «EXTRA VIRGIN OLIVE OIL»
- b) "VIRGIN OLIVE OIL"
- c) "OLIVE OIL - COMPOUND OF REFINED OLIVE OILS AND ERGINE OLIVE OILS"
- d) "OLIVE-POMACE OIL"

In general, the origin of the oil is determined by two components, that is, by the state in which the olives were harvested and by the state in which the mill that located them is located.

Therefore, when the designation of origin indicates a Member State or the European Union it means that both phases (olive harvest and subsequent milling) took place in that declared Member State or in the European Union.

For example, to say that an oil is:

"Italian" means declaring that the olives were harvested in Italy and their milling took place in Italy of the "European Union" means declaring that the olives have been harvested in the European Union and their milling took place in the European Union.

If the olives have been harvested in a Member State or in a Third country other than the one where the oil mill is located in which the oil was extracted, this circumstance must be highlighted. To do this, it is necessary to resort to the specific indication of the origin.

Designation of origin is always mandatory for "extra virgin olive oil" and for "virgin olive oil" but is prohibited for "olive oil - composed of refined olive oils and virgin olive oils. » and for the « olive pomace oil ».

The designations of origin that can be reported can be:

a) in the case of olive oils originating in a Member State or a third country, a reference to the Member State, the Union or the third country (e.g. Italian, Greek product, etc.);

(b) in the case of blends of olive oils originating in more than one Member State or third country, one of the following indications:

- "mixture of olive oils originating in the European Union" or a reference to the Union;
- "mixture of olive oils not originating in the European Union" or a reference to the origin outside the Union;
- "mixture of olive oils originating in the European Union and not originating in the Union" or a reference to the internal and external origin of the Union,

c) a protected designation of origin (PDO) or a protected geographical indication (PGI) pursuant to Reg. (EU) no. 1151/2012, in compliance with the provisions of the relative production specification;

d) "(extra) virgin olive oil obtained (in the Union or in the denomination of the Member State concerned) from olives harvested (in the Union or in the denomination of the Member State or of the third country concerned)" when the olives have been harvested in a Member State or a third country other than the one where the oil mill is located in which the oil was extracted (Example "Extra virgin olive oil obtained in Italy from olives harvested in Tunisia").

The label cannot refer to references to smaller origins of the Member State such as:

- ❖ the regions (e.g. oil from the Puglia, oil from Western Greece, oil from Basilicata, from the Lucanian hills, from the Sparta hills, etc.)
- ❖ the provinces / municipalities / hamlets / locations (e.g. oil from the province of Bari, Regional Unit of Aitolokarnania, etc.)
- ❖ generic geographical areas (produced in Central Italy, Greek Islands, etc)

The "**sales denomination**" and the "**origin**" must be "grouped" in the "main visual field". Each of these mandatory indications must appear "in full" and in a "homogeneous body of text".

The information on the oil category to be used are as follows:

a) for extra virgin olive oil:

"Superior category olive oil obtained directly from olives and solely by mechanical means";

b) for virgin olive oil:

"Olive oil obtained directly from olives and solely by mechanical means";

c) for olive oil - composed of refined olive oils and virgin olive oils: "oil containing exclusively olive oils that have undergone a refining process and oils obtained directly from olives";

d) for olive pomace oil: "oil containing only oils derived from the processing of the product obtained after extraction of olive oil and oils obtained directly from olives";

or «oil containing only oils from the treatment of olive pomace and oils obtained directly from olives».

Information on the category of oil can be indicated anywhere on the label.

It does not need to be shown near the sales description.

### **Organoleptic characteristics**

art. 5, letter c), of Reg. (EU) n. 29/2012

Annex XII of Reg. (CEE) n. 2568/91

art. 8 of the Ministerial Decree of 10 November 2009

It is possible to report the organoleptic characteristics relating to taste and / or smell on the label of "extra virgin olive oil" or "virgin olive oil". In order to do this, company/producer must have had the "panel test" done according to the method set out in Annex XII of Reg. (EEC) no. 2568/91 that certifies that that batch of oil has that particular organoleptic characteristic.

### **LABELING ORGANOLEPTIC ATTRIBUTES THAT CAN BE USED:**

Fruity, Intense Fruity, Medium Fruity, Light Fruity, Green Fruity, Intense Green Fruity, Medium Green Fruity, Light Green Fruity, Ripe Fruity, Intense Ripe Fruity, Medium Ripe Fruity, Light Ripe Fruity, Intense Bitter, Medium Bitter, Light Bitter, Intense spicy, medium spicy, Spicy light, Balanced, Sweet oil.

Indications other than those indicated above are prohibited.

### **Varieties/Cultivar**

The variety (or varieties) of cultivated olive trees from which the olives that produced the oil were obtained can be indicated on the label.

a) Company/producer must be able to demonstrate that you have actually used the varieties you are indicating on the label;

b) always shows the exact name of the variety, that is, the one indicated in the "National olive oil register" to avoid possible evocations of DOP certified oil;

c) the company file ("fascicolo aziendale") must be updated with an indication of the varieties you wish to put on the label.

### **Indication of chemical characteristics**

it is possible to report other values besides the acidity (for example ethyl esters, the peroxide index, the wax content, the absorption in ultraviolet, total sterols, etc.), determined in accordance with regulation (EEC) n . 2568/91.

The EU standard that changed the indication of acidity on the label also had effects on the methods of indicating the other chemical parameters.

The company can indicate one or more analytical data on the label, bearing in mind that the value it declares is the maximum value expected on the date of the minimum retention period.

It is necessary to add a sentence that makes it clear to the consumer that the indicated values refer to those that are expected to be achieved when the minimum storage term is reached.

In order to report one or more analytical data on the label, it is necessary to have suitable documentation certifying the chemical analysis per batch of product that Company intends to qualify, in accordance with the methods of Reg. (EEC) no. 2568/91

### **"Not regulated" indications**

It is also possible to include information on the oil label that is not governed by current legislation. However, when supplied, these must not mislead the buyer:

1) as regards the characteristics of the food and, in particular, the nature, identity, properties, composition, quantity, shelf life, country of origin or place of provenance, the method of manufacture or production;

2) attributing to the food product effects or properties that it does not possess;

3) suggesting that the food has particular characteristics, when in reality all similar foods have the same cha

racteristics, in particular by explicitly highlighting the presence or absence of certain ingredients and / or nutrients;

4) Furthermore, the information must not be confused and ambiguous for the consumer.

### SOME MISTAKES EXAMPLES AND THEREFORE NOT USABLE:

- "Genuine" extra virgin olive oil (all oils must be genuine)
- "Authentic" extra virgin olive oil (all oils must be authentic in terms of declared origin and product category)
- Extra virgin olive oil "obtained from olives only" (all extra virgin olive oils are obtained exclusively from olives)
- It prevents tumors (it is an unhealthy indication for oils)
- The olives were harvested in the Sparta hills (contains a geographical reference in contrast with the current one regulations)
- Harvest year 2016/2017 and 2017/2018 (in contrast with current legislation given that the harvest of collection must be unique)

### **Conclusions**

The desire to describe a complex of chemical-organoleptic characteristics capable of unequivocally identifying the origin of an olive oil and therefore its authenticity, is a path already experimented for some time by numerous public and private institutions. Unfortunately at the state of the art, no study or publication is available to support the preparation of a technical product standard that can be subject to certification and auditing by a certification body.

Furthermore, the well-defined net of laws on "added value" and the identification of olive oils requires that members of the Authentic-Olive-Net project be extremely careful in the declarations to be affixed on the label.

So the concept of "authenticity" that the members of the Authentic-Olive-Net project will put in place will be based on the following elements:

- Membership of a collective cross-border trademark
- Geographical belonging to the areas involved in the Authentic-Olive-Net project (Puglia, Epirus and Western Greece)
- Being producers of extra virgin olive oil
- Selling olive oil with physico-chemical characteristics (at the time of bottling) conforming to a list of parameters to be defined through the planned sampling and analysis work
- Selling olive oil with organoleptic characteristics (at the time of bottling) conforming to a list of parameters to be defined through the planned sampling and analysis work
- Being a skilled producer

Each producer can therefore join the program by satisfying the five points outlined above.

Joining the program will allow the producer to use a promotional platform made up of telematic tools and the possibility of participating in trade fair and dissemination events.

The use of the online platform will allow internal documentary audits to be performed in order to avoid costly inspection visits to companies.

## Membership and control scheme

- ✓ Membership of a collective cross-border trademark
- signing by the manufacturer of a non-binding agreement to use the (Authentic-Olive-Net) AON brand
  - ✓ Geographical belonging to the areas involved in the AO Authentic-Olive-Net project (Puglia, Epirus and Western Greece)
- Provide objective evidence of the company location (assured by a public body such as the Chambers of Commerce, equivalent bodies or Organization of producers, cooperatives)
  - ✓ Being producers of extra virgin olive oil
- Provide objective evidence of the company production (assured by a public body such as the Chambers of Commerce, equivalent bodies or Organization of producers, cooperatives)
  - ✓ Selling olive oil with physico-chemical characteristics (at the time of bottling) conforming to a list of parameters to be defined through the planned sampling and analysis work
- Publish on the online platform all the physical-chemical analyzes relating to the bottled lots
  - ✓ Selling olive oil with organoleptic characteristics (at the time of bottling) conforming to a list of parameters to be defined through the planned sampling and analysis work
- Publish on the online platform all the organoleptic analysis relating to the bottled lots
  - ✓ Being a skilled producer
- demonstrate that they possess technical skills in relation to the organoleptic characteristics

Therefore, in conclusion, the authorization to use the AON seal can be given to all the companies that have signed the rules of use of the brand and that have registered on the online platform.

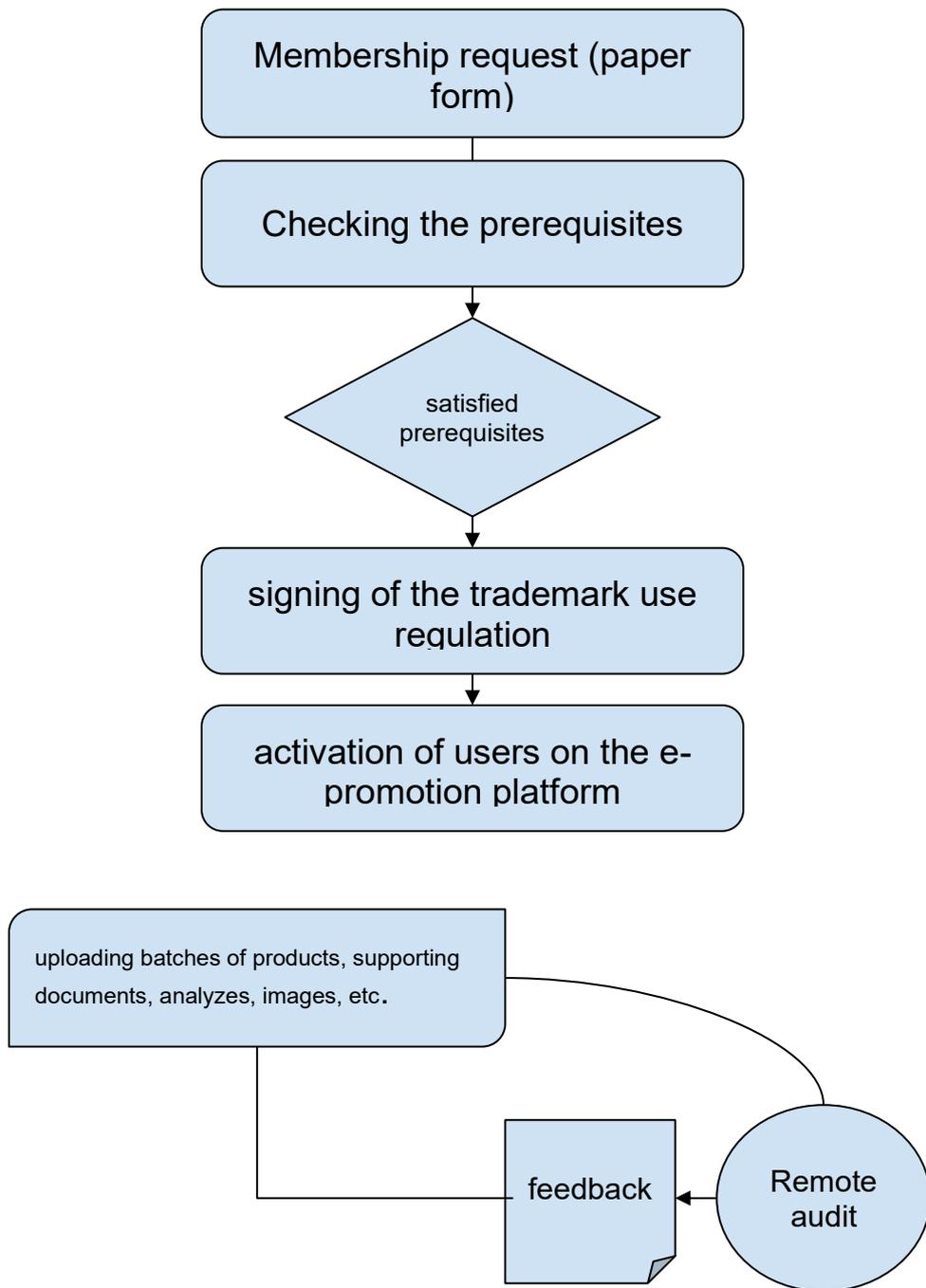
The certification of the requirements will be made by Assoproli for the Bari area, by the Foggia Chamber of Commerce for the Foggia area, by the Preveza Chamber of Commerce for its area of competence and by the Region of Western Greece for its area.

Each person in charge of the responsible bodies will be able to use the E-Promotion platform to check the documents and the organoleptic physical-chemical analyzes.

The regulation for the use of the AON seal will contain the exclusion principle in the event that the manufacturing company does not comply with the membership rules contained in the technical standard.

In view of the strict labeling laws for olive oil, the AON seal will have to refer only to a generic "*Cross-border Olive Oil Quality Improvement System*".

It will not be possible to declare anything more than what is already regulated by the regulations in force.



### 3. 1° Pillar - Origin

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The cultivated olive belongs to the species *Olea europaea*. It is a fruit-bearing, evergreen and subtropical tree. The main feature of the olive tree is its longevity. It is one of the few fruit trees that is considered age-old. Olive trees of this age that show the longevity of the olive are many not only in Greece but also in other countries and many of these olive trees have been designated as protected natural monuments. The longevity of the olive tree is due to the latent buds that exist in the new and old wood. These buds either grow on their own or we force them to grow to renew the tree. The olive tree has the ability to germinate again even if its aboveground surface is damaged or injured. It thrives in arid regions and has the ability to bear fruit even in stony and barren soils.

