MANS

Metodo Agricolo Naturale Sostenibile

Sustainable Natural Farming Method

First part

PIAN DEL PINO

Bio Wine Artisans

SUSTAINABLE NATURAL AGRICULTURAL METHOD. Part I

The search for the Method.

In agriculture, as in any discipline, **following a method is essential** to obtain the best results. This is even more true in viticulture, where it is essential to develop one of the most important skills: **the ability to adapt**.
But the central question is: **what is the best method?**

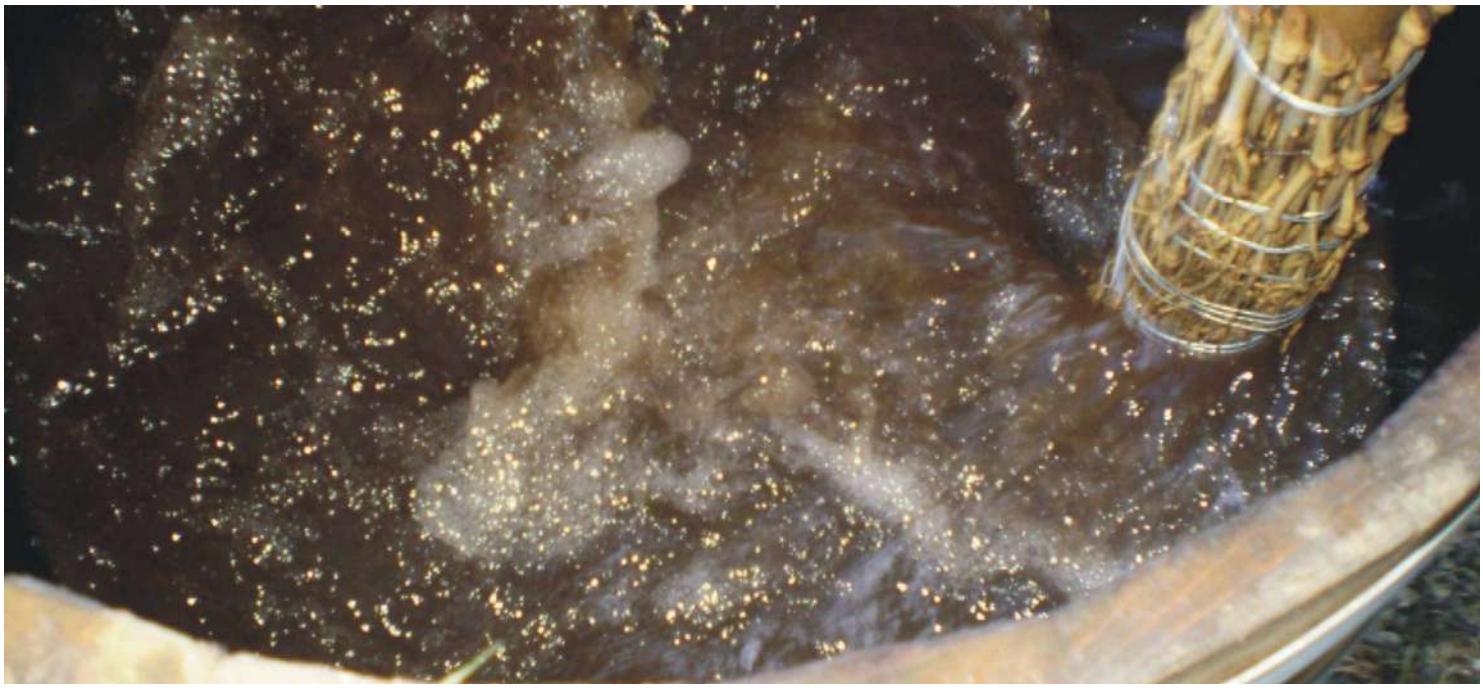
MY QUEST FOR NATURA FARMING.

For years, I have pondered this question. My goal was clear: to cultivate This quest led me to explore different forms of unconventional agriculture.

ENCOUNTERS THAT SHAPED MY VISION.

My first great love was undoubtedly the **biodynamic method**, which I applied for over ten years. The results were very interesting, but over time I realised that to improve further I had to open myself up to other perspectives.

The discovery of **Mokichi Okada's method** and, later, **Masanobu Fukuoka's natural farming** was fundamental. The principles of these techniques were not only agricultural, but also a philosophy of life. They maximised **biodiversity and resilience,** values that I felt deeply akin to my own approach. Later, I approached **permaculture,** which opened up new possibilities. This discipline then led me to discover **syntropic agriculture,** based on the imitation of natural ecological processes, such as **ecological succession** and **cooperation between species.**



THE CHALLENGE: TO APPLY THESE PRINCIPLES TO VITICULTURE.

The real crux of the matter was this:

How to translate the principles of these unconventional forms of agriculture into the world of viticulture?

And, more generally, what aspects of these disciplines could help me achieve my goal?

My aim was clear: to grow my plants as naturally as possible, taking a holistic approach. This meant managing soil, plants, animals and climate in an integrated way.

THE CHARACTERISTICS OF AN EFFECTIVE METHOD.

To be effective, an agricultural method must fulfil certain basic conditions:

1. **Definition and constancy**, 'Success is the sum of small efforts, repeated day after day.'
- **Robert Collier**
2. Order and structure, 'To reach the dawn there is no other way but the night.'
- **Kahlil Gibran**
3. **Adaptation to local reality,** 'Do what you can, with what you have, where you are.'
- **Theodore Roosevelt**
4. **Creativity and respect for traditions,** 'Creativity is intelligence having fun.'
- **Albert Einstein;**

'Creativity requires the courage to let go of certainties.'

- Erich Fromm

MY THOUGHTS ON NATURAL FARMING.

While I wanted to take as natural an approach as possible, I also knew that there **can be no such thing as strictly natural farming**. So I asked myself: **what should a perfectly natural agriculture look like?**

this gave rise to my idea: to define the **basic principles** of a sustainable and natural farming method and to understand how close a farming method comes to these basic principles.

We will explore these basic points of my approach in the nexT articles.

SUSTAINABLE NATURAL AGRICULTURAL METHOD. Part 2

How should Cultivation According to Nature be?

IIn Albert Howard's book 'An Agricultural Testament' (1943) there is a nice definition of a natural method of cultivation. Here is what Howard writes:
'What are the fundamental principles underlying Nature's agriculture? These can most easily be seen in operation in our woods and forests."

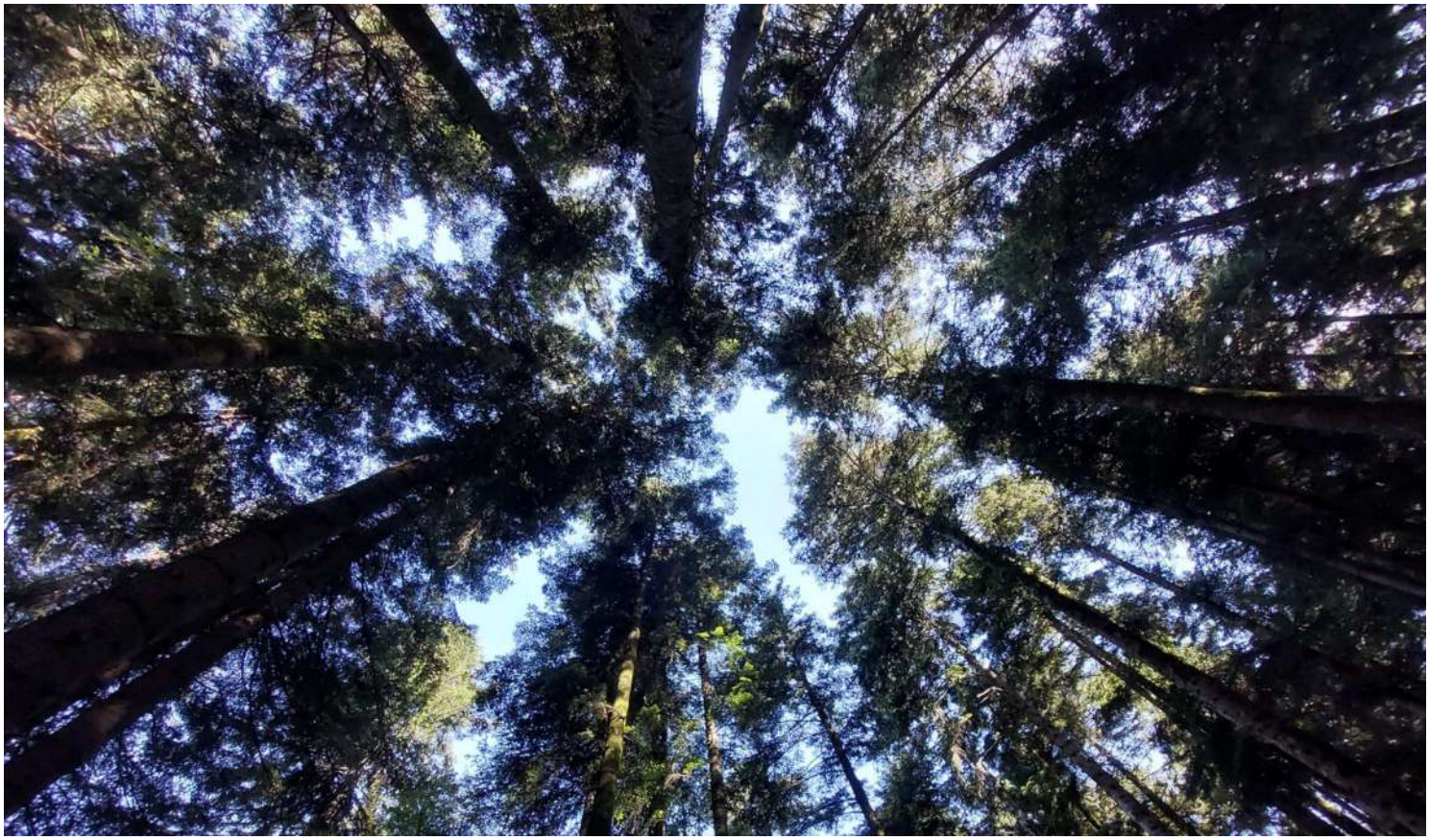
Mixed farming is the rule: plants are always found with animals: many species of plants and animals all coexist. All forms of animal life, from mammals to the simplest invertebrates, occur in the forest. The plant kingdom presents a similar range: **there is never any attempt at monoculture: mixed crops and cultivation are the rule.**

The soil is always protected from the direct action of sun, rain and wind. In this soil care, strict economy is the watchword: nothing is lost. All the energy of sunlight is harnessed by the foliage of the forest canopy and undergrowth. The leaves also break up the rain into fine spray so that it can be more easily dealt with by the litter of plant and animal remains that provide the last line of defence for the precious soil. These protective methods, so effective against sun and rain, also reduce the power of the strongest winds to a gentle draught.
Precipitation in particular is carefully stored. A large portion is retained in the surface soil: the excess is gently transferred underground and in due course into streams and rivers. **The fine mist created by the foliage** is transformed by the protective soil litter into thin films of water that move slowly downwards, first into the humus layer and then into the soil and subsoil.

These are made porous in two ways: by the creation of a well-marked crumb structure and by a network of drainage and aeration channels made by earthworms and other burrowing animals. The pore space of the forest soil is maximised so that there is a large internal soil surface over which thin films of water can seep. **There is also ample humus for the direct absorption of moisture.**

The excess drains slowly through the subsoil. There is remarkably little runoff, even from the primeval rainforest. When this happens, it is practically clear water. **Almost no soil is removed**. Nothing in the nature of soil erosion occurs. The streams and rivers in the forest areas are always perennial due to the large amount of water slowly flowing between the storms and the sea. **There is therefore little or no drought in forest areas** because much of the rain is retained exactly where it is needed.

The forest is self-fertilising. The soil always carries a large **fertility reserve**. There is no existence in nature's agriculture. The reserves are transported to the upper layers of the soil in the form of humus. Yet any unnecessary accumulation of humus is avoided because it is automatically **mixed into the top soil** by the activities of burrowing animals such as earthworms and insects. The extension of this enormous reserve is only realised when trees are cut down and virgin soil is used for agriculture.'



TO SUMMARISE :

1. The first rule is that nature does not like monocultures but always breeds mixed crops;
2. Mother Earth also never attempts to cultivate without the help of animals;
3. In Nature there is the highest expression in soil preservation and erosion prevention;
4. In Nature, mixed plant and animal waste is converted into humus;
5. In Nature there is no waste;
6. In Nature, growth and decay processes balance each other out;

7. In Nature there is a constant aim to maintain large fertility reserves;
8. In Nature, soils are porous and well ventilated;
9. In Nature there is the utmost care to store rain;
10. In Nature, both plants and animals protect themselves from disease;
11. In Nature there is self-sufficiency and all processes take place independently and permanently;

These are some of the characteristics of what we can call Mother Nature's method of cultivation, something quite different from today's agriculture.

The word agriculture is derived from Latin: ‘ager’: means field or arable land, ‘culture’: means cultivation or care. Combining the two terms, it literally means **cultivation (care) of the fields.** But while this term once reflected the deep bond between man and the land he worked to obtain sustenance, in the last 150 years that deep bond has been broken.

It is undeniable that technology has brought extraordinary benefits to agriculture, but it has also caused the loss of that spiritual and practical bond with the land (which rather than an element to care for has become something to exploit). Recovering it requires a cultural change and reflection on the value of the soil as a **common good,** not just as an economic resource.

