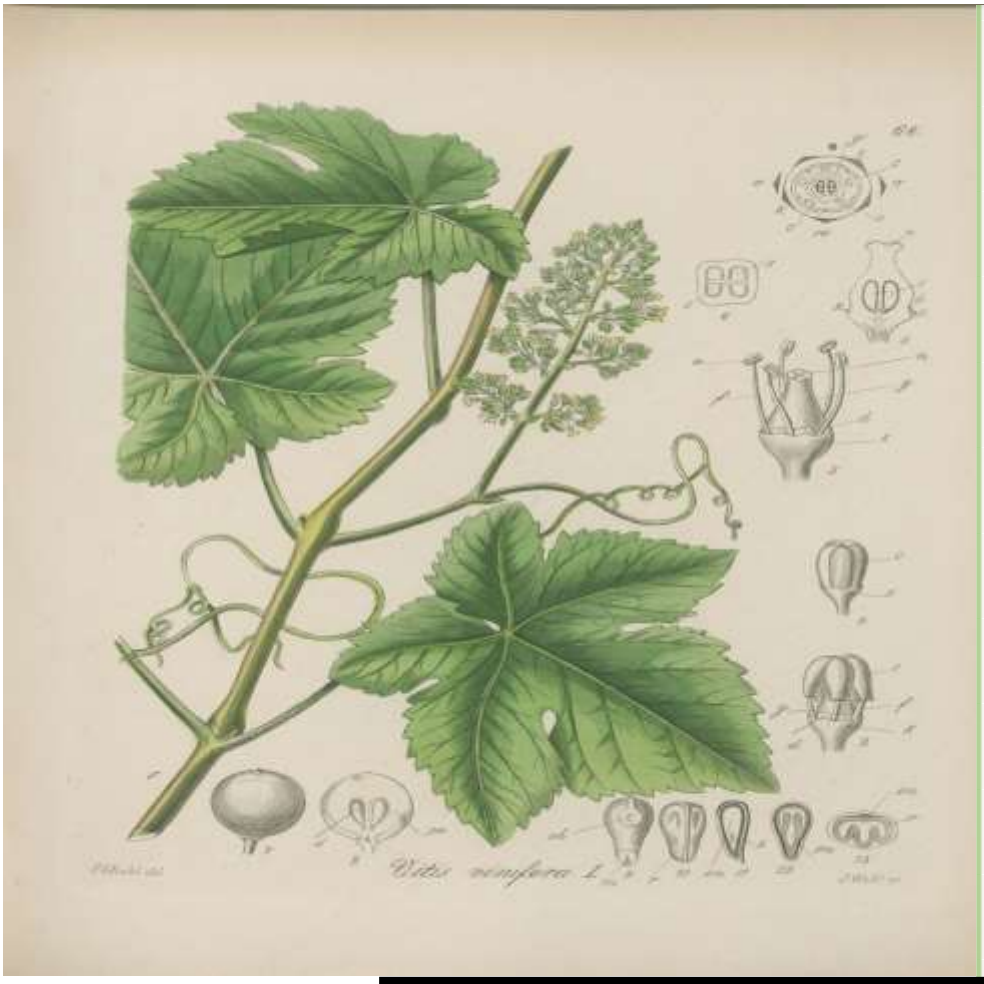

“Horizons” Association

A Guide for sustainable wine-sector practices. Guidelines for development of viticulture and winemaking in the cultivation of endangered local vine varieties.

This Handbook is a collection of guidelines and practices for sustainable organic farming in the Cross-border Region of Bulgaria-Greece in two parts:

Bulgarian and Greek

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A guide to sustainable wine-sector practices. Guidelines for the development of viticulture and winemaking in the cultivation of endangered local vine varieties.
For the Bulgarian part of the Cross-border Region Bulgaria-Greece

I. Content for Bulgarian part

Content for the Greek part

Handbook for sustainable wine-sector practices. Guidelines for development of viticulture and winemaking in the cultivation of endangered local vine varieties

Bulgarian part

1. Introduction

This Guidance Handbook is the result of the researches, reports, analyses, strategies and research in the field of conservation of old local vine varieties on the territory of the Cross-border Region of Bulgaria-Greece under the program "VINE SOS" of the EU, co-financed by the European Regional Development Fund. The lessons that we learnt are the basis for the awareness of sustainable viticulture practices, which will serve the wine-growers and authorities managing the wine production process, their evolution and strategic progress in the field of conserve of the vine gene pool and the existing bio-ecological systems in the territory.

In this handbook, anyone, even a beginner vine-vinar, can find the most appropriate ways principles and ideas to launch its own organic production, tailored to the environmental norms and guidelines of the 21st century. Based on traditional, old and eco-friendly ways to work with plants and in particular with vines, this document describes traditional methods for working with old local varieties, which help to create and maintain a bio-agro system.

2. Biodynamic, organic and sustainable viticulture and winemaking. Recommendations for the construction of bio-agro vineyards in order to conserve the old local vine varieties and the existing ecosystems in Bulgaria and cross region Bulgaria – Greece.

The creation of the Biodynamic cellar, organic farm and Permaculutra is based on the principles and methods of organic farming. The aim is to achieve an economic activity that is not in violation of the existing ecosystem on the territory of which is built, producing a final environmentally friendly product.
When we talk about bio-agro systems, in the modern world, manufacturers have come to the conclusion that the methods should be combined in order to obtain a socially, economically and environmentally sustainable production of the market. For this purpose, farms meeting the requirements of the State and certification bodies for high environmental assessment are constructed, which produce more than one product, mutually bound in permaculture. This way, a farm can cultivate on its territory old local vine varieties, roses, strawberries, indigenous breeds of sheep, bees, cows, horses, goats, arthropod, etc.
When building a farm is started with planning. Each activity must rest on philosophy and observe a line of conduct that will bring it into the future with success. Therefore, in this handbook, we will begin with a description of the organic farming, which would serve as a starting point for every future farmer.

2.1 Basic principles and methods of organic farming

It is a production system that is managed in such a way that it can meet specific local needs such as, integrate cultural, biological and agricultural practices that allow for the resumption

of resources, strengthen the ecological balance and preserve biodiversity. Organic farming is based on the following principles:

- ✓ The farm is perceived as a standalone system or "organism" that exists in the context of the local ecosystem;
- ✓ In organic farming, the balance between the farm inside and the local ecosystem with her is maintained;
- ✓ Within the farm, a great biodiversity is maintained to stimulate the fight against parasites and pests;
- ✓ Natural biological cycles are used, with particular attention being paid to the biological cycles of organic substances in order to stimulate the formation of humus in the soil;
- ✓ The maximum solar energy is used and the use of chemicals and detergents is minimised.
- ✓ Use of intermediate crops, green fertilizing crops, farmyard manure, manure from other domestic animals and crop rotation to improve soil fertility, increase biological activity and maintain good soil health in a long term;
- ✓ Use of biological control, crop rotation and other techniques to combat weeds, insects and diseases;
- ✓ Focusing on the biodiversity of the agrarian system and the environment;
- ✓ Use of rotation (alternation) of pastures and grassland with compound feeding stuffs in the rearing of animals, as well as alternative veterinary methods of treatment and provision of good conditions for the animals;
- ✓ Reducing imported substances and preparations from outside and eliminating the use of synthetic pesticides and fertilisers and/or other substances such as hormones, antibiotics and genetically modified organisms;
- ✓ Focusing on renewable raw materials, preserving soil and water and practices that maintain ecological balance.

When creating a Vine farm, every future vine-vintner should get acquainted with the principles of sustainable viticulture. In 2004 the World Organisation of Vine and Wine (OIV) with resolution defines sustainable viticulture and winemaking as a global strategy for the production and processing of grapes, which is a complex of practices for the economic sustainability of structures and territories producing quality products, for precision in sustainable viticulture, taking into account the risks for the environment, the safety of the products manufactured and the health of the consumers while conserve the historical, cultural and genetic heritage, as well as the ecological and aesthetic aspects. In 2008 OIV published a guide for environmentally sustainable wine-winemaking in the production of grapes, wine and its packaging with recommendations for its observance by all winemakers.

2.2 Organic Wine

Organic wine is the result of sustainable viticulture and is produced from organically grown grapes. The certification of the Vine plant is organic after a three-year transition process of the respective production plants in which organic farming methods are applied. The main concern is the health and fertility of the soil, preservation and maintenance of biodiversity, with special attention to the species – natural enemies of the enemy and the diseases of the vine. The use of synthetic pesticides and fertilisers, as well as GMOS, is prohibited. Lis treated

only with the allowed of European norms for organic production of products, the emphasis is on prevention, if necessary, using copper containing, sulfur preparations that do not penetrate into the tissues of the vineyards are easily washed away from a strong and prolonged rain, and a need for new spraying arises. Other permitted products are also used, based on extracts from plants and strains of microorganisms with proven insecticidal effect. The result is a healthy production without pesticide residues, which contains and transmits the specific characteristics of the terroir and the wine.

The difference between organic production and conventional agriculture is that, in the second, chemical preparations are used to promote larger yields and protection against diseases. These same chemicals are absorbed from the roots of the vine and then pass through the leaves and clusters of the berries. As a result, residues of these chemicals can be found in the finished wine. In addition to the impact of direct consumption, conventional, "based on the use of chemicals" agriculture has a significant impact on soil and water quality. Supporters of organic wine production believe that conventional agriculture destroys the uniqueness of the land and the unique taste that "terroir" attaches to wine.

Organic wines are produced on holdings which are certified for organic production, subject to the following requirements:

- ✓ In the cellar only the additives allowed by regulation are used-avoid risks of contamination with banned substances or products;
- ✓ Oenological processes and practices may be carried out only after thorough and proper cleaning of the production equipment and installations;
- ✓ The production of the ecological wine and bottling must be separated (in place or time) by similar operations with non-certified products;
- ✓ Use of products approved in the food industry (bio wine is not a wine produced without any preparations and additives but their use is controlled and limited).
- ✓ It is allowed the addition of sulphites in certain norms, of certified organic tannins, enzymes, yeasts, etc.

Until recently, the production of organic wine was specialized in the small craft cellars. The demand for this product has, however, recently necessitated its perception as an almost obligatory assortment for the wine industry. To bear the Bio label each batch of wine is certified and monitored by special certification authorities. Organic vine cultivation and wine production is supported by priority in most European programmes.

2.3 Biodynamic farming. Biodynamic wine.

Biodynamic farming, is a strand in agriculture, and has its own scientific and spiritual basis. Broadly speaking, this strand is based on the view that man, agriculture, the environment and the production cycle are part of a whole and must develop harmoniously. This view was presented by Rudolf Steiner-the founder of the Antropo-philosofy in the year 1924 in his cycle of eight lectures on soil fertility. Then he launched the idea that the elements that make up our world are interconnected and that man has limited opportunities to influence the factors that determine the development of the world. Steiner has never claimed that nature should be left to itself. He claims that man should participate wisely throughout the food production cycle. According to him, yields depend on weather conditions – from the amount of rain, from

wind, temperature, sun shine, the length of day and other factors that are considered together, make up the elements of the macro-climate. This theory is distributed mainly in Germany and in northern Europe. According to her, all the organic substances that result from the production processes on the farm must be returned back into the system. In addition, the farm should create a harmony between animals, fields, lawns and forest plantations in order to achieve self-regulation and self-insurance. The main purpose of biodynamic agriculture is to achieve self-sufficiency of fertilizers, seeds, reproduction of animals and production of biochemical preparations. The use of imported substances from outside must be minimised and the only fertilisers that can be used are natural manure and possibly powdered rock materials, limestone and phosphates which have not been previously treated. The manure produced on the farm should become compost in place and can be supplemented with home-made plant-based preparations prepared by Dr. Steiner's recipes of Yarrow, chamomile, nettle, oak bark, dandelion and valerian. This is done in order to stimulate the natural processes of degradation and transformation of compost. Two of the homemade prepared preparations are applied directly to the field. One of them contains small amounts of humus and manure and stimulates the life processes in the soil, and the other contains finely ground quartz, which strengthens the plants, increases their ability to assimilate nutrients, stimulates photosynthesis and strengthens their resistance to diseases. According to this direction in agriculture, when it comes to sowing and sowing seedlings, it is necessary to study space forces and more precisely the location of the moon and other planets, as it is believed that this influences the development of the plants on the ground. For this purpose, a special calendar should be prepared for sowing each year so that the farmer can comply with astrological influences, taking advantage of the positive and avoid the negative.
Biodynamic viticulture and winemaking, observing the principles of the Stauer generates biodynamic wines. In recent years, the tendency to produce biodynamic products is generally very popular, as consumers prefer goods derived from biodynamic holdings. The largest such manufacturers can be found on the territory of France, Italy and South Africa and Australia. According to marketing specialists, Biodynamic Wines have an exceptional future and will soon be displaced by the market, the products produced with additives and without the certification logos.

