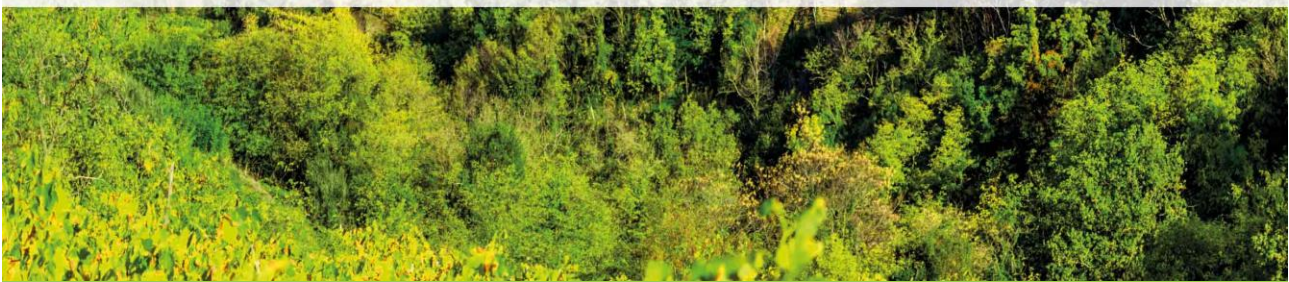




Proposal for designation as
Globally Important Agricultural Heritage System (GIAHS).

SOAVE TRADITIONAL VINEYARDS - Italy -

Version 31/10/2018



SUMMARY

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I. SUMMARY INFORMATION

A. Name/title of the Agricultural Heritage System

Original name in Italian: Le colline vitate del Soave
Translation into English: Soave Traditional vineyards

B. Requesting agency / organization

Consorzio Tutela Vini Soave e Recioto di Soave

C. Responsible Ministry

Original name in Italian; Ministero delle politiche Agricole, Agroalimentari e Forestali
English: Italian Ministry of Agriculture, Food and Forestry Policy

D. Location of the site

Italy/Veneto Region/Verona Province.

The area proposed as GIAHS, coincides with the area that has similar characteristics such as garganega grapes, pergola veronese, steepy hills. It could be very well identified in the Soave wine district.

Coordinates; 45°25'10.38'' N 11°14'45.38''

(annex 1 – boundaries of the proposed GIAHS site)



E. Accessibility of the site to capital city or major cities

Soave town is 20-minute drive from Verona, one of the main Italian cities for transports, connected to the other parts of Europe in multiple ways, with roads, railways and an international airport. It's 1-hour drive from Venice.

Verona (and Soave as well) is connected West to East to the European Route E70 and North to South to the European Route E45. From these routes start a broad system of secondary roads that links quickly the countryside to the major cities. These routes coincide also with the two railways that in the future will be converted in high-speed train lines. The international airport "Verona Catullo" is only 40-minute drive from Soave.

F. Area of coverage

13.623 hectares,

G. Agro-ecological zones

More than the 60% of the area is planted with vines, the 4% is used as orchard, the 4% as olive groves, the 9% is housing and the remains as chestnut groves, wood or arable land. Soils are peculiar, starting from a calcareous, sedimentary soil at west to the paleo soils of the volcanic hills in the eastern part of the proposed GIAHS site. Slopes are steep, and the vineyard are spaced with olive trees or woods to prevent soil erosion. Regarding landscape, this area is made by a succession of hills and plain.

H. Topographic features

The area proposed as GIAHS is located on the slopes of the Lessini plateau, where the hills meet the Veronese plain, in the eastern part of the Verona Province. The altitude of the hills starts from 30 m to 689 m above the sea level. The territory is divided based on gradients, which show that the 51% of the area has a gradient lower than 10%. Moreover, only the 15% of the soil has a gradient between 10 and 20%. Another 18% could be more useful thanks to appropriate terracing and edges. On the remain 16%, there are other cultivation such as cherry and olive trees.

I. Climate type

The climate of Soave region has mild winter and pretty hot summer and it was defined by the climate classification of Köppen (Calo' et alia 1985), hot-summer Mediterranean climate. The Consorzio Tutela Vini Soave in cooperation with CREA of Conegliano (Agricultural Research Centre) in 2000 had started research on the relationship between the climate change and the vineyard management. 2003-2006-2012-2017 summers have confirmed that we are in a new climate era. Rainfall rates are very variable year by year.

(annex 2 – climate information)

J. Approximate population (beneficiary)

The total population of the 13 municipalities included in the proposed GIAHS site is 99.700 inhabitants and 40.887 families, according to last data available. The inhabitants for km² is an average of 320. The population density index is steady but slowly increase. According to ISTAT 2011 data, the average rate of employees in agricultural segment in this area is 10%, more than the regional average that is settled to 4%

K. Ethnicity / indigenous population

No specific ethnic groups

L. Main source of livelihoods

The main economic resource of the area is agriculture, and in particular viticulture. The area is largely private owned (98%) and it mainly belongs to small or micro farms. In the municipality of Monteforte d'Alpone, the 95% of the agricultural area is intended to specialized vineyards. The average properties' area is about 3.000 m², a specific measure called "campo veronese". However, from 2003 to 2014 the average farm surface has grown, while we had a significant contraction of farm extended to less than one hectare. Tourism is a resource that is developing more and more with a consciousness of growing a sustainable eno-tourism.

M. Executive summary

Soave traditional vineyards are an agro-economic system that provide income to many families (above 3.000) since 200 years. The grape growing is completely directed to the production of a typical wine, the Soave DOC, that is one of the most famous Italian white wines, exported in 80 countries all over the world. Aside to this there's a small production of a typical product called Recioto di Soave that is made with the ancient technique of drying grapes, that find its roots since Middle Ages.

This system succeeds in distributing an income and security to the various farms involved in the production chain (grapes producers, wine producers and bottlers) even during the most difficult periods. Even though it is characterized by small or micro estates, it has succeeded in remaining competitive thanks to cooperation and innovation. This is the active role of Soave Consorzio and of the cooperative system that make this aggregation happen and thrive. Now Soave is a complete circle economic system, where about 3.000 families live on it and it creates a related economy that involve more than 10.000 people.

Soils, expositions and climate define a peculiar and original identity. The proposed GIAHS site is geologically divided between volcanic soils at east and limestone soils at west. Hills aren't high, but they are characterized by gradients that reach 30-40% and a south/east - south/west exposition. It is on that hills that, thanks to the determination of the grape growers and the symbiosis between Garganega (that compose the 80% of the production) and Trebbiano di Soave (the remaining 20%), the native varieties, and the environment, that the entire system strengthens.

The traditional way to train the vines, the Pergola Veronese, is an iconic feature of the landscape. Its structure is suitable to produce fine white wines in a climatic change context, even though it does not allow a high rate of mechanization. The grape grower, in fact, must intervene manually both in the maintenance and in the management of the canopy, and they harvest by hand. This traditional processing has passed through generations.

Since the Soave Vineyards were known in the past two hundred years as symbols of a quality wine region, the production of grapes has always been the main crop in the area, surviving to phylloxera threat at the beginning of the 20th century and then to other diseases such as powder and downy mildew. Garganega and Trebbiano di Soave grapes are native because their presence is documented since the middle ages and they are in a complete balance with the soil and the climate conditions. In this moment in Italy there are 9.420,6 hectares of Garganega grape (they were 9700 in 2016 source UIV) planted only in Veneto and the surface is decreasing year by year because of the planting of more profitable varieties such as Glera and Pinot Grigio. Of this, the 86% is in Verona and mainly around the Soave hills. Garganega is a unique crop in all over the world that has to be preserved. In addition, in the area there are other cultivations of typical varieties such as cherry trees (Mora di Cazzano) and olive trees (Grignano) that continue to be planted and used for integrate the incomes that come from viticulture.

Some projects started 10 years ago, made this a pioneering area in the preservation of the soil and the landscape, to prevent erosion with the arrangements such as stone walls, terraces etc. and with the studies on biodiversity. On the other hand, the studies on sustainability, both for the environment and for people try to find solutions for the technical problems originated from working on steeply slopes, starting from the maintenance to the way to lead the vineyards in terms of agricultural choices such as organic or integrated agriculture.

These factors combined with the strong determination of the grape growers to continue this kind of viticulture despite all the difficulties make the proposed GIAHS site an example of preservation of a traditional agricultural site, recognized as the first Italian rural historical landscape for its unchanged characteristics within a century.

II. DESCRIPTION OF THE AGRICULTURAL HERITAGE SYSTEM

1. SIGNIFICANCE OF THE PROPOSED GIAHS SITE

Within the varied world of Italian wine, Soave, with its aspects linked to history, production and trade, represented a major phenomenon from a stylistic and organizational point of view. Today, on the other hand, it has become an outstanding production system, characterized by the specific nature of its products, the coherence with which it expresses itself and the reliability of the substantial volumes it puts on the market. These are the fundamental factors – along with flexibility, long sighted organization and careful management of yields – that have allowed a “phenomenon” to become a system. In this context, where there's a progressive and continue growth of vineyards planted in plain areas, that could be easily mechanized, Soave Traditional Vineyards system is characterized by some elements that makes it a reference point.

The grapes grow on the hillsides around the municipalities of Soave, Monteforte D'Alpone, Colognola ai Colli and Roncà, that since the nineteenth century were completely dedicated to grape growing. In many cases in that time farmers were encouraged to transform into vineyards their lands previously devoted to pasture and arable crops, adapting the best the small and medium sized estates to the hillside viticulture. To increase yields, there was a great improvement on specialized agriculture. The way people prepared the hills varied from zone to zone, adapting the viticulture to gradients, to the type of soil and the presence or not of water. The entire area has always been affected by widespread hydraulic-agrarian arrangements, which have shaped the hillsides. Where the land is steeper, there are terraces and embankments; where the slopes are less pronounced, the pergolas are arranged in a girder. The contour plowing shaped the landscape without changing it and the presence of the pergola veronese, that is a typical training system in this area, has undoubted advantages in this time of climate change. The extra-ordinary vines conversion has been realized respecting the original orography of the hills. The vineyards were realized adopting, among the first, the “palo secco” and separating the vineyards with little woods and hedges with local varieties of plants, giving us the recognition as the First Italian Rural Historical Heritage.

The vine cultivation in this area is affected by some unique features;

- The presence of native varieties such as Garganega and Trebbiano di Soave that are endemic of this area.
- A typical training system, the Veronese Pergola, that can be managed only manually.
- A strong fragmentation of the grape growers' owned vineyards that are usually far from each other.
- No mechanizable plantings, because of the presence of gradients contained by dry-stone walls and embankment.

The difficulties to work on steepy soils and the large numbers of families involved in the grape growing activity, has generated a series of traditions and knowledges consubstantial with this work. Forms of worship, stronger probably in the past are linked to more secular traditions and refer to the relationship between the God and the farming community, that had to be preserved against natural disasters such hail or floods. That involved the whole Soave community, that is called into question to be proactive with the best practices to co adapt a modern viticulture to a very ancient shaped landscape, finding solutions to overcome difficulties. Soave vineyards are a unique model where the modern practices had to be adapted to the oldest one, where a continue positive dichotomy between business and the social keeps the entire system in place.

Without the system that has been created in the last 100 years, made of social cooperatives that guarantee the income even for small fragmentations, there would have probably been an emigration of people from this area towards the cities or a complete industrialisation of the area, like we've seen in the nearest valleys. The problem we are facing now is that in the vineyards planted with pergola, all the works must be done manually. In times where there were no alternatives, the efforts and the costs were well absorbed by the market, but in this moment in Veneto we are witnessing a slipping of the viticulture towards the flat land, where everything could be mechanized cutting down the costs. The abandonment of the hillside viticulture is a phenomenon that must be prevented, not only for avoiding migrations of population towards the cities but also for soil erosion's issues. We are witnessing also a lack of politic and technological instruments that may allow us to encourage the hillside viticulture.

A complex system of dry stone walls and embankments

The proposed GIAHS site has an area of approximately 12.000 hectares, where vineyards represent 7.000 hectares and there are almost 3.000 small farms. Most of these farms are family run businesses and the majority are organized since a hundred years as members of social cooperatives. If there wasn't this system, a farm of 2 or 3 hectares might not be competitive and survive in global markets.

Soave is characterized with a strong fragmentation of the vineyards. We have a typical metrical system that is the "campo veronese" (that correspond to 0.3 hectares) and the vineyards were originally divided with this measure. Gradients and soils texture are linked to the impossibility to work the vineyards mechanically, so this division was mandatory to manage the terraces at their best. The division was materially made with stone walls where the soil was prevalently made on limestone or embankments where the soil is on volcanic origin. This soil arrangements are useful for retaining the earth and to control water flows, preventing soil erosion phenomenon.



The Pergola Soavese



The Pergola Soavese is a particular vine training method, that is one of the first evolution of the traditional training system with "sostegno vivo" (the vine leant on a tree). The vine is a kind of plant that normally needs something to lean on to grow up. The need to make a more specialized agriculture in a context of manual work, of steepy slopes and even the need to have a discrete production, found in the pergola the perfect training system. Since the 20s in fact this was the most extended training method in the region, and during the years we had a develop in materials and distances between the rows, but it witnesses a productive, organizational and landscape identity, and fits at its best with the native varieties such Garganega and Trebbiano di Soave that adapted on it during the centuries.

Two native varieties that risk to disappear: Garganega and Trebbiano di Soave.

The Garganega and the Trebbiano di Soave are a local evolution of what were called the "retiche varieties", very ancient varieties brought both by the first Venetians and by the Roman Empire and that adapted in this environment, surviving and thriving thanks to their resistance to diseases and the quality of the final product.

At the beginning of the 20th century the spread of the two varieties was on balance but during this century, the major ability of Garganega grape to resist to mildew thanks to its long and separated bunch and a constant productive, make this variety prevail.



Recioto and drying system



The production of the Recioto di Soave is a very old technique, that has its roots since Middle Ages. The grapes are dried slowly thanks to the action of the fresh air, sugar are concentrated, there's a huge loss of water and weight so at the end of the process the must is very rich of sweetness. The drying methods are two, one is to hang the grapes in vertical, with nets; the other is the use of "arele" or plastic boxes where grapes lie down and rest for at least 4 months before being pressed.

2. CONTEMPORARY RELEVANCE OF THE SITE

In 1931, Soave wine is the first Italian wine to be recognized as "a typical and fine wine" (Ministerial Decree of 23 October 1931, Delimitation of the "Soave wine" territory of origin). In 1968, it was conferred the Denominazione di Origine Controllata (PDO) recognition (by Presidential Decree on August 21, 1968), modified in 2002 with the M.D. of September 6, 2002.

The recognition as PDO, is a primary step to have lots of benefits such as:

- notoriety in the markets
- improvement of the value of the grapes and wine
- access to national or European funds
- traceability of the products, that means a better consumer's guarantee

In 2016 Soave was recognized as the first Rural Historical Landscape of Italy for the way it maintained the landscape and local traditions intact. This recognition has been given by the Italian Ministry, evaluating the capacity to preserve the environment in a long period of time and the active role of the Consorzio, the producers and the municipalities to be able to continue this task. This recognition has the mandatory requirement to provide an active maintenance of the site following the directive of the Ministry to avoid any impairment of the site.

(annex 3 – Italian Ministry letter of recognition)

The uniqueness of Soave is, as mentioned, the ability to mix together tradition and innovation, in a continuous virtuous system.

Actually Soave Traditional vineyards is a circle system that, following Sustainable Development Goals (<https://sustainabledevelopment.un.org/?menu=1300>), could be replicable and an example for other rural systems. We are developing projects that go through lot of direct effects in terms of

safeguarding the landscape and preserving biodiversity, tradition and cultural heritage. The most important are:

- **No rolling stones;** The project aims to test and apply practices and processes to prevent, reduce and to manage the productive soils along hills and mountain ranges with reference to grape growing. Today emergencies are of two types. The use of new conception's mechanicals, which act on very large surfaces with large movements of soil, with the aim to maximize the use of the soil with high risk of erosion and loss of the identity of the landscape. The second one concerns to the historical accommodations realized hundreds of years ago. In these contexts, we witness to a physiological degradation of the accommodation and artifacts (walls, drains, roads inter pedestrian) which require reconsolidation and being arranged. The interventions made till today in the economic sphere tend to compromise the original harmonies not only in an aesthetic view but also in technical. The project with an activation of an operative group aims to identify professionals, experiences and projects to provide concrete guidelines for new interventions that are looking to minimize over time the risk of erosion of soils on slopes, developing a series of innovative and affordable technologies to consolidate or recover artifacts such as stone walls, embankments and roads in order to enable hill's operators to continue their work safely and in an efficient way by continuing to be the defender of an unique landscape system and historicized quality productions.
- **Itaca** Heroic viticulture in Veneto is a huge issue, of a great economic, social, landscape and touristic importance. The objectives of this projects are
 - 1) To find an efficient the pest management with a reduced environment impact;
 - 2) to produce a low pesticide wine;
 - 3) To give to grape growers more and quicker information:
To get past those challenges it has been projected and installed a fixed installation for the spraying. In this way the grape grower could control the entire treatments without enter in contact with the spraying cloud and treatments are done only if necessary, thanks to the information given by a computerized sensor.
- **Volcanic Wine Park** is an innovative project that put into network Consortium, hotels, agritourism etc. This is targeted to Eno gastronomic tourism and its objective is to increase the potential hospitality, finding resources to improve the existent structures. In this moment the network is composed of 8 elements and more than 500 sleeping accommodation spread in the area. Tourism is actually an important issue, that could increase the jobs.
- **Worldwide promotion of wine.** The Consortium and the wineries co-fund the international promotion of Soave Wine. Promotion is quite important and strictly connected to marketing and territorial marketing.
- **Green label:** or LCA – Life-cycle assessment. The LCA considers the environmental impacts on the human health, the quality of the ecosystem and the impoverishment of the resources, considering also the economic and social impact. The LCA objectives consist in defining a complete picture of the interactions of a product or a service with the environment, helping to understand the environmental consequences directly or indirectly caused and, therefore, giving to those who have the decision – making power the information necessary to define the behavior and the environmental effects of an activity and to identify the opportunities for improvement in order to achieve the best solutions to intervene on environmental conditions.
 - **Energy consumption:** electricity, gas, oil, methane, etc.
 - **Resource consumption:** water and raw materials;
 - **Consumption of materials and auxiliary products** (glass bottles, corks, labels, oenological products, additives, plant protection products, fertilizers);
 - **Production of waste**
 - **Wine and other products productions**

This initiative has allowed us to make a deep analysis of the ecological balance of the Soave system.

Although the definition of the environmental product declaration has not been reached yet, this study has already contributed to the launch of many new single or coordinated initiatives on the territory in terms of environmental sustainability.

Therefore, with the coordination of the Consortium, defense strategies with a low environmental impact have been relaunched to respond to an increasingly strong and widespread demand from operators of the sector of technical-scientific references able to provide reliable data and objective indications from specific commercial interests.

- **RISORSA:** This project is focused on customizing the informatic systems on support of decisions aimed on sustainable management of the vineyard. We use control units located all around the area, that are functional to detect important parameters to support the decisions and the agronomic choices (defense, nutrition, irrigation). In this way we develop new processes to manage water with a sustainability focus. The objective is a sensitive reduction of the chemical products used in the vineyard and the correct management of water, that become itself a vehicle of distribution of breeding elements. This will help the grape growers to prevent climate change's negative effects and to examine in detail the micro areas.

To achieve these objectives, we have activated a qualified collaboration with other organization for the supply of a specialized consultancy to support the decision of the Consortium coordination pool. At the same time, qualified initiatives have been planned on the territory as well as concrete experiences to reduce the environmental impact of some health centers.

In particular, there is a "sexual confusion" project active in the Soave Classico areas: this is a pioneering example to demonstrate how it is possible to concretely intervene by creating a sharing of objectives on these techniques between neighboring companies and between wine-producing holdings and holding associated with wine cooperatives.

The initiative undertaken in collaboration with the Institute of Agricultural and Environmental Chemistry of the Faculty of Agriculture of Piacenza is also very innovative: it concerns the importance that the wine-growing activity has on the surface water in the lively areas of Soave.

This activity highlights a sensitivity to the environmental aspect as well as the support for initiatives proposed in the territory by highly motivated companies with significantly innovative projects. We are thinking about the Free Wine initiative proposed and shared by some companies with the aim of producing wine with low or no content of sulfur dioxide.

Another innovative project is the result of a synergy between the Consortium and the private sector for the recycling of the carbon dioxide from the fermentation process supported by the Veneto Region.

This project aims to quantify the CO₂ emissions in alcoholic fermentation and to evaluate the possibility of using technologies to catch and purify this residual gas as a useful tool for winery processes, exploiting its antioxidant capabilities, but also with other possible uses, such as the neutralization of wastewater or as a soil fertilizer. The project aims to eliminate the emissions of the greenhouse gas (CO₂) from the oenological establishment, capturing them to purify them and compress them in a liquid state, waiting to be usefully reused. Considering the general usefulness for the oenological sector, the results will be presented in OIV (International Organization of Vine and Wine) for a rapid international diffusion in which the Veneto region is seen as the root of innovation and environmental protection.

In all this is very important the phase of communication with the creation of a virus circle of information transfer which can reach and sensitive the Soave wine-producing holdings and cooperatives. This objective is achieved through a strategy aimed at involving, as an active part of communication, not only the actors directly involved in the experimentation, but also subjects that can become vehicles for disseminating information in favor of the same supply chain: trade associations, research entities, international circuits connected to the world of research and innovation, etc.

The objectives, therefore, are linked to the protection, enhancement, and promotion of local resources.

These resources are present but often hidden, as they are not adequately known and still not integrated within projects that can promote them on larger consumption circuits. For this reason, the candidacy helps to "create" these resources, since it is the top that allows them to be recognized and exploited in economic terms.

The Soave terroir, in fact, is marked by individual vineyards, mostly small, which are family-managed by more than three thousand wineries, thus giving life to the largest single-bodied vineyard by the surface in Europe with its 7,000 hectares. A wonderful landscape, to which are added Romans baths, walled cities, Romanesque churches, villas, castles, and museums. But the minor anthropic or natural heritage, which contributes to characterizing the Soave park, should not be underestimated.

Paths, roads, capitals, watercourses, flora and fauna, rows, pergolas and old vines, become precise iconems capable of distinguishing the uniqueness of the biodiverse and variegated microcosm. The strength, as an institution of governance, will be the ability to combine products of the earth and tourism with the participation and consultations of producers and users.

For this project, there is the need for a territorial and competent coordination body, established in the basis of a precise local development project, which can have its reference point in the current Consorzio di Tutela precisely for its specific and articulated functions.

Statistics from the Rural Development Program

Over the years, the Soave wine producers have had access to several initiatives provided through the Veneto Rural Development Program. The measures taken by the Consortium of Soave in several areas and axes in the seven-year period 2007-2013 are listed below.