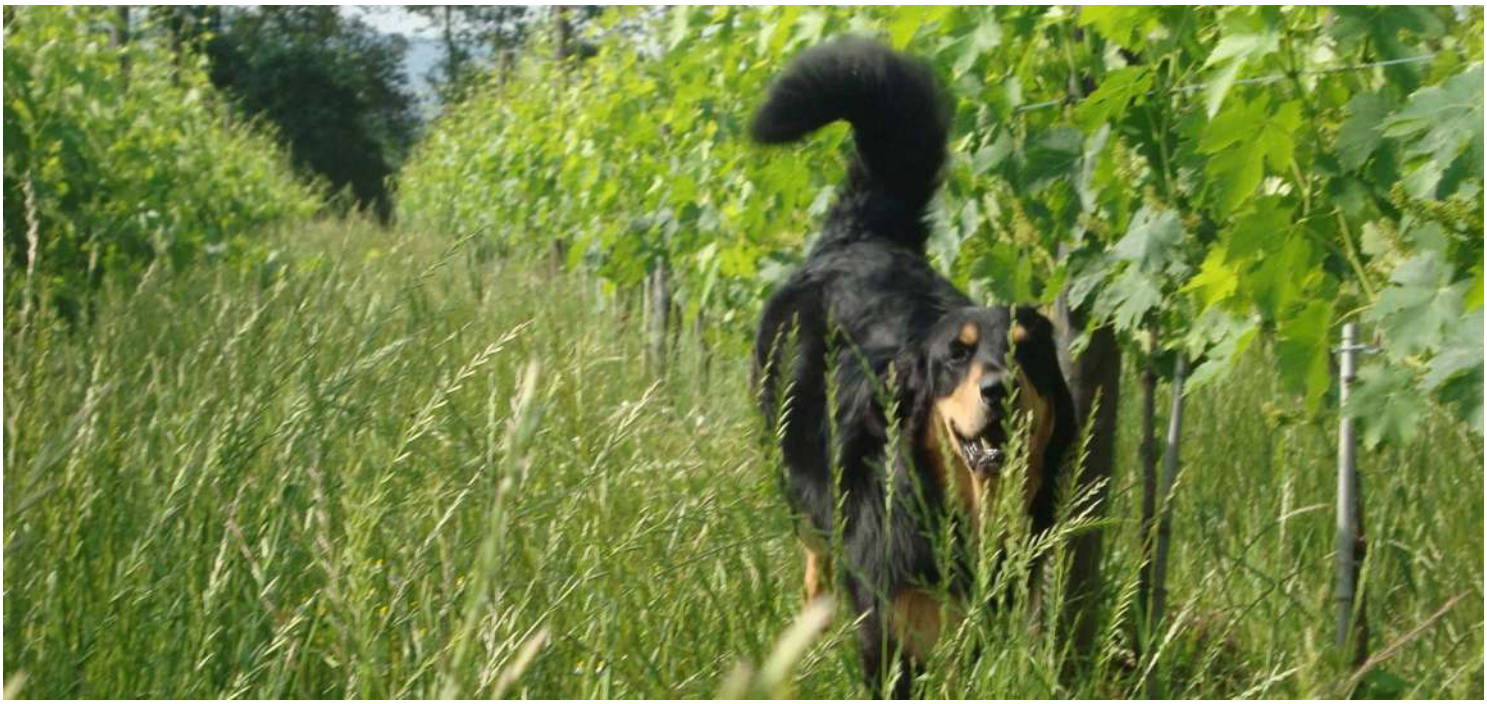
In this respect, the disciplines I have experimented with bring benefits: biodynamic agriculture seeks to re-establish a balance with nature; permaculture seeks to integrate agriculture, ecology and design to create self-sufficient systems; syntropic agriculture is a regenerative method that mimics natural ecosystems, promoting biodiversity, fertile soil and ecological sustainability.

By combining these disciplines, I have over time built a **cultivation method** that is very close to what happens in nature, and therefore sustainable, as well as profitable in terms of both quality and quantity.

The next article will discuss the eight crucial points, the pillars on which the Natural Sustainable Farming Method (MANS) is built.

SUSTAINABLE NATURAL AGRICULTURAL METHOD. Part 3

the eight cornerstones of the M.A.N.S. method.



Nell'articolo precedente, abbiamo esplorato le regole che Madre Natura adotta per far crescere le piante e i loro prodotti.

Riassumendo, le parole chiave sono molteplici e includono:
– policoltura,
– sinergia con gli animali,
– preservazione del suolo,
– sviluppo dell'humus,
– assenza di sprechi (tutto è risorsa),
– equilibrio dinamico tra crescita e decadimento,
– riserve di fertilità,
– no alla compattezza dei terreni,
– massima predisposizione del terreno nell'assorbimento delle piogge,
– difesa dinamica dalle malattie,
– autosufficienza.

'OK Giovanni,' you will say, 'so many fine words, but how can they be put into practice in an agricultural system that starts from such different assumptions from those of a natural ecosystem?'

It is true: in nature, there is an intrinsic balance that guarantees the recycling of resources, the stability of ecosystems and a continuous capacity for adaptation and evolution. In contrast, traditional agriculture often interrupts these cycles, causing serious damage.

For example, intensive monoculture has profoundly altered biodiversity, eliminating many plant and animal species that are fundamental to maintaining the natural balance. Furthermore, the excessive use of chemical fertilisers and pesticides has impoverished the soil, reducing its capacity to regenerate and encouraging the accumulation of harmful substances.

Paradoxically, today, despite access to advanced technologies, we are witnessing an increasing fragility of plants, an increase in diseases and a significant reduction in their longevity. Added to this is the impact of climate change, with extreme events becoming more frequent, while conventional agriculture contributes to the problem through deforestation and greenhouse gas emissions, altering the balance between growth and decay.
In recent years, there is more and more talk of practices such as regenerative agriculture, which seeks to mimic natural processes by promoting recycling of organic matter and diversification, but sometimes these regenerative approaches are not so decisive.

TOWARD AN AGRICULTURAL METHOD INSPIRED BY NATURE

Realizing that a perfectly natural farming method is impossible, I have worked to develop an approach that comes as close as possible to Mother Nature's. The goal is to restore the balance between growth and decay, restore soil fertility, improve biodiversity and ensure long-term sustainable production.

The Natural Sustainable Agricultural Method (MANS) applied to viticulture is based on eight essential principles:

1. Care of the soil and thus of organic matter

Increasing or preserving fertility in a natural way, favoring the use of organic matter and promoting the formation of fertile humus.

2. Permanent weeding.
Keeping the soil covered at all times to protect it from erosion, improve water retention capacity and reduce weed proliferation.
3. Agricultural organism and self-sufficiency.
Integrate the different components of the farm into an interconnected and resilient system, reducing dependence on external resources.
4. Crop diversification, complementary plants and polyculture.
Promote polyculture and complementary plants to increase biodiversity and reduce disease risk.
5. Promotion of biodiversity.
Fostering rich and stable ecosystems in which species interactions improve nutrient cycling and overall resilience.
6. Integration with animals and sustainable animal husbandry.
Integrating animals on the farm to close the nutrient cycle and enrich the soil with their natural contribution.
7. Water management and waste reduction.
Optimize the use of water resources and enhance agricultural wastes as resources.
8. Climate change adaptation.
Develop flexible strategies to cope with changing climatic conditions and improve pest manageme.

It is not a completely original method (you will see in this many key points of the other methods as well), but it has the advantage of being extremely practical and feasible, gives much importance to the awareness of the farmer, the first maker and first connoisseur of his agricultural organism.

It is a strictly non-patentable method (you cannot patent nature itself!), it will still have to comply with EU legislative regulations (a condition that is very easy to achieve since farming according to nature requires even more demanding practices than those allowed by the Bio specification).

In future articles we will delve into each of these principles, exploring their practical application and benefits for truly sustainable agriculture.

SUSTAINABLE NATURAL AGRICULTURAL METHOD. Part 4

Principle No. 1 - The Importance of Soil Care, Organic Matter and Natural Fertility of the Land.

Principle No. 1

If there is one aspect that accumulates all alternative to conventional farming methods, it is the recognition of the importance of soil organic matter.
Conventional agriculture has thought for years that it had found a shortcut, revolutionizing the concept of plant nutrition. It replaced the input of organic matter, including in the form of manure or mature compost, with chemical fertilizers.

In 1840, German chemist Justus Von Liebig discovered that plants can take up the minerals they need for their nutrition in soluble form, thus through soil water, and not necessarily through humus. This discovery gave birth to the chemical fertilizer industry.
Over time, “feeding” the soil through chemical fertilizers became the practice, much easier and cheaper than composting. This quickly led to soil depletion, increased disease and groundwater pollution.

For years, some scholars have tried to warn of the negative consequences of this “revolution.” However, they were largely ignored, as the future now seemed destined for chemicals, and those who opposed this view were considered out of touch.
It is important to reflect on this phenomenon and understand its causes, because history, as it often does, should teach us not to repeat mistakes.

The main factors that favored the use of chemistry include:
- **Green Revolution:** chemical fertilizers were thought to be the key to solving world hunger.
- **Science and technology:** were increasingly being used as authorities, legitimizing the use of chemicals.
- **Messages of immediacy of results** and the resulting advertising campaigns.
- **Creation of a culture of dependence:** agricultural enterprises seemed unable to do without these new tools.
- **Image of modernity and progress:** new products were presented as the future, while those who continued to use organic matter were seen as anachronistic.

The intensive use of chemical fertilizers inevitably led to the depletion of soils, as it was soon realized that this approach neglected other essential elements, such as organic matter. This imbalance reduced microbial biodiversity, which is essential for soil health, and accelerated the degradation of its structure. In addition, the accumulation of salts and acidification caused by synthetic fertilizers compromised the soil's ability to retain water and nutrients. Over time, the soil became less fertile and increasingly dependent on further fertilization, creating a vicious cycle of environmental depletion and degradation.

The importance of organic matter: some famous quotes.

Today we see numerous speakers in seminars extolling the importance of organic matter as if it were something new. This seems to me to be an unappreciative attitude because no one remembers what was said over a century ago! Instead, in honor of these "pioneers," I would like to recall some famous phrases that are often quoted today:

- "The maintenance of soil fertility is the first condition of any permanent agricultural system." - **Albert Howard (1900-1940)**
- "Soil health cannot be preserved by chemical fertilizers, but only by practices that restore organic matter and promote microbiological life." - **Hans Muller (1920-1930)**
- "Soil fertility comes from soil life itself, not from chemical fertilizers. Only organic farming can adequately nourish the soil." - **J.I. Rodale (1930-1950)**
- "Plowing and the use of chemical fertilizers deplete the soil and its ability to support life in the long run." - **Edward H. Faulkner (1940-1950)**
- "Organic matter in the soil is essential for maintaining its health and preventing the depletion of natural resources." - **David Pimentel (1950-1970)**
- "Organic matter in the soil is the soul of the earth. Without it, the soil becomes dead, unable to nourish plants." - **Rudolf Steiner (1924)**

ALTERNATIVE METHODS AND SOIL FERTILITY.

Alternative methods to conventional see natural soil fertility as the main means of doing agriculture. Some of the pioneers of these practices were:

- **Bill Mollison (Permaculture)**: "The health of the soil depends on the health of its organic matter. Without it, the soil becomes barren and unable to support life."
- **David Holmgren (Permaculture)**: "Fertile soil is that which contains a good amount of organic matter. Without it, there is no healthy agriculture."
- **Ernst Götsch (Syntropic Agriculture**): "In syntropy, organic matter is essential. It is through compost and green manure that the soil is enriched and becomes fertile, supporting a complex ecosystem."

- **Masanobu Fukuoka (Natural Agriculture)**: “Natural agriculture is nothing more than a return to living soil, rich in organic matter, which nourishes both the plants and the soil itself.”
- **Ruth Stout (No-till farming)**: “The earth is like a sponge: if we leave it covered with organic matter, it will retain moisture, nourishment and life.”
- **Jean-Martin Fortier (Synergistic Agriculture)**: “Whenever we put something in the soil, it should be something that nourishes it, that enriches it with organic matter.”
- **Eliot Coleman (Organic and Synergistic Agriculture)**: “Soil fertility is not just about nutrients. It is the life itself in the soil that needs to be nourished, and that can only be achieved by the supplementation of organic matter.”
- **Vandana Shiva (Sustainable Agriculture and Biodiversity)**: ‘The secret to a fertile soil is to feed it with organic matter. Impoverished soil can never support life.’

NATURE AND THE CYCLE OF LIFE.

Soils, particularly litter, contain most of the living biomass on our planet. Darwin was not wrong when he said that “soils in nature are regularly plowed by earthworms”!
In nature, a healthy soil can host about one billion micro-organisms per gram. Soil is self-fertilizing through a process composed of macro- and micro-organisms, both plant and animal, working together.
The first objective of the **MANS method** is therefore to ensure the natural fertility of the soil through practices that ensure the life of the fauna and microorganisms that inhabit it. The cultivation technique must allow the soil to remain well aerated, slightly moist, porous and capable of retaining water, without being subject to erosion or leaching. It must mimic the three stages that occur in nature:
1.**Mineralization:** Supply of minerals to plants.
2.**Reorganization:** Ensuring the continuous cycle of nutrients for fauna and microorganisms.
3.**Humification:** Nourishing the soil itself through the formation of humus.
A fertile, self-sustaining soil integrates all three of these stages without relying on chemical fertilizers. This process is like a symphony in which each note is fundamental.

MAN-S METHOD PRACTICES.