2.4 Permaculture

The permaculture method includes growing crops throughout the year and farming practices and operations using small amounts of energy in the best possible way. This method is particularly attractive for small producers working with specific varieties, which will preserve their boutique appearance. The founding principles of the work are:

- ✓ Exploiting the land on a small scale;
- ✓ Growing a wide variety of crops, not large quantities of a crop;
- ✓ Growing rather than perennial plants, rather than annuals;
- ✓ Maintenance of a wide variety of plant and animal species, agricultural crops, microclimatic conditions and habitats;
- ✓ A vision for the future, which includes the fate of future generations;
- ✓ Cultivation of indigenous species as they are best adapted to specific soil and climatic conditions (avoiding hybrids that are actually weak, expensive and difficult to adapt);

- ✓ Creating a network of mutually beneficial working relationships between all elements of the system – humans, plants, animals, sun, wind, water, buildings and earth;
- ✓ Pay special attention to the so-called finite and non-productive areas: steep plots of land, rocky places, especially dry or swash places.

The Permaculture method is intended to predict the effects of climate change. Supporters of this method claim that the plants soften the climate and are able to reduce negative climatic changes. Diversity and environmental diversity are seen as a peculiar insurance policy against fires, drought, wind or torrential rain. The structural and functional diversity of plants diversifies microclimatic conditions, and this in turn creates favorable conditions for a larger number of useful plants. In this way, plants create better conditions for both humans and animals, and this is a typical example of useful interaction according to the Permaculture method.

Permaculture is often combined with biodynamic production, this guaranteeing the finished species of Bio-Agro Farm. Wine-growers from South Africa, for example, combine local vine plantations varieties with avocados, kiwi, strawberries, indigenous sheep breeds and bees. This results in a closed circle of interdependent, growing in permaculture plants and animals that generate products – wine, milk, cheese, fruits, vegetables, etc. The animals provide natural fertilizer, their mutually influencing plants fruits and vegetables, and the bees pollinated the crops.

2.5 Natural farming

This system is based on the principle of minimum interference in the activities of nature. It was developed in Japan by Masanbu Fukuoka under the influence of Zen-Buddhism and Taoism. According to natural agriculture, there are four principles that one should be guided in their relationships with the land:

- ✓ Do not destroy the integrity of the Earth in any way, because the roots of plants, insects and microorganisms do this in a natural way;
- ✓ Do not use fertilizers because they worsen the quality of the soil. Traditional farming practices destroy quantitative and qualitative relationships in the land and make it vulnerable and artificially create the need for fertilization. Natural agriculture allows the land itself to be maintained and to provide itself with fertilizers using the natural cycles of plants and animals that inhabit it;
- ✓ Do not use chemical products because they reduce the power of plants. If a plant is prone to diseases, harmful insects become a threat. The danger of diseases always exists, but the disease develops only if the natural balance with the natural stress is disturbed. Nature is able to maintain perfect balance in itself, and a healthy environment protects against diseases.
- ✓ Do not remove weeds because they have always been part of the living structure of the ecological system. The weeds that grow naturally are extremely strong and stimulate all life forms. Therefore, one of the basic principles of natural farming is that they are left to grow.

When the farmer starts to apply the methods of natural farming at the beginning, the land will need to restore its lost vitality within a few years. The crop of land that has been treated with too many fertilizers will initially decrease by 10 to 15%.

Organic farming in all its diversity is based on the choice of vision, motivation, knowledge, entrepreneurial attitude, technical means and skills, which are in harmony with the principle of sustainable development and protection of the land. And so to borrow a man with organic farming means that he shares these principles.

3. Production of wines from endangered local varieties.

The production of traditional vine varieties for a given territory is under the protection of the so-called Protected Designation of Origin (PDO) and Protected Geographical Indication (PGI).
The protected name is the name of an area or a specific locality used to describe a particular wine. In order for a product to fall into the category "Wine with PDOS" it is necessary to produce it in a specific geographical environment which, with its inherent natural and human factors, determines the quality and characteristics of the wine. The grapes from which it is produced must "originate exclusively" from that medium (region, micro-region or locality) and the vine varieties are of the species Vitis Vinifera L.

A protected geographical indication means an area or a specific locality the name of which is used to describe wine. The wine must be produced in the area and possess ' specific quality, prominence or other characteristics attributable to its geographical origin '. For this purpose, at least 85%, of the grapes used for its production must originate in the relevant geographical environment. The regulation allows wine to be derived from vine varieties belonging to the species Vitis vinifera or originating from a cross of the species Vitis vinifera and other species of the genus Vitis.

Bulgaria has a wide variety of climate, terrain and soils, which offer excellent conditions and opportunities for viticulture and winemaking. Due to the historical traditions and the listed climatic and soil factors, as well as the 5 numerous climatic subareas with specific topography and soils in Bulgaria have been formed specific areas for the production of quality wines. Currently in Bulgaria and in the European Union are registered with the respective demarcated areas 2 wines with protected Geographical Indication (PGI) respectively "Dunabe Plain" and "Thracian Valley" and 52 wines with Protected Designation of Origin (PDO).

With the promotion and protection of 52 wine production areas with PDO and 2 regions for the production of wine with PGI, it is confirmed that our country possesses unique natural resources for the production of high-quality wines both red and white wines, in wide varietal range and a wide variety of taste and aromatic qualities. The main role for the quality of wines, in these areas is to preserve the traditions in their production, conservating as well as the genenic material and the always-viticulture techniques.

PDO and PGI as well as wine using that geographical name in accordance with the product specification shall enjoy legal protection against:

- ✓ Direct or indirect commercial use of this protected name;
- ✓ Misuse, imitation or reference, even if the true origin of the product or service is indicated, or if the protected name is translated, transcribed, transliterated or accompanied

by an expression such as "style", "type", "Method", "as produced in", "imitation", "flavour", "like" or other similar expressions;

✓ Another false or misleading indication of the place where the product comes, the origin, the nature or the essential properties of the product, the inner or outer packaging, the advertising materials or documents relating to the wine product concerned and the packaging of the product in a container in such a way as to create a false impression as to its origin;

✓ Other practice which could mislead consumers as to the true origin of the product.

Recently, many changes have been made to European legislation in the sector to make it easier for producers and to reduce administrative burdens. The changes make it possible to increase the interest of producers in investments in the production of biodynamic wines from PGI and PDO, under the conditions of sustainable viticulture and winemaking, certification of production and final product, and last but not least the creation of permaculture or bio-farm in the conditions of an existing bio-agro system. The European support programmes in the sector are also targeted at this group of wine producers.

The European funds are a good opportunity to create vine plants with disappearing varieties, since these varieties are included in the official varietal list of our country and are allowed for planting in the border areas, the object of the project " VINE SOS".

From all this 52 protected names only two of the PDO do not include any of the traditionally endangered Bulgarian varieties, the object of the project. There are two options for local wine producers:

- To create new areas for the production of wine of these varieties (new PDO);
- To amend existing PDOs – in this case, administrative procedures would be simplified – only varieties of endangered species could be added, with the possibility to expand significantly and the outlines of the region.

4. Guidelines for organic farming practices applicable in the viticulture of the cross-border region and guidelines for the production of wine from indigenous varieties.

4.1 Suitable for implementation bio agricultural practices, applicable in the construction of bio-agro farms and cultivation of vineyards in the cross-border region of Bulgaria-Greece, in the Bulgarian part.

The World Organisation for Vine and Wine resolution OIV-CST 518-2016 builds on the definition and scope of implementation of sustainable production by defining common principles for the implementation of sustainable wine-making by integrating the three aspects of sustainability: the environment, social and economic.

✓ **Principle 1 The sustainable approach integrates environmental, social and economic aspects.**

✓ **Principle 2: Sustainable viticulture and environmental protection.** Before planting new vines the process of protecting local biodiversity and preserving the agro-bio environment can be achieved through good planning of the vineyard itself and the service facilities, using the

methods of the staff, permaculture and biodynamic farm, which are validated ecological principles. To this end, the following aspects are planned:

- **Select a location.**
- **Soil resources.**

The soil should be protected from erosion and nutrient loss through fertilization with organic fertilizers, and by applying effective treatments. Soil fertility and biodiversity must be maintained to ensure environmental sustainability. The influence of the technique used on the soil should also be taken into account in order to limit compaction and preserve its structure. During the planting of vineyards or meliorative activities, earthly works in an existing vineyard must be carefully planned in order to minimise negative impacts on soils, the environment and the landscape. Contamination of the soil with waste solutions, materials, fuels, etc. must not be allowed.

- **Preserving biodiversity**

It is of utmost importance the preservation of variety and clonal diversity of local wine varieties in the area. The conservation of the existing ecosystem with its surrounding flora and fauna may exist in equilibrium. Within the sown areas, it is possible to plan:

In terms of flora -protected Hedges; leaving existing tree species as a natural barrier in the Territory; conserve of existing plant species such as herbs, shrubs and sowing of crops that exist in symbiosis with Vitis, such as strawberries.

In terms of fauna – building nests for local breeds of birds and attracting other breeds indigenous to the region to "clean" pests from the vineyards and avoid harmful species of Vitis; use of arthropod species to protect against bacterial contamination of vines instead of artificial preparations; creation of symbiotic societies, complementing the vegetation and breeding process of the vines, such as bee families; etc.

The existence of measures implemented to protect and improve the biodiversity and especially of local microorganisms, fauna and flora in the habitat where the wine-making activity takes place guarantees the conservation of the variety in its terroir, preservation the gene pool, as well as certification of the final product, which is sought and fashionable for the end user. The mechanized processing applied in the vineyards especially in Bulgaria, where the grassing of the line distance is rarely applied, leads to a decrease in biodiversity. Of course, the vineyards can not be processed, but care can be taken to protect the plant and animal species around the vineyard.

- **Environmental protection**

It is necessary to carry out an assessment of the impact on the environment during the development phases of the vineyard, planting, grubbing-up or construction, as well as in establishing the architecture of cellars and processing facilities. It is important to identify in advance the environmental characteristics that must be safeguarded. Viticulture and winemaking are some of the sectors in agriculture that emit the most greenhouse gases. The OIV has developed an international plan for the accounting of greenhouse gas emissions in the production of grapes and wine. It gives business and other interested parties a clear and

consistent method for the overall assessment of greenhouse gas emissions related to the activities of Vine and wine companies. More and more vine-growing farms that have adopted the principles of sustainable viticulture compile and introduce a carbon calculator, through which calculate the carbon footprint in the production of one bottle of wine from the vineyard to the labelling.

- **Optimization of energy use.**

It should be noted here that in the performance of the classification of projects under the measure "investment in enterprises" under the National support programme for the wine sector, one of the criteria for evaluation for which points are given is "projects aimed at improving the energy efficiency of the enterprise"

- **Optimization of water use.**

In the case of water use, account shall be taken of its availability as well as the impact on groundwater quality. Automated irrigation systems with controlled feeding and low water consumption are preferable.
Priority are systems conducive to efficient and re-use of water at all stages of production. Consumption monitoring makes it possible to draw up a plan or strategy to optimise water consumption.
Similar to the carbon footprint, a methodology was developed to calculate the water footprint – the waters expended to produce one bottle of wine.

- **Optimizing the use of materials and raw materials during the production and processing phases.**

Used equipment and inputs in the viticulture, as well as those in wine production, must limit the environmental impact to a minimum and encourage renewable resources. Their use should be limited to the minimum quantities needed for optimum results.
Input packaging materials (bottles, cans, etc.) can be optimized. An example is the use of lightweight glass bottles or labels from recycled paper. The idea is to give preference to recyclable materials and to those obtained with minimal impact on the environment, as this should not be at the expense of quality.
In the use of substances and means for the processing of wine, the storage, recycling and disposal of wastewater and waste products should be taken into account.

- **Waste Management**

The level of waste should be limited, giving priority to best practices and the production strategies of the wine sector. The recycling or reuse of waste should be taken into account in order to reduce their impact on the environment and public sewage networks.
Very good practice is the use of energy derived from by-products – e.g. the extraction and use of biogas (methane). In this process, an accurate, qualitative and quantitative inventory of the waste must be kept.

- **Managing by-Products**

Where possible, by-products should be recycled or reused locally to reduce their impact on the environment. The treatment or recycling of by-products must be carried out with minimal impact on the surrounding environment. Where it is not possible to exploit the by-products, they must be shown as waste.

- **Limiting noise and air pollution.**

Efforts should be made to reduce noise and air pollution (dust, contamination by organic and inorganic compounds, odours, etc.) generated by wine-sector activities in order to limit their impact on the close proximity of vineyards and near sector enterprises.

