



GAROFOLI

CASA FONDATA NEL 1901

INTEGRATED PEST
MANAGEMENT

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Foreword

We have the good fortune to live and cultivate our grapevines in the Marche Region of Italy, a territory that is particularly well suited to wine making, where the green hills roll into the blue of the Adriatic Sea.

It is here, between the upper Misa valley and the upper Esino valley, where **our family has been producing wine for five generations. Our wines are authentic, representative of the land** from which they come.

Our ancestors worked the land with care and respect, and they passed that down to us. It is thanks to them if after having inspected the long rows of vines we are able to sit in the shade on a sunny day and gaze out over these beautiful green hills.

Over the course of more than a century of history, we have always known how to work with great respect for the environment and our workers.

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For us, taking care of the land to preserve and sustain it is the only approach possible to our work.

In 2012, Italy issued legislation regarding Integrated Production. The commitment we have always had regarding environmental protection and sustainability was further reinforced by this. It was the ideal occasion to certify what we had always demonstrated: **our love for the land.**

We were among the first Italian companies to voluntarily adopt the precepts of the Procedural Guidelines for Integrated Production in the Marche Region. This protocol for agricultural cultivation is more restrictive than the national laws, and establishes precise criteria for agricultural procedures in respect of the grapevines, the environment, man and the consumer.



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The procedural guidelines in fact limit the use of PPP (Plant Protection Products) and forbid the use of chemical substances considered harmful for the health of grape growers, of those who live in the area, and of consumers.

The choice to adhere to the Procedural Guidelines was made to protect our wine making production from attacks of parasites on the one hand and at the same time safeguard the environment, remaining faithful to what has always been our philosophy: continuous updating of production methods with respect for tradition, the environment and the life of our workers.

Our agronomists work every day to enhance the special characteristics of the land in each of the estates, safeguarding the fertility of the soil and the ecosystem by:

- Selecting the certified shoots of the vines
- Fertilizing the land with organic substances
- Using the natural technique of “sexual confusion” as a method for controlling harmful parasites
- Using traps for monitoring
- Pruning the plants to strengthen them
- Maintaining hedges and stone walls that host various species useful to the ecosystem

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In recognition of our commitment to environmental sustainability, **our wines have obtained the SQNPI (National Quality System for Integrated Production) quality certification assigned by RINA AGROQ** (a quality control agency accredited by the Ministry of Agriculture for certification of vineyards) that **guarantees our consumers that the entire production cycle respects what has been established by the Procedural Guidelines for Integrated Production in the Marche Region.**



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The certified wine is therefore just the final result in a process made up of inspections along the entire production cycle, starting in the fields and ending up with bottling.

The checking is performed by us and by inspectors, guaranteeing furthermore that every single bottle is perfectly traceable and that the wine comes exclusively from certified grapes.

We aim to have our wines represent the perfect union of the grape variety's characteristics and respect for the environment and for those who live and work in it.

By taking care of our land today, we will be able to turn over to future generations a protected territory that is clean and rich in biodiversity, just like our parents did before us.

Integrated Pest Management: a General Overview

In recent years, the European Union has undertaken a process for reviewing the world of PPP (Plant Protection Products), guaranteeing a higher level of safety for agricultural endeavors in all Member States.

The goals of the regulations are essentially two: **protecting human health and safeguarding the environment.**

The EU guidelines sought to institute a common framework of action for all Member States with the goal of sustainable use of pesticides. It is the first European directive regarding this type of product that goes beyond criteria for authorization and aspects linked to residual amounts in foodstuffs.

In Italy the European legislation was adopted by issuing law D.L-gs n.150/2012, and instituting a **National Plan of Action (PAN) that establishes the goals, measures, timeline and indicators for the**

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reduction of risk and environmental impact deriving from the use of PPP products.

Each Region and Autonomous Province drafted its own Guidelines for Integrated Production (DPI), that is, a document based on respecting the criteria and regulations regarding both agronomic techniques and defense techniques.