The MAN-S method aims to create a strong, balanced and self-sufficient agricultural ecosystem with the ability to independently resist pests. This is achieved by creating a favorable environment for natural predators as well. Some of the principles of the method include:

🌱 1. Do not overwork the soil (No-Till or minimum tillage)
🍂 2. Increase organic matter in the soil
🌾 3. Cover crops
🐞 4. Promote biodiversity
💧 5. Natural water management
🦠 6. Nurturing soil microbial life
🛡️ 7. Avoiding artificial chemical inputs
🌍 8. Design in tune with nature
📊 9. Constantly monitor and adapt
🤝 10. Education and collaboration

We are faced with the need to implement a virtuous system that combines various sustainable agricultural practices, an approach that cannot be reduced to a few simple operations. It is not enough to administer manure or horn manure just once, nor to simply practice green manure: it is essential to activate a set of integrated operations that are part of a broader vision of agricultural management.
We also need to understand the effects of each individual operation. To better illustrate this concept, let us take the chopping of annual grasses as an example. This practice certainly brings fresh organic material, rich in readily available nitrogen. However, it is important to consider that shredded plants have a rather low nitrogen to carbon (C/N) ratio, which implies some specific dynamics:

- Rapid decomposition of organic matter
- Accelerated action of decomposing microorganisms
- Production of nitrate nitrogen, readily assimilated by plants
- Fast plant response, which, however, does not always result in higher quality
- Potential loss of nitrogen during heavy rains

A quite different practice might be the use of wood chips. In this case, the organic material contributed has a high C/N ratio, slowing decomposition. The microorganisms that break down lignin and cellulose compete with the soil for available nitrogen, and initially the nitrogen is “immobilized” by the microorganisms themselves. This means that, during the initial stages, nitrogen is less available to plants. However, over time, the organic material continues to decompose, releasing nitrogen in the form of ammonium, which is more suitable for tree and shrub plants.

In summary, we have two agricultural practices whose effects may differ:
- The chopping of annual grasses: brings available nitrogen in the short term, mainly in the form of nitrates.
- Wood chipping: brings long-term nitrogen, initially immobilized, which will be released as ammonium in the later stages of decomposition.
So these are two completely different effects that need to be well managed in our agricultural system.

The use of manure is also a practice that needs to be applied with experience, care, and a clear strategic vision suited to the context. First of all, it is important to know what kind of manure is best to use (it is assumed that it is well composted!). There are five main types of manure: cattle, sheep, horse, pig and arvicultural, each with specific characteristics.

Of these, cow manure is generally considered the most balanced and stable, but I prefer horse manure for my farm for the following reasons:

- It contains a good amount of minerals and especially phosphorus and potassium.

	Nitrogen (N)	Phosphorus (P)	Potassium (K)
- 🐄 Cattle manure	0.5 - 1.5%	0.2 - 0.5%	0.5 - 1%
- 🐑 Sheep manure	1.5 - 2%	0.3 - 0.6%	0.5 - 0.7%
- 🐎 Equine manure	0.5 - 1.5%	0.3 - 0.6%	0.6 - 1.0%
- 🐖 Swine manure	1.0 - 1.5%	0.5 - 1%	0.6 - 1.0%
- 🐔 Pollen	3.0 - 5.0%	2.0 - 3.0%	1.0 - 2.0%

- It is ideal for clay soils, as it makes them softer and more airy due to the presence of crude fiber that is not fully digested
- It keeps, therefore, the soil vital and active, improving aeration (which is very useful for our soils, which are certainly not light).
- Promotes the development of beneficial microorganisms, such as mycorrhizal fungi and nitrogen-fixing bacteria, improving nutrient bioavailability.
- Contributes to the formation of stable humus, which is critical for long-term soil fertility (in fact, its isoumic coefficient 0.7-0.9 is among the highest, higher than bovine coefficient 0.6-0.8 making it ideal for improving soil porosity and aeration).
- It stimulates spontaneous grassing due to the presence of weed seeds, which is particularly useful in natural vineyard management.
- Is gentle on plants, unlike other types of manure, such as chicken manure.
- Does not acidify the soil, as pig manure can do, for example.
- **Fits perfectly with the physiological cycle of the vine**, supporting the critical stages of growth and fruiting.
- **Stimulates flowering**, probably due to the balance of nitrogen and carbon, which promotes flower production without stimulating excessive vegetative growth at the expense of fruit formation.
- Is ideal for combining with **wood chips,** further improving compost quality.

The chemical composition of horse manure is perfect for vines:

- The nitrogen content is not excessive, however with a good share in organic form, thus avoiding too much vegetative growth, which could compromise grape quality.

- The balance in phosphorus promotes root development and shoot differentiation.

- Potassium content supports fruit ripening, improves resistance to water stress and disease, and increases the organoleptic quality of grapes.

- High carbon content (due to coarse fiber) is essential to enrich soil organic matter.

- C/N ratio, generally between 25:1 and 30:1, promotes slow and steady mineralization of nutrients, avoiding excessive nitrogen releases that could unbalance the plant.

In conclusion, I think I have expressed how important it is to care for, develop and preserve organic matter and natural soil fertility (also primary goals of the MAN-S Natural Sustainable Agricultural Method) and true modernity in the agricultural world can also be found in the past. Soil fertility is achieved through a plurality of operations, all interconnected, many of which will be discussed in more detail in future articles. In this installment, we have focused on composting and the use of a particular type of manure (self-produced), which is critical for stimulating microbial activity, improving soil structure and increasing nutrient and water holding capacity, promoting healthier and more productive plants. Large quantities of manure are not needed in the vine crop, but it is important to distribute it, where it is needed, in early November (if the soil permits), to encourage slow decomposition over the winter. The
distribution of compost should be the first real act of the new agricultural season. Not surprisingly, agrarian covenants used to be made at this time.
In the next article, we will delve into the practice of permanent grassing.

SUSTAINABLE NATURAL AGRICULTURAL METHOD. Part 5

Principle No. 2 - Permanent grassing.

Principle No. 2

The practice of permanent grassing without tillage is, in my opinion, one of the most interesting agronomic techniques and is fully practicable in our area with a few caveats. This technique offers numerous benefits from both an agronomic and environmental point of view. Let us see them in detail.

Benefits of permanent grassing.

1. **Improvement of soil structure**
   - o The roots of herbaceous plants stabilise the soil, reducing erosion and allowing the passage of agricultural vehicles even after heavy rains.
2. **Increased biodiversity**
   - o Stable soil cover encourages a greater variety of insects, microorganisms and other useful organisms, enriching the ecosystem.
3. **Improved water management**
   - o Grassland increases the soil's ability to infiltrate water and reduces surface evaporation, improving water efficiency.
4. **Reduction of compaction**
   - o By avoiding heavy tillage, the soil retains its natural porosity, reducing the risk of compaction.
5. **Weed control**
   - o Well-managed grassland limits the development of undesirable weed species, reducing the need for remedial action.

6. **Sustainability and emission reduction**
   o Less mechanical work reduces the consumption of fossil fuels, contributing to a significant reduction in CO_2 emissions.
7. **Quality improvement and sustainability**
   o In addition to improving the quality of the grapes, grassing reinforces the health of the soil and the environment, aligning perfectly with the principles of organic and sustainable viticulture.
8. **Climate stability**
   o A covered soil is better protected from temperature fluctuations, both in winter and summer, favouring more stable climatic conditions for cultivation.

THE ROLE OF HORSE COMPOST IN PERMANENT GRASSING.

In my experience, the use of horse compost is a key factor in making grassing more effective. I have observed an immediate effect in promoting grass growth due to the presence of nitrogen, which stimulates the development of herbaceous plants and makes the turf more vigorous.

Why does horse compost stimulate turf?

The particular effectiveness of horse compost stems from the nature of the horse's digestive system, which is less efficient than that of other ruminant herbivores such as cattle and sheep. This has some specific advantages:

1. **Intact seed passage**
   # Many seeds pass through the horse's digestive system without being damaged, retaining their germination capacity.
   # Seeds of grasses (e.g. ryegrass, fescue, poa), legumes (e.g. clover, wild vetch) and other species (e.g. plantain, romaine) can germinate directly from the compost.

2. **High carbon content**
   # Since the horse is not a ruminant, its ability to digest fibre is limited. This results in a manure rich in carbon, which contributes to improved soil fertility.

Synergy between horse compost and grassland.

Supplementing permanent grassland with the application of horse compost offers multiple benefits:

- It stimulates soil fertility due to the combination of nitrogen and carbon.
- It improves soil structure, favouring drainage and porosity.
- It increases microbiological dynamism, enriching the soil with beneficial microorganisms that support plant health.

Permanent grassing, enhanced by the use of horse compost, is a sustainable and regenerative practice that improves soil health, grape quality and environmental balance. This synergy between natural techniques and advanced agronomic management is a concrete example of how productivity and respect for the environment can be reconciled.

CONTINUOUS OBSERVATION AND MANAGEMENT.

As Alessandra Cappellozza, agronomist and expert in agricultural sustainability, points out:

'Permanent grassing is not just an agronomic choice, but a dynamic balance between the vine, the soil and the environment that requires constant care and a long-term vision.'

Permanent grassing is an indispensable practice to improve soil structure, reduce erosion and increase biodiversity. However, it requires careful management based on knowledge and constant observation. Two key aspects to be monitored are:

1. **General balance**
   # Balancing the vigour of the grasses with that of the vines is crucial.
   # Over-stimulation of the grasses can lead to competition for water and nutrients, especially in drought years.
   # For this reason, grassing must be kept under control with targeted interventions.
2. **Mix of herbaceous species**
   # Initially, some sowing is necessary, but the long-term goal is to favour indigenous species.
   # After years of experimentation, I have obtained a perfect mix of:
      - Nitrogen-fixing species, such as clover and vetch.
      - Low-competitive species, such as poaceae and grasses (e.g. fescue and ryegrass), which are also particularly useful as fodder for horses.

Mowing management.

Mowing management is a critical aspect. It is necessary to consider:

- **Techniques and timing:** The frequency and manner in which mowing is carried out can influence the vigour of the grasses and competition with the vine.
- **Soil care:** Soil with a good supply of organic matter facilitates grassing management.

NATURAL GRASSING: A CONSCIOUS CHOICE.

My aim is not simply **cover crops,** but **spontaneous grassing**, which allows a more natural, low-intervention and less expensive approach. This choice favours biodiversity, simplifies management and promotes more sustainable agriculture.

Why clover is an ideal choice in natural grassland.

Having a good presence of clover in your fields brings numerous advantages:

1. **Nitrogen fixation**
   - As a leguminous plant, clover fixes atmospheric nitrogen through a symbiosis with rhizobial bacteria in the roots.
   - It transforms nitrogen into a form that can be assimilated by plants, naturally enriching the soil.
2. **Uniform soil cover**
   - Clover creates a low, dense mat, protecting the soil from erosion and limiting the development of unwanted weeds.
3. **Increasing functional biodiversity**
   - Attracts pollinating insects and other beneficial organisms.
   - Supports an active microfauna in the soil, essential for organic matter decomposition and nutrient cycling.
4. **Competition with weeds**
   - Once well established, clover suppresses the most aggressive weeds, reducing management intervention to a minimum.

Clover in the vineyard: a perfect ally.

In the vineyard, abundant nitrogen supply or excessive nitrogen release is not necessary. Clover is therefore an ideal choice among leguminous plants, thanks to:

- A moderate and well-balanced nitrogen fixation.
- A simple and natural management.

Thanks to these characteristics, clover integrates perfectly with the needs of the vine, contributing to a balanced and sustainable system.

Leguminous	**Medium Nitrogen input** (kg/ha/year)	**Nitrogen fixation capacity**	**Nitrogen release**
Red clover (Trifolium pratense)	100-150	Moderate	Gradual
Common vetch (Vicia sativa)	100-200	High	Rapid
Fennel (Vicia faba)	200-300	Very high	Rapid and abundant
Lucerne (Medicago sativa)	150-250	High	Gradual
Sainfoin (Onobrychis viciifolia)	50-100	Moderate	Slow
Protein pea (Pisum sativum)	150-200	High	Rapid
Lentil (Lens culinaris)	50-100	Moderate	Slow
Lupin (Lupinus albus)	150-250	High	Gradual

Careful clover management: practical tips.

Clover is a valuable resource for natural grassland, but requires targeted management to promote its growth and stabilisation. Here are some useful tips:

1. **Do not mow during flowering**
   - o It is important to avoid mowing or shredding during the flowering period to allow natural sowing and seed dispersal.
2. **Maintain turf height**
   - o Keep the grass at a height of approximately 8-10 cm, an ideal level that does not penalise the growth of clover.
3. **Limit tillage**
   - o Clover takes time to stabilise. Even superficial soil tillage can impair the presence of this important grass.
4. **Compost management**
   - o Use compost in moderation, just enough to vitalise the soil and encourage grasses, without overdoing it, as an excess of nutrients could reduce the competitiveness of clover.

Because grasses are also essential.

Grasses not only complement clover, but also bring unique benefits to the soil and the vineyard ecosystem:

1. **Fibrous roots for optimal soil structure**
   - o The fibrous, branching roots of grasses:
     - They improve soil porosity.
     - They prevent compaction, keeping the soil aerated and draining.
2. **Stabilising effect**
   - o The surface root system of grasses keeps the soil compact, especially during periods of heavy rain, reducing the risk of erosion.