The cultivation of olives all over the world covers an area of 100 million acres, and the number of olive trees amounts to 800 million. Of this cultivated area, about 98% is located in the Mediterranean basin. (Spain, Portugal, Italy, Greece, Malta etc..)

The main products produced from the cultivation of olives are olive oil and table olives. Of these two products, olive oil is of greater economic importance.

In our country, when we talk about oil, we mean olive oil, the "liquid gold" according to Homer.

According to the current quality classification "virgin olive oil" is: the oil obtained only by mechanical methods or other natural treatments, with conditions that do not cause deterioration of the oil and which have not undergone any treatment other than washing, transfusion, centrifugation and filtration. Excludes oils obtained with solvents, with receiving excipients having a chemical or biochemical action, or by methods of re-esterification or admixture with oils of other nature. Therefore, "virgin olive oil" is the 'natural juice' oil, which contains intact all the essential ingredients contained in the olive fruit (vitamins, trace elements, trace elements, etc.) and consequently the one that has all the health benefits properties.

"Virgin olive oils" are classified and classified in detail under the following names, depending on their content of free fatty acids (acidity) and with some special characteristics provided for each category:

- Extra Virgin Olive Oil (acidity  $\leq 0.8\%$ )
- Virgin Olive Oil (acidity  $\leq 2.0\%$ )
- Labante olive oil (acidity  $> 2.0\%$ ) (unsuitable for consumption as it is - intended for refining or industrial use).

| <b>Table:Quality criteria limits in Reg. (EEC) 2568/91</b> |                                   |                             |                                    |                              |                                |                             |                               |                   |
|--|-----------------------------------|-----------------------------|------------------------------------|------------------------------|--------------------------------|-----------------------------|-------------------------------|-------------------|
| <b>Category<br/>Parameter</b>                              | <b>Extra virgin<br/>olive oil</b> | <b>Virgin<br/>olive oil</b> | <b>Disadvantaged<br/>olive oil</b> | <b>Refined olive<br/>oil</b> | <b>Composite<br/>olive oil</b> | <b>Crude kernel<br/>oil</b> | <b>Refined<br/>kernel oil</b> | <b>Kernel oil</b> |
| <b>Acidity%</b>  | <b>≤0,8</b>                       | <b>≤2,0</b>                 | <b>&gt;2</b>                       | <b>≤0,3</b>                  | <b>≤1,0</b>                    | <b>-</b>                    | <b>≤0,3</b>                   | <b>≤1,0</b>       |
| <b>Number of<br/>peroxides<br/>mEq O2/kg</b>               | <b>≤20</b>                        | <b>≤20</b>                  | <b>-</b>                           | <b>≤5</b>                    | <b>≤15</b>                     | <b>-</b>                    | <b>≤5</b>                     | <b>≤15</b>        |
| <b>K270/268</b>  | <b>≤0,22</b>                      | <b>≤0,25</b>                | <b>-</b>                           | <b>≤1,25</b>                 | <b>≤1,15</b>                   | <b>-</b>                    | <b>≤2,0</b>                   | <b>≤1,70</b>      |
| <b>K232</b>  | <b>≤2,50</b>                      | <b>≤2,60</b>                | <b>-</b>                           | <b>-</b>                     | <b>-</b>                       | <b>-</b>                    | <b>-</b>                      | <b>-</b>          |
| <b>ΔK</b>  | <b>≤0,01</b>                      | <b>≤0,01</b>                | <b>-</b>                           | <b>≤0,16</b>                 | <b>≤0,15</b>                   | <b>-</b>                    | <b>≤0,20</b>                  | <b>≤0,18</b>      |
| <b>Organoleptic<br/>Examination</b>                        |                                   |                             |                                    |                              |                                |                             |                               |                   |
| <b>Average price<br/>Defects (Md)</b>                      | <b>=0</b>                         | <b>≤3,5</b>                 | <b>&gt;3,5</b>                     |                              |                                |                             |                               |                   |
| <b>Average price<br/>fruity (Mf)</b>                       | <b>&gt;0</b>                      | <b>&gt;0</b>                | <b>-</b>                           |                              |                                |                             |                               |                   |
| <b>Ethyl mg / kg</b>                                       | <b>≤35</b>                        | <b>-</b>                    | <b>-</b>                           | <b>-</b>                     | <b>-</b>                       | <b>-</b>                    | <b>-</b>                      | <b>-</b>          |

## Organoleptic characteristics

**Fruity:** It is the most important property. If fruity smell is not detected, olive oil can not be classified as extra virgin or virgin. It is a set of senses which depend on the variety of oils and are characteristic of olive oil derived from healthy and fresh olives, unripe or ripe. The fruity is perceived either directly from the nose or from the back of it.

**Bitter:** It is a characteristic taste of olive oil that comes from green olives or from olives whose color begins to change. Bitterness can be more or less pleasant, depending on its intensity. In no case, however, can be considered as a defect.

**Spicy:** It is the characteristic feeling of discomfort in the throat, which comes from olive oils produced at the beginning of the olive growing season, mainly from unripe olives. This sensation is caused by the action of phenolic substances and is eliminated a few seconds after the test. The intensity of the spice decreases during the ripening of the olive oil.

Common defects are,

- **atrochado:** comes from anaerobic fermentation, which takes place in the poor storage of the olive fruit until the olive oil extraction.
- **moldy:** odor from fungal activity on the olives.
- **murga:** due to the long stay of the olive oil with the sediment.
- **tango:** characteristic odor of oxidized olive oil.
- **wine-vinegar:** due to fermentation in the olive fruit with production of acetic acid, ethanol and ethyl acetate and
- **metallic:** due to contact of olive oil with unsuitable metal surfaces (eg barrels).

## VARIETIES

### **A.OLIVE KORONEIKI (Olea europea)**

Koroneiki also has the synonyms: Vatsiki, Kritikia, Koronia, Koroni, Ladolia, Lianolia and Psilolia. It is cultivated mainly in the prefectures of Messinia, Achaia, Etolokarnania, Kefallinia, Zakynthos, Samos, Cyclades, Chania, Rethymno, Heraklion and Lassithi.

It has the advantage of adapting to adverse conditions, extremely dry and to withstand strong winds. It can be cultivated from the coastal areas, up to an altitude of 500 meters. It grows on a tree 5-7 meters high. Its leaves are deep green, 5.47cm long and 1.03cm wide. The fruit has a cylindrical shape with an average weight of 1.3g. The ratio of flesh to kernel of the fruit is 6.6: 1. The oil content of the fruit ranges from 15% to 27%. It is used exclusively for the production of vintage oil that corresponds to 60% of Greek production.

Despite the fact that the Koroneiki tree needs minimal care and can withstand low temperatures, it is what gives the best oil quality compared to other varieties in Greece. The trees can give stable fruiting and high yields that range between 30 and 100 kg of fruit per tree depending on the conditions. It is resistant to cyclone, moderately resistant to verticillium wilt and susceptible to cancer (pseudomonas). Finally, it is susceptible to dandruff and snout. The fruit ripens from early October to December.

### **PDO-PGI PELOPONNESE**

#### **✓ PDO and PGI Olive oils of Achaia**

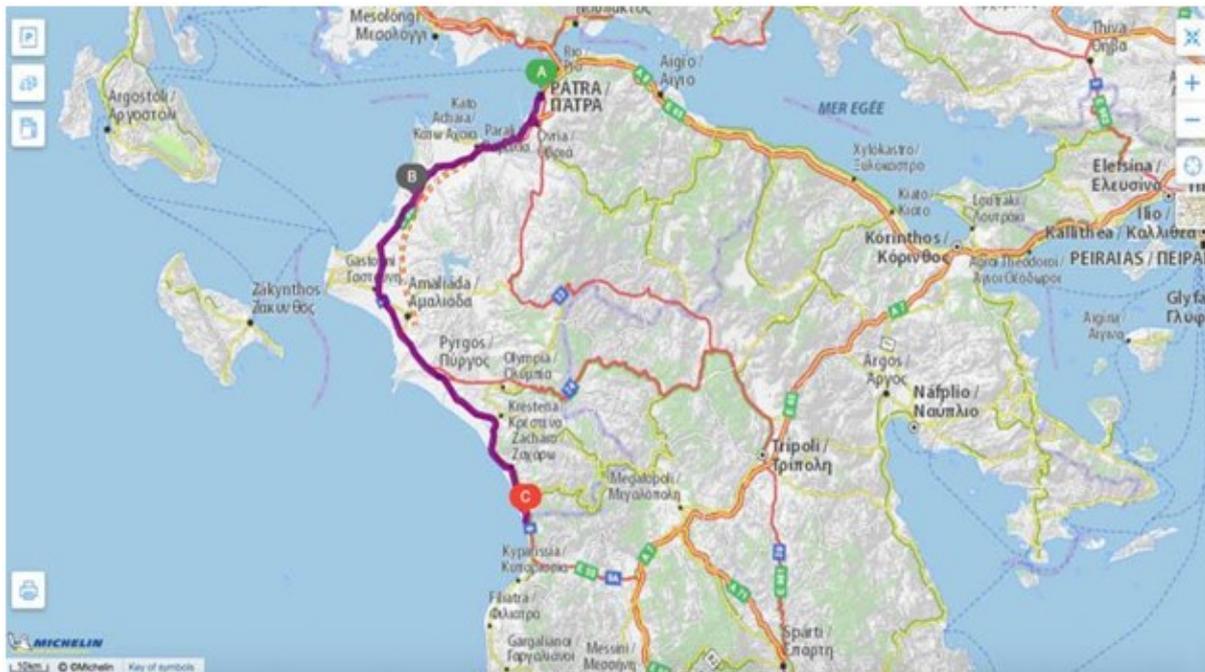
In Achaia there are olive trees with trunks whose diameter exceeds one to one and a half meters, the so-called old trees. Their presence in the area testifies to the long-term involvement of the inhabitants with olive production. Olive oil is one of the most important agricultural products, of particular nutritional and economic importance for the wider region of Achaia. Areas that are distinguished for the systematic cultivation of olives, are located mainly in the semi-mountainous zone of Western Achaia, in the province of Patras and Egialia. The total number of olive trees exceeds four million and the number of olive growers 24 thousand while the oil production exceeds nine million kilos. The main varieties of olives grown for oil production are Koroneiki, Koutsourelia, Mothonia and Lianolia. The yield of these varieties in oil ranges from 15% to 22%. The dual-use Megaritiki variety is cultivated on a smaller area, especially in the mountainous Aegialia.

#### **✓ PGI Olive Oil Olympia (Ilia)**

A legend tells that the first wild olive tree was planted in Olympia. Today Olympia produces the extra virgin olive oil rich in flavor and aroma produced from a unique blend of Kolireiki and Koroneiki olives. The fruit is always harvested by hand from strictly selected olive groves in the area of Ancient Olympia. It is immediately transferred to the olive mill for immediate processing, thus maintaining all its quality characteristics. PGI Olive Oil Olympia is the only olive oil that bears the PGI label in the prefecture of Ilia.

## ✓ PDO Olive Oil of Messinia

The olive oils of Messinia are produced from excellent olive varieties of olives, mainly Koroneiki. In the olive groves of the area, the fight against pests and diseases is done in a biological and fruit-friendly way. After the collection and during the obligatory three days, the classic or centrifugal olive mills of the area undertake the processing of the olive fruit in all phases of the process. The oil is then subjected to physicochemical analysis and organoleptic testing according to the instructions of the Ministry of Agriculture. The result justifies the prefecture of Messinia, which can be proud of the extra virgin fruity olive oils of green-green color that give off a aroma of fresh fruit and bear the name PDO next to that of their region.



### ✓ **PDO and PGI Olive oils of Laconia**

Laconia lists three PDOs and another PGI olive oil labels, almost every corner of the prefecture produces its own extra virgin olive oil. In the olive groves of the area, the fight against pests and diseases is done in a biological and fruit-friendly way. After the collection and during the obligatory three days, the classic or centrifugal olive mills of the area undertake the processing of the olive fruit in all phases of the process. The oil is then subjected to physicochemical analysis and organoleptic testing according to the instructions of the Ministry of Agriculture. Laconic olive oil comes mainly from the varieties Koroneiki, Myrtolia, Asprolia but also Kalamon, Athinolia, Koutsourolia, Manaki and Myrtolia. Its colors vary from warm and intense gold to the relaxing yellow-green and each test brings out the freshness of the fruit plain with a slightly bitter taste that seals its quality.

### ✓ **PDO Agrolida Olive Oils**

PDO olive oil of Ligourio is the result of the special way of cultivation. Proper watering whenever needed, plowing, weeding, sprinkling with non-chemical preparations - every movement, time, season contribute to the creation of the extra virgin PDO olive oil of Ligourio. The experience and the secrets of the years create the perfect combination of purity, taste and quality.

### ✓ **PDO Olive Oil Kranidi Argolida**

Extra Virgin Olive Oil of Protected Designation of Origin. This excellent oil is produced in the centrifugal oil mills of the demarcated area. From the varieties Manaki and Koroneiki emerges the clear golden yellow color and the characteristic bittersweet taste.

## **Geomorphological elements**

The Region of Western Greece (P.D.E.) occupies the NW part of the Peloponnese and the Western tip of Central Greece. It includes the Prefectures of Etoloakarnania, Achaia and Ilia. Its total area amounts to 11,350 km<sup>2</sup> and covers 8.6% of the total area of the country. Most of its soils are mountainous (45.3%) and semi-mountainous (25.6%), while only 29.1% are lowland. Primarily, the mountainous Prefecture of the Region is the Prefecture of Etoloakarnania. The P.D.E. has extensive beaches in all three prefectures, which are bathed by the Ionian Sea and the bays of Amvrakikos, Patraikos and Korinthiakos.

The geomorphology of the Region presents an exceptional variety, as it includes mountains with special altitude (Aroania 2,335 m, Erymanthos 2,222 m, Panacheiko 1,926 m), large natural lakes (Trichonida 95.8 km<sup>2</sup> - the largest in the country, Amvrakia 14.4 km<sup>2</sup> , Lysimacheia 13 km<sup>2</sup> etc.) and rivers (Acheloos 220 km, which is the second longest river in Greece, Pinios, Alfeios, Evinos, Selinountas, Vouraikos, Peiros and Glafkos).

