

Bio-dynamics – an Introduction

Biodynamics is an advanced organic method in which no artificial fertilizers or chemical sprays are used. The biodynamic grower learns to see the plant in its overall context, not just by itself in a plot of soil. The plant is influenced not just by the soil in which it grows, but by the water in the soil and the atmosphere, other plants nearby, the air around it, the amount of light and warmth it receives from the sun, and also the influences coming from other cosmic bodies, the moon, planets and stars.

The Biodynamic grower learns to view the plant in this overall context, observing carefully the various influences acting upon it. Many of these factors can be employed and imbalances redressed to allow the plant to grow to its full potential in health and vitality, resulting in the most beautiful, tasty health building food.

The soil is the most important basis of all gardening and farming. For optimum plant vitality, soils are gradually developed into a humus – rich, friable, well structured, well drained state. Rudolf Steiner described a method of making a series of biological activator preparations which would powerfully influence soil development in all these aspects and allow plants to grow with optimum health feeding naturally from the soil humus, not artificially from the soil water as described below.

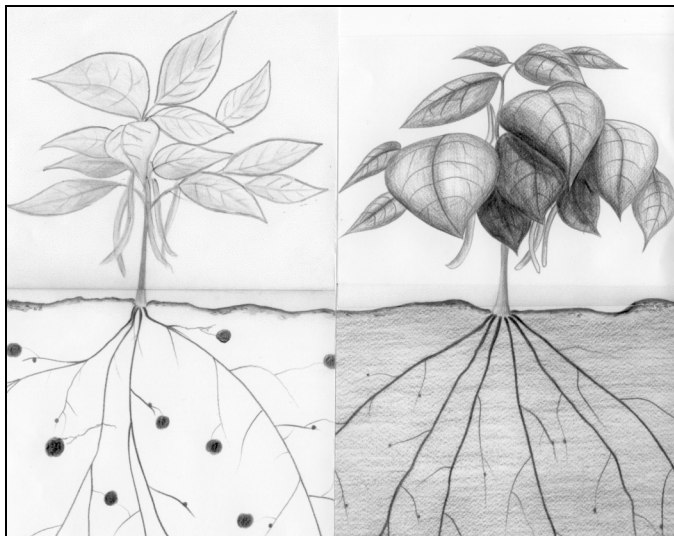


Figure 1

Figure 2

Plant Feeding

Natural Plant Nutrition - an understanding of the difference between natural and unnatural plant feeding (first described by Alex Podolinsky in the 1970's) is fundamental to an understanding of Biodynamic agriculture (and also of good organic agriculture).

In Figure 1 we see a bean plant growing in a soil well supplied with humus particles (represented by the dark pockets), and, Nutrients are contained mostly in the soil colloidal humus, in a soluble state, available to plant roots but held by the humus colloids. Because no water

soluble fertilizers have been used, the soil water is relatively pure. Plants have no independent warmth metabolism as have animals, and rely on sun warmth to tell them when to feed. When sun warmth indicates feed, takes up nutrients from the soil humus, using fine hair feeder roots.

Plants must transpire (evaporate water from the leaves) continuously just as we must breathe continuously and the roots have to take water in from the soil to replace that lost from the leaves. Water uptake is essentially a separate process from nutrient uptake. Water is taken in by thicker more vertical roots and is relatively free of dissolved minerals. The plant is metabolically balanced – nutrient uptake matches growth needs as dictated by the sun. The plant is upright, a healthy green colour and well furnished with beans. It is not attractive to insects and is resistant to disease.

Unnatural Plant Nutrition - in Figure 2 we see a bean plant fertilised with water soluble fertilizer. The nutrients, once dissolved, spread through the soil water (the darker colour of the soil in the picture is used to indicate the dissolved nutrients). As the plant takes up water (to replace that lost in transpiration), it must also take up nutrients independently of sun warmth – it must continuously feed. The role of the sun in governing feeding is diminished. The plant accumulates more nutrients than it can metabolically cope with and cells become overfull with nutrients. The plant takes in more water to dilute these excess nutrients but with the water comes more minerals. Cells become distended with mineral salts and water, the plant becomes overblown and darker green in colour. The guard cells of the stomata on the leaf also become distended and so exchange of gases and photosynthetic efficiency are affected. The plant is unbalanced and more susceptible to insects and disease. Flavour, nutritional value and keeping quality are impaired.

Biodynamic growers use a variety of techniques to develop healthy humus levels in soil so that plants can feed naturally. They *never* apply raw manures or compost which has not been properly matured to food crops as this would result in soluble nutrients spreading through the soil water, causing the same unnatural forced plant feeding as artificial fertilizers with the same undesirable consequences.

