The importance of Bio-Dynamie.
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Wine lovers around the world hear more and more about biodynamic viticulture. Only a few years ago, pioneering bio-dynamists were looked at strangely: they had the image of being bizarre organic growers, using funny method to cultivate their vineyards, including using moon cycles, planets and stars… In the past ten years, the opinion of the public has moved from amusement to curiosity and perhaps even to respect, as more and more good vineyards are now being cultivated using biodynamic concepts. What is in fact bio-dynamie? Why is this happening? And how does it influence the wines and their production methods? These are all the questions that most people ask themselves when tasting a wine made from biodynamic grapes.

What is bio-dynamie?

The principles of bio-dynamic farming were defined in 1924 in Germany by Rudolf Steiner, as he responded to farmers that could see their land threatened by the abusive use of fertilizers originating from the growing German industry.¹ These principles can be very succinctly summarized by the following three points:

- the upgrading of the soil and plant life in its natural environment due to the use of products made from vegetal, animal and mineral origin,
- the application of these products at specific times during annual cycle (sun, moon…), this is the dynamic part.² It recognises that the land (earth = mother, sun = father) is an organism in its own right. The biodynamic farmer will choose specific treatments that will mostly bring forces of life to the soil and the plant.
- The working of the soil by ploughing, tilling, blazing…

It’s Goal

Biodynamic agriculture is mainly taking care of the soil. It involves making sure that it is properly balanced and creating harmonious life conditions between land, plants and the environment. Biodynamists believe that the quality of a soil is not made by its chemical composition and structure, but mostly by the quality, quantity and variety of bio organisms existing in the sol. Bio-dynamie will seek improvement of the quality of the soil by the presence of large variety of bacteria, mushrooms, worms…in order to help the plant with

Rudolf Steiner gave a series of conferences that established the base of bio-dynamic farming. Already in 1924 he warned farmers not to use animal proteins as food substitutes to animals not capable of properly assimilating them, because this would make them “mad”.
² Maria Thun « Calendrier des Semis » Mouvement de Culture Bio Dynamique. This is a specific calendar that indicates all information concerning solar, moon, planet and constellations positions as well as precious information to bio dynamist farmers.
thicker, healthier and longer roots as well as a better development of leaves, flowers in providing them the energy required for a harmonious growth.

**Bio-dynamic in grape growing**

A vineyard can be considered as a living organism in biodynamic vision. Cultivated soil is not just a simple support for vines, but rather a living environment, a source of energy for the vine just like its outdoor environment.

In this way, the vine - a median organism – creates and nourishes its soil in this inhabited and living environment that surrounds the roots. The exchanges that take place between the root and the foliage systems enable the soil characteristics to be transferred to the grapes, increasing the quality of their flavour. A 1000 years of viticulture certainly does change the soil. Vines will then completely transform the structure and life, in a way, creating its own ‘terroir’. ³

Bio-dynamist vignerons believe that most soils are not structurally unbalanced or lacking certain elements. In most cases, there isn’t enough life surrounding the roots, making them incapable of finding those elements, often locked up in very stable humus/mineral complexes that can only be unlocked by a rich organic life in the soil.

Modern agriculture, ironically called ‘conventional’, has developed fertilizers that act like salts, ready to dissolve in contact of water in the soil, thus ready to use for the vines, but also migrating very quickly to the water table, causing massive pollution problems.

Are vines meant to produce wine? Wild vitis vinifera will only produce grapes under certain stress, as the plant fears for its existence and wants to produce seeds. The yearly pruning done by the grower will provoke fruit every year. It is the genius of the vigneron, not the ‘producer’, that will use the fact that the vine will store all the elements vital to the survival and future growth of the peeps in the grapes, and make good wine with it.

