

Educational material for the training seminar in the framework of the project EnvironmentYou - Environmental Management Enhancement by Youth-run SMEs

Educational Thematic

Bio-agriculture Mainly in Mountainous Areas

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1. A WORLD OVERVIEW OF ORGANIC AGRICULTURE

The objectives of the educational material and therefore of the first educational unit are multiple. It is addressed to both those who practice agriculture and those who are trained in order to practice it later, but also to those young people who are hesitant in their professional choice, not knowing which profession to choose. Farmers with many years of experience in either conventional and organic farming or livestock farming in the mountains need to realize the rich tradition on which their work is based and the huge efforts of hundreds of scientists who have built current knowledge stimulating their interest in a deeper knowledge and study of the industry.

Purpose

The first educational unit aims to introduce the concept of organic farming by separating it from the conventional one, to present the evolution and trends of organic farming on a global scale both in terms of product production and in terms of their purchase and consumption. It also highlights the need to create an internationally recognized standard for organic farming and the principles by which it is governed.

Expected results

From this unit the trainees are mainly expected to realize the problems created by the methods of modern (conventional) intensified form of agriculture - animal husbandry, to raise awareness and understand the value of protecting the natural environment and consuming quality food products.

Also, to describe the state of organic farming in the world, to recognize the usefulness of the standard of organic farming, to know the concepts and keywords, to refer through nostalgic references and presentations to images of traditional agriculture.

1.1 Historical background

Agriculture is the primordial art created by man to satisfy in a stable context his needs for nutrition, clothing and the supply of raw materials for all kinds of other products. It includes all the efforts aimed at improving the quantity and quality of plant production through the cultivation of the land and the improvement of the breeding of farm animals, whose food is based on plant products. Modified natural ecosystems, agro-ecosystems, are formed through agriculture.



The growth of capitalism, the rapid technological development and the increase of the world's population had a huge impact on agriculture as well. Conventional agriculture - in its most common form - especially from 1930 onwards, greatly alters the structure and operation of animal ecosystems. The productivity and mobility of organisms increase, many species in the food chain are threatened, genetic and biological diversity is reduced, biogeochemical cycles are opened and the stability of the ecosystem is deregulated.



Use of technology in crop irrigation (https://eclass.teiep.gr/courses/TEXG108/)

Therefore, after the Second World War, there is self-sufficiency in basic food items, increase in productivity, decrease in production costs, increase in the number of citizens fed per farmer. This was expected to cause a general euphoria.

Agricultural development plans (EU Common Agricultural Policy) focus only on productivity in order to feed the ever-increasingly rapidly growing population, especially in the poorest countries.

On the other hand, general euphoria has led to an increase in urban centers and the urban population, while at the same time agricultural land and agricultural holdings are declining, as is the active rural population.



Agricultural production was intensified with the aim of maximizing output through the reckless use of chemical fertilizers, irrigation water, pesticides and soil tillage.

The crop rotation system was abandoned and valuable biological and genetic material of plants and animals disappeared, while there was also an import of foreign species for cultivation.



Application of pesticides in olive cultivation (Directorate of Rural Development of Ilia, 5-9-19. https://www.protinews.gr/blog/dolomatikoi-psekasmoi-gia-dako)

The effects on the degradation of the environment, whether natural or residential, and the quality of agricultural products are significant, both in terms of organoleptic (taste, aroma, color) and in terms of their hygiene and safety. There is a lot of water pollution where pesticides and nitrates are detected beyond the permissible limits. Soils are degraded (eroded) in many areas, forests are exploited predominantly, and natural resources (ores, water, flora and fauna) are lost resulting in agricultural lands becoming unproductive. The loss of agricultural land has led to the deforestation of forests, which are given for use as agricultural land. The resistance of crop enemies to pesticides is growing, and the result is that more and more quantities are being used and are now being detected in food. The use of water in agriculture for irrigation tripled in the decades 1950-1990 and the available amount of water per inhabitant decreases.





Soil erosion and desertification (http://www.texnologosgeoponos.gr/2020/06/blogpost_913.html)



Frequent occurrence of rural area with pollution from empty packages of plant protection substances -5-19, https://www.xronos.gr/repart/voynooi-(18 kenessyskeyasiesfytofarmakonse-pollasimeiatoy-nomoy-rodopis).



Products with the most excesses in pesticide residues

	Control product	Excess percentage (%)
1	Legumes	11,1
2	Spicies and nuts	8,1
3	Grapes	6,6
4	Green vegetables	5,8
5	Solanacene (tomatoes,	6,2
	peppers)	
6	Citrus fruits	3,4

Benakeio Phytopathological Institute, https://docplayer.gr/5800132-Trofima-nera-kai-ypoleimmata-georgikon-farmakon-dr-g-e-miliadis.html2010.

Animal farming is equally intensified following industry standards. Outputs increase with genetic improvement, food rich in nutrients and energy, medicines, antibiotics and growth hormones.



Suffocation cages for cows managed by a well-known dairy company based on industry standards, (28-3-2017, https://www.reader.gr/extras/ta-kloyvia-tis-asfyxias-salos-me-tis-synthikes-diaviosis-ton-ageladon-tis-marks-spencer-pics)

At the same time, the use of Genetically Modified Organisms (GMOs) begins in agriculture, i.e. plants and animals to which genes from completely different microorganisms are transferred. This venture is particularly profitable for companies.

The image of bliss, however, quickly began to blur. The first serious problems appeared as early as the 1970s. The soil began to "get tired" and the organic matter was depleted. The quantities of chemical fertilizers that had to be used to produce specific quantities of product had to be constantly increasing. Something similar



happens with pesticides. Their almost absolute effectiveness in the first years of applications gave way to problems such as the following:

- resistance of many plant enemies to the active substances of pesticides
- extermination of beneficial organisms
- collapse of the ecological balance of the systems
- water and soil pollution
- air pollution and therefore deterioration of the greenhouse effect
- poisoning, toxicity and carcinogenesis in producers/users
- residues in agricultural products and effects on the quality of life of consumers, food scandals in recent years ('crazy cows', 'swine flu', 'bird flu', etc.).