What advantages are offered?

Integrated pest management is a strategy that allows for limiting damage coming from plant parasites using methods and techniques that respect the environment, limiting the negative effects both on the health of agricultural workers as well as all those who for any reason may accidentally come into contact with them.

Among the principal advantages of integrated production:

- greater environmental sustainability
- long-term effectiveness
- does not lead to resistance
- optimizes use of resources and technical means to guarantee effective amounts of production
- allows for producing crops that are safe and good for human health
- reduces health risks of all those responsible for use of PPP



Scheduled chemical defense aims at eliminating the harmful agent; integrated pest management proposes **reaching a long-term equilibrium through progressive reduction of intervention that has the goal of bringing farming back to a state of equilibrium.**

Moreover, an exclusively chemical defense requires constant work with more and more frequent intervention in order for it to be effective, thus increasing the risk that target pests are no longer sensitive to the products used.

Among the principal advantages of integrated pest management instead is that in addition to environmental sustainability for production, we also find that the resistance of the problem-causing agents is eliminated and thus **effectiveness is maintained in the long run**, benefiting future generations.

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One of the fundamental criteria on which integrated defense management is based is that **we are able to decide in a more precise way when and how to intervene, on the basis of constant monitoring of the crops' state of health.**

With respect to other farming methods, in fact, **integrated pest management uses intervention methods that eliminate undesirable effects on ecosystems that are not the object of the intervention.**

Thus the species that are the natural antagonists of the harmful species are preserved, like for example ladybugs, as well as pollinators such as bees, and the fauna of the land and the water table.

Main Agronomic Practices for Prevention

Preventive measures are at the basis of our integrated pest management strategy. Thanks to maintenance and reinforcement of natural equilibriums, in fact, there is an early advantage by intervening on conditions that favor the development and spread of pests that are harmful to the grapevines.

Our agronomists use various measures for prevention that may also be utilized to remedy the situation where necessary, like for example:



INTERCROPPING

Increasing biodiversity enhances equilibrium. Specific combinations of various bushes in the same parcel of land may create an unfavorable environment for development of plant parasites.

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DRAINAGE

With a proper water regime it is possible to prevent some plant diseases, especially in a moment like the present one in which there are enormous climate changes and when distribution of water is not always optimal. Excessive irrigation creates an increase in humidity that fosters the development of root rot and disease on the aerial part of the plant. Moreover, soil that is asphyxiated with a lot of water and little air impedes the correct absorption of nutrients on the part of the plant.



PRUNING

If adequate, it allows for better action on the part of the sun and the antagonists that inhibit development of pathogens. Moreover, the action of rejuvenating the plants also has a positive effect on their health and consequently on their ability to respond and resist attacks from parasites.