✓ **Principle 3: Sustainable viticulture in accordance with the social and cultural traditions of the area.**

- **Respect and fair treatment**
- **Health and safety of workers**
- **Integration, training and continuity of the workforce.**
- **Integration with the local socio-economic and cultural environment.**
- **Cultural features.**

The sustainability of production involves engaging with, preserving cultural and historical traditions and values in the area. The contribution of the participants in the wine sector to the cultural identity of a region can be in a wide range: crafts, architecture, music, painting, local traditional events, literature, advertising of local varieties Vitis and their way of production in preserved traditions, etc.

- **Development of relations with the wine-wine community.**
- **Health and safety of consumers.**

✓ **Principle 4: Sustainable viticulture strives to sustain economic viability**

Before crossing the holding to sustainable production, it must assess its economic viability. In order to generate sustainable growth that will provide income and employment in future times, it is necessary to implement innovation and provide management costs to ensure adaptation to technological and socio-economic changes imposed by the transition to sustainability and purely organic production.

✓ **Principle 5: Sustainable initiatives require planning and evaluation**

Planning. Sustainability on all three aspects – an environmental, social and economic process needs to be assessed through indicators and criteria. In most sustainability programmes, reliable indicators are used to assess the sustainability commitments and obligations. In all programmes after evaluation, the manufacturer shall be certified or validated for sustainability by giving it the right to signify the products with the sign (label) of the program.

Communication. Any measures taken to move towards organic and sustainable agriculture must be communicated in all possible ways. Initiatives to develop sustainable viticulture are voluntary, but can grow into collective through the adoption of common guidelines or policies that comply with the principles of sustainability.

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4.2 Benefits for wine-growing in the cross-border region Bulgaria-Greece from the implementation of sustainable viticulture. Production of organic wine. Recommendations for the production of vine planting material from endangered local vine varieties.

The potential benefits of Sustainable Wine implementation in the cross-border region are expressed in several respects:

Economic benefits

- ✓ Long-term viability of land and business.
- ✓ Long-term cost savings.
- ✓ Improving the quality of the wine.
- ✓ Preparedness for future international trade certification as ISO14001.
- ✓ The value of real estate is rising.
- ✓ Increase of competition and market value of wine.
- ✓ Niches on specific markets, oriented towards biologically and ecologically produced products.

Environmental benefits.

- ✓ Long-term viability of the land
- ✓ Management of unique and specific land
- ✓ Conservation of natural Resources

Social benefits.

- ✓ Health and wellbeing of the farm's employees and the winery andthe Neighbours.
- ✓ Ties with neighbours and communities
- ✓ Approval from consumers and tourists.
- ✓ Strengthening links with regulators and public policy institutions (government, media and educators)

For the purpose of the handbook, Basic concepts and categories of wine production will be derived, with which future producers can meet. In essence, the project "VINE SOS" aims not only preservation of important for the cross-border region of Bulgaria-Greece, gene, historical, botanical, etc., types of information for future generations, as well as the creation of first steps in the right direction for the future generations of vine-winemakers, where this process is primary and there is no need for correction. Just so, it would guarantee success in the creation of natural bio-agro systems in terms of weather.

There are identified the following tools and practices that may be useful for the management of vineyards as factors that may limit the use of pesticides: prevention practices; early detection and monitoring and direct control and management

✓ **Prevention practices**

- ➢ Creation of ecological infrastructure, both on the farm in order to improve microclimatic conditions and increase biodiversity including useful insects, spiders, etc. Mites, microorganisms and predators. Strips of flowering flowers and grasses with alternating interleaved, live hedges, wood belts and shrubs can be cut into the vineyard;
- ➢ Selection of varieties and pads adapted to local conditions. Efforts to grow new tolerant vine varieties over the last 10 years have resulted in several quality varieties and pads that have a high potential for reducing pesticide use;

- ➢ Strategies for crop management that prevent, suppress or at least mitigate the development of pests and diseases for example, soil management, which facilitates drainage, balanced fertilization with nitrogen to limit excess plant strength, leading to a decrease in

resistance to mildew and powdery mildew, workouts sanitary measures to prevent the spread of diseases such as removing sick plants in the vineyard.
The most innovative technologies allow the monitoring base to make very specific, timely and site-related forecasts. There are systems in place to support the manufacturers ' solutions (DSS) for the effective application of plant protection (whether to spray, when to spray and what to spray). Through the use of meteorological stations, wireless sensors and "internet Platforms" (IoT) technologies are developed on the basis of two tools: Applications and web-based services that can be used directly by farmers. These tools rely on forecasting and continuous monitoring systems, allowing for high efficiency and savings.

✓ **Methods and tools for direct control without pesticide use.**

These include:

– Mechanical systems for control, mechanical removal of weeds or flame weeding (instead of chemical or mechanical weeding) to a more high-tech interruption of the mating of Cicadi by sound signals;

– Biological control methods, for example: disruption of mating with the help of Ferromonomer dispensers, use of micro-organism products such as Bacillus thuringiensis for moth control; Ampelomyces quisqualis (sponge parasite) to reduce the formation of overwintering structures of powdery mildew; Bacillus subtilis (bacterium) to counter infections by powdery mildew and other pests by competing with them to place, feed or parasitize on them.

Pesticides should be used as a last resort, which should be those with the lowest rate of risk to health and the environment.

4.3 Good practices for sustainable water use in viticulture

Conventional watering methods in the viticulture can lead to depletion of local stocks of surface water or groundwater. This requires a reduction in consumption, optimising the efficiency of water use and improving the condition of water supplies.

In the event that the vines are grown in heavily dried conditions and the yields are threatened, it is necessary to apply watering by applying modern technologies, including drip irrigation, regulated irrigation and humidity monitoring in the vineyards. Irrigation should lead to quality assurance of yield, depending on the direction of winemaking in the region, while ensuring good efficiency of water use. On the other hand, irrigation can lead to a secondary effect resulting in increased growth and deterioration in the quality of yields.

Basic principles for the choice of irrigation method:

✓ **Choice of terrain and planning.**

In planning the construction of irrigation system it is necessary to study the hydrological stocks, the amount of rainfall, climatic factors, as well as the possibilities of water abstraction.
In arid areas, planning the necessary quantities of water is obligatory because of the global rise in temperatures and the intensity of climatic anomalies such as droughts, heat waves, etc. will result in a high degree of transpiration of water from the vine. However, in dry climates, vine plantations with soils with high or medium soil water can support viticulture without or with minimal irrigation.

✓ **Water regime in the vineyard.**

Weather conditions and in particular, solar radiation, temperature and humidity, wind speed and their interaction with the vine determine the total evaporation of water from the vine Plantation (esvatory) and therefore its need for water. The actual value of the eets is usually determined by local observations and reported parameters or models adapted to local conditions. Therefore, the assessment of the need for water for vine plantations must be adapted to the climatic and soil conditions of the area. The regional and local conditions and the specific planting and shaping systems, in combination with the focus and the production objectives, influence the need of the vineyards of water. In some cases, a combination of soil type, depth of the soil horizon and the root system can provide enough water to meet the requirements for the vine and to disregard the variability in time and volume of rainfall. The need to install an irrigation system must be based on a methodology for assessing consumption and the need for water.

An important factor in the estimation for irrigation needs are the used padding, the variety (branch of the variety), the formation, the retaining structure. Vineyards located in areas where irrigation is required, for example in dry to semi-arid areas, must be irrigated on a schedule and volumes determined by monitoring the condition of the vine in order to optimise the efficiency of water use. At the same time, it should be taken into account the need for adequate drainage of the vineyard in order to avoid soil salinity.

Vine as a crop can successfully adapt to water stress in a wide variety of conditions, especially when combined suitable pads. When soil and climatic factors cause frequent or severe drought and there is no possibility of irrigation, it is recommended to select appropriately adapted or tolerant varieties, branches of varieties and pads adapted to the conditions of the area. It is best to plant local vine varieties that have proven their adaptability to the conditions of the area.

The reduction of water consumption in the different phenopases can be controlled by soil processing, green slices or by removing green harvesting, mulching the soil surface, etc.

- ✓ **Mulch.** By mulching can improve the structure of the soil, its water retention ability, and from there also reduce the evaporation of moisture in it.
  The other benefits of mulcizing are: stocking the soil with nutrients and thus reducing the amount of fertilisers used; Weed control, which in turn reduces the use of herbicides; Reduce soil erosion. As mulching materials, straw, wood residues from winter slices, by-products, etc. can be used.
- ✓ **Grassing.** In semi-arid areas, the use of grassing in the row is debatable, due to the fact that during the summer season the grass vegetation competes with the vine in the use of soil moisture. The positive effects of the grass coating are expressed in the low vegetative growth of the vines, the prodlbočavane of the root system and the reduction of the surface runoff of the water. However, it is necessary
- ✓ **Green slices**. These operations are well researched, and one of their meanings is a reduction of the leaf mass, and from there the transpiration.
  - ✓ **Irrigation. In the** case of irrigation in semi-arid areas where water needs are greatest, it should be taken into account that: watering can affect water supplies in the area; The increase in yields in the result of watering may lead to a decrease in quality; excessive irrigation leads to stress and imbalance between reproductive and vegetative organs.

To reduce the amount of water used for irrigation and at the same time obtain high quality yields, the so-called deficient irrigation is applied. In this technique of irrigation is fed as much water on the vine that it is maintained in a state of regulated water deficit. Limiting the amount of water applied, the vine falls into a regulated stress and thus directs more resources from the vegetative parts to the reproductive, which leads to reduced growth of the shoots and the production of better

quality of the grapes. With this type of watering it is important precisely to control the submitted amounts of water, depending on the climatic factors of the environment, because both excessive irrigation and excessive drought will degrade the quality of the yield.

It is common ground that the irrigation in the vineyards must be carried out with modern automated drip irrigation systems, in which the necessary quantities of water are fed precisely and controlled. The most innovative are the IoT "Internet of Things" systems, which together with sensor stations can take into account multiple parameters and as a result, maintain the entire irrigation cycle. These systems can save 30% of irrigated water, as well as 50%-60% of the working time used to manage and record irrigation.

5. Traditional biotechnics for the care of vines, displaced by new technologies.

Traditional methods of care for vines are characterized by the use of solutions of water and the previously known plants and natural materials, which lead to the improvement of the state of the vines in all their parts and protect against pests and diseases. Biotechnics for care, over time, are displaced by fungicides and pesticides due to their labor intensity and lack of rapid results. However, if you wish to manage Biodynamic farm and comply with sustainability principles, pesticides are unacceptable. Their harmful effects on man and the environment have been proven and, in order to end their practical use, national, European and World organizations introduce protocols and restrictions to the final irradiated products, in order to limit the use of pesticides and fungocytes.

In this handbook on sustainable viticulture practices, we will provide more easily integrating recipes, as well as a number of recommendations for biological protection in the creation of a biodynamic farm, encompassing different cultures in symbiosis with the Vitis Vinifera, which build agro-bio system.

- ✓ Wood ash, onion flakes and garlic – these funds have been known in folk practice for centuries and are used for protection against pests of different species, such as caterpillars and mites. The setting consists of 50 g., garlic, onion flakes or wood ash, which is soaked in 500 ml, water for three hours, strain and make up another liter of water. The spraying of the vines is repeated at an interval of one week for a month. This is recommended in the months of June and July, as in the beginning of July, the ugliness is already the size of a pea, allowing the prevention and treatment of fungal infections. This prevention is followed after spraying with the above-mentioned solution and is a solution of 10 l water, 50 g of soda and liquid bio soap. If the two activities are performed sequentially, a pattern is obtained, which can be repeated in the autumn. After harvesting, when not a few pests are active, a suitable agent is iron sulfate, with the help of which the plants are protected from premature loss of leaves. An alternative to the iron sulphate which is not suitable for more acidic soils is the lime solution, which is made in the following way: One kg, not slaked lime is poured with 2 L., water. Then, gradually add more water at constant stirring until the total volume of the mixture reaches 10 liters. Looking at the top, the scheme is a concern for the vines during the period of prodonement.

- ✓ Burgundy mixture. The popular solution for spraying vines should be 1%. It is prepared from 1 kg., blue stone of 100 L., water. Add 750 g. Quicklime or double the slaked to achieve the Ph in the range 7.5-8.5.

The Burgundy mixture is sprayed immediately after preparation, as after a few hours it thickens and precipitates, making it unfit. This method is a proven remedy against fungal infections in the vines. It is applied at least three times during the high season: at the very beginning of spring, before tying and immediately after it. The first spraying is a 3% solution, the subsequent one by 1%.