Conventional agriculture therefore leads to a dead end and alternative forms of agriculture are sought, which are in line with technological progress, economical in natural resources, efficient, reliable. In this context, the model of sustainable agriculture was proposed, which manages the agro-ecosystem in a holistic way, and includes integrated management and organic farming. It tries to be the link that will reconnect communications that have been interrupted for years. To restore the way of thinking, where nature is treated with respect and the producer realizes that he must finally keep up with it and accept its laws and limits and not ignore them.

The history of organic farming, of course, is lost in the depths of the centuries. The principles and methods that follow are a continuation of the so-called traditional agriculture. From the writings of the ancient Greeks, Romans (naturalists and doctors) and Byzantines (mainly monks) valuable information is drawn on how to cultivate and fertilize various fruit trees and vegetables, the treatment of diseases and pests of the soil, and on which Rudolf Steiner was based for his study of plant growth.

New forms of organic farming have appeared since the first decades of the 20th century, while its first movements are associated with the various spiritual and internal currents of philosophical basis (Goethe, Steiner, Pfeiffer) and aim at human development through various activities between including healthy eating and living. They are, however, characterized by an excessive dogmatism and mysticism and for many years remained far from any scientific development. We come to 1924, where the Austrian Rudolf Steiner organized the "Agricultural Seminar" and practically established organic-dynamic cultivation, an alternative way of practicing agriculture, highlighting the relationship of the natural ecosystem with cosmic influences.

In the following decades, a movement was created in Switzerland with economic and socio-political motives, such as producer self-sufficiency and local consumption. In 1960, the movement expands its goals by promoting the protection of the environment, the quality of food, the evolution of soft and renewable forms of energy, while abandoning the model of full autonomy of the agricultural enterprise and beginning to accept some natural inputs, such as minerals for soil enrichment. Leading representatives are Hans Mueller and Hans Peter Rusch.

In the United Kingdom after World War II the need to promote natural agriculture and soil-plant-animal-human communication was strongly expressed, so that the Soil Association was founded, an organization that highlights the role of



organic matter, soil activity in plant growth and resilience, with Eve Balfour and Albert Howart (1940) as the main representatives.

In France after World War II, two main movements were created: the first by doctors and physiotherapists with the aim of healthy eating and the second by rural people who promoted the importance of soil fertility for the growth of healthy plants. Later, consumer cooperatives were created in urban centers for the systematic promotion of organic products. Organic farming by Masanodu Fukuoka also spread in Japan.

Defining what organic farming is, we would say it is a holistic production management system that promotes and enhances the health of the agro-ecosystem, including biodiversity, biological cycles and soil biological activity. It emphasizes on the application of management practices (such as carving), which are preferred over the use of external inputs taking into account microclimate and local conditions.

Goals of organic farming should be:

- increase of biodiversity in the whole agro-ecosystem
- increase of biological activity of soils
- maintaining soil fertility in the long run
- recycling of plant and animal residues to restore soil nutrients, reducing the introduction of non-renewable resources
- use of renewable resources through locally organized agricultural systems
- promoting the proper use of soil, water and air for hygiene and safety
- handling of agricultural products with emphasis on processing methods to maintain the biological integrity and quality of products at all stages
- possibility to determine the required time period of conversion of the crop from conventional to organic

The principle of organic animal farming is the link between animals and their farms. The animals have access to open areas, their diet comes from the field itself and they are veterinary monitored for their health and well-being.



1.2 Organic farming in the world

Organic farming is applied in many countries of the world, the areas of which are constantly increasing with the main criterion being the increasing demand for organic products mainly in Europe, the US and Japan.

In *Latin America*, the region with the greatest biodiversity and microclimate in the world, producers use the knowledge inherited from the Inca era, and cultivate millions of acres with many different species and varieties of potatoes. Microclimate and biodiversity favor organic farming.

In some parts of Peru, 30% of the crop is organic. Argentina, Brazil, Peru and Colombia are the Latin American countries with the highest rates of organic farming. Legislation is being developed, producers are being supported scientifically and commercially even though governments are not providing financial support.

In *Africa*, organic production has little effect. Although most of the production is close to the standards of organic farming, there is a lack of certification, relevant legislation and the products are sold as conventional. It is generally gaining ground on the one hand due to the growing demand observed in developed countries and on the other hand due to the effort to prevent soil erosion and desertification. A shift to organic farming is observed in countries where there is an inability to dispose the overproduction of conventional agricultural products, as well as in cases such as Burkina Faso, which is unable to import chemical fertilizers and pesticides for economic reasons. It is worth mentioning that the Ministry of Agriculture of South Africa is expected to establish rules for production and certification.

In *Asia*, the proportion of organically grown land is very small. Japan has a 1% organic farming program for 2003. Turkey and Israel also produce organic products (mainly fruits and vegetables), as well as China, India, Sri Lanka and Korea (cocoa, coffee, greens, spices, rice, tea, vanilla).

In Australia has had national standards for organic farming since 1992. Today, 70.7 acres, the largest in the world, belong to the church and are used for grazing. Australia also supplies Europe with fruit and vegetables in the winter.

More than 10.3 million acres are organically cultivated in *North America*. The US, Canada and Mexico show significant percentages of organic farming and export many of their products.



Organically cultivated areas and number of farms worldwide by continent, 2006

A/A	Continent	Area Percenta		Number of
				farms
1	Oceania	116.451.000	2,59	2.669
2	Europe	69.204.620	1,38	187.697
3	Latin	58.093.200	0,93	176.710
	America			
4	Asia	28.935.720	0,21	129.927
5	North	21.992.250	0,56	12.063
	America			
6	Africa	8.905.040	0,11	124.805
	Total	305.581.830	0,74	633.891

Source: $\Delta H\Omega$, 2008.

1.3 The status of the international market

In most developed countries, organic products cover the full range of the food market. They are available in supermarkets, food stores, special stores for natural and organic products, in special public markets and in the farms where they are produced or delivered by the producers themselves to the homes of consumers in boxes.

1.4 The need for internationally recognized standards

Consumer demand for organic products is constantly increasing and has been linked to the response to the mad cow crisis, bird flu and the spread of genetically modified organisms (GMOs). The crisis of 1929 and the economic catastrophe of many farmers in America helped spread organic farming to this continent.