The Prefecture of Achaia with a total area of 3,274 km<sup>2</sup>, is characterized by strong soil contrasts. Its lands are mostly (about 60%) mountainous and are crossed by relatively small rivers (Vouraiiko, Selinounta and Peiros) and smaller torrents, which flow into the Gulf of Patras and Corinth. The center of the economic life of the Prefecture and the Region is the city of Patras.

The Prefecture of Ilia with a total area of 2,621 km<sup>2</sup>, has flat land by 60% and is crossed by the rivers Alfeio, Pinios, Erymanthos and their tributaries. The Prefecture is characterized by the existence of coastal wetlands (Kotychi, Caiaphas) of exceptional natural beauty and ecological wealth. The plain of Ilia is the largest in area in the Peloponnese. The mountainous areas of P.D.E. disadvantaged compared to the lowlands, due to climate, geomorphology and location. The development prospects of agriculture are limited and their economy is based mainly on livestock.

## **Climate**

The climate in the region of Achaia is temperate, and can be characterized as Mediterranean in the coastal and continental in the interior and mountainous part of the Prefecture. The average annual temperature is around 17 to 18oC in the coastal area and lower in the mountainous areas. In winter the average temperature is higher than other areas of the Peloponnese, because it is affected more by the westerly winds than by the colder northerly winds, because it is protected by the mountain ranges of Central Greece. In the mountainous part of the Prefecture the winter season lasts longer with frosts and a lot of snow. In the Northern coastal zone the annual rainfall is between 700 and 821.3 mm, while in the inner part it increases, proceeding to the mountain ranges.

The climate of Ilia is marine Mediterranean, with mild winters and cool summers mainly due to the influence of the sea. The temperature rarely drops below zero in winter and only in the interior lowland area exceeds 40oC in summer. The relative humidity of the air ranges from 67.5 - 70%, with the wettest month being December and the driest being July and August. Ilia belongs to the areas with the least cloudiness: the average annual cloudiness is between 3.5 and 4.0, the clear days are more than 150 and the clouds are less than 50. During the summer months the westerly winds prevail as sea breezes and the northwestern ones as «meltemia», which, however, show less intensity and frequency compared to those in the Aegean region. The rains are abundant from October to March, and the rainfall levels are more than double those recorded in the eastern regions of the Peloponnese. Snow, especially in coastal areas, is low. On the contrary, hail is very common, which often causes significant damage to agriculture.

## **Environment (Natural and man-made)**

The Region of Western Greece is privileged in terms of the natural environment. It hosts many important and diverse sensitive ecosystems. Furthermore, the Region includes protected (2) aesthetic forests and (7) natural monuments, as well as important landscapes of special natural beauty (The Natura 2000 network includes 31 areas).

All this natural wealth is seriously threatened by deforestation, illegal grazing and logging, fires, implementation of infrastructure projects with insufficient control of compliance with the 4 environmental conditions, lack of measures to repair the damage to the environment that occur during the construction of infrastructure and the over-intensive exploitation of natural resources.

In terms of water resources, agricultural crops are the main consumer of water. In the PDE. A number of existing, under construction and future irrigation projects (dams, enrichment projects, water refineries for water use) are recorded, in order to better manage water resources at the level of hydrological basins and water compartments.

### **Soil-climatic requirements of promoted and alternative crops**

The olive grows in areas that have mild winters (minimum temperature -3oC) and hot and dry summers (maximum up to 40oC). Temperatures below -10oC can damage branches or the entire tree. High temperatures in spring cause flower falling and later fruit falling or even new flowering.

The soil where the olive grows and performs well is the deep sandy loam. It can of course survive in barren rocky soils but it bears fruit every 2-4 years and the yields are very small.

According to the Ministry of Agriculture, the cultivation of olives is promoted as a species. The cultivation of olives is promoted only with regular planting and with Greek varieties which are adapted to the soil-climatic conditions of each region. The aim must be: the preservation of the cultivated areas, the support and the modernization of the existing processing enterprises with possibilities of tracking the products, development of self-control systems and certification (PDO, PGI). Advertising of olive products Preservation and expansion of the variety.

## **B. CORFU LIANOLIA**

Lianolia of Corfu is cultivated mainly in the prefecture of Corfu and to a lesser extent in the prefectures of Zakynthos, Kefalonia, Lefkada, Preveza and Thesprotia.

Lianolia Corfu also has the synonyms: Korfolia, Ladolia, Nerolia, Prevezana, Souvliolia and Striftolia.

It grows on a tree 12-14 meters high. The leaves are light green golden, length 6.67cm wide 1.49cm. The fruit has a cylindrical shape, with one side slightly curved, average weight 2.3gr and has a small nipple. The core has a cylindrical shape, average weight 0.27gr and has unpainted glyphs. The ratio of flesh to kernel of the fruit is 7.5: 1.

The oil content of the fruit is around 19%. It is mainly used for the production of good quality oil. It is considered a variety demanding to moisture, so it thrives in areas of heavy rainfall and high atmospheric humidity.

The variety "Lianolia" gives high quality extra virgin olive oil (acidity up to 0.8) provided that some basic rules are observed in cultivation practices and the harvesting, transport and processing of olives.

Harvesting should be done at the stage just before normal ripening, and transport and processing in the mill as soon as possible (1-2 days).

It is recommended to use bags made of natural materials and not plastic (or even better crates) during transport to adequately ventilate the olive.

During the kneading of the olive dough in the olive mill, it is recommended that the temperature does not exceed 27°C and the kneading duration should not exceed 80 minutes in order to achieve excellent results.

The olive oil of "Lianolia" has a strong fruity taste and characteristic aroma and in addition has a characteristic bitter and spicy taste, to a greater extent than other varieties (eg Koroneiki) that give more "sweet" oils. The bitter and spicy taste in no case should be considered a negative feature, on the contrary it is included in the positive organoleptic properties of olive oil, since it is due to increased concentration of polyphenols, substances that are powerful antioxidants. The intensity of the bitter-spicy is related to the degree of ripeness of the fruit (it decreases as the olive matures) and can be controlled during processing depending on the amount of water added to the separator. A higher water / oil ratio in the final separation phase removes more phenolic components and produces a "sweeter" oil.

"Lianolia" produces olive oil with a higher content of polyunsaturated fatty acids (mainly linoleic) compared to "Koroneiki" and other varieties and this means greater sensitivity to oxidation.

Regarding the good storage practices, in order for the olive oil to maintain its quality characteristics, the following are recommended: The first storage should be done in metal cylindrical containers with inverted conical bottom and with a suitable tap placed above the base of the cone, to be transfused after from 10-30 days, to remove the sediment.

The best containers for storing oil are the stainless steel metal ones and the dark glass ones, so that light does not pass through. Avoid plastics, clay cups and tins that may have rusted inside. The storage area must be clean and cool. The optimum storage temperature is between 10 and 17°C.

## **Morphological and climatological environment of Corfu**

### **Natural environment**

The Prefecture of Corfu has a semi-mountainous morphology and consists of low mountains and hills. A prominent figure is the mountainous area of Pantokratoras (+ 911m) which occupies a significant area in the NE part of the island. The semi-mountainous areas occupy a significant area in the Prefecture. Significant plains are created within this relief as well as many smaller valleys and streams.

Regarding the geology of the Prefecture, it consists mainly of limestones that form the mountain range of Pantokrator and of gypsum that occupy large areas in Central Corfu. The hydrographic network of the Prefecture is quite rich with rivers and lakes but also with several quantities of groundwater.

### **Soil elements**

Regarding the soil, it is reported that this is 63.4% lowland (406,500 acres), 34.1% semi-mountainous (218,000 acres) and 2.5% mountainous (16,000 acres). Geographically, the northern part of the island is covered by mountainous areas that form small valleys and a few lowland areas. In the central part, hilly and lowland areas with small mountainous areas prevail. While the southern part is characterized by the presence of small hills and plains.

In Corfu there are 5 characteristic types of soils.

The soils of the high zone. It is shallow, rich in skeletal molecules, red to reddish brown in color. Uncultivated soils have rich native shrubs. If plowed, these soils are rich in humus, due to the decomposition of wild vegetation products and have a darker color than the cultivated ones. They are attributed to the crop after the removal of the stones and their formation into terraces. They are rather poor and dry, moderately cohesive, they wear out agricultural tools. These are indigenous soils which came from the disintegration of the parent limestone.

The soils of the hilly zone. It is the most of the hilly soils of Gyros, Mesi and some areas of Lefkimmi. Moderately deep, orphan-yellow to light orphan, poor in skeletal molecules (rarely gravelly), rather cohesive, of moderate fertility. Hard-working, do not wear out agricultural tools. They are mostly occupied by olive groves and to a lesser extent by vineyards, while in the past they were cultivated with cereals or remained dry while citrus and other fruits are grown. Most of them are indigenous soils, formed on the site by disintegration of shale, sandstone and sometimes gypsum. However, heterogeneous soils of gravity are inserted.

The soils of the valleys. It is clayey, sandy loam and fertile outside the valley of Korissia which are sandy and poor. They are mostly deep, cohesive and red soils if they come from the disintegration of limestone rocks or orphan dark to orphan open, when they come from the disintegration of shale marl and sandstones. The last category includes the meadow of Ropa, whose soil is more cohesive, not well drained. Some of its sites are used as natural grasslands. These are generally heterogeneous aquatic soils whose parent layer is found at a depth of more than 3 meters and consists of pure clay completely waterlogged.

The soils of the northern coastal zone. They are flat, deep, cohesive, orphan-like, with several skeletal molecules in layers, fertile enough, but not sufficiently drained so that in winter they are very wet, and in summer with drought they form cracks. Heterogeneous soils from torrent deposits.

The lowlands of Lefkimmi. Moderate to deep, poor skeletal molecules, moderately cohesive, moderately fertile, reddish in color. They are occupied mainly by olive groves and vineyards. It retains the moisture of winter, so that there is a need to open drainage ditches to enable their cultivation. In summer they show cracks. These are aquatic soils from the disintegration of the surrounding limestone hills. An important part of the eastern beach of Lefkimmi, 100-200 meters wide, consists of saline soils due to periodic flooding by sea waters and is therefore unsuitable, as it is, for agricultural use.

### **Climatic conditions**

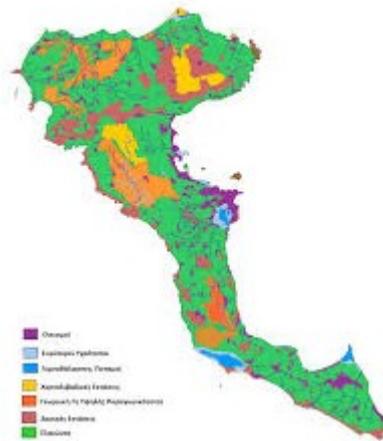
Corfu is climatically included among the predominantly temperate zones of the Mediterranean. The average temperature of the year is between 17-24 °C. The warmest month is August and the coldest is January. The minimum temperature rarely drops below zero, rarely above 37 °C.

Atmospheric humidity is much higher than other regions of the Mediterranean and the country. The average relative humidity of the year exceeds 70% to reach during the winter months sometimes more than 78%. This explains the existence of rich vegetation until the first months of summer.

The amount of annual precipitation usually exceeds the measure and is higher than the average rainfall of the Mediterranean countries. The distribution of rainfall during the different seasons is uneven, so that the year is divided into wet and dry periods. December is the wettest month and July is the driest.

The rains usually start in early autumn, are rapid and interfere with agricultural work during the winter and first months of spring, in contrast to the drought that occurs gradually from the end of spring, when crops are in the initial momentum of vegetation, and suffer from relative lack of moisture.

The high relative atmospheric humidity inhibits the rate of evaporation and perspiration of the leaf surface, thus contributing to the prolongation of vegetation. The only disadvantage is that favorable conditions are created for the growth of a variety of nutrients from the combination of high humidity and mild ambient temperature throughout the year. The data show that the climate of the island is characterized by mild winter, with high rainfall, high air temperature, high sunshine and high levels of atmospheric humidity.



In Greece, in a country where olive oil is intertwined with the culture of its people both at the level of producers and consumers, the knowledge and recognition of its characteristics is of major importance. The application of Integrated Management Systems to producers, Quality and Traceability Systems in mills and standardization plants and the tendency of consumers to "look" before buying, ensures the combination of delivery, development, quality production and sustainability, parameters that give an added value to the Greek and its history.

### **C. THE FAVOLOSA FS-19**

The Favolosa FS-19 plant is a selection from clones that originates from one of the most popular and appreciated varieties in Italy, the Frantoio variety. Due to its particular characteristics, Favolosa plant is particularly suitable for super-high density olive farming: fast growth, early entry into production and, above all, high resistance to Xylella bacterium have made the success of this variety, which is increasingly widespread in Italy.

The Favolosa FS-19 is a type of plant that stands out for its excellent adaptability to the most different soil and climate conditions and for the early entry into production, from the second year of planting, with a rapid increase in production that reaches an optimal regime from the fourth to the sixth year of planting.

Regarding its characteristics, we can illustrate:

- The leaf, medium in size, elliptical in shape and with a flat surface.
- The fruit, spherical in shape, symmetrical and with a round apex, wine-red in colour when fully ripe.
- The core, ovoidal in shape, slightly asymmetrical and with a rough surface.
- The Favolosa FS-19 plant has a very high yield, considering its resistance to the most common diseases, cold and water stress, and thanks to the excellent pulp/stone ratio. The oil obtained from this variety has an excellent quality, with a medium-high content of polyphenols and a pleasantly fruity taste.

## **D. THE CORATINA**

The cultivation of Olive Coratina, has characteristics favorable to the production of olive oil. The variety has its origin in the Italian province of Apulia (Puglia), where it is one of the main varieties. Its oil is of very high quality and easily adapts to various environments. Despite its good characteristics, the variety has barely spread to other parts of the world.

Names or synonyms: The Coratina olive tree is also known for: Racema, Racioppa, Olive to Racemi, Racemo di Corato, Coratese, Olive tree to Grappoli, Olive tree to Confetti, Olive tree to Racimolo, Cima di Corato, La Valente, Olive tree to Raciupope, Racemo and Racioppa di Corato.

The Coratina olive tree, due to its good characteristics, adapts well to different areas, maintaining high olive oil productions.

