

Biodynamic agriculture

I am a member of the UK organisation Garden Organic (formerly the Henry Doubleday Research Association) which promotes and practices organic methods of gardening at its centre, Ryton Gardens, in Coventry. I have generally been impressed by the wide range of articles on organic gardening methods which my wife and I seek to use in our own garden. I have been equally impressed by publications of the more established Soil Association. I was therefore surprised to see articles by these organisations which appeared to promote biodynamic gardening and activities at Camphill communities, both of which evolved from, and reflect, Rudolf Steiner's esoteric spiritual ideas. The Elsie Biodynamic Garden at Ryton is treated with biodynamic preparations. Part of the description provided for biodynamic gardening was "Fundamental to biodynamic gardening is the recognition that all life is interconnected. Each plant, each insect, the rocks below, the moving clouds and the stars above, all form part of the living organism of our planet. Every piece of land, including the smallest garden, can be considered as a microcosm of the greater whole. The biodynamic gardener works as an artist within this context". Although much of this description can be reconciled with a common understanding of organic farming methods, the idea of relating plant growth to the stars or Steiner's pseudo soil preparations, bear no relation to these methods. Hence this led me to write letters to both the Soil Association and Garden Organic asking if they would explain their attitude towards biodynamics.

The reply from the Soil Association suggested that it did not promote biodynamics, but had a good relationship with biodynamic farmers, some of whom were its members.

However, a decision by the Soil Association to list a biodynamics workshop for fruit growers and vineyards with Monty Waldin on its web site led me to write once again to the Soil Association regarding the assertion that it did not promote biodynamics. Patrick Holden, who has claimed to be a biodynamic farmer, had been executive director of the Association for many years. He left this position in 2010.

I received a reply on 10th April 2013.

The reply from Garden Organic states that it "does not promote biodynamic precepts nor does it espouse the practices of biodynamic gardening."

The reply I received from Tim Young, Managing Editor of the Soil Association gave a detailed account of the Association's relationship with biodynamics and its present attitude towards it. Some of the information provided is taken from its [published standards](#), all of which are publicly available. Some practitioners of organic farming may be interested in biodynamic farming [I have sent Patrick Holden an EMail asking if he would confirm that he is a biodynamic Farmer].

" Historical context

The origins of organic farming

Three different strands contributed to the founding of organic farming.

- Rudolf Steiner delivered a series of eight lectures to a group of farmers in Austria in 1924. These lectures defined biodynamic agriculture and the Demeter symbol was created in 1927 to identify foods grown by these methods.
- Lady Eve Balfour was inspired by the work of Sir Albert Howard (on composting and agricultural health) and sir Robert McCarrison (on diet and human health), both working in India. She started the Haughley Experiment on her farm in Suffolk researching the links between the health of soil, plants and animals within different closed systems. Based on this work she wrote *The Living Soil* in 1943 - the book which stimulated the founding of the Soil Association in 1946.
- Also in the '40s, Hans Muller together with Hans Peter Rusch developed a natural approach to farming and soil fertility in Switzerland particularly using rock dusts.

However, J I Rodale in the US actually coined the term 'organic' in 1942 when he started publishing the magazine *Organic Gardening*.

Despite their differences these founding strands shared and underlying basis:

- The concept of the farm as a living organism, an integrated whole.
- The concept of a living soil as the basis of health right up the food chain.
- The whole being greater than the sum of its parts.

So although organic farming involves and develops simple traditional agricultural practices, it is very different and involves a great deal more. Organic farming is not necessarily a low input system, as it aims to maximise the farm's own inputs. As few inputs as possible from outside the farm are used.

The origins of organic standards

Apart from Demeter, there was no formal definition or recognition of organic farming until the 1960s. The Soil Association was the first, publishing its 'standards for organically grown food' as four pages of guidelines in its magazine Mother Earth. The standards ended with a 'declaration of intent' for those prepared to subscribe to them.

In 1973 the Soil Association took the next step and formed the Soil Association Organic Marketing Company Ltd as a wholly owned subsidiary. Initially its role was to market grown to the Soil Association standards. However, it soon dropped marketing to concentrate on certification.

Through the '70s and early '80s the inspection element was informal and cursory, but this gradually changed as the organic method of production became more prominent. Later, to reflect this change, the company changed its name to the Soil Association Certification Ltd (SA Certification).

So clearly in the historical context there were clear links between the development of organic and biodynamic agriculture and practically speaking there are shared similarities between the two approaches to this day. It is therefore perhaps to be expected that some practitioners interested in biodynamic agriculture and vice versa (and permaculture for that matter). That said, the Soil Association's founders had a wide range of views and philosophies, some sympathetic to Steiner's esoteric approach and others less so - and in practice this sense of a 'broad church' has continued to the present day.

For more on the historical content we'd recommend Philip Conford's book on The origins of the organic movement ,which provides an account of the relationships between Steiner and the individuals who established the Soil Association.

Does the Soil Association 'promote' biodynamics today?