3. **Contribution to humus formation**
   - o Grasses are particularly effective in humus formation due to: **Fine, exudate-rich roots.**
     - They explore large portions of soil and release sugars and organic compounds that feed microbial activity, which is essential for humus formation. When the roots die, they leave a network of fine organic residues in the soil, enhancing the stabilisation of organic matter.
4. **High biomass and carbon production:**
   - o Grass residues have a relatively high carbon/nitrogen (C/N) ratio, which slows decomposition and favours the formation of stable humus.
   - o The lignin present in the residues is particularly resistant to microbial decomposition, contributing to the formation of stable humus.
5. **Balance between rapid decomposition and stabilisation:**
   - o Grasses offer a combination of easily degradable materials (sugars and proteins in fresh roots) and more resistant materials (lignin and cellulose). This balance:
     - Provides constant microbial nutrition.
     - Allows stabilisation of more resistant fractions, creating long-lasting humus.

Conclusion: the ideal grassland mix.

A balanced approach between **clover** and **grasses** offers synergistic benefits:

- o Clover provides nitrogen and functional biodiversity, improving soil cover and competition with weeds.
- o Grasses contribute to soil structural stability and the formation of stable humus.

This carefully managed combination results in a natural, balanced and sustainable grassing system that supports soil health and vineyard productivity.

WEEDING V/S TILLAGE

It is inevitable that proponents of tillage emphasise the benefits of this practice. However, when analysed carefully, it turns out that many of these benefits are only temporary and, in the long run, can be counterproductive.

Alleged benefits of tillage: a critical evaluation.

1.Improvement of soil structure

- Yes, but... Tillage breaks up surface compaction, temporarily improving structure. However, within a few weeks, the soil tends to recompact, often to a greater extent than before, requiring further action.

2.Ease of water penetration

- Yes, but... This effect is also temporary. Over time, tillage can increase surface compaction and reduce the soil's ability to absorb and retain water.

3.Reducing competition for water and nutrients

- Only in extreme cases. In very dry environments, this can be useful, but in well-managed vineyards with good organic matter, as in my area, it is not a major problem.

4.Better incorporation of compost and organic matter

- Yes, but not always desirable. Tillage accelerates mineralisation, but in a high-quality oriented vineyard it is not advisable to over-stimulate vegetative growth.
- Alternative solution: Spreading the compost in November allows a gradual release of nutrients, coinciding with the vine's periods of greatest need.

5.Weed control

- Not necessary. Weed control can be achieved just as effectively with mowing and chopping, which also stimulates the decomposition of organic matter.

6.Soil warming in spring

- Questionable effect. A tilled soil warms up more quickly in spring, but this can anticipate the vine's vegetative cycle, exposing it more to the risk of late frost. Stimulating a slightly delayed vegetative cycle is often more advantageous.

The irrefutable disadvantages of processing.

Despite the alleged benefits, processing has several disadvantages, many of which have negative impacts in both the short and long term:

1. Loss of organic matter

- Tillage accelerates mineralisation, causing a decrease in soil fertility over time.

2. Soil erosion

- On hilly or sloping land, tillage exposes the soil to water erosion and nutrient leaching. This risk is also present in flat land, albeit to a lesser extent.

3.Reduction in soil biodiversity

- Frequent tillage not only impoverishes above-ground biodiversity, but also disturbs the soil microbiome, compromising underground habitats.

4. **Compaction of deep layers**
    - Tillage favours the formation of compact layers in the subsoil, below the depth of the plough. This phenomenon is aggravated by the passage of agricultural machinery.
    - A practical example: Notice how the tilled soil of a vineyard tends to be lower than the untilled soil.
5. **Increased costs and energy consumption**
    - Tillage requires machinery, fuel and labour, increasing operating costs. They also increase CO_2 emissions, with a significant environmental impact.
6. **Less resilience to drought**
    - Tilled soil loses moisture more quickly than soil covered with turf, making the vineyard less resilient in summer.

Conclusion: the advantages of permanent grassing.

In the light of this analysis, it is clear that the alleged advantages of tilling do not justify the long-term disadvantages. **Permanent grassland** is a sustainable and regenerative solution that improves soil structure, reduces erosion, increases biodiversity and supports more resilient and cost-effective agricultural management.

Choosing grassland means investing in a healthier soil and a more balanced vineyard, capable of facing future challenges with greater sustainability and respect for the environment.

MULCHING OR MOWING

Working the soil regularly does not make much sense, except on exceptional occasions, e.g. to clear it for the passage of vehicles or in other situations of real need. Rather, it is more useful to focus attention on how to manage grass in the vineyard, considering two main techniques: **chopping and mowing.**
The choice between these two options depends on agronomic objectives, vineyard characteristics, soil type and climatic conditions. Below, we analyse the advantages and disadvantages of each technique.

Mulching: cutting and fragmentation of the grass.

Mulching involves cutting and fragmenting the grass into small pieces, which are distributed on the ground.

🌟 **Advantages of chopping**

1. Rapid supply of organic matter
    - The chopped grass decomposes quickly, releasing quickly available nutrients for the plants.
2. Improvement of soil surface structure
    - Stimulates the activity of earthworms and decomposing microorganisms, improving soil quality.
3. Reduction of water evaporation
    - The layer of shredded material helps retain moisture, particularly useful in hot, dry climates.

⚠️ Disadvantages of chopping

1. Higher energy consumption
    - Mulchers require more power and fuel than mowers.
2. Risk of compaction
    - If carried out on wet ground, the repeated passage of machinery can compact the soil.
3. Choking effect
    - An excessive layer of chopped material can create anaerobic conditions, hindering natural decomposition.

👉 When to choose chopping? Mulching is ideal for sandy or well-drained soils, where it is important to return nutrients to the soil quickly, e.g. during the plants' periods of greatest need.

Mowing: cutting without fragmentation.

Mowing involves simply cutting the grass, which is left on the ground without further processing.

🌟 Advantages of mowing

1.Improved soil aeration
- Mown grass decomposes more slowly, avoiding anaerobic conditions.

2.Less risk of compaction
- Mowers are lighter than mulchers, reducing the mechanical impact on the soil.

3.Flexible sward management
- Allows the grass height to be precisely adjusted, maintaining an ideal balance.

4.Gradual nutrient release
- Slow decomposition promotes controlled release, ideal for maintaining soil and plant stability.

5.Less impact on biodiversity
- Mowers disturb beneficial insect populations less than mulchers.

6.Greater mulching effect
- The remaining grass layer offers long-term protection against evaporation and erosion.

7.Reduced mechanical passage
- Grass regrowth is less rapid than with mowing, reducing the need for frequent intervention.

⚠️ Disadvantages of mowing

1.Slower release of nutrients
- This can be a disadvantage if you need a quick supply, but in my case it is a desired effect to ensure a natural soil balance.

👉 When to choose mowing?

Mowing is ideal for clay soils or during rainy years, where a gradual release of nutrients is preferable to maintain a natural balance without excess nitrogen.

Conclusion: conscious management.

Each technique has its advantages and disadvantages, but in my case, mowing is more suitable. I particularly like the fact that it leaves a thicker and more persistent grass layer, providing a superior mulching effect in the long run. However, there are specific situations, such as rapid nutrient release in summer, where chopping may be a more appropriate choice.

The key is to observe and adapt agronomic practices to climatic conditions, soil characteristics and the specific objectives of the vineyard.

CHOPPING OR MOWING? A FLEXIBLE CHOICE.

Although I prefer mowing, it is important to adapt to weather conditions and specific needs. For example, in situations where a rapid release of nutrients to the soil is needed (such as in early summer), chopping may be a more advantageous choice.

Optimising the timing of cutting in natural grassland.

A key aspect of managing natural grassland is the choice of **cutting timing and frequency,** which can favour some grass species over others. Only through observation and experience can you get the most out of this practice.

Cutting timing and benefits

Type of intervention	***Benefits***
Spring cutting (before flowering)	Reduces competition, prevents weed expansion and favours nitrogen-fixing leguminous plants.
Summer cut (after flowering)	Encourages natural propagation of nitrogen-fixing plants and promotes biodiversity.
Autumn cutting	Prepares the soil for winter, reduces seasonal competition and improves soil management.

Cutting frequency and benefits

Frequency of cut	**Effects**
Frequent	Controls excessive grass growth, reducing competition with vines.
Less frequent	Stimulates biodiversity and encourages natural reproduction of native plants.

Grassing: an ecological and sustainable solution.

If managed properly, **spontaneous grassing** can become a pillar of sustainability in the vineyard:

- It increases biodiversity.
- It promotes local fauna and flora.
- Improves soil health.
- Reduces the need for outside intervention.

References and authoritative voices.

Numerous scholars have addressed the benefits and challenges of no-tillage. Here are some notable references:

1. **David L. Rowland**, University of Wisconsin, USA.
2. **Rolf Derpsch,** agronomist, pioneer of conservation agriculture.
3. **Jean-Michel Gaillard**, INRA, France, with contributions on soil health.
4. **Thomas A. M. P. Van der Heijden**, University of Zurich, Switzerland.
5. **Alan R. Borré**, researcher in sustainable agronomy.
6. **Alessandra L. Cappellozza**, University of Turin, Italy.
    - **o** Specializing in grassing practices and sustainable soil management in organic vineyards.
7. **Fabio Antichi**, University of Bologna, Italy.
    - **o** With studies on the effectiveness of conservationist agricultural practices in vineyards.

Famous quotes about permanent grassing.

1.**Claude Bourguignon**, soil microbiologist:
"A covered soil is a protected soil. Permanent grassing is one of the keys to preserving soil fertility and life."

2.**Pierre Masson**, biodynamic agricultural consultant:
"Permanent grass cover is not just a green cover: it is a filter, a regulator, a barrier against erosion and a biological bridge between the soil and the plant."

3.**Marc-André Selosse,** biologist expert in mycorrhizae:
"Permanent grassing is the skin of the soil. Removing it means exposing the soil to irreparable injury."

4.**Alain Canet**, agroforestry and soil expert:
"Permanent grassing is not just an agronomic choice, but an act of responsibility to future generations."

5.**Stefano Mancuso**, plant neurobiologist:
"Plants are not just roots and leaves; they are intelligent networks that communicate, protect and build the ecosystem. Permanent grassing harnesses this natural network for plant health."

Conclusion.

As you may have realized, permanent grassing is not just an agronomic practice, but an integrated ecological approach that combines science, ethics and sustainability. It is the basis of the MANS method, a conscious choice for agriculture that respects the soil and the future.

MANS

Metodo Agricolo Naturale Sostenibile

Sustainable Natural Farming Method Second part

PIAN DEL PINO

Bio Wine Artisans

SUSTAINABLE NATURAL AGRICULTURAL METHOD. Part 6

Principle No.3 - Agricultural Organism and Self-sufficiency.

Principle No. 3

One of the concepts that has fascinated me most in biodynamic agriculture is that of the **'agricultural organism'**. This theme, developed by Rudolf Steiner, is one of the pillars of biodynamics and was introduced with the second of the eight lectures on agriculture in 1924, known as the **"Koberwitz Course."**

The Concept of the Agricultural Organism according to Steiner.

Steiner's perspective was decidedly innovative for the time (and also for the following years), as he proposed to consider the farm not as **a simple place of production**, but as an **autonomous living organism,** in equilibrium with itself and the surrounding environment. In essence, each element of the farm (soil, plants, animals and humans) is seen as part of a **harmonious system,** where each component plays a specific role and contributes to the well-being of the whole. It is as if each individual factor were an **organ of a single living body.**

Steiner based this view on a **few key points:**

1. **Autonomy and Self-sufficiency**

The farm must be as self-sufficient as possible, producing internally what it needs, such as compost, seeds and animal feed.

2. Closed cycles

Nutrients must be recycled within the farm, thus reducing dependence on external inputs. A prime example is the use of animal manure as a natural fertiliser for fields.

3. Diversity of Elements

A biodynamic farm must promote biodiversity by cultivating different varieties of plants, breeding animals and preserving natural spaces such as hedges, groves and refuge areas for wildlife.

4. Balance between Plants and Animals

The presence of animals is essential to the agricultural cycle: their manure enriches the soil, while the plants provide food for the animals, thus closing the circle of integrated and regenerative agriculture.

Rudolf Steiner's true objective, underlying the concept of the **agricultural organism**, is to create a **harmonious, resilient and sustainable ecosystem** in which each element contributes to the overall well-being. This is not just an agricultural technique, but a **holistic view** that considers the earth, the environment and man as interconnected parts of a single living entity. In this way, Steiner gave birth to a new form of agriculture that is not dependent on the chemical industry and plays an essential role in maintaining **biodiversity** and **sustainability.**

According to Steiner, the concept of an agricultural organism is based on the **requirement of self-sufficiency** and, consequently, a 'complete' farm (e.g. with **composting** and a **variety of crops**). Unfortunately, many modern farms have progressively lost this self-sufficiency character, becoming less and less ecologically balanced. For Steiner, on the other hand, it was essential to maintain **a natural balance between production and resource consumption**, where the nutrient cycle is closed through composting and without overexploitation of pastures. Agricultural self-sufficiency, therefore, entailed significant benefits, such as **soil health, animal welfare, product quality, environmental balance and economic sustainability.**

Today, the self-sufficiency outlined by Rudolf Steiner is an **ambitious ideal**: many biodynamic farms fail to achieve it completely and continue to depend on external inputs in various respects. However, the practice of composting should remain a minimum requirement, ensuring an internal cycle of soil regeneration.
The concept of an **agricultural organism** is also found in other agricultural methods, such as permaculture. Between biodynamics and **permaculture** there are several points of contact and some differences. In permaculture, the farm is seen as an **integrated, resilient and self-sufficient** system that mimics **natural ecosystems**, not unlike biodynamics. As in Steiner's vision, the aim is to create a **closed cycle** with minimal external inputs and to value the principle that **'everything is connected'.** However, permaculture relies above all on a **design approach** that brings the elements of the system together, without including a **'spiritual'** and **cosmic** perspective, which is characteristic of biodynamic agriculture.