Bio-dynamists use different products, mixtures of animal, mineral and vegetal matter, to compensate the risks of imbalance due to a one-crop farming:

- M.T. (from Maria Thun) is a small manure compost that support and reinforces the decomposition process of the soil, around 120 g/ha
- P500 (horn manure) reinforces subterranean life and roots growth, around 120 g/ha
- P501 (horn silica), brings warmth and sun energy to the leaves and fruits, only a few grams/ha.

These three preparations must go through the dynamisation process before being used on the soil or the leaves.

- other preparations, made from Achillea, Camomile, Nettle, Oak bark, Dandelion and Valerian have all undergone transformations, removing all their primary properties by transforming them into humus with specific qualities. These preparations are necessary as they will be used in the biodynamic compost, in order to adjust the fermentation required for correctly balancing and harmonizing the soil and plant life.

³ Claude Bourguignon, Laboratoire de microbiologie des sols. www.lams-21.com . Research shows clearly the importance of micro organisms such as mucchorize (microscopic mushroom living in symbiosis on the roots of the vine), allowing the roots to adsorb mineral substances from the soil)

⁴ Dynamisation : bio-dynamic preparations are dissolved in pure fresh water in a copper, wood or ceramic container. The water is then violently rotated in one direction, creating a vortex, and then, abruptly the direction changes forcing the water to turn in the other direction, breaking the vortex and creating a chaos. This is done alternatively for 20 to 60 minutes. The aim is to give to the water all the influences from the preparations and the cosmos.
Bio-dynamie also give great importance to the cultivation of the soil, not just as an ecological method to remove weeds (instead of using herbicides!), but also in order to favour the installation of life process, by tilling the soil at different periods of the year, month or day. In this manner, hoeing during the lunar spring will have a different effect than during the lunar autumn. Working the soil in the morning will give vitality to the vines, while hoeing in the afternoon will help keep the water in the soil and help the vines resist to droughts. Some days will favour plant growth, some other will stop the weeds to develop… such examples are numerous.

If the soil is properly balanced, the plant will protect itself against, rather than attract, parasites, cryptogams, insects… However, the farmer will have to help keep the plants healthy by using herbal teas, decoctions or homeopathic plant dilutions and, if necessary, natural products such as Bordeaux mixture or sulphur dusting.

Wine grower’s motivations to go bio-dynamic

Bio-dynamie is more than just an organic farming technique. Reasons to go biodynamic are multiple:
- research of a certain life philosophy (anthroposophy),
- concern about the future of our soils and ecosystem (are our vineyards able to continue to produce great wines for the next 1000 years with conventional techniques?),
- interest in experimenting different methods to solve viticultural problems,
- certification in organic or bio-dynamic products ⁵,
- marketing/sales effect of using biodynamic principles….

On the last point, it is very rare to see wine growers that have successfully worked in bio-dynamie over 3 years on their entire estate (a minimum condition to be either Demeter or Biodyvin certified) if they are only motivated by the marketing image of being an organic/ bio-dynamic ‘producer’. The most ardent practitioners of bio-dynamie do not always advertise it, even when they are properly certified.

In some warmer climates, where sun damage can be even greater, it is possible to see some retro-gradation of the soils. In a normal soil, not compacted by heavy machinery and full of life, the mother rock produces earth under the action of the plants and life (some theories would even mention that plants are older than arable land in certain conditions !). In a dead soil, poisoned by abusive use of herbicides, chemicals, and fertilizers and asphyxiated by severe compaction, it is the opposite that happens. Crystallisation (mostly calcium in France) around organic matter not decomposed will provoke a retro-gradation of the arable land back into crystals and eventually rocks. This is the classic process of desertification, that some areas in France are witnessing today. Bio-dynamie, and especially the use of certain preparations, can bring such soils back to life, sometimes in a spectacular way, if the process is not to engaged.

Does it work?

