Biodynamics[1]

There are essentially only six types of wine (red, white, pink, still, fizzy or fortified) and only four broad ways of growing the grapes:

1) Conventional, using modern farming techniques which include soluble fertilizers ('NPK') developed in the late 19th century and weedkillers, systemic (sap-penetrating) fungicides, and pesticides developed after the 20th century's two world wars (organophosphate pesticides were developed from nerve gas technology). These products are controlled by regulators who say they are safe and pose no risk to human health or the wider environment. Products found to be risky must be withdrawn. Most wine, food and even the textiles for our clothes are grown "conventionally".

2) Sustainable or "low input" which is essentially the same as conventional but with reduced volumes of largely the same range of inputs, with use of some of the so-called "harder" chemical sprays actively discouraged. Using climate data (high humidity, dry periods) growers can plan ahead for disease outbreaks so they spray or irrigate only when they need to. This saves waste, time and money.

3) Organic which prohibits the use of the conventional inputs mentioned above but relies more on disease prevention eg. better winter pruning and canopy management during the growing season (leaf plucking, shoot positioning); cover crops, compost and rocks dusts which feed the soil (microbes) rather than the vines for higher soil fertility but reduced yields (and thus reduced risk of disease). Contact sprays (which wash off grapes) like Bordeaux Mixture and sulfur for disease control of the two mildews can be used (these are also widely used in conventional/sustainable systems). Systemics may not be used in organics. Organics generally produces lower yields with lower inputs hence organic growers often demand higher prices for their products which, they say, are better for us both environmentally and nutritionally.

4) Biodynamics which has organics as its base but which also uniquely seeks to moderate and regulate the biological processes in nature ("Bio") whilst enhancing and stimulating forces that form or shape material substance ("Dynamics"), both on the farm and within the farmer via the use of nine biodynamic preparations (three as field sprays, six in compost) with the goal of making farms/vineyards self-sustaining living organisms. As wine is about managing living organisms - fungals in the vineyard, yeast in the winery, and bacteria in the wine – biodynamics and wine seem a good fit.

[1] Abridged from: '*Monty Waldin's Biodynamic Wine Guide 2011*' (England, 2010)

Origins of Biodynamics

Biodynamics dates from Rudolf Steiner's 1924 "*Agriculture*" course. Biodynamics is the oldest "non-chemical" farming system (organics dates from the 1940s). Steiner (and others) felt that the rapid industrialisation of how food was grown (farming), of how things were made (manufacturing) and even of how people communicated (the telegraph) was both cause and consequence of human spiritual weakness, spiritual weakness meaning humans' collective inability to use their "senses" rather than their lack of attendance at church. He felt centuries of peasant wisdom regarding how plants grew, when to gather them and the plant and animal worlds' inter-connectedness to Earth and the wider cosmos was about to be obliterated by rational, scientific progress. While science had it merits it was, Steiner felt, neither infallible nor capable of explaining everything in either our physical world or the spiritual aspect of reality which lies behind it.

As a university student in his native Austria[2] in the 1880s Steiner (1861-1925) abandoned his scientific studies, and was soon asked to edit the scientific writings of Germany's most famous writer and poet, Johann Wolfgang von Goethe (1749-1832). Goethe's pioneering work in phenomenology and the organic sciences provided Steiner with what he had yearned for, the bridge between the seen physical world and the unseen spiritual world.

Goethe's phenomenological approach held that through regular observation of plants, animals or other living organisms in all stages of their growth, inner and outer pictures of their processes of movement and their changes of form could be developed. Goethe's approach asks us to think about how plant growth is affected by intangible but identifiable "nitrogen processes" rather than merely by how much nitrogen a plant has been fed with, which is the approach of physical chemistry, for example. Vines for example can be seen as sun-seeking plants which climb trees (in the wild) because they are being pulled upwards by solar forces, however their potentially deep root systems show how they are also being pulled inwards or down into the earth. The best wines are often described as having ripe fruity "sun" flavours combined with terroir-driven "earthy" notes.

While working on Goethe's archives in Weimar, Germany from 1890 to 1897 Steiner published his own seminal work called *The Philosophy of Freedom* (1894). Its anti-materialist thrust, that humans become spiritually free only through the conscious activity of thinking, was the basis of Steiner's own theory of spiritual science or "Anthroposophy", from the Greek *anthropos* or "wisdom of man".

Steiner became a prolific writer and intellectual. The First World War then wrought abrupt and massive social and economic changes, not least the fact that Europe's farms lost many of its farmers and farm hands. Technology and science were ready to fill the gap. However some farmers sensed their farms were becoming much weaker with modern farming techniques: steel ploughshares and biologically 'dead' soluble fertilizers did produce bigger yields but of only lower quality crops and livestock. They asked Steiner for solutions.

[2] Steiner's birthplace of Kraljevec was then part of the Austro-Hungarian empire but is now part of Slovenia

Steiner's 1924 "*Agriculture*" course[3] was his answer to the farmers' concerns. Steiner said that the human spirit and our ability to "sense" needed a boost. For this we needed to eat food which was more (spiritually and bio-chemically) nutritious. To get that we needed to remedy the food crops and this would only be achieved by remedying the soil in which they grew. Steiner's tool for remedying the soil was via nine biodynamic preparations. These are made from medicinal plants, the mineral quartz and cow manure. Although these preparations are not homeopathic treatments *per se*, they are used in homeopathic quantities, meaning they produce an effect in extremely diluted amounts. The methods used to make the preparations can seem strange initially but anyone, even children can (and do) make them. This is because they are neither hi-tech, expensive or harmful and nor are they protected by trade secrecy laws meaning they can never realistically be made purely for profit; and they seem to get good results, both for farms and for farmers. The nine preparations are essential to biodynamic agriculture and their use is the main requirement of Demeter, the organisation which has overseen biodynamic agriculture worldwide since 1928.

The nine biodynamic preparations

Rudolf Steiner created the nine biodynamic preparations from natural substances – medicinal flowers and bark, cow manure and our most abundant mineral, quartz. Making the preparations involves sheathing some of these substances in specific animal organs to enable their medicinal properties to become fully effective once applied to the farm via compost or as sprays. Understanding each preparation becomes easier if one thinks of the substance (animal, mineral, plant) itself, the (animal) sheath it is prepared in if one is used, whether the substance/sheath undergoes a transformation by being buried in the earth or hung in the air or soaked in water, the time of year it is made, and the period of the year through which it is left to transform.[4] Note that the animal sheaths used to make the biodynamic preparations are not used on the crops or land but are re-used (in the case of the horns) or discarded.