Here are the main differences between the concept of the Agricultural Organism in Permaculture and Biodynamics

Aspect	**Biodynamics (Steiner)**	**Permaculture (Mollison/Holmgren)**
Basic philosophy	Spiritual and cosmic approach	Practical and ecological approach.
Interaction with the cosmos	Fundamental (lunar, planetary rhythms).	Non-central, focus on local ecosystems.
Closed cycles	Central for agricultural self-sufficiency.	Central, but with more flexibility
Design	Based on holistic principles and cosmic balance.	Based on observation, design and optimisation of ecosystems.
External inputs	Avoidable, but accepted if biodynamic.	Avoidable, but not excluded if ethical and sustainable.
End goal	Harmony between man, earth and cosmos.	Self-sufficient, resilient and ecological agricultural systems.

The concept of the agricultural organism is also found in other forms of agriculture, sometimes with new ideas and practices. One example is **syntropic agriculture**, which integrates elements such as **ecological successions, plant stratifications** and **cooperation between species**. This is a fascinating topic, but in order not to dwell on it too much, let us now focus on how the concept of the agricultural organism is structured within the **MANS method.**

THE CONCEPT OF AGRICULTURAL ORGANISM IN THE MANS METHOD

Aspect	MANS METHOD
Basic philosophy as	- Practical and ecological approach, with a reference to the rhythms of the moon the cosmic element to be considered. - Each phase prepares the ground for the next, creating a continuous cycle of regeneration. - The objective is not only agricultural production, but also the constant regeneration of the soil and the ecosystem, so as to preserve its fertility in the long term.
Interaction with the cosmos	- On a practical level, elements are taken into account to improve production, but the focus remains on a holistically oriented operating system. - Lunar rhythms are evaluated to optimise sowing, pruning and harvesting cycles.
Closed cycles	- Central to ensuring agricultural self-sufficiency while maintaining flexibility in particular years. - Organic waste produced by plants returns to the soil as nutrients. - Plants and animals coexist in natural symbiosis, reducing the need for chemical fertilisers and pesticides. - The system tends to self-regulate, relying on natural processes.
Design	- Based on observation, design and optimisation of ecosystems. - Great attention is paid to the optimal use of sunlight, space and available resources. - Plant and animal species are selected to work together and maintain ecological balance. - Practices adopted must respect the soil, climate, local biodiversity and farming traditions.
External inputs	- Avoidable, but not excluded if they are ethical and sustainable.
Ultimate goal	- To create harmonious, self-sufficient, resilient and ecological agricultural systems, capable of regenerating ecosystems whenever necessary. - Man is not merely a cultivator, but a facilitator of natural processes. - The farm is seen as a dynamic system that regenerates itself, ensuring long-term sustainability.

The MANS Method thus aims to enhance the concept of the agricultural organism through a mix of sustainable practices, closed cycles and a holistic approach that integrates traditional knowledge with modern ecological requirements. These elements contribute to self-sufficient and regenerative farms in which human beings participate as conscious directors of wider natural processes.

SELF-SUFFICIENCY, HARMONY AND ENVIRONMENTAL ORGANISM IN THE MANS METHOD.

In the MANS Method, the key words are self-sufficiency, harmony and farm (or environmental) organism. These concepts must always be considered together, because only through their integration can a truly sustainable agricultural system be created.

1. Self-sufficiency

Self-sufficiency is the ability to produce what is necessary for one's livelihood, reducing dependence on external sources as much as possible.

This also includes the ability to regenerate oneself, to keep one's internal cycles in balance and to respond autonomously to external challenges.

- Soil fertility: Through practices such as composting and nutrient recycling, an agricultural system maintains its productivity without relying on chemical fertilisers.
- Self-regulation: Biodiversity, promoted by mixed and polycultures, helps prevent pests and diseases in a natural way.
- Flexibility: Being self-sufficient does not mean closing oneself off completely to external influences, but rather limiting the input of unsustainable inputs.

2. Harmony

Harmony is the achievement of a state of dynamic equilibrium, in which each element (humans, plants, animals, soil, climate, etc.) coexists and interacts synergistically, supporting and nourishing each other.

- Dynamic balance: Harmony is a constantly evolving process, which depends on adaptation to seasonal, climatic or nutritional changes.
- Biodiversity: By fostering biological diversity, a cooperative rather than competitive environment is created, increasing resilience and long-term sustainability.
- Respect for natural cycles: Every agricultural action (sowing, pruning, harvesting) takes place in harmony with natural rhythms, favouring the balance of the system.

3. Environmental organism

The agricultural ecosystem is conceived as a living organism in its own right, whose elements (from biodiversity to soil quality) cooperate in continuous interaction.
- Dynamic and adaptive: Like a living body, the environmental organism is self-regulating through cyclical feedbacks and is constantly evolving.
- Energy flow: Every part of the system (plants, animals, microorganisms, soil) contributes to generating an energy flow that feeds all vital processes.
- Role of the farmer: The farmer is a conscious actor, who must never make decisions that weaken the system, but rather strengthen and sustain it.

INTEGRATION OF THE THREE CONCEPTS

Self-sufficiency, harmony and the environmental organism form a whole:
- Without **harmony,** self-sufficiency cannot develop in the long term.
- Without **self-sufficiency**, the agricultural organism is too dependent on the outside and does not achieve equilibrium.
- Without the **vision of a living organism**, there is a lack of awareness of how each individual element interacts with the overall system.

Recommended Bibliography

If you would like to learn more about the topics discussed in this episode, you can consult these books that illustrate the practices and theories behind the concept of the ‘agricultural organism’ from different perspectives:
- Scientific-Spiritual Impulses for the Advancement of Agriculture, by Rudolf Steiner
- Permaculture: A Designers' Manual, by Bill Mollison

- The One-Straw Revolution, by Masanobu Fukuoka
- Agroecology: The Ecology of Sustainable Food Systems, by Stephen R. Gliessman
- The Soil Will Save Us, by Kristin Ohlson
- The Resilient Farm and Homestead, by Ben Falk
- The New Organic Grower, by Eliot Coleman
- Restoration Agriculture, by Mark Shepard
- Farming with Nature: The Case for Community-Supported Agriculture, by Sara Snow
- Ecology of a Cracker Childhood, by Janisse Ray
- The Holistic Orchard: Tree Fruits and Berries the Biological Way, by Michael Phillips

Conclusion and Anticipation

I hope I have provided useful information on the concept of the agricultural organism and why, at the heart of the MANS Method, there is an ongoing effort to realise this goal. As you will have realised, it is more than just an agronomic practice: it is an ecological approach that combines science, ethics and sustainability.
In the next episode, we will explore how the agricultural organism is not only a system to produce quality food, but also a tool to achieve sustainability and regeneration in the long run. We will focus on operational aspects such as crop diversification, complementary plants and polyculture.

SUSTAINABLE NATURAL AGRICULTURAL METHOD. Part 7

Principle No4 - Crop diversification, complementary plants, polyculture and order in nature.

Principle No. 4

Imagine you are in an area full of vineyards, with very long, endless rows of vines, where everything is perfectly tidy. You will probably think: Wow! How beautiful! I too, many years ago, experienced the same feeling. It is normal. However, that order is far removed from the supreme order that exists in nature.

Human linearity: order or illusion?

It is important to understand why we are attracted to this linearity. The contrast between the linearity to which man is attracted and the complex, non-linear order of nature has solid biological, cultural and cognitive foundations.

Indeed, man is attracted to linearity for several reasons:

- Cognitive efficiency: Our brain looks for simple, repeatable patterns to save energy. Straightness is easy to recognise, predict and control. Straight lines give a feeling of order, predictability and clarity, allowing the mind to relax when faced with a system that appears 'under control'.
- Dominion over natural chaos: Straightness symbolically represents human dominion over the disorder of nature. Fields cultivated in rows evoke the idea of organisational power, a kind of psychological reassurance resulting from the imposition of human order on an otherwise unpredictable context.
- Practical function for the grower: Straight rows make agricultural work easier, allowing the use of machinery, simplifying crop management and optimising space. They are also easier to design and implement, responding to the human desire for immediacy and predictability.

Nature's higher order.

Nature, on the other hand, operates on a completely different plane from human linearity. Seemingly chaotic, nature is based on complex, adaptive and dynamic patterns.

- Biological efficiency: Nature does not seek symmetry or repetition, but patterns that optimise resources and functions. Its forms follow adaptive principles, such as Fibonacci sequences in sunflowers or logarithmic spirals in shells. This complexity allows nature to respond to change resiliently and creatively.
- Interconnectedness: Nature does not like isolation, but favours networks of relationships. One example is forests, where roots and fungi create interconnected underground systems. This distributed system ensures that there is no easily attacked 'weak point', as each element is integrated and functional to the whole.

Man and nature: a complex confrontation.

It is normal to ask: Why is man so approximate to nature? One answer lies in the very functioning of the human brain. Complex as it is, the brain is not designed to fully process natural systems, which operate on immense temporal and spatial scales. Instead, man tends to reduce complexity to simple, repeatable patterns.
Moreover, his vision is short-term: while nature works for long-term sustainability, man often thinks short-term, favouring immediate productivity. Finally, technological progress has reinforced the need for simple, linear patterns of production. Nature, on the contrary, is 'biological' and self-organising, capable of continuous adaptation without a predefined plan.

Learning from nature.

These arguments lead us to a fundamental question: What can we learn from nature? In many fields, such as biomimicry, solutions inspired by natural systems are already being designed (cities that follow flows similar to nervous systems or river networks, for example). But in agriculture, how can we apply these principles?
The answer lies in the development of agroforestry and polycultural systems, which mimic natural systems to increase biodiversity and resilience. These models are inspired by forests, combining plants of different strata and functions.

THE MANS METHOD AND THE IMPORTANCE OF SYNTROPY.

The idea of **syntropy** is central to this vision. In the Mans method, tree cultures around vineyards play a fundamental role. Small plots surrounded by trees and shrubs improve biodiversity and create more resilient ecosystems. In addition, the introduction of plants along the rows, such as almond trees or coral trees, adds additional centres of biodiversity that are very useful for the entire cultivated area.
Seeing a tree towering among the vines requires a different perception of order. This apparent 'disorder' is not inefficiency, but **dynamic adaptation.** The challenge is to learn to see the higher order in natural systems and integrate it into our practices, accepting that natural chaos is actually a model of incomparable resilience and innovation.

The invisible order of nature.

Nature's order often operates in the unseen. For example, the roots of plants are connected to networks of **mycorrhizal fungi,** which enable the exchange of nutrients, water and information between trees, creating a 'natural internet'. Furthermore, there is **collaboration between trees:** a young tree receives nutrients from larger trees through this network, improving its survival. In addition, trees can warn their neighbours of pest attacks by sending chemical signals via fungi.
In this case, the higher order is represented by a system of interconnections that ensures the survival of the forest community as a single entity, going beyond competition and exploiting collaboration.
Let us make it more practical by asking what the higher order of nature can teach the grower . Here is what I have learnt.

PRACTICAL LESSONS FROM THE NATURAL ORDER.

Lesson one: Collaboration, not control.

Instead of forcing nature through intensive practices, the farmer should collaborate with natural processes, letting the ecosystem guide him.
This is why the Mans method adopts plant intercropping or agroforestry, where different species work together, reduces the need for chemical fertilisers and pesticides. Favouring less linear and intensive pruning systems, such as the sapling, is a way to co-create with nature, where man is not a dominator but an attentive and respectful guardian.

Lesson two: Adapting to change.

Nature teaches that resilience comes from the ability to adapt to change, not from the imposition of a rigid order. Resilience is not rigidity but flexibility. This is why in the Mans method there can be not only vineyards, but also diversified crops and agro-ecological practices to mitigate risks related to climate, disease and economic fluctuations.

Lesson three: Diversity as a strength.

No one can dispute that biodiversity is a key element for long-term stability and productivity. For this reason, the Mans method integrates trees, shrubs, herbaceous plants and annual crops into a single system. Grape varieties are selected not only on the basis of type but also on the environmental connections in which they are found.

ILesson four: Think in terms of cycles, not linearity.

Nature works in closed cycles (energy, water, nutrients) where nothing is wasted; this teaches the farmer to design circular systems. This is why the Mans method promotes the collection of crop residues to produce compost or mulch, returning organic matter to the soil. Perennial crops and plant cover crops are integrated to regenerate nutrients continuously and animals are included in the farming system to close nutrient cycles (e.g. by letting animals graze between crops to fertilise the soil).

Fifth lesson: Balance between productivity and regeneration.

It is not just about maximising the immediate harvest, but balancing production and regeneration in the farming system. Nitrogen-fixing plants, such as clover, must never be lacking in the rows to improve soil fertility, and great care is taken to manage grass cover.

Lesson six: Observation and patience.

Just as nature takes time to reveal its patterns, the grower must learn to observe carefully and act patiently. The basis of the Mans method is observation. Monitoring how plants interact over time is crucial. Making decisions based on long-term results guides every action, starting with improving soil quality and the local ecosystem.

Seventh lesson: Beauty as an indicator of health.

A visually balanced and diverse agricultural system is often also ecologically healthy.