- Regularity of bearing: Coratina is a variety with good regularity productive (little time).
- Flowering: Presents very under ovarian abortion (15%). Although self-fertile, the Olivo Cellina di Nardo is often used as a pollinator .
- Vigor and bearing of the tree: The Coratese olive tree has medium vigor, is open bearing and the glass is globose and of high density.
- Leaf: The Coratina olive class has the leaves of elliptic-lanceolate, long and medium-width.
- Maturation: Coratin is a late-ripening olive and stepped olive tree.
- Size: Coratina olive is large size (5 grams).
- Shape: elliptical and slightly asymmetric, with olives of absent nipple.
- Skin color: The Coratina olive variety is harvested when it reaches the wine red color.
- Yield: Coratina olive olives are extremely high yield (they can reach 25%).
- Collection: Coratin has medium resistance to detachment.
- Uses: The Coratina olive variety has very good aptitude for oil production and is also valid for dressing.
- Advantage Coratina Extra Virgin olive oil, is of good organoleptic characteristics.

The Olive oil extracted from Coratina olive has excellent quality and conservation capacity . It its very high fruity and powerful flavor. Coratina olive oil also stands out as one of the Italian oils with the highest concentration of polyphenols,

## **E. THE PERANZANA OLIVE**

Peranzana olive tree is an Italian variety of little diffusion. Its area of traditional influence is Apulia (Northeast of Foggia). Its characteristics are good for dressing and insufficient for oil production, although this is of good quality.

In Apulia, varieties such as Cipressino, Coratina or Carolea, are productively more interesting.

Names or synonyms: the Peranzana olive tree is also called: Provenzale, Francese, Provenzana and Tondina.

- Productivity: the Peranzana variety is of medium precocity and of medium-high production.
- Regularity of bearing: their productions are alternate, veceras or not very regular.
- Flowering: the variety of Peranzana olives, is partially self-compatible. On the other hand, the pollen has a very low fertility, being habitual to resort to 10% of plants of the Rotondella cultivar in the plantations.
- Vigor and bearing of the tree: Peranzana is of medium-low vigor, open bearing and medium thick crown.
- Maturation: Peranzana is a olive variety of late maturation.
- Size: Peranzana olive produces olives of medium size (3 grams).
- Shape: the Peranzana olive, is symmetric, of spherical shape. This type of shape is much appreciated for table olives.
- Skin color: Peranzana olive, matures color violet. It has abundant lenticels and small size.

The Extra Virgin Olive Oil Peranzana, is an interesting oil with a certain presence in the Italian market. It has a flavor with medium-low fruity, bitter and spicy values. Among the aromas to which it reminds us, the olive leaf, green grass and artichoke stand out, more subtly we can also find the tomato.

Properties: Peranzana olive oil is composed of a high percentage of linoleic acid (10%), medium of oleic acid (72%) and has a high availability of polyphenols (410).

## **Link with the geographical area**

The request for recognition is based on both the quality characteristics and the reputation of 'Olio di Puglia'.

Apulia is the easternmost region of Italy and its southern part is set in the Ionian and Adriatic Seas; it has a markedly Mediterranean, semi-arid climate.

Rainfall amounts on average to 600 mm annually, precipitation is irregular and approximately two-thirds is concentrated over the winter period, with occasional light snowfall caused by bursts of cold air from the north or north-east.

Southern winds are the most frequent in Apulia; the "Scirocco" or "Libeccio" winds blow in summer with the arrival of very hot air from Africa that causes rapid and marked temperature spikes. Temperatures generally remain very mild for most of the year, particularly on the coastal plains. The karstic nature of much of Apulia and the scant rainfall makes the region particularly lacking in surface watercourses. Apulia does not have mountain barriers. Half the territory of Apulia is on the plain, at heights of no more than 100 meters above sea level. The hilly strip of the territory reaches altitudes of just over 680 meters. The particular features of olive growing in Apulia can be attributed to these very specific geographical, orographic, soil and climatic conditions that have proved to be exceptionally propitious for growing olives. The specific climatic variations described above, observed in the geographical area where olives are typically grown, is the factor of primary environmental importance during the olives' oil accumulation and ripening phases, and indeed critical for bringing about certain quality parameters, such as the oil's phenol and volatile compound content. The heat and water stress that occurs during the olives' oil accumulation phase (from August to September) triggers the synthesis of polyphenols that build up within the olives. Polyphenols form as a result of intense stress, such as lack of water and/or excessive heat and are used by the trees to counteract the production of free radicals. Autumn rainfall (October-November), meanwhile, promotes the synthesis of volatile compounds. This particular weather cycle in Apulia, i.e. hot and dry during the oil accumulation phase and cooler and damper during the ripening phase, is of key importance for determining the olives' concentration of polyphenols and subsequently of volatile compounds. The polyphenols provide the bitter and pungent taste and give the product its health value, which is a key quality characteristic that marks out 'Olio di Puglia' PGI with regard to the quality standard of products of the same type from outside the production area. The latter, on the other hand, are responsible for the green aromas, described in point 3.2, that are the olfactory signature of 'Olio di Puglia' PGI.

The interplay of these qualities combined with the olives' genotypes produces a unique phenotype. There is a wealth of scientific literature, starting from the early 1960s, attesting to the interaction between genotype and environment on the product's quality characteristics.

The main cultivars used are the most ancient varieties grown in the region, which are widespread throughout Apulia, albeit with some areas that are more specialized. Such cultivars produce oil with specific chemical and sensory properties that are clearly distinctive and constitute a profile that is easily recognized by consumers.

Precisely thanks to this variability in conditions described above, the extra-virgin olive oil produced in Apulia has wide variations in color, fruitiness, bitterness and pungency that, combined with the biophenol content (> 250 mg/kg upon certification) produced by stresses in terms of heat and water, typify the link with the defined geographical area.

It is therefore this aspect that is common to all olive oils from Apulia, which have bitterness and pungency values ranging between 2 and 7; these values are what makes it possible to distinguish 'Olio di Puglia' extra-virgin olive oil from extra-virgin olive oils produced outside the production area that do not meet the same quality standard.

Today, the bitter and pungent taste conferred by polyphenol molecules is considered a positive attribute, and is a useful marker for assessing the oil's freshness. Such molecules tend to oxidize over time, losing their characteristic taste and health-giving properties. The specifications of 'Olio di Puglia' PGI, designed to also make a feature of the product's 'freshness', require the year when the olives were harvested to be marked on the label.

The specific soil, climatic and geographical conditions also determine the oil's composition in terms of sterols, terpenes and volatile substances, particularly rich in hexanal, which gives the oils the scent of cut grass.

Farming techniques help to fix and develop such specificities, particularly during harvest and when managing irrigation.

The olives are usually harvested according to degree of pigmentation, which must be between 2 (more than 50 % of the epicarp is pigmented) and 5 (100 % of the mesocarp is pigmented), so before the polyphenol content drops significantly. Irrigation is mainly managed using dry farming techniques, and where irrigation is practiced it is generally kept in deficit so as to preserve both the polyphenol and the volatile compound contents, thus fixing the green aromas that typify this oil. In any event, it should be pointed out that with the particular succession over time of climatic conditions in Apulia during the ripening of the olives, there is an interplay between the two farming techniques that determines first the accumulation of polyphenols and subsequently of volatile compounds, such that they comply with the values for the characteristics laid down in the current specifications.

Lastly, it is the interplay of these farming and climatic factors, combined with the olives' genotypes that produces a unique phenotype.



## 4. 2o Pillar - Production Methods

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### 4.1 Production Methods - Farming Techniques

#### Introduction

The olive tree is considered a hardy plant and it's cultivated in marginal areas, nevertheless it requires specific cultivation techniques coordinated and integrated with each other in order to exalt their productive potentialities.

Several factors must be taken into account in olive orchards management: soil, nutrition, irrigation, pruning and harvesting, and each of them plays an important role in achieving a greater vegetative and reproductive plant balance, and cost containment should be the main goal that guides management decisions.

#### Soil

Soil is an extremely complex, variable and living medium, and represents a non-renewable resource which performs many vital functions: food and other biomass production, storage, filtration and transformation of many substances including water, carbon, nitrogen. Soil structure has a positive effect of on root growth, water availability, gas transport in soils as well as the positive effects of soil structure on soil strength. Furthermore, the anthropogenic activities such as tillage, mineral fertilization, waste disposal and industrial pollution, affect both chemical and physical natural soil properties.

The soil characteristics of an olive plantation are especially important in terms of vulnerability to erosion and, to a lesser extent, to leaching of potentially contaminating elements contained in fertilizers and pesticides. The root system of the olive is concentrated in the top 50-70 cm of soil although it may send out roots to a depth of more than one meter to satisfy its water needs. Therefore, the soil must have an optimal texture, structure and composition to a depth of at least one meter. The management of a cropping system requires periodic evaluation that includes systematic testing, with the aim of determining the nutritional status of soils in order to assess the existence of any nutritional deficiency, excess or imbalance and form a basis for planning the nutrient supply as well as other practices (tillage, amendment, correction).

In order for plants to live, two key functions can be attributed to soil: habitability and nutrition. The function of habitability mainly depends on the physical and chemical characteristics of the soil. The function of nutrition depends on the factors that make nutrients bio-available to the plants determining the fertility of the soil as productive attitude.

Tillage consists of some mechanical operations, performed with different tools, which modify soil structure, according to the management needs, that can be summarized as: increase of the soil mass (active layer); increase in soil permeability, runoff and erosive phenomena; accumulation of water reserves; reduction of evaporation due to interruption of superficial capillarity; destruction or containment of weeds; burial of fertilizers, corrective and crops residual.

Usually, for olive groves a deeper autumnal tillage is carried out, to increase the water reserve and to bury the phospho-potassic fertilizers; while during the spring-summer period, some harrowing is performed to reduce evaporation and to eliminate weeds. Soil tillage was classified according to the epoch and the type of performance, distinguishing into preparatory practices, performed before the plantation, to constitute suitable conditions to sustain the crop after the implant, and subsequent practices, performed during crop culture.

The choice of the best tillage technique must be performed in order to: reduce costs, in terms of working times and fuel needs; increase the timeliness of intervention; maintain a suitable productive level of crops and soil fertility; contain erosive phenomena.

## **Nutrition**

The olive tree is often considered a rustic plant, having little nutritional requirements and capable to survive even in rough environments, with minimal care and management. The olive plant grows in most soil types as long as they are well drained. These plants, could also vegetate in the absence of fertilization, but require suitable nutrition to express their productive and qualitative potentialities.

In the traditional olive-grove plant nutrition is mainly based on systematic and massive inputs of chemical nutrients distributed to the soil, not always correctly and often unnecessarily (if not harmful) for plants and the environment (groundwater pollution).

The compilation of adequate fertilization programs, in terms of type, doses, epochs and disposal of the nourishing elements, are not of simple generalization and depend on local environmental and climatic factors, as well as on the effectiveness of the fertilizer composition and its application method.

It is indispensable to carry out a prior analysis of soil chemistry and of the nutrient contents of the plant by plant tissue analysis (usually leaves are used). These analyses will give significant data on the status of both soil and plant, indicating the most useful typology and doses of nutrients to apply in the fertilization plans.

Fertilization systems include: chemical fertilizers (NPK applied beneath the tree canopy projection, usually in the form of combined fertilizers), organic fertilization (green and animal manures, leaves, compost, manufactured organic fertilizers), and fertilization through watering systems and through foliage.

During the first three years of the olive plantation, when vegetative activity prevails on fructification, it is important to stimulate, with fertilization, rapid canopy and root growth of the tree to predispose the plants quickly to flowering and fruiting ([Palese et al., 1997](#)). In this phase, Nitrogen is the essential element, while phospho-potassic fertilizers at this time are less important, provided that during the preparatory work of the soil for planting, such fertilizers were distributed over the entire surface and buried with deep tillage.

When the plant completed the first phase of growth (5th - 6th year) and during the entire life of the orchard, the scope of fertilization is to induce and support the yield and, simultaneously, also to ensure the renewal of fruiting shoots and roots.

Plant nutrition is physiologically dependent on the absorption of nourishing elements through the roots; it is therefore necessary to ensure that in the active soil layer there is a suitable endowment of available nourishing elements for the plants. Normally fertilizers are spread on

the soil, but they can also be supplied by the foliage, and in olive trees this characteristic can be effectively exploited in order to satisfy the needs of the plants in situations of particular demands (lacks of microelements), or as integration of soil fertilization in the different phenological phases. This technique is considered to be a valid support to increase the nutrient levels and the crop yield, reducing competition among metabolic sinks (shoots, inflorescences and fruits) and increasing the absorption of nutrients through the roots. It provides nutrients quickly, uses low amounts of fertilizer, can be combined with pesticide applications, is well suited to rain-fed olive trees or when ground fertilizations would be useless due to a lack of soil humidity.

In irrigated orchards it is possible to supply nutrients to the plant by watering systems (fertigation). The advantages of such practice consist in the easiness of application and in the efficiency of fertilizers, being able to reduce the needs of fertilizers by up to 30% in comparison to soil distribution. Fertigation implies a sensitive reduction of the management costs both in terms of purchase, transport and distribution of fertilizers, enhancing their efficacy in order to grant a better nutritional level to the trees, to maximize yield, oil production and profitability.

## **Irrigation**

The efficient use of water resources in agriculture is extremely important in order to improve the economical and environmental sustainability of agricultural activity. Mediterranean regions of Italy are characterized by a high evaporative demand of the atmosphere, water scarcity and increasing negative consequences of climate change. In Italy the rainfall can vary annually from less than 400 to over 800 millimeters, and the lack of precipitation that is often manifested during the summer, involves the use of irrigation during dry periods to ensure the constant productivity of olive orchards.

In traditional olive cultivation areas, characterized by water scarcity, rainfall and underground water resources are the only supplies for the olive tree water requirements. Rainfed olive groves, therefore, are characterized by low plantation density which allows the exploitation of an adequate soil volume by the root system, minimizing competition for water among plants.

The olive is able to tolerate the low availability of water in the soil by means of morphological and physiological adaptations acquired in response to coping with drought stress. Olive plants maintain a high rate of photosynthesis during long drought stress periods. The high efficiency of the olive is also due to its ability to continue to absorb carbon dioxide and to produce carbohydrates in water deficit. A higher photosynthetic rate under drought is a decisive factor for better drought tolerance in olive cultivars

Olive tree water requirements are variable and depend upon factors such as soil type, climate, planting density, age of trees, cultural management (e.g. fertilizing, pruning) and the method of irrigation. During the annual cycle there are nevertheless some critical periods, during which the plant mostly needs water. Increasing irrigation leads to fruits with a greater water content (lower oil percentage), and irrigation has been found to decrease the polyphenol content which then changes the oil bitterness and spicy tastes. Irrigation increases free fatty acids in oil, can affect the fatty acid composition and the accumulation of secondary metabolites, that are fundamental in improving the organoleptic characteristics of the oil, is increased.