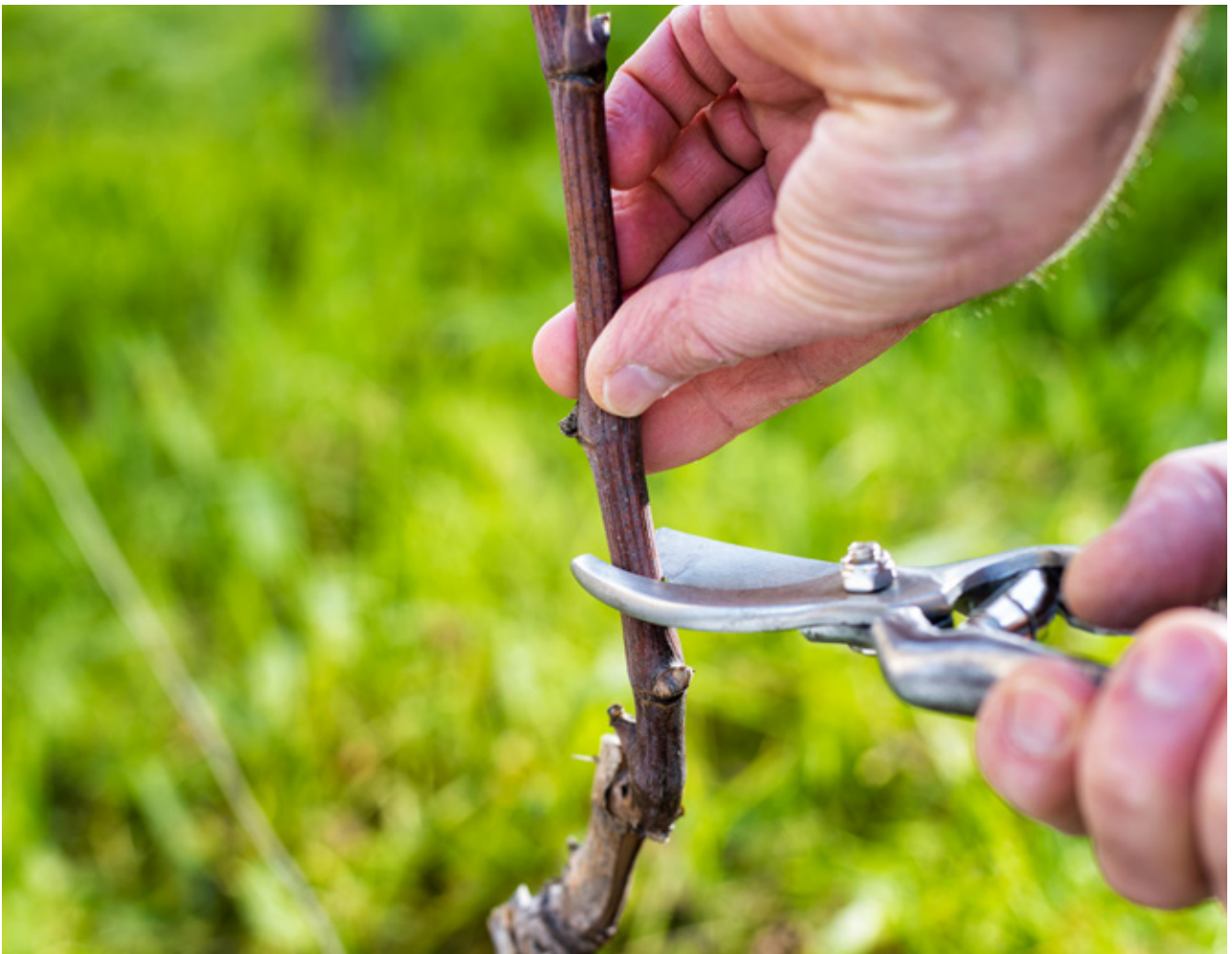
HYGIENE

Disinfecting tools and machinery used in the fields reduces the appearance of parasites. The use of disinfecting pastes applied to the pruning cuts is one such example, and ends up much more effective than any type of chemical treatment against the cancers of fruit trees.



LAYOUT OF BORDERS AND HEDGES

Borders and hedges play an important role in managing the spread of harmful organisms and/or limiting the damage that they provoke. In fact, they contribute to maintaining the crops in a good state of thriving production and guarantee the equilibrium of the farming ecosystem.



Monitoring Harmful Organisms

As we have seen, a key point in integrated pest management is that the crops must be checked often and performance of potential intervention must take place only after having ascertained the effective presence and extent of the damage-causing pest.

Thus the concept of pre-established, calendar-driven pest management determined ahead of time to defend crops, as happens with other farming methods, is overturned.

Correctly performing the sample-taking is surely the most important and delicate aspect of integrated pest management.

There are essentially two main types of sample-taking:

- **visual**
- **with traps**

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The most commonly used traps are those with sexual pheromones that are specific to the species to be monitored.

In the case of the European grapevine moth, for example, the strategy of 'sexual confusion' is used: that is to say, the moment of the first mating is disturbed, impeding it or reducing it significantly.

The use of diffusers for the pheromones that are the same ones that are naturally emitted by the female insect in the mating period confuses the male, which then usually is not able to mate any more.