In 7 years of biodynamic practice on our estate (which is really very short in fact), we have seen and also experimented multiple effects of biodynamic principles on the vines. About a decade ago, we decided to produce our own compost, being unsatisfied from organic commercial compost (they lack the life that makes composts interesting). We tried for years to produce high quality compost, but experienced great difficulty, until the year we were able to collect only biodynamic manures and saw a great improvement in the quality of the compost. We decided then to apply all the 6 preparations in order to energise the compost and saw an even greater improvement. The result was a compost of formidable structure, fresh smell and full of organic life. This experience convinced us to use all the biodynamic principles in our vineyards.

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⁵ 2 organisms certify the proper use of bio-dynamic farming principles: DEMETER (international organisation) and BIODYVIN (syndicat international des vignerons en culture bio-dynamique) (www.biodyvin.com)
Other wine growers have entered the biodynamic world through similar experiences: vine roots development after using P500, transformation of un-decomposed humus when using M.T., reaction of the vine and leaves to the powerful silica (P501)… All such experiences are often eye opening for many estates.

Proper scientific studies and experiment are rare in bio-dynamic. Most preparations are prepared by the growers (François Bouchet explains in his book how to prepare and use them) or cost very little to buy. There is little commercial value in such preparations, therefore no large companies invest in the research in bio-dynamic, unfortunately. Public organisms in France are today investing more in research and development of clonal material, genetically modified rootstocks or vines…

Ultimately, the final motivation for most growers persisting in biodynamic practice for years is the research of quality in their wines through a living organism, the soil, capable to give to the grapes and the finished wine all the characteristics that define a true terroir.

The Syndicat International des Vignerons en Culture Bio Dynamique (SIVCBD), which delivers the Biodyvin certification, has started an extensive research program in cooperation with the Enigma Laboratory of Pr Philippe Coulomb. Annex 1 and 2 describe the work done in 2002/2003. Annex 3 describes the research more specific on the different preparations 500/500A/501 used in bio dynamic.

**Is it more expensive?**

Biodynamic preparations are inexpensive to make or buy. A lot of the plant decoctions are made by the growers themselves at little cost. Some biodynamic wine growers actually do make some savings on their purchases, as they buy no more herbicides, chemicals, and systemic spraying products….. Unfortunately, not using such products, often means a huge increase of manual labour and time spent using expensive equipment, in order to be able to replace the chemical molecule. For example, commercial fertilizers are very cheap and 100 kg of nitrates per hectare are enough to boost a vineyard to an incredible 100 hl/ha production. It will take a few minutes for one person to spread it. It is another story for 10 tons of compost per ha, especially if the slope forbids the use of tractors. Buying manure from bio-dynamic farms is relatively expensive, often means lots of manipulation/labour to collect it, and requires lots of space and time to prepare the compost and equipment (trucks) to bring it to the vineyards and spread it.

Complications start when one realizes that, in bio-dynamic, there are no curative solutions. Everything is preventive, obliging the viticulturist to be constantly in his vineyards, observing his soils, vines, detecting the slightest sign of ‘pre’ problem and react to it.

If bio-dynamic products are often cheaper, their numerous and more complicated applications (dynamisations, short life of the preparations, calendar restrictions…) result in more spraying equipment and labour force (for example, it is not possible to mix bio-dynamic preparations with classic Bordeaux mix; P501 has to be done only certain days and before the sun shines !). Most products against parasites are used in tiny quantities (100g/ha for Bordeaux mix for example) and are classified as ‘contact’ products. This means that they can be washed away with as little as 1 inch of rain or are efficient for only 10 days. This obliges the grower to repeat frequently the sprayings, with different equipment.