- ✓ Sodium bicarbonate. Soda solution affects mildew, powdery mildew, antracinosis, etc. Usually, iodine or potassium permanganate is added to the solutions of sodium bicarbonate for a complex effect against possible pathogens. Add liquid organic soap, which helps the "healing mist" to be retained on the smooth surface of the vine leaves. The solution is prepared from 5 tablespoons of baking soda, which is showered with a glass of boiling water. Stir the liquid until the baking soda is completely dissolved. Add 20 drops of iodine. Pour the mixture into a container of 10 liters of water and stir well. 2-3 crystals of potassium permanganate are released, until they receive a pale pink coloration. Finally, pour two tablespoons of liquid bio soap or the same amount of grated tar soap.

- ✓ Blue Stone. Three percent solution of copper sulphate or blue stone is a test tool for protection against fungal diseases and putrefactive processes of the vines. Spraying with such a solution is recommended in the spring practice, through which the spores are cleared of fungal spore and harmful insects. It is suitable for prevention and treatment. With contaminated foliage after spraying, the leaf surface is covered with a thin blue zipper, which does not allow the pathogens to develop and they perish. The solution is prepared from 50 g., Blue Stone of 10 L., water. The blue stone does not penetrate the inside of the vine fruit.

- ✓ Sulphur. An effective means of protecting the vineyards from infection, as well as for the treatment of odium and grey rot. The known practice in Bulgaria is processing with sulfur powder – direct search of the reflection through the mesh fabric. This is done with a developed foliage, first of all, when the young stems have a length of 10-15 cm, then at the end of April before tying and another 2-3 times afterwards. This type of treatment is not made at temperatures above 30 °C.
  There is a version for the use of colloidal sulfur, it is a solution with heat treatment, using slaked or ungasidic lime. For this purpose, 40 L., water is heated slowly with 12 kg of quicklime, add 24 kg., sulfur powder and stir. Make up another 50-60 liters, water and boil it for about an hour. The clarified liquid for spraying is used.

- ✓ Potassium permanganate. Solutions with potassium permanganate in the viticulture are used in the autumn. For prevention, a solution of 10 liters, water and 3-5 pieces, crystals of potassium permanganate is prepared. If the vineyard is infested with a odium, a more concentrated solution, 8 crystals at 10 liters of water, is applied for treatment. The rout can be used in the fight against insects in the vineyard. Its application in this case is based on a solution of 300 ml, water and about 1g crystals.

- ✓ Iodine. Gray rot is a common problem in grape fruit. For its prevention, a iodine solution of 20 drops of iodine per 5 liters of water is made. The leaves and bunches are sprayed.

- ✓ Nettle. Nettle is a natural method of fighting aphids on vines and fruit crops including roses. Besides the high effect of protecting the infestations from pests, the nettle does not create precondition for undesirable chemical acts or damage due to improper treatment. Solution: A kilogram and a half of nettles (stems, leaves and root, together or separately), soak in 10 L., cold water for ten days. Strain and use for spraying in the period May-June. The same effect can be achieved with a half-kilogram of dried nettle in 10 liters of water.

- ✓ Dandelion. A solution of 250 g dry roots or 500 grams of overground mass of dandelion is soaked in 5 liters, lukewarm water for 24 hours. The extract is sprayed directly on the leaves and the fruit of the vine.

- ✓ Chilies. Solution of 500 g, fresh or 250 g., dried hot pepper, which are cut and boiled 1 hour in 5 L., water. After boiling, continue to soak for two more days in a well-closed glass or enameled container. The softened peppers are crushed well, squeezed out and the decoction is strained. Pour the concentrate into dark bottles and place in a cool dark place. The flower crops are sprayed with 125 ml of concentrate, diluted with 10 L., water and mixed with 10 ml, liquid organic soap. The solution is suitable for treatment of bio-certified products.

- ✓ Tobacco. The leaves of the tobacco are chipped if they are dried in advance in water and then boiled half an hour. After cooling the liquid, strain and the solution is ready for spraying. Can be used for all parts of the vine, preventing fungal infections. Suitable for all fruit trees in the organic farm.

- ✓ Arthropods. An example is the cultivation of ladybugs, which are a natural enemy of leaf lice and their larvae. The ladybugs are sensitive in terms of aromatic flowers. In the past, roses were used, on whose hornets were bred populations of ladybugs, which on the exfoliates way pass on the vines and other fruit trees on the farm. The sowing of roses at the beginning of the rows with vines is a practice from the distant past, after it has been established that the symptomatology in infection stands out first on the roses, and then on the Vitis.

6. Biological means of plant protection in the fight against plant diseases. Plants suitable for the construction of biocenosis agro-bio systems. Plants that suppress each other. Useful advice in building and planning biodynamic and Permacultural Productions.

In the creation of biodynamic production with elements of permaculture, by a method of Stauer or sustainable viticulture, vegetable crops and tree species part of the bio-agro medium must be healthy. This annex is a good alternative for the implementation of biological plant protection products that lead to positive results within the farm.

6.1 Means of pest control:

Fruit worm:

• Tomato plants are used in the fight against leaf lice, fruit worms and larvae of butterflies in fruit and vegetable crops. Finely chop 1 kg of tomato plants and soak in 1.5 liters of water. After 1 hour the extract is strained, dilute with 7 liters of water and add 5 ml of liquid soap.

• Common Artemisia for fighting larvae of fruit worms, mites, eating leaves caterpillars and cabbage moth. Raised during flowering 2.5-3 kg fresh plant mass or 800 g of dried wormwood soak in 10 liters of water for 24 hours, then boil for 30 minutes. The solution is strained before spraying is diluted with water in a ratio of 1:1 to 10-15 ml of liquid soap added to it.

• Veratrum Lobelianum Berhn for fighting apple fruit worm, caterpillars, raspberry beetle, Strawberry otiorrhynchus rugosostriatus, phytodecta fornicata and others. The above-ground parts are applied, collected during the vegetation and the roots harvested in the autumn. Plants after grinding can be used to make the attacked crops. 1 kg of raw plants could be used, 500 g of semi-dry, 250 g dry or 100 g roots. Pour 10 liters of water and leave to stand for 48 hours. The decoction is prepared from the same quantities of vegetable materials that are poured with 10 liters of lukewarm water. Allow to soak for 3-4 hours, then boil for 30 minutes.

• Black elderberry against Erannis defoliaria, mites and plum fruit worm. Sown or twigs in the crowns in flowering.

Caterpillars:

- Universal pesticide: 10 cloves of garlic, 5 small chillies, 3 medium onions, 1 L. Water. Mix all ingredients, put to simmer on low heat 10 min. Let stand for 1 night, then add 2 tablespoons milk and pour in a glass container with tight clogging. Before use, dilute 1 Cup 50gr., of drained liquid with 9 liters of water. Any sprayer can be used.
- Tomato against leaves eaters caterpillars, apple fruit worm and aphids. 4 kg finely chopped green mass in 10 liters of water. Boil 30 min., then 2-3 l of it is diluted with 10 liters of water and 40 gr. soap.
- Common wormwood against leaves eaters, caterpillars and apple fruit worm. One kilogram of dried mass is boiled for 10-15 minutes in a little water. After cooling the mixture to it is added a decoction of 1 kg of dry bird manure, soaked in water for one or two days. The resulting preparation is strained and diluted to 10 liters of water. The fruit trees are sprayed twice at an interval of 7 days.
- Chilli Peppers. The same volumes of chili peppers and water are crushed and the cold mixture is sprayed on the caterpillars. Do not allow contact with eyes and skin.
- Vinegar can be useful against caterpillars and sucking insects such as palomena prasina, lice, mildew, etc. Recipe for spray: 1part vinegar, 3 parts water and 5 G. Filings of pure soap.
- Basil destroys all species of caterpillars. 50 g of dry leaves and stems are soaked for 24 hours in 1 liter of water.
- Onions and garlic destroy mites and caterpillars. 20 grams of whole heads or peels are soaked in 1 liter of water for 24 hours.
- Consolida regalis, against Caterpillars of the ring, white fruit butterfly, moths, white, cabbage and radish butterfly, cabbage bat, wasps, larvae of leaves eaters, beetles and leaf fleas (for Apple). 1 kg of dry grass, soaked for 2 days in 10 liters of water, or decoction after the tincture, boiled 1-2 hours.
- Autumn colchicum against caterpillars. A tincture of dry bulbs (1.5 kg per 10 liters of water) for 3 days.
- Decoction of Tanacetum and extract of Artemisia, solution of soft soap. To fight caterpillars. At the lavane of butterflies with baits from fruit juice, molasses and beer.

- Chamomile against sucking, caterpillars and false caterpillars (wasps). 1 kg of dry mass of 10 liters of water for 12 hours. Strain and add another 30 liters of water and 120 g of soap (40 g every 10 liters of water).
- Cotinus tea against caterpillars.
- Euphorba is used to fight the caterpillars of leguminous, vegetable and fruit crops. Blossomed plants are used. Finely chop about 3 kg of fresh leaves and stems and boiled 150 minutes in 3 liters of water. Strain the decoction, make up to 8 liters of water and add 5-6 ml of liquid soap. It is necessary to prepare it carefully, as it is poisonous to humans. It breaks down in plants quickly for 4-5 days. Therefore, it should be sprayed repeatedly every 7 days.

Aphids and other small sucking insects.

- Grassy elderberry destroys when spraying leaf lice and other small sucking insects. Water infusions of fresh leaves and blossoms collected in the flowering period. For this purpose, 500 g of elderberry leaves are poured with 3.5 liters of water and boiled 30 minutes. Make up the evaporated amount of water. It's strained and sprayed.
- Chili peppers against leaf and thyroid lice in flowers and some fruit crops. 100 g chillies are soaked in 2 liters of warm water for 5 days. Strain the extract and add 3-4 ml of liquid soap. It is sprayed at an interval of 7 days.
- Chillies against aphids, fleas, caterpillars, trips, mites, butterfly larvae and slugs. 1 kg fresh or 0.5 kg of dried peppers are cut in half and boiled 1 hour in 10 liters of water in a closed container (or tincture). Soak 2 days in a well-closed glass container. The softened peppers are crushed well, squeezed out and the decoction is strained. 125 ml is dissolved in 10 liters of water and 40 g of soap.
- Onions against Spider-forming mites and aphids on fruit crops, beans and cucumbers: 200 gr. finely chopped onions are soaked for 15 h in 10 liters of water. The resulting tincture is strained and applied triple spraying every 5 days during the vegetation. It is good to add liquid soap.
- Garlic for the destruction of aphids, trips and mites on the apple, pests of the plum, strawberry and other cultures. Peel the cloves of 3-4 heads, finely chop and screw. Mix with 10 liters of water. Leave to stay for 7 hours. Add 6 ml of liquid soap. The solution is ready for use. It is used several times every 7 days.
- Garlic: 500 g of garlic is crushed in a wooden pot. The resulting mash is put in a thre liters container of dark glass and make up with clean water with a temperature of about 25 degrees. The dish is held in dark and warm for 7 whole days, after which it is strained. It is applied against trips, lice, mites. Dilute the infusion by adding 10-60 ml of it + 5 ml ofliquid soap to 10 L of water.
- Potatoes against aphids and mites in cucumbers. 1.2 kg of fresh mass (or 0.7 kg dry) per 10 liters of water for 3 hours.
- Calendula vs. aphids. Decoction 1 kg per 10 liters of water.
- Tanaceum vulgare against aphids. Decoction 1 kg per 10 liters of water.
- Taraxacum against aphids, fleas and mites on fruit. 200-300 g of fresh roots (or 400 g leaves) are flooded with 10 liters of slightly warmed water for 1-2 hours. First spraying when dissolving the buds, second after flowering, next 15 days.
- Achillea millefolium against aphids, fleas, mites and tripxes. 800 gr. dry mass is chipped and boiled with boiling water for 30-40 min. (or boil). Make up to 10 liters of water and soak for 36-48 hours.

- Clematis vitlba against aphids. Not bloomed blossoms from the flower (1.125 kg) are soaked for 1-2 hours in 10 liters of water.
- Datura stramonium against cabbage and beet aphids. Dried stems and foliage 400 gr. per 10 liters of water. Datura 100 grams of overground mass boil 1 hour in 1 liter of water. Destroys all kinds of insects.
- Tobacco against aphids, fleas, tripxes, Archips rosana L, cabbage moth, Athalia rosae and Caliroa cerasi L. 400 g finely chopped mass of 10 liters of water for 2 days. Strain and add another 10 liters of water and 8 ml of soap.
- Tagetes (Marigold) against nematodes. They are planted between the rows of strawberries. Against aphids tincture of 1 kg of colors of 10 liters of water.
- Orange peel against the shield and other lice. 1 kg of dry orange peels are soaked 3 days in 10 liters of warm water in a dark and warm room, strain, add liqud soap and spray without dilution.
- Rumex patientia against aphids and mites. Tincture of 1 kg per 10 liters of water for 1 day.
- Ranunculus sceleratus against aphids. Tincture 1 kg per 10 liters of water.
- Helleborus against aphids, mites and thrips. Tincture 1 kg per 10 liters of water.
- Extract from nettle against aphids 500 fresh nettle (before flowering) is poured with 4 liters of water, stays for 12 to 24 hours. Without dilution, it is sprayed against aphids.
- Tea from Artemisia against insects 1 full teaspoon of Artemisia is boiled in 1 l of water. Strain and allow to cool. Sprayed undiluted against aphids, Sitona crinita, peas Archips crataegana Hub, wasps, as well as on the way of ants.