Biological Control

Among the various precautions that we use in integrated pest management are biological controls that often represent a good solution.

In this case, **the goal is that of promoting the development of useful organisms naturally present in the crops or of using biological antagonists introduced by man.**

Among the most important biological means are:

- **insect antagonists:** this means above all other insects that directly eat or parasitize insects that attack the plants. Among the most important, for example, are ladybugs.
- **entomopathogenic fungus antagonists:** among these there are mostly other fungi

Agronomic and Physical Control

In addition to strategies of prevention and methods of biological control, there are various non-chemical alternatives that it is possible to use to counter possible adversities. There are several agronomic, physical and mechanical means, of which a few serve as example:

- **elimination and destruction of residual grass from farming:** this helps reduce the populations of parasites on plants
- **proper surface management of the soil:** allows for bringing to the surface insects and spores of microorganisms, exposing them to attack from their enemies and the sun
- **use of heat:** among the physical and mechanical means used, a technique known as soil solarization is used. In this case, a strong increase in the temperature of the surface layers of the soil is applied, for example due to using a thin plastic covering, thus rendering inactive the seeds of weeds, insects in dormancy, nematodes and spores of entomopathogenic fungi.

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Chemical Control

Only and exclusively when the measures for prevention adopted do not prove to be sufficient for controlling the spread of a pest that risks compromising the successful outcome of the cultivation **is it possible to rely upon the use of chemical means.**

In this case, the choice of the active substance to be used falls to one of those that:

- is as selective as possible toward organisms to be treated and **not all those in a wide range**
- **has minimal effects on human health and on the natural environment**

The general principle applied is that, agronomic efficiency being equal, **the plant protection product that has the least impact on human health and the natural environment is used.**

SQNPI Certification: National Quality System for Integrated Production

Considering the approach to viticulture and business management, we decided to adopt the national brand developed by the Ministry of Agricultural and Forest Policy, **SQNPI** (National Quality System for Integrated Production) **to better enhance the company's voluntary commitment to adopt systems for integrated production according to robust regulations for production which are reviewed and developed annually by the Regions of Italy.**

The SQNPI certification therefore endorses the company's adoption of the Region's Integrated Production Procedural Guidelines as well as the implementation of the PAN (National Action Plan), in addition to a rigorous system of traceability.



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System of Control

A dual level of control is planned with the goal of demonstrating application of the Regional Integrated Production Procedural Guidelines in the various phases of production (agricultural, transformation to product, packaging).

Thus the system of control is organized in two steps:

- **company self-regulation:** provides for checking the requirements for conformity on the part of operators inserted in the SQNPI for the activities performed at its own production sites (for example, keeping the agricultural register, purchase and use of plant protection products, results of soil analysis, outcome for calibration of spraying machines, etc.)
- **control performed by expressly authorized organs of the MIPAAF Ministry for Agricultural and Forest Policy:** for viticulture, there is an annual check during the period of cultivation and transformation or processing. The check may take place on raw materials (grape clusters and leaves) or on the product, requiring among other things, proof of traceability of the grapes used for the production of the wine.

Conclusion

The choice to adopt integrated pest management techniques was made with a view to protecting our vineyards from damaging parasites, using natural methods that allow for triggering **positive effects on the natural environment, on human health and above all on the quality of the wines bottled.**

An understanding of the characteristics and specific qualities of the soils in each estate that is home to our vineyards, as well as the continuous monitoring of the crops, allows us **to improve the areas of cultivation and to intervene only if necessary and in a focused way.**

In this way, we promote safeguarding the main organisms useful for natural containment of adversity, with respect for the farming ecosystem, and with positive repercussions on the **quality of the grape clusters.**



Obtaining the SQNPI quality certification for our wines is therefore just the final result in a process made up of careful attention and attentive checking performed all along the entire production cycle.

As the old saying goes, and we could not agree more:

“The land was not inherited from our fathers; it was loaned to us by our children”.

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