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6 The S.I.V.C.B.D. has started an experimentation program on bio-dynamie with the laboratory Enigma. First results can be seen on their web site (www.biodyvin.com)


8 Nicolas JOLY : Le vin du Ciel à la Terre ; edition Sang de la Terre.

9 Enigma (Etudes des Effets Non Intentionnels Générés par les matières Actives sur la faune auxiliaire et le végétal) www.enigma-France.com. The complete work done in association with the SIVCBD can be found on www.biodyvin.com
Soil cultivation can also cause massive cost increase (certainly the biggest investment for an organic grower) compared to the use of herbicides. A yearly herbicides program will cost between 150 to 300€ per hectare. One person will do 2 applications in roughly 1 to 2 hours per ha. Working the soil with a tractor will need between a minimum of 4 to 6 (or sometimes more in a warm humid year) different ploughing, often with different equipments and various results and efficiency. In an easy topography (flat alluvial vineyard land for example) it will take 2 to 6 hours per ha to cultivate one time only each row in a high density vineyard. This will have to be done by a skilled driver, using much more complicated and expensive tractors and equipment than a simple herbicides spraying machine.

Basically, every estate will eventually need all kinds of machines, in order to adapt them to different soil characteristics, weather or slope; and eventually, manual hoeing will be needed, especially around the vine stock.

When the slopes get steeper, it becomes more complicated and costs increase exponentially. Physically, the work becomes also harder (manual ploughing, winch or horse traction). Using a winch or a horse cost about 50€ per hour, and it takes 1 to 4 days/ha to do only one soil cultivation.

Bio-dynamists often have a strong quality ideal, and will develop systems that will cause dramatic cost increases. One of the easiest to understand is the drop in yield and production per vine, often associated with an increase of the vine density per hectare. Top quality wines are made from low yielding vineyards but also from high density, in order to reduce the amount of grapes per vines, increase the ratios leaves/grapes and roots/grapes. No calculator is necessary to understand all the cost impact on a bottle in cultivating a 10000 vines/ha vineyard producing only 35hl/ha compared to only 3000 vines producing twice as much ! Often lower density vineyards will allow bigger, larger, heavier tractors, that are actually half the price of specific, narrower, lighter, rubber caterpillar systems that respect more the soil.

Respect of the soil is also a big concern for bio-dynamic growers. Compaction will cause severe damage on the structure and therefore life in the soil. If there is no oxygen, there is no life and therefore no roots development. In compacted soil, roots are often found very near the surface, unable to explore the soil deeply and therefore unable to bring the soil characteristics to the grapes. A mechanical harvester will do almost more damage to the soil than the grapes ! The lightest machine will always be heavier than a person, for this reason, a lot of bio-dynamists prefer to use manual labour than the equivalent in machines. The work is also better done and the vine always rewards the presence of the grower in his vineyard. (Our estate employ 26 permanent persons, beside harvest, in order to produce an average of 15000 cases from 40 ha. In cost, this represent 6.5 times more labour/ha than the average in Alsace).

Of course, none of these operations are strictly bio-dynamic and none of them are compulsory to be certified. It explains why there is a big graduation in prices in conventional, organic and bio-dynamic wines.

Is it worth it ?

Bio-dynamic farming respect the earth and life in general. It doesn’t generate pollutions (no pollution is sustainable !), doesn’t releases poisons or toxic products in the air, soil, on the plants (grapes) or water table and is perfectly integrated in a durable agricultural system for the long future, even in the case of a one-crop system like grape growing.

Beside those environmental and health concerns, wine lovers around the world should seek personality and true character in their wines. Over yielded vineyards, dead soils, vines nourished with mineral salts… cannot produce grapes with a true original expression. They will only reveal the chemical characteristic of the products used by the wine ‘producer’. Such grapes will need skilled wine ‘makers’ that will use lots of makeup to disguise a total lack of personality. Oenologists invented aromatic cultured yeasts, new oak and all sorts of marvels that only give the same characteristics to all the wines. Only farming principles that respect life will allow wine ‘growers’ to truly express the characteristic of their climate, grape variety and soils in their wines.
Of course, wines are judged on their aromatic complexity, harmony, pleasure potential, concentration, ageing potential, and personality… Wine should also be judged on its none palatable quality. While drinking a bio-dynamic wine, the drinker also absorbs in his body all the forces of life that were mobilised to create it. Do we really want to put in our body all the destructive forces used in conventional farming?