6.2 Biological struggle with plant diseases:

- Mildew, rusts and bacterial burrill in tomatoes. Tea from Tanacetum vulgare. 30 gr., of flowers with stems of dried Tanacetum are boiled in 10 liters of water. The resulting decoction is diluted with two parts of water.
- Tomato mildew: Bear onion (Ramsons) is also used against aphids. Tincture of flower stems (collected in May-June), bulbs, leaves. Double-spraying. 1 kg finely chopped green mass of bear onion and garlic, soaked in 3 liters of water for 12 days 300 g of it per 10 liters of water.; It is used when mildew occurs.
- Bacterial burrill in tomatoes, and also against powdery mildew on the apple and rusts in fruit trees. Decoction of Horsetail against powdery mildew 500 g fresh or 150 g dried horsetail soak in 4 liters of water for about 24 hours, then boil 1/2 hour. After cooling, strain and dilute in a ratio of 1:5.
- Fungal infections: 1 medium-sized clove of garlic is crushed and poured with 1 litre of hot water. Strain and allow to cool, then use for spraying without diluting. It also has an effect against mites.
- Fungal diseases: garlic, onion, potassium permanganate, potassium thiosulfate. Aronia leaves, picked up in June-July.
- Mould: Spraying with whole milk and water in equal amounts every 2 days can help in the fight against fungal diseases/powdered mold/. They are a problem for peas, tomatoes, pepper, pumpkins, cucumbers.
- Bacterial diseases: garlic powder.
- Rusts: Decoction of Horsetail, sulfur
- Powdery mildew: lime-suflur solution, colloidal sulfur in 8-14 days, prevention decoction of horsetail, sulfur.
- Chlorosis: Liquid manure from nettle.
- Vitis Philoxera. Use curly-leaved parsley. Around Vines, in the rows.

- ❖ Decontamination of the seeds: decoction of chamomile; Thermal treatment - beans, peas, tomatoes, okaya. For tomatoes in hot water at 56 ° C for 30 min.; Dry heat treatment at 56 ° C for 6 hours, then at 80 ° C for 24 hours. Cabbage seeds against bacterosis and mildew in hot water at 50 ° C for 30 min., and for cauliflower for 18 min. Brown onion against Mana 16 hours at 40 ° C, 8 hours at 43 ° C or placed on direct sunlight for 1-2 weeks.

6.3 Traditional methods of fighting in theprivates:

- White cabbage butterfly: chopped stems and tomato leaves are soaked for two hours in two liters of water. The extract is used undiluted.
- Cabbage moth: Mix 1/4 vinegar with 3/4 water, then add 1 teaspoon liquid soap, which will bats the vinegar to the larvae, worms, bedbugs. You can add molasses to this tincture.
- Onion Fly: decoction of Palmate; Mixed with carrot juice.
- Carrot Fly: Mixed juice from onion, garlic, leek, lavender. Against the slugs and the carrot fly between the carrots and the strawberries shallow is buried chopped into pieces onion.
- Mites: Decoction of Horsetail, 0.3% mild soap with nettle fertilizer, garlic.
- Red Mite: 1.5 -6 kg finely chopped Plants of white mustard are soaked 3 days in 10 liters of water. When you strained the extract, attached liquide soap for cladator. It is applied in 5-7 days.
- Thyroid lice: a solution of mild soap, Serinoacidic clay.
- White-winged: a solution of mild soap, Serinoacidic clay, Encarsia (more effective in greenhouse conditions).
- Nematodes: Mixed crops with tagetis.
- Earthen fleas-especially dangerous in cabbage crops. To apply a mixed culture with spinach or salad, decoction of Artemisia and Tanacetum vulgare (1:1)
- Mole cricket:
- Burial of vessels to the surface of the soil.
- Nailing the twigs alder.
- Wire worms:
- Processing of soil, ploughing or ising up to 15 cm., in depth.
- Lures cooked corn or wheat grains, 5-6 kg per dka, soaked in a decoction of Boxerica (Veratrum Lobelianum Berhn).
- Against Bayonles (Forficula auricularia) in the hazelnut and other insects-the empty bottle with the last drops of beer is hung on the tree, which has parasites such as: bayoners, beetles, flies and whatever insects you remember. The suspension is with the back on the top, but still not vertically, about 45-75 degrees!

- If a Mole-rat (blind dog) or mole appears in the garden, it can be expelled with a bad smelly scent for them: grind and mix garlic/or onions/and camphora spirit and put in the moles or in the underground moves of the blind dog. Take green hemp, put it in the curries and in the moves of the blind dog/in a different place from the previous mixture/. The hemp starts to act only after it rots, so if the first mixture did not expel the enemy, then the hemp will cope with it.
- Mole-rat: Dry and fresh leaves of wormwood (Artemisia), chrysanthemum.
- If there are any twigs in the moles, this will expel the mole. Sambucus, tobacco, nettle or/and buried around the perimeter of the section empty bottles in an angle of 45 degree with open throats, playing in the wind, reliably unblock moles, mice and other rodents.

- Water-alcohol extract of Veratrum Lobelianum Berhn is effective against mice and rats. One part of the plant raw material is poured with 1 to 5 parts of the Spirit-water mixture (equal amounts of water and alcohol). In this solution soak grain of wheat for 4-5 days and bet as bait to the entrances to the rodents. The solution and baits should not be touched by hands.
- For birds, attacking the fruit – place chopped onion bulbs in trhee crowns or rows (for strawberries).
- Garlic against Sitophilus. 100 kg grain, rice, flour 200 g bulbs
- Slugs: Traps with beer, compost, extract from the Begonia, wood ash around the plants, soot, stone flour and lime; Baits from potato parts, decayed tomatoes, cucumbers.

6.4Tips:

- When planting around the tree trunk to plant Mint or Mentha spicata, which repel ants, because they are a major culprit for the presence of aphids. Do not cutt the grass too low around the trees-this is how to create a natural dwelling for beetles (predators), which feed on the parasites in the orchard.
- To reduce damage from gray rot (caused by the fungus Botrytis) in the strawberries, keep the plants with pine needles. This way, you will prevent the growth of weeds, remove the ploughs and your fruits will acquire a taste of forest strawberries. The same work can do black dense nylon, but it is more expensive and less environmentally friendly.
- To remove the worm on the leeks (the fly larva of Phorbia Antiqua), which invades brown onion too, put tomato leaves and stems to rot at the end of the Lesh. The strong smell of the decaying plant mass will quickly make them go away.
- To banish the cabbage butterfly, spray with a slurry of rotten nettle, the strong smell acts repulsive. This also nourishes the plants.
- To protect your vegetables from the birds that move the seeds or damage the tomatoes, put nets on the crop. Leave nearby and a vessel with water, because birds peck tomatoes more than thirst, than from hunger.
- To protect your tomatoes from peronospora (which manifests as brown spots on the top surface of the leaves, on the stems and on the fetus), pin in each main stalk a copper nail or a piece of copper wire. The antifungal properties of copper also act against other pests of the same genus.
- Horseradish: for storing fruits. On 40 kg is placed 3.2 kg. 200 g grated horseradish retains for 5 months the caskberries (at a height of 25 cm and a diameter of 25 cm).

6.5 Plants that help and live in symbiosis.

- White wormwood (Artemisia absinthium) between the French grapes (Ribes) protects it from rust.
- Eggplant (Solanum melongena) and green beans together stump the Colorado potato beetle. Instead of beans, the same effect is achieved with peas. It's not even necessary to plant a large amount. In rows of potatoes up to 10 m is enough from both ends of each row to plant one root peas.
- The Colorado potato beetle (Leptinotarsa decemlineata) doesn't like pumpkins. For this purpose, the pumpkin violins are best, because they play long milliones and walk through the potatoes to keep.
- Tropaeolum majus and horseradish repel the leaf lice, caterpillars and mice. Lattium enhances the aroma of the radish. • The Tropaeolum majus planted in a greenhouse

banished the annoying greenhouse white flap. • Green Salad hinders the attack of various types of radish and cabbage from earthen fleas.

- Carrots and onions or leeks-protect each other from carrot fly and lucha fly and moth. • Leek located between celery protects against rust on celery and attack from trips;
- Leguminous crops and celery (ratio 1 to 6) or cucumber-a very useful combination for good development. Legumes are sown around the cucumbers nest.
- Celery and tomatoes-protect all kinds of cabbage from the white cabbage butterfly; • Spinach or salad with cabbage-against earthen fleas;
- Digitalis and Convallaria majalis (beauty tear)-improve the quality of the tomatoes.
- Nettle, farmed to essential oil plants increase the content of essential oils in them up to 80%. • Rosehip, elderberry and mustard-useful plants around the vegetable garden
- Celery and cabbage is not attacked by the white cabbage moth and the rust celery
- Onion, garlic and leek provide protection against pathogenic fungi.
- Satureja (Savory) in the rows of beans-leaf lice pass away beans.
- Basil to cucumbers-protect cucumbers from mildew
- If near the strawberries or parsley plant onions, garlic or leeks, then you will not have a problem with the gray mold (botulism) on them. They expel the slugs, the mice and protect the strawberries from pathogenic fungi.
- Lavender around roses or other cultural plants banish ants and leaf lice
- Horsetail and Nettle banish red spiders.
- Garlic and Tanacetum vulgare banish the leaf lice.
- Wormwood stumps flies from crops.
- The Satyreja banish the cabbage butterfly.
- Garlic gives off the attacks of the peronospora in tomatoes.
- Rosemary and thymus banish the cabbage butterfly.
- The radish strips off the red spiders.
- Plants will not suffer from the invasion of earthen fleas, if you sow radishes and turnips next to the salad and tomatoes. In the cabbage with tomatoes, sow parsley, so you will solve the problem with the appearance of brown rot on them.
- The kitten/Anemone Pulsatilla/does not allow the development of fungal diseases even in the wettest summer.
- White Sinapis alba: Inhibits the development of weeds. The mixture with peas increases the yield. Protection strip for fruit (and coriander).

6.6 Best combinations in the vegetable garden, when constructing permaculture are:

- **Brassica** with beetroot;
- Celery with tomatoes and beans;
- Tomatoes with parsley;
- Beans with carrots and cauliflower;
- Potatoes with garlic and horseradish; • Carrots with dill;
- Beans with savory;
- Cucumbers with peas or beans;
- Salads can develop wonderfully in the vicinity of carrots;

6.7 Plants that mutually suppress their development:

- Tomatoes with Brassica, fennel (Foeniculum vulgare) or red cabbage
- Beans with onion or garlic
- Onions with potatoes or cabbage
- Parsley with carrots or cabbage
- All vegetable crops near wormwood
- Never side to side bulbous (garlic, asparagus, onion, leek, etc.), Solanaceae (tomato, potato, etc.) and Fabaceae (beans, peas, broad beans, lentils, etc.). These are "families of enemies"-they weaken each other when they grow up together.

7. Measures for preserving and increasing the bio diversity and management of agro-eco systems in the cross-border region Bulgaria – Greece, for the Bulgarian part

Measures that would be effective in preserving local bio diversity in the cross-border region are based on compliance with the main world-renowned sustainability practices, and they are:

- ✓ The theory of the Stauer
- ✓ The principles of building a biodynamic farm.
- ✓ The Permaculture theory
- ✓ The principle of non-invasive non-local species for an ecosystem.
- ✓ Reduction of androgen influence.
- ✓ Preservation the overall resilience of an ecosystem with its adjacent parts: biological, historical, genetic, coursework, social and economic.
- ✓ Using sustainable practices in all actions to change the state of an ecosystem.
- ✓ Compliance with the principle of biocenosis in species.
- ✓ Limiting and prohibiting the use of pesticides, fungicides and other chemical preparations.

8. Proposals for integrated measures and recommendations to local and national authorities for the Bulgarian part of the Cross-border Region Bulgaria-Greece, taken in accordance with local vine varieties, their development and reconstruction.