Three Field Sprays

Horn Manure '500'

Soil spray made from cow manure buried in a cow horn over winter and applied at 30-120g/ha after one hour stirring (dynamising) in water. Stimulates root growth and humus development. Establishes relationship between plant and inner planets (moon, Venus, Mercury) and earth forces, allowing vines to create their own sense of self and self-expression, their "me-ness", by expressing themselves vertically downwards underground via their roots. It is the very basis of the concept of biodynamic *terroir*. Lovel[5] calls horn manure 500 the quintessential humus, the basis for intelligence and self-awareness, a central nervous system for the farm organism; the horn silica 501 then provides the sensory organs so that this self-awareness can be expressed and the farm manifests its own farm individuality. In wine-speak this means that each

---

[3] Steiner, Rudolf., *Spiritual Foundations for the Renewal of Agriculture* (Bio-Dynamic Farming & Gardening Association, Inc. USA, 1993) trans. by C. Creeger and M. Gardner
[4] Berger, Ed., 'Oak-Bark Preparation, Observing and learning from oak trees', *Star and Furrow* 102/2005, p.27.
[5] Lovel, Hugh., *A Biodynamic Farm* (Acres USA, 2000), p.99.

biodynamic vine should be capable of expressing its own micro-terroir via its grapes and wine. This contrasts with our normal approach of seeing *terroir* expression as collection, a "vineyard-rather-than-vine" thing.

Horn Silica '501'

Atmosphere spray made from ground silica (quartz) buried in a cow horn over summer. Applied at 5g/ha after one hour stirring (dynamising) in water. Stimulates and regulates plant growth. Steiner[6] said that "it is through silica that the actual cosmic factor is absorbed by the Earth and becomes effective." He also said that "everything active in silica-like substances contains forces that do not originate with the Earth, but rather with the so-called distant planets - Mars, Jupiter and Saturn. These planets are working in the siliceous substances." Silica's relationship with these higher or so-called "warmth" planets is said to give it the ability to make a tremendous impact on the light assimilation of plants. Around 90% of a vine's annual growth above ground results from photosynthesis and the atmosphere rather than from the roots and the earth. Stimulating photosynthesis - the transformation of invisible, intangible, cosmic matter into matter - in the leaf helps chlorophyll formation which in turn stimulates enhanced fruiting (fertilisation) both in the year the vines are sprayed, and in the following year too because reserve buds form on the current year's fruiting shoots. This in turn enhances seed formation and means grapes are more disease resistant. The vines produce grapes with enhanced aroma, colour, flavour and nutritional quality (lower nitrates, increased dry matter) and their wines keep better.

Thus horn silica 501 complements horn manure 500 by putting the silica-rich flesh on the horn manure 500's calcium/lime-filled bones.

THE TWO BIODYNAMIC HORN PREPARATIONS – A SUMMATION

The two horn preparations can be seen as equals and opposites, especially since Steiner said that the oxides of calcium and silicon (lime and silica) were the two opposite poles of life chemistry. Horn manure '500' supports what Steiner called the earthy or lime/calcium principle while horn silica '501' supports the opposite cosmic or silica principle. Horn manure 500 works with the etheric or life force energy of the earth itself, and comes to expression in the growth of the plant, working on the plant 'directly' and in a 'building-up' way below ground, mobilizing the roots and humus, allowing the forces of the nearer planets (Moon, Mercury and Venus) to help plants grow and reproduce. Balance comes with horn silica 501 which ensures that whatever is produced in the way of crops is ripe, tasty and healthful.

Common Horsetail '508'

Crop or soil spray made from the silica-rich horsetail plant (*Equisetum arvense*). Suppresses fungal disease by "tightening" plants. Horsetail is a green plant that propagates itself by fungal spores, not seeds and is seen to have "conquered" the fungal realm. After all silica sachets in your camera or laptop bag keep the electronics from going mouldy.

NB: these three field sprays are first stirred or "dynamised" before use. See *Dynamising*, below.

---

[6] Steiner, op. cit., p.82.

The Six Biodynamic Compost Preparations

Around 1/16th ounce (1.75 grammes) — a level teaspoon (5ml) — of each of the six biodynamic compost preparations (502-507) is added per 7-10 tonnes of compost.

Yarrow '502'

Made from yarrow flowers (*Achillea millefolium*) stuffed in a stag's bladder. Yarrow's perfectly balanced relationship with potassium and sulfur forces allows plants to connect with the outer celestial sphere.

Chamomile '503'

Made from chamomile flowers (*Matricaria chamomilla*, *Chamomilla recutita*) stuffed in a cow intestine. Chamomile's relationship with sulfur and calcium forces allows it to stabilize nitrogen forces in the compost, which allows the whole biodynamic composting process to run smoothly.

Stinging Nettle '504'

Made from Stinging nettle (*Urtica dioica*) shoots and leaves (not roots) buried in the earth (no animal sheath). Stinging nettle's relationship to iron forces means it already has enough "intelligence" Steiner said and has no need of being sheathed in an animal organ. In compost stinging nettle reinforces the work of all the other preparations.

Oak Bark '505'

Oak bark (*Quercus robur*) buried in an animal skull (cow, sheep, pig) in a wet, mulchy place. Oak trees's strong relationship to calcium forces allow oak trees to grow slowly, live for ages, and show incredible resistance to the weather, pests and disease – all qualities which vines need and will benefit from if the soils they grow in are giving biodynamic compost '502-507'.

Dandelion '506'

Dandelion flowers (*Taraxacum officinale*) stuffed in a cow mesentery (which holds the animal's main internal organs). Dandelion's relationship to silica forces is what gives biodynamic compost '502-507' its capacity to induce a brightness of appearance, health and flavour in crops.

Valerian '507'

Valerian flowers (*Valeriana officinalis*) made into an extract (no animal sheath). Valerian's relationship with phosphorus forces allows it to act like a protective blanket over the compost pile and the humus being created within.

Steiner[7] said he created the six biodynamic preparations intended for compost piles - yarrow 502, chamomile 503, stinging nettle 504, oak bark 505, dandelion 506 and valerian 507 - in response to modern methods of fertilizing which "sometimes give astonishing looking results", but ultimately risk turning potentially top quality crops "into mere stomach-fillers. They will no longer have real nutritive power for human

[7] Steiner, op. cit., p.100.

beings. It is important not to be deceived by things that look big and swollen [high yields]; what is important is that their appearance be consistent with real nutritive power."

Steiner [8] maintained sound and substantial plants would not grow by simply enlivening the watery part of the soil via mineral (water soluble) fertilizers "because no further vitalization proceeds from the water that seeps through the soil. We have to enliven the soil directly, and this cannot be done with mineral fertilizers, but only by means of organic material that has been conditioned to organize and enliven the solid earth itself…infusing the manure with living forces, which are much more important to the plants than the material forces, the mere substance."

Therefore as regulators rather than inoculants or activators the biodynamic compost preparations' main role is to radiate forces rather than to supply material. They act as foci through which various forces and influences can work into the different types of organic matter being composted, guiding and supporting their breakdown to create a harmonious whole which, once spread on the land, makes crop plants more receptive to substances and forces coming from the cosmic environment.[9]

Steiner[10] said making the biodynamic compost preparations 502-507 does take "a certain amount of work…but if you stop and think about it, it actually takes less work than all the fooling around in chemical laboratories that goes on in the name of agriculture, and which also has to be paid for somehow. You will find that what we have discussed is much more economical."