- Improvement of the competitiveness of the agricultural and forestry sector - Axis 1.
- Education and development of human resources
- Measure 111 - "Professional education and information for persons engaged in the agricultural, forestry and food sector".
- Measure 114 - Use of the advisory services
- Measures aimed at the reorganization and development of physical capital and at the promotion of innovation
- Measure 123 - Increase the added value of agricultural products.
- Measure 124 - Cooperation in the development of new products, processes, technologies in the agricultural, forestry and food sector.
- The "Biodivite" project - biodiversity in the vineyard in relation to the improvement of local wines
- The "ECO-2 project - Reusing the carbon dioxide obtained from fermentations as antioxidant and ally of the wholesomeness of wines"
- "VITI.VER project - Clonal and sanitary selection of varieties of VITe VERonesi"
- "VITIREs project - Genetic improvement of vines to withstand any disease"
- Wine Local Brand project
- "Residuo 0 project - Elimination of chemical treatments that lead to the formation of remnants in the fields and in the wine cellar".
- "CO2 Reduction System" project - new methodologies for calculating the reduction of CO2 at the level of wine-growing region with a view to the economic and market sustainability.
- "Thirsty Grapes" project - Induction of tolerance to water stress in the wine and protection from grape rot during the drying by the use of protein hydrolysates of vegetable origin
- Measures aimed at improving the quality of the production and the agricultural products
- Measure 132 - Participation in food quality schemes, modernization and innovation of the companies promoting the efficient organization of the offer and the supply chain integration.
- Measure 133 - Activities of agri-food information and promotion
- Quality of life in rural areas and diversification of the economy - Axis 3
- Measures for the diversification of the economy
- Measure 313 - Promotion of tourist activities - actions 1-3-4-5

The activities carried out in the Local Action Groups and in the Integrated Rural Development Project, diversified in ASSISTANCE, RESEARCH and PROMOTION, but also touristic diversification and promotion were essential for the area development.

3 HISTORICAL IMPORTANCE

The initial phase of the spread of viticulture and of winemaking in this area took place in Roman times. Starting from the last centuries of the late Empire and in those of the early Middle Ages, the region had undergone a process of gradual neglect, which would only be overturned by the advent of the Lombards. After the Carolingian parenthesis, which favored the development of a certain number of curtes, between the middle of the 9th century and the middle of the 10th (as had also been the case for the Holy Roman Empire in this geographical context) there took place in Soave and in the neighboring municipalities a phase of castellation.

At a local level, this was especially thanks to the new acquisition of land for cultivation, the regulation of the waterways and a considerable increase in trade. A more balanced territorial division came into being in the relationship between the plain and the hilly area, since each area of the territory began to take shape regarding that relationship, responding to a logic based on horizontal geographic relations based on commercial exchanges, no longer of a local kind, but also covering medium and long distances. Soave played an important role because it was close to the main communication thoroughfare, the road that both goods and people had to take, where one could control traffic and demand the payment of tolls (Villanova) In spite of the fact that the climate continued to be characterized by particularly cold winters, between the 12th and 14th centuries the agricultural economy began to be transformed due to the effect of Cistercian colonization, which tended to favor land on the plain, as in the case of the Abbey of Villanova at San Bonifacio, close to Soave and owning property in that area. The Cistercian monks also favored hillside slopes with good exposure to sunlight but that were not too steep, where a certain amount of development of viticulture took place.

In fact, some documents from the 12th and 13th centuries that are still preserved in the archives of this monastery contain frequent references to donations made by the devout to the Abbey, including vineyards, vineyards containing trees (alteni), and wine.

It should also be remembered that from the 13th century and for the next three hundred years the *alteno*, the system whereby vines were trained between supporting trees and which had been very widespread during Classical times, would become a significant component in the rural landscape around Verona. But the document that links the most Soave to the grape production is a Latin inscription on the front of the Law Courts in the center of the town of Soave: "Seventy-five years after 1300/ when the countrymen press their grapes with their feet...": this inscription to be found in the Law Courts in Soave summarizes the true spirit of the town and its surrounding area. Numerous medieval documents refer to the presence of grape and wine production in Soave. This recall of the grapes pressing found in this inscription, underlines the significance and the dissemination of grape production in the area since medieval age and it has become a basic time reference. During 16th century vineyards became very widespread, although the prevailing type of farm management was that of sharecropping.

The landscape took on an aspect characterized by an increasingly intense presence of vine-growing, which in this zone started to take over the hillsides. The predominant vine varieties were autochthonous and produced types of grapes that now no longer exist.

In the Soave zone there were also forms of aggregation within farms or homes that included entire families, who gave their names to the sites where they lived and worked.

In the area around Soave vineyards were to be found just about everywhere, though revealing greater concentration in certain zones in the region, and vines were to be found in almost all the cultivated areas.

At the end of the sixteenth century the landscape linked to growing vines was still characterized by essentially promiscuous farming, with low vine-rows alternating with areas cultivated with pulses or wheat, whereas by the end of the 18th century the walnut and fig trees had all been uprooted and burned because of the impoverishing effect they had on the vineyard soils and the shade that they cast over the vines themselves.

The agricultural situation in fact had a completely different reality despite the actual one. The few arable lands were interested by cereals and legumes, spaced with orchard (peaches, figs, apples, nespola and nuts) and rare vineyards.

Dogwoods, oaks, beeches, blackthorns and hawthorns, occupied the gradients everywhere. In the same way hoeing, which was carried out only once a year (in April or May) in the 17th century, would be doubled in the century thereafter. the first half of the 19th century viticulture prospered, but subsequently would not be spared by the infestations of oidium, peronospo and phylloxera. Up until this point there was an expansion of viticulture, to the extent that it attained dimensions such as to transform it into the driving force of the local agricultural economy as a whole. In many cases, the farmers were encouraged to transform into vineyards their lands previously devoted to pasture, arable crops (especially maize, because of the saturation of the world market) and to mulberries, which had become increasingly unprofitable because of the relentless crisis demonstrated by the silk farming Industry. This phenomenon manifested itself predominantly in the hillside zones, where the small and medium-sized estates were those that adapted best to improved methods of cultivation and vinification. Consequently, to increase yields per hectare, there was a notable reduction of promiscuous farming and a great increase in specialized agriculture, thus revealing a trend that was diametrically opposed to that seen in the second half of the 18th century. The development of small farming properties must be linked to the parallel growth in population that took place in this period, which, in turn, had favored an increase in the labor force available. These workers, given the lack of more desirable alternatives (if not that of emigrating to the Americas), through their gradual and painstaking toil had transformed in vineyards the land that hitherto had been destined for pastures and woodland. The modest income deriving from viticulture was supplemented by that from sericulture and fruit-growing, which were practicable in promiscuous farming, associating vines and fruit trees with cereals and legumes. These were activities for which no equipment, capital or a radical transformation of agricultural techniques were necessary. The restoration that began in 1814 - 1815 ended a twenty-year cycle of war and political and economic precariousness in Soave as well. To begin with, one must note the extraordinary extension of promiscuous farming, which occupied almost all of the land in the census area of the municipality of Soave, leaving room for just a few specialized vineyards or arable crops and for meadows in those parts of the area where the difficult elevation profile made the terrain more humid or subject to water stagnation along the course of the Tramigna (a characteristic that is notoriously inconducive to vine-growing). The landscape of promiscuous plantings on the plain of the Veneto was not the same everywhere. The way the land was prepared in fact varied from zone to zone, adapting itself to the climate, the type of soil and the greater or lesser presence of water. There were numerous variables: the type of trees used as supports, the distance between the live supports, the position of the vine, the geometry of the vine row, the distance between the vine rows, the type of crop and rotation carried out on the arable part, the height and disposition of the vine and its shoots, and the preparation of the soil along the vine row. at the beginning of the 20th century, the Soave area (and especially the hilly zone) was characterized by an agricultural economy, dominated by viticulture. Phylloxera would represent a breaking point. After a brief period of crisis in the countryside, that with a vocation for growing vines, a rapid process of reconstituting the vineyards on American rootstock took place, a phenomenon that involved a radical upheaval in traditional systems and techniques, as well as a gradual, but swift passage from the promiscuous model of viticulture to a more specialized one. There was also a growth in the cooperative movement, which promoted and stabilized in various vintages the economic potential linked to the market and to production

1. FOOD AND LIVELIHOOD SECURITY

1.1 A SYSTEM THAT SERVES THE COMMUNITY

Soave was recognized in 1931 as “Vino Tipico Italiano” and the wine region was delimited. In 1968 it was given the PDO status to an area of 6.000 hectares of vineyards officially registered, with a production of 450.000 hectoliters. PDO status allows to maintain a quality level in the grape and wine production, to raise the net values and maintain the prices stable.

The farms and the farmers

In Soave area now are operating (source AVEPA) 3281 farms. Farm is the Italian “Azienda Agricola”, a specific legal form for companies which operates only in agriculture, for cultivation, transformation, selling and promotion of agricultural products. These 3.281 has at least a part of their lands registered as to produce Soave DOC. A further distinction could be made in dividing these farms in 3 categories. Cooperatives' members are the ones that sell their entire production to social cooperatives, that transform the grapes and bottle, promote and sell the wine. Owned farm, that follow all the process from the grape to the selling and private grape growers, that sell their grapes to owned farms.

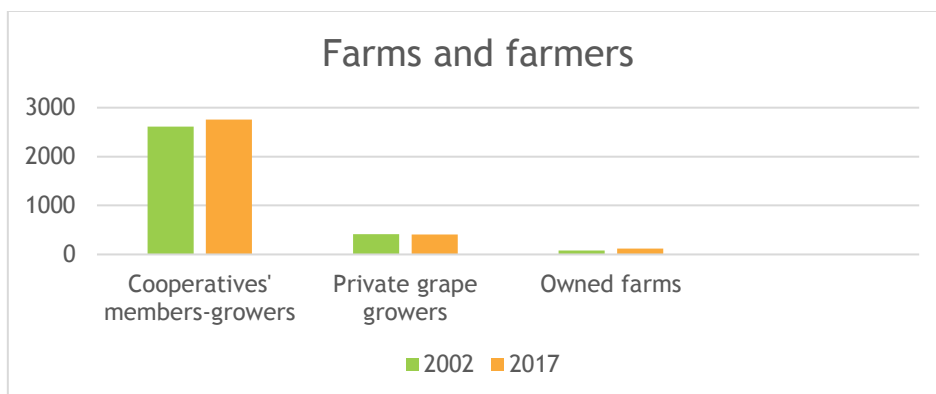
The factors that affects the mechanization in Soave Traditional Vineyards, make agriculture and viticulture very expensive in terms of labour hours necessary for the management of the vineyard. Net income in a flat land vineyard is 15.000 euros per hectare (those varieties are more valuable), while in the hills net income stops to 5.000 euros. This creates some problems in order of hill abandon due to the increasing ageing of grape growers. This is another reason of the fragmentation of the vineyards, where the grape growers choose to have some vineyards on the flat land and some on the hills.

If we calculate the costs, making an estimate of 12€ per hour of labor force, the detailed net income could be calculated in this way

COSTS	EUROS
Fertilization	216€
Pruning	1020€
Spraying / pest control	1020€
Grassing	264€
Green harvest	300€
Insurance (hail)	500€
Harvest	1440€
Taxes	200€
Amortization	1000€
Machinery	500€
TOTAL COSTS	6460€
REVENUE	12000€
NET INCOME	5540€

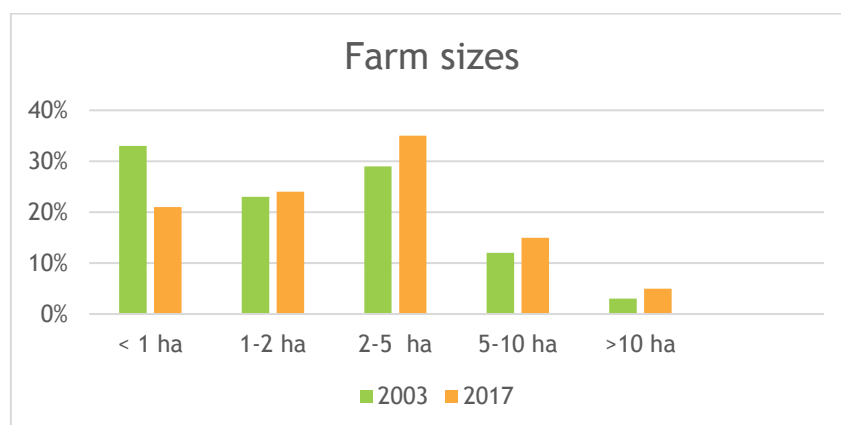
If we want to estimate the number of people involved in the proposed GIAHS site, we calculate the number of farms operating in the area.

FARMS	2002	%	2017	%
Cooperatives' members-growers	2.612	84%	2.756	984%
Private grape growers	417	13%	408	12%
Owned farms	80	3%	117	4%
TOTAL	3.109	100%	3.281	100%



Regarding the farm dimensions, the data underline the micro – small size of more than the 80% of these.

FARM SIZES	2003	2017
< 1 ha	33%	21%
1-2 ha	23%	24%
2-5 ha	29%	35%
5-10 ha	12%	15%
>10 ha	3%	5%



The entire grape growing system is supported by families that work directly or indirectly in the vineyards. While some grape growers are employed full time in the vineyards, some of them are part time employed. We can say that the 10% of the population is employed full time in agriculture, while this percentage augment to 50% during the harvest. Fragmentation is high and if the sizes are small or micro the income would not be sufficient. The harvest is the moment where people are engaged the most and there's a mutual aid between one to each other, even because the weather conditions and other threats could strongly interfere, so they need to hurry.

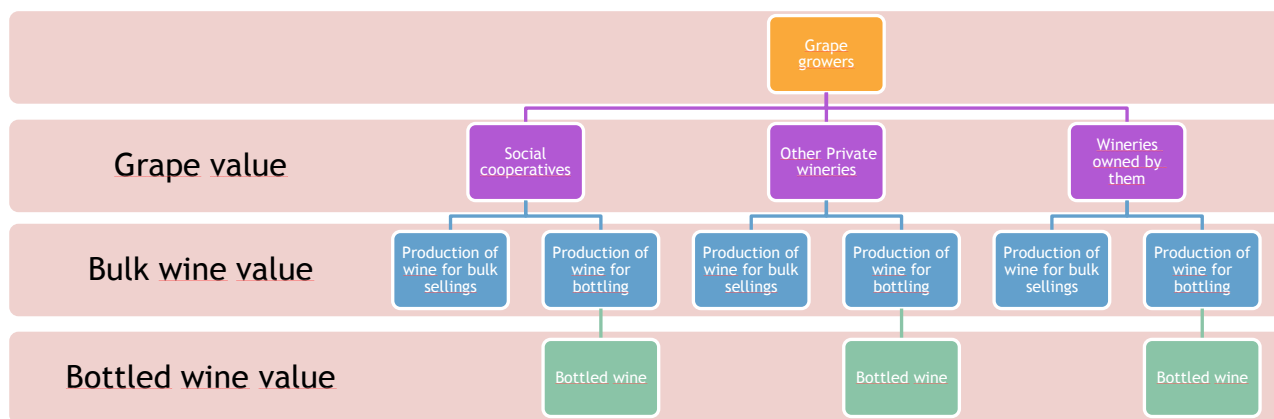
In the most structured wineries we have other specialists that are employed in the wine making process. This creates the necessity of jobs such as agronomist, oenologist, winemakers, workers for

the industrial phases (bottling, cellar works...) and also for the sales such as export managers, employees, marketing managers etc. Usually those are very specialized jobs with a high degree of instruction.

Also, in the proposed GIAHS site, we don't have to forget those jobs in secondary and tertiary sectors. Grape growing needs machinery such as tractors, grass cutter etc. and the wine transformation need stainless steel vessels, usually with conditioning system, fans and other high-tech equipment. All those machineries need maintenance and specialized technicians.

There's a strong development of eno tourism in the area that involves hotels, b&b, restaurants and the wineries themselves that employ staff for the hospitality.

We can synthetize the valuing system with this graph:



Grape growers are at the center, but the grape production is completely finalized to the production of wine; without the wine industry there wouldn't be viticulture. The economic values increase in each single phase of the transformation of the grapes. The higher is the grapes quality, the higher will be the grapes value. This is called "liquidazione delle uve", it is made by social cooperatives and the evaluation comparing these parameters:

- The region (classic or not)
- Sugar content
- Health of the grapes
- Production per unit
- Particular production (quality projects)
- Chemical parameters
- Manual or mechanical harvest

This system represents overall 77% of the area under vine and around 70% of production.

The widespread and professional efficiency of the cooperative wineries created an integration with their member-growers, giving indications on the times and procedures for harvest, spraying, pest control etc. with a view to making the qualitative characteristics of the product ever more in line with the requirements of the consumer. With a complex compensation system, the cooperatives guarantee to their members a fair income each year, despite the fluctuations in the market prices.

Beside these cooperatives, there are a group of bottling companies that buy quality bulk wine and promote Soave wine in all the world's market and a group of small and medium-sized, predominantly family run estates that use their own grapes or buy quality grapes from private grape growers to produce wine.

A productive constancy

If we compare the grape production of the last 15 years, we can see that it remained stable during the years. This is due to a wise management of grape production and stock, that permitted during the years to face the demand for Soave without generating an over-production.

Years (Average decade datas)	Number of farmers	Surface Ha	Productive potential (x 100 kilos)	Production of grapes (x 100 kilos)			HL obtenabile
				d.o.c.	classica	totale	
1972-1982	3.099	6.497	909.846	496.343	136.900	633.243	443.270
1983-1992	3.573	6.247	874.613	532.109	164.876	696.986	487.811
1993-2002	4.015	6.494	909.183	551.084	174.711	725.794	508.056
2003-2012	2.800	6.540	915.600	549.000	170.111	724.635	509.790
2013-2017	3.281	6.929	950.000	546.361	141.498	687.858	481.500

We are waiting for the decree of implementation of a National Law (art. 7 Testo Unico del Vino e della Vite 238/16) that identify historical and heroic viticulture as needy of an attention and support.

1.2 THE COOPERATIVE WINERIES

The cooperative system is of strategic importance in the Soave area, representing overall 77% of the area under vine and around 70% of production.

The high level of integration that the cooperative wineries of Soave succeed in creating with their member-growers undoubtedly constitutes a competitive advantage, as demonstrated by the growing number of ramifications in payments for grapes, the stress on quality-based projects, and the indications given on the times and procedures for picking the grapes, with a view to making the qualitative characteristics of the product ever more in line with the requirements of the consumer.

The cooperatives have, in recent years, reacted to the dynamics of the market by widening their selections and setting off a process of renewal and Improvement that inserts them in vibrant segments of the market.

Some of these wineries are also able to reach out to the end consumer with a relevant share of product in bottle.

It appears to be worthwhile noting how the cooperative wineries have increased, in recent years, their attention towards the new approaches of relationship- and territory-based marketing, by forming part of networks between (both private and public) actors, to incentivize collaborative processes that can promote the region of origin and its artistic and cultural assets.

This goes to show that the cooperative movement in the Soave area has attained such a level of technical professionalism and perfection as to be able to guarantee growing success in the commercial sphere.

This development of cooperative is also a valid instrument for viticultural progress, in that the member-grower is paid for the grapes he delivers based on the quality of the fruit itself, its sugar content, the acidity of the must, etc., and he is therefore stimulated to improve his techniques of vineyard husbandry.

Other favorable consequences have been more balanced training systems, especially in the new vineyards that replaced those affected by phylloxera or were planted to improve the profitability of land that was previously devoted to other crops.

This was a period of great development for viticulture in the hilly areas of Soave, and the landscape here rapidly took on the characteristics that we can still appreciate today.

As early as 1950, in fact, this area produced over 80,000 hectolitres of Soave, of which almost 1000 were already being exported to the United States.

These were also important times for the establishment of commercial success for Soave, especially in Italy itself, even if Switzerland, Austria and Germany were also beginning to show an interest that would become increasingly consolidated over the course of time.

The very guarantee of providing an adequate income has allowed for the conservation of the landscape and of the environment, the safeguarding of indigenous grape varieties, the development of organic farming, the growth of structures offering hospitality and accommodation and the maintenance of growth in a virtuous and widespread rural economy.

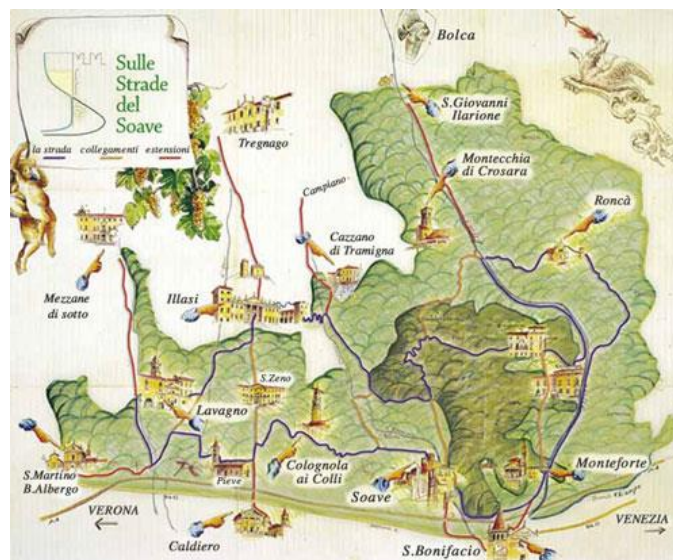
In times where the negotiating position is favorable to bottlers and the success of marketing policies is linked to an organized structure with an important distribution chain, the cooperative wineries are strategic to managing the planning, the management and the control of the sales activities that attract the consumer.

1.3 TOURISM ASPECTS

From the tourist point of view, in the proposed GIAHS site there are two wine routes (strada del vino Soave and Strada del vino Durello) that have the aim to promote tourism and the knowledge of wine products.

Tourism is a growing aspect of the economy of the region and it involves many people. The most structured wineries have started to make investments to build, aside the cellars, B&b or agriturisms, following specific training courses. In some cases, specialized labor force is employed in hospitality, to organize private tours, tastings or events to attract consumers and tourists.

Travel agencies are organizing incoming tour, both with bikes or electric cars to discover the hills and there has been made a project that is called Volcanic Wine Park, that brought investments to improve both tasting rooms, facilities and to promote worldwide this land.



1.4 WINE PRODUCTION

Soave is a white wine that could be produced only in the region delimited by the D.M. 21/08/1968, N 269 of the 22/10/1968.

This wine must be produced only with the minimum of 70% of Garganega grapes, maximum 30% of Trebbiano di Soave or Chardonnay. The production follows the normal rules for production of white wines. (see the picture). Soave could be made in different styles indeed. It has light body, zesty and citrus flavors when it come from the flatland, while in the hills it become more concentrated, more complex, with tropical and stone fruits flavors, medium body, high acidity. Some producers use the wine to make it sparkle, so they to a second fermentation in autoclaves or bottles, to produce and naturally retain carbon dioxide. Recioto di Soave is a sweet white wine, made only with the best grapes and with a drying process



HOW WHITE WINE IS MADE

designed by @jelledeRoock + jelledeRoock.kunbar.com

GROW SOME GRAPES & HARVEST



PRESS
EXTRACT JUICE FROM THE GRAPES
FRENCH: "PRESSURAGE"



SETTLING
PARTICLES FORM SEDIMENT AT THE BOTTOM OF THE TANK
FRENCH: "DÉBARRAGE"



ALCOHOLIC FERMENTATION
SUGAR + YEAST
↓
ALCOHOL + CO₂



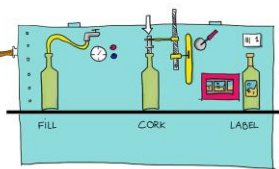
OAKED



MALOLACTIC CONVERSION
MALIC ACID → tart & sour ☹️
IS CONVERTED INTO
LACTIC ACID → tart & smooth 😊



RACKING
REMOVING THE CLEAR WINE FROM THE SEDIMENT
FRENCH: "CORNÉE"



BOTTLING

ENJOY! 🍷

designed by Jelle de Roock
drawing is partly original line
winefolly.com/tutorial/how-is-white-wine-made



<https://winefolly.com/tutorial/how-is-white-wine-made/>

2. AGRO-BIODIVERSITY

Regarding agro-biodiversity, Soave system is exclusive and features a coexistence of different natural species (wildlife and plants) in the same environment and the presence of each single species is linked to the other. Vineyards, orchards and olive trees are strictly connected and shape the landscape. Among them, insects, little reptiles and mammals thrive while the grape growers are working with a greater consciousness about sustainability and preservation of the environment. The grape growers of Soave area must be aware of their role as “territory guardians”, since the alternative to vines could only be more intensive plantations. These ones would have a deeper impact on the agro-system, so the grape growers must properly maintain the different ecological features (ecological hallway, minor crops, marginal areas) to best express the typical properties of the territory and its variety.