✓ On the basis of the studies made in the project, it is clear that the recently used in the Bulgarian wine Production "modern" – brought to our country varieties despite modern marketing, are difficult to enforce in new markets. The fact is that more and more search acquire the strangers, exotic, bearing new taste and aromatic sensations wines produced in different from the generally accepted methods, and from different from those known to all varieties. And since very often the new is well forgotten old – the moment is suitable to give priority to the vanishing Bulgarian varieties. This chance would be incomparably higher if the varieties were planted in the territory and approved for the production of wines with PDO/PGI – Wines of a higher class with protected geographical indications and a link with their natural terroir. The supply of wine from old, local Bulgarian varieties is the main thing they expect to discover, specialists, connoisseurs and seekers of exotic tourists, and Bulgaria with its preserved nature and eternal history will continue to attract tourists. These factors, combined with the possibilities and conditions for organic or biodynamic production are key to success of Bulgarian wines in international markets.

✓ Currently, a large number of users worldwide have an opinion on the impact of wine production on the environment and their health. This is because of the growing tendency to consume organic products and healthy eating. The introduction of environmental norms, certification and sustainable organic viticulture and wine in Bulgaria will enhance consumers ' interest in domestic wines. As part of this process, it is necessary to carry out research and bring evidence of the impact of environmental health practices in order to motivate consumers to buy wine from sustainable production.

✓ With thecooperation and mutual support of all players in the winesector, institutions and organizations are of great importance.

✓ For the purpose of preservation endangered local vine varieties, the experience of France in the delegation of powers to growers who are growing in areas with PGI and PDO, with a specific terroir, may be used to produce propagating material of the same under control. The controller shall ensure the proper planting, and cultivation of the variety. When selecting a manufacturer to delegate rights to create a genetic field, the following characteristics are respected: location, climatographic characteristic, terroir accuracy, application of sustainable viticulture practices, production certification.

✓ Of utmost importance for the future development of the wine sector, is finding solutions for the challenge of environmental and social sustainability while maintaining economic viability. Achieving this objective requires, on the one hand, support for producers in the implementation of sustainable practices and, on the other, increase consumer awareness and the development of wine culture. Part of this process is also the initiation of appropriate marketing strategies to encourage consumers to choose sustainable, biodynamic wines.

✓ To encourage the adoption of sustainable practices among winemakers it is necessary to familiarise them with the economic benefits for the environment. They must be convinced that by adopting the principles of organic farming and sustainability, they will reduce their costs, and that they will be able to rely on technical assistance from the various European and national programmes. It Is necessary to bring together producers in an industrial group or multi-stakeholder partnerships in order to promote practices that have high environmental, social and economic benefits for communities and regions.

9. Main problems facing producers in the cross-border region

- The winemakers experience difficulties with the process of certification of wine production as a BIO product.
- Winemakers find this zoning inaccurate, and from there comes the inaccurate determination of the territory of the local old varieties.
- Viticulture is a separate but connected and important for winemaking work. At present, the vital for the sector association and arrangement between the grape and the wine-suppliers is lacking, which is why the pay for the raw material and lack of motivation to improve the quality and certification are inadequate.

- Eradication of indigenous old varieties and their replacement by modern, widespread in the community, predominantly French. Wine producers do not find a niche market for wines produced by traditional Bulgarian varieties.
- Lack of sufficient information about bio-support productions, sustainable wine-sector practices and institutional conditions for their introduction in Bulgaria.

II. Conclusion

Project "Vine SOS for endangered traditional Vine varieties", is a successful beginning, in terms of preserving old local vine varieties. The identified problematics, the studies carried out, the opinions taken, the scientific research of the DNA of Vitis Vinifera orig. in the Cross-border Region of Bulgaria-Greece, they give reason to conclude that the efforts on preservation are not in vain. The usefulness of the overall impact of the project, and in particular this handbook, will be able to take into account after some period, but the information exposure that the project has achieved is already positive, in the face of eminent winemakers who are ready to put into practice the exposed sustainable principles and start working with local varieties.

Guidelines for sustainable agri-environmental practices in viticulture
Greek part

INTRODUCTION

Vitis vinifera or grape vine more in common is an angiosperm plant, and belongs to the order of Vitales and the family of Vitaceae with many different varieties grown in the Mediterranean region, of the earth. Specifically it is a spruce shrub, where it climbs various natural or technical supports or springs with its vines and propellers. It is perennial and develops rapidly. It is mainly grown for its fruit, the grape, while its leaves are used in cooking. Its fruit can be used for confectionery, or for the production of raisins, wine, other spirits such as tsipouro and finally alcohol (ethanol).

Vine varieties threatened under extinction in the Greek-Bulgarian cross-border area, related to the local biodiversity and vine varieties, especially those within Natura 2000 sites.

Main Greek Vine Varieties:

1. Limnio (Evros)
The cultivation of this vine variety is recommended in the vineyards of the prefectures of Evros, Rodopi, Xanthi, Drama, Kavala, Serres and Halkidiki and in the region of Limnos where it is also place that was found. Synonyms of the variety are Limniona, Limniona, Limnia according to Aristotle and Kalambaki. The flesh is sweet and delicious. Its must is used for the production of premium wines.

2. Sefka (same as Bulgarian Nicheftka mainly in N. Serres)
Red variety of Bulgarian origin, grown in Eastern Macedonia and Thrace. It is threatened under extinction This Variety is very well grown and very productive
Resistant to disease and drought

3. Bogialamas, (Thrace)
Red, deep-colored, variety cultivated in Eastern Macedonia and Thrace
In recent years great efforts have been made to highlight its particular characteristics and for diffusion of the cultivation. Wines are produced for aging with high alcoholic strength, high concentration of phenolic compounds and characteristic aromatic profile.

4. Zoumiatiko or Damiatis (the same as Bulgarian Dimyat, mainly in Serres and Xanthi)
White variety of Balkan origin, known since the 12th century

5. Karnachalas, Thrace
Red variety of Evros and especially of Soufli area
A variety of moderately lively, fertile and quite productive

6. Pamidi, or Pamidi (the same as the Bulgarian Pamid, Thrace)
Red variety found in areas of Eastern Romelia, Eastern
Macedonia and Thrace. Depending on the winemaking method, white or rosé wines are produced. Pamidi is a well grown, very productive variety

7. Mavroudi (the same as the Bulgarian Mavrud, Thrace)
Red variety which is a Thracian variety (including southern Bulgaria)
The name Mavroudi comes from the Greek word "black" because it has a deep dark ruby color

8. Keratsouda (the same as the Bulgarian Keratsuda, Thrace)
Keratsunda is a red-green variety of northern Greece, found in old vineyards in the area of Soufli and Eastern Romania.It probably comes from areas near the Strymonas River, in Bulgaria and Greece. It is now in danger (under extinction)

Productive Systems

(Cultivation manners associated with vine cultivation nowadays).

The following four types of cultivation are distinguished in agricultural production according to the way of intervention in the cultivation of the vineyard:

1. Natural Farming

The natural agriculture, or natural farming, is based on a nature completely free from all human intervention and mediation. According to the founder of Masanobu Fukuoka, he "strives" to repair the damage caused by human knowledge and action to nature and to "restore a divinity-free humanity". It has its core in the East and America. It describes its application systems, adapted mainly to the cultures of the eastern world. For the scientist who is convinced that nature can be understood and used through human intellect and action, natural cultivation is a special method. As a way of farming in contrast with nature, it does not accept the anthropogenic interventions of tillage, fertilization, the use of plant protection products, botanicals and pruning (Polyrakis 2003). The number of farmers who consciously follow this method is very limited.

2. Sustainable agriculture

It is the method of farming that is called upon to replace and solve the problems created by conventional farming. Sustainable agriculture (sustainable farming) is defined as the production of agricultural products through a system that increases the inherent capacity of natural and biological resources, compared to the discussion. At the same time, it allows growers to enjoy a good income and provides consumers with safe and healthy products while minimizing adverse effects on the environment (Benbrook, 1991).

Sustainable agriculture aims at both maintaining and improving food production, reducing the level of production risks, protecting the potential of natural resources and preventing soil degradation and water quality while being economically viable and socially acceptable (FAQ), 1993 schjonning et al, 2004). These goals are a shared vision of both producers and consumers. Central to sustainable

development is the principle of continually satisfying the human needs of the present and future generations. The achievement of this principle requires the balance and harmony of human resources and the continued maintenance of agri-ecosystem elements.

It should be emphasized that sustainable agriculture is not the opposite of business, as many believe, although there is a lot of argument about the possibility of sustainable agriculture to display a business character and also the strengthening sustainability in agriculture threatened the economic viability of the farm. On the other hand, experience from other countries (the Netherlands) has shown that the economic viability of farming is only threatened by overproduction and rising prices, rather than by the transition to sustainable practices (Polyrakis 2003).

Sustainability strategies or methods of agriculture that need to be adopted to achieve the agriculture of the future.

3. Conventional agriculture (Conventional Agriculture)

The intensive form of farming with the application of high input systems for high yields is called conventional farming. This term is widely used in international literature to describe conventional agriculture (Pacini et al, 2003). It is generally considered to be any kind of agriculture that uses chemical inputs, over-cultivates the soil (intensive farming) and aims to maximize production by neglecting the future impacts (predatory farming) that these actions have on land resources, that is, land water and air (Koutsos 2010). Relevant to conventional farming are the following terms: intensive farming, chemical farming, industrial farming.

Over the last fifty years there has been a proliferation of modern intensive farming on a global scale, and as a result when we refer to the practice of farming we mean mostly intensive / conventional farming. The result of this form of economic growth is the increase in productivity and consequently the sharp increase in agricultural income in the first few years. Initially, this method of cultivation helped substantially in the development of the rural area and supported the rural economy in comparison to the extensive farming that was used in the past. In the long run, however, the over-supply of agricultural products in the market has caused prices to fall, problems in agricultural policy and environmental impacts on the agro-ecosystem have begun to emerge. Practicing of agriculture at such a high intensity has led to the biological simplification of the farm environment and the creation of an artisanal ecosystem that requires constant human intervention to regulate its internal functions (Alteri, 1999).

For all the above reasons, agriculture in nowadays is being subject to serious pressure to re- examine the effects of intensive farming systems and in particular their impact on the environment, rural areas, human health, healthy nutrition, agricultural profitability, etc. of the International Food and Agriculture Organization (FAQ food and agricultural organization) report that cropland over the past decades has been reduced due to desertification and erosion by 1/5. If the same rates of decline continue, then the area under cultivation by 2030 will fall to half that of the 1990s. This is because the cultivation of the plants whose name was etymologically derived from the adjective "good" and the essential "work" and enabled man to secure his food by doing "good work" was transformed from modern man into "bad work". »

4. Integrated Management

Integrated Management in Agricultural Production is the balanced concern for the environment and

product quality. It is an environmental management system with quality system elements, based on compliance with legal requirements, rational use of all inputs (water, fertilizers, plant protection products, energy, etc.) and monitoring and controlling all production phases with aim at protecting the environment and the consumer, as well as producing branded, high quality, safe and competitive products.

✓ By implementing an Integrated Management System we achieve a sustainable production process by continually exploiting all available information (on cultivation, means of production and the environment).

✓ Integrated Management is an alternative method of management more environmentally friendly than the conventional production method.

✓ The implementation of Integrated Management System achieves:

✓ Organizing the farm with planning production. Control at all stages of the production process

✓ Ongoing information and training of the producers involved Reduce production costs due to the rational use of inputs The production of quality, safe and competitive products.

✓ Protecting the health of producers and farm workers

✓ Improving soil fertility, rational management of water resources and effective plant protection in accordance with legal requirements.

Integrated management in agriculture, and therefore in viticulture, is not, in fact, an alternative cultivation method, but rather a way of streamlining chemical inputs and farming interventions to reduce adverse environmental effects, without jeopardizing economic survival. of the farm.

Integrated management is based on the "right dose at the right time". Close and continuous monitoring of the operation, so that any problem can be identified and dealt with in a timely manner in the most appropriate way. For fertilization, the amount and type of fertilizer, soil and leaf analysis is performed. Traps and predatory mites are used to combat insects, as well as the use of some biological preparations where applicable.

The integrated management system made its appearance in the European north in the 1990s, which had an obscure past about chemical interventions in the fields and the increasing pollution of the environment, groundwater and increasing consumer demand. for healthier and more environmentally friendly products.

5. Historical Throwback

Organic farming emerged in the early 20th century, almost simultaneously with the intensification and industrialization of agriculture. After 1924, sociologist Rudolf Steiner gave a series of lectures on an alternative form of agriculture, discussing human beings, healthy eating and living, positions that then became the basis of organic - dynamic farming or "Biodynamic Agriculture", its precursor Organic Agriculture as we know it today. Subsequently, other scientists were studying alternative methods of organic farming, such as: British botanist Sir Albert Howard, who now considered the Father of Organic Farming, Lady Eve Balfour, who compared organic and conventional farming in 1939; and Masanobu Fukuoka, a Japanese microbiologist, an inventor of Natural Cultivation.

These various movements, which owe their origin to some of the terms protected by Community law,

considered the link between agriculture and nature essential, as well as respect for natural equilibrium, and abstained from a rather guided approach to agriculture. yields through multiple interventions with different categories of synthetic-chemical inputs (Ziopoulos, Papatheodorou, 2000).