After all, in Europe there are many who consider organic farming important for the protection of the environment. It is not only a method of agricultural production, but also a complete proposal for life. A proposal that covers the essential human needs for healthy eating, natural living and participation in the commons.



Because, therefore, the field of organic farming is threefold: it is at the same time a social movement, a scientific field and a productive field, it contains economic interests. A retailer or a conventional crop producer could call their products organic in order to profit from the added value. It is therefore necessary that the meaning of these relevant terms be clear and that organically produced products meet them.

The need for specific and harmonized rules to protect and inform producers and consumers led to the establishment of various private bodies, such as the IFOAM (International Federation of Organic Agriculture Movements) in 1972, and state authorities. The FAO (Food and Agriculture Organization) and WHO (World Health Organization) of the United Nations and the European Union (EU) were also involved. IFOAM adopted in 1998 the General Specifications of Organic Agriculture and Processing, which are not mandatory, but are a guide to EU Regulations and the legislation of the various countries.







It is indicative that in 2008, 69 countries already had their own regulations for organic products and 21 were in the process of drafting regulations. In 2007, organic product standards were agreed between the countries of East Africa and the East African Organic Mark was created.

Summary of Educational Unit 1

Organic farming, although it has a history of thousands of years as a continuation of traditional agriculture, it has only developed as an result to the food scandals of the 20th century in many parts of the world and is cultivated in a small percentage of areas with increasing rates of expansion. Awareness of the problems posed by conventional agriculture, sensitivity to the protection of the natural environment and consumer demand for quality food lead to the need to create internationally recognized standards of organic farming.



2. Organic Agriculture in Europe

The <u>purpose</u> of the second educational unit is to present the situation of cultivated areas of organic farming in European countries, in which there is a great increase, to describe the legal framework in force in the Euro zone and the specifications of organic and livestock products, how to produce them in order to maintain soil fertility and restore ecological balance with the least possible human intervention.

Through this unit, trainees are expected to master the terms of organic farming, to understand the common legislation between the Member States of the European Union, to conclude a possible connection between the legislation and the cultivated areas and species, to be able to describe the possible ways to enhance soil fertility and therefore plant nutrition, to treat pests and plant diseases in a biological way and to learn the permissible breeding conditions of livestock and bee colonies.

2.1 Cultivated areas by species and country

The ideas of organic farming were born in Central Europe and resonate in many European countries from the early 1990s to the present.

In the EU, in the period 1986-1996, areas under organic farming increased by 30% per year, as the farms included in organic farming increased. Already in some areas the percentage of organic farming in relation to the total cultivated area is in double digits and in some mountainous areas of Austria it reaches 50%. The greatest growth was observed in the Nordic and Mediterranean countries. Italy has the largest organic farms in absolute numbers, while Austria has the largest share of the total cultivated area. In our country one of the highest growth rates was observed, but the sizes are still quite low.

According to statistics from the European Union of 25 Member States for 2005, the area occupied by organic crops was only 3.9% of the total utilized agricultural area. This figure, if compared to the figures of the 15 Member States in 1998, shows a significant increase from 1.8% in 1998 to 4.1% in 2005. In terms of the number of organic farms, they represent 1.6% of the total amount of farms. In almost all 25 Member States of the European Union, the average organic farms was higher than the overall average of farms, as the number of acres per organic farm is 390 acres, while the number of acres per property is estimated at 160 acres, which is the average of all agricultural farms. The largest organic farms are found in Slovakia (4,630 acres / farm) and in the Czech Republic (1,420 acres).

Measurable data is also available for the year 2006, in which the total organic farming area in Europe amounted to 69,204,620 acres, while the number of organic farms to 187,735. Italy is the country in Europe with the largest organically cultivated area (10.8 million acres), followed by Spain (8.07 million acres), Germany (8.07 million



acres) and France. (5.6 million acres). In terms of the number of organic farms in 2006 in Europe, the first country is Italy (44,733 farms), second Austria (20,310 farms), third Germany (17,020 farms) and fourth Spain (15,693 farms). However, based on the percentage of organically cultivated area over the total area, the ranking changes, as the largest percentage is found in Liechtenstein (27.9%), followed by Austria (14.2%), Switzerland (10.9%) and Italy (8.4%).

The average annual increase of biological areas during the period 2005-2011 was 7.9% in Europe, 7% in the EU of 27 member states and 14% in other European countries outside the EU. The highest average annual increasing rates in organic areas were recorded in Montenegro (692%), the Russian Federation (198%), FYROM (157%), Bulgaria (64%), Croatia (49%) and Turkey (42%). In most major producing countries increasing rates were also satisfactory (Poland 26%, Spain 18%, Sweden 14%, Czech Republic 10%, France 10%), while it was lower in Germany (3.9%), Denmark (3.2%), the United Kingdom (0.9%) and Italy (0.7%).

In 2011, according to IFOAM estimates, the largest producers of organic products based on their cultivated areas, was Spain with 1,621,898.3 hectares (corresponding to 15.25% of the total area in Europe), Italy with 1,096,889 hectares (10.32%), Germany with 1,015,626 hectares (9.55%), France with 975,141 hectares (9.17%), the United Kingdom with 638,528 hectares (6 %), Poland with 609,412 hectares (5.73%), Austria with 542,553 hectares (5.1%) and Sweden with 480,185 hectares (4.5%).

During the period 2010-2016 the total agricultural area used for organic farming in the EU increased from 9.1 million hectares to 12 million hectares, i.e. an increase of 33%. In 2016, the percentage of organically cultivated areas amounted to 6.7%. During the same period, retail sales of organic products increased from 18.1 billion euros to 30.7 billion euros, an increase of 69%.

The latest available data for the year 2018 regarding organic agricultural land in the European Union, according to Eurostat, amounted to 13.4 million hectares. Specifically the areas of organic agriculture and animal farming in the period 2012-2019 increased by 34%. In Bulgaria, Croatia and Ireland organic areas more than doubled, but there were also two EU countries where there was a decrease, the United Kingdom (by 22.5%) and Poland (by 26.1%). Spain, France and Italy had the most organic farms and livestock in both 2012 and 2018. These three countries, together with Germany, accounted for more than half of all EU organic farming in 2018. In particular: Spain (16.7%), France (15.1%), Italy (14.6%) and Germany (9.1%), with a total of 55.5%.