Natural beauty can be an indicator of the success of the system. This is why the Mans method does not neglect the cultivation of flowers, trees and edible plants that attract pollinators, natural predators of pests and improve the aesthetics of the land. The presence of useful insects and wildlife indicates a balanced system. Dogwood plants, for example, are one of the first to flower (February-March, depending on the climate), at a time when pollen and nectar sources are scarce. Its yellow flowers are particularly attractive to bees and provide a valuable resource for the latter, which emerge after winter and need to feed to sustain the colony. This is why it is particularly useful to plant dogwoods between crop rows or as part of multifunctional hedges, to support pollinators and improve ecosystem health.

Lesson eight: Integration of productivity and culture.

Nature teaches us that agriculture is not just an economic activity, but a cultural expression rooted in territory and time. This is why the Mans method pushes towards the use of traditional and local varieties (such as Colorino del Valdarno), which are often better adapted to the ecological context. Furthermore, it promotes the creation of agricultural spaces that also serve as natural habitats, places of beauty and connection with nature.

Certainly the rules that can be learnt by the cultivator from the higher order of nature are many more than eight. Everyone can experiment with them as he or she pleases, provided, as I have already said, that man acts not as a dominator, but as a careful and respectful custodian. Agriculture must be seen as an interconnected and collaborative system, not as a collection of isolated elements. This approach helps to build a more resilient, sustainable and productive agriculture, where soil and plant health is put at the centre, just as it is in nature.

Obviously, there is something we cannot do without if we want to sustain our families: for example, the linearity of rows (at least in viticulture). However, it is important to compensate for these approximations with sustainable practices and principles of biodiversity. Linearity is not just a tradition, but a response to the need to combine quality and quantity.

IN CONCLUSION, THIS IS WHAT THE MANS METHOD PROPOSES:

1.Diversify crops: There can be more than just vineyards in one's agricultural organism. By integrating other crops, various plant species interrupt the life cycles of many pests and pathogens. In addition, greater climate resilience is achieved: a variety of crops makes the agricultural system less vulnerable to extreme events.

2.Complementary plants: Complementary plants are species that, when grown together, offer mutual benefits. This concept underlies techniques such as intercropping and is based on natural synergies, both above and below ground.

3.Polyculture: Polyculture consists of the simultaneous cultivation of several plant species on the same land. It is opposed to monoculture and offers several advantages: functional biodiversity, optimisation of resources (crops with roots of different depths explore various soil layers, making the best use of water and nutrients), increased overall yield (due to the beneficial interactions between species, the total yield of the farming system is in the long term often higher than with monoculture).

For this reason, the Mans method places great emphasis on permanent grassing and tree cultivation around and within the vineyard.
Biodiversity and sustainability will be discussed in the next episode.

SUSTAINABLE NATURAL AGRICULTURAL METHOD. Part 8

Principle No5 - Biodiversity and Sustainability.

Principle No. 5

Biodiversity and sustainability are fundamental pillars of the **MANS method**, we have already talked about them, but they are so crucial that they deserve further elaboration. This agricultural approach not only promotes a resilient wine-growing system, but also helps to preserve and regenerate ecosystems.

STRATEGIES FOR BIODIVERSITY AND SUSTAINABILITY IN THE MANS METHOD.

1.Associations and permanent grassing.

- Promotes plant diversity in the vineyard and ensures a balanced ecosystem.
- Stimulates plant roots without requiring irrigation, creating a self-sufficient environment.

2.Hedges and trees.

- Hedges and trees, positioned around and within the vineyard, improve the microclimate and attract useful species, strengthening the ecological network.

3.Compost and natural fertilisers.

- The use of compost enriches the soil with organic substances and beneficial microorganisms, promoting a fertile, living soil.

4.Pastures and diversified crops.

- The integration of horse pastures and alternative crops reduces monoculture and contributes to the balance of the system.

5.Preference for local cultivars.

o Enhancing native varieties means preserving the genetic heritage and increasing resilience to local climatic conditions.

6.Biological pest control.

o The introduction of beneficial insects and the monitoring of animal and plant species contribute to the natural balance of the ecosystem (e.g. the phytoseid spider house for erinosis control)

Focus on cover plants and microbial biodiversity

1.Cover plants.

o Species such as clover and vetch, together with grasses, are used to improve soil structure and enrich the soil.

o Careful management of cover crops promotes soil regeneration and biodiversity.

2.Microbial biodiversity.

o The introduction of mature compost and the stimulation of mycorrhizae promote nutrient uptake and improve vine health.

o An active microbial community is essential to ensure a fertile and resilient soil.

Honey plants and the role of pollinators

Native melliferous plants such as **dogwood, blackthorn and hawthorn** are integrated between the rows or along the borders. These flowers attract pollinators such as bees and beneficial insects, which are essential for both plant reproduction and biological pest control.

Sustainable soil management

1.No tillage.

o Avoiding tillage protects soil structure and preserves the microbial community.

2.Organic mulching.

o The use of biomass, shredded prunings and organic mulches maintains moisture and enriches the soil with organic matter.

3. Mature composting and monitoring.

o Regular introduction of compost and monitoring of soil quality ensures the balance of nutrient cycles.

Water management: a natural balance

Vineyards managed using the MANS method benefit from an ecosystem that requires no irrigation, even for the youngest vineyards. This is made possible by permanent grassing, soil conservation practices, plant biodiversity that improve the soil's ability to retain moisture, but above all by the type of planting that preserves the roots without cutting them.

A STRUCTURED AND SYNERGETIC ECOSYSTEM.

The MANS method demonstrates how a holistic approach to viticulture can integrate biodiversity, sustainability and resilience, creating vineyards that not only produce high-quality wines, but also regenerate ecosystems. This approach represents a model for sustainable agriculture that respects nature and its resources.

The method adopts a holistic landscape approach that transforms the farm into an **integrated ecosystem.** This system includes vineyards, pastures and forests even with non-productive areas that become refuges for wildlife, contributing to the conservation of biodiversity.

Vineyard design is not limited to grape production, but considers the entire system, **with both melliferous and non-melliferous trees surrounding the vineyards**, creating natural synergies and improving soil health. This approach not only ensures environmental sustainability, but also offers fundamental support for wine quality.

The soil: foundation of life and quality

A **living, healthy soil** is the key to regenerative and quality viticulture. Its functions go far beyond supporting plants:

1. Carbon immobilisation and water retention:

o A soil rich in organic matter is capable of retaining water and storing carbon, reducing dependence on external inputs.

2. Basis for spontaneous fermentations:

o A viable soil improves the accumulation of indigenous yeasts, as well as providing essential nitrogen and vitamins for optimal spontaneous fermentations.

Ultimate goal: Authentic, artisanal wines

The ultimate goal of the MANS method is not only to produce quality grapes, but to create **authentic wines** that are the result of an artisanal approach and free of external inputs.

The link between the **soil microbiome,** the health of the vine and the indigenous yeasts is fundamental to making wines that fully express the **terroir.**

Role of the microbiome in vineyard and wine improvement

1.Vine health and vitality:

o The soil microbiome, consisting of bacteria, fungi and other microorganisms, is essential for vine health.

o Beneficial microorganisms increase the availability of essential nutrients, such as nitrogen and phosphorous, promoting balanced growth and reducing stress.

2.Symbiosis with roots:

o Mycorrhizae and beneficial fungi create a symbiotic network with roots, improving nutrient uptake and optimising water balance.

3.Optimal nitrogen supply.

o The use of compost and nitrogen-fixing plants, such as clover and vetch, enriches the soil with organic nitrogen, which is assimilated by the vines and stored in the grapes. This ensures ideal APA (yeast-assimilable nitrogen) content, which is essential for smooth spontaneous fermentations.

4.Presence of essential vitamins.

o The soil microbiome produces B vitamins (thiamine, niacin, pantothenic acid), which are transferred to the plant and accumulated in the berries.

o Thiamine (B1), in particular, is essential for the growth and activity of yeasts during fermentation, promoting a more robust and stable process.

5.Less need for intervention in the cellar.

o A healthy microflora on the grapes therefore reduces the need to inoculate commercial yeasts or use correctors to support fermentation, making the process more natural and less invasive.

Regenerated soil: foundation for quality

Healthy, regenerated soil not only improves the quality of the grapes and the yeasts themselves, but also provides essential nutrients, such as assimilable nitrogen and vitamins, for complex and robust spontaneous fermentation. This approach enhances the link between soil, vine and wine, expressing the authenticity of the terroir to the fullest.

FIELD TRIAL: EXPERIENCE AND SCIENTIFIC EVIDENCE.

I myself have observed the direct benefits of these practices over time. Spontaneous fermentations, which were initially slow and unpredictable, have progressively improved, with waiting times for fermentations to start considerably reduced.

But in addition to practical experience, scientific research also confirms the importance of the soil microbiome in determining grape and wine quality.

This is made possible by the promotion of biodiversity, both in the subsoil and in the surface layer, and the integration of the vineyard into the landscape and the surrounding environment.

The development of biodiversity in the subsoil is crucial, as it stimulates **symbiotic interactions** between plants, microbes and animals. Similarly, the integration of other plant species into the vineyard contributes to the creation of **mycorrhizal corridors**, natural networks that promote nutrient transfer and improve plant health.

The importance of preserving natural connections.

These mycorrhizal networks, however, are delicate and can be damaged by deep tillage. For this reason, the **MANS method** does not involve breaking up the soil at the time of planting. Instead, it adopts surface tillage that does not go deeper than 30 cm, thus respecting the natural soil structure and preserving the vital connections between the roots.

A look at the next instalment

In the next chapter we will explore an equally fascinating topic: the integration of vineyard, animal and sustainable farming practices. We will discover how this synergy can further enrich the agricultural ecosystem and contribute to a more regenerative and environmentally friendly agriculture.

Here are two recent studies:

1.Study on Vino Nobile di Montepulciano (Tuscany)

- Researchers from the University of Bologna analysed the soil microbiome in different geographical units in the Vino Nobile di Montepulciano area.
- The results showed that specific abundances of bacteria and fungi in the soil directly influence key wine characteristics such as aroma, colour and flavour.
- Link to the study (https://www.nature.com/articles/s42003-024-07261-8)

2.Study on the microbiota of vineyards in Monforte d'Alba (Piedmont)

- Researchers from the Department of Agricultural Sciences examined the bacterial and fungal biodiversity in vineyards in the Monforte d'Alba area, correlating the data with production parameters such as leaf pH, production per plant and phenolic seed maturity.
- The research showed that greater microbial biodiversity in the soil is associated with higher production and quality characteristics of the grapes.
- Link to the study (https://www.accademiadiagricoltura.it/wp-content/uploads/2024/09/Staffolani-N-Stuardi-M-Masoero-G-Guidoni-S-2023.pdf)

This scientific and practical evidence shows that a regenerative approach to soil not only improves vineyard health, but has a direct and tangible impact on wine quality. The connection between the soil microbiome, indigenous yeasts and winemaking is central to producing authentic, complex and distinctive wines that tell the story of the terroir from which they come.

CONCLUSION: A VINEYARD AS A LIVING ECOSYSTEM.

The MANS method represents an approach capable of transforming the vineyard into a true living ecosystem, capable of producing high quality wines in perfect harmony with nature.

SUSTAINABLE NATURAL AGRICULTURAL METHOD. Part 9

Principle No6 - Connections with the animal element.

Principle No. 6

One of the main problems of modern agriculture **is the loss of connection with the animal element**. Some might think that this disconnection might seem a negligible aspect, something the modern farmer can do without. However, it was precisely the advent of heavily chemical-based agriculture, in particular artificial fertilisers, that encouraged this separation.

In the past, however, animals were an integral part of the agricultural ecosystem. Their organic waste, carefully composted, contributed naturally to soil fertility.

The removal of animals from agriculture has broken what **we can call a natural symbiosis**. This loss has compromised fundamental ecological services such as the control of insect infestations or the regeneration of pastures, often leading to the need for artificial solutions. A paradoxical example is artificial pollination, which is becoming an increasingly common practice in many countries where the decline of natural pollinators - bees, butterflies and other insects - has reached critical levels.

Industrialised and specialised agriculture has shifted the focus to crop intensification, often sacrificing sustainable practices. It used to be normal for farmers to rear livestock to produce meat, milk or wool. This production, besides being a source of income, was part of an integrated and sustainable agricultural system.

Fortunately, today there is a renewed interest in the inclusion of animals in agriculture. Practices such as biodynamic agriculture integrate animals into the agricultural cycle, using their presence to improve soil health and promote biodiversity. Similarly, permaculture aims to create agricultural ecosystems that include animals, thereby optimising natural cycles.

However, this approach still remains the exception. The relationship with animals, over time, has degraded and today is often reduced to:

- **Intensive exploitation:** overcrowding, massive use of antibiotics.
- **Environmental impact:** greenhouse gas emissions, water pollution, deforestation.
- **Loss of biodiversity:** priority given to the most profitable species at the expense of less productive ones.
- **Dehumanisation of the human-animal relationship:** a relationship increasingly removed from respect and understanding.

The Natural Sustainable Agricultural Method (MANS) recognises the fundamental importance of animals, both domestic and wild, in the creation of balanced agricultural systems. Integrating animals into agriculture, as well as fostering better coexistence between wildlife and agricultural activities, **is not only an ethical choice, but an intelligent strategy to create productive, resilient and sustainable systems.**

Connection with wild animals and benefits.