THE NINE BIODYNAMIC PREPARATIONS – A SUMMATION

Rudolf Steiner saw that plants are connected through their roots and soil life not only to every surrounding plant but also to celestial bodies in the far reaches of the cosmos. The biodynamic preparations 500-508 provide the growth and reproductive forces plants need to realise their full potential. Growth forces which help vines' self-expression below ground are provided by horn manure 500 whose calcium or lime forces work with the earth and water elements, thus promoting terroir-driven wines.

These growth forces are then balanced above-ground by the hardening and ripening forces of silica which works with air and warmth to promote taste via horn silica 501, and health via common horsetail 508, combining to promote terroir-driven wines which are ripe and clear.

Steiner said that the elements of carbon (earth), oxygen (water), nitrogen (air), and hydrogen (fire) bind together to make food and wine with the help of sulphur and phosphorus, which bear light forces. Potassium, magnesium and the trace elements are also realized as forces and not just substances and the processes of these forces are what Steiner said biodynamic farmers should be interested in.

The six compost preparations allow forces to permeate the vineyard which promote: the mobilisation of trace elements via sulfur and potassium forces (yarrow 502);

---

[8] Steiner, ibid., p.91-93.
[9] See Soper, John., *Bio-Dynamic Gardening* (Souvenir Press, 1996), eds. B. Saunders-Davies and K. Castelliz, p.42; and West, Lynette., 'Using Liquid Manures', *Star & Furrow* 109/2008, p.16.
[10] Steiner, op. cit., p.101-102.

individual plant health via calcium forces (chamomile 503); overall soil health via iron and silica forces (stinging nettle); overall farm health via calcium force (oak bark 505); the sensitising and balancing of plants to their precise surroundings, namely the plot of earth they grow in as well as exactly where that plot of earth relates to in the greater celestial sphere via silica forces (dandelion 506); the preservation and enhancement of forces brought by all the other preparations via phosphorus (valerian 507). Biodynamic preparations should enrich both the vineyard and the wine-grower in varied, balanced, life-enhancing ways to promote terroir-driven wines which as well as being ripe and clear are also complex and true.

NB: Rather than being a "magic bullet" the biodynamic preparations are the cherry on the 'good viticulture/good farmer' cake.

Biodynamic farms should be Self-Sustaining Organisms

A fundamental tenet of biodynamics is each farm or vineyard should try to become a self-sustaining organism. From a wine perspective vineyards which are self-sufficient are more likely to produce wines tasting of a sense of place or "terroir".

Steiner[11] said that "a farm comes closest to its own essence when it can be conceived of as a kind of independent individuality, a self-contained entity…every farm ought to aspire to this state of being a self-contained individuality. This state cannot be achieved completely, but it needs to be approached. This means that within our farms, we should attempt to have everything we need for agricultural production, including, of course, the appropriate amount of livestock."

In other words, rather than buying in soluble fertilizer (the conventional/sustainable approach), or buying in bio pellets (the organic approach), a biodynamic wine-grower should recycle all waste generated by the vineyard/winery. Composting prunings, grape skins and old filter pads is fine; however, without livestock any farm recycling program soon runs out of steam, Steiner said.

This is because while plants (ie vines) are formative in that they build matter (trunks, shoots, leaves, grapes) they are not capable of transforming this matter. This is the role of animals like wild birds or rabbits which eat berries and other vegetable matter, or earth worms and microbes like mychorrizal fungi on vine roots or even fungi on vine leaves. Ultimately plant matter should be broken down and transformed into humus, a dark, colloidal material which smells of the forest floor and which can be said to be "the soil within the soil". The best way of doing this is via compost which incorporates animal manure and the six biodynamic compost preparations.

Hence biodynamic farmers recognise animals as an integral part of any farm system especially as biodynamics concerns both (etheric formative) **forces** as well as (material) **substances**. Animal manure is key because from a biodynamic perspective manure is not simply vegetable matter that has passed through an animal's digestive system and been broken down (transformed) there. Animal manure is vegetable matter which has also been impregnated with an animal's metabolic forces because of

[11] Steiner, Rudolf., *Spiritual Foundations for the Renewal of Agriculture* (Bio-Dynamic Farming & Gardening Association, Inc. USA, 1993) trans. by C. Creeger and M. Gardner, p.27.

the nervous development the animal exerted when digesting the plants to produce the manure in the first place.

Wild birds or rabbits alone cannot provide enough forces for a commercial farm/vineyard so incorporating livestock as part of the farm organisim is especially beneficial. Cows are favoured because for every acre of land a cow needs to live off her manure can fertilise two acres - hence in "backward" India the cow is both sacred and a key commercial and social tool as part of a marriage dowry. The cow is a fertility machine (20kgs of manure daily, plus milk) – but also a wise, gentle and companionably docile animal to have around.

Biodynamic Compost '502-507'

We tend to think that soil is what makes healthy plants. In fact it is the other way around.[12] Plants grow by their ability to capture solar energy and when they die and decompose they condense what was intangible into that which makes the soil and the humus it contains. Composting is simply a way of getting microbes already present in disparate waste organic materials like plant leaves, plant prunings, plant residues (grape pomace), plants which have been eaten and digested by animals (manure) and other biodegradable waste first to decompose, then to break down into something more homogeneous, and finally to reconstitute what has broken down into something capable of feeding and enhancing soil in the ideal way. Rudolf Steiner[13] said that "in compost we have a means of kindling the life within the earth itself."

Composting allows the recycling back onto the land of the by-products of wine production when microorganisms (mainly bacteria) in manure are allowed to break down organic matter into gas (carbon dioxide), water and most importantly solid, stable humus. The two obvious by-products of wine-growing are cut vine prunings in late winter/early spring, and anything left over from winemaking every autumn, mainly the grape pomace, pressings, stems and lees. Other winery by-products which can also be composted include diatomaceous earth, bentonite finings, used filter pads, even shredded waste paper (a carbon source) from the office.

Grape prunings can of course be recycled *in situ* by being left to decompose by neglect where they fell in the vineyard. Grape pomace, however, is almost impossible to spread evenly across the vineyard because volumes of it are so relatively small. Also, pomace quickly turns vinegary attracting fruit flies so composting it first maintains soil and vine health because the heat generated by the composting process kills off or neutralises undesirable pathogens. Allowing pomace and prunings to decompose into the soil does provide it with moisture and nutrients and might not necessarily do any harm, but the way this fresh meaning uncomposted organic matter breaks down there does little to build the stable soil humus necessary for enhanced soil structure and thus is unsustainable. Growers who take wine from the earth while putting nothing back ultimately impoverish their soils and cannot justifiably claim to respect the biodynamic notion of the Earth itself being a living being.

---

[12] Joly, Nicolas., *What is Biodynamic Wine* (Clairview, 2007) trad. da M. Barton, p.49.
[13] Steiner, Rudolf., *Spiritual Foundations for the Renewal of Agriculture* (Rudolf Steiner Press, 1958) trad. da G. Adams, p.70.

WHAT GOES INTO A COMPOST HEAP?