2.2 Community Legislation

The need for specific and harmonized rules for the protection of organic farming has led to a control system that secures products, producers and consumers. It consists of a body or bodies and a process of controlling the observance of the cultivation specifications and the certification - labeling of the products. Characteristics of this process are impartiality, objectivity and scientific adequacy of potential and infrastructure.

It aims to protect the interests of the consumer from counterfeit products and the organic farmer from unfair competition of such products, as producers are treated with the same measures and the same strictness, to facilitate the free movement of organic products in the EU and to formally acknowledge and recognize the benefits of organic farming in rural development planning at various levels.

The first level concerns the Standards, as described in the relevant legislation, is in terms of what or to what criteria we refer today to an organic product. It is a set of written instructions that clearly define the context in which the producer will move and concern the methods and means of production: what is required, what is proposed, what is allowed and what is forbidden. Although the producer may resort to sophisticated ecological practices, such as biodynamic products or the protection of wildlife around the crop, it may not exceed the minimum requirements of the specifications.

Biodynamic products receive the Demeter certification from the respective movement, which includes factors of research, production specifications, training, marketing, certification bodies in various countries. Prerequisite for certification is certification according to European regulations 834/2007 and 889/2008. A development of biodynamic agriculture is the homodynamic agriculture inspired by the Italian Enzo Nastati of the organization "Tree of Life" and is supported in Greece by an informal group, which organizes research, regular training meetings on biodynamic and homogeneous agriculture.



Logo for the international standard Demeter



Many years of experiments comparing biodynamics with organic and conventional agriculture have proven the following:

- a) the soil is more alive (with more organic matter and microorganisms) and retains more moisture
- b) yields are reduced (by 20%), but efficiency is increased.

One kilo of biodynamic product requires 50% less amount of nutrients and 25% less energy consumption compared to conventional. Nitrogen and carbon losses in the environment are reduced.

This means that biodynamic agriculture emits less carbon dioxide - one of the greenhouse gases. Animals prefer biodynamics to other foods in experiments.

The superior quality of biodynamic products is captured by special illustration methods, e.g. crystallography. There is scientific evidence that consuming biodynamic products increases the well-being, improves the immune system and lowers blood pressure.

The differences between organic farming, which is implemented according to the EU Regulation, and the specifications of Biodynamic Agriculture are the following:

- a) organic and non-organic farming is not permitted on one farm, the whole farm has to be cultivated hemodynamically
- b) there must be animals on annual crops preferably ruminants (goats, sheep, cows), with the exception of arboriculture, vineyards and vegetables
- c) the seed is biodynamic or at least organic
- d) special farm-made fertilizer and special biodynamic products are used
- e) animal feed comes from at least 2/3 of biodynamic companies
- f) a specialized consultant in biodynamic agriculture is required.

The standards of organic farming were originally formed through organizations of the countries of Europe and North America in the period 1930-1970, they are consolidated for the first time historically within the framework of the I.F.O.A.M. at the end of the 70's, then by the relevant European Regulation (2092/91), which was voted by the Council of Ministers of Agriculture of the then EEC, today EU, and gradually entered into force in various Member States.



Logo of the organization IFOAM

It has enacted a rather complex piece of legislation, which describes the various terms and indications on organic products, their production methods and how to ensure compliance with these rules. Each Member State should designate at national level a competent audit authority to monitor the certification process for organic products, which may be entrusted to public services or private bodies approved by the national audit authority.



One year after the adoption of the above-mentioned basic Regulation, the Council of the EU adopted Regulation (EEC) No 2078/92 on agricultural production methods, which comply with the requirements of environmental protection and conservation of natural space.

In contrast to the first European Regulation, the second does not refer exclusively to organic farming, but is one of the so-called accompanying measures of the Common Agricultural Policy (CAP), concerns general environmental methods of agricultural production. Its implementation is carried out through specific national programs submitted by the Member States and based on the diversity of the natural environment and the different structures in them.

This Regulation was supplemented and amended by newer Regulations: Reg (EU) 1257/99, 445/02, 963/03, 1783/03, 817/04 and 1360/05.

The European Union Regulation 1804/1999 was adopted in 1999, laying down Community rules relating to the production of products of organic farming and creating a complete legal framework for both plant and animal production. It listed the permitted raw materials, feed additives and permitted products for cleaning and disinfecting livestock facilities.

It was the product of a consensus between the conflicting interests of the Member States of the European Union and of farmers wishing to join this production system. Its introduction has accelerated following consumer pressure as a result of various food scandals (mad cow disease, meat meal, dioxins) and concerns over GMOs.

Subsequently, with regard to Regulation (EU) 223/2003, issues related to animal feed were settled, as when a product of animal origin bears the label "organic", the feed used to contain at least 95% raw materials of organic origin.

The protection of organic products was strengthened in March 2000 with the creation of a community logo characteristic for organic farming. The logo states that the product bearing it has been produced in accordance with the relevant EU standards and that it is subject to a system of control and certification.



The EU logo for organic products, https://filikicert.wordpress.com/tag/logo/

European Regulation 734/2007 is now in force, which replaced the previous 2078/92, with the aim of simpler use by farmers and stockbreeders, increasing



consumer confidence and facilitating and stimulating the marketing of organic agricultural products in the Community and on international level. 2001, therefore, will go down in history as the year in which organic products gained prominence in all retail chains, showing more aggressive trends than in previous years.