Regarding grapes, in Soave we may find two indigenous varieties that grow practically only in this region in the world. Both have a deep historical connection, witnessed with the fact we can find in the classic area of production vines that have more than one hundred years.

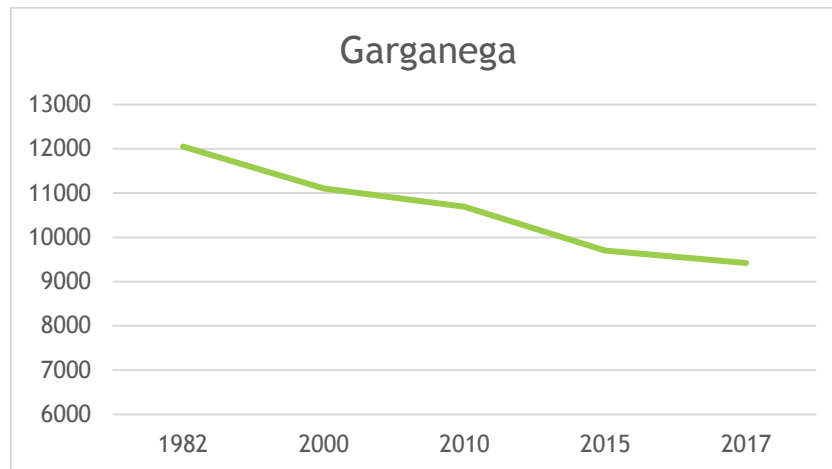
GARGANEGA



Garganega represents an ancient and renowned vine, cultivated especially in the Veneto region and in the districts of Verona and Vicenza, even if its origin is still unknown.

If we look at the evolution of the Garganega during the last 20 years we may see a decrease of the surface planted with garganega (data UIV, AVEPA, ISTAT). It is important to preserve this unique variety.

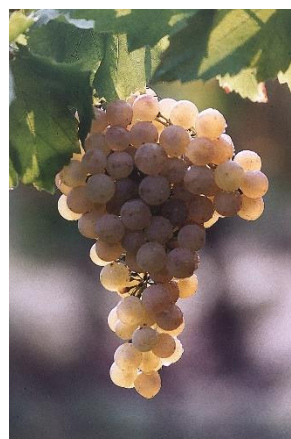
1982	2000	2010	2015	2017
12050	11100	10690	9702	9420



High vigor, one of the longest vegetative cycles for white grape varieties (160 days from germination to harvest), acceptable and constant productivity, average sensitivity to powdery mildew and grey mold, reduced sensitivity to downy mildew are the main features of the vine. Garganega is registered in the national register of wine varieties (a register of all the grape varieties allowed to produce wine in Italy) at number 92. During the centuries grape growers and breeders have selected the strongest and most productive vines at first with mass selection (starting from one-year-old wood shoots) and then clonal selection (replication in nurseries). The clones now used in Soave area have been selected by the Italian selection centers such as Vivai Rauscedo and CREA Conegliano. Then each clone is now replicated in local specialized plant nurseries that provide the vines to all the Soave area; That is because in Italy to produce wine, the planted vines must be free from infections.

(annex 4 – more about Garganega)

TREBBIANO DI SOAVE



This variety is quite ancient, and it was known during Roman age. The various biotypes are cultivated in many areas in Italy but in Veneto and in Veronese area it has found a perfect environment. Genetically speaking is quite close to Verdicchio. It has a more compact bunch, comparing to the

Garganega, less vigor and a higher acidity. It is harvested a month before the Garganega. The variety has had a spread thanks to the use in another DOC area, the Lugana, where it takes the name of "Trebiano di Lugana". In the Soave area it remained 102 hectares of Trebbiano di Soave, that is allowed for Soave wine at the maximum of 30%.

anno	1970	1982	1990	2000	2010	2018
Trebbiano di Soave e Trebbiano di Lugana	1693	1993	2368	1803	950	1800

OTHER VARIETIES PLANTED IN THE AREA

As already mentioned, the incomes of grape growers are usually supplemented with others crops such as cherries and olive trees for the production of olive oil.

CHERRY TREES

Cherry tree has always been a loyal mate of vineyards in Soave wine land. Cherry origins in Verona date back to ancient times, even if important information is available from the Nineteenth Century. Cherry cultivation was mainly practiced for a local consumption, with plants among family properties or used to define among different properties. Cherry trees were used also for "maritare" the vines

It was only after Second World War that a particular selected variety, the "**Mora di Cazzano**" original for the Soave area, has become the most important cultivar in Verona. In the '70s the introduction of wine DOC legislation prevented the planting of other plant varieties among the vineyards, so it boosted the specialization and the separation between the two crops.

OLIVE OIL IN SOAVE HILLS

Regarding olive trees, Verona is the city with the highest density of olive trees plantings in Northern Italy. The most important variety in Soave area is the Grignano, that is an ancient variety that adapted itself to cool climates. This variety, with its peculiar citrus notes, has a very confined production, but it is growing more and more. Local demand is very high and the oil it is gaining in notoriety and value abroad thanks to promotional activities. In Soave areas olive trees are planted where vines couldn't be planted because of the gradients. The strong roots of olive trees go deep in the soil and help to retain it and prevent soil erosion.

Olive oil from Grignano variety has a stronger and more robust character than the milder extra-virgin olive oil of Garda. The Verona Hills olive oil has extraordinarily low acidity and a notable stability of oxidation due to an efficient olive harvest (still hand-made between November and January) and fast processing in the olive press. Annual production is from 3,000 to 5,000 tons of olives, the equivalent of 500 to 700 tons of olive oil. All the hilly area of Soave wine has always been a point of historical interest also for olive oil cultivation, both in specialized cultivation and together with the vine.

Verona viticulture tradition is bound to medieval religion. The olive oil hadn't just a cooking function, but it was also strictly bound to holy and sacred purposes. Apart from being the fundamental element for what concerns sacraments, it was used also to lighten holy places. This cultivation expanded in the east side of Verona in the Nineteenth Century where olive trees were often used also to contain terracing.

Nowadays olive oil production comes after only wine production with a high-quality level and a relevant technological innovation in the olive presses to protect the fruit integrity.



Olive trees are perfectly integrated in the landscape along with the vineyards

THE COLOGNOLA PEA

Even if it is still a confined production, it is quite interesting the history of recover and promotion of the Colognola pea, commonly known as the “biso de Colognola” that belongs to Verdona Nano Variety. The intercropping between this pea and the vine is a common practice around Colognola hills and it comes from organic practices. Legumes release naturally nitrogen that is very important for vines nutrition and prevent some diseases. The reintroduction of the pea was done after Second World War in times when people struggled for their lives.

2.1 PRESERVATION OF AGRO BIODIVERSITY

FUNCTION OF THE MARGINAL AREAS AND HEDGES

Especially in the vineyards the presence of useful insects could be a determining factor to contain the pests, limiting the density below the threshold for damaging. It is known for example that the hedges could stop the flight of the *Lobesia botrana*, the European grapevine moth, whose larvae make great damage on the grapes. Another example is the presence of some phytoseiid mites to control the spread of damaging mites. The presence of some plants like the *Carpinus Betulus* or the common nettle, have this function. Another intervention is the seeding of nectariferous plants that may feed some parasitoids (butterflies) or useful predators. The introduction of some non-productive plant species in the agro-system showed how this element contributed to increase beneficial arthropods. The projects started in some areas of the Soave vineyards are focused on the planting of nectariferous and other plants in the hedges as shelter and breeding of lots of micro and macro organisms.

(annex 5 - Plant species that are going to be planted in the area and their benefits)

(Annex 6 Flora in Soave Area) (Annex 7 Fauna in Soave area)



Green manure on Soave vineyards (Balestri Valda and Filippi)

TURNING ORGANIC

The issue of a sustainability is becoming more and more important in discussions on modern agriculture in Europe. In Soave region, the balance achieved during the centuries by Soave Traditional Vineyards permits to avoid strong intervention of chemical products in the vineyard, and this is certified by an independent association, the World Biodiversity Association, that every year evaluate the environmental quality in the agro-system, by measuring the presence of particular organisms, known as bioindicators.

On either side, there's lot of wineries that are reducing the use of chemical in the vineyards and started the conversion to organic agriculture. **The Consorzio and the single wineries have started a series of projects focused on the preservation of agro-biodiversity such as the Green Label, a method that permits to identify which are the most impactor factors to the processes, the pheromones and sexual confusion for the control of the European grapevine moth, the use of the bacillus thuringiensis, a particular bacteria that control mosquitos, larvae, and other pests.**

Another important intervention is the decompaction of the soils to create the perfect conditions for microflora and microorganisms that are the true biodiversity in the Soave Traditional Vineyards. The presence and the spread of these useful elements are what make this environment in balance.

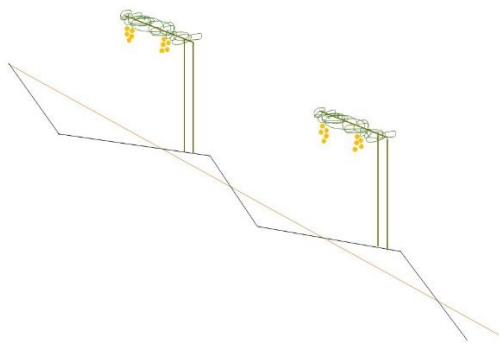


Pest control in Cantina di Monteforte vineyards

3. LOCAL AND TRADITIONAL KNOWLEDGE SYSTEM

3.1 HYDRAULIC-AGRARIAN ARRANGEMENTS AND GRADIENTS

In the proposed GIAHS site, to prevent soil erosion and exploit the gradients, the most widely system of planting in rows is the contour plowing. Contour plowing is a perfect method to retain soil and limiting surface runoff but is not suitable to mechanization. Rows are positioned in parallel to the contour lines and the storm drains are dug along them in order to lead rainwater in another drain which is located along the maximum gradient line. Though this technique is common in other parts of Italy, it adapts perfectly to the Soave hills where the shape of the fields is irregular and of limited size because of the high fragmentation of the property. In these plots of land, the mechanical processes are hampered by the slope of the land.



a. scheme for contour plowing

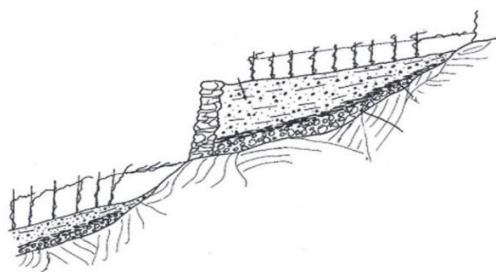


b. contour plowing in Castellaro hill

Men had to work on these slopes to allow the growing of vines, so they have studied the techniques to model and support the land: embankments, terracing and dry-stone walls have always modelled these slopes.

Dry-stone walls

They are not necessarily soil retaining walls, but they can also be used in the fencing and delimitation of the roads connecting agricultural holdings, thus becoming characteristic elements of the Soave landscape. The steps fit on a case-by-case basis to the slopes as that in the same contour level it may be different in the height. They are supported downstream by edges or dry-stone walls.



c. scheme for dry stone walls



b. dry stone walls on

Embankments and cigs

Among the hydraulic-agrarian arrangements, in the area we can find both embankments and terraces to varying degrees, depending on the slope of the land and on the quality of the soil. Through the embankments system the hill is divided into terraces with limited slopes, on which the vine is cultivated; the terraces are supported by embankments, usually wooded or bushy. The rainwater collection takes place at the base of the embankment or of the dry-stone wall, which conveys the water towards channels that run along the gradient lines. This limits the mechanization too.



e. embankments in Foscario hill

(annex 8 - summary of the hydraulic-agrarian arrangements)

Heroic viticulture in Soave Traditional Vineyards



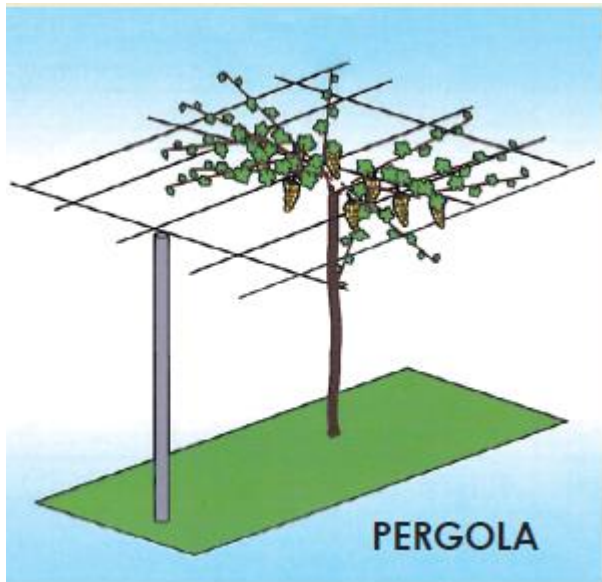
f. Manual spraying in Castellaro hill

3.2 THE PERGOLA VERONESE

The **most common vine-growing form** in the Soave area is the so-called Veronese pergola, that is typical and unique.

It is a system characterized by a sloping or sub-horizontal scaffolding, which is fixed to the supporting pole and composed of wooden elements to which are fixed the wires that support the vines. Thus, the sequence of pergolas forms a series of extraordinary plant-based galleries that are about 1,70 or 2 meters high, usually with a contour plowing arrangement that characterizes the Soave landscape in a unique way.

The origin of this vine-growing system is unknown; however experts say that it is very ancient. What is certain is that this is proved since ancient times.



According to recent studies, the pergola is the most suitable form of vine breeding for the production of the Soave wines. Compared to the most modern espalier structures, the pergola shows the maximum capability in its interception of the solar radiation and an excellent ability to achieve a good balance between growth and fruit production in the most vigorous environments. For the free position to fall of the bunches under the leaf cover, the pergola allows the creation of microclimatic conditions suitable for the ripening and health of the grapes, thanks to a good irradiation of the bunch and to a temperature of the berries that never reaches excessive levels. The structure assumed by the plants, however, does not allow a high rate of mechanization. The winemaker, in fact, must intervene manually both in the maintenance and in the management part of the vegetative wall, and in the grape harvesting period. On the one hand the pergola creates microclimatic conditions suitable for the ripening of the grapes but, on the other hand, these conditions can be achieved only if the roof of leaves that compose the pergola is properly taken care of, allowing the right light and the ventilation to pass. Throughout the modern age, the sub-horizontal supports that formed the pergola were fixed to the tree supporting the vine. As we have seen, only in the Soave hills are there were the "ronchi vitati", dry-wood vines that can be considered as direct ancestors of the specialized vineyard of the post-phylloxera reconstruction. The reaction to the terrible disease in the Soave area in the early years of the Twentieth Century causes the gradual replacement of the tree with the dry pole, but the shape of the pergola remains substantially unchanged. As the vintage images show, the post-phylloxera pergola has been preserved untouched in the Soave landscape from the early years of the Twentieth Century until today.

Comparing Pergola to other training systems (guyot)

The Guyot vine training system has much lower running costs and charges since all the production steps can be performed mechanically.

However, to facilitate the use of mechanical tools and adequate rainwater flow, a larger size of the plots is required.

If the pergola and the embankment system to which the pergola is connected have plots of 30 to 50 meters in length, the Guyot vine training system has larger dimensions, from 50 to 100 meters in length. Nevertheless, the Guyot vine training system has some advantages from the productive and economic point of view, since with the use of mechanical tools the production time decrease and, consequently, also the use of labor, increasing significantly the profits.

The mechanization of the vineyard reduces the use of labor and the costs of production, but it goes to the detriment of the number of employees in the primary sector, causing a negative impact on the local communities.

Furthermore, the mechanization involves the necessity of larger spaces with constant and not too marked slopes, which lead to the creation of new non-traditional agrarian hydraulic arrangements. However, studies carried out by the Consortium show that the Guyot vine training system would not be the most suitable for the cultivation of the Garganega and for the production of the Soave wine. The main problem with this system is that bunches are not adequately shaded, and this can compromise the quality of the grapes, especially in more sunny and drier periods.

Operating and planting costs make the grape growers prefer guyot to pergola because it is less expensive. This cause a different ripening, conditioned to the micro climate of the bunch less ventilated and hotter in the row. The contents of macro and micro constituents inside the bunch is the result of a complex series of biochemical reactions that could be compromised by the effect of high temperatures. The Consorzio Tutela Vino Soave and the CRA-VIT of Conegliano had made a 9 years study that investigated the contents of sugars, acids and flavours, comparing two different training systems, Pergola and Guyot.

In times of climate changing, where the annual temperatures are high above the average of the last 50 years, viticulture (and agriculture in general) must face the threats, not only of high temperature (above 33-35°C for more than 7 days in a row) but also insolation.



a. damages of heat

In guyot training system, the bunches remain shaded for the 48% of the time, while in pergola training system the bunches remain shaded for the 71% of the time. (annex in Italian)

Grapes and bunches exposed to sun had different flavours, that gave more complex and long-lived wines but with less acidity, while the pergola gave more floral, mature fruit and balsamic flavours. In the end in the grapes under the pergola, the aromas and flavours are more preserved and persistent. It is important to choose the proper training system to protect the grapes.

3.3 TRADITIONAL PROCESSING

Until the 1930's, the operations connected to the cultivation of the vine were done completely manually, requiring a considerable sacrifice from the farmers. This dedication continues today and, in some of its practices, it is performed in the same way. Below, the traditional practices are described with the estimated percentage with which they are maintained among producers.

Manual pruning: it takes place in January, the long and old shoots are cut through the use of shears or billhooks (curved knife) 100% of the surface. Vines may be bound with small willow branches (60%)



During the period of the first plant growth, from May to July, special activities and preventative measures are planned in order to obtain a better quality and product, a higher alcohol content and the optimal protection of the plant from parasites and possible diseases.

Hoeing of the soil around the vines and landfilling of the manure (50%, 100% if new planted rootstocks)

Manual thinning of the sprouts and, at a later time of the bunches. (100%)

Spraying with copper or copper sulfate. Occasionally made handy (100%)





Manual harvesting: mainly during September and October with the help of temporary workers in the big companies, while in small firms the grape harvest is a moment of family celebration. Along the rows may be placed plastic containers, wooden baskets and buckets, in which the bunches are thrown or gently laid for the Recioto wine.

3.4 RECIOTO WINE AND ITS DRYING PROCESS



“Recioto” is a word of the local dialect that comes from “recia” (ear) which is the upper part of the Garganega bunch, the part richest in sugar and better exposed to the sun. It's a sweet white wine made with a selection of the best grape bunches which are then placed on trellis for drying. The first traces of this wine come from a famous epistle of Cassiodoro, one of the erudite minister of Theoderic the great, king of the Lombard that ruled Italy in the first years of Middle ages.

After the harvest all the grapes are brought in a “fruttaio”, a special room where humidity is controlled by the opening or the closing of windows, or with fans. Traditionally the “fruttaio” has always been

oriented north to south to let enter the fresh air that comes from Lessini Mountains that is strategic for a perfect drying. The time for drying the grapes may vary from 30-60 days to 90-100 days, it depends on the season, on the temperatures and on the environment humidity. The aim is to concentrate the sugars in order to make a sweet wine.

There are 3 different ways in the local tradition to dry the grapes:

1. Nets

They are called "rele" in the local dialect. The nets are now made of polycarbonate and the grapes are hung, supported by the stems, for a quite long period. This method permits a good drainage and transpiration, with a very small percentage of grapes hit by the mildew. This method is very expensive in terms of labor force.

2. Arele

The Arela is a bamboo rack structure where the grapes are lied down to dry. In the past times the structure was made of canes that came from the ditches, and they were used both for the breeding of the silk worms and for drying the grapes. This method allows a perfect control of the state of health of the grapes, but you must turn them a couple of time during the drying process to prevent the mildew and to remove the hit grapes.

3. Wooden or plastic boxes

This is the most common method. Boxes could be stacked and are very easy to move form a part to another. This requires also less labour force during the operations.



Three ways to dry the grapes

The vinification of the Recioto di Soave begins, after the drying of the grapes, generally at the end of January, with the soft pressing of the same grapes (with roller grape presser with or without destemming). In some cases, the dried grapes are directly crushed, whole, in the common grape presses, which are still in use, or in the more recent horizontal presses. In the composition of the wine an important role is logically given by the more or less accentuated drying of the grapes and by the presence, in the same grapes, of the molds both in the noble form and in the common one which brings serious inconveniences.

4. CULTURES, VALUE SYSTEMS AND SOCIAL ORGANISATIONS

A. HARVEST TIME

Harvest is a moment of sweat and celebration, even now where technology may help a bit in some moments. Harvest involves every home and animate the hills: those are days of intense physical effort and everything is made as a religious ritual that is replicated every single year.

“ROGAZIONI” RITUALS FOR THE HARVEST AND FOR RURAL LIFE

As it is understandable from the etymology (the Latin verb ROGARE means to pray insistently), they are processions and prayers to ask and beg the Lord to protect the people and the fruit of their labour, and to preserve the harvest from disease, hail, drought and natural disasters. The population and the different associations with their uniforms took part in it.

The “Rogazioni” occur right before the Ascension.

They were probably Introduced by S. Mamerto (V century), bishop of Vienna in Delfinato (Gallia).

They are the Christian version of a pagan tradition: the “ambarvalia”, a procession around the cultivated fields to push away disease and disgrace.

SAINTS AND PRODIGES

The hardships of peasant life brought the people from Soave to their knees to pray to the patron saints who could protect them from natural disasters, disease and epidemics like the plague.

The saints were helpers who mediated between the supernatural world and daily troubles, pictures and names to whom appeal in times of need and danger.

So, Saint Anthony was invoked, like Saint Bovo, against contagious diseases, first of all against the “Saint Anthony fire”, the herpes zoster. The classic iconography pictures him like an elderly man with a flowing beard next to the pig, after whom he is named “Santo dai porceléto”, saint of the pig.

The odd association comes from the habit of the Anthonians to eat wild pork meat coming from popular charity. Still today his picture is found in barns to protect the livestock.

The night before his celebration was considered magical. They believed that animals could speak among themselves and that it was mortally dangerous to hear them speak.

One of the most invoked protectors was Saint Rocco, after whom Soave named a church.

Saint George was also very important for the inhabitant of the area. Saint George is a knight who fought a dragon and this image is also linked to the good that fight the evil, an apotropaic symbol of protection. We find lot of churches, chapels or paintings dedicated to Saint George or to the Virgin Mary that keep a snake under her feet (Madonna di Fossa Drago in Monteforte d'Alpone). Those images are usually placed in places where there's a water spring or close to the rivers. A correct interpretation of this recurring symbol is the man that fight the waters (floods were very common since middle ages) with the help of God.

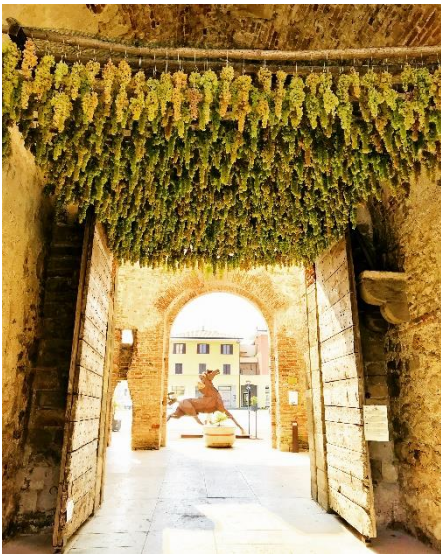


Madonna di Fossa Drago

B. TRADITIONS FOSTERED BY GRAPE PRODUCTION

THE MOST ANCIENT GRAPE FESTIVAL OF ITALY - LA FESTA DELL'UVA DI SOAVE

Undoubtedly, the most prestigious celebration in Soave is the Grape Festival, which occurs every year on the third week end of September. It was initiated on September 29, 1929, thanks to Luigi Zannini, a surgeon and President of the Cantina di Soave at that time and it was the first a kind in Italy. It was introduced as the First Grape Festival and it met a success that overcame the limited town borders to spread around the Peninsula. During the following years, the celebration included also some cultural aspects. Today there's an annual competition to decide who produced the best grapes. During the festival a local Association, the Amici delle Antiche Torri hang the grapes under the Medieval gate to make a particular Recioto di Soave.