Compost is made essentially from two main types of organic materials, those with a high nitrogen content and those with a high carbon content. The most common nitrogenous materials are fresh animal manures, fish wastes, and freshly cut green plant materials (weeds, grass). The most common carbonaceous materials include hay, straw, shredded vine prunings, sawdust and other wood waste, dried seaweed, and dead leaves. Nitrogenous materials are less stable than carbonaceous ones – fresh animal manures left on their own tend to putrefy.

CARBON:NITROGEN (C/N) RATIO

The challenge is to make balanced compost from this manure, assuming that the other most common nitrogenous compostable materials like grass clippings, cut weeds or cover crops are rarely to hand because they are invariably left to mulch back into the vineyard soil rather than collected. Balanced compost is defined by the ratio of carbonaceous and nitrogenous materials it contains, the so-called carbon:nitrogen or C/N ratio. Compost with a C/N ratio of 25:1 will contain 25 times as much carbon as nitrogen. Koepf [14] gives some examples of C/N ratios of materials used for composting: sawdust 150:1, straw between 150 and 50:1, and manure with bedding material between 25 and 20:1. Koepf then states that a C/N ratio of between 25 and 30:1 is the ideal mixture from which to begin composting, that finished compost should have a C/N ratio of between 14 and 20:1, and that stable humus in fertile soils has a C/N ratio of between 9 and 14:1.

The main source of carbon for a vineyard compost pile is shredded prunings (if these can be collected from the vineyard) or other woody matter. Research suggests that prunings and woody matter, and also seaweed, help compost piles to develop organisms called actinomycetes. These filamentous bacteria resemble (and are sometimes wrongly described as) large diameter or long hyphae fungi. Actinomycetes give the characteristic earthy smell to soil and help maintain a “forest floor” type ecosystem there, one that some wine-growers argue is especially beneficial to vines which evolved to grow up trees in forests.

The other advantage of carbonaceous matter is that it is more stable than nitrogenous matter, and if the compost pile smells of ammonia it means that nitrogen is being lost because manure in the pile has become too hot due to a lack of carbon to bind it. The pile is overheating. If there is a lack of nitrogen however the pile is too cool and will fail to ferment. A compost pile should smell only when the fresh manure it is being built from is being moved around. Once working the pile should be almost odourless.

Soon after the pile is built it begins to warm up via the activity of microorganisms, mainly bacteria of the type commonly found in topsoil, which are mesophilic, and capable of thriving at moderate temperatures of between 15-40 ºC (77-104 ºF). They rapidly break down soluble, readily degradable compounds but also produce heat.

The rise in temperature encourages thermophilic or heat-loving microorganisms (mainly bacteria of the genus *Bacillus*) to take over the pile precipitating a high-temperature composting phase. This can last from a few days to several months. Ideally the temperature of the pile will rise above 55 °C (131 ºF), the point at which

[14] Koepf, Dr Herbert., *Compost - What It Is, How It Is Made, What It Does* (Biodynamic Farming & Gardening Association USA, 1980), p.5.

many microorganisms pathogenic to humans or plants are killed, while staying below about 65 °C (149 ºF) so that the diversity of bacilli species which help decompose compostable material into stable humus remains.

The high temperature phase is also known as the breakdown phase because this is when organic residues are decomposed into smaller particles by breakdown organisms, ammonifiers, nitrate formers and cellulose, sugar, and starch digesters. After a few days to several months, the compost temperature gradually decreases and mesophilic microorganisms once again take over and the final or build-up phase of the composting process begins, and simple compounds are re-synthesized into complex humic substances by aerobic nitrogen fixing bacteria. The compost is cools and decomposition becomes complete when earthworms (*Lumbricus terrestris*) and red wigglers (*Eisenia foetida*) appear. The suck up bacteria, fungi, protozoa, and organic matter leaving nutrient-rich castings in their path. The compost is finished when the development of humus can be seen because the compost pile has taken on a darker, more homogenous colour[15], and the smell has changed from being raw and pungent to something more mature and earthy.

Usually the six biodynamic compost preparations 502-507 are added to compost piles immediately they are built. This ensures the beneficial forces the preparations carry can radiate throughout the pile's entire composting process.

Dynamising (stirring)

The underlying principle of the nine biodynamic preparations 500-508 is that they are substances which carry etheric formative forces. Carrying the forces contained in the six compost preparations 502-507 over large areas of farmland is made possible by the act of spreading biodynamic compost. The compost brings these forces as well as valuable substances to the soil. For the forces contained in the three biodynamic field spray preparations horn manure 500, horn silica 501 and common horsetail 508 to reach the farm it is first necessary to dilute them in water and then stir or "dynamise" them. The same process is used for the valerian 507, the only liquid compost preparation, before it is applied to the compost.

On one level the stirring or dynamising process allows both the forces contained within the preparations as well as those from the cosmos to reach the land. The theory is water keeps the memory of the dissolved biodynamic preparation[16] and that this "information" can be transferred.[17] On a practical level stirring helps the substances to be thoroughly mixed in the water. The oxygenating effect the stirring has brings a substantial increase of oxygen in the water, up to 75% after one hour of manual stirring according to Pfeiffer.[18] This helps microbes present in for example horn manure 500 or Maria Thun's barrel compost spray 502 507 to multiply rapidly.

---

[15] See Diver, Steve., *Biodynamic Farming and Compost Preparation* (http://www.attra.ncat.org/attra-pub/PDF/biodynam.pdf).
[16] See Schiff, Michel., *The Memory of Water: Homoeopathy and the Battle of Ideas in the New Science* (Thorsons, 1995).
[17] See Schwenk, Theodor., *Sensitive Chaos* (Rudolf Steiner Press, 1996) trans. by O. Whicher & J. Weigley.
[18] Pfeiffer, Ehrenfried., *Biodynamics: three introductory articles* (Biodynamic Farming and Gardening Association USA, 1956).

Steiner[19] described the stirring or dynamising process he intended when discussing horn manure 500: "You must make sure…that the entire contents of the horn have been thoroughly exposed to the water. To do this, you have to start stirring it quickly around the edge of the bucket, on the periphery, until a crater forms that reaches nearly to the bottom, so that everything is rotating rapidly. Then you reverse the direction quickly, so that everything seethes and starts to swirl in the opposite direction. If you continue doing this for an hour, you will get it thoroughly mixed."

When stirring a biodynamic preparation in water in a vertical container a whirlpool effect is created by the wall of water which forms at the centre. Steiner described this as a "crater", but this is now more commonly referred to as the vortex. Jennifer Greene calls the vortex the water's sense organ.[20] This recalls the idea of how six of the nine biodynamic preparations are sensitised to formative forces by being enclosed in sense organs (animal sheaths). The vortex is the water's way of rhythmically ensheathing the forces contained in the preparations. When the direction of the stirring changes from one way to another the vortex is lost as the water seethes and undergoes chaos. This moment of chaos is when the preparation being stirred is said to receive the imprint of the cosmos.

Lunar & other celestial cycles

As well as being the oldest organic movement biodynamics was modern farming's first attempt to take active account of the movements of and forces exerted by the moon and other planets, and by the sun and other stars, when timing agricultural work. Steiner[21] said "it is impossible to understand plant life without taking into account the fact that everything [which happens] on Earth is actually only a reflection of what is taking place in the cosmos." Hence biodynamic farmers accept that life originates from the whole universe rather than solely from what the earth provides.