The new regulation differs in the following points from the previous one:

- extends its application to aquaculture products, algae, yeasts and wine with special production rules
- the use of low solubility inorganic fertilizers is allowed
- the ban on the use of Genetically Modified Organisms is linked to the current legislation for conventional products, according to which 0.9% random presence of approved GMOs is allowed without making the relevant indication mandatory
- it is possible to operate units for the parallel production of conventional and organic products
- the use of biodynamic products is allowed
- specific products and active substances for organic farming are approved and a list is drawn up
- conversion periods are defined specifically for each type of conventional or organic farming or animal farming
- the adoption of any exceptions to the rules of organic farming and breeding is provided for, in accordance with the principle of flexibility
- the European logo is placed on the "pre-packaged" organic food in the EU countries giving the opportunity to affix the national logo too
- when the European logo is affixed, the place of production is indicated
- permanent regulations for products imported from third countries, which have not received equivalence themselves or their audit body or authority, the European Commission recognizes the audit authority or bodies of those countries and their equivalence on the basis of Codex Alimentarius CAC / GL 32 guidelines and not in accordance with EN 45 and ISO 65.

In terms of tolerance for the presence of GMOs in organic and farming products, European and environmental organizations, as well as the European Parliament, had called for stricter limits to ensure their excellent quality. However, a stricter demarcation would impose stricter and therefore more costly controls.

Whether a product is organic or not is not determined by scientific testing. Maintaining and justifying consumer confidence in products labeled as organic depends on the ability of the control and certification system to reduce the likelihood of companies not complying with the relevant standards.

2.3 Information and training mechanisms

The official website of the European Commission for Organic Agriculture is an initiative of the EU Directorate-General for Agriculture and Rural Policy as part of the



campaign for the development of organic farming throughout the European Union. The website serves as a key component of the campaign, the general content of which is tailored to consumers. A special toolbox section also provides printed photographic and audiovisual material for use by stakeholders including farmers and agricultural cooperatives, processors and retailers, thus promoting the campaign in the various EU Member States. The website also contains the latest news, lists of events related to organic farming, as well as links to other sources of information and members of the field.

2.4 Financial Support

Pursuant to Regulation (EEC) No 2078/92, a specific Community scheme for financial support for organic farmers through subsidies of acres co-financed by the European Agricultural Guidance and Guarantee Fund (EAGGF) was introduced for the first time and was replaced by 734/2007.

2.4.1 Rules for the production of organic products

As a holistic production management system, organic farming takes into account all the factors involved. The producer needs to think about the effects of his actions on the atmosphere, on soil organisms, on the wider farm environment, on the quality of his and consumers' health. The purpose of the producer's choices is to promote the balance and harmonious development of the factors involved in agricultural practice without isolating a factor, such as increasing production.

For example, the type of plant that the farmer chooses to plant will be the result of studying the potential long-term effects on the soil, the adequacy of water available for irrigation, the variety of plant species on the farm and the wider area. It is necessary to study whether the plant is suitable for the specific soil or whether there will be deficiencies of nutrients such that its cultivation is economically unprofitable. Also he will consider whether it will be able to meet high water requirements that will be forced into costly drilling resulting in depletion of the area's water resources and long-term effects on the balance of the local ecosystem.

The collection of native vegetation in the natural environment, in forests and in agricultural areas is considered a method of organic production provided that these areas have not received interventions that are prohibited in organic farming in the last three years. Attention needs to be paid to maintaining the stability of the natural habitat and to the conservation of the species collected for marketing.





Picture: Collection of wild (native) edible grasses that can be considered organic https://defkalionas.wordpress.com/2012/06/09/πότε-μαζεύουμε-βότανα

When transitioning to organic, it is good for the conventional crop producer to know that the minimum transition period is two years before seeding for annual crops and three years for harvesting in permanent crops. These periods are modified according to the history of previous crops.

The producer is also called upon to maintain a direct contact with the consumer, which will give him recognition, appreciation for the work and the role he plays and therefore an ethical reward. The producer becomes more responsible and careful in terms of production, its effects on health and the environment. The consumer, for his part, gains confidence in the quality of the products, but also satisfaction that by his action he contributes to the wider mobilization for the quality of life and the protection of the environment.



Picture: Organic wheat flour with the name of the producer https://www.bioshop.gr/aleuri-st.-olikis-skliro-bio-1000gr-viougeia.html



2.4.2 Organic livestock breeding rules

With regard to organic livestock, for each species of animal there are specific periods of transition of its breeding from conventional to organic, in accordance with the specifications of the relevant European Regulation so that the animals and their products can be sold as organic.

Care should be taken in the selection of adapted breeds in the breeding environment in order to utilize the local vegetation and show resistance to diseases. They must come from biological units or import animals for herd renewal and males intended for reproduction.

Most animal feed (90% for ruminants and 80% for omnivores) comes from fully certified organic feed or transitional organic feed. Feed derived from GMOs, meat flour and other substances is prohibited. It is good to prefer feed of the same production, while weaning is done with natural milk.

With regard to animal husbandry conditions, ruminants should have access to pastures and omnivores in courtyards whenever the weather permits, while permanent restraint and stabling of animals, cages for laying hens and individual cages for hens and mammals are generally prohibited. These cages give the minimum possible area for each animal to have at its disposal. Protection of the animal from stress during transport and slaughter is provided.



Picture: Free grazing of ruminants

https://www.akroama.gr/απτά-μέτρα-στήριξης-ζητούν-αγρότες-κα/

Vaccinations and deworming are allowed to prevent and treat diseases. The use of homeopathic and phototherapeutic drugs and micronutrients are encouraged, while the use of antibiotics is not prohibited. Recycling of packaging is encouraged.

In the case of organic beekeeping, the hives are placed in the appropriate place and environment so that the sources of nectar and pollen within three kilometers are available, coming from organic crops or from crops with little disturbance in the



environment. They should be placed far from any source of contamination - urban centers, landfills, industrial centers, waste incineration sites.



Picture: Apiary protected from the north-west direction https://blog.beeing.gr/πως-τοποθετούμε-μια-κυψέλη-στο-μελισσ/

2.4.3 Rules on processed organic products

Processed products are marked as "organic" as long as 95% of the ingredients of agricultural origin are organically grown and exclude the use of GMOs in their ingredients, while ingredients of non-agricultural origin are allowed, such as additives, perfumes, water, salt, products based on microorganisms and minerals and technological auxiliaries. The remaining 5% of the ingredients of agricultural origin are approved to be non-organic if they are not at least sufficiently available on the market.