Irrigation can be realized in different ways and the choice of the optimal method should be made according to each single olive-grove typology and environments. Sprinkling methods,

with giant irrigators or wings, have the advantage of adapting to any soil condition, the facility of moving and transfer, and the timeliness of intervention, but generally with high costs and low efficiency of water. On the contrary localized irrigation, that allows water distribution evenly in sloping land, is a technique which offers the possibility to intervene in certain biologically critical phases for the plants (flowering, fruit setting, pit hardening, etc.), allowing a significant reduction, of about 25-30%, in the consumption of water; furthermore it allows a more uniform distribution of water over time.

The irrigation intervals depend on the type of soil and therefore from the quantity of water that it can retain. The most critical phases in which water stress should be avoided are at floraison, at fruit set, at fruit growth and at inolution. An effective watering season could start, according to watering water availability, at the end of flowering (May-June) and continuing until late September.

## **Pruning**

Pruning is a very expensive practice in olive grove management, reaching up to 40% of total cultivation costs, but it is also essential for olive grove profitability. It is finalized to modify the natural shape and structure of the trees, to reduce to the least one skeletal structures, to balance the vegetative and productive activity, and to maximize fructification. To reach the best results, pruning must be rationally managed, and based on the harvesting system. Strategies of “minimum pruning” can be developed at a farm level independently of the type and size of the orchard. Managing the canopy according to the criteria of “minimum pruning” is suitable both for traditional olive groves and modern, high-density orchards. The growing habit of the cultivar, the natural tendency for high vegetative activity, the type of buds and branches, and alternate bearing are all important biological features of the olive tree that it is important to consider for pruning.

Pruning old trees requires drastic cuts to rejuvenate or to restore the health of the plants so as to stimulate their growth and renew fruit-bearing shoots and branches. Pruning also contributes to reducing the occurrence of pest and disease. Dense canopies encourage the presence of parasites due to high relative humidity, whilst well-aerated canopies considerably decrease the attack of pest and disease such as the ‘olive knot’ which appears on branches and is otherwise very difficult to control.

A first objective of pruning is to provide a shape and structure to the tree which guarantees proper illumination of the canopy to enhance photosynthesis, good circulation of air, avoidance of pest disease, and a better disposition of fruiting shoots to facilitate and maximize the harvest. At plantation, the first cuts are executed to plan the scaffold and the principal branches are chosen according to the selected shape. In the following years, pruning will be limited to the elimination of unfit shoots, favoring correct skeletal development. After the third-fourth year, with the beginning of the yield, annual pruning will have to balance volumetric growth with the vegetative-productive equilibrium of the trees.

Pruning intensity increases with the age of the tree. Pruning is light on young trees to allow the shaping and to grow and build energy reserves. Pruning must be carried out at the end of winter, before the restart of vegetative growth. It must be avoided after the harvest, because it reduces the cold resistance of the plants and does not allow wounds to heal, favoring diseases from fungi or other parasites. Traditionally in late summer a second pruning is performed on adult plants to eliminate suckers inside the plants.

## Harvesting

In olive grove management, the harvest is the other most expensive practice, together with pruning. Manual harvest can be improved using hand-held pneumatic combs to detach the olives from the plant that assuage the work, and give maximum flexibility in terms of harvesting time, and increase the operators productivity, but it is time-consuming and costly.

Mechanical harvesting is executed with a shaker, also equipped with a reverse umbrella as an olive interceptor, that has considerable economic advantages compared with traditional manual picking procedures. In this way a great reduction in labour costs, harvesting timeliness and good performance, is achieved. Nevertheless it is difficult to apply in the majority of traditional olive groves due to the presence of malformed, voluminous plants, or those of an unsuitable cultivar. In the new intensive olive groves, with trees optimized for cultivar and structure, mechanical harvest is instead applicable with positive results, usually in a step, getting up to 80-90% of yield. In these orchards with well pruned trees it is possible to harvest up to 50 trees/hour with a suitable shaker and collecting system.

## Olive farming in Italy

The Italian olive-growing sector is in a moment of transition in which it is necessary to deal with the new cultivation techniques of olive trees: traditional, intensive or super high density (SHD) olive groves are different models of olive growing, which differ in production methods, yields and structure. Here are the main differences between traditional olive groves, the intensive cultivation of olive trees and a [SHD olive orchard](#).

### Traditional olive grove

Olive oil in Italy is a product of excellence, extra virgin olive oil is widely consumed and produced for centuries in many regions. Even today, the systems of cultivation of olive trees dominant in Italy are mostly attributable to **traditional olive** grove that has some distinctive characteristics:

- Low plant density with less than 200 trees per hectare.
- The soil is often irregular, mainly hilly.
- High productivity per tree but low productivity per hectare.
- Low mechanization and consequent high production costs.

A traditional olive grove, moreover, often develops on contained surfaces and the collection and management remains mostly manual, albeit with some help from new technologies.

### Intensive olive grove

Since the 1960s, in order to compete with other world producers, Italy felt the emergence of the intensive cultivation of the olive tree, which ensures a higher yield and a more innovative mechanization. The factors characterizing a [high-density olive grove](#) are:

- Density of planting with 250/400 olive trees per hectare.

- Regular uniforms, usually of rectangular shape.
- Irrigation systems and mechanized harvesting of olives from the tree.
- High productivity of extra virgin olive oil per hectare.

The intensive grove of the olive tree therefore ensures a higher economic profitability compared to traditional olive growing and a better yield, even if pruning is still performed manually and the mechanical harvest is limited to the single plant.

### **Super high density olive farming**

On the Spanish model, also in Italy SHD olive orchard began. The differences between traditional, intensive and SHD olive groves are remarkable and here are the main characteristics of a super high density olive farming:

- High density of plant, between 600 and 1600 olive trees per hectare.
- Reduced dimensions of the tree and arrangement with parallel rows.
- Mechanical harvest using pruning machines and harvesters that act not on the single tree but on the production wall.
- Precocious entry into production and very high yield.

Super high density olive orchard is therefore a cost-effective method that does not compromise the excellent quality of the final product, on the contrary it has been widely demonstrated that high-density olive grove does not worsen the quality of the oils but exalts it.

### **References**

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2. © 2017 Soc. Agr. Buccelletti Vivai

## 4.2 Production Methods - Processing Techniques

The steps for Olive Oil Production are:

- Olive Fruit Harvesting & Transportation
- Leaf Removal & Washing
- Olive Fruit Processing
- v Olive Oil Storage & Labelling

### **Traditional Methods**

The first method of harvesting olives was to collect fruit from the ground late in the growing season when the physiologically mature fruit abscises naturally. On the ground fruit can be further degraded, infected and infested. The result was a decrease in olive oil or table fruit quality. Thus harvesting fully mature olives from the ground for table or oil processing was abandoned early in olive production and replaced with hand harvesting, a method still used extensively.

Hand harvested fruit gets removed directly from the tree with a downward hand motion and placed into baskets, bags or boxes. If the olives are destined for table fruit processing the laborers often wear knitted cotton gloves. Hand reach can be extended with hand held wooden or metal toothed devices resembling coarse combs or rakes, used with the same downward motion. Poles have been also used to beat the branches. The latter method is only effective with mature fruit for oil extraction. These methods of extending hand harvest have improved efficiency of removal, but poling results in tree damage, and all methods are inefficient and slow, and require fruit to be picked up from the ground.

Traditional processing approaches use the same type of classic techniques that have been applied for centuries. Traditional methodologies are known as 'discontinuous' systems, due to their stop-and-start nature that results in individual batches of oil, rather than a continuous supply.

The traditional way of olive oil production is the method used in the past, and still used by very few old mills also today.

Traditional methods begin with olives being cleared of any leaves or twigs. Clean olives are washed in cold water and dried prior to being crushed into a smooth pomace paste using stone milling equipment. The resulting olive pomace is then spread out on to natural filter mats which are stacked, sometimes up to 50 layers high, in a vertical press to extract what is known as the first 'cold pressing' of oil. The mats are pressed together, using relatively little pressure, to squeeze out the oily liquid which contains a mixture of oil and water.

This liquid is later left to decant, as the oil floats to the top due to density differences. Batches of oil are traditionally left unfiltered, as filtering can remove many beneficial nutrients.



Image xxx: Traditional Methods

### **Traditional Pressure Method**

More specifically, olives are crushed by big millstones (most commonly made of granite) at a moderate-low speed. This naturally helps to protect the paste from a relevant increase of temperature throughout the process; when the temperature is constantly kept under 27°C, the product can be defined as “cold-pressed”. The millstones rotate for 30-40 mins, during which the olive paste is formed; here begins the malaxing stage, which lasts for an additional 10-30 mins maximum once the millstones stop working. The olive paste obtained as a result is then spread over circular fiber disks piled up on top of each other from which the oil can be extracted by the work of hydraulic presses: the pressure applied to the disks makes the solid phase compacting and the liquid phases (oil and vegetation water) percolating. After this phase, the olive oil produced is centrifuged, filtered and bottled.

The main disadvantages of the traditional methods are:

- ❖ Usually, different farmers bring their olives to the same oil miller. Given the considerable length of time of the extraction phase and consequential cleaning of the traditional mill, the olives are kept in their bags or containers for a prolonged period of time, a procedure which allows the start of fermentative degenerations.
- ❖ Millstones must be cleaned at every usage.
- ❖ The prolonged exposure of olive paste to oxygen: traditional grinding machines do not operate in a closed system; as a result, the oil produced starts to oxidize immediately, thus reducing the olive oil shelf life.
- ❖ The fibers absorb all the components of the product during the process, thus creating a favorable environment for micro-organisms growth and fermentative events.

## **Modern Methods**

Olive harvest technology can be broadly divided into hand held machines and larger machines mounted on tractors or on self-propelled units. Technically, hand held harvesting units are harvest aids and serve a function in smaller, particularly hilly, orchards, but cannot be considered mechanical harvesting because the speed and efficiency of the unit is determined by the operator, and there is no collection mechanism. The units can extend an operator's reach by 4 meters and remove fruit with a vibrating motion of the comb, or by clamping on the branch and shaking. A single operator can harvest 300 - 450 kilos per day, before fruit collection. This is at least 50 kilos per day better than the best hand harvest laborers. However, collection of the dropped fruit onto nets, as opposed to already being deposited in the picker's bag, can eliminate some of the efficiency of removal.

Mechanical Olive Harvesters fall into two general categories based upon the principal of removal. They either shake the trunk or branches, or use picking heads to connect directly with the canopy. The most modern versions of both are self-propelled with catch frames incorporated in the machine and are therefore capable of continuous operation. Each technology has advantages and disadvantages.

For a shaker harvester to achieve a 90% removal efficiency when harvesting table olives either a short stroke, less than 2.5 cm and a frequency above 2500 cycle per minute, or a long stroke, 10 cm and low frequency, 1000 cycles per minute, is required. Efficiency would probably be higher when harvesting mature olives for oil. With the latter combination limb breakage is a problem and with the former leaf loss is a problem. The most efficient versions have an integrated catching frame with a mechanism for downloading that allows continuous operation. This type of shaker can be used with traditional trees pruned to an upright vase with vertically oriented scaffolds. Bark damage to the trunk can occur if the clamping strength is too great. Fruit damage, both bruising and cutting can result from the fruit falling through the canopy into the catch frame.

Picking head type harvesters were adapted from grape harvesters. The picking head consists of ranks of meter long graphite or fiberglass rods radiating from a cylinder. The cylinder rotates passively on its central axis when the rods connect with the hanging shoots. The rods have a 30 cm horizontal whipping motion, and as they connect with the shoots, this motion removes the fruit. This harvester can achieve 90% fruit removal efficiency if the tree is properly configured and the canopy does not overlap on itself as the picking head moves forward. The major problem with this harvester is the fruit bruising and cutting when harvesting immature olive for table processing. The harvesting head has been mounted on other units for harvesting olives for oil processing.

More modern approaches to the manufacture of olive oil have continually evolved and technology is now well advanced. Large-scale production plants operate continuous shifts during harvest periods applying fully mechanized systems to crush olives, extract oil and package the products. Recent developments have concentrated on improving the equipment used for separating olive oil from the remnant components, and the latest advances include new types of centrifuge systems.

As the olives are made up of 50% water and 20-25% oil, crushed and milled olive pomace is spun at high speed in a rotating decanter and the oil, being lighter, moves towards collection

points close to the rotation axis, whereas the heavier pomace and vegetable water are spun to the outer edge of the decanter. Subsequently, the oil gets filtered to remove suspended micro-particles.

In the modern (or continuous) mill, all the extraction phases are conducted in a “closed” system, so that oxidation levels are kept at lower degrees than those typical of the traditional system.

First the olives are mashed by stainless steel crushers made of a body and toothed rollers or hammers. In modern systems it is possible to choose the rotation and speed of the machine, which will result in a difference in the characteristics of each olive oil produced (e.g. the use of a low frequency usually results in the production of less bitter olive oils than the ones manufactured at a high rotation frequency).

The malaxing lasts longer than in the traditional method, about 45 mins, as oil drops are smaller and need more time to aggregate. New malaxers operate in a controlled atmosphere (nitrogen) to slow down the oxidation process. In the continuous system, olive oil extraction is performed by centrifugation using either three-phase or two-phase decanters (to separate, respectively, oil, water and solids, or oil from wet olive pomace). Two-phase extraction is preferable as it does not require the extra supplement of water, which is instead needed when the three-phase system is used; water dilutes and eliminates polyphenolics substances, and creates additional toxic waste (vegetable waters).

The use of the continuous system implies a better control in sanitation, temperature and oxidation processes, and an increased work capacity than in the discontinuous method. The disadvantages are in the need to constantly control the temperature reached during the grinding phase, as due to friction the temperature tends to naturally increase. When the temperature of the product is controlled and gets maintained below 27°C throughout all phases of the process, the olive oil produced is defined as “cold extracted”.

## **Centrifuge Systems**

### **Two-Phase & Three-Phase Systems**

The three-phase decanter processes were the industry standard for many years. These involve an initial decanting phase, which cleans the olives, washes them and grinds them into a pomace. The beaten olive paste is then made more fluid, by adding one liter of water per kilogram of paste. The liquid paste is spun, during the second decanting phase, in a horizontal centrifuge that separates solids from the oily liquid. A third and final decantation phase uses a vertical centrifuge to separate the olive oil from the fruit vegetable water.