The organic farming movement obtained as a system of management and production of agricultural products based on natural processes. That is, the non-use of chemical synthetic fertilizers and pesticides, the use of non-chemical methods to deal with pests, diseases and weeds, and the use of appropriate production techniques. These include crop rotation, selection of durable varieties, recycling of plant and animal residues that maintain the natural balance and fertility of the soil (Galanopoulou et al., 2001).

Today we are experiencing a rapid growth of the Organic Farming sector both at the level of consumption, as well as at the level of research, information and production. It has the political support at EU level. as its citizens have become aware of the impact of conventional farming on the environment, on the quality and potential risks arising from agricultural products and now require more from producers. The increase in nutritional risks due to globalization, the huge food scandals of recent years and increasing consumer awareness of health and environmental protection are having a positive impact on demand for organic products.

Organic products have some pre-defined characteristics: they must be packaged, labeled "organic products" and sold only in their season.

The tendency of wine growers to focus on the organic method of cultivation has been increasing in recent years, due to both consumer insecurity and - often undetermined - soil effects from the continued application of the conventional cultivation method.

This alternative (biological) method results in the production of healthier grapes and more generally natural balance, higher soil fertility, preservation of ecosystems and reduction of pollution.

The EU logo for organic products.

IV.The goals of organic farming

- Organic plant production pursues the following objectives:
- According to the International Federation of Organic Farming Movements, the goals of organic farming are (IFOAM, 2002):
- Produce food of high nutritional value in sufficient quantity.
- To coexist with natural ecosystems and not participate in human domination.
- Encourage and enhance the bio-cycles of the agro-ecosystem with the modern participation of micro-organisms, flora and fauna, crops and farm animals.

- Maintain and increase soil fertility in the long run. Properly implement systems for self-sufficiency in organic matter and nutrients.
- Rationalize, as far as possible, the use of natural resources and renewables in farming systems organized locally.
- Contribute to the sound ecological management of genetic biodiversity.
- Work with materials and substances that can be reused or recycled on a farm.
- Limit all forms of pollution arising from agricultural practice.
- Maintain the genetic diversity of agricultural ecosystems, including the protection of plants and wildlife. Animal breeding conditions can be created to maximize their own behavior.
- Provide to producers a way of living based to human rights of United Nations, cover their basic needs and provide them with adequate income and job satisfaction in a safe working environment.
- Proper assessment of the effect of cultivation techniques interaction with the ecological and social environment.

V. Basic principles of organic farming

The general principles of organic farming are holistic approach, timely treatment and direct contact of the producer with the consumer.

1. Holistic approach

The farmer must deal with all the factors that determine the amount and quality of production holistically. That is to say, that in the agro-ecosystem, as in any ecosystem, each factor is co-dependent and influenced by other factors. For example, to replenish nitrogen, which is an essential nutrient of plants, the producer should not choose the use of nitrogenous chemical fertilizer, which will not only help in the development of vegetation but will ignore other factors (soil, beneficial). organisms, nutrients, etc.). On the contrary,

will select methods (green manure, vegetable residues, etc.) that will promote a balanced and harmonious development of all the factors involved in agricultural practice (Vlontakis et al., 2001).

2. Timeless treatment

The second basic principle of organic farming states the approach of agricultural practice based on its long-term impact on the actors involved. That is, it does not suffice for fragmentary actions and results of a single growing season, but every action is considered to be a consequence of the former and the preparation of the next (Dantsis, 2004).

Thus, when a problem arises in the crop, the producer should identify the cause and not just deal with it immediately. For example, an entomological attack may be due to the disappearance of useful predatory pests, inappropriate lubrication, wrong pruning, poor selection of varieties, etc. and its extermination is not enough. The causes must be sought and the problem radically addressed (Dantsis, 2004).

In general, maintaining plant health is based on precautionary measures, such as the selection of

suitable species and varieties resistant to pests and diseases, appropriate crop rotation, mechanical and physical methods and the protection of natural enemies of pests.

3. Producer-consumer connection

The third principle governing organic farming relates to the producer-consumer relationship. Organic farming promotes its products in local markets, bringing producers and consumers in direct contact, thereby creating mutual trust between the two sides. In addition, the 'locality principle' should apply, meaning that production should be locally specialized and enhanced with the widest possible reduction in long-distance trade. This will allow direct consumer-producer contact.

The producer should select the specific distribution channels of his products in order to come into direct contact with the consumer (direct marketing) and to know the target market. It can also monitor consumers' preferences and needs in terms of quality and variety of products, varying their production accordingly. On the other hand, the consumer is also informed about the production of the products, the problems encountered in the field, etc. (Fotopoulos and Krystallis, 2003)

Finally, the lack of an intermediary that characterizes the channels of direct marketing allows the producer to achieve better prices than the wholesaler, but also to provide the consumer with organic products at prices lower than those of retail stores (Dantsis, 2004).

Governments around the world are increasingly promoting the production of organic products.

VI. Organic vineyard farming

Introduction

It is a fact that the cultivation of vineyards and mainly of wine-growing grapes in Greece, having gone through several stages more or less favorable for its development, is now emerging with new data, which seems to justify a biological version of the cultivation. More specifically, these data relate to:

✓ The pursuit of improving the quality of wines, which is anyway imposed by strong competition, with the relatively low area per acre of vineyards, especially those producing wines of designation of origin (VQPRD).

✓ Consumers' shift to higher quality wines.

The awareness, both of viticulture specialists and viticulturists, that quality grapes are not produced by living vineyards, where vegetation is difficult to control, while forcing the grower to frequent

interventions (peaks, summer pruning) thus augmenting the cost of production. Quality is ensured by balanced vines, which have a good leaf surface, capable of good photosynthesis but also provide adequate ventilation, thus creating the ideal microclimate for ripening grapes.

VI. Rules applicable to the organic cultivation of vineyards

The following rules apply to organic crop production in accordance with Article 11 of Regulation 834/2007:

- Biological organic crop production uses tillage and cultivation techniques that maintain or increase soil organic matter, improve its stability and biodiversity, and prevent its compaction and erosion.
- Soil fertility and biological activity are maintained and improved by multiannual crop rotation including legumes and other green manure crops and by the spread of animal manure or organic matter, both preferably composted, from organic production.
- The use of biodynamic preparations is permitted.
- Fertilizers and soil conditioners may only be used if they have been approved for use in organic production.
- Inorganic nitrogen fertilizers are not used.
- All plant production techniques applied prevent or minimize the contribution to environmental pollution.
- The prevention of damage caused by pests, diseases and weeds is primarily based on protection from natural enemies, the selection of species and varieties, crop rotation and cultivation techniques and thermal processes.
- In the event of a threat to crops, plant protection products may be used only after they have been approved for use in organic farming.
- Only seeds and propagating material produced by the biological method are used for the production of products other than seeds and vegetable propagating material.
- Purification and disinfection products in vegetable production are used only if they have been approved for use in organic production.

Installation of crop rotation system

- In the context of organic farming, the producer has the possibility, in accordance with EEC Regulation 2092/91, to improve the fertility of his fields by relying on the cultivation of legumes (clover, broad beans) or other deep-rooted grasses, oats, rye). Ratio: legume forthe vine 4: 1.

- in October, when the field is in its 'root', the milling is done, followed by sowing legumes and cutting them and incorporating them when they reach about 20 cm. In this way the soil is enriched with organic matter (from 2 tonnes per acre of greenhouse we can get 300-600 kg of humus, if we accept as a humidity factor 0.1 - 0.15, while the manure has 0.4 - 0.6).

But here we have to pay attention to some points so as not to be led to failure. Green leguminous

fertilizer supplies nitrogen to the crop and improves soil organic matter. But at the same time, for a few months it acts competitively with the main crop, as far as it concerns water and nutrients providing. However, it can be a problem even when, for example, during the winter months the rainfall levels are low and the fields cannot be irrigated. The legumes, having exhausted the available water reserves, can create a shortage of water in the crops and limit their growth (e.g. clover has high demands on water).

For these reasons, the following should be considered before installing the crop rotation system:

a. Soil analysis and leaf diagnostics in order to determine: soil type, pH, conductivity, etc.
b. Weather conditions, frosts, temperatures etc.
c. The existence of water and its quality
d. The biological cycle of the plant.

It should be noted that green lubrication does not have to be done every year. It can be applied from time to time or every two years at most.

Crop rotation guide

VII.Fertilizers and soil conditioners in organic farming

The use of synthetic chemical fertilizers is prohibited in organic farming. The products that may be used to improve and fertilize the soil in organic production are as follows:

Designation	**Description, composition requirements, conditions of use**
Farm manure	Product exclusively composed of mixtures of animal feces and plant material (animal bedding). Origin from intensive farming is prohibited.

Dried manure and dehydrated poultry manure	Origin from intensive farming is prohibited.
Composted animal excrements, including composted poultry manure and farm manure	Origin from intensive farming is prohibited.
Wet animal excretions	Use after controlled fermentation and / or appropriate dilution. Origin from intensive farming is prohibited.
	Product produced from separated household waste composted or anaerobically fermented for

Composted or fermented domestic waste	biogas production. Household waste only of vegetable and animal origin. Only when they are produced in a closed and controlled collection system acceptable to the Member State. Maximum concentration in mg / kg of dry matter: cadmium: 0.7; copper 70; nickel 25; lead 45; zinc 200; mercury: 0.4; 70; chromium (total): 70; chromium (VI): 0.
Peat	Use restricted to horticulture (horticulture, floriculture, horticulture, nurseries).
Mushroom cultivation waste	The initial composition of the substrate is limited to the products in this Annex.
Worms' (compost) and insects' feces	
Guano	It is a natural fertilizer, consisting of ammonium phosphate, calcium, etc.
Composted or fermented vegetable mixtures	Product obtained from mixtures of plant materials that have been composted or anaerobically fermented for biogas production.
The following products and by- products of animal origin: blood meal (dry blood), hoof flour, horn flour, bone meal or degelatinized bone meal, fish meal, meat meal, wings, hair and meal "chiquette", wool, fur, dairy products	Maximum concentration in mg / kg

	dry chromium (VI): 0.
Vegetable fertilizer products and by products	E.g. oilseeds, cocoa butter, malt root.
Seaweed and seaweed products	Long as they are received directly from: -natural processing, including dehydration, cooling and milling -Extraction with water or with acidic and / or alkaline solutions -fermentation.
Sawdust and wood chips	Wood not chemically treated after logging.
Composted tree bark	Wood not chemically treated after logging.
Wood ash	Wood not chemically treated after logging.
Ground soft natural phosphate minerals	Products with a cadmium content less than or equal to 90 mg / kg P205.
Aluminum phosphate - calcium	Product with a cadmium content less than or equal to 90 mg / kg P205. Use restricted to alkaline soils (ph> 7.5).
Peeling slags	
Crude potassium or kainite salts	
Potassium sulphate which may contain magnesium salt	Product made from crude potassium salt by natural extraction process and possibly containing magnesium salts.
Vinification and vinification extracts	Ammonia vinases are excluded.
Calcium carbonate (chalk, marl, ground limestone, Brittany improver, limestone phosphate, etc.)	Only of natural origin.
Magnesium and Calcium Carbonate	Only of natural origin e.g. magnesite, ground magnesium, limestone.
Magnesium sulphate (kiserite)	Only of natural origin.
Calcium Chloride solution	Treatment of apple foliage after calcium deficiency detection.
Calcium sulphate (gypsum)	Only of natural origin.
Industrial lime for sugar production	By-product of sugar beet production.

Industrial lime from sugar production	Industrial lime from vacuum salt production.
Elemental sulfur	
Trace elements	Inorganic micronutrients.
Sodium chloride	Exclusively from mineral salts.
Rock dust and clays	

VIII. Pesticides - plant protection products in the organic cultivation of vineyards

The products authorized to be used, in accordance with the general principles of organic farming, for the control of pests and plant diseases are the following:

Designation	**Description, composition requirements, conditions of use**
Azadirachtin obtained from Azadirachta indica (Neem tree)	Insecticide.
Beeswax	Pruning agent.
Gelatine	Insecticide.
Hydrolysable proteins	Attractive, only in permitted applications in combination with other suitable products in this directory.
Lecithin	Fungicide.
Vegetable oils (eg peppermint or mint oil, pine oil, caraway oil)	Insecticide, acaricide, fungicide and inhibitor of vegetation.
Pyrethrin-based preparations extracted from Chrysanthemum cinerariaefolium	Insecticide.
Cassettes obtained from Quassia amara	Insecticide, repellent (insect repellent).
Rotenone obtained from Derris spp., Loncho-carpus spp. and Cubé et Terphrosia spp.	Insectcide.