Full & New Moon (the synodic)

Our closest celestial body is the moon (once itself almost certainly part of the earth).

This cycle relates to the moon's position relative to the sun as seen from earth. It is the lunar cycle we are most familiar with because it governs which if any part of the side of the moon facing us is visible. This is due to the effect of the sun's light from different angles on the moon's surface. The cycle lasts 29.5 days and during it the moon appears to increase in size when it is said to be waxing, and to decrease in size when it is said to be waning.

The moon's influence on earth is felt through the medium of water. Hence full moon may bring extra fungus disease pressure and weed growth because humidity is more active by bringing a more outward expression in plants. On the plus side seeds need

[19] Steiner, op. cit., p.73.
[20] Dagostino, Kathryn., 'A new way of looking at water: an interview with Jennifer Greene', *Applied Biodynamics* 16/1996, p.6.
[21] Steiner, Rudolf., *Spiritual Foundations for the Renewal of Agriculture* (Bio-Dynamic Farming and Gardening Association USA, Inc. 1993) trans. by C. Creeger and M. Gardner, p.129.

light and water to germinate, and tests show that seeds (for vegetables or even cover crops) germinate better when sown just before full moon. Liquid manures/compost are more effective if spread around full moon. New moon is a good time to plough in cover crops because new moon is a time of inward contraction.

Moon-Opposition Saturn

Oppositions occur when celestial bodies stand opposite each other in the sky at 180 degrees, the most obvious one being full moon, when the moon faces the sun. Oppositions can benefit plant growth, with the moon-Saturn opposition seen as especially beneficial. In his 1924 *Agriculture* course, Steiner outlined how the strongest plant growth resulted when there was a balance between the two force poles of lime/calcium and silica. Silica influences plant form or shape while calcium influences plant substance or its matter. Steiner saw that the moon and the inner planets Mercury, Venus supported or enhanced calcium processes, while the outer planets Jupiter, Saturn and Mars supported silica processes. Sowing seeds or working with plants at moon opposition Saturn intensifies both their quality and growth.

Apogee-Perigee

This cycle relates to the distance of the moon from the earth. It takes 27.55 days for the moon to return to exactly the same place relative to earth as it is orbiting it. However, rather than orbiting earth in a perfect circle the moon does a boomerang-style ellipse. This means the moon is nearer earth at certain times but farther away from it at others. The moon's closest point to earth is called **perigee**. Tides are especially strong at perigee, and seeds sown at perigee may produce big yields, albeit of potentially 'watery' crops which store poorly. The perigee moon is said to bring a 'winter' mood because the moon's 'watery' element strongly inhibits the sun's relationship with earth. Fungus disease spores become more active at perigee, especially when perigee and full moon coincide (about once every 14 or 15 months). Ploughing during this 'watery' lunar double whammy might needlessly set soil-borne fungus disease spores in motion while also releasing humidity from the newly turned soil. The moon's furthest point from earth or **apogee** is said to bring a 'summer' mood because the moon's 'watery' element is weakest.

Ascending & Descending Moon

Just as the sun's position in the sky relative to the equator is constantly changing, reaching its highest point in the sky at summer solstice and its lowest point at winter solstice, so the height of the moon in the sky also changes. The only difference is that the moon's rise, fall, and rise takes 27.3 days whereas the sun's takes 365.25 days.

The ascending and descending moon is the only lunar rhythm which differs between the two hemispheres. A descending moon in the northern hemisphere is an ascending moon in the southern hemisphere, and vice versa.

During an **ascending moon** the earth is said to breathe out, and plant growth is concentrated above the soil level, as life forces stream upwards from the roots. The upper parts of the plant fill with sap, vitality and aroma. Ascending moon periods are good times to spray horn silica '501', to sow cover crop seeds (stronger germination), and to harvest flowers for display (longer lasting blooms), or even Christmas trees

(the needles take longer to fall). It is also the time to pick grapes (longer-lived wines). Thun recommends that fruit being picked for storage is best harvested during an ascending moon, for it will keep longer without spoiling, so this is of especial interest to winemakers of *recioto* styles, in which the grapes are dried after picking for days or even months and must not spoil before they are pressed into wine.

When the moon is **descending** the earth breathes in, and growth forces are concentrated underground as sap flows downwards into the roots. This descending or autumn-winter moon period is a good time to work on the roots by applying solid compost, spraying horn manure '500' and other soil sprays, or to cultivate the soil. The descending period is the best time to plant young vines, and to prune, for the sap will be concentrated in the roots. Biodynamic winemakers will also try to take account of the periods of the ascending and descending moon when working in the cellar: for instance by racking wine during the descending phase when sediment will be at its most compact, and wine aromas are less likely to rise out of the wine and be lost.

The Sidereal Cycle

There are eighty-eight constellations in the sky, but the sun, moon and planets only ever pass in front of those twelve along a line called the ecliptic because this is the only place (from our earthy viewpoint) where eclipses can occur. Whereas the sun takes 365.25 days (one year) to pass in front of all twelve of them, it takes the moon only 27.3 days; and whereas in the tropical zodiac, the twelve signs in the zodiac of popular astrology are all the same size (30º) when laid out in a circle the astronomical constellations we see in the sky vary in size, or width along the ecliptic, from Virgin (46º) to Scales (21º).[22] They form the sidereal zodiac, from the Latin word *sidera*, meaning star. Some constellations actually overlap, such as Goat and Waterman, and there are big gaps between others, such as Goat and Archer.

From the 1950s German market gardener Maria Thun (now in her eighties) began researching how the four elements (earth, water, air, fire), plant growth and the moon-zodiac cycle were related. Thun saw four groups each containing three planets which strong strongly influenced the growth not just of plants but of particular parts (organs) of plants.

This followed Steiner's idea of there being four etheric formative forces: the warmth ether which works through the element of warmth or fire; the light ether which works through the element of light or air; the chemical ether which works through the

[22] The signs of the tropical zodiac given by astrologers date from ancient Greece. At that time in the northern hemisphere the sun stood in Ram on March 21, at the vernal point meaning the point in the zodiac where the sun stands when it is exactly overhead on the equator. This is when day and night are of equal length over the whole earth, and is the moment of the spring equinox. However, the sun moves backwards through the astronomical zodiac by one degree every 71.5 years (thus it takes the sun a 'Platonic year' of 25,920 years to make the complete 360 degree circuit). This is called the precession of the equinoxes. Its backward movement means that the sun now enters Fishes on March 11, meaning this is the constellation the sun stands in on March 21, not Ram (or Aries, which is what the astrology column in your daily newspaper appears to suggest). The sun now enters Ram on April 18. By 2375, the sun will stand in Waterman at spring equinox. This text refers to astrological signs using their Latin names (Aries, Taurus, Gemini, Cancer, Leo, Virgo, Libra, Scorpio, Sagittarius, Capricorn, Aquarius and Pisces) and the astronomical constellations by their English equivalents (Ram, Bull, Twins, Crab, Lion, Virgin, Scales, Scorpion, Archer, Goat, Waterman and Fishes).

element of water; and the life ether which works through the earth. These etheric formative forces influenced the shape or form or the plant, rather than its substance.