On the label, in addition to the EU logo, the code of the audit body is indicated as well as a statement to whether the agricultural raw materials that make up the product have been produced in the EU or in third countries (or both), as in the pictures below.



Picture 14: Label model of processed agricultural product (> 95% organic ingredients) https://physiologike.gr/content.php?cat id=20&ctg id=48&lang=el



2.4.4 Transfer rules

The transfer of organic products takes place in bulk when it takes place from the production unit to the marketing unit, as long as these two units are controlled by the same audit body. In case the products are transported from one production unit to another, the products are in closed packages where the name and address of the producer or processor and the name of the product and the method of production are indicated.

Livestock products are distributed only packaged and frozen in organic stores.



Picture, Bulk sale of organic products at the entrance of the farm, Prokopi Evia https://www.lifo.gr/articles/greece_articles/205813/ena-magiko-agroktima-sto-prokopi-eyvoias

2.4.5 Rules for the production of biodynamic agriculture products

Licensed in over 60 countries around the world, biodynamic farming is a method of organic farming with a holistic and spiritual approach to sustainable food production.

As mentioned in Section 2.2, biodynamic agriculture is a sophisticated ecological practice of Organic farming and its products receive the Demeter certification from the respective movement, which includes bodies of research, production specifications, training, marketing and certifications operators in different countries.



Used in more than 60 countries, Demeter certification confirms that biodynamic products meet international standards in the production and processing of sustainable foods. Regulated in the UK by the Association for Biodynamic Agriculture (BDA), Demeter's biodynamic standards are based on EU biological standards.

Prerequisite for certification is accreditation according to European regulations 834/2007 and 889/2008.

In biodynamic agriculture, two preparations are mainly used: fertilizer - horn preparation (BD 500) and quartz-horn preparation (BD 501). Used to improve the biological environment of the soil, (BD 500) is produced from fresh cow manure, which is collected in the autumn, placed in a cow horn and buried in the soil for a period of six months. The quartz-horn preparation (BD 501), in turn, is used to treat plants and is made of finely ground quartz mixed with a paste. After light moistening, the quartz powder is placed in cow horn and buried in the soil for several months. Activation of both preparations is done by stirring for an hour, then sprayed on the soil or plants.

Preparation of a biodynamic product







Traditional agriculture has long used the lunar phases as a guide for crops. The biodynamic calendar also includes constellations and planetary arrangements. Inspired by Steiner, the biodynamic calendar was developed by German farmer Maria Thun (1922 - 2012), who experimented with the planetary effects on planting, sowing and harvesting. The biodynamic calendar can be adapted to specific hemispheres of the planet. Although not part of the Demeter accreditation requirements, the calendar is used by most farmers and gardeners who practice biodynamic farming.

2.5 Promotion of organic agriculture and livestock products

2.5.1 Distribution of organic agriculture and livestock products and networking

Trade in organic products is on the rise, leading to long-distance transport of food, either fresh or processed, produced inside and outside the EU. Although the new regulation on organic products includes the aim of encouraging short distribution channels and local production, the term "organic" is not synonymous with the term "local". The biggest exporter of organic products to the EU is China.

Therefore, the prices paid by consumers for organic products are higher than those of conventional ones, usually much higher. The price difference is affected by both consumer demand and differences in processing and distribution costs. The reported price increases vary considerably between studies and food species, and only a portion of this increase is collected by growers and breeders.

High retail prices are considered as the most serious disadvantage of organic products that restricts consumers from buying, especially uninformed and opportunistic consumers. The "price" factor acts as a deterrent to conscious consumers, when the price difference exceeds the psychological limit of 25-35% (depending on the product), while it is completely dissuasive to unconscious or opportunistic buyers of organic products.

The only network of integrated services to small and medium-sized enterprises to enhance their competitiveness through their internationalization is the Enterprise Europe Network, which emerged from the integration of the European Information Centers and the Innovation Promotion Centers. It started functioning in early 2008 and it consists of 70 consortia (600 organizations) in more than 40 countries (European Economic Area member states, candidate countries and third countries). It includes over 500 contact points for entrepreneurs in Europe, which provide a full range of support services for small and medium-sized enterprises throughout the Community and beyond. The mission is to strengthen competitiveness, support the development of less-favored areas, promote innovation and entrepreneurship, strengthen links between industry, research and investment capital, and foster economically and environmentally sustainable growth and employment.



The European for SMEs / SMEs and Innovation portal provides access to information on the full range of EU policies, legislation, programs and initiatives for small and medium-sized enterprises in Europe.

IMPtove is an initiative designed to encourage small and medium-sized enterprises to develop and improve their innovation management skills. With the support of the INNOVA European Initiative, the starting point of IMPtove is an online tool with which companies can evaluate their existing capabilities. After comparing their own performance with that of their peers, IMPtove offers them an advisory service to improve their performance in innovation management.

2.5.2 Competitiveness research

The development and spread of organic farming in the EU strengthened significantly through research. Until the 1980s, surveys were conducted mainly by private companies. In 1982, it was integrated for the first time in the planning of research activities by an EU university, while in the 1990s the first - EU-funded - research projects on organic agriculture began. At the same time, many national operational programs have included specific measures and actions to support organic farming research. Mention can be made of the Federal Organic Farming Plan (BOEL) in Germany (since 2002) and the Organic Farming Research Program (DARCOF) in Denmark (since 1996).

The key priorities regarding the needs of the organic farming sector in EU research are presented in the Table below.