Ph credit Pietro Masnovo

THE CONTRADE COMPETITION - MONTEFORTE D'ALPONE

This manifestation, besides its traditional aspects, is characterized by meanings related to the promotion and good outcome of the future harvest season. The elderly has fond memories of men "cycling" inside the vat, sweating in the fresh air of the first autumn evenings. Loyal to ancient rituals, the "contrade" competition (contrada is a kind of neighborhood) is still held today in a barefoot pressing grape challenge among different areas of the town: Pria, Sero, Madonnina, Sarmazza, Drio Piazza make an historical parade through the town with contrived carriages celebrating wine and grapes and they stomp until the last drop of must is extracted in order to receive the prestigious award.

THE WINE FESTIVAL AND THE "IMPERIALE CASTELLANIA"

Soave has not yet stepped away from the Middle Ages, especially with its medieval atmosphere and architectural features.

The ideas flowed when it came to create a new celebration theme to take inspiration from the chivalric times of the Scaligeri family. The idea became a reality in 1971 thanks to the poet Mario Maimeri and the collaboration of the Pro loco association and the town hall administration. The first and only Italian wine sorority, known in the national artistic and cultural context was founded.

In accordance with the mayors of Soave and Monteforte d'Alpone during the Soave White Wine Festival, authorities and celebrities from all over Italy meet in the Soave Castle to take part in an unusual ceremony: the solemn investiture of the "Imperiale Castellania di Suavia". From that year on, on the traditional Soave White Wine Festival, the solemn investitures of the "Imperiale Castellania di Suavia" are an annual celebration. Few men, chosen for their prestige and as high-quality wine lovers are sworn in as "spadarini" to defend the sorority.



C. ADOLFO MATTIELLI - THE PAINTER OF EVERYDAY LIFE

Adolfo Mattielli was a painter born in Soave in 1883. He studied in the prestigious Cignaroli academy of Verona that in the end of the 19th century was the forge of the most important painters of Northern Italy. He was one of the most active and prolific fresco painters in Italy, and he frescoed more than 50 churches in all the Northern Italy. In 1960, after travelling a lot, he returned in Soave where the Sweden Commodore, Hammargren, ordered to him a series of paintings of rural scenes of Soave life. Thanks to these paintings we have some genuine and simple portraits of how the harvest was during that period, with no machineries and technology





He died in 1966 and the municipality dedicated to him a road, the one where is located the Consorzio of Soave headquarter.

D. TRADITIONAL CUISINE

THE PORK SACRIFICE

It was not an easy life when everything depended on the fruits of the land, but when the time for slaughtering the pig came, it was a moment of celebration and abundance for everyone and the different steps of the procedure were seen like rituals. People would wait for the first cold snap of winter after the mild warmth of November to slaughter the sow.

They did it on a sunny day, possibly with the land dusted with white snow or frost.

However, the scenery was not essential, the fog would work too. The "mesa", a long wooden recipient, was an essential utensil during the slaughtering, quartering and cleaning of the pork. For sausage and cured pork, a long wooden table with an engine to grind the meat was manned by the expert butcher, called "masciaro".

At this "celebration", children could attend and sometimes they were exceptionally allowed to miss school for it.

The adults of the neighborhood were invited to help, and were usually happy to lend a hand, just to take part in the "galdega", party at the end of the day: spaghetti full of sauce and sautéed liver with roasted onion. The dramatic act was done in the early morning outside, the same way it happened back in times when they used to execute people. It looked like the pig had an instinctive foreboding and it tried to resist desperately to those who pulled it to the execution place.

It screamed, breaking the morning silence, which at that time was total. Then the last scream, when the butcher plunged the knife: a precise and neat hit and then ready to collect all the blood in a bucket, because meat was a rarity, and nothing could go to waste. Not even "grustoli", the fat used to make traditional sweets. The blood put together with grapes made the "brigaldi". Only a few things were not used: the bristles and some stripped bones. However, one day a person from the

plains came to get them for few coins, together with some cloths, an old iron and other miscellaneous things.

The closing act of the drama took place inside the kitchen, when the boiling water steam used for the one bath of the victim was stagnating. The butcher had the control of the situation: he ordered the cleaning of the "buei", intestines, picked the bones clean, selected the different meat and for some product he measures the mixture. Many things were created: codeghini, "morete" (blood sausages), mortadelle, salame, bondole, which ended up hanged on the canopy next to the most prestigious products: lengoa (the tongue) and ossocoio (made from the neck meat).

PAMOJO AND ITS CONFRATERNITA

There is the so-called "panchiutto ligure", the "panchiutto calabrese", the "pantrid màridaa lombarda" and "pamojo veneto".

With or without tomatoes, eggs or the basic principle of these dishes is the same: nothing has to be wasted, especially bread. Agricultural wisdom gives, in this way, birth to recipes "poor" in ingredients but "rich" in nutrition and tasty like pan-mojo (soaked bread). It is made from a broth of water, potatoes and pumpkin, browned onion, tomato, lard and baked bread; everything is then cooked in a wood oven.

Recently pamojo has had a culinary revival thanks to the initiative of a restaurant in Roncà (Agriturismo Da Gasparin) serving it to customers as a "main dish".

So, if in the past, putting it on the table meant "obedience and respect for bread", nowadays it also means handing down traditions and local values.

That's why the Confraternità del Pamojo was created in Roncà: an association of friends, and food lovers proud of their origins.

It aims to promote the enjoyment of pamojo while keeping local customs and traditions from this area alive.

POLENTA, MILK AND CHEESE

...but also potatoes, snails and chestnuts.

These are the basic ingredients of traditional fare, rediscovered only recently by local chefs, based on what mountain ingredients offer with some ingenious elaborations out of necessity. A great example is the recipe for "gnocchi di malga", gnocchi prepared only with soy flour, fioretta (a kind of ricotta) and water, cooked in butter, not with water.

Recipes like these are typical of the calcareous "karst" rocks and soil found in the Lessinia mountains, which are poor in water, but rich in pastures for cattle and bovine for the production of milk, butter and cheese.

Even today, many "malghe" or summer barns and the "baiti" mountain huts are still open and dot the landscape.

In the past the "baito" where the milk was collected in the morning, was the center of the local economy.

The pails were emptied, the milk weighed, while everyone waited for the cream to surface. It was then collected and beaten until it formed butter. Once separated, the remaining milk was warmed in the "caldera" copper pot, where rennet was added to make cheese.

Part of the heritage of Lessinia's traditions lives on in the production of the prized Monte Veronese DOP, obtained by mountain pasture milk, where favorable environmental conditions, rich pastures and traditional cheese making, produce one of the region's most sought out cheeses.

"BOGONI" (SNAILS) MARKET

The precise date of the beginning of this market tradition is unknown, but it is almost certain that it was already active in 1160 and that besides the snails that made it famous, corn, poultry, tools and animals were also sold.

The market took place under the watchful eyes of the Benedictine monks at the powerful Abbey in Badia Calavena; they never missed demanding payment of an "obol" tax for every product sold. The main reason the market began to be held at sunrise was probably to avoid this high taxation.

Today, people coming down from the mountains to sell their goods set appointments with wholesalers at the market, where they negotiate the price of the snails picked throughout spring and summer. The reason for today's early hours is because the snails are still in their operculum and haven't yet peeked out as they do later in the day.

In Sant'Andrea, only one organic snail farm remains, owned and managed by Franco Gugole in the Carni contrada

E. OTHER FESTIVALS

THE ANCIENT "MUSSI" COMPETITION

Every year in Siena the famous Palio takes place, in Arezzo "la Giostra del Saracino", in Ferrara "la corsa delle asine e dei cavalli", in Asti "il Palio degli scudieri"...

Even in Terrossa, a small village near Roncà, can be proud of a small but felt Palio: the "Palio dei Mussi" (donkeys competition).

During the Saint Mary Magdalene Feast, on the fourth Sunday of July, the streets in Terrossa become a hippodrome that hosts the annual race, founded around 50 years ago when donkeys were still loyal life companions and a means of transport in rural communities.

In such hard times, every bit of help was a blessing and the one offered by donkeys in the fields took on an inestimable load of work.

Since donkeys are no longer present in Valdalpone's fields and villages, donkeys arrive in Roncà from southern Italy to honor local traditions.

Every single Contrada (similar to a quarter or neighborhood) of Terrossa decorates the houses with their insignia flags.

The most important choice involves the jockey; he will have to race during the Feast on behalf of his Contrada.

There is a challenge for everyone: children, participants and non-participants.

The ancient "Palio dei Mussi" is a popular feast and so a great opportunity for everyone, especially for young people to be together and rediscover ancient customs.



THE CARNIVAL

It is not surprising to find an occasional profane, partying and authentically carnivalesque spirit next to the daily routine of rural lifestyle. After all, this is exactly what the Monteforte people's temperament is about: kind, welcoming, strange, as they define themselves ironically, but funny. Like their town, starting from the odd church tower.

Beside the wine, the Carnival is one of the reasons why Monteforte has become famous beyond the borders of Verona. They call it "Carnevalon", the great Carnival.

It is **a colorful and noisy party** in the main square, almost **exaggerated for the sounds and the magnificence of the floats**, which are year by year more and more spectacular for the number of costumed participants and for the extravagance of the groups that take part in the parade.

The origin of the event is from Roman times, but the tradition here is almost a hundred years old for a Carnival that involves for weeks group of friends and different areas of the town.

They work for free to build the floats and to appoint the local masks: Re Torbolin, the new vintage wine king and Sior Carnevalon, the lord of the Carnival.

THE MONTEFORTIANA MARATHON

Frosca, Foscario, Val dell'Acqua, Tramenalto, Castellaro, Fittà, Castelcerino, Rocca are not only famous because of the best Soave wine production.

There is also an event that makes that involves them as settings for running challenges.

It is called Montefortiana and it has successfully brought together wine, sport and environment since 1973. Every year on Saint Anthony's day more than twenty thousand people from Italy and abroad gather here to run, do some sport and much more.

A VIRTUOUS SOCIAL SYSTEM

In recent years, to increase yet further the quality of the grapes and, consequently, their price, the denomination has been reorganised from a quality point of view, according to different climatic, orographic and pedological parameters.

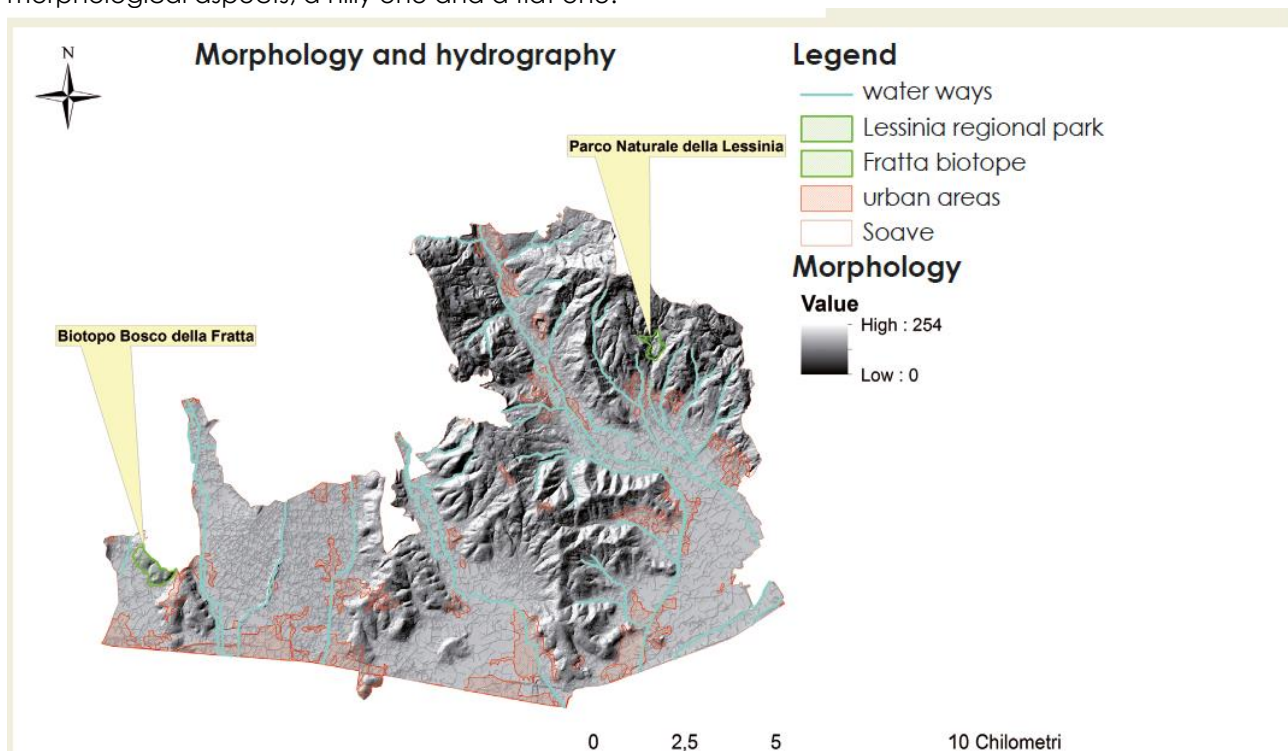
This has been made possible to the zoning project, to stricter grape selection and to a profound revision of the production regulations, decided on by the producers themselves. The individuation of different vineyards has enabled the delineation of a quality pyramid.

The zoning project has been started in 1995, when the Consortium published an accurate map of the Classic area to evidence both the "crus" and the single vineyards. In 1998, it has started a characterization program with the help of the Istituto Sperimentale per la Viticoltura di Conegliano. This project provided the study of the factors of production in different areas of the appellation, to identify macro areas based on the specific characteristics of the grapes. The phenotypic responses of the vines are originated not only from environmental factors but also from the human activity that affects environment and vineyard management. The role of the grape grower is to interpret these responses and to identify every different identity.

At the beginning they were selected, based on historical importance, 14 macro areas with 70 vineyards with a distinctive identity. The survey has been carried on for 5 years and the zoning was integrated with a soil investigation that covered the entire appellation. In 2001 the Consortium released a research of the historical place name of the single vineyards, creating a map that identified the most important of them, clustered in macro areas. This Cru map was the first important result of the survey, that gathered all the information about soil, climate, and other useful information to have a specific distinction of the single areas. In 2006 the work has been extended to all the appellation with the Grand cru map. From this path, jointed with a deeper study of the soils, comes now the proposal of the 33 Geographic Units of Soave that will be included soon in the product specification. At its summit is Soave Superiore D.O.C.G., representing a synthesis of selection and rigour of production, followed by Soave from hillside sites, both In the Classico version (if obtained from the historic zone) and in the Colli Scaligeri version. Lastly, at the base of the pyramid, there is Soave D.O.C., which is characterized by its excellent value for money. It should be noted, therefore, that one of the first economically differential elements of quality lies in the objective characteristics of this region.

5 LANDSCAPE FEATURES

The "Soave" area covers about 13,623 ha from almost 30 m above s.l., in correspondence of the Southern border in line with the S.S. 11, to 689 m above s.l. in correspondence of the Cima di Tre Punte di Prealta, where it's possible to see a large view which includes Val Tramigna, Cazzano di Tramigna, the Illasi castle and the Illasi Valley. This land embraces a group of 13 towns: Caldiero, Cazzano di Tramigna, Colognola ai Colli, Illasi, lavagno, Mezzane di Sotto, Montecchia di Crosara, Monteforte d'Alpone, Roncà, San Giovanni Ilarione, San Martino Buon Albergo, San Bonifacio and Soave. The city councils of the Soave area are located in the eastern Lessinia area and they present two morphological aspects, a hilly one and a flat one.



The hilly side of Soave area is predominantly located in the northern and eastern region while the flat side is in the east-southern part.

From the soil map it is clear how the hilly sides are made up of the calcareous and volcanic lithology typical of the Lessinia region with a substrate of volcanic origin and soils with substratum made of stratified calcareous rocks.

The flat land, instead, consists of alluviums and stratum detritus.

The morphology of the hills presents in volcanic areas, have rounded shapes while calcareous formations produce a major slope and small escarpments.

Dome-shaped peaks are the result of columnar basalts presence, that is to say the more resistant volcanic formations. (ANNEX 9 - SOIL MAP)



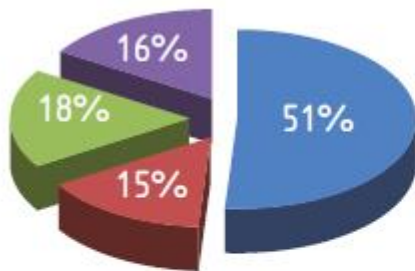
The four soils of Soave.

The territory is divided based on gradients, which show that the 51% (6955 ha) of the area of Soave has a gradient lower than 10%. Moreover, only the 15% of the soil has a gradient between 10 and 20%. It's

possible to use machines on more than the 66% of the Soave area, which is the land mostly covered by vineyards. Another 18% could be more useful thanks to appropriate terracing and edging. On the not-workable territories, vineyards have been replaced by other cultivations such as the cherry and the olive tree.

About 2260 ha have a gradient which exceeds the 35%, so those areas are not-workable territories and they're covered by natural vegetation.

The different heights of the territory show that the 55% of the land is 100 m above s.l. at most: the 27% is above 50 m s.l. at most and the 29% between 100 and 250 m above s.l. (over half between 100 and 150 m above s.l.). The 16% of the territory is over 250 m above s.l.



THE TOPOGRAPHICAL GRADIENTS

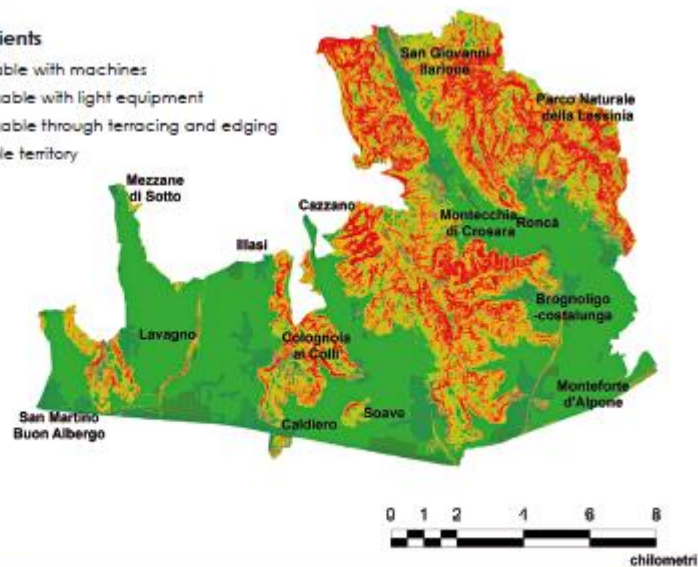
- % 0 - 10 territory workable with machines
- % 10 - 20 territory workable with light equipment
- % 20 - 35 territory workable through terracing and edging
- % 35 - 100 not-workable territory

Legend

- towns and municipalities
- industrial areas

The topographical gradients

- % 0 - 10 territory workable with machines
- % 10 - 20 territory workable with light equipment
- % 20 - 35 territory workable through terracing and edging
- % 35 - 100 not-workable territory



The procedure set out in "From land cover to landscape diversity in the European Union" developed by the European Commission pays attention on three key features of the landscape:

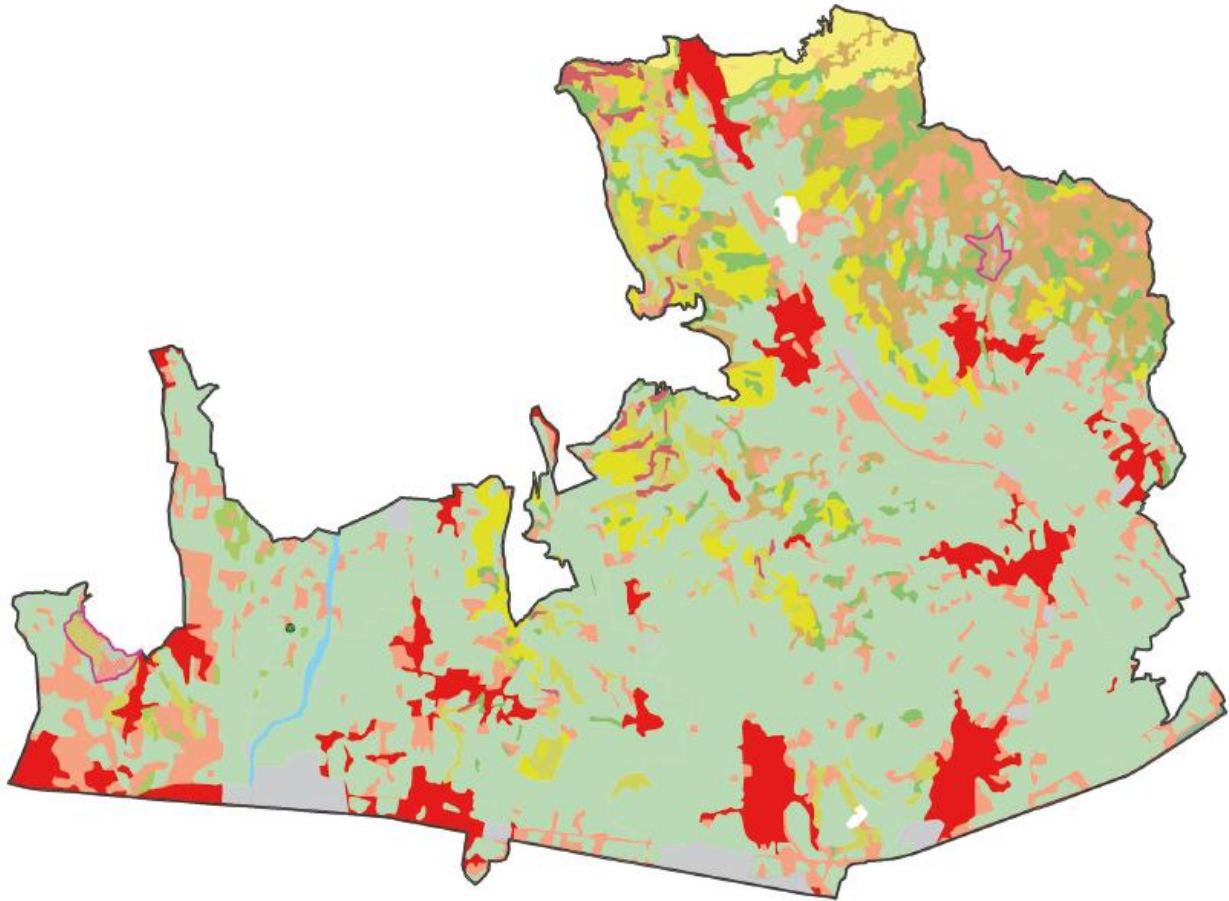
- Fragmentation
- Diversity and heterogeneity
- Spatial organisation and composition

According with these three points, the Soave area has been deeply studied to reach the recognition of First Italian Rural Historical Landscape in 2016. All the Soave Traditional Vineyard area in 2008 has been charted with the Corine Biotopes Classification and the result Charter of Habitats.