When the four etheric formative forces are applied to the growth of plants there is an undeniable logic. Higher, seed-producing plants first develop by putting roots into the earth. Then leaves grow which are full of water. With enough leaves plants can produce flowers whose airy scents attract fertilizing pollinators like bees. Fertilized flowers in the vine's case become fruit (grapes), inside of which are the seeds (pips), and this fruit-seed needs sunlight and warmth (fire) to ripen. Thun set out to prove that the moon's movement through the sidereal zodiac catalysed the growth of particular parts ("organs" in biodynamic-speak) of plants as the roots, leaves, flowers, and fruit-seeds found expression in the four elements.

Thun said her results showed that root crops like parsnips and carrots performed best when sown, watered and hoed with the sidereal moon standing in the earth constellations of Bull, Virgin, and Goat. Flowers did best with the sidereal moon in air/light constellations Twins, Scales, and Waterman. Leaf crops like cabbage and lettuce performed best with the sidereal moon in water constellations Crab, Scorpion, and Fishes. Fruit-seed crops performed best with the sidereal moon in warmth constellations Ram, Lion, Archer with fruit crops like vines corresponding especially to Ram and Archer and seed crops (cereals, sunflowers) corresponding especially to Lion.

One difficulty is that the optimum periods identified by Thun only last two or three days at a time, which makes working bigger vineyards to the Thun's sidereal model difficult – especially if the ideal sidereal period coincides with bad weather, a weekend, or a public holiday. The other difficulty is that while Thun sees the moon as transmitting forces from the constellation lying behind it, Steiner saw the moon more as a mirror of what was in front of it." Hence Steiner saw the moon as blocking forces from whatever celestial body lay behind it, as he had made clear in a lecture[23] he gave just before the 1924 *Agriculture* course – the exact opposite of the Thun model. Perhaps this is why concrete proof of the sidereal model advocated by Thun, for whom the moon acts as a transmitter of forces of whichever sidereal constellation lies behind it, remains so apparently elusive.

[23] Steiner, Rudolf, *From Beetroot to Buddhism, Answers to Questions, 16 discussions with workers, Dornach, March 1 - June 25, 1924* (Rudolf Steiner Press, 1999) trans. by A. Meuss.

The Biodynamic Vineyard Year

Autumn – Post-Harvest #1

AUTUMN EQUINOX (21ST SEPTEMBER)

Make and bury Horn Manure '500' (afternoon, descending moon) when the earth's forces are inwardly directed (centripetal) using manure collected a few days beforehand.

BETWEEN GRAPE PICKING & LEAF FALL

Spray (afternoon, descending moon) Horn Silica '501' over the vines a) to help vines send carbohydrates to their roots in preparation for autumn, which Steiner said was the most 'truly fertile moment of the year', and b) to allow vines to enter dormancy fully sealed/protected (openings left by falling leaves cauterize more quickly).

AS LEAF FALL STARTS

Spray (afternoon, descending moon) Horn Manure '500' on the soil (every other row) as a life-giving, fertilizing force (not a fertiliser), ideally as the dew is falling and if possible 1-2 days before Moon-opposition Saturn.

AS LEAF FALL ENDS

Spray vines with (pre-)pruning wash made from barrel compost '502-507' or fresh cow manure, whey and bentonite (or kaolin) diluted stirred in rainwater to cleanse vine wood of pathogens. This follows on from Steiner's idea that tree (vine) trunks are just like soil raised up above the earth's surface, the tree's bark representing the soil surface and the shoots/branches representing annual plants growing in the soil.

Spray (afternoon, descending moon) Barrel Compost '502-507' on soil (240g/ha) which is about to be tilled or just after it is tilled, as a soil cleanser, activating soil micro-organisms so they can digest and recycle fallen leaves upon which potentially harmful fungal spores can over-winter.

Spread last year's biodynamic compost '502-507' and turn in.

Make new biodynamic compost '502-507' using winery waste, old prunings (from healthy not virused/unhealthy vines) and animal manures, inserting the six biodynamic compost preparations yarrow '502', chamomile '503', stinging nettle '504', oak bark '505', dandelion '506' and valerian '507'. Leave for at least six months.

Spring #1

POST-PRUNING

Spray vines with (pre-)pruning wash made from barrel compost '502-507' or fresh cow manure, whey plus bentonite or kaolin diluted stirred in rainwater to cleanse vine wood of pathogens.

Salve pruning wounds on weak vines (esca) with tree paste ("tree compost"). This is made by combining the three basic components of the soil - clay, sand and cow manure[24] - with horn manure '500'. Mix one part each cow manure, silica sand or diatomaceous earth and potting clay or bentonite with stirred horn manure '500', sufficient to make a thin paste sloppy enough to apply to vine trunks with ease. Or use common horsetail '508' decoction instead of horn manure '500'. A liquid manure (common horsetail, stinging nettle) or rainwater may also be used to dilute it.

SPRING EQUINOX

Around 21st March or later if the ground is still hard dig up Horn Manure '500' (should be dark and smell of humus). Make and bury Horn Silica '501' (morning, ascending moon).

Spray (afternoon, descending moon) Horn Manure '500' on the soil (every other row) as a life-giving, fertilizing force (not a fertiliser), ideally as the dew is falling.

Spray (afternoon, descending moon) Barrel Compost '502-507' on soil (240g/ha) which is about to be tilled (eg. soil being prepared for sowing a summer cover crop), or just after it is tilled (eg. on soil whose winter cover crop has been turned in).

Turn last autumn's biodynamic compost '502-507' if necessary. Make new biodynamic compost '502-507' if possible/necessary.

Spray under vines with valerian '507' as an anti-frost measure.

SPRING SHOOT GROWTH VISIBLE

Spray (morning, ascending moon) Horn Silica '501' for the first time in the growing season on older vines, not very young ones, when the first leaves are visible ('two flags'). For younger vines wait until the bunches are visible, or when the bunches separate, or when the individual flowers are clearly distinct/visible.

Spray common horsetail (*Equisetum arvense*) '508' as a mild fungus disease suppressant either as a fresh tea on the foliage or as a fermented liquid manure on the soil around full moon or lunar perigee to rein in excess growth forces (100-300 g/ha) on an as-needed basis.

Collect flowers for and make the Yarrow '502', Chamomile '503', and Dandelion '505' preparations and hang the stuffed animal organs (respectively a stag's bladder, cow intestine & cow mesentery) in a sunny place (a tree) facing the equator until autumn burial. Use dried flowers from the previous year if necessary.

Late Spring/Early Summer

Make use of plant decoctions (plants in cold water brought to a near-boil) or teas (plants macerated in freshly boiled water poured over) or liquid manures (plants macerated in water for 4-10 days). These liquids are especially effective if pre-stirred for 20-60 minutes.

[24] Proctor, op. cit., p.102.