Table: Research priorities in the field of organic farming

Criteria-	A/A	Research areas
Objectives	,	
J	2	arable crops reduction of labor costs seeding plant protection fruits and vegetables plant protection varieties labor cost
Increase in at least 20% of the total cultivated		qualitymarketing
area	3	non-ruminants
	4	ruminants
	5	meadows (pastures)



	6	economic prospects - opportunities
	7	policy making
	′	• institutional tools to support
		organic farming
		research on the benefits of
		organic farming
		strategies for optimizing them
	1	ruminants
	1	spongiform encephalopathy
		spongnorm encephalopathy antibiotics
	2	milk quality fruits and vegetables
	2	fruits and vegetables
		plant protection
		heavy metal residues
		nitrogen cycle
		organoleptic characteristics
	2	product appearance
Ensuring	3	labor and trade law issues
successful	4	non-ruminants
marketing of		dietary cycles
organic products		• housing
		antibiotics
	5	arable crops
		nitrate fertilizers
		mycotoxins
		soil erosion
	6	protection of the environment
	7	meadows ·
		intensive use
		lack of biodiversity
	8	processing
		product differentiation
		organoleptic characteristics
	4	• GMOs
	1	ruminants
		ethical issues
Long-term and		• nutrition
sustainable		holistic approach to animal health
development of	2	non-ruminants
organic farming		• nutrition
	_	free range systems
	3	protection of the environment



4	 agricultural development possibilities maintenance-protection of the landscape job creation
5	organic products in supermarkets • fair trade products
6	 energy renewable energy sources energy production in organic production units control - reduction of consumption
	 optimization of packaging & transport activities
7	land management

Summary of Educational Unit 2

Organic Agriculture in the European Union is governed by the European Regulation 734/2007, more simplified and flexible than the previous 2078/1992. This Regulation was enacted out of the need to protect the interests of the consumer and the farmer, for the free movement of the products and the securization and official recognition of these benefits as a result of consumer pressure for quality food.

A sophisticated ecological practice is also biodynamic agriculture, which relies on the transfer of the forces of nature at the appropriate time and their utilization for maximum possible yield of crops.

Compliance with the standards for the production, distribution and promotion of organic products allows the products to bear a special sign with the Community logo and the indication of the country of production. The specifications include all permissible interventions to enhance soil fertility and protect crops and farm animals from enemies and diseases with the least possible human intervention.

Organically grown areas are following an increasing trend as a result of legislation and financial assistance on average, while in some European countries in the last 6 years there has been a decrease.

Support for organic farming in mountain areas is provided at European level through research and information as well as training for farmers and consumers.



3. Organic farming

Organic farming guarantees sustainability, equity, food and climate security. It can restore soil fertility, end desertification, extract accumulated carbon into the atmosphere and take it to the soil.

The organic farming is an agricultural method of food production that uses natural substances and processes. This means that organic farming usually has a limited impact on the environment as it promotes:

- responsible use of energy and natural resources;
- conservation of biological diversity;
- protection of the regional ecological balance;
- improving soil fertility;
- maintaining water quality.

In addition, the rules on organic farming promote a high standard of animal welfare and require farmers to take into account the specific behavioral needs of animals.

European Union regulations on organic farming aim to provide a clear structure for the production of organic products throughout the EU. The aim is to meet consumer demand for reliable organic products, while ensuring a fair market for producers, distributors and traders.

Organic farming is a fast-growing area of EU agriculture due to the increased consumer interest in organic products. In response to the challenges posed by this rapid development, and in order to provide an effective legal framework for industry, the EU has adopted new legislation. Due to the complexity and importance of the secondary legislation currently being prepared, the Commission proposed to postpone its entry into force for one year - from 2021 to 2022. The initial request for a postponement was made by EU countries, the European Parliament, outside the EU and other stakeholders.

Among the changes that will be introduced with the new legislation in the field of organic production are:

- strengthening the control system in order to strengthen consumer confidence in the EU organic production system;
- new rules for producers that will facilitate the transition of small farmers to organic production;
- new rules on imported organic products to ensure that all organic products sold in the EU meet the same standards;
 - expanding the range of products that can be sold as organic.

In the next part we will take a look at the situation in Greece and Bulgaria in terms of organic farming.



3.1. Organic farming in Greece

Organic farming in Greece began in the early 80's. Today there are 8269 organic farms with a total area of nearly 250,000 hectares.

The first organic farmers just experimented out of curiosity. In 1982, a Dutch company appeared looking for organic raisins and thus began organic production for commercial purposes. Four years later, a German company supports the production of organic olives and olive oil, but mainly for export. In the following years, individual farmers turned their farms into organic, guided by the recommendations of foreign certification bodies such as Soil Association, Naturland and Skal, as Greece does not yet have its own.

Today, Greece has several certification companies, the largest being DIO. It was established in 1993 and is a full member of IFOAM (International Federation of Organic Agricultural Movements). Typically in Greek, the name DIO comes from the poetic name of the goddess of fertility - Demeter. DIO claims that the land of the Greeks is one of the most fertile and has great potential for the development of organic farming.

A few facts:

There are 8269 organic farms in Greece with a total of 249,488 hectares of land certified as organic. 78% of this land is pasture and the remaining 22% is arable land. This makes 2.7% of the agricultural sector. (For comparison, there are 351 organic farms in Bulgaria and 12,284 hectares certified as organic land, which makes 0.2% of our agricultural sector).

Nearly 9% of world production of organic citrus fruits falls on Greece. Over 50% of the arable organic land in our southern neighbor is occupied by olive trees, which makes 8% of the production of organic olives and olive oil in the world. Greece is the only European country that produces organic cotton. Nearly 4% of the world's organic grapes are produced from Greece. It goes for direct consumption, wine or raisins.

In 2004, the cost of organic food per capita in Greece was 2 euros. These costs are too small compared to the costs of the Swiss (105 euros), the British (30 euros), the Italians and the Germans (42 euros), but in Bulgaria, for example, such costs are almost non-existent.

In 2004 the turnover from the organic market was 22 million euros, and in 2006 it was already 40 million euros. Experts predict that this market will double in the next three years.

Indeed, if until ten years ago most of Greece's organic production was exported, today domestic demand is much higher. Proof of this is the existence of 25 open street markets mainly for local agricultural organic products, almost every



supermarket has organic stands, and in addition there are about 350 specialized organic stores in the country and their number is constantly growing. There are even organic restaurants, such as Mystic Pizzeria, where they offer pizza with hemp seed flour, organic sweets and organic drinks.

In Greece, olive oil is part of almost every dish, perhaps that is why it is the most common organic product, but there are also olives and olive soap.

The range of organic fruits and vegetables is very wide. Organic wine is another product that is highly valued by the Greeks, because according to connoisseurs, its taste and aroma are much richer than ordinary wine. As the share of organic pastures in Greece is quite large, different types of cheese and yogurt are also produced. And to promote the benefits of organic milk, some supermarkets such as Veropoulos offer it at a lower price.