After the kneading stage, the olive paste is conveyed into the centrifugal extractor (decanter) by a mono pump with adjustable flow-rate. Inside the decanter, the two liquid phases, oil and vegetable water, are discharged through two different outlets positioned on the same side, while the solids are discharged through a third outlet positioned on the opposite side. This separation is possible due to the addition of hot water to the inlet paste, obtaining a big quantity of vegetable water to be disposed of and husks with about 50% humidity.

Recent innovations have led to the introduction of a new two-phase centrifuge process which uses a horizontally mounted centrifuge for primary separation of the olive oil fraction from the vegetable solid material and water solution. The process is virtually the same as the three-phase approach, with the difference that instead of adding new water for the horizontal centrifugation, vegetable water is recycled in a closed loop system.

In the 2-phase running process, the decanter is preset with only two outlets: one for the oil and the other for the vegetable water and husk together. With this type of extraction it is possible to reduce or eliminate completely the addition of water to the paste, with the double advantage of saving disposal costs and natural resources. The husk coming from the two-phase process has 60% humidity.



Image xxx: Three-Phase & Two-Phase

## Multi-Phase Systems

In multiphase processing the centrifugal extractor is designed to have three outlets: one for the oil, one for the husks and one halfway for the pâté.

This type of extraction has the advantages of the processing without the addition of water (two-phase) plus the versatility of a decanter able to run both in continuous and in batch processing. Multiphase extraction gives the possibility to recover a certain quantity of husk - called "pâté" - made up of wet pulp without any traces of kernel directly inside the bowl. Multiphase running process produces a dehydrated husk similar to that from a three-phase decanter.

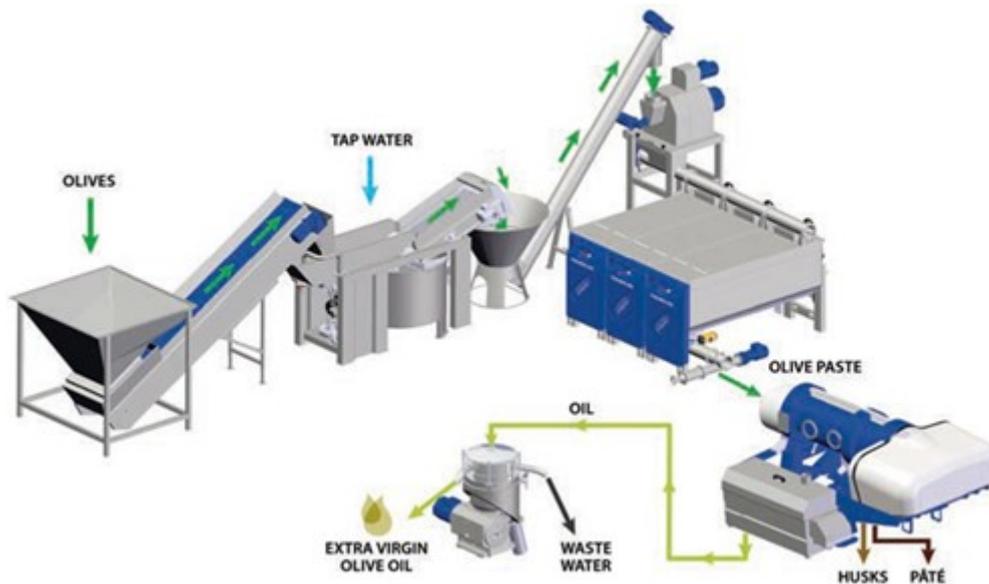


Image xxx: Multi-Phase System

### Percolation or Sinolea Method

Introduced in 1972, Percolation or Sinolea method is a third olive oil extraction method, much less common than the other two already described. In respect to the other two methods, the Sinolea system applies a different technology to separate the olive oil drops from water and solids; the process is based on the principle of different surface tension of the vegetation water and the oil: olive oil adhere to steel plaques, thus separating itself from water and solids. Advantages are the higher polyphenol content of oil, the low temperature method, the low labor, the fact that the oil/water separation step is not needed and the low energy requirement. Disadvantages are potential rapid oxidation of the olive product and the fact that this process is not completely efficient as it still leaves a large quantity of oil in the olive paste.

### Olive Oil Production Standards

#### EU

There are eight different categories of olive oils and olive-pomace oils. Not all of these categories can be sold to consumers. More specifically, only edible olive oils can be purchased directly at retail level.

1. Extra Virgin Olive Oil
2. Virgin Olive Oil
3. Lampante Olive Oil
4. Refined Olive Oil

5. Olive Oil composed of Refined Olive Oil & Virgin Olive Oils
6. Olive Pomace Oil
7. Crude Olive Pomace Oil
8. Refined Olive Pomace Oil

## Standards

- **“Extra Virgin Olive Oil”** is the highest quality of olive oil. In order to classify an olive oil as extra virgin, its acidity should not exceed 0.8% and its other chemical characteristics must comply with those laid down in Regulation (EEC) No 2568/91, and it must not have any organoleptic defect.
- **“Virgin Olive Oil”** is also fruity but has some slight sensory defects. In order to classify an olive oil as virgin, its acidity should not exceed 2% and its other chemical characteristics should comply with those laid down in Regulation (EEC) No 2568/91. In addition, its organoleptic defects must not exceed the 2.5 units mark in terms of intensity.
- **“Lampante Olive Oil”** is the lowest quality virgin olive oil. In order to classify an olive oil as Lampante, its acidity should exceed 2% and its other chemical characteristics should comply with those laid down in Regulation (EEC) No 2568/91. In addition, its organoleptic defects must exceed the 3.5 units mark in terms of intensity.
- **“Refined Olive Oil”** is a category of oil that is still not edible in the EU, while in other markets, mainly in the American continent, it is considered edible and it is marketed under names like light olive oil or extra light olive oil. It is not intended to be marketed at retail stage. It has a degree of acidity up to 0.3%.
- **“Olive Oil composed of Refined Olive Oil & Virgin Olive Oils”** is the result of a mixture of olive oil of category 4 with olive oil of category 1 and / or 2. In order to classify an olive oil as “Olive Oil composed of Refined Olive Oil & Virgin Olive Oils”, its acidity should not exceed 1% and its other chemical characteristics should comply with those laid down in Regulation (EEC) No 2568/91.
- **“Olive Pomace Oil”** is the result of a mixture of olive oil of category 7 with olive oil of category 1 and / or 2. In order to classify an olive oil as “Olive Pomace Oil”, its acidity should not exceed 1% and its other chemical characteristics should be in line with those laid down in Regulation (EEC) No 2568/91.
- **“Crude Olive Pomace Oil”** is the oil obtained out of the olive-pomace, which is the residual paste that gets obtained after the oil is extracted from the olives. In order to become edible, such an olive oil should first go through the refining process.
- **“Refined Olive Pomace Oil”** is not edible and is obtained after the refining of olive oil of category 7. When the refining phase is completed, the resulting oil is neutral, i.e. odorless, colorless, tasteless and acid-free. Its degree of acidity can be up to 1%.

## 5. 3° Pillar - Quality

### 5.1 3° Pillar – Quality - Chemical Analysis

#### Sample collection and dataset preparation

Olive oil samples from 5 different olive varieties, cultivated in the northwestern part of Greece (cv. Koroneiki, cv. Lianolia Kerkyras) and the southern peninsular of Italy (cv. Coratina, cv. Peranzana and cv. Favolosa) were collected in three consecutive harvest periods. A total of 224 and 161 olive oil samples were collected during the first and the second harvest period respectively in order to create the dataset used for model training for olive cultivar prediction. In the extension (third) period 20 more Greek olive oil samples were collected. The total number of samples collected during project implementation are shown in Table 1, and their distribution across periods is shown in Table 2.

**Table 1** Number of olive oil samples per variety

| Variety   | Samples |
|-----------|---------|
| Koroneiki | 77      |
| Lianolia  | 90      |
| Coratina  | 100     |
| Favolosa  | 58      |
| Peranzana | 80      |
|           | 405     |

**Table 2** Number of olive oil samples collected in three harvest periods from Greece and Italy

| a/a          | Period | Country | Variety   | N          |
|--------------|--------|---------|-----------|------------|
| 1            | 1st    | Greece  | Koroneiki | 44         |
| 2            | 1st    | Greece  | Lianolia  | 60         |
| 3            | 1st    | Italy   | Coratina  | 61         |
| 4            | 1st    | Italy   | Favolosa  | 19         |
| 5            | 1st    | Italy   | Peranzana | 40         |
| 6            | 2nd    | Greece  | Koroneiki | 21         |
| 7            | 2nd    | Greece  | Lianolia  | 22         |
| 8            | 2nd    | Italy   | Coratina  | 39         |
| 9            | 2nd    | Italy   | Favolosa  | 39         |
| 10           | 2nd    | Italy   | Peranzana | 40         |
| 11           | 3rd    | Greece  | Koroneiki | 12         |
| 12           | 3rd    | Greece  | Lianolia  | 8          |
| <b>Total</b> |        |         |           | <b>405</b> |

**Table 3** Chemical compounds of olive oil used in the study

| <b>Faty acids</b> | <b>Sterols</b>             |
|-------------------|----------------------------|
| C14:0             | 24_meth_cholesterol        |
| C16:0             | b_sitosterol               |
| C16:1             | campestanol                |
| C17:0             | campesterol                |
| C17:1             | chlerosterol               |
| C18:0             | Cholestanol                |
| C18:1             | $\Delta$ 5,24_stigm/dienol |
| C18:2             | $\Delta$ 5-avenasterol     |
| C18:3             | $\Delta$ 7-avenasterol     |
| C20:0             | $\Delta$ 7-stigmastenol    |
| C20:1             | sitostanol                 |
| C22:0             | stigmasterol               |
| C24:0             | Total. $\beta$ _sitosterol |
|                   | Total.erythrodiol          |
|                   | Total sterols              |

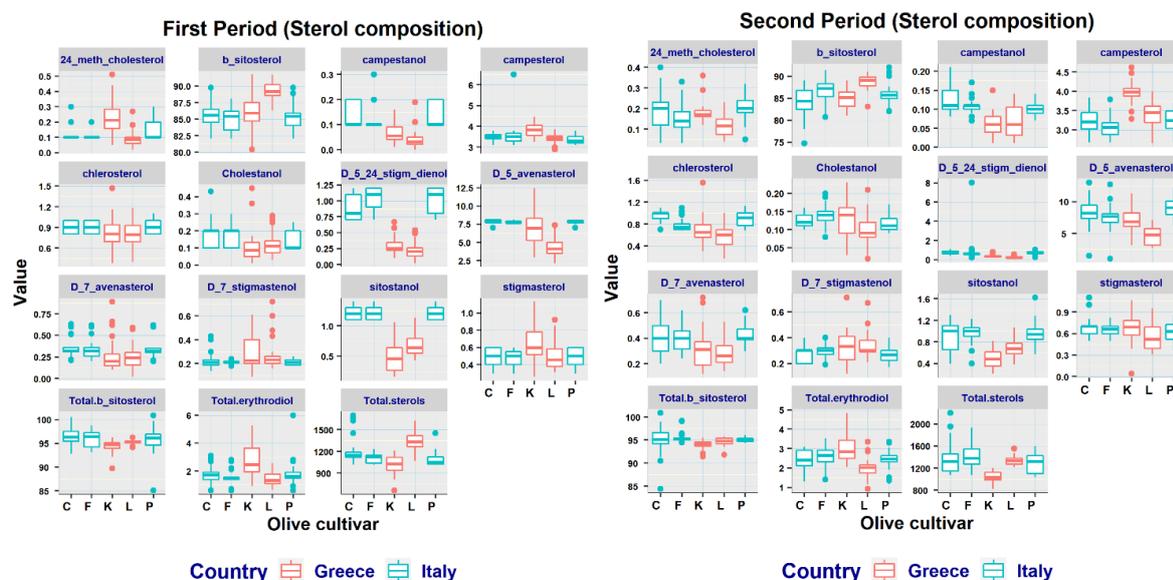
Samples were collected directly from the cooperative local olive mills, following the same olive oil extraction procedure as arranged in a fixed instruction protocol. The obtained olive oil samples were labelled accordingly, and transferred directly at two accredited laboratories in Greece and Italy until chemical analysis were performed.

A total of 34 olive oil chemical characteristics were analyzed, including acidity, peroxide value, K232, K268, sterolic content and fatty acid composition. All chemical analysis were performed following the official analytical methodology (Commisiton Regulation EEC/2568/91). The main qualitative indices of acidity, peroxide value and spectroscopic measurent were performed in order to classify olive oil samples according to their category. All samples belonged to the highest category of “Extra Virgin Olive Oil”. The chemical parameters of fatty acid and sterolic profile (28 variables) were used as the exploratory variables of the dataset.