Spray vines with yarrow tea as an aid/alternative to sulfur. Spray vines likely to suffer heat-stress with chamomile or stinging nettle tea. Spray vines likely to suffer from fungal diseases with willow or oak bark decoction, or dandelion tea. Teas can be combined with copper/sulfur treatments.

Spray around vineyard boundaries aromatic plants (fennel, garlic, lavendar) as essential oils to confuse/ward off predator insects until but no later than veraison.

PRE- & POST-FLOWERING

Spray (morning, ascending moon) Horn Silica '501' before flowering to encourage stronger, more upright canes (less compact canopies), especially if the vines are too vigorous to reduce the risk of poor set.

Spray nothing (usually) during flowering.

Spray (morning, ascending moon) Horn Silica '501' after flowering (when the flowers have been fertilized) to help cane ripening, grape flavour and the wine's capacity to age.

Mid-Summer

SUMMER SOLSTICE

Collect flowers for the valerian '507' compost preparation in the afternoon and make this preparation.

Collect stinging nettles (*Urtica dioica*) for the stinging nettle '504' compost preparation and bury in a sealed clay container.

Spray (morning, ascending moon) Horn Silica '501' (5g/ha) to help cane ripening, grape flavour and the wine's capacity to age.

Late Summer/Pre-Harvest

Spray (morning, ascending moon) Horn Silica '501' (5g/ha) when the grapes begin to undergo veraison (change colour).

Spray (afternoon, descending moon) Horn Silica '501' (5g/ha) post-véraison until harvest if ripening is too slow to bring an "autumn mode" to the vines.

Autumn – Post-Harvest #2

AUTUMN EQUINOX

Around 21st September dig up Horn Silica '501' buried six months previously. Excavate stinging nettle '504' compost preparation buried at least 15 months previously.

Collect oak bark and make the oak bark '505' compost preparation by sheathing the bark in the skull of a domestic animal before burying in a watery place or in a rain barrel.

Bury the Yarrow ‘502’, Chamomile ‘503’, and Dandelion ‘505’ preparations made the previous spring.

Spring #2

POST-PRUNING

Dig up the Yarrow ‘502’, Chamomile ‘503’, and Dandelion ‘505’ preparations made the previous spring and buried the previous autumn. Dig up the Oak bark ‘505’ preparation made and buried the previous autumn.

Maria Thun's Barrel Compost Spray 502-507

This is simply a speeded up form of solid biodynamic compost 502-507 but which is applied in infinitely smaller volumes and in liquid form. After horn manure 500 and horn silica 501 it is probably the most frequently, if not universally, used spray in biodynamic wine circles. It goes by numerous names – barrel prep, barrel manure, biodynamic compound prep, cow pat pit/prep, dung compost spray, manure concentrate, *le compost de bouse* in French – but has a simple function, offering an easy, quick way of getting the biodynamic compost preparations 502-507 onto the vineyard without the actual bother of making tonnes of solid compost. This is especially appealing to growers with large or steep vineyard holdings, or who are located in areas where compostable material is hard to come by, or who are so keen to get started with biodynamics they would rather get their first set of biodynamic compost preparations 502-507 on to the vineyard within a matter of weeks rather than wait the six to twelve months it takes a compost pile to mature.

Barrel compost 502-507 also initiates the process of repairing or healing soils damaged by chemical spray residues by reversing the erosive, hardening tendency soluble chemical fertilizers have by turning soil clay (aluminium silicate) back into rock.[25] Barrel compost 502-507 softens compact soil by bringing air into it, balancing soil nutrients, improving soil structure, stimulating humus formation and generally improving soil quality. It is seen as a useful primer for the very first application of horn manure 500. Hence it is often the first tool used by wine-growers converting to biodynamics even if it is not a long-term substitute for solid biodynamic compost 502-507 which is said to impart a more profound, longer-lasting biodynamic effect.

Barrel compost was developed in the early 1970s by Maria Thun.[26] Its precursor was the 'collective preparation' or *Sammelprepärat* developed in 1927 by MK Schwarz, one of the first German farmers to adopt Rudolf Steiner's biodynamic ideas. Schwarz made his collective or 'birch pit' preparation by lining a long pit dug into the ground with birch poles and locating it near the barn in which farm animals overwintered. Their manure was emptied into the pit and the biodynamic compost preparations 502-507 were dropped in. The manure was left to compost for several months and then spread on the farm in solid form, and the pit was re-filled with fresh manure. Rudolf Steiner made no reference either to barrel compost or a collective/birch pit preparation in his 1924 *Agriculture* course.

Maria Thun's barrel compost 502-507[27] is known as the *Pfladenpräparat* (cow pat preparation) in her native Germany, and is made broadly as follows. Fifty litres of cow dung (same quality criteria as for horn manure 500), five-hundred grammes of basalt grains or powder (basalt can easily be added as grit) and one-hundred grammes of finely crushed, dried eggshells are placed in a container, like a barrel stood on one end with the other knocked out, under a descending moon and when the sidereal moon stands in a root/earth constellation: Virgin in the northern hemisphere and either Goat or Bull in the southern hemisphere. Once in the barrel the ingredients are stirred from the outside in for one hour, after which Thun says the mixture should have become "one dynamic whole", resembling a big cow pat with a slightly dilute colour. Peter Proctor told me that during the mixing or stirring farmers can become bored and not mix as well or long as required, but a good stirring will "make all the

[25] Bouchet, François., *L'Agriculture Bio-Dynamique* (Deux Versants, Paris, 2003), p.67.
[26] See Thun, Maria., *Work on the Land and the Constellations* (Lanthorn Press, 1979).
[27] Thun, Maria., *Gardening for life* (Hawthorn Press, 1999) trans. by M. Barton, p.52-54.

difference" to this preparation's quality. Some find mixing the ingredients easier in a wheel barrow than in a barrel. Others say a cement mixer is easier still.

Half of the manure, basalt, and eggshell mixture is then placed in another barrel stood on one end, but with both ends knocked out. This would have previously been dug into a hole in the ground, not quite half as deep as the barrel, with the excavated earth piled around the part of the barrel poking up above ground level. The barrel is left open at both ends so the contents within may receive both earthly and celestial forces. The five solid biodynamic compost preparations 502-506 are inserted one by one and separately into the mixture, with stinging nettle 504 usually placed at the centre. Then the remaining half of the manure, basalt and eggshell mixture is placed on top, and it too has a set of solid compost preparations inserted. Finally, a liquid mixture made from five drops of the valerian 507 preparation stirred for 10 minutes in a litre of water is poured over the top.[28] The barrel is then covered with its lid. When the descending, sidereal moon is back in front of the same earth/root sign, twenty seven days or one sidereal month later, the contents of the barrel are 'dug over' or aired, by turning briefly with a spade. Thun says to wait another two weeks for the barrel compost to be ready; Bouchet says to wait a whole sidereal month. Henderson[29] reports some New Zealand farmers leave their barrel compost in the barrel for six to eight months, and even upto one year for it to experience all four seasons. Whenever it is removed the finished preparation should resemble very rich, dark, fine earth with a clean, intense earth smell. As there is usually some form of worm activity by this time leaving the preparation *in situ* means worms will devour it. The finished preparation is stored in the same way as horn manure 500.