Plain land zones and hills were destined to vineyard cultivation and in mixed cultivation with some trees. The historical diseases that hit the vines during the Nineteenth-Century (oidium, phylloxera, downy mildew) also decimated the area of Soave. Luckily the reconstruction didn't distort its historical landscape that still conserves nowadays some peculiar features:

- The presence of vineyards that characterizes use of land in the hills
- The deep structure of the landscape represented by its unique properties, water and road networks, the shape of the volcanic hills and the presence of dry-stone walls.
- The extraordinary presence of trees among the vines
- The presence of some historical chestnuts
- The historical system of handmade buildings

The European hop-hornbeam bush , Corine Biotopes Code 41.81. <i>Syntaxon: Ostryo-Carpinenion, Laburno-ostryenion, Campanulo mediae-ostryenion pino calabricae-Quercion congestae (erico-pinetea)</i>	1,6 %
Chestnut groves , Corine Biotopes Code 41.9. <i>Syntaxon: Querco-Fagetea</i>	3,0 %
Quarries , Corine Biotopes Code 86.41. <i>Syntaxon: Artemisietea</i>	0,5 %
Towns and residential areas , Corine Biotopes Code 86.1. <i>Syntaxon: Artemisietea, Stellarietea</i>	9,3 %
Extensive farming and complex agrosystems , Corine Biotopes Code 82.3. <i>Syntaxon: Stellarietea mediae.</i>	4,5 %
Mediterranean forests covered by poplars , Corine Biotopes Code 44.61. <i>Syntaxon: Populetum albae.</i>	0,3 %
Orchards , Corine Biotopes Code 83.15. The code 83.1 (orchards) includes the cultivation of many different fruit trees species provided with logs. Those not considered are included in the code 83.15.	4,0 %
The herbaceous subalpine and alpine vegetation , Corine Biotopes Code 24.221.	1,0 %
Olive groves , Corine Biotopes Code 83.11. <i>Syntaxon: Stellarietea mediae</i>	4,5 %
Fertilized and grazed well-stocked water lands which have been abandoned by vegetation and are not cultivated areas anymore. Corine Biotopes Code 38.1. <i>Syntaxon: Cynosurion, Cirsetalia vallis-demonis.</i>	1,9 %
Oak groves of the Northern Italy , Corine Biotopes Code 41.59. <i>Syntaxon: Ostryo-Carpinion p.p., Quercion pubescentis-petrae.</i>	2,4 %
Robinias , Corine Biotopes Code 83.324. <i>Syntaxon: Galio-urticetea</i>	1,6 %
Continuos and intensive arables , Corine Biotopes Code 82.1. <i>Syntaxon: Chenopodietalia, Centaureetalia cyani.</i>	1,0 %
Industrial active sites , Corine Biotopes Code 86.3.	3,2 %
Vineyards , Corine Biotopes code 83.21. <i>Syntaxon: Stellarietea mediae</i>	61,2 %



EVALUATION OF AN INTACT LANDSCAPE – SOAVE AS THE FIRST RURAL HISTORICAL LANDSCAPE OF ITALY

The evaluation of the intactness of a historical landscape presupposes the comparison between the situation of two or more different ages. From the intactness point of view, the Soave landscape presents an excellent persistence of vineyard in the hilly area, documentable up to the first years of the Nineteenth Century (Napoleonic Land Register).

From nineteenth-century tax records, object of a specific research, it is possible to notice that the extent of vine cultivation already presents in most of the hilly area. Apart from some pastures and some lawns, the alternation of vineyard/woodlands was very similar to the current one.

A little bit different from this analogy is the presence of arable land: however, it is impossible to evaluate the percentage of arable land in Soave hills at the beginning of the Nineteenth Century. But if we come examine more recent aerial photography, the comparison with photos of GAI flight (the flight that in 1954 and 1955 interested all national land, by providing the last image of Italian terrain before the big agricultural transformation after the Second World War) we can document with a certain precision the entirety of Soave landscape. The analysis of GAI (Italian Aeronautic Group) flight gives an accurate account of the continuity of pergola trellising way back from 1955 until to today, shows the conformity of rural roads and gives a good estimate of the remarkable permanence of trees inside vineyard. A further confirmation is given by the Land Use Map published by CNR (National Research Council) in 1965 (the first systematic land use map of Italy) that identified Soave area as a vineyard area, at that time the largest one in Veneto region.

In 2012 the Italian Ministry, following a European directive called **European convention on landscape**, that officially recognize the landscape as an essential component of the life of population, and an

expression of the diversity of the common cultural and natural heritage and the fundament of an identity, created the National register of Italian Rural Historical Landscapes.

A confirmation of entirety level of hilly landscape of Soave comes from VASA evaluation, concerning Soave Classic DOC area. Environmental and historical evaluation VASA conducted by following indications of the Ministry in the Soave area, allowed to estimate the degree of intactness of the landscape, about the evolution of the rural landscape from 1955 to today. The Vasa method is an evaluation method developed by the Italian Agricultural Ministry to see the evolution of the historical landscapes comparing their changes during a period of 60 years old and the soil use. Comparing two moments, 1954 and the actual one, we can reconstruct all the modifications that affected rural landscapes. 1954 was the year of the GAI flight, a set of aerial photographs taken by the Gruppo Aeronautico Italiano which represent the first available flight covering almost the entire Italian territory after the WWII.

The Italian Ministry than identified 6 classes of soil integrity that represent how much the landscape remained unchanged during this period. The classes are the following:

CLASS I	0 – 20 %
CLASS II	20 – 35%
CLASS III	35 – 50%
CLASS IV	50 – 65%
CLASS V	65 – 80%
CLASS VI	80 – 100%

The results obtained from VASA evaluation show how the percentage of land use remained 68 %. This allows to insert Soave landscape in the V class (65 - 80 %) of the six classes, where landscapes with values 6 stand for a historical landscape with a high degree of intactness, while those with values 1 present a more or less disappearance of the historical landscape. In 2016 Soave has been the first landscape that was evaluated and awarded of this recognition.

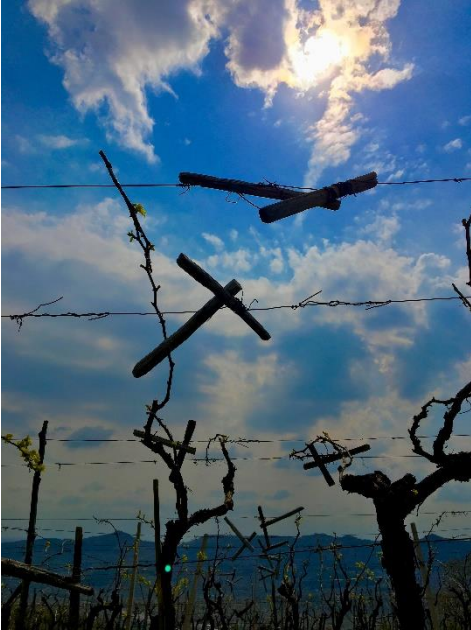
INFRASTRUCTURAL AND SETTLEMENT ORGANIZATION

Among elements of persistence it is also possible to recognize infrastructural and settlement organization that results to be steady in its deep structure.

To list finally to the most characterizing elements of the agricultural landscape, we absolutely have to remember: pergola vine arrangement, present in this area since ancient times; water and agricultural settlings with terracing; the presence of rural courtyards and refuge for tools (the so-called "baiti" o "casotti"), capitals, dry-stone walls to support terracing and to delimit roads.

Technical knowledge about viticulture are not so indifferent elements that Soave and Monteforte communities keep on handing down and their witness is the conservation of many traditional hand-work, despite the difficulties due to the mechanization Human and technological evolution that characterized human beings in the last century led to many changes of the land, but it never managed to delete its distinctive features.

MENATOLI



Typical of pergola landscape are tie-rods ("menatoli" in Verona dialect) with whom it is possible to stretch or to loosen the iron threads that support vine shoots. We can find them in the most ancient vineyards but also in the modern ones and they are hand-made with two wood pieces by using hard wood

CAPITOLS



Capital (votive aedicule) are the most genuine expressions of the people's religiosity. They were in the so called "crocicchi", passages almost obligatory imposed by the hilly landscape. It deals with a typical mark of Veneto people's religiosity that has the land and its holy dimension as constant reference point.

BAITI or CASOTTI

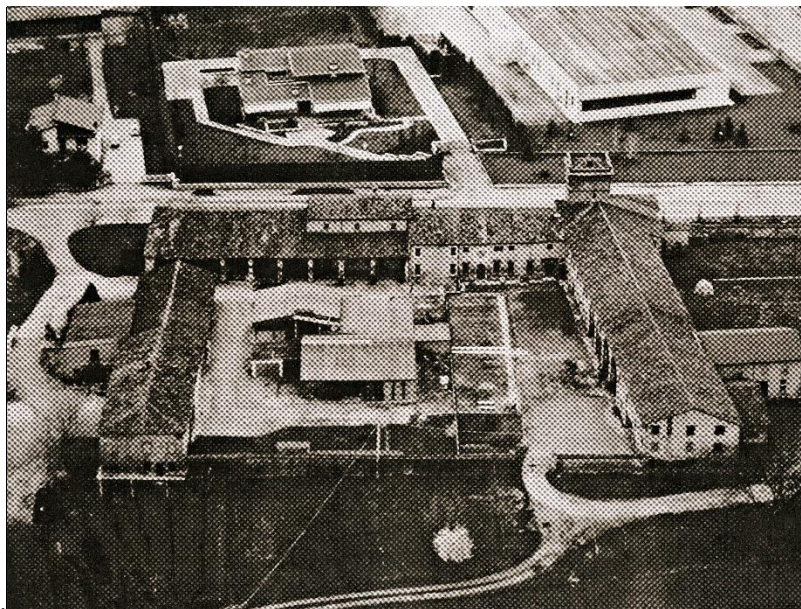
The so-called "baiti" or "casotti" are very little single cell buildings, realized with local rocks and used as refuge for small tools for vine cultivation and as shelter for vine-growers in case of rain. They date back to a period going from the end of the Nineteenth Century and the beginning of the Twentieth Century.



RURAL COURTS

Those structures have always been dedicated to the production of agrarian crops and they are linked closely to rural life. They usually give the name to the place and to the wine that is produced in the surroundings. All the architecture was thought to be functional to agriculture.

There was a wide forecourt, the "selese" where the grains were sieved before being grinded, the "barchessa" that was an arched recovery structure of tools, hay balls etc., the "granaio", the granary for ripe fruits or store wheat flour for the wintertime, and the sharecropper houses.



III. ACTION PLAN

1. SCOPE AND STAKEHOLDER INVOLVMENT

The activities of this application involve at least 4 important levels:

1. The protection and enhancement of the natural, landscape and artistic resources of the territory;
2. A quality production, oriented towards the typical and traditional product;
3. An activity of transformation of the products of the earth;
4. The offer of tourist hospitality infrastructures and services;

The objectives, therefore, are linked to the protection, enhancement, and promotion of local resources.

These resources are present but often hidden, as they are not adequately known and still not integrated within projects that can promote them on larger consumption circuits. For this reason, the candidacy helps to “create” these resources, since it is the top that allows them to be recognized and exploited in economic terms.

For this project, there is the need for a territorial and competent coordination body, established in the basis of a precise local development project, which can have its reference point in the current Consorzio di Tutela precisely for its specific and articulated functions.

The activities on which the conservation strategies can be based are organized into three main axes:

1. The first axis combines the preliminary activities with the candidacy; they ensure their protection over the time through the recognition of the original environmental, landscape and cultural characteristics, including the traditions related to the cultivation of the vine and the vinification of the grapes;
2. The second axis identifies the productive and aesthetic Soave style, that is the set of activities more directly connected to the production of wine and landscape. In this case, it is a matter of promoting an integrated supply chain of products and services;
3. The third axis of activities is the promotion of human and ethical values, which have first to characterize the development of human resources and the management of the innovation of products and processes.

The aim is to achieve a step change for a territory that, thanks to the wealth of its environmental and monumental heritage and the widespread wine-growing knowledge, has all the possibilities to face the challenges of the future, evolving from a patchwork system, formed by numerous small vineyards, in a Park symbol of lifestyle, for the quality of its Soave wine and for the quality of the environment, offered in a context of authentic rurality to a multiplicity of users, both metropolitan and international.

This project involves all the local authorities - Region, Province, Municipalities and all the actors who could contribute to defining the objectives from every point of view. First, there are the grape growers the main actor to be involved directly in a dynamic conservation of the environment.

All the topics are constantly subject to comparisons, reflections, documentation and in-depth analysis, involving every expression of the territory. On the integration front, there are numerous companies that today avail themselves of the collaboration of more recent residents. In some cases, these people have allowed and facilitated the return of a whole series of new strategic professionalisms for the recovery and the consolidation of artifacts, for the implementation of more sustainable forms of cultivation, for the sharing of projects and results.

2. PROBLEMATIC ISSUES

The wine-growing landscape and productive system of Soave presents some elements of vulnerability, mostly linked to the introduction of the modern method of production that could irreparably change the landscape of the Soave hills. The recent introduction of the espalier systems, of the Guyot vine training system, which allows obtaining high yields per hectare and an extreme mechanization of the processes, is perhaps the most problematic element and must be monitored. The diffusion of the espalier system facilitates, where the slopes become sweeter and there are no alteration of altitude or other elements that interfere with the sliding of the machines, the introduction of the "ritocchino" system, which means that the rows follow the land slope, often in correspondence of larger land ownership or holdings, where the use of mechanical means is definitely preferred. This is how we got to the removal of the historic dry-stone walls and embankments used to support the plots organized through the contour plowing practice. According to a specific survey, the main issues are:

1. Changes in the wine-growing system, with the adoption of modern Veronese Pergola system in Soave Hills and to find new mechanical solutions for heroic viticulture;
2. New hydraulic-agrarian arrangements, to prevent soil erosion issues and protect the environment;
3. Introduction of extraneous elements or materials starting an innovative project of evaluation of the grapes based on the landscape preservation. The more the vineyard is in a perfect state the more the grapes must have value;
4. Concrete strategies and actions on the environmental sustainability front: governance of the phytosanitary activities and an environmentally friendly behavior and health tutelage of the operators and the citizens.
5. The Landscape Identity that consist on a series of "iconemi" that defines its specific value. Their tutelage fuels the entire system identity;
6. Biodiversity conservation, in a contest with an important presence of viticulture;
7. Water management, in a climate change condition;
8. Proposal for tourist promotion and hospitality;

While in all the action, there will be some steps in the implementation, in action 4 and 6 we want to do all the best to apply two protocols that has been written in the last two years and need to be promoted with a series of meeting and training courses with all the farms involved in the projects

1. Changes in the wine - growing system

Even if the pergola remains the most widely used form of the vine in the Soave and Monteforte d'Alpone areas, in the last twenty years also on the Soave hills have appeared the espalier forms of importation if we take into consideration the whole area of the Soave DOC.

The data collected by the Soave Wine Consortium show how the use of the pergola has decreased from 89% to 78% from 2003 to 2014. The Guyot vine training system and other espalier systems are growing.

Anyway, this inclination to reduce the pergola-based system in the Soave Classico DOC area is still very limited.

Studies activated by the Soave Consortium in 2011, detailing different areas planted both with pergola veronese and Guyot. The qualitative results, even with the wine comparison, gave some positive indications on the role of the pergola system in this moment of climate change.

Objectives:

- Preventing the decrease of the use of the Pergola
- Give some new instruments to the grape growers to continue to plant the pergola in a wine conversion project.

Actions to be taken:

- Persuade the Veneto Region that the Pergola training system could be funded in the PSR Measures* concerning the wine conversion project.
- Following the art. 7 of 238/2016 law, inclusion of Soave in the rural historical and heroic vineyards protected by law. We are waiting for the decree that has to be released in 2018-2019.

INITIATIVE	CONTENT OF INITIATIVE	RESPONSIBLE ACTORS	FINANCIAL RESOURCES	TIME SHEET				
				2019	2020	2021	2022	2023
Preventing the decrease of the use of the Pergola	Meeting with the Veneto Region, with the aim to include Pergola training system in the PSR Measures concerning the wine conversion project.	Consorzio, Regione Veneto	PSR measures and programs	X	X			
	Soave will be included in the rural and historical vineyards in Italy. With the funds that could come from this activity, we want to implement some projects of recovering old pergolas or plant new innovative pergola vineyards	Italian Ministry, Consorzio	The financial resources will be released by the Italian Ministry of Agriculture in the next years	X	X	X		

Give some new instruments to the grape growers to continue to plant the pergola in a wine conversion project.	Meeting and courses with the grape growers to teach them how to manage correctly a pergola	Consorzio, cooperatives, grape growers, other local organizations	Internal resources		X	X		
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*PSR Measures are “piano di sviluppo rurale” measures. It means special funding, co-funded from privates at 50 to 80%, to encourage economy in rural areas. They are provided by the European Community and distributed by the Regions in Europe.

2. New hydraulic - agrarian arrangements /

The modifications of the hydraulic-agrarian arrangements of the Soave hills, as well as the progressive replacement of the pergola with the Guyot vine training system, in correspondence with the expansion of plots, are the main consequences of the evolution of the Soave wine landscape. The ancient hilly areas are unlikely to adapt to mechanical means, this is the reason why in some areas, even in the Soave DOCG classic area, can be seen excavations and remodeling interventions on the hilly surfaces, with the elimination of the embankments, the contour plowing, and the “ritocchino” system. The “ritocchino” system, with the rows perpendicular to the line of maximum slope of the hills, allows a greater outflow of water, increasing the erosion phenomenon that was previously well controlled and contrasted by the contour plowing system. Furthermore, the contour plowing system preserves the rainwater in the ground and keeps the soil damper and more suitable for crops, which is not guaranteed by the “ritocchino” system. The climate change and the rising temperatures accentuate the problems of drought, thus making the water an even more precious resource also for crops. This entails higher costs for the rainwater collection and the need to adopt the vines of technological infrastructures. Even man-made artifacts used in the contour plowing system are eliminated. In many cases, dry-stone walls must be removed to allow the leveling of the slopes for the “ritocchino” system rows. Beyond the consideration on the importance of the cultural and environmental value of the traditional arrangements, as emerges from the tests carried out by the Experimental Institute of Conegliano of behalf of the Consortium, one factor that could stop the propensity towards new accommodations is the fact that the organoleptic quality of wines produced from soils to which stones have been removed is lower.

Objectives:

- To find new conception's mechanicals or to study new ways to help grape growers in every day's operations.
- To prevent the physiological degradation of the accommodation and artifacts, which requires reconsolidation and new interventions.

Actions to be taken

Provide concrete guidelines that minimize the risk of erosion, developing a series of innovative and affordable technologies to consolidate or recover artifacts such as stone walls, embankments and roads. Those guidelines propose new technologies in relation to:

- development of alternative and economic technologies for the consolidation of "ciglioni" and "muri a secco"
- development of innovative materials for regeneration of rural roads
- validation of new solutions for steep slopes
- development and validation of new vine systems in difficult areas
- development of more effective and safe technologies and operative machines on steep slopes, also for operations under foliage
- identification of materials to be used and definition of operational guidelines for consolidation and restoration of terracing
- economic analysis of intervention, convenience and efficiency on the various proposed systems.

INITIATIVE	CONTENT OF INITIATIVE	RESPONSIBLE ACTORS	FINANCIAL RESOURCES	TIME SHEET				
				2019	2020	2021	2022	2023
Provide concrete guidelines that minimize the risk of erosion, developing a series of innovative and	<ul style="list-style-type: none"> · development of alternative and economic technologies for the consolidation of "ciglioni" and "muri a secco" · validation of new solutions for steep slopes 	Private wineries, Consorzio, private grape growers	The resources will be both public (PSR programs) and private (some private wineries started with their own investments those recover)	X	X	X		

affordable technologies to consolidate or recover artifacts such as stone walls, embankments and roads.	Development of innovative materials for regeneration of rural roads	Municipalities, private owners	National and regional measure, private investments		X	X	X	
	Identification of materials to be used and definition of operational guidelines for consolidation and restoration of terracing	Municipalities, Consorzio	National and regional measure, private investments		X	X	X	
	Economic analysis of intervention, convenience and efficiency on the various proposed systems.	Consorzio	Internal resources			X	X	X

3. Introduction of extraneous elements or materials

As the First Rural historical heritage, this territory must be preserved and projected in terms of asset recovery, valuing, mitigation or removing of critical issues. In the last decades there has also been a change in the materials that compose the vineyard: instead of the traditional chestnut poles, there is the tendency to use metal or concrete poles not always chosen with an attention to the aesthetic effect. There is also the problem of the dry-stone walls, traditionally built with stones deriving from the hilly soils and assembled without the use of binders.

The state of abandon and the lack of maintenance are beginning to show the first signs of small collapses, which could seriously change the historic landscape if there is no intervention as soon as possible.

In modern system are particularly recommended the wooden poles, generally, pine or chestnut wood, not necessarily regular since many people still prefer not turned wooden poles. For the intermediate supports are generally appreciated metal stakes, which can give a good aesthetic result if they are dark colored. Metal alloys with the typical rust effects offer the highest aesthetic quality. The supports in galvanized steel painted in dark brown are also good, as well as the recently widespread fiberglass: they combine satisfactory aesthetic and lasting qualities.

The idea of introducing also a parameter related to landscape quality of the single plot and of the fund in the evaluation of the grapes could represent a concrete economic incentive for the continuous research of the aesthetic quality, which, in some cases, also involves significant economic sacrifices. Even more important would be the cultural impact.

The wine-producing evaluation can help in highlighting the practical importance of harmonizing the economic activity with the environment as a fundamental element of progress and development. The experiences and the results acquired have already been shared and made available with other similar territories.

Objectives:

1. Awareness programs for grape growers, with the award of higher grapes prices.
2. To includes a series of rules addressed to the grape growers towards a more respectful and environment friendly behavior.

Action to be taken

- To deep statistical analysis related to dry stone and embankments materials
- To deep statistical analysis related to the usage of different vine poles (concrete, wood, iron poles)
- Mapping the trees, the hedges and all the natural borders
- To create a series of parameters that would be gathered in a schedule used by the social cooperatives wineries to value the vineyards and the grapes. The more the vineyard is harmonized with the environment, the more the grapes will be paid.

INITIATIVE	CONTENT OF INITIATIVE	RESPONSIBLE ACTORS	FINANCIAL RESOURCES	TIME SHEET				
				2019	2020	2021	2022	2023
Awareness programs for grape growers, with the award of higher grapes prices.	To create a series of parameters that would be gathered in a schedule used by the social cooperatives wineries to value the vineyards and the grapes. The more the vineyard is harmonized with the environment, the more the grapes will be paid	Consorzio, social cooperatives	Internal resources, Private investments of grape growers coordinated by the social cooperatives, regional programs	X	X			
include a series of rules addressed to the grape growers towards a more respectful and environment friendly behavior	<ul style="list-style-type: none"> ·deep statistical analysis related to dry stone and embankments materials ·deep statistical analysis related to the usage of different vine poles (concrete, wood, iron poles) ·Mapping the trees, the hedges and all the natural borders 	Municipalities, Consorzio	Internal resources and national programs	X	X	X		

4. Concrete strategies and actions on the environmental sustainability front

We have already highlighted in the previous pages how the natural and human factors come together in delineating the peculiar wine and territory identity.

Just consider how the interpretation of the landscape in the Soave hills has contributed to define one of the most typical characteristics of this wine. The historical role of the Consortium in defining or planning initiatives aimed at improving the winemakers' approach to the territory has also contributed to a cultural growth towards a particular environmental sensitivity.

It is worth mentioning how, alongside the historic and accurate coordination activity, also in synergy with the wine cooperatives, the Consortium has always promoted a whole series of initiatives in this sector.