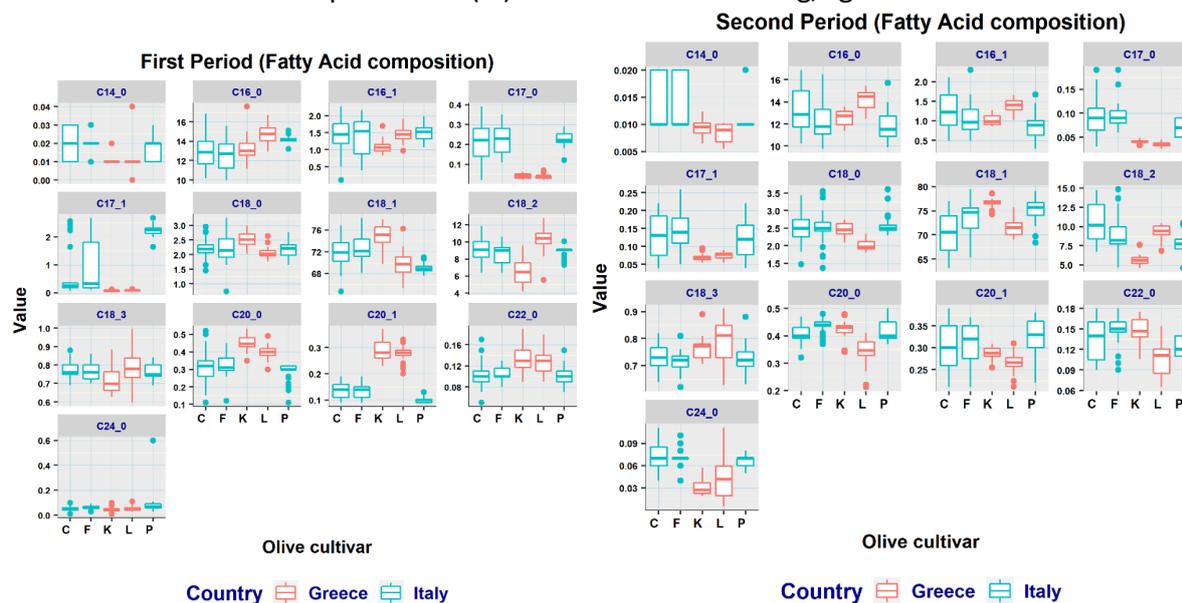
### Statistical Analysis

Statistical analysis involved exploratory methods (EDA), principal components and regression analysis and was performed by using or programming functions of the following libraries of the “R” statistical language (R Core Team 2018): “tidyR” (Hadley Wickham 2021); “dplyr” (Hadley Wickham et al. 2021); ggplot2 (Hadley Wickham 2016); “emmeans” (Russell V. Lenth 2021); “performance” (Daniel Ludecke et al. 2021); “mice” (Stef van Buuren and Karin Groothuis-Oudshoorn 2011); “caret” (Max Kuhn 2020); “openxlsx” (Philipp Schauburger and Alexander Walker 2021); “factoextra” (Alboukadel Kassambara and Fabian Mundt 2020); “FactoMiner” (Sébastien Lê et al. 2008); “xgboost” (Tianqi Chen et al. 2021).

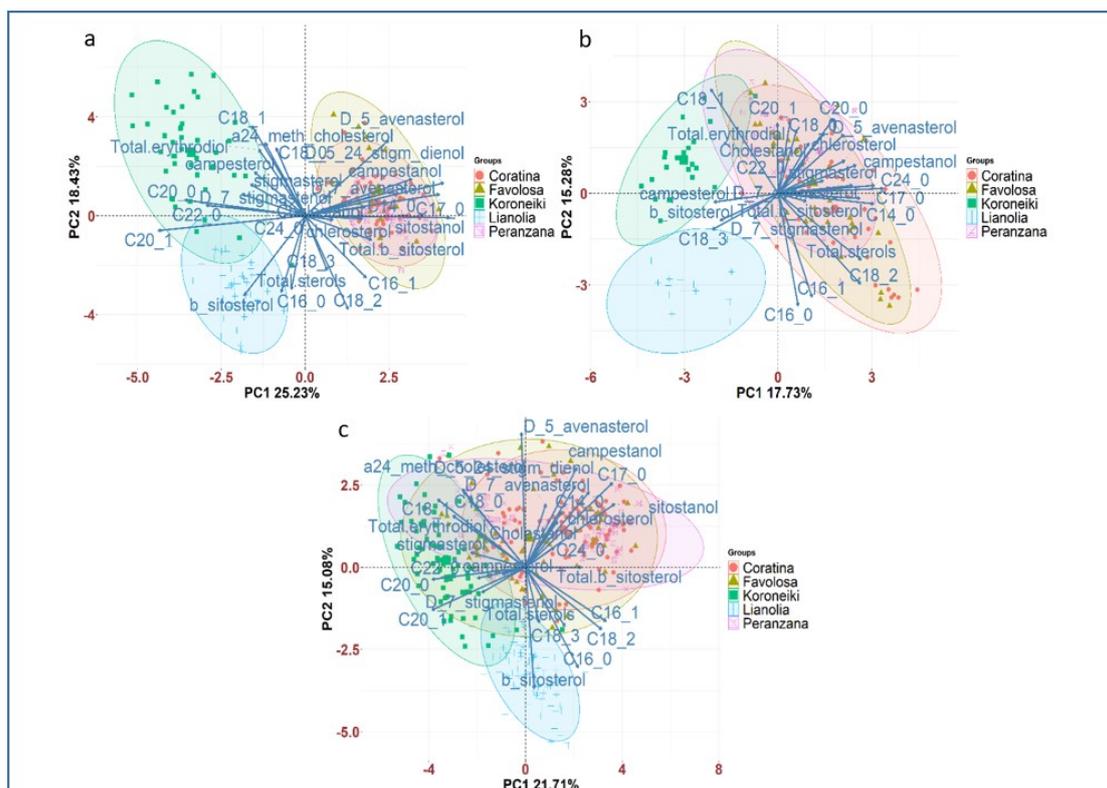
## Results



**Figure 1.** Box plot description of the sterol variables of the first and second sampling periods. C, F, K, L, P stand for Coratina, Favolosa, Koroneiki, Lianolia and Peranzana, respectively. Individual sterols are expressed in (%) and total sterols in mg/kg.



**Figure 2.** Box plot description of the fatty acid variables of the first and second sampling periods. C, F, K, L, P stand for Coratina, Favolosa, Koroneiki, Lianolia and Peranzana, respectively. Fatty acids are expressed in %.



**Fig.3.** PCA analysis of the first two principal components for the first (a, upper left), second (b, upper right) and both crop years (c, center).

## Machine learning

In this work we used the olive dataset, obtained through the period of project implementation to train a model on the available records of olive oil chemical compounds paired to the corresponding olive varieties. We used decision trees as the predictive model and specifically extreme-boosted trees implemented by programming the XGBoost library in “R”.

**Table 5.** Confusion matrix of known (Reference) vs predicted (Prediction) varieties resulted from model application on the testing subset.

|            |           | Reference |          |           |          |           |
|------------|-----------|-----------|----------|-----------|----------|-----------|
|            |           | Coratina  | Favolosa | Koroneiki | Lianolia | Peranzana |
| Prediction | Coratina  | 29        | 5        | 0         | 0        | 2         |
|            | Favolosa  | 3         | 13       | 0         | 0        | 1         |
|            | Koroneiki | 1         | 0        | 24        | 0        | 0         |
|            | Lianolia  | 0         | 0        | 1         | 33       | 0         |
|            | Peranzana | 3         | 3        | 0         | 0        | 20        |

**Table 6** Performance parameters obtained from the confusion matrix.

| Testing Dataset | Olive variety |          |           |          |           |
|-----------------|---------------|----------|-----------|----------|-----------|
|                 | Coratina      | Favolosa | Koroneiki | Lianolia | Peranzana |
| Sensitivity     | 0.8056        | 0.619    | 0.96      | 1        | 0.8696    |
| Specificity     | 0.9314        | 0.9658   | 0.9912    | 0.9905   | 0.9478    |

|                   |        |        |        |        |        |
|-------------------|--------|--------|--------|--------|--------|
| Pos Pred Value    | 0.8056 | 0.7647 | 0.96   | 0.9706 | 0.7692 |
| Neg Pred Value    | 0.9314 | 0.9339 | 0.9912 | 1      | 0.9732 |
| Balanced Accuracy | 0.8685 | 0.7924 | 0.9756 | 0.9952 | 0.9087 |

## Conclusion

The developed XGBoost model showed high ability in botanical discrimination, with the Greek varieties showing the highest performance followed by most Italian varieties with highly successful scores. Thus, these results are highly suggestive for incorporating machine learning technologies in olive oil varietal authentication.

## 5.2 3° Pillar - Quality - Organoleptic Analysis

The EU regulation 2568/91 and subsequent implementations absolutely establishes that the product category of a virgin olive oil must be exclusively established by a recognized group of tasters. The EU regulation, from a sensorial point of view, substantially distinguishes virgin oils in these categories: oil without organoleptic defects and oil with organoleptic defects, oil with a positive sensation of fruity and non-fruity oil. The product categorizations arise from these main differences: extra virgin, virgin, lampant.

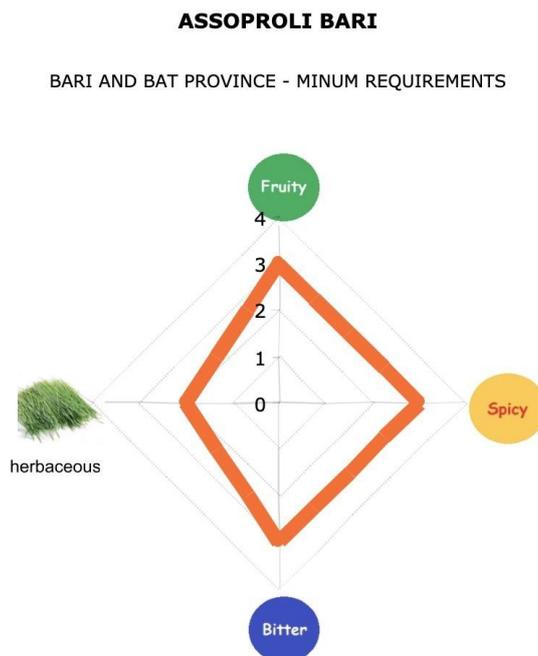
The EU standard also strictly establishes which mentions of the organoleptic characteristics can be made on the label of virgin olive oil packaging.

The Authentic-Olive-Net project aims to group oil producers from specific geographical areas and thus be able to describe a set of common characteristics of the product with a collective brand.

Therefore, leaving the product categorization to the recognized tasting groups, the AON seal will identify a set of particularly frequent and evident positive characteristics in the oils produced by the participants in the project.

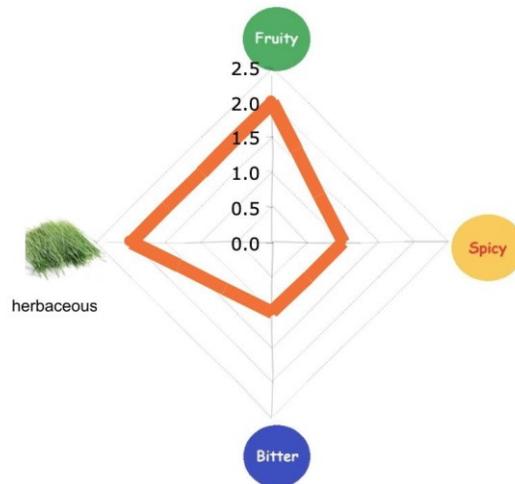
**The AON sensorial characteristics set must be ascertained by a recognized tasting group or by self-assessment following the training provided by the AON organization.**

Each operator should only sell sealed olive oil with the following sensorial features :



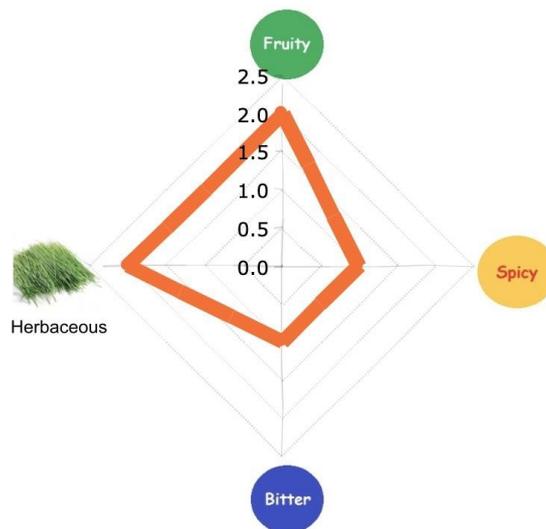
## CCIAA FOGGIA

FOGGIA PROVINCE - MINUM REQUIREMENTS



## PREVEZA Chamber of commerce

WEST GREECE REGION - MINUM REQUIREMENTS

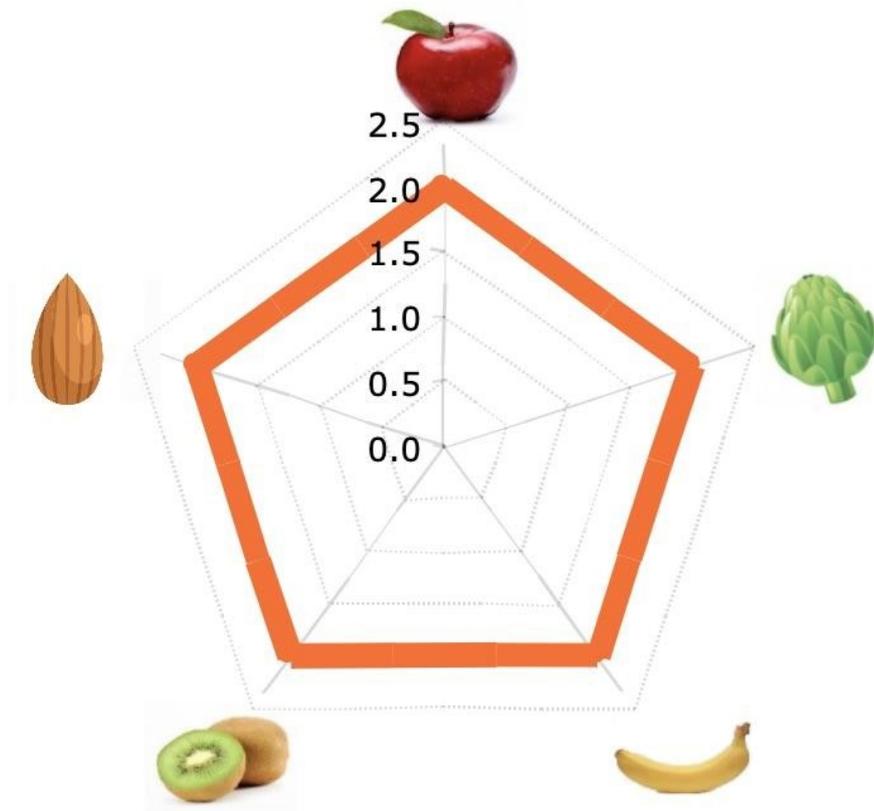


In addition to the minimum organoleptic requirements necessary to bottle oil with the AON seal, each company must strive for the production of oils with specific fragrances. To do this, the olives must be carefully selected, paying particular attention to the integrity of the fruits, to their state of ripeness (at most half veraison), to the speed of the crushers (high / very high for green olives, low for ripe ones), reduction at the minimum of the extraction temperatures (max 25 °), reduction to the minimum of the kneading times considering the entire period from the entry of the olive paste to the exit and immediate filtration after extraction.