Before being sprayed on the soil barrel compost is diluted in water and dynamised for twenty minutes, rather than for a full hour which is the case for the two biodynamic horn preparations 500 and 501. This is because barrel compost has already been dynamised for one hour in its solid form, so only 20 minutes of stirring when the finished preparation is diluted in water prior to spraying is needed. This is because the compost preparations 502-507 are already present within the barrel compost dynamisation for another full hour risks inverting certain beneficial processes, such as barrel compost's anti-cryptogamic effect.[30] For one hectare Thun advises mixing 240 grammes of barrel compost in 40 litres of water and applying the preparation as a fine spray on the soil within at most four hours of dynamising.

THE ROLE OF EGGSHELLS & BASALT Thun decided to add calcium-rich eggshells to her barrel compost because she found that oats, celery and tomatoes growing on limestone soil had healthier root systems and contained far fewer residues of Strontium 90 radioactive fallout left by the American 1958 atomic bomb tests than plants of the same kind which had grown on sandy (siliceous) granitic soils. Biodynamic wine-growers are encouraged to keep chickens to have a source of fresh eggshells for this part of the preparation. Thun says basalt's role is to support those living organisms and processes in the soil involved in or which work towards decomposition, and thus promote humus formation. Henderson[31] points out that in chemical terms this leads to the formation of more clay-minerals, which encourage humus formation (clay-humus complex). The basalt acts in a nitrogen-fixing capacity

[28] Some practitioners chose to add the valerian 507 later and only when the barrel compost has transformed into humus. See the profile of valerian 507, p.00.
[29] Henderson, Gita., 'Cow Pat Pit, Where Did it Come From?', *Harvests* 55/2 (2002), p.4.
[30] Bouchet, op. cit., p.158-9.
[31] Henderson, op. cit., p.3.

when even more finely ground than grit, she says. Another way of looking at the addition of eggshell (calcium) and basalt is that they represent two basic soil types: basalt is of ancient volcanic origin and comes from inert magma within the earth's mantle and amounts to embryonic, new soil[32], like infant clay[33]; calcium is a geological baby present in limestone-rich soils formed above-ground by marine deposits from living creatures within the last several hundred million years. From a biodynamic perspective the eggshells provide the lime polarity (crop growth) while basalt provides the balancing silica polarity (crop taste). See also the introduction to Germany for a variant of barrel compost in which eggshells are replaced by volcanic ash.

USING BARREL COMPOST 502-507 Barrel compost activates soil organisms while improving soil structure. It is commonly sprayed on freshly ploughed soil or soil about to be ploughed, such as when compost or green manures (cover crops) are turned into the soil[34], usually in autumn and/or spring. The theory behind spraying barrel compost in autumn is to stimulate the soil at the moment the vine roots become active and start drawing downwards the sap from the previous year's vine growth. A follow-up application of barrel compost in spring is seen to bring to a close the winter process of decomposition underground. If soil microbes are still having to work on decomposing compost, cover crops, fallen leaves or vine prunings left between the vine rows by the time spring and budburst arrives, then vines may lack the nitrogen they need to force the grape-bearing shoots out from their awakening buds.

Like horn manure 500, barrel compost 502-507 is most effective when sprayed in the afternoon, in autumn and under a descending moon when the earth inwardly inhales. Proctor advises to wait two days after applying barrel compost (or his version of it which is described immediately below) before applying either horn manure 500 or horn silica 501. Mixing barrel compost 502-507 and horn manure 500 together to save spraying time risks creating the same opposition of forces potentially present in prepared horn manure 500 + 502-507. For this reason Bouchet[35] advises leaving a three week gap between spraying horn manure 500 and barrel compost 502-507 (see also *Winter Tree or Pruning Paste/Wash*, below).

Other uses of barrel compost 502-507 include combining it with plant-based liquid manures for the soil or directly on plants as a foliar feed with an additional anti-fungal effect provided (it is believed) by the anti-fungal properties of cow manure; spraying it on the root balls of young vines just before they are planted; helping the decomposition of matter in effluent ponds (farmers find it easier to add a few handfuls of barrel compost 502-507 than to fiddle with individual compost preparations); and as a seed bath. Plants grown in potting mixes doused with barrel compost are observed to come on earlier. Barrel compost 502-507 can be added to heaps of manure or other material intended for composting before a proper compost heap is made.

PROCTOR'S COW PAT PIT/PREP Proctor calls his version of Maria Thun's barrel compost the cow pat pit or cow pat prep ("CPP"). This is because he prefers to make it in a shallow pit or trench about 90cm long by 60cm wide and 30cm deep.

---

[32] Lovel, Hugh., *A Biodynamic Farm* (Acres USA, 2000), p.123.
[33] Poppen, Jeff., *The Barefoot Farmer* (USA, 2001), p.193.
[34] Sattler, Friedrich., and von Wistinghausen, Eckard., *Bio-Dynamic Farming Practice* (Bio-Dynamic Agricultural Association UK, 1992) trans. by A. Meuss, p.89.
[35] Bouchet, op. cit., p.120-121.

Proctor told me he found “making barrel compost problematic because it is slow, and hard to get the preparation out of the barrel when it is ready; and the preparation can smell because it has gone anaerobic in the barrel. I find it easier to make the preparation in a pit lined on all four sides by old bricks. These adsorb moisture but keep the dung cool, while stopping it from drying out.”

Proctor says he lays the dung to a depth of 10-12cm. Any deeper and the transformation process will take too long. It should take about two months. He lines the pit with the cow dung together with 200 grammes of powdered eggshell and 200 grammes of basalt dust. “These are first mixed together for 15-30 minutes in your hand,” he says “rather as you would mix dough, with a sort of flipping motion. Put the mixture into the pit and pat it down, but pat lightly, as you do not want to overly compact the mixture. It should be level. Then add 1-3 grammes of the solid biodynamic compost preparations [502-506]. Then potentize [stir] the valerian compost preparation [507] in the usual way and sprinkle over the cow pat mixture. Then spread a damp hessian sack or gunny bag over the top. You should lay the brick pit in a shady place to keep it cool by allowing a good air flow in hot weather, to stop it from getting wet from rain, and to keep it sheltered in cold weather. The aim is to achieve a constant temperature and humidity. So in dry weather you can sprinkle the bricks with water every two or three days to keep them damp and to maintain humidity. After 6 weeks turn the preparation with a garden fork. If the dung has not broken down add another set of compost preparations. The dung should lose its smell. You will see decomposition begins at the edges of the pit where air flow is greatest."

Cow pat pit is the most popular form of barrel compost in Proctor’s native New Zealand. For one hectare Proctor dilutes 2.5 kg of preparation in 112 litres of water, nearly twice as much as Thun, probably because Proctor’s main consulting work was with Indian farmers working parched, easily eroded soils so a concentrated dilution means the preparation acts almost as a liquid soil manure, or manure concentrate.[36]

[36] Proctor, Peter., with Gillian Cole., *Grasp the Nettle* (Random House New Zealand, 1997), p.113.