The constant monitoring of contaminants in the soil and subsoil, the control of the residues of treatments on the grapes, the consumption of water, the management of products for the protection of the plants, the constant informative activity to the producers up to the achievement of the environmental certification.

The objective of the Consortium and of the whole Soave system is, therefore, the improvement of the overall economy by respecting the shared environmental requirements.

The constant objective is to limit the chemical inputs in the vineyards based on the real necessity and to sensitize the producers to the use of more environmentally friendly products in the maximum respect of their distribution methods.

The action of the Consortium thus becomes the instruments through which the protection, not only of the quality of the products but also the sanitary parameters to safeguard the environment.

Objectives:

1. To adopt rational monitoring systems that allow an adequate assessment of the phytosanitary situation of the crops;
2. To favor the use of auxiliaries;
3. To favor the phytosanitary defense with a low contribution of chemical products through the adoption of agronomic techniques and alternative means (physical, mechanic, microbiological, etc.);
4. To limit the exposure of the operators to risks deriving from the use of plant protection products, (personal protective equipment, etc.);
5. To rationalize the distribution of plant protection products by limiting their quantity, waste, and losses due to drift, run-off, and percolation;
6. To limit the pollution due to the incorrect preparation of the solutions to be distributed and to the incorrect disposal of the same;
7. To optimize the management of warehouses in which plant protection products are stored;
8. To recover or properly dispose of plant health products and their packaging;
9. To develop adequate defense strategies that allow, inter alia, to prevent and manage the development of pest resistance to plant protection products.

Actions to be taken

Fundamentally the action is the application of the Advanced defense model of Soave. This service is coordinated by the Consortium through weekly meetings held during the vegetative season, from May to August each year and with updating meetings with technicians in the remaining period of the year.

The professional experience of each expert is continuously updated through these meetings, whose reference is the Phytosanitary Service of the Veneto Region's Handbook.

Any innovative service initiatives can be carried out in collaboration with institutions such as universities or Veneto Agricoltura. These projects may concern the research and the study of new techniques to reduce the use of pesticides and herbicides, safeguarding the quality of the production, the respect for the environment and the health of operators and consumers.

This will involve for the next five years the entire supply chain, from the grape grower, olive oil producer, cherry producer, to the private wineries, to the municipalities that must make the Defense Model being respected. This will take a long process of training of the farms, meeting with them to find new solutions. The advanced defense model is not a project that has to be funded, but it depends on the single farm that will apply with his sensitivity to reach the aim to reduce pollution.

(ANNEX 10 – THE ADVANCED DEFENSE MODEL)

5. The landscape identity

The Soave DOC wine production area has in fact been considered one of the most suitable to viticulture areas that have been studied both from the agronomic and technical-productive point of view. Numerous studies, carried out by institutes and universities, by the Consortium or by private companies, have, at different times, underlined the pedological, climatic and ampelographic characteristics, highlighting the peculiarities of a unique territory and the originality of the white wines produced on these hills. In the past landscape preservation projects, we have dealt with the theme of the maintenance, the consolidation of the characteristic elements, the restoration of parish churches, capitals and dry-stone walls. We have defined a user manual of the territory shared with the operator and hypothesizing how people who work for a better landscape can be rewarded. We have dealt with the theme of a protective and conservative territorial and urban planning, thinking about scenarios of future use of what has been achieved. We have also studied the close relationship (analyzing the strengths and weaknesses) between landscape and economy.

Objectives:

- Protection of the specificities and of the morphological characteristics of the territory;
- Promotion of sectoral studies on ecosystems, biotypes, flora and fauna to define environmental and landscape action plans;
- Environmental enhancement projects;
- Project of environmental recompositing and restoration - natural engineering interventions;
- Sector studies on linear vegetational systems and wooded areas;

- Protection of significant panoramic views of landscape appreciation;

Actions to be taken

- The greater efficiency of the earthmoving machines allows the realization of interventions that, in the past, were economically unjustifiable. It is believed that this aspect must be carefully examined, to favor not only the maintenance of the correct hydrogeological structure but also the enhancement of the territory from the point of view of the landscape.
- The awareness that each intervention must be examined for its specificity, cannot exempt us from proposing some concrete technical parameters for the evaluation of the impact of the interventions of land improvement.
- the total cultivation monotony should be avoided by reintegrating some different tree species, in the form of hedges and rows, wooded patches or even single plants of adequate size. The presence of different plants, even to a limited extent, contributes very often to the great enhancement of the landscape of the specialized vineyard; the valorization of the combination of wine and territory has, however, to set objectives of excellence.
- every winemaker must constantly look at the issue of researching the quality of his vineyard, also from an aesthetic point of view, without neglecting anything in this regard.
- Even the simplest rustic outbuildings must present a coherent design, with a minimum but complete finishing level. More or less precarious and random structures, developed over time without any organization with respect to pre-existing structures, must be avoided.
- redevelopment of the existing building heritage, of accommodation activities related to rural tourism, promotion of touristic structures, museum activities (ancient agricultural equipment); protection and enhancement of the cultural heritage with the identification of functions related to tourism and cultural tourism, enhancement of the traditions; Redevelopment of the existing building heritage according to rural, food and wine, cultural tourism (for example the "theatre in villa" venture).

INITIATIVE	CONTENT OF INITIATIVE	RESPONSIBLE ACTORS	FINANCIAL RESOURCES	TIME SHEET				
				2019	2020	2021	2022	2023

<ul style="list-style-type: none"> -Protection of the specificities and of the morphological characteristics of the territory; -Protection of significant panoramic views of landscape appreciation; -Project of environmental recompositing and restoration - natural engineering interventions; 	<ul style="list-style-type: none"> · each intervention must be examined for its specificity, cannot exempt us from proposing some concrete technical parameters for the evaluation of the impact of the interventions of land improvement. · redevelopment of the existing building heritage, of accommodation activities related to rural tourism 	<p>private owners, grape growers, municipalities with the role of rural police</p>	<p>Private investments. Some of them are directly financed by regional measures for agriculture, but always with a co-funding</p>		X	X	X	
<ul style="list-style-type: none"> · Promotion of sectoral studies on ecosystems, biotypes, flora and fauna to define environmental and landscape action plans · Sector studies on linear vegetational systems and wooded areas 	<p>the total cultivation monotony should be avoided by reintegrating some different tree species, in the form of hedges and rows, wooded patches or even single plants of adequate size. The presence of different plants, even to a limited extent, contributes very often to the great enhancement of the landscape of the specialized vineyard;</p>	<p>Consorzio. Universities</p>	<p>Regional measures of cooperation between subject for research projects. University's funds</p>	X	X	X		

6. Biodiversity conservation

The "biodiversity in the vineyard" project, activated by the Consortium in 2015 and 2016 in synergy with the Biodiversity Friend association, the most titled association in the world for the environmental monitoring on the biodiversity front, has achieved its first objective with the publication of the first data related to the survey carried out in the context of the historical vineyards of the denomination.

The focus of the BWA has, in fact, focused mainly on the classical area where the wine-growing concentration is among the highest in Italy. 1,500 certified hectares on 1,700 total hectares.

The area has been chosen for its production specificity to have reliable data on the impact of a monoculture on the biodiversity, highlighting its values and critical points.

It has been therefore drawn up a map of the habitats and it has been implemented also a series of surveys using very innovative indicators, such as Orthoptera (grasshoppers) as certifiers of the organic quality.

Objectives

- maintaining and restoring the natural elements and residual vegetation (i.e. rows, hedges, wooded spots, etc.), which play an ecological role in that they break the homogeneity of the farming landscape and the countryside and offer points (habitats) or corridors of displacement for many species of wildlife, supporting the many ecological processes that take place in it (e.g. pollination, nesting, etc.). The creation of buffers or strips of vegetation both along field borders (hedges and trees arranged cross-wise compared to the maximum slope line) and along the riparian strips (systems of irrigation ditches and canals), besides offering shelter to insects and fauna, contributes to the reduction of the loss of nutrients in the soil, has a wind-breaking action and constitutes a barrier to the drift of pesticides. In particular, the rehabilitation of vegetation should prioritize the use of native species of trees and shrubs.
It is also best to ensure that the formation of hedges, rows and ecotone strips avoid those species that can host pathogens of the cultivated plants. Finally, it is necessary to maintain isolated plants and characteristic elements (i.e. drywall), which may represent an important nesting site for insectivorous birds and host micro-fauna and amphibians.
- protect the so-called agricultural biodiversity through the preservation of the genetic heritage and recovery of local cultivars linked to specific areas of the sloping land and their farming tradition.

Action to be taken:

The preservation of biodiversity can be broken down into the following steps:

- a. less simplification of the landscape and increase of widespread naturalness through the recovery/creation/ management of riparian and ecotone strips and hedges
- b. use of indigenous species of trees and shrubs
- c. conservation and restoration of local cultivars
- d. conservation and restoration of mixed crops
- e. rearrangement of the surface-water drainage network

f. use of bio-engineering techniques for the recovery of the farming landscape and water resource management. Agriculture has always played a major role in the development of this territory, both economically and in terms of the land and landscape.

(annex 11 - biodiversity Friend protocol)

The implementation of the Biodiversity Friends Protocol has to be pursued every year by the Consorzio, and the results of the survey must be used by the single farms to improve their biodiversity indexes with punctual interventions. This project has a very long timing, more than 5 years, to make all the system become more and more sustainable. The project is funded with internal resources of the Consorzio, but it is quite close linked to point 4. of this action plan.

7. Water management

The hydrography of the area becomes important also from a profile of climate change and hence of resource availability. Sustainable recovery and water resource saving/management to prevent erosion or desertification phenomena that cause landslides.

Objectives:

About water resource management it is necessary, on the one hand, to maintain the functionality of the surface hydrographical network by protecting and maintaining the system of canals, irrigation ditches, wells, springs, minor road networks and agricultural plots.

On the other hand, it is essential to preserve the filtering capacity of the soil and of the slope profile for the protection of the drainage system.

In order to ensure optimal water resource management, the custom is to most commonly resort to agronomic-conservative practices, which if implemented enable proper rain water infiltration, reduce runoff flow rate, intercept and channel runoff water on the surface into appropriate reservoirs and avoid stagnation. The aim is to make all the actions to be taken, an ordinary practice of each single farm, and this is obtained with a training of the grape growers.

Actions to be taken

- Maintaining and/or restoring the characteristic elements and hydraulic and agricultural irrigation and drainage networks, such as runoff water, ditches, level ditch roads, terrace canals, terraces, terracing, embankments, etc., which are used both to stabilize the slopes and to adjust the laminar flow of downstream runoff water, since they reduce the gradients and erosive power of the runoff water;
- Works along level curves are more effective than those carried out in the direction of the maximum "ritocchino" slope (note: a system of arranging hilly areas so that the ditches that collect the runoff water are cut in the direction of their slope), either because they favor the formation of stable aggregates or because they provide protection against erosion and geological and hydraulic instability;
- The addition of crop residues and soil organic materials such as compost and woody residues increases the level of organic substance in the soil and helps to fight the erosion and loss of water due to runoff and evaporation, facilitating the structuring of soil particles into resistant aggregates and protecting the soil from the action of pelting rain (reduced runoff flow rate of surface water, increased infiltration, etc.);
- Ongoing maintenance of a vegetation cover during the winter season;

- The use of grassing, especially in the vineyards, to reduce runoff flow rate of surface water, enables greater infiltration and decreases evaporation, and also increases the bearing capacity of the soil and the exploitable insect fauna;
- Preservation of buffers or strips of vegetation land along the field borders (hedges and trees) that help reduce runoff of surface water

INITIATIVE	CONTENT OF INITIATIVE	RESPONSIBLE ACTORS	FINANCIAL RESOURCES	TIME SHEET				
				2019	2020	2021	2022	2023

<p>maintain the functionality of the surface hydrographical network by protecting and maintaining the system of canals, irrigation ditches, wells, springs, minor road networks and agricultural plots.</p>	<p>Maintaining and/or restoring the characteristic elements and hydraulic and agricultural irrigation and drainage networks, such as runoff water, ditches, level ditch roads, terrace canals, terraces, terracing, embankments, etc., which are used both to stabilize the slopes and to adjust the laminar flow of downstream runoff water, since they reduce the gradients and erosive power of the runoff water;</p>	<p>Grape growers, single farms, municipalities</p>	<p>Public and private coordinate investments; In Italy land could be private or public, so the coordinate interventions have to be decided and done by the both if the area of intervention is co-ed. (example: level ditches on private roads that flows in a public level ditch) The maintenance must be ordinary to not become extraordinary in case of major climatic events.</p>	<p>X</p>	<p>X</p>	<p>X</p>	<p>X</p>	<p>X</p>
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<p>preserve the filtering capacity of the soil and of the slope profile for the protection of the drainage system</p>	<p>The addition of crop residues and soil organic materials such as compost and woody residues increases the level of organic substance in the soil and helps to fight the erosion and loss of water due to runoff and evaporation</p>	<p>single farms, social cooperatives</p>	<p>Private investments. This practice must become an ordinary one</p>	<p>X</p>	<p>X</p>	<p>X</p>	<p>X</p>	<p>X</p>
<p>enable proper rain water infiltration, reduce runoff flow rate, intercept and channel runoff water on the surface into appropriate reservoirs and avoid stagnation</p>	<p>use of grassing, especially in the vineyards, to reduce runoff flow rate of surface water, enables greater infiltration and decreases evaporation, and increases the bearing capacity of the soil and the exploitable insect fauna; Preservation of buffers or strips of vegetation land along the field borders (hedges and trees) that help reduce runoff of surface water</p>	<p>single farms, social cooperatives</p>	<p>Private investments. This practice has to become an ordinary one</p>	<p>X</p>	<p>X</p>	<p>X</p>	<p>X</p>	<p>X</p>

8. Tourist promotion and hospitality

The action plan to be developed must ensure the protection of artefacts constructed using traditional methods and locally sourced materials, since they are characteristic elements of the agrarian landscape of Hills planted with vines of Soave, encouraging their recovery, also as a way of meeting the production needs of agricultural lands and to stimulate the practice of widespread hospitality. The best proposals will be those that encourage widespread hospitality, such as B&Bs, Wwoofing (World Wide Opportunities on Organic Farms), volunteer tourism, organic farms, educational farms, holiday farmhouses, eco-museums or other forms of hospitality and tourism, allowing and supporting the rehabilitation, renovation and saturation that will increase the capacity for hospitality and accommodation of these areas.

The concept of multi-functionality in agriculture is now widely accepted and shared. Agricultural multi-functionality means attributing added potential to agriculture, which is not only production but also the ability to provide services, such as maintenance of the territory and preservation of biodiversity, for instance. The task that more than any other can integrate agricultural income is tourism and all the initiatives that revolve around hospitality. A form of tourism that often revolves around hiking or, in other words, that is limited to a single day and that is mindful of the landscape resource in its natural, historical and cultural components, especially the specific forms in which man intervenes in the territory.

The kind of tourism that could be developed in agriculture would help to satisfy the widespread and growing social demand for specific attractions, differentiators, local typicality. Tourists are increasingly looking for unique and authentic experiences, and the farming business can become the front office of this activity, becoming the leading provider of experiential tourism linked to the use and knowledge of the territory and local specificities.

The tourism offer consists of some basic elements that form the tourist product, namely accessibility, accommodation facilities and hospitality.

Objectives:

- building bicycle lanes and new integrated pedestrian paths with explanatory road signs, for instance, or implementing existing ones, integrating them more closely with the cultural and productive landscape (farms, agricultural land, exceptional crops, etc.).
- Development of the wine roads
- Creation of furnished sightseeing attractions
- Experiential tourism proposals

Actions to be taken

- At a municipal or inter-municipal level, we suggest organizing a network of educational paths, identifying new paths to add to the existing network or promoting the creation of a new network. This process involves the actors, with the idea of creating a land system for the dissemination of environmental education linked to agriculture and in general, for a better enjoyment of the landscape.

- The development of wine roads can take place through the strengthening of existing signs with an easier identification of affiliated firms, openness to the world of social networks, e-marketing and online platforms and Online Travel Agencies (OLTA), and the integration of services of local promotion in keeping with the initiatives of individual members.
- Taking advantage of the natural conformation of the land or existing sightseeing attractions near the secondary road network and hills, we suggest the creation of equipped outdoors squares with signs pointing to the Hills of Soave.
- Analyzing the activities related to the seasonal nature of agricultural and forestry processes, food and wine and environmental aspects, experiential paths will be identified to be proposed in the offer, such as "theme-based" weeks related to the grape harvest or pressing, or local cooking classes. As part of the plan, we will survey and analyze points of interest (POI) of the territories involved to then design the routes depending on the navigation mode best suited to the itinerary. Guests will be given the opportunity to experience first-hand the typical activities of the economy of the Soave Hills planted with vines, with unique experiential content referring to the historical-cultural and naturalistic itineraries.

INITIATIVE	CONTENT OF INITIATIVE	RESPONSIBLE ACTORS	FINANCIAL RESOURCES	TIME SHEET				
				2019	2020	2021	2022	2023
- Development of the wine roads	organizing a network of educational paths, identifying new paths to add to the existing network or promoting the creation of a new network. This process involves the actors, with the idea of creating a land system for the dissemination of environmental education linked to agriculture and in general, for a better enjoyment of the landscape	Wine Roads board, municipalities, hotels and wineries	POR-FESR measures and programs of tourism development, private investments	X	X			

<p>- Experiential tourism proposals</p>	<p>Analyzing the activities related to the seasonal nature of agricultural and forestry processes, food and wine and environmental aspects, experiential paths will be identified to be proposed in the offer, such as "theme-based" weeks related to the grape harvest or pressing, or local cooking classes. As part of the plan, we will survey and analyze points of interest (POI) of the territories involved to then design the routes depending on the navigation mode best suited to the itinerary.</p>	<p>Incoming travel agencies, hotels, b&B, public organization, Regione Veneto</p>	<p>POR-FESR measures and programs of tourism development, private investments</p>	<p>x</p>	<p>x</p>	<p>x</p>		
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Annexes

1. Boundaries of the proposed GIAHS site

The boundaries of the proposed GIAHS area are the one that since 50 years are related to the growing of Garganega for the production of Soave wine.

The "Soave" area covers about 13,623 ha from almost 30 m above s.l., in correspondence of the Southern border in line with the S.S. 11, to 689 m above s.l. in correspondence of the Cima di Tre Punte di Preatta, where it's possible to see a large view which includes Val Tramigna, Cazzano di Tramigna, the Illasi castle and the Illasi Valley. This land embraces a group of 13 towns: Caldiero, Cazzano di Tramigna, Colognola ai Colli, Illasi, lavagno, Mezzane di Sotto, Montecchia di Crosara, Monteforte d'Alpone, Roncà, San Giovanni Ilarione, San Martino Buon Albergo, San Bonifacio and Soave.

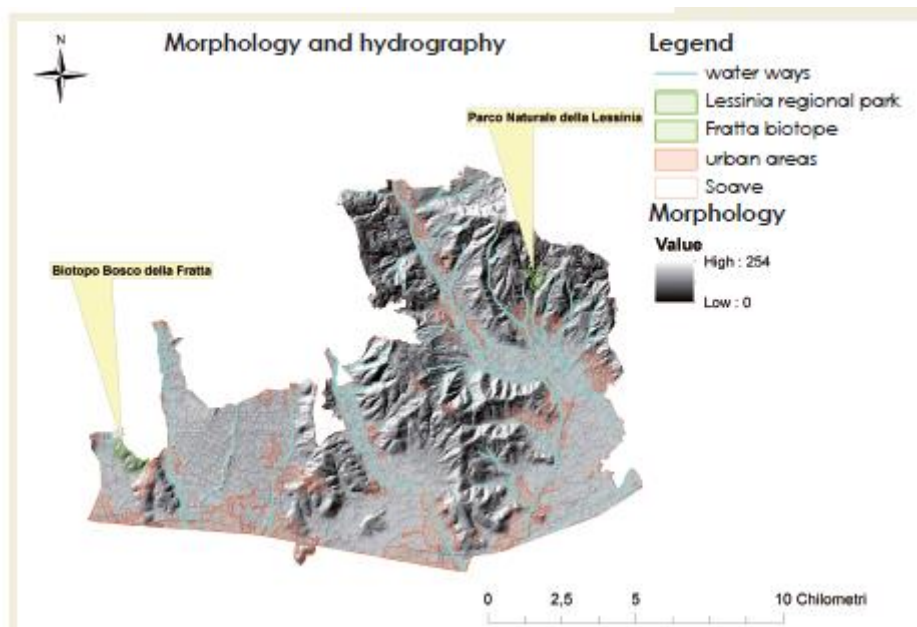
Five deep cuts cross the area of Soave in a North-South direction and they affect the morphology of the land, but also its agricultural use. From the West to the East it's possible to see Marcellise Valley, which is an enclosed valley crossed by the Progno di Marcellise. This creek belongs to the hillside area from the North to the South, which separates the Marcellise Valley and the Mezzane Valley reaching the S.P. 37. Its sides are covered by the Fratta Wood, a very natural area (Biotope), but integrated into a deeply man-made territory.

It follows Mezzane Di Sotto Valley, covered by two watercourses: the Dugale and the Progno di Mezzane. A ridge goes from the East to the South, from the Guaite Mount to Croce di Guala and the Vegro Mount. It also crosses the Mezzane Valley and the Illasi Valley, which is the longest valley of Verona, characterised by the Illasi Creek and the Prognolo.