The Biodynamic Preparations

500 - the most powerful substance on earth for the development of soil fertility – cow horns are filled with fresh cow manure and buried in well drained fertile soil in autumn. The horns are dug up in spring. The manure has been transformed into a sweet smelling pure colloidal humus substance. It is liquefied, stirred in a specific way for 1 hour, then sprayed on moist soils

several times per year. It is a very powerful soil builder, fostering microbial activity, humus formation and root growth, resulting in progressively better structured, richer, darker and deeper soils.

501 - cow horns are filled with a paste made from finely ground, clear quartz crystals and buried over summer. The resulting pure white powder is liquefied and stirred as for 500, then sprayed as a fine mist over plants on a sunny morning. It is used when excess wateriness or fertility is present in plants (due to heavy rainfall for instance) and greatly enhances light metabolism resulting in crisper, more upright plants which have more flavour, higher sugar content and better keeping qualities and are also much more resistant to fungus and other diseases.

Compost - the compost preparations, 502 - 507 are made from specially prepared plant materials (yarrow, chamomile, stinging nettle, oak bark, dandelion and valerian – see preparation article, p. for details) and are used in compost heaps to produce 100% colloidal humus which turned into the soil is the ideal plant food. Good compost should be moist, dark and sweet smelling, and have a texture and kneadability similar to putty or modelling clay.

Prepared 500 - preparations 502 – 507 are added to 500 to produce “prepared 500” an enhanced 500 which can be used on farms after several initial seasonal applications of 500 or from the start in home gardens well supplied with organic matter. The beneficial soil building effects of the compost preparation can thus be easily applied to soils without having to wait for large scale compost application, which is in any case a very long term project on broadacres.

Cultivation - open friable soil structure developed by 500 application can be damaged by inappropriate cultivation techniques. Biodynamic growers use carefully selected implements to conserve and further develop soil structure. For instance, gardeners use thin tined garden forks rather than spades for digging, while farmers prefer tined implements such as chisel plows. Discs can be used, but with all due care and at low speed. Rotary hoes are permitted for some applications but must be chosen for low speed of blade rotation and correct blade shape. Unless a suitable machine is used (modified if necessary), rotary hoe cultivation deeper than about 5cm can severely damage soil structure.

Green Manures - a wide variety of plants are used as green manures to build humus levels in the soil in preparation for crops. Raw manures or blood and bone *can* be applied to green manure crops, but another green manure should be grown after the first *without* such fertilisation, and prepared 500 used to assist the decomposition process. In this way, all nutrients will be incorporated in the soil humus to feed the subsequent crop naturally.

Companion planting - different plant species can influence each other's growth – some plants help others, some hinder others, while some combinations are mutually beneficial. Companion planting was used traditionally in many countries in the past, and Rudolf Steiner recommended some useful plant combinations in 1924. The observations of Biodynamic growers in Europe and America were gathered in a book called *Companion Plants* (Helen Philbrick & Richard B. Gregg), published in the US in 1960. Since then companion planting has become very popular. Many books have been published, most of which draw heavily on the work of Biodynamic growers presented in *Companion Plants*.

Dynamic Grass Management - for the ongoing and progressively deeper development of soil structure, it is essential that rotational grazing is used. Many paddocks (fields) are created so that grazing animals can eat grass that has reached an optimum height. When the grass is grazed down, a certain number of roots die, worms and microbes digest these roots creating humus. Stock are moved to fresh pasture leaving the grazed grass to regrow to an optimum height and new roots are formed. Over the years this (in conjunction with the application of 500) results in progressively deeper root penetration, increased humus content and deeper, well structured soil.

The same principle applies to orchards, where grass is not allowed to stagnate but dynamically managed by mowing when an optimum height is reached. In home garden lawn management it is not so simple, but lawns can be mowed less frequently to allow more development than is possible with continual close cutting.

Sowing by the moon and stars - Biodynamic growers follow a sowing chart developed as a result of research carried out over many years. It has been found that seed is best sown on a waxing (increasing in size) moon and that, depending which zodiac star grouping is behind the moon at the time, the plants are influenced to grow more root, leaf, flower or fruit. We can then produce large carrots with compact tops, lettuces which are more resistant to bolting etc. There are also optimum times for transplanting, cultivation, 500 spraying, hay cutting, pruning, grafting etc. based on moon phases, all backed by research. These practises are not based on folklore, traditional practises or mysticism, but on solid research findings, and really work if done correctly.

Seed Saving - a very exciting part of Biodynamics. Evidence is emerging that Biodynamically grown seeds produce plants with more vitality, more beautifully refined structures, and better pest resistance with each successive generation. These seeds never need the fungicide or insecticide coatings that conventionally grown seeds require to survive. Germination is very successful and the young plants grow vigorously and vibrantly.