It is true: many wild animals, such as wild boar, roe deer and porcupines, can cause significant damage to vineyards. In Tuscany, for example, cultivating vineyards without adequate fencing is now practically impossible. However, in many cases, these problems have been created by man himself.
Certain fauna management policies, in fact, have led to the introduction of wild boars for hunting purposes, often belonging to more prolific species or subspecies, capable of giving birth several times a year, larger in size and with a more demanding diet. Added to this is the reduction of natural spaces and the lack of protection areas. Furthermore, current agricultural models, characterised by intensive cultivation and high-calorie monocultures - such as extensive vineyards - have favoured this problem. It is therefore not surprising that crop damage is increasing.

Animal inspiration in the vineyards.

Many of our vineyards draw inspiration from animals. Examples such as the 'Vigna del Picchio Verde' (Sangiovese), the 'Vigna delle Farfalle' (Sangiovese, Colorino del Valdarno, Merlot) or the 'Vigna dell'Usignolo' (Tempranillo, Trebbiano, Malvasia) are not just evocative names. Indeed, birds and insects are indicators of a healthy and balanced ecosystem: nutrient-rich soils, diverse vegetation, availability of water and food. In other words, a living environment.

BENEFICIAL ANIMALS IN VINEYARDS.

Many animals, wild and domestic, contribute to biodiversity, reduce the risk of pest infestation and support vineyard resilience. Here are some examples:

Beneficial insects:

- **Ants:** They help control pests by preying on eggs and larvae.
- **Bees and bumblebees:** Pollinate surrounding plants, improving biodiversity.
- **Solitary bees:** They do not pollinate vines directly, but carry pollen that enriches the agricultural ecosystem.
- **Carabidae:** Voracious predators of larvae and parasites.
- **Ladybirds:** Natural predators of aphids, mealybugs and other small insects that infest vines.
- **Night moths:** They pollinate surrounding wild flowers and are a food source for bats and nocturnal birds.
- **Butterflies:** Sensitive indicators of a healthy environment and contribute to plant diversity by feeding on melliferous plants.

Mammals and small vertebrates:

- **Hedgehogs:** Excellent bio-indicators of a healthy environment.
- **Shrews:** They feed on insects and larvae in the soil, reducing pests.
- **Foxes:** Regulate rodent populations, preventing damage to roots and clusters.
- **Badgers:** They feed on larvae, earthworms and insects, contributing to biological pest control.

Birds:

- **Hoopoe:** Feeds on beetle larvae and soil-damaging insects.
- **Swallows and swifts:** They hunt flying insects, including pests such as flies and vine moths.
- **Jays:** They help disperse seeds and maintain the biodiversity of the environment.
- **Oxen guards:** A sign of a healthy, integrated ecosystem where there is a balanced relationship between wildlife and human activities.

Reptiles and amphibians:

- They prey on insects such as flies, aphids and small spiders, acting as a link between the vineyard and surrounding ecosystems.

Soil organisms:

- **Earthworms:** They improve the structure of the soil, increasing its drainage and fertility.
- **Mycorrhizal fungi:** They form symbioses with the roots of the vines, improving the absorption of nutrients and water.
- **Decomposing insects** (e.g. collemboles, dung beetles): They break down organic matter, enriching the soil with essential nutrients.

ECOLOGICAL BALANCE AS A GOAL.

Every animal that contributes to biodiversity strengthens the vineyard against pests and diseases. Promoting the presence of these natural allies is fundamental to creating a more resilient, productive and sustainable agricultural system.

Presence of insects and birds: indicators of fertility and land health.

The presence and variety of insects and birds are the best natural indicators of the fertility and health of an area. Monitoring and fostering biodiversity through sustainable agricultural practices not only improves soil and crop quality, but also helps preserve the environment for future generations.

Increased biodiversity reduces damage caused by pests in vineyards. This is because biodiversity acts as a biological control network in which predators, pests, plants and other organisms interact to maintain the natural balance. Predators such as insectivorous birds, bats, spiders and predatory insects (e.g. ladybirds, praying mantises and carabids) keep populations of harmful insects such as aphids, moths and other pests under control.

The role of hedges and agricultural diversification.

To maximise the benefits of biodiversity, vineyards should not be too large (to reduce the damaging effect of monoculture) and should be surrounded by hedges and trees. These provide shelter and nesting places for birds and predators that feed on larvae and harmful insects.

In a rich ecosystem, pest species must compete with others for food and shelter. This natural competition reduces the likelihood of population explosions of harmful species. Furthermore, in vineyards with vegetation cover, pests have more difficulty concentrating exclusively on vines, finding distractions and ecological barriers.

Integration of grazing animals and biological control.

There are good experiences showing the benefits of integrating grazing animals such as sheep, cattle and horses in vineyards. These contribute to weed control and natural fertilisation. Furthermore, hens and ducks are used with excellent results in countries such as South Africa and New Zealand for biological pest control, although their management requires careful planning.

The experience of the Pian del Pino vineyards.

In the Pian del Pino vineyards, which have been cultivated for more than 20 years using the MANS method without using external fertilisers, numerous insectivorous birds, including some increasingly rare ones such as nightingales, have been observed. Their presence helps to maintain a balance in the insect populations. Birds use vineyards as hunting areas, especially when surrounded by hedges and trees, which provide shelter and nesting sites. This balance enriches the vineyard ecosystem, contributing to its resilience.

The nightingale's ecological role.

The nightingale, known for its melodious song, plays an ecologically significant role in vineyards and agricultural ecosystems. During the breeding season, it feeds mainly on insects and small invertebrates, including larvae and caterpillars that can damage vines.
It hunts in the twilight and night hours, supplementing the action of other insectivorous birds active during the day. In addition, the nightingale creates an ecological bridge between forest and vineyard, linking forest and agricultural ecosystems.
Encouraging the presence of the nightingale means enriching biodiversity and enhancing the vineyard also from an aesthetic and cultural point of view, making it more attractive to wine tourism and nature lovers. To encourage its presence is essential:
- Maintain hedges and marginal areas.
- Reduce chemical treatments to a minimum.
- Create microhabitats with spontaneous vegetation, thickets and trees in or on the edge of vineyards.

The contribution of the green woodpecker.

The green woodpecker also plays an important role in vineyards, being a natural predator of parasites and pests. Its presence, rare but valuable, is often indicative of a healthy and diverse ecosystem.
This bird feeds on larvae and insects that could damage the vines, thus reducing the need for chemical interventions. It is a specialist in hunting ants, helping to maintain the ecological balance.

The Value of Fauna in Vineyards.

Integrating and enhancing the value of wildlife in vineyards not only contributes to an ecologically balanced environment, but also improves the quality of the final product. This enriches the sustainable and cultural value of agriculture.
In the MANS method, horse compost plays a crucial role: it stimulates vegetation and feeds the entire life system, demonstrating that everything is interconnected. By following models that mimic nature, one can clearly see how each element supports the cycle of life.

AN INDICATOR OF BALANCE: THE GRAPEVINE SPHINX.

It is exciting to find rare animals such as the **vine sphinx (Deilephila elpenor**) in vineyards. Have you ever seen it? Besides being fascinating, it is one of the greatest indicators of a healthy and diverse environment. This species only thrives in balanced habitats and is also an important pollinator. It encourages spontaneous vegetation around vineyards, enriching the surrounding ecosystem and supporting other beneficial species.

However, to ensure the presence of these animals, they are necessary:
- **Natural habitats:** hedges, shrubs and wild vegetation around the vineyards.
- **Elimination of pesticides:** to protect the most delicate species and preserve biodiversity.

The reflections of philosophers, farmers and poets remind us of the importance of the connection between animals and agriculture:

caterpillar sphinx of the vine

Famous Phrases and Popular Sayings.

- Albert Howard, pioneer of organic farming:
'*Agriculture is the art of making friends with nature, and animals are its messengers.'*
- Masanobu Fukuoka, father of natural farming:
'Animals are at the heart of every agricultural ecosystem: where they are, there is balance, life and fertility.'
- **Rachel Carson,** biologist and writer:
'*In every healthy soil there are millions of invisible creatures working with us, not against us.'*
- Leonardo da Vinci:
'*Animals share with us the privilege of having a soul; in agriculture, they are the custodians of the earth they tread.'*
- Rudolf Steiner, founder of biodynamic agriculture:
'*Animals are the farmer's allies: they transform the soil, nourish it and make it alive.'*
- African proverb:
'*Where the cattle graze, the soil sings and the trees grow strong.'*
- Traditional proverb:
'*The stable next to the field is a guarantee of abundance throughout the year.'*
- **Gandhi:**
'*The greatness of a nation and its moral progress can be judged by the way it treats its animals. The same applies to the land it cultivates.'*
- Tagore, poet and philosopher:
'*Agriculture is the poetry of the earth, and animals are its living verses.'*

The Philosophy of the MANS Method: A Holistic Synergy between Man, Animals and Nature.

The MANS Method promotes a harmonious synergy between domestic animals, wildlife and plants, creating ideal conditions for a rich and resilient biodiversity.

This ecological network integrates predators, pests and vegetation into a natural biological control system, ensuring balance and sustainability. With time-honoured practices such as grassing and the use of horse compost, the 'real black gold', MANS regenerates the soil, promotes vitality and supports respectful, productive farming in harmony with nature.

SUSTAINABLE NATURAL AGRICULTURAL METHOD. Part 10

Principle No7 - Irrigation and waste reduction.

Principle No. 7

The Natural Sustainable Agricultural Method (MANS) emphasises the recovery of organic matter as an essential practice. Any waste, from kitchen leftovers to prunings, from ashes to coffee powder, is considered a valuable resource. Burning prunings or brushwood is strongly discouraged, as these can be turned into compost. For this reason, every farm should equip itself with a chipper and acquire expertise in composting, a fundamental practice for:

- **Reduce environmental impact,** due to lower water consumption and waste reduction.
- **Promote the circular economy,** by reintroducing waste into production processes.
- **Improve soil and crop** health by increasing yields through composting.
- **Create new economic** opportunities by turning waste into value-added products.

Absence of irrigation in the MANS method.

In my area, the MANS method does not provide for irrigation of vineyards, even for newly planted ones, even in particularly difficult seasons. A significant example was the **Nightingale vineyard,** planted in June 2022: despite the fact that the soil reached temperatures of 65 °C in July, the Tempranillo plants grew perfectly without irrigation. This result (and more generally the non-need for irrigation) was possible thanks to four main factors:

1.Manual planting technique: The rooted cuttings are planted without cutting the roots.

2.Presence of organic matter: A crucial component that improves the soil's ability to retain water and nutrients.
3.Soil structure: Well-aggregated soils with good drainage capacity.
4.Environmental peculiarities: The area's unique microclimate, influenced by geographical and geological factors.


THE IMPORTANCE OF KEEPING ROOTS INTACT

Planting plants with intact roots is an advantageous agronomic and ecological technique. This method allows plants to develop a complete root system, which:
- Improves the ability to absorb water and nutrients.
- Promotes vigorous development and greater resilience to environmental stresses.
- Enables better adaptation to the soil, making maximum use of its resources.

Intact roots interact effectively with beneficial soil microorganisms and fungi, such as mycorrhizae, which optimise nutrient uptake and increase disease resistance.

Sustainable techniques for soil improvement

The MANS method promotes regenerative practices that produce humus, improve soil quality and reduce the need for irrigation:
- Conservation of organic matter through composting.
- Controlled weeding and permanent vegetation cover.
- Creation of habitats for useful fauna (hedges, trees, and wetlands).
- Biological monitoring to assess soil vitality.

These practices improve water retention, increase cation exchange capacity and stimulate microbial life, which contributes to nutrient uptake. During dry periods, humus acts as a reserve, gradually releasing stored water.

The role of clays in the MANS method.

The soil in our area contains **highly evolved clays,** deposited during the Pliocene period. These clays:
- **They retain water** stably and release it slowly to the roots.
- **They have a well-aggregated structure**, which favours drainage and reduces the risk of compaction.
- **They are particularly suitable** for late-ripening grape varieties, such as Sangiovese, which benefit from slow and regular ripening.

The combination of illites and smectites, together with the presence of humus, further improves water retention and reduces soil structural problems.

The area's unique microclimate.

The geographical position of the vineyard, **with the Arno river to the south and the mountains to the north**, creates a favourable energy and climate system. The river brings movement, humidity and warmth, while the mountain protects from cold winds and provides stability. This natural balance contributes to:
- Avoiding water stress during the summer months.
- Favour gradual ripening of the grapes.
- Create a fertile and dynamic environment, ideal for sustainable viticulture.

Conclusions

The MANS method demonstrates that careful soil and ecosystem management can eliminate the need for irrigation, even under difficult climatic conditions. Practices such as composting, grassing and keeping roots intact not only improve soil quality, but also make agriculture more resilient and sustainable, making the most of available natural resources.

SUSTAINABLE NATURAL AGRICULTURAL METHOD. Part II

Principle No8 - Climate Change Adaptation.

Principle No. 8

Here we come to the last of the eight pillars on which the MANS method is based: adaptation to climatic conditions.
For years, at the end of each season, I have devoted myself to a "hot" commentary on the vintage that has just passed (see Vintages: how to recognize a good vintage). As I write these reflections, I realize that what was once considered "abnormal" has now become the norm, while a regular vintage is now the exception (as was, for example, 2015).

We are witnessing a series of extreme weather phenomena:
- Extraordinarily hot and drought years: 2003, 2011, 2017, 2022.
- Late spring frosts: 2017, 2021.
- Intense hailstorms: 2016.
- Extremely wet springs followed by record droughts and heats: 2023 and, in part, 2024.
The phrase "*I've never seen anything like it*" is now on everyone's lips, even the oldest.