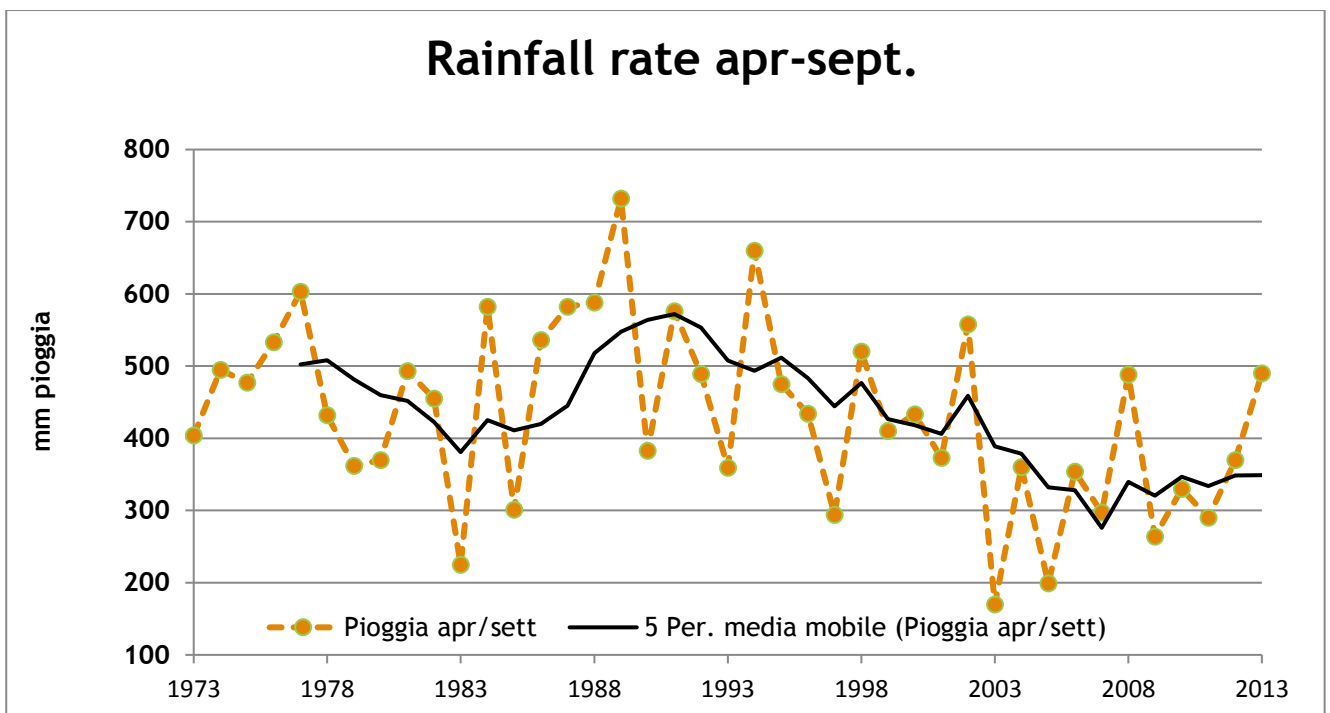
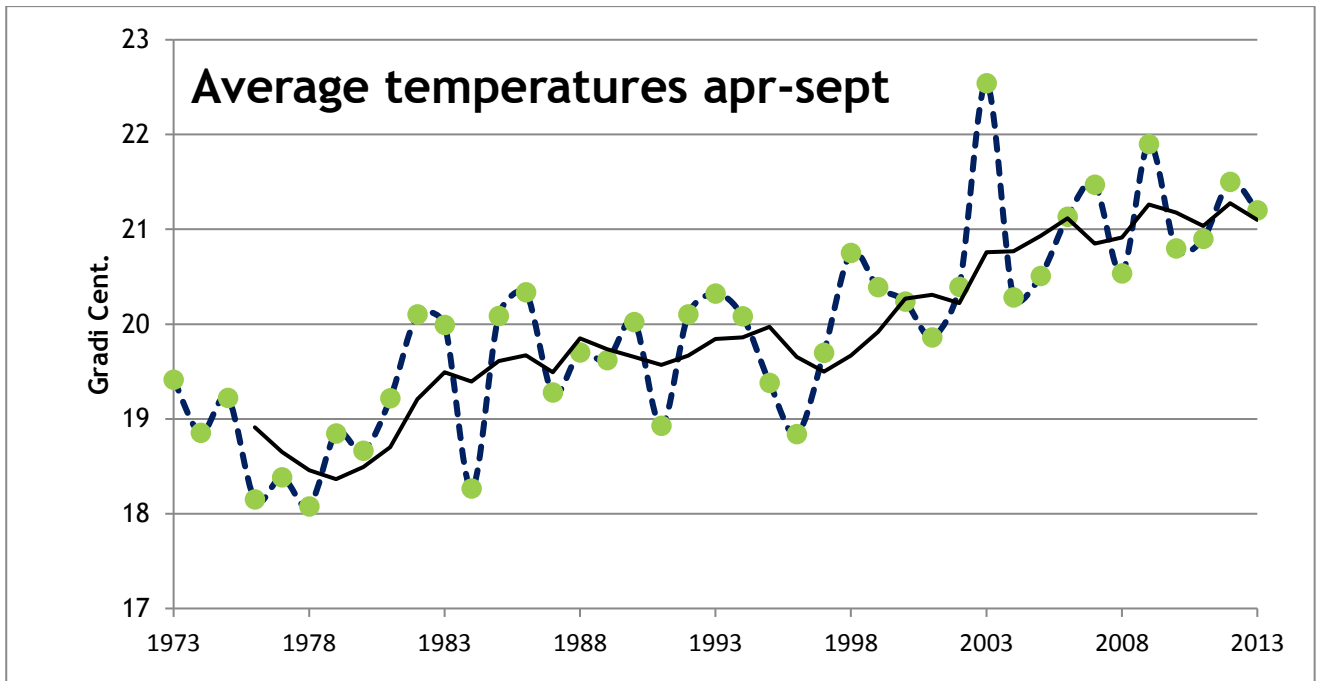
The ridge of the Tenda Mount separates this valley from the Tramigna Valley, crossed by the Tramigna River, which is connected to the Tramignola Creek, the Rio Vaiolo, the Panari Valley, the Faella Valley (or Pissolo Valley) and the Maddalene Valley.

Monteforte D'Alpone is situated on a large plain which connect Verona and Vicenza. This town is the last part of the D'Alpone Valley crossed by the Alpone Creek, the Roggia Vienega and the Rio La Vanganella, which at the end diverts to Soave. The last watercourses go from the hills in Roncà (located North-East) to the Fiumicello River and the Paradiso Valley.

The South-East plain is crossed to the East-West by the Aldegà Creek which flows into the Chiampo Creek. The Geographic Information System (GIS) allows people to clearly intuit the structure of the territory, thanks to the data given by the Province of Verona and the Veneto Region.



2. Climate information



3. Recognition as Rural Historical Landscape System



*Il Ministro delle politiche agricole
alimentari e forestali*

Paesaggio Rurale: Colline Vitate del Soave
(allegato al decreto di riconoscimento)

Motivazione dell'Iscrizione

Le colline del Soave sono un paesaggio storico caratterizzato dalla coltura della vite che affonda le sue radici nel periodo romano, la cui matrice viticola giunge a completa maturazione nel periodo ottocentesco. L'area possiede anche notevoli valori estetici e panoramici, soprattutto in relazione alla avanzata della urbanizzazione nella pianura che si estende a sud dell'area collinare.

La significatività del paesaggio è legata alla persistenza storica di una estesa ed omogenea copertura a vigneto che caratterizza l'uso del suolo. La forma di allevamento tradizionale è rappresentata dalla pergola veronese; tale pratica agricola conferisce un valore notevole alle tessere del mosaico paesistico che presentano tale forma colturale. La conservazione delle forme storiche della viticoltura, in termini di tecniche di allevamento ed architettura degli impianti, è in grande sintonia con gli aspetti produttivi e qualitativi, marcando una differenza considerevole rispetto ad altre zone viticole. Le dimensioni degli appezzamenti e la loro disposizione variano nel territorio, creando una discreta diversità del mosaico paesaggistico con elementi di variabilità che stemperano l'uniformità della copertura viticola.

Un ulteriore elemento di significatività è rappresentato dalle sistemazioni idraulico agrarie. La forma prevalente appare essere il girapoggio, soprattutto nei versanti meno ripidi, mentre il terrazzamento e il ciglionamento appaiono maggiormente utilizzati nelle pendenze più accentuate. Riguardo al terrazzamento, sono presenti strutture diversificate, come caratteristiche costruttive e materiali impiegati, prevalentemente provenienti da opere di spietramento eseguite durante la messa a coltura. È importante segnalare come entrambi i sistemi siano particolarmente efficaci per contenere lo scorrimento superficiale delle acque, contribuendo alla riduzione del ruscellamento, dei valori di picco e di rischio di dissesti idrogeologici. Particolarmente importante appare il patrimonio arboreo associato alla viticoltura. Il suo valore paesaggistico si esplica in una grande varietà di forme, caratterizzate dalle specie utilizzate e dalla loro disposizione sul terreno.

Integrità

L'area presenta un alto grado di integrità in termini di conservazione della destinazione agricola delle colline; il presidio storico vitivinicolo gioca un ruolo fondamentale non solo per l'attualità ma anche per il futuro. La ridotta urbanizzazione nell'area collinare assicura la qualità del paesaggio ed è sostenuta soprattutto dalla struttura produttiva del Soave e dal consorzio dei produttori che li riunisce. Si registra la conservazione di molti ciglioni a girapoggio e dei terrazzamenti, anche se destano qualche preoccupazione le trasformazioni in corso ed i nuovi impianti a rittochino, anche per le implicazioni idrogeologiche. Ugualmente destano qualche preoccupazione alcuni materiali impiegati per i muri, sia dei terrazzamenti sia a bordo strada, non in linea con i caratteri storici di tali manufatti. Ulteriori elementi che compromettono l'integrità riguardano le forme di allevamento - quali la presenza di filari a spalliera - rispetto alle pergole, come pure la cosiddetta "pergoletta", in parte utilizzata in sostituzione della pergola. Un elemento problematico è il largo impiego del palo di cemento, forma di sostegno che non solo dal punto di vista estetico, ma anche da quello storico, non è in sintonia con le tradizioni locali. Qualche perplessità destano le



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caratteristiche estetiche degli impianti di irrigazione dei vigneti, con tubazioni spesso sopraelevate di grande visibilità.

L'analisi allegata al Dossier conferma un'integrità del paesaggio pari alle classe V prevista dall'Osservatorio, con una percentuale del paesaggio storico compresa fra il 65 e l'80%.

Gestione

La conservazione e gestione del paesaggio, oltre al sistema delle tutele ambientali e paesaggistiche, è in primo luogo assicurata dai produttori e dalle attività del Consorzio che li riunisce. Il riconoscimento e il mantenimento del rapporto fra qualità del vino e conservazione delle tecniche di allevamento e della architettura degli impianti tradizionali è l'asse portante della corretta gestione dell'area.

Raccomandazioni

In conseguenza della valutazione del Dossier di candidatura e dei risultati del sopralluogo effettuato, si invita l'Ente Gestore a considerare le seguenti raccomandazioni:

- approfondire le analisi statistiche relative ai materiali impiegati nei manufatti (muri a secco e terrazzamenti)
- approfondire le analisi statistiche relative all'impiego di varie tipologie di tutori per le viti (pali in cemento, legno, ferro)
- operare una mappatura delle alberature in vista di future indicazioni gestionali o di misure del PSR
- operare una valutazione delle potenzialità turistiche in relazione alla conoscenza dei caratteri storici del paesaggio locale
- valorizzare gli aspetti della biodiversità riferendosi alla diversità "bioculturale" secondo le indicazioni della dichiarazione UNESCO-CBD di Firenze del 2014 e delle raccomandazioni della ultima sessione del WHC del 2015, Decision 39 COM 8B.23 (sito Borgogna)
- implementare il rapporto fra conservazione delle tecniche viticole e del paesaggio tradizionale nella classificazione e nelle valutazioni qualitative dei vini prodotti nel territorio della DOCG.

4. The Garganega grape – history, diffusion, genetic origin, the rootstocks

The history of the Garganega vine is indissolubly connected to the history of the Soave white wines, even though it represents a key-variety in the Italian wine-growing landscape.

Already in the 15 BC the Veronese territory was administratively part of the Raetia Curiensis together with South Tyrol and Valtellina. Date back to that period the historical annotations related to the quality of the Raetia wines made by many Roman writers, among them Pliny the Elder and Martial, almost certainly relative to wines produced in the Veronese countryside, where the "Pagus" of Soave extending from Colognola ai Colli to Monteforte continue to produce wine even in the period that follows the fall of the Roman Empire.

Several testimonies with regard to products of great values have been gathered in the Soave area. Cassiodoro (503 AD) describes the Acinatico wine (dried grape wine), forefather of the current Recioto of Soave, a wine obtained from the drying for several months of the best bunches of Garganega grapes, selected in the vineyard. Date back to 1276 notarial documentations regarding the "cum vineis" lands in Soave and the "sclavis et majoribus" vineyards in the district of Castelcerino.

Towards the end of the 1200s Pier de' Crescenzi has pointed out in his essay about agronomy "Ruralium Commodorum"; that the Garganega was among the most cultivated varieties wine grape of the period. In an inventory written in 1952, in order to list the areas for the fithe use in favour of the church of Brognoligo (a district of Monteforte d'Alpone), it is reported the existence of a land cultivated under "Schiave and Garganiche" vines. In the 17th century the viticulture (and the economy in general) in the area of Soave received new impulses and reached important extensions planted with vines, especially in the area of the actual "Soave classico" wine, where the Garganega, together with the other native of this territory, the "Trebiano di Soave" wine, continues to create white wines of great finesse and fame that are widely sold outside the production territory. With the first half of the 1900s the local winemakers began to replace the Trebbiano di Soave, a vine variety very sensitive to humidity because of the compactness of the grapes,

with the Garganega, vine variety which on the volcanic soils of Soave can express itself in a generous way with less health issues.

Outside the Soave area, the Garganega is cultivated also in other areas of Verona. Just beyond the eastern borders of the Soave DOC we can find the vine growing also in the area of Vicenza (where it is the basis for the Gambellara DOC), of the Berici Hills until the Eugenean Hills in the Paduan area. It is cultivated in Sicily as well under the name "Grecanico". As we have seen, the Garganega represents an ancient and renowned vine, cultivated especially in the Veneto region and in particular in the districts of Verona and Vicenza, even if its origin is still unknown. Against this background, it was plausible to hypothesize that this vine could have generated offspring over the centuries or that it could have relationships with other vines, sharing with them the cultivation area.

From the comparison with the archival data of the molecular database of Conegliano, have emerged possible relationships of first-degree of kinship, examined in depth extending the molecular analysis to 36 loci SSR, approving this relationship for a large series of vines and some of them are important from the economic and/or historical point of view like the Trebbiano toscano also known as Ugni blanc wine, the Catarratto wine, the Frappato wine, the white Marzemina wine and the Grecanico wine.

These results outline the role played in Italy by the Garganega in the evolution of the national ampelographic platform.

The outcomes of the molecular analysis have been compared, as already mentioned above, with the molecular database of Conegliano. Regarding the pedigree relationships, the Garganega shows a first-degree relationship with different vines, first of all the well-known and widespread Trebbiano toscano (Ugni blanc); then the Albana, the Romagna, also mentioned in 1200 by Pier de' Crescenzi; the Empibotte, the white Malvasia of Candia with a soft taste, the white Marzemina, the Catarratto and finally the unacknowledged Greco del Pollino. Since the Garganega's parents are not known yet, it is difficult to hypothesize about its precise relationship with the highlighted vines. More over than the clones and the genetic variability of Garganega grapes, the grape growers have to choose a correct rootstock to grow its vines.

As is well known, the rootstock in the past was used to prevent the attack of phylloxera, while nowadays it is a mediator between soil and climate conditions and varietal characteristics. The most used rootstocks are Berlandieri x Riparia.

The grape grower have to find the right combination between clone and rootstock for his requirements.

In Soave, where the planted surface is about 7.000 hectares, most of all trained with the pergola system, we can estimate about 3.000 vines per hectares.

So the number of Garganega vines is about 21 millions with a renewal percentage of 3% per year.

This includes both the oldest vineyards that are non-productive than a small percentage of missing plants that have to be substituted. So we replant more or less 700.000 vines each year to maintain the effectiveness of the vineyards.

Of this, the 40% are of big dimension and that is to prevent the intraspecific competition for light and nutrients with the other vines.

The clone R4 and ISV 24 are the most request for their flexibility. Some agronomic practices such as the reduced pruning and the thinning, modulate the most productive clones to lower yields. Even the aromatic profiles depends on the rootstock. The most used rootstock in the Soave are is the SO4, that is suitable to flat land and hills vineyards.

Its great affinity with the Garganega is the best choice to renewal or replacements. The 420A was called the "cao moro" (the dark shoot) for its colour. It was the most used in the past but it is not good in case of renewal.

5. Plant species that are going to be planted in the area and their benefits

SPECIE VEGETALE	EFFETTO POSITIVO	RIFERIMENTO BIBLIOGRAFICO
Alaterno (<i>Rhamnus alaterno</i>)	Ospita varie psille e può quindi diventare un "serbatoio" di antocoridi	Favre d'Acier <i>et al.</i>
Alloro (<i>Laurus nobilis</i>)	Ospita la psilla <i>Tricca alacris</i> , nelle cui galle si rifugia in inverno l'antocoride <i>Anthocoris nemoralis</i>	Favre d'Acier <i>et al.</i>
Biancospino (<i>Crataegus monogyna</i>)	Costituisce un rifugio per le coccinelle in autunno	Nicoli <i>et al.</i> , 1995 IF7-8/95, pp 58-64
Carpino bianco (<i>Carpinus betulus</i>)	Ospita fitoseidi diversi che possono migrare sulla vite ove controllano acari tetranychidi	Duso <i>et al.</i> , 1993
Edera (<i>Edera helix</i>)	Ospita sirfidi, coccinellidi e imenotteri parassitoidi di litofagi dei fruttiferi	Favre d'Acier <i>et al.</i>
Gelso nero (<i>Morus nigra</i>)	Costituisce un rifugio per le coccinelle in autunno	Nicoli <i>et al.</i> , 1995
Ginestra dei carbonai (<i>Sarothamnus scoparius</i>)	Ospita varie psille e può quindi diventare un "serbatoio" di antocoridi	Favre d'Acier <i>et al.</i>
Nocciolo (<i>Corylus avellana</i>)	Ospita fitoseidi diversi, tra cui <i>Amblyseius aberrans</i> , che possono migrare sulla vite ove controllano acari tetranychidi	Duso <i>et al.</i> , 1993 Collier, 1956
Noce nazionale (<i>Juglans regia</i>)	Ospita fitoseidi diversi che possono migrare sulla vite ove controllano acari tetranychidi	Duso <i>et al.</i> , 1993
Ontano nero (<i>Alnus glutinosa</i>)	Ospita varie psille e può quindi diventare un "serbatoio" di antocoridi	Favre d'Acier <i>et al.</i>
Ortica (<i>Urtica dioica</i>)	Ospita il fitoseide <i>Typhlodromus pyri</i> , agente di controllo di acari tetranychidi su vite	Duso <i>et al.</i> , 1993
Prugnolo (<i>Prunus spinosa</i>)	Costituisce un rifugio per le coccinelle in autunno. Ospita l'imenottero <i>Anagrus atamus</i> , parassitoide delle cicaline della vite	Nicoli <i>et al.</i> , 1995 Favre d'Acier <i>et al.</i>
Rovo (<i>Rubus ulmifolius</i>)	Ospita fitoseidi diversi che possono migrare sulla vite ove controllano acari tetranychidi	Cerutti <i>et al.</i> , 1989 Duso <i>et al.</i> , 1993
Salici (<i>Salix spp.</i>)	Ospitano popolazioni di afidi molto precocemente in primavera sulle quali si sviluppano predatori che poi migrano sulle piante coltivate	Favre d'Acier <i>et al.</i>
Sambuco (<i>Sambucus nigra</i>)	Ospita l'afide <i>Aphis sambuci</i> , a carico del quale si sviluppano predatori e parassitoidi che poi migrano sulle colture	Favre d'Acier <i>et al.</i>
Siliquastro (<i>Cercis siliquastrum</i>)	Ospita la <i>Psilla pulcilla</i> e può quindi diventare un "serbatoio" di antocoridi	Favre d'Acier <i>et al.</i>
Querce (<i>Quercus spp.</i>)	Ospitano con vittime dei parassitoidi delle tignole dell'uva	Servadea, Zanigheri

Fonte: Alberto Aldini, Tiziano Quaini - Schede tecniche frutticoltura biologica, 2001

6. Flora in Soave area

The vegetation of a certain territory can be deeply affected by the different uses of the soil. The surfaces which are used for agricultural purposes show a reduced variety of flora compared to a natural environment. This is due to the fact that in those natural environments the anthropogenic impact is almost null or just restricted to short periods of time. Agriculture implicates significant variation in the physical and chemical characteristics. It affects the microbial life in the subsoil and the spread of plants.

In those kind of situations, the vegetable species which adapt themselves to the less stable conditions usually survive.

For this reason, many herbaceous species on the grassy surface under olives and vineyards have been disappeared, since they were typical elements of dry fields and pastures.

For example, many species which belong to the orchid family are disappeared because they need stable climatic conditions.

The increase of anthropogenic interventions fosters the less exacting and easily adaptable plants. This kind of flora is known as Synanthropes, since they're opportunist and linked to human activities. They favour modified environments and they're all joined through a very quick reproduction and adaptability. All those characteristics make them particularly competitive since they can colonize all those settings modified by human beings.

The plants which contribute to the vegetable composition of the cultivated lands (synanthropes) can be divided into two groups:

- Anthropiphyte, they're existence is strictly connected to the people. This group includes the species which are connected to herbaceous annual-cycle cultivations, but also to plants that favour fresh air lands with a high nitrate and ruins concentration.

- Epiphyte, they are indigenous plants that usually are on our natural vegetal formations. Those plants can spread out on the cultivated territories, even if there are other kinds of vegetable too.

To the East of Verona there are more than 300 hundred species which belong to different family, slightly less than half of them belong to the first group, instead the remainder belongs to the second one.

The Archaeophytes belong to the Anthropiphyte, long time ago they have been mainly brought in Europe by the Eastern territories together with the wheat cultivation.

The Corn-cockle (*Agrostemma githago*), the Wild Larkspur (*Consolida regalis*), the Adonis' Flower (*Adonis annua*), the Corn buttercup (*Ranunculus arvensis*), the Papaver (*Papaver rhoeas*), the Shepherd's-needle or "Venus' comb" (*Scandix pecten-veneris*), the Scarlet pimpernel (*Anagallis arvensis*, *A. foemina*), the Rough corn bedstraw (*Galium tricornutum*), the Field gromwell (*Bluglossoides arvensis*), the Annual sorceress (*Stachys annua*), the Chamomile (*Matricaria chamomilla*), the Canarygrass or the confused "Shortspike" (*Phalaris brachystachys*), the Wild oat (*Avena fatua*) and the Wild rice (*Lolium temulentum*) are just some of the examples.

Others Anthropiphytes such as the Neophytes, recently introduced from America with the corn cultivation, have been added: many Amaranths (*Amaranthus* spp.) and the Canadian horseweed (*Conyza Canadensis*).

The majority of the Archaeophytes quickly disappear after agriculture has been abandoned, but also after the natural vegetation won back the land.

On this kind of areas, farmers use chemical weeding with a selective action, which causes the complete disappearance of many plants that were typical elements of the hilly landscape (such as the Papaver, the Corn-cockle and the Cornflower).

Neophytes tend to disappear too, even if they still exist in other areas as wilder plants.

The second group, the Epiphyte one, includes more species than the first one. They are characterised by the surrounding greenery of cultivations, such as: Field horsetails, Knotweeds, the Arugula, Peas, the Comfrey, Spearmints, Speedwells, the Coltsfoot, Chamomiles, Switchgrasses, Gramas and the Arum. Those ones stay on the surface of the cultivated areas and they're usually more widespread than the natural environments. Their spread is promoted by a low competition with other plants, they have a variable diffusion according to the environmental conditions (soil, exposition, humidity, etc.) and to the kind of cultivation. The annual species predominate on the intensely cultivated territories, on the contrary the two-year and perennial ones predominate the softly cultivated ones.

The Dock (*Rumex crispus*), the Winter aconite (*Eranthis hyemalis*), the Ragged lady (*Nigella damascena*), the Lesser celandine (*Ranunculus ficaria*), the Whitetop (*Cardaria draba*), the Charlock Mustard (*Sinapis arvensis*), the Giant mustard and the Wild radish (*Rapistrum rugosum*, *Raphanus raphanistrum*), many

Legumes (especially those which belong to the *Vicia*, *Lathyrus*, *Trifolium* genre), the Sun spurge (*Euphorbia helioscopia*), the Mediterranean hartwort (*Tordylium apulum*), the Looking glass (*Legousia speculum – veneris*), the Field marigold (*Calendula arvensis*), the Creeping thistle (*Cirsium arvense*), the Oxtongues (*Picris* spp.), the Hawksbeard (*Crepis* spp.), the Chicory or “Blue daisy” (*Cichorium inthybus*) are some of the most striking species because of their blooming, height and wealth. There are also many Grasses which belong to the *Sorghum*, *Setaria*, *Digitaria*, *Phalaris*, *Alopecurus*, *Avena*, *Poa*, *Bromus*, *Lolium* genre.

In this area almost all the specialised cultivations of forage are disappeared.

Only some wild grassy rooms are still visible, but they're covered by more or less natural flora of little woods and cultivations.

They are often marginal surfaces with grassy scarp or dry and steep slopes.

The flora changes according to the environmental conditions, to the soil, humidity and dryness, so there could be remarkable differences.

Grasses belong to the most widespread species, which are green during the spring but they dry out during the autumn and the winter (giving a sense of dryness to the landscape). Those plants are botanically interesting, even if not very striking.