The oils that will bear the AON seal should express characteristic scents as described below:

## ASSOPROLI BARI

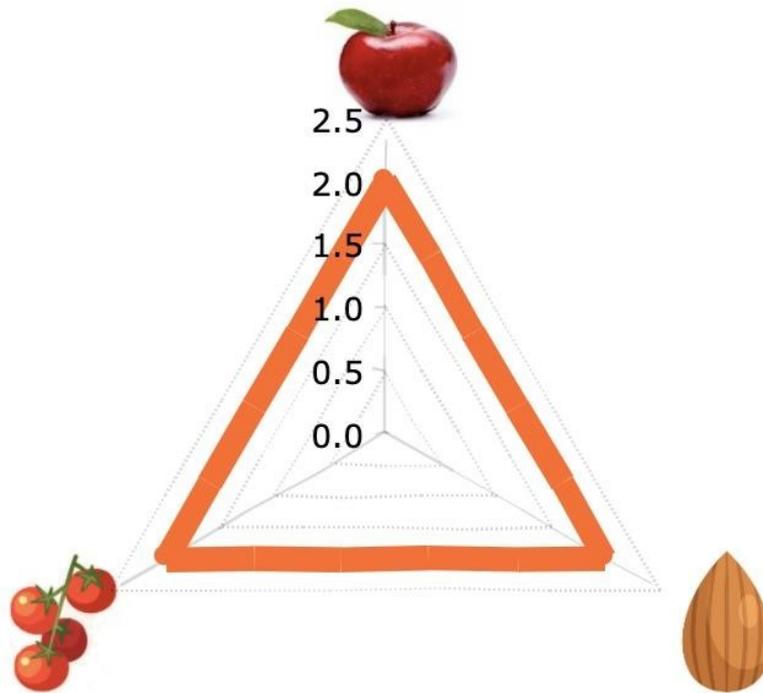
Possible additional scents



# CCIAA FOGGIA

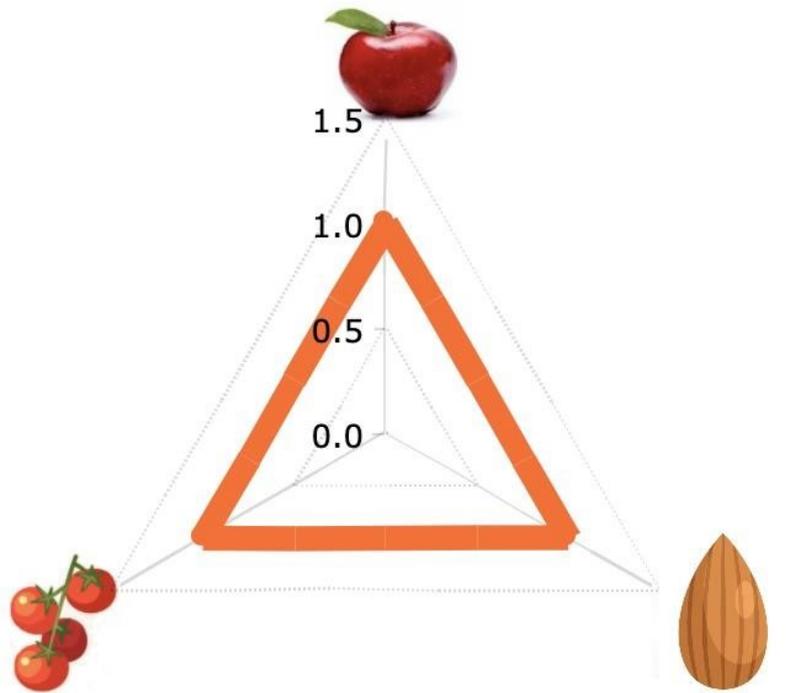
06/11/2020

Possible additional scents



# PREVEZA Chamber of commerce

Possible additional scents



## 6. THE AUTHENTICITY SEAL

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### Introduction

Compliance with the requirements of the Authentic - Olive - Net product specification enables the producers concerned to demonstrate the authenticity of the product to third parties and, more specifically, to consumers and the market.

This evidence is provided by the use of the authenticity mark.

The registration of the trademark, its issue and use, is subject to a series of regulatory and procedural indications.

The “Autentich Olive Net” trademark is not an individual trademark as it refers to a plurality of subjects. The proprietor of the trademark, having obtained the registration, in fact grants the use to those who request it; these will use it legitimately respecting a special Regulations of Use.

The trademarks referable to several companies can be divided into:

- Collective trademark;
- Guarantee or certification mark.

### The Collective Brand

The Collective Trademark is a distinctive sign that serves to distinguish products of several companies by their specific origin, nature or quality, performing a product guarantee function according to a specific (disciplinary) regulation, which must be filed together with the collective trademark application. .

The filing of the specification may not be contextual to the application and may be made within two months of filing.

Collective trademarks are intended to be used by a plurality of entrepreneurs other than the owner who, generally, does not use them. The holder may be any person who carries out the function of guaranteeing the origin, nature or quality of certain products or services, and the specification must contain the expected quality standards and the related controls, and the name of the person responsible for the inspection.

## **The guarantee or certification mark**

The guarantee or certification mark, on the other hand, aims to certify certain characteristics of the product (for example quality), according to a specific regulation (use regulation), which must be filed together with the trademark application.

An Italian guarantee or certification mark can also be used to certify the geographical origin of products and services; however, it is necessary to remember that the European Certification Mark does not allow it and the prohibition concerns both the sign and the regulations of use.

## **Who can apply for trademark registration.**

The transposition of Directive (EU) 2015/2436 clearly distinguishes between collective marks and certification marks, both in terms of the active legitimacy of applicants and in terms of objective.

A collective mark makes it possible to distinguish the products of the members of the trade association that owns the mark from those of other companies that do not belong to that association. The collective mark therefore informs consumers that the producer belongs to a specific trade association and that he has the right to use the mark.

In relation to this function, it is provided that only legal persons governed by public law (such as the State and local public bodies) and trade associations of manufacturers, producers, service providers or traders may request registration. Companies with share capital may not apply for registration of a collective mark.

On the other hand, an autonomous regulation on the certification mark is introduced.

In fact, the holders of a certification mark can be natural or legal persons, including institutions, authorities and bodies accredited under the current legislation on certification to guarantee the origin, nature or quality of certain products or services for which the trademark must be registered, provided that they do not carry out an activity that involves the supply of products or services of the certified type. It is also provided that a certification mark can consist of signs or indications which in trade can be used to designate the geographical origin of products or services.

In both cases, the trademark use regulation must necessarily be attached to the application for registration, indicating the controls and penalties provided for.

An Italian guarantee or certification mark can also be used to certify geographical origin; however, it is necessary to remember that the European Certification Mark does not allow it and the prohibition concerns both the sign and the rules of use.

## **Olive oil and designation of origin**

Reg. (EC) No. 1019/2002, provides specific rules for the marketing of olive oil. The EU regulation expressly provides for the possibility of "designation of origin", that is, the indication of a geographical name on the packaging or label.

However, Article 4 of Reg. (EC) No. 1019/2002 indicates the possible cases of use of an indication of a geographical name on the packaging or on the label.

Specifically, the designation of origin at regional level is possible for products that benefit from a protected designation of origin (PDO) or a protected geographical indication (PGI), so it is possible to give a territorial connotation only if the product it is recognized as PDO, adhering to the relative control plan and after product certification.

## **The choice of the brand**

From a careful analysis of what is indicated, the brand that meets the needs expressed by the parties involved and that at the same time guarantees a more streamlined operational process, to guarantee the authenticity of the product is the collective brand.

In fact, the collective brand:

- distinguishes products of several companies;
- provide guarantees on the product;
- gives the possibility to public bodies and trade associations to request trademark registration;
- does not provide for the accreditation of Bodies intending to apply for the certification mark;
- is in line with the needs of producers regarding the process of being subjected to controls and the potential costs involved;
- does not provide for the certification of geographical origin, avoiding the difficulties indicated for the European certification mark and the indications of EC Reg. no. 1019/2002.

## **Hypothesis of the seal**



## **The application for registration of the "Authentic - Olive - Net" trademark**

In order to protect Italian and Greek productions, the Authentic - Olive - Net program provides for the registration of the trademark in the countries of the two project partners: Italy and Greece.

In Italy, the request for registration of the trademark can be made by a public body (Chamber of Commerce of Foggia) or by a trade association (Assoproli) according to the indications given by the Ministry of Economic Development.

In Greece, the request for registration of the trademark can be made by Chamber of Commerce of Preveza and by Region of Western Greece.

In Italy, the trademark registration application must be made on a specific form (Form MA-RI) which can be filled in and downloaded from the website <http://www.uibm.gov.it> and filed with any Chamber of Commerce, Industry, Handicraft and Agriculture, or it can be filled in and sent directly through the new UIBM online system Alternatively, the application can be sent by post to the Italian Patent and Trademark Office - DIV VIII - Via Molise, 19 - 00187 ROME, by registered letter with return receipt.

The procedure provides for the filing of no. 1 (original)+2 copies of the application form (Module MA-RI) and additional module if used, on one of which (original) must be applied a stamp mark of € 16.00.

The MA-RI application must indicate whether it is a first filing or a renewal. The model standard is unique for both individual and collective trademarks, so the type of trademark must be specified in the form with the letter "C" for the request for registration of a collective trademark.

The nature of the trademark shall also be specified:

- D for word mark that is verbal, - F figurative mark with image.

A short and precise listing of the distinctive features of the brand is required and the list of colours contained in the representation of the brand, including black and white, shall be specified. The colours are claimed only if they are an essential characteristic of the mark and therefore the applicant intends and declares to use only those. In this case the applicant may indicate the colours according to the proposed standards (Pantone/ etc.).

In addition, the following must be indicated in the application:

The applicant and his personal data;

The elective domicile (must correspond to a location within the EU) including e-mail or PEC.

The applicant shall sign each sheet.

The MA-RI application form can be downloaded at the following link:

[https://uibm.mise.gov.it/attachments/article/2036086/Modulo%20MA-RI\\_CDC.pdf](https://uibm.mise.gov.it/attachments/article/2036086/Modulo%20MA-RI_CDC.pdf)  
and shall be filed together with the following Annexes:

[https://uibm.mise.gov.it/attachments/article/2036086/Modulo%20MA-RI\\_CDC.pdf](https://uibm.mise.gov.it/attachments/article/2036086/Modulo%20MA-RI_CDC.pdf)

and shall be filed together with the following Annexes:

1. payment of fees to the Inland Revenue - Pescara Operations Center which must be made using form F24 containing the data relating to the application that will be delivered by the employee, at the same time as submission.

|                      |  |
|----------------------|--|
| FIRST DEPOSIT        | € 337,00                                   |
| (Validity: 10 years) | (registration fee for one or more classes) |

The filing date of the application will start from the date of payment made;

2. receipt of the payment of the administrative fees to the Chamber of Commerce where the deposit is made (see the provincial Chamber of Commerce website <http://www.xx.camcom.it> where xx = province vehicle code) € 40.00 or € 43.00 + a revenue stamp of € 16.00 (if a certified copy of the deposit report is requested);

3. letter of appointment, proxy act or declaration of reference to general proxy (if any).

The letter of appointment (art. 201 of the Legislative Decree no. 30/2005) in stamp from € 16.00; must be signed by the applicant and countersigned, for acceptance, by the person in charge; applies for the filing of one or more applications of an individual applicant.

There is a government concession fee for the letter of appointment equal to € 34.00;

4. instrument of delegation (if any);

5. copy of the trademark (attach, in addition to the trademark applied on the application, another copy of the trademark on A4 sheet, attached);

6. copy of the regulation on the use of the collective mark and its controls and penalties (and any production specification).

Further details and the reference forms can be downloaded at the following link:

<https://uibm.mise.gov.it/index.php/it/modalita-telematica/2036086-marchi-primo-deposito>

In addition, the Italian Patent and Trademark Office will make available (UIBM), starting from July 13, a new utility that allows you to pay the stamp duty digitally, for an amount of 16 euros.

The utility is available on the UIBM online deposit portal, accessible at the link <https://servizionline.uibm.gov.it>, which can be accessed after registering.

Payment can be made directly on the PagoPA platform managed by AGID by credit card, bank transfer or other method provided therein, using one of the payment service providers participating in this platform.

The receipt of the payment must be kept by the user and included in the documentation to be subsequently submitted to the UIBM.

In Greece, the trademark registration application will be according to the indications given by the Secretariat of Trade and Consumer Protection of the Ministry of Development & Investments.

<https://gge.mindev.gov.gr/tomeas-emporiou/%CE%B5%CE%BC%CF%80%CE%BF%CF%81%CE%B9%CE%BA%CE%B1-%CF%83%CE%B7%CE%BC%CE%B1%CF%84%CE%B1/#>

## 7. AON - Description of the Authentic-Olive-Net common value system - Decalogue

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### The AON common value system

#### Premise

Concept of "authenticity" that the members of the Authentic-Olive-Net project will put in place will be based on the following elements:

- Membership of a collective cross-border trademark
- Geographical belonging to the areas involved in the Authentic-Olive-Net project (Puglia, Western Greece, Epirus)
- Being producers of extra virgin olive oil
- Selling olive oil with physico-chemical characteristics (at the time of bottling) conforming to a list of parameters to be defined through the planned sampling and analysis work
- Selling olive oil with organoleptic characteristics (at the time of bottling) conforming to a list of parameters to be defined through the planned sampling and analysis work
- Be a specialized manufacturer trained in quality production
- Be a careful producer to the continuous improvement of production

Each producer can therefore join the program by satisfying the points outlined above.

Joining the program will allow the producer to use a promotional platform made up of telematic tools and the possibility of participating in training events, trade fair and dissemination events.

The use of the online platform will allow internal documentary audits to be performed in order to avoid costly inspection visits to companies.

### **The decalogue of common values:**

- 1. Adhesion to the Authentiv Olive Net (AON) platform;**
- 2. Transparency towards the final consumer and the customer;**
- 3. Contribute to the well-being and health of consumers;**
- 4. Commitment to compliance with the agronomic requirements set out in the specification;**
- 5. Commitment to compliance with the technological and processing requirements set out in the specification;**
- 6. Commitment to apply best professional practices and best possible technologies at each stage;**
- 7. Commitment to compliance with the traceability requirements that give evidence of the product batches obtained according to the indications of Authentic-Olive-Net;**
- 8. Commitment to mutual technical support between operators and sharing of knowledge, with the aim of improving know-how and guaranteeing a continuous exchange between producers;**
- 9. Ensure that staff are adequately trained on Authentic-Olive-Net issues**
- 10. To ensure the sale of oil with chemical-physical and organoleptic characteristics in line with the Authentic-Olive-Net program in order to ensure high product quality standards.**