In Greece you can find some strange for us organic products such as natural gum or capers and of course - organic ouzo.

There are also various organic exhibitions in Greece, but the largest is ECOFESTIVAL, which presents various organic products from the country and abroad. If you happen to have a trip to Athens, keep in mind that this year's eco-festival is from November 8 to 11.

Recently, various tourist services with an organic focus are offered, such as a stay in an organic farm, where you have the opportunity to grow your own food (if you wish, of course) or different types of tours with tastings of organic products.

Until a few years ago, Greece was one of the most backward countries in the European Union in terms of organic farming, but recently it has been quickly catching up.

3.2. Organic farming in Bulgaria

In recent years, organic farming in Bulgaria is one of the sectors that is developing rapidly in a crisis, with an ever-increasing area and the number of producers included in the control system. The reasons are related to the very good prerequisites in our country for its development - ecologically preserved areas; awareness and desire of consumers to eat healthy; perceived benefits for the environment and rural areas; support for organic producers - as well as with the good reception of organic products on foreign markets.

In total, over 12.2 thousand hectares or about 1.2% of the arable land are occupied with organic crops in Bulgaria. According to a plan of the Ministry of Agriculture in 2013, 8% of the used areas will be cultivated in an organic way. 56 plant and five livestock farms, as well as four farms for seeds and planting material have bio-certificates from the Bulgarian control bodies. There are 23,508



certified bee families.

In Bulgaria, organic production is still poorly represented - as a percentage of the total agricultural area, the areas for organic production in our country have the lowest share among all other EU countries. Most of the ecological products are exported abroad, as about 6-7% find a market in Bulgaria as well.



According to statistics, over 90% of the currently produced certified organic products in Bulgaria are exported mainly to Western European countries, the United States and Canada. These are mainly herbs, fruits, vegetables, honey and nuts. And among the most common organic wild products are mushrooms, herbs and nuts. In Bulgaria, organic production is still in its infancy, although according to general expert estimates it is a very suitable sector for Bulgaria - both because of its real natural resources and less polluted land, and because of its image as a traditional producer of quality agricultural products. Only organic beekeeping and production of bee products, traditional agricultural activity in our country, show high and competitive results.

The Ministry of Agriculture, Food and Forestry (MAF) of Bulgaria has prepared a National Action Plan for the development of organic production until 2027. The main strategic goals for organic production are set together with representatives of controlling and consulting organizations, research institutes and universities, biological organizations. manufacturers and traders. According to the Ministry, the number of biological operators has increased by 20 times, as in 2008 they were 311, and at the end of 2018 were 6,660. Certified areas for growing organic crops in Bulgaria in the last 7 years are increased more than 6 times. As of 2018, the areas in the control system are 162,332 ha, and as of 2011 they were 26,622 ha.



Since 2015, Bulgaria has been one of the leading countries in terms of areas under vines grown by organic farming in the EU, which makes it possible to produce organic wine. Our country is among the leaders in Europe in terms of the number of beehives raised in accordance with the methods of organic farming.

- As of 2011, their number is 58,855
- in 2018 it increased four times and reached 265,069.

In the period from 2016 to 2018 there is an increase in the areas planted with roses and lavender, respectively by 2018 they are 2255 ha and 7 021 ha. Bulgaria is the largest producer of organic rose and lavender oils in the world. This fact, as well as the growing production of various other organic essential oils, such as balm oil, strengthens its position as a traditional and sought-after producer of these essential oils. This defines the country as a key producer with traditions in the production of raw materials for biocosmetics.

Organic farming is a priority sector for support under the investment measures under the RDP. From the beginning of 2007 until now, about 150 million euros have been paid under the Program, mainly for projects for modernization of organic farms, followed by projects of young farmers, small farms and projects for processing of organic raw materials.

A special directorate "Organic Production" has been established to support the control in the department. Among the objectives of the department are the inclusion of schemes and measures to support farms that do not meet the criteria for support under measure 11 "Organic production" under the RDP. It is estimated that 30% of them will be supported under such schemes. Conditions are created for the sustainability of small and family organic farms by encouraging the association of producers. Organizing organic products in the School Fruit and School Milk schemes is also one of the current tasks of the plan.

Annual participation of organic farms in temporary employment schemes for workers in them is envisaged.

In order to ensure comprehensive monitoring of the organic production in the country, according to the requirements and regulations of the European Union, an electronic register has been established for the operators and subcontractors, which may produce, process or import organic products.

Due to more expensive production and lower yields, as well as the fact that these farmers protect the environment, they need adequate support.

Under measure 11 Organic Agriculture in 2018, BGN 43.5 million were paid in three areas: Organic Plant Breeding - with 2,900 applicants, Organic Animal Husbandry - with 84 applicants, and Organic Beekeeping - with nearly 950 applicants.

Measure 11 Organic farming - Campaign 2018

BGN 43.5 million paid in three directions:



Organic plant growing - 2900 candidates

Organic animal husbandry - 84 candidates

Organic beekeeping - nearly 950 applicants

40 million euros were transferred to measure 11 "Organic farming"

After a meeting of the Monitoring Committee of the RDP 2014-2020, the Managing Authority presented to stakeholders a proposal to amend the Program. It includes a reallocation of funds in relation to the implementation framework and a proposal to transfer funds from non-launched measures.

The redistribution of funds envisages new commitments under measure 11 "Organic farming" within the 2019/2020 campaign. New commitments under measure 11 will be possible only with positive results regarding the implementation of organic farming and control systems in the country. They will be subject to scrutiny by the European Commission services.

Organic farmers who have passed the transition period and who have not been participants in measure 11 so far will be able to undertake new 5-year biological commitments, and in the first three years of implementation the commitments will be financed from the RDP budget 2014-2020, and the remaining two years - from the budget of the Strategic Plan for the CAP 2021-2027. EU financial support can be both for the transition to organic production and for maintaining the status of organic producer. This is a recognition of the role of organic farming in terms of the different priorities for rural development and the potential benefits to society from organic production methods. EU countries can grant aid in a variety of ways to address the specific challenges that their organic farmers may face.