The Erect brome (*Bromus erectus*) and the Tor-grass (*Brachypodium pinnatum*) rule the vegetation of the uncultivated arid areas. The first one characterised almost stable consortiums (bromide) and it's connected to other Grasses, since they are both good for dry lands. Contrary, the second one is very widespread on uncultivated lands or area which have been abandoned several years before, they are a kind of first dynamic stage of more complex and advanced plants.

7. Fauna in Soave area

Botanists and zoologists have usually ignored the stud of farming areas, since they believed those territories didn't provide an interesting flora and fauna, which seemed to be almost absent. For this reason, the information about the fauna of a mainly agriculture area like the one of Soave comes from surveys about vaster areas (like the Province of Verona or the Region of Veneto), do they're not focused studies.

It's possible to give some preliminary data about both integrated production and organic management thanks to different surveys about the fauna, which have been recently conducted in some agricultural companies in the area of Soave. Mr. Roberto Zorzin and Mr. Leonardo Latella of the Civic Museum of Natural History in Verona discovered a reassuring information about the fauna of the analysed territories. The sampled soils show a good or at least a decent environmental quality. In 2014, other surveys which have been done by the WBA onlus compared different methods to evaluate the biological quality of soils. This diversity has been analysed through different techniques and it has been expressed in a concise and numerical way with calculations and formulas. The first approach is based on the number of species. The Ground beetles and the Rove ones have been used as steering groups. The IBS-bf index of the WBA onlus, the classic H index of Shannon-Weaver and the QBSar index of the University of Parma are being elaborated because of the diversity numerically measured. The values obtained in the companies of the area of Soave seem particularly high according to the Shannon-Weaver index, which has been analysed with both falling traps and soil sampling. So those companies have the highest diversity among the analysed ones. The biodiversity is qualified also through environmentally rare and exacting species (bioindicators). In this case it has been pleasantly surprising to identify a very little bug never found before in Italy. It's the Rove beetle *Aleochara bellonata* Krása, known only in some towns of Europe and North-Africa so its biological knowledge was very limited. Its larva is probably a parasite of flies' pupas. This species has been found in an integrated production of a hilly company next to a wood, which now is a “biodiversity reserve”.

It's a bit premature trying to evaluate the results of a preliminary part of this research, even if they're possibly connected to the structure of the landscape and to the examined sites. In fact, those companies are a sort of patchworks, because of hedges on the plain and woods on the hills.

Those elements are connected the landscape diversity and they're able to considerably increase the species of flora in the vineyards. Most vertebrates who live in the area of Soave, they live also on the foothill hills of Verona and cannot be considered as exclusive of that area. Anyway, according to the Habitat Directive 92/43/CEE some elements are very important since they're part of the Community Interest species. The European Union asks for a paying a particular attention on the preservation of those species, because of their rarity, precariousness and peculiarity. Some of the most important amphibious that live in the area of Soave are: the Fire salamander (*Salamandra salamandra*), the Smooth newt (*Triturus vulgaris*), the Yellow-bellied toad (*Bombina variegata*), the Toad (*Bufo bufo*), the Balearic toad (*Bufo viridis*), the

Italian tree frog (*Hyla intermedia*) the Edible frog (*Rana esculenta*), the European frog (*Rana temporaria*). Reptiles are represented by different species, such as: the Western green lizard (*Lacerta bilineata*), the European wall lizard (*Podarcis muralis*), the Slowworm (*Anguis fragilis*), the Green whip snake (*Hierophis viridiflavus*), the Aesculapian snake (*Zamenis longissimus*), the Grass snake (*Natrix natrix*) and the Asp viper (*Vipera aspis*). The Avifauna of the area is abundant and diversified, it includes some of the rarest provincial species environmentally and zoogeographically interesting. In the adjoining cultivated territories with coppicing woods, the Eurasian wryneck (*Jynx torquilla*), the Hoopoe (*Upupa epops*), the Great spotted woodpecker (*Dendrocopos major*), the European green woodpecker (*Picus viridis*), the Long-tailed tit (*Aegithalos caudatus*), the Coal tit (*Periparus ater*), the Eurasian blue tit (*Cyanistes caeruleus*), the Great tit (*Parus major*), the Oriole (*Oriolus oriolus*), the Red-backed shrike (*Lanius collurio*), the Eurasian jay (*Garrulus glandarius*), the Cuckoo (*Cuculus canorus*), the Chaffinch (*Fringilla coelebs*) and the Cirl bunting (*Emberiza cirlus*) are some of the most common species. Fresher air cultivated areas with grasslands, hedges and dry stones are occupied by the Eurasian skylark (*Alauda arvensis*), the Nightingale (*Luscinia megarhynchos*), the Tawny pipit (*Anthus campestris*), the Redstart (*Phoenicurus phoenicurus*), the Barred warbler (*Sylvia nisoria*), the Whitethroat (*Sylvia communis*), the Chiffchaff (*Phylloscopus collybita*), the Spotted flycatcher (*Muscicapa striata*), the European goldfinch (*Carduelis carduelis*), the Linnet (*Carduelis cannabina*), the European greenfinch (*Carduelis chloris*), the Eurasian wren (*Troglodytes troglodytes*), the Ortolan (*Emberiza hortulana*), the Corn bunting (*Emberiza calandra*), the African stonechat (*Saxicola torquata*) and the Northern wheatear (*Oenanthe oenanthe*). The Eurasian scops owl (*Otus scops*), the Little owl (*Athene Noctua*), the Tawny owl (*Strix aluco*) and the Long-eared owl (*Asio otus*) are some of the most important birds of prey.

Many mammals are present too. The European hedgehog (*Erinaceus europaeus*), the European mole (*Talpa europaea*), the Shrew (*Sorex araneus*), the Etruscan shrew (*Suncus etruscus*), the Striped field mouse (*Apodemus agrarius*), the European hare (*Lepus europaeus*), the Hazel dormouse (*Muscardinus avellanarius*), the Squirrel (*Sciurus vulgaris*), the Dormouse (*Glis glis*), the Fox (*Vulpes vulpes*), the Badger (*Meles meles*), the Marten (*Martes foina*), the Least weasel (*Mustela nivalis*), the Wild boar (*Sus scrofa*) are some of the most interesting species. It's possible to suppose that the Greater horseshoe bat (*Rhinolophus ferrumequinum*), the Lesser horseshoe bat (*Rhinolophus hipposideros*), the Bent-wing bat (*Miniopterus schreibersii*), the Kuhl's pipistrelle (*Pipistrellus kuhlii*), the Pipistrelle (*Pipistrellus pipistrellus*) and the Brown long-eared bat (*Plecotus auritus*) are present on this surface too.

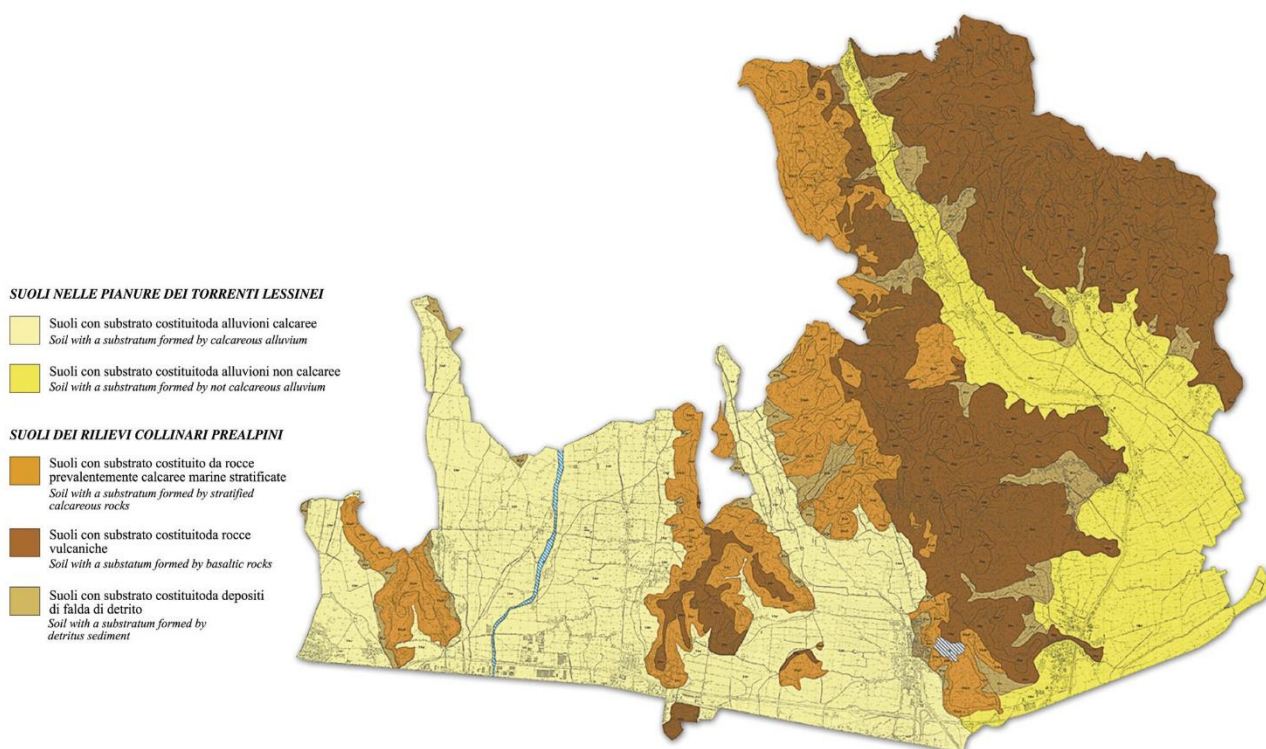
All those species represent a guarantee for the area of Soave and for its entirety. Some of these elements are actual biological and environmental quality indicators, so they have to be safeguarded to maintain biodiversity in cultivated areas too. Only a more accurate management to the biogeochemical balance will allow people to reach that goal. Olives, dry fields, hedges, woods and wild territories.

8. Summary of the hydraulic-agrarian arrangements

a. SPREAD	b. LOCALIZED
Ducts and rural arrangements with a "spread" feature in the whole territory	Hydraulic-agrarian arrangements which a conformation that responds to morphological features that are specific for each plot.
<p>a.1 Retaining walls for viability Their role is to contain the embankment with the vineyards to prevent landslips and blockage of the roads or to support the road metalling to avoid structural subsidences.</p>	<p>b.1 terraces "a filo" They are a series of walls that shape the hillside in cultivable embankments more or less regular. This containment facilities are generically realized by layered and overlapped stones to guarantee the perfect drainage of exceeded seepage.</p>
<p>a.2 Main ditches Main ditches are a specific type of culvert, that have a role of manifold of the waters drained from the splinter shaft, from the embankments, to convoy them in the lower hillside to the main channels</p>	<p>b.2 dry-stone walls and steep. The steeps fits on a case-by-case basis to the slopes, as that in the same contour level it may be differences in the height. They are supported downstream by edges or dry-stone walls.</p>
	<p>b.3 Edges The edges have a no regular shape, with a slight gradient (2-3%) The slopes created during the creation of the cultivation plan, is permanently covered by grass and has an inclination less pronounced than the embankments with retaining walls. The edges are most used were there's a lack of rocks and the grassing is quick. It is the most important embankment type.</p>
	<p>b.3 vertical division walls They are complementary arrangements, in this case located aside the ditches. In those cases they have only a function of delimiting proprieties. The structure is similar, but simpler, to dry-stone walls.</p>



9. Soil map



10. The advanced defense model

The advanced Soave defense model that is reported in this chapter presents the guidelines that the Consorzio di Tutela and the production chain activate with the aim of optimizing the technical results, the environmental attention and the protection of the operator on the whole area from the sustainability point of view. The Soave's vineyard management model systematizes all the acquired experiences of the territory in over 20 years of activity on the production side integrated into the vineyard and on the defense techniques adopted and certified EN UNI ISO 14000 in 2006.

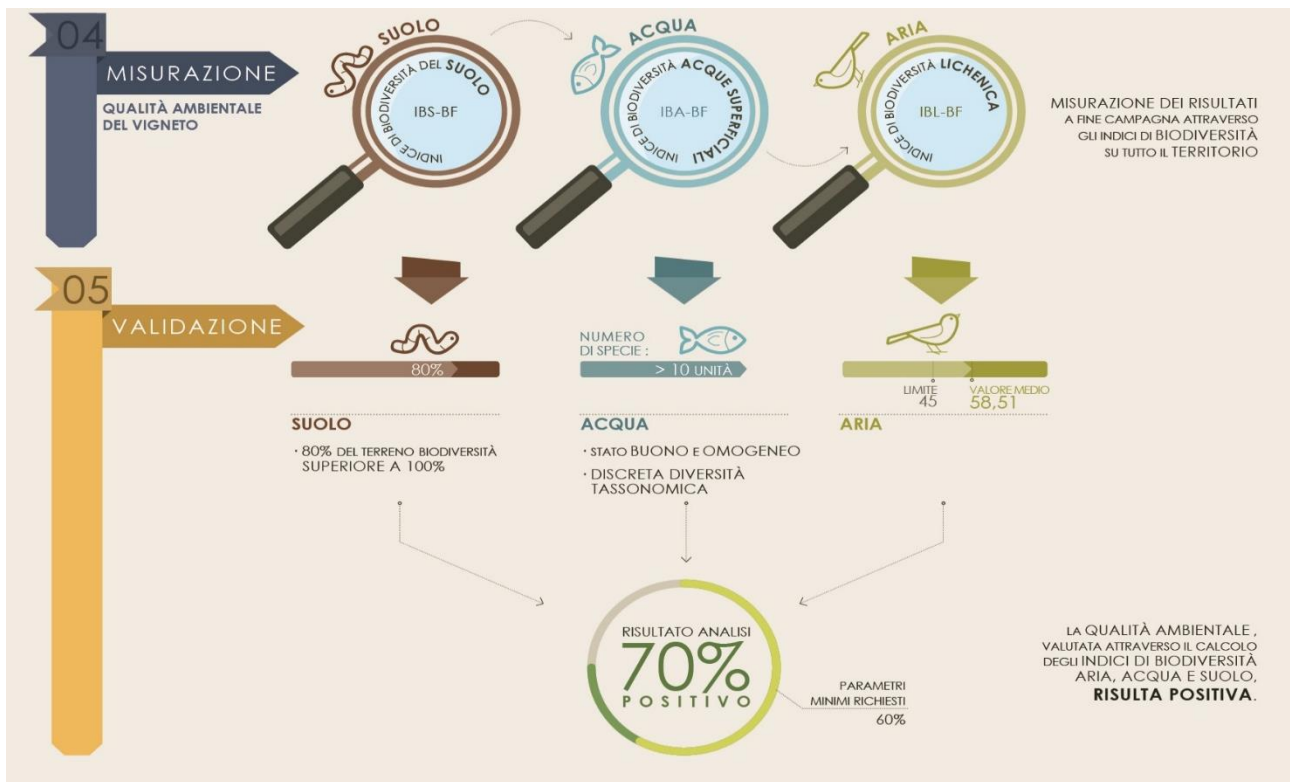
The aim of the activity is to minimize the impact of the use of products for the protection of the plant on humans and environment.

This can be achieved by involving at the highest level all the supply chains connected to the integrated production in the vineyard, therefore producers, technicians, institutions, retailers, and companies producing sanitary appliances and operating machines. The reference documents are the integrated production regulations and the integrated defense technical lines that the Regional Phytosanitary Service prepares every year. These documents are analyzed by the **group working for an advanced defense** with the issuance of a more restrictive **guidance document** regarding the principles and the intervention timelines to which reference is made for the operating addresses of the current year.

This model was created by the need to guide, guarantee and monitor a process of change in the practices of utilization of the plant protection product towards other forms characterized by greater compatibility and environmental sustainability in the vineyard. This model represents the goal that for years the entire production chain has been set by the whole production chain, including companies that produce plant protection products and local retailers who have shared and contributed to the realization of this document.

Knowledge, competence, and sharing are strengths of this operational model. An advanced integrated defense model for the adoption of a virtuous attitude in the plant production products and agronomic field that responds fully and in a more restrictive form to the current European and national legislation. It is part of a collective strategy to implement policies and actions aimed at reducing risks and impacts on the human health, on the environment and on the biodiversity derived from the use of plant protection products. Within the framework of a voluntary integrated defense, the agronomic approach aimed at improving the overall microclimatic conditions of the leaves is also essential, in order to increase the performances of the plant protection products used to protect the vine.





The Soave's advanced wine management model refers to the "Integrated regional defense technical guidelines", borrowing the objectives and it is aimed at encouraging the adaption of adequate monitoring methods and tools, which allow an adequate assessment of the phytosanitary situation of the crops; - promote the use of auxiliary organisms; - promote the application of biological, biotechnological, physical and agronomic methods in the phytosanitary defense as an alternative to the chemical fight; - limit the exposure of the operators to risks deriving from the use of crop protection products (personal protective equipment - PPE - limitation of products with unfavorable toxicological classification, etc.); - rationalize the distribution of plant protection products by limiting the distributed quantity, the waste and losses by defining the reference water volumes and the methods for the functional control and the correct regulation of the equipment. There are 15 agro-meteorological stations for the collection of weather data, installed in points that represent the climatic reality of the Soave area.

The sensors, 4 times per minute, detect:

1. Air temperature (°C)
2. Average relative humidity (%)
3. Precipitation (mm)
4. Leaf wetness time (minutes)

The data are processed and verified by the specialized Operations Center and updated on the websites of our companies. The decisions of the operative group regarding the interventions in the vineyard are communicated via text message to all the operators of the territory and entered in the voicemail at 11 am every day (except Sunday).

On this occasion, the agro-meteorological bulletin is drawn up, on which are specified the recommended treatments, the period of execution, the areas and vines involved, the products (low-impact active ingredients) for the main diseases. Special method to be adopted for exceptional situations such as hail, prolonged rainfall, the presence of particular insects, intense manifestations of flavescence dorée and black wood are also defined.

Upon request of the producer, the technicians of the Consortium and of the wine cooperatives can visit the farm to analyze particular situations from the agronomic point of view. These visits consider a verification of the company's environmental management ability and are carried out through the collection of leaves, products and soils samples in order to identify:

- Residues of plant protection products (in the grapes);
- Deficiencies or imbalances of elements (in the soil and leaves)

The samples are then analyzed in specialized laboratories and selected by the Consortium; the results, therefore, allow the technicians to provide targeted indications on the fertilization to be carried out and/or to highlight any trends in the pollutants attributable to the training, the assistance and the sensitization activities carried out by the technicians themselves.

All the visits are documented.

11. Biodiversity Friends protocol

The evaluation of the environmental quality in the agro-system occurs by measuring the presence of peculiar organisms, known as bioindicators. Those ones have a high pollution perception, a low mobility and capability of collecting of polluting substances in their tissues. Thanks to those characteristics, they're particularly good on being used in the evaluation of the soil, air and water quality. This can be done through the calculation of the "Biodiversity indexes", which have been developed by naturalists of WBA onlus.

Concerning the soil, the procedural guide foresees analysis of soil sample where it's possible to detect the presence of invertebrates, especially of annelids, springtails, acarids, isopods, centipedes, millipedes, beetles and others. This allows the resolution of the Soil Biodiversity Index (IBS-bf), obtained by attributing to each group a score according to their role in the flora environment.

The evaluation of the air quality is done through the Lichen Biodiversity Index (IBL-bf). Lichens are a kind of organisms developed thanks to the symbiosis between a algae and a fungus. They deeply perceive environmental pollution, which is determined by peculiar gasses and they're considerate as excellent bioindicators. They're often used in biomonitoring of the air quality, both in rural and urban settings. In fact, lichens deeply perceive not only urban pollution, but also the exaggerated use of agricultural pesticides. The calculation of Lichens' Biodiversity Index is based on the presence and the attendance of lichens that can be measured on the country trees cortex.

The quality of surface water is estimated by analysing the composition of aquatic invertebrates' community. The calculation of the Water Biodiversity Index of the "Biodiversity Friend" (IBA-bf) is based on the presence on the surface water of aquatic macroinvertebrates with a different endurance to pollution. For example annelids, caddisflies, beetles, stoneflies, mayflies, molluscs and crustaceans. Each group is evaluated through a specific score based on how it perceives pollution.

The realize surveys during 2014-2015-2016 in the area of the Soave Wine Consortium allowed people to gather a series of useful information and to define the average conservation status of the vineyard agrosystem in that area. The environmental quality which has been estimated through air, water and soil biodiversity indexes seems to be satisfying, even if with some levels of criticality. Up until now, almost two thousand species have been catalogued, even if the naturalists believe that the real amount of species is at least ten thousand. Most of them is grouped in the tropical rainforests.

Nowadays we only know one fifth of the animal and vegetable species which exist on our Planet. Every year, zoologists and botanists find out 17,000 new species, but meanwhile other tens of thousands species get extinguished.

This is due to the annual destruction of almost 100,000kmq of the tropical rainforests, which implies one of the major contemporary environmental diseases: the loss of biodiversity.

THE SOIL

The method of the "Biodiversity friend" protocol for the soil establish a series of analysis of some soil samples in which it is detected the presence of many endogenous species for the determination of the "Soil Biodiversity Index" (IBS-bf); the presence of each group is reported with the related score in a specific evaluation form.

The first survey made in 2015/2016, mainly involved 15 sites of which 12 has recorded a IBS-bf over 100 (that means a good biodiversity level) and one of them had a score of 180 that is an exceptional level. The samples evidences a steady and abundant presence of molluscs, gastropod, pulmonatas, spiders, acarus, ants, beetles (mainly carabidae and rove beetles), and these last with a very numerous and diversified number of species. Diplopods and Chilopodes are frequent and abundant in almost all the 15 sites, and

the Collembola were in 10 sites on 15, in a small number and the group less specialized, the one with the jumping organ.

Of some interest is the presence of Diplura and Chilopodes Geophilomorpha. They are specialized in underground life, being blind and without a pigment pattern, that means good indicators of soil quality. In the 3 sites on 15 that were detected with an IBS-bf lower than 100, the experts said that there weren't a problem of a general degradation of the sector, but probably a soil management of the single farm not lead correctly (compacting of the soils, chemical weeding etc.)

It has to be noted a data of high fauna interest, which is the discovery in one farmland, some examples of Coletinia Thysanura, a blind and not pigmented insect, very rare in Italy and that usually live inside some caves. The material was send for a deeper and definitive classification to the Cordova University.

To improve the soil biodiversity it is suggested to restore an adequate green belt with indigenous species, even in marginal areas.

THE WATER

The method of the "Biodiversity friend" protocol for the water (IBA-bf) includes not only the detection of the fauna components but also some chemical parameters of the water itself such as temperature, PH, electrical conductivity and dissolved oxygen. Then they analyses the width, the fluvial morphology, the water regime, the vegetation along the banks. Every single species has its own peculiar pollution tolerance, so the presence of two species of bioindicators very sensitive to pollution mean that there's a good water quality.

The survey was done in 3 sites in the classic area, and the result was generally good and substantially homogenous. Every single station revealed the presence of a water community with a discrete taxonomic variability, some of them belongs to the macroinvertebrate fauna with a low tolerance to pollution (mayflies and trichoptera), and this demonstrates how the impact of the agricultural activities do not affect these areas.

LICHENS AND THE AIR

The lichens biodiversity is an excellent bioindicator of the presence of air pollution. To verify the average atmosphere ratio, it was made a survey on the lichens biodiversity based on 10 sites. The index is the IBL and it is used to detect the presence of phytotoxic gases.

During the survey they detected 22 different lichen species, and the average nuber of species in each site is 8.88 that is a good number for IBL. It means that the 90% of the entire investigated surface has an IBL above the limit defined by the protocol and only the 10% is under this limit.

12. Videos (attached to the document)

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