1. **Micro-organisms allowed for biological control of pests and diseases:**

   - Bacteria
   - Viruses
   - Fungi

2. **Substances to be used only in traps and / or evaporators:**

   ✓ Ammonium Acid Phosphate (Traps Only)
   ✓ Pheromones (Attractive, Inhibitor of Sexual Action)
   ✓ Pyrethrinoids (S-methrin and l-cyanothrin only) (Insecticide against Bactrocera olea & Ceratitis capitata Wied)

Surface application preparations between cultivated plants: Phosphorus Iron (Molluscicide)

3. Other substances from traditional use of organic farming

Designation	**Description, composition requirements, conditions of use**
Copper in the form of copper hydroxide, copper oxychloride, acid sulfur copper (tribasic), copper oxide, octane copper	Fungicide up to 6 kg of copper per hectare per year. For perennial crops, Member States may, by way of derogation from the preceding paragraph, allow the limit of 6 kg of copper to be exceeded in a given year, provided that the total quantity actually used over a period of 5 years, consisting of the year and the previous four years shall not exceed 30 kg.
Ethylene	Maturation of bananas, kiwi and kaki; Citrus ripening only as part of a strategy to prevent damage to the fruit fly on citrus fruits; Pineapple induction; Suspension of potato and onion vegetation.
Potassium fatty acid salts (soft soap)	Insecticide.
Clay (Aluminum Sulphate)	Retardation of ripening.
(Kalinite)	
Lime sulphate (calcium sulphide)	Fungicide, insecticide, acaricide
Paraffin oil	Insecticide, acaricide
Mineral oils	Insecticide, fungicide. Only in fruit trees, vines, olive trees and tropical crops (such as bananas).
Potassium permanganate	Fungicidal, bactericidal. Only on fruit trees, olive trees and vineyards.
Quartz sand	Insect repellent
Sulfur	Fungicide, acaricide, insect repellent.

Other substances:

Designation	Description, composition requirements, conditions of use
Calcium Hydroxide	Fungicide. Only in fruit trees, and in their nurseries, for the control of galligena.
Potassium bicarbonate	Fungicide.

IX.Cultivation of Vine with Aromatic Plants

Many plants have natural ingredients in their roots, flowers, leaves, etc. which can alternatively repel or attract insects depending on their needs. In some cases they can help boost vegetation and aroma of various vine varieties. Our experience has shown that the cultivation of plants is an important factor that helps in the complete control of pest insects. In essence, nurturing helps us bring a balance to our garden ecosystem by letting nature do the work.

Table: Indicative Plants that Protect against Insect Infestations

Insects & Pests	Repellent Plants
Ants	Mentha, Artemisia
Worms	Lavender, petunias
Leaves	Mentha, Artemisia, lavender, mint
Rodents	Mentha
Beetles	Garlic, Geranium
Ciccias	Geranium, Petunias
You're spinning	Marigold, Salvia, Dahlia, Calendula
Snails	Rosemary, Artemisia
Slugs	Rosemary, Artemisia
Chalky (white fly)	Marigold

X.Bio Dinamic Agriculture (organic-dynamic) and vineyard application

Biodynamic farming (or bio-dynamic) is an ecological farming that takes into account natural factors and invisible forces in nature that play an important role in the various physiological functions of plants (www.demeter-hellas.gr).

According to the basic principles of this theory, all correlations within nature are taken into account such as influences from the Universe and mental and spiritual influences.

Basic principles of biodynamics are:

- The overriding principle is the global consideration of all factors related to agriculture.
- Achieve the recycling of organic materials harmonized with the natural flow between vineyards, animals and soil.
- Avoiding any kind of environmental damage and weakening the life of cultivated plants by seeking to stabilize the ecological balance as well as to balance the forces of life with the psychic powers.
- Protection and enhancement of various micro-organisms in the soil and generally of the soil microcosm, with appropriate organic fertilization to promote the growth and development of vines.
- Organic materials (manure and vegetable residues) are prepared for composting and transfer of balanced forces that enhance vineyard health. In addition, crop production is combined with livestock production so that the nutritional needs of the vineyards are met by the production of the estate. Appropriate mineral and rock powders, algae organic materials for soil cover and green lubrication are also used to enrich the soil and the vigorous growth of vineyards.
- Choose suitable tolerant vine varieties and suitable for the conditions of the area
- Limit the use of mechanical devices (tractors, etc.) to avoid soil erosion, waste of energy and the creation of polluting gases in the environment.
  The ultimate goal is to maintain good soil structure and increase humus.
- Of primary importance is the maintenance of longevity and good animal health with proper nutrition and preventive treatment based on herbs.
- Harmonious landscaping with beautiful aesthetic diversity of vegetation, orchards and pastures.
- The following shall be prohibited in contravention of the said principles:
- Chemical synthetic pesticides and fertilizers both during the growth of vines and during storage, processing or maturing of their fruits.
- Hormones and genetically modified products.
- Biodynamic agriculture is not only a sustainable way of producing fruits but also a philosophy aimed at re-purifying our planet and man himself.

XI.BIO Dynamic Compost Biodynamic compost

It is made with continuous coatings of different materials and each layer is sprayed with Valerian water. Specifically, the first layer is made of twigs (2-3cm in diameter) so that a good drainage is achieved. Next, a layer (20cm thick) of cultivated or native annual herbaceous or weeds, haystacks or any fresh vegetable residue is placed. On top of this is placed a layer (2-3cm thick) of manure (hen, cow, pig etc.). Then lay a layer of vegetable residue (3-5cm thick) and soil layer (2-3cm thick).

Then a layer of manure is applied and so on. When the pile reaches a height of 1.2–1.5m, it is tilted approximately 70º to the sides of the pile until the top of the pile reaches 60cm wide.

Biodynamic compost is used as a surface fertilizer in spring and autumn at a rate of 1.5-5 tn / acre every four years. As a basic fertilizer for soil improvement, compost is incorporated at a depth of 5-10cm in amounts of 4-7 tn / acre.

As Pfeiffer points out, a good compost can be used at any time, in any crop and in any quantity. In addition, it has been shown that the better the quality of the compost, the less quantity required.

XII.Biodynamic Organic Preparation

Biodynamic preparations are the key element in the biodynamic process and originate from Anthroposophy. The preparations are made according to the needs of each crop and in combination with the microclimate of the area. They do not completely replace lubrication but their mission is to enhance the digestive processes of manure, compost, liquid waste and to act as mediators for the transmission of the forces of the Earth and the Universe to maximize the ability of plants to act as sensors. instruments of the Earth. Although the way they are made is special and the use of animal organs (as a "wrapper") has been controversial by some researchers, however, thirty years have shown the beneficial effect of biodynamic preparations on crops and soil.

Biodynamic preparations are generally added to the pile of natural fertilizer at very low dosages (eg a few grams per ton of compost). The primary purpose of these compounds is not to add nutrients but to stimulate nutrient, energy cycle processes and to affect humus decomposition / formation and to improve soil and crop quality (Ponzio et al., 2013).

The main biodynamic preparation is manure from various animals.

- ✓ **Manure with simultaneous use of farm animal horns**

The collected manure is filled in the hollow part of the horns and then placed in a pit for three to four months. Then the content is ideally digested and obtained to be used as a preparation for activating the microflora (enhancing beneficial bacterial growth). ground. It also promotes vigorous root activity as well as regulation of Calcium and Nitrogen (Wistinghausen et al., 1997, 1998; Panagos 2005)

- ✓ **Silicium crystals (SiO2) with simultaneous use of farm animal horns**

The silicium is ground until it is powdered and then mixed with water to become a fluid paste and placed in the horns. After being left buried in the soil for a period of four months, we pick them up and use them in foliage cultivation.

This preparation helps plants take advantage of heat and radiation and enhances photosynthesis. It also enhances plant resilience and improves the quality of fresh fruit (Ponzio et al., 2013).

- ✓ **Herbal residues used as biodynamic preparations are as follows**

A. Wild Radish (Taraxacum officinale)

B. Acchillea millefolium

C. Nettle (Urtica dioica)

D. Oak Bark (Quercus robur)

E. Valerianna officinalis

F. chamomilla (Matricaria chamomilla)

A. Wild Radish (Taraxacum officinale)

For the preparation of the mixture-basically, the flowers of this plant are used. Once collected, they are dried, wrapped in a gut and placed on the ground in a pit for six months. According to Steiner, this preparation has the ability to regulate the relationship of silicium acid and potassium within the plant (Tobkins and Bird, 1991).

B. Acchillea millefolium

The flowers of this plant are used for the preparation of Acchillea millefolium. The Achillea millefolium, officially named Achillea millefolium, is a herbaceous, perennial, flowering plant with complex and spiky leaves. It has a height ranging from 20cm to 1m and belongs to the Asteraceae family.
Their inflorescences are collected on sunny days and allowed to dry. In the spring they mix with fresh inflorescence juice to obtain sufficient moisture to place in special organic vesicles and then enter the soil at a depth of 25-30cm throughout the winter.
This preparation enhances the resistance of the plant against insect and disease infestations and improves the nutritional properties of the plants, their quality characteristics such as taste and aroma and finally has a positive effect on the fruit's preservation.
In addition, according to Pfeiffer investigation Achillea extract has been shown to act as a biocatalyst as it has a positive effect on the transport and uptake of sulfur and potassium from plants. According to Pfeiffer's findings, Achilles' plants contained 30,000 aerobic bacteria / gram, while the use of the preparation increased the bacteria to 910 million. Finally, it is worth mentioning that while Achilles contained mainly bacteria at the end of the experiment other bacteria and fungi such as radionuclides and bacilli that are important for nitrogen uptake and assimilation.
The result of the above study was to increase nitrate nitrogen assimilation up to 35 times (Tompkins and Bird, 1991).

C. The Nettle (Urtica dioica)

The whole plant is cut at the beginning of flowering. The plants are then dried and potted in the soil for about a year. When we take the contents of the pit ie the humus from the nettles we have a rich mixture of nutrients (Potassium, Iron, Calcium, Sulfur).

D. Oak Bark (Quercus robur)

In this preparation, the oak barks are placed on an animal skull and covered with peat and water.

E. Valerianna officinalis

In this preparation the flowers are extracted and their extract is collected. Where this extract is used

according to many researchers (Steiner; Tompkins and Bird, 1991) This extract helps the plant to easily absorb and assimilate Phosphorus. It also stimulates the activity of earthworms and enhances the resistance of plants to frost (Koeph, 2005).

F. chamomilla (Matricaria chamomilla)

In this preparation the whole inflorescences of chamomile are used where as in the previous solutions they are dried and in the spring they are re-concentrated with a fresh flower extract. The solution is then put into animal gut and then into the soil for enrichment.
According to Steiner, this extract helps improve nitrogen uptake and develop more biomass and better crop yield (Tompkins and Bird, 1991). The addition of chamomile extract also has a synergistic effect with calcium in the soil.

- ✓ **Preparation for fungal control**

Cantilever grass (Hippuris, Equisetum arvense)

They are used as a preventive fungicide. At first the green supernatural part of the plant is collected and then dried and the plant tissue is extracted with the extractant.

The result is used to fight various fungi either by rooting or foliar spraying. Also with the spraying of plants there was an improvement in the quality of plants and an increase in antioxidants (ascorbic acid).

XIII.CONCLUSIONS

CREATION OF THE VINE DOMESTIC ORGANIC PRODUCTS MARKET

The introduction and implementation of the Organic Farming Regulation in Greek and Bulgarian country, as well as the financial support provided for, marks a new era for the development of organic farming. However, there is a serious problem with the lack of a domestic market and a stable organic marketing network. It is clear that in order to 'buy' a product there must be a supply of the product on the one hand and demand for that product on the other. In recent years there has been an attempt by both the state and producers to encourage the purchasing public, emphasizing the importance and profitability of organic products. Of course, the Greek market suffers from many problems that have to be overcome to achieve the expected result. The production volume of organic vine products (currants, table grapes and grapes for vinification) is disproportionately small in size. and the extent of the country's crops. Most vineyard growers work cut off from their colleagues due to their lack of organization in cooperatives, associations, etc., which causes problems both in their own production (misunderstanding of any problems a crop has.) 1997), as well as the availability of their products (the absence of a single product distribution body). The volume of exports of organic viticulture products as their total production is disproportionately large compared to that of conventional crops. In contrast to conventional production, where the production and distribution time of most products has grown significantly, while the smooth supply of the market is self-evident, it takes a considerable amount of time and organization to produce organic produce to reach a similar point. which will of course also mark the beginning of the creation of the market for organic products. Nevertheless, the organic products of the vine are clearly present superior quality in terms of agrochemical purity as well as nutrient content.

III. Used literature and consultants for the Bulgarian part:

Consultants:

1. D. Fursova – IALC

2. P. Hristova – Horizons Association

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