In Tuscany, despite being one of the regions of Italy with a traditionally more temperate climate, we clearly feel the signs of climate change:
- Rising temperatures: increasingly mild winters and fewer frost days than in the past.
- Changes in precipitation patterns: rainfall tends to be concentrated in extreme events, while dry spells become longer.

- **Extreme weather events:** sudden storms, hailstorms, late frosts.
- **Effects on ecosystems:** native plant and animal species are increasingly threatened.

These signals are a stark reminder of the urgency of decisive and coordinated action, locally, nationally and globally, to mitigate and adapt to the effects of climate change.
One of the most significant problems to be addressed is **drought** and **water stress**, but heat waves are inevitably associated with phenomena such as **hailstorms.**

In the past, urban areas were more limited and surrounded by countryside. Today, overbuilding has supplanted much of the green space. Where **polyculture** used to dominate, **monoculture** now prevails, making the problem even worse. The elimination of greenery and deforestation have contributed to rising temperatures, reducing shading and the albedo coefficient.
The consequence is that these practices promote atmospheric instability: warm air on the ground, rich in water vapor, rises rapidly to the cooler layers of the atmosphere (a phenomenon known as convection), increasing the likelihood of hailstorms.

Maintaining greenery, forests and woodlands is essential to reducing global warming and stabilizing the climate. In contrast, overbuilding and even **industrial viticulture**, with continuous and invasive soil tillage, promote conditions for heat waves. The latter, in turn, increase atmospheric instability, generating violent storm events as well as hailstorms.
Mitigation of the effects of climate change also comes through **reforestation and forest protection**, strategies that can reduce the frequency and intensity of these extreme events. This intertwining of different climate and land dynamics highlights the need for sustainable land and natural resource management.

A method such as MANS (Method of Natural and Sustainable Agriculture), which promotes biodiversity, agroforestry and sustainability, creates the conditions for greater adaptability to climate change:
- **Biodiversity:** promotes reduced vulnerability to pests, diseases and climate change, as each species contributes uniquely to the ecosystem;
- **Agroforestry:** improves microclimate regulation, water retention, and erosion protection; and trees absorb CO_2, contributing to global warming mitigation.
- **Sustainability:** regenerative practices improve soil structure, making it more resilient to extreme events such as droughts and floods; healthy soils rich in organic matter retain more water, releasing it gradually; integration of vineyards with hedgerows and tree plants creates complex and resilient ecosystems.

Conventional agriculture, on the other hand, proposes different paths, such as:

- Development of **resistant varieties** (biotechnology and GMOs).
- Use of **advanced fertilizers and pesticides.**
- Mechanization and automation.
- Adaptation to large monocultures, with **agricultural insurance** and **emergency funds** to compensate for losses caused by extreme weather events.
- Economies of scale and centralization.

However, this approach has significant limitations:
- **Technology dependence** and high initial costs.
- **Reduced biodiversity** and negative environmental impacts (intensive fertilizers and pesticides, even if advanced, can cause long-term damage).
- **Limited social sustainability**: tends to exclude small farmers, exacerbating rural inequalities.
- **Standardization of production,** reducing adaptability to local context.
- **Short-term focus,** neglecting long-term sustainability.

In contrast, farming according to nature represents an approach that focuses on collaboration with natural cycles, **soil regeneration**, **biodiversity** and **lasting sustainability.** An example of this philosophy is **polyculture,** which allows multiple species to be grown in the same plot, making the most of natural synergies. Each plant contributes to the overall balance of the ecosystem, making it less vulnerable to pests, diseases and climate change.

Farming according to nature means working **with the environment**, not against it, ensuring healthy food and more balanced territories for future generations. The MANS method offers solutions that are more sustainable, economical and suitable for small and medium-sized farms, favoring harmony with natural cycles.

The industrial model, on the other hand, focuses on advanced technologies and high yields, often at the expense of biodiversity, soil health and affordability.

Here is a comparative prospectus showing how the MANS method, applied to viticulture, promotes high quality, environmentally friendly and climate change adaptable production, with a focus on biodiversity, resilience and enhancement of local grape varieties.

Prospetto Comparativo sulla Viticoltura.

TILLAGE

MANS Method (natural and sustainable)

– Shallow tillage to minimise soil disturbance and preserve the natural structure and microbial life.
– Use of hand or light tools to reduce the impact on the soil..

Industrial Method

– Deep tillage (even more than 1 metre) by mechanical means to increase root penetration.
– Heavy machinery that compacts the soil and can alter the water balance.

PLANTING

MANS Method (natural and sustainable)

– Manual planting of rooted cuttings, avoiding cutting the roots, to encourage natural rooting and balanced growth.
– Maximum attention to root positioning to ensure natural contact with the soil, with deep watering with natural products that stimulate rooting.

Industrial Method

– Mechanised planting with (partial) cutting of the roots to facilitate deep insertion of the vines.
– Standardisation of planting to speed up the process, sacrificing the natural relationship between roots and soil.

SOIL MANAGEMENT

MANS Method (natural and sustainable)

– Permanent grassing to preserve soil structure and fertility.
– Natural mulching (e.g. straw, compost) to retain moisture and prevent erosion.
– Wild cover crops (e.g. clover) to improve soil health and reduce weeds.

Industrial Method

– Possible mechanised tillage to improve aeration and facilitate operations.
– Chemical fertilisers to ensure rapid growth and constant yield.
– Grassing often followed by chemical herbicides on the row to eliminate competition between weeds and vines.

BIODIVERSITY

MANS Method (natural and sustainable)

– Intercropping of vines with aromatic plants (e.g. lavender, rosemary) to attract pollinators and repel pests.
– Use of indigenous varieties
– Preservation of hedges and habitats for beneficial insects.

Industrial Method

– Grassing often followed by chemical herbicides on the row to eliminate competition between weeds and vines.
– Monocultures with standardised vines for high yield.
– Use of vines based on assumed market needs.
– Elimination of non-productive flora to maximise cultivable space.

CLIMATE AND MICROCLIMAT

MANS Method (natural and sustainable)

– Agroforestry to create shade and protect grapes from heat and hail.

Industrial Method

– no form of agroforestry

SOIL FERTILITY

MANS Method (natural and sustainable)

– Organic compost and natural soil conditioners to enrich the soil.
– Rotation of neighbouring crops to enrich the soil with nitrogen and nutrients.

Industrial Method

– Controlled-release fertilisers to ensure constant nutrition.
– Use of chemical additives to quickly correct nutritional deficiencies.

PESTS AND DISEASES

MANS Method (natural and sustainable)

– Biological control

– Associated crops to repel pests (e.g. repellent plants).

Industrial Method

– Synthetic pesticides to eliminate pests and fungi.

– Use of precision chemicals distributed by drones or machinery.

CLUSTER QUALITY

MANS Method (natural and sustainable)

– Balanced bunches thanks to natural soil and microclimate management

Industrial Method

– Standardised bunches with high yield, but sometimes less aromatic quality.

ECONOMY AND ACCESSIBILITY

MANS Method (natural and sustainable)

– Low initial costs due to local and natural solutions.

– Enhancement of the quality of indigenous wines on the market.

Industrial Method

– High initial investment in advanced technology and infrastructure..

– Mass production to compete with global markets.

The Natural and Sustainable Agricultural Method (MANS), with its focus on biodiversity, agroforestry and regenerative practices, offers a complementary model capable of filling the gaps in industrial agriculture. The combination of advanced technologies with natural approaches could provide an effective balance to address future climate challenges.

Integrating these two philosophies would make it possible to preserve the **quality of territories** and the **health of ecosystems** while enhancing **agricultural production**. In this way, agriculture can evolve towards a system that not only meets current needs, but also protects resources for future generations.

Ultimately, **farming according to nature**, as MANS proposes, means investing in a more resilient, harmonious and responsible agriculture, capable of transforming climate change from a challenge into an opportunity for sustainable innovation.

'It doesn't end here: in the next episode, we will explore together the final insights, where reflections and perspectives intertwine to reveal new horizons.'

SUSTAINABLE NATURAL AGRICULTURAL METHOD. Part 12

Conclusion.

We have reached the conclusion. Two important reflections emerge at this point.

First reflection. The first reflection concerns the number of principles: why eight and not ten, fifteen, or perhaps less than eight? I chose the number eight for several reasons, but certainly the most important are two.
The first is that it seemed to me a balanced and suitable number to describe the MANS method. Adding other principles could have made it dispersive.
The second reason lies in the symbolic properties of the number 8, which are closely linked to concepts such as balance, harmony, infinity, renewal and synergy, which are also the guiding principles of the method. The Pythagoreans regarded the number 8 as a symbol of perfection and completeness. In Egyptian civilisation, eight was linked to creation: the 'Ogdoad' of Hermopolis represented eight primordial deities, organised in male and female pairs, who embodied the fundamental forces of creation. Also in Chinese culture, the number 8 was considered a symbol of prosperity and good fortune. Finally, I recall that the octagon, a geometric shape closely related to the number 8, is often used in sacred architecture, such as in Christian baptisteries and temples, to represent the bridge between earth (square) and sky (circle).
If we wanted to go deeper, we could discover even more symbolic aspects linked to the number 8. However, let us stop here, because the connection between earth and sky remains the central concept. This theme is at the heart of many agricultural philosophies, such as biodynamics, where the earth is seen as a living organism in continuous dialogue with celestial forces. It is no coincidence that preparations 500 and 501 of the biodynamic method serve precisely to enhance this connection.

Second reflection. The second aspect to highlight, as you will have noticed, is that whenever one principle is mentioned, it is inevitable to recall all the others, without which that principle could not exist. This is quite normal and consequent to the fact, repeatedly stated, that **in nature everything is interconnected,** everything is closely related.

We think about cycles, symbiosis (the cooperation between species), ecological networks. For me, it is already a wonder to simply observe the seasonal cycle of annual grasses. With the arrival of spring, the soil needs to be regenerated, purified and vitalised, and dandelion, nettle, shepherd's purse, cress appear. Then comes summer: the herbs bloom, refresh and aromatise the environment, attracting pollinators: this is the time for camomile, mint, lemon balm and many other medicinal herbs. In late summer, however, the soil hardens and becomes very hot. Most annual plants die, feeding the next cycle. Then extremely leathery, deep-rooted herbs emerge, often aromatic and rich in essential oils: this is the time for the beautiful blue and purple flowers of wild chicory, wild fennel, plantain and wild carrot.

The herb cycle is a perfect example of balance and interconnection. If we observe carefully, wild herbs follow the rhythm of nature: in spring they purify and regenerate the soil; in early summer they reach their peak, attracting pollinators and spreading fragrances; in late summer they ripen their seeds and close the cycle, preparing the earth for winter rest.



Nothing could be simpler and yet complex. Nature is like that: complex to be simple and simple to be complex. Its apparent simplicity conceals an intricate system of interconnections that works with such grace and efficiency that it seems almost obvious. This paradox is an invitation to look beyond appearances and understand that simplicity and complexity are not opposites, but two sides of the same coin.
It is a eulogy to the beauty of the systems, ideas and experiences that surround us, that urge us to find the essential in the process, in the 'journey of discovery'.

Instead of being overwhelmed by complexity, we can look for that 'common thread' that gives meaning to the whole system. We need to go beyond appearances, both when we face complexity that seems chaotic and when we come across simplicity that seems trivial. This invites us to develop a deeper attention, capable of grasping fundamental truths and the wonder hidden in everything. It is a praise for curiosity, contemplation and discover.

That is why the MANS method places so much emphasis on observation.

In agriculture, observation is the key to understanding and working in harmony with the rhythms and needs of nature. This ability, which requires attention, training, sensitivity and patience, transforms the farmer from a simple operator into a true custodian of the land.

We must observe:

- **To understand the environment:** the soil, the seasons, the plants.
- **To check for harmony with nature: natural** cycles, insects, wild herbs.
- **To identify problems to be solved:** pests, imbalances in the soil and plants.
- **To value biodiversity:** local flora and fauna, associations.
- **Out of respect and gratitude** for the wonder that nature continually offers us.

An invitation to change perspective.

And here we come to the conclusion of the MANS method, which is not limited to rules and techniques, but is also an invitation to change perspective.

We must dwell on the contrast between the aesthetic and harmonious language of nature and the rational and cultural language of man. Nature expresses itself through phenomena, images and beauty, using a universal language that conveys balance and cyclicity. Every natural event, like a seed that retreats into the earth to gather energy before emerging towards the sun, is part of this universal melody.

Man, on the other hand, has created his own idiom made up of words, morals and values, which is often in dissonance with the natural language. Human morality, while inspired by the ethics of nature, tends to translate it into conflicts, ideologies and judgements of good and evil. The shadow, which in nature is a place of regeneration and wisdom, becomes for man a symbol of negativity and discomfort.

The oak tree, which unites earth and sky, reminds us how important it is to remain rooted without forgetting our origins. However, modern man tends to ignore this connection, seeking to control nature instead of collaborating with it.

Applying a natural and sustainable agricultural method is possible, but first of all I invite you to 'understand the language of beauty'. This means abandoning the desire to dominate nature and learning to listen to it and harmonise with it. It is a path that requires humility, sensitivity and attention, qualities that are often neglected in the frenzy of contemporary life.

As the parable of the man who finds success only when he stops looking for it suggests, true fulfilment comes when we embrace the natural rhythms and welcome life's small gestures with simplicity.

A big greeting to all,

Giovanni Batacchi