While the Soil Association today continues to involve people with a wide range of views, the central reference point for our values as an organisation are the principles of organic agriculture agreed by the International Federation of Organic Agriculture Movements (IFOAM): ecology, fairness, care and health; and our interpretation of these principles is secular. However, we work with others who come to these principles from different perspectives, including biodynamic farming organisations that build on Steiner's thinking. We do occasionally work with the biodynamic movement (mainly Demeter) informally, e.g. sharing information about events etc. That said, on projects such as our [Future Farming programme](#) we also work with a broad spectrum of different farmers including non-organic 'mainstream' farmers interested in learning about organic techniques . Our attitude towards other groups is that an open discussion and exchange of ideas, and collaborative working where appropriate, is a worthwhile endeavour - and we don't think such an approach means we are secretly promoting other groups we work with (either biodynamic groups or non-organic farmers). However, of course others are free to interpret our actions as they see fit!

Can organic farming feed the world?

We have done a fair bit of work on this, and published at [report](#) on it. As I understand it the essence of the debate about 'feeding the world' is how you frame the question. So, for example, studies in France, Germany and Austria have all found that organic agriculture can probably feed the world the world population of 9.2 billion in 2050 - but only if relatively modest diets are adopted, with a low level of inequality in food distribution. These scenarios assume that in countries like the UK, we will both produce food differently and

eat differently, as it is clear for health and environmental reasons that diets must change. So therefore the question becomes not 'can organic farming feed the world based on our present system of production, distribution and diet?' (to which the answer is probably no), but 'can our present system of producing, distributing and eating food ever feed the world?' (to which the answer is presently no, given that 1 billion people across the world are malnourished, and probably no in the future given environmental and resource constraints). And if the answer to the second question is (as we believe) no, then the obvious follow up question is 'what do we need to change about our system to ensure that we can feed the world?'. Of course each individual's answer to that question may vary, but in our view, rather than concentrating our time, energy and investment in 'techno fixes' that seek to promulgate an existing production system and diet that isn't fit for purpose, we should be developing more democratic, more sustainable systems of food production and diet that can actually feed a growing world population. And we see agricultural production based on organic approaches as playing a key role in that process."

The above reply suggests that the Soil Association's association with biodynamics does not amount to the promotion of biodynamics and it is for the reader to decide. An [article by Nick Nakorn](#) 'Can we trust the Soil Association' suggests that there is a closer connection between the Soil Association and biodynamic agriculture than its public stance implies. Nick Nakorn maintains that "science is taking us towards the view that a combination of proven organic methods, genetically modified crops and a more judicious use of synthetic fertilizers, herbicides and pesticides might take the 'Green Revolution' to the next phase; lowering soil erosion, vastly improving the energy ratio and efficiency of food production, reducing water use and increasing biodiversity. If we are to feed a population of perhaps 12 billion people over the next few decades, we will need to go in that direction. The exact combinations of the proposed methods are being researched for different climates across the globe but it is becoming increasingly clear that a mixed approach is required: pure organic agriculture simply won't provide enough without perfect politics and perfect distribution while Big Ag has proved to be an environmental disaster and, anyway, needs more oil than might be available in future decades".

I don't know if he is right in his assessment.

With regard to organic agriculture, I have been disappointed in the reply to a question I put to a president of the Association "Can organic farming feed the world?" The reply was "You are asking the wrong question". The same question was put Patrick Holden at a meeting in Swindon, UK, and the answer given was the same as the one given to me. Tim Young's reply goes along way towards providing an answer and it is clear to me that it is a question that will be increasingly posed in the media as time goes by.

The 'mixed approach' appears to be the message coming from a study ([Article by David Biello](#) in Scientific American) by environmental scientists at McGill University in Montreal and the University of Minnesota which performed an analysis of 66 studies comparing conventional and organic methods across 34 different crop species "We found that, overall, organic yields are considerably lower than conventional yields" explains McGill's Verena Seufert, lead author of the study to be published in Nature on April 26 [2012]. (Scientific American is part of Nature Publishing Group.) "But, this yield difference varies across different conditions. When farmers apply best management practices, organic systems, for example, perform relatively better." [A copy of the [study](#) is available]

In particular, organic agriculture delivers just 5 percent less yield in rain-watered legume crops, such as alfalfa or beans, and in perennial crops, such as fruit trees. But when it comes to major cereal crops, such as corn or wheat, and vegetables, such as broccoli, conventional methods delivered more than 25 percent more yield.

The key limit to further yield increases via organic methods appears to be nitrogen -- large doses of synthetic fertilizer can keep up with high demand from crops during the growing season better than the slow release from compost, manure or nitrogen-fixing cover crops. Of course, the cost of using 171 million metric tons of synthetic nitrogen fertilizer is paid in dead zones at the mouths of many of the world's rivers. These anoxic zones result from nitrogen-rich runoff promoting algal blooms that then die and, in decomposing, suck all the oxygen out of surrounding waters. "To address the problem of [nitrogen] limitation and to produce high yields, organic farmers should use best management practices, supply more organic fertilizers or grow legumes or perennial crops," Seufert says.

In fact, more knowledge would be key to any effort to boost organic farming or its yields. Conventional farming requires knowledge of how to manage what farmers know as inputs-synthetic fertilizer, chemical pesticides and the like-as well as fields laid out precisely via global-positioning systems. Organic farmers, on the other hand, must learn to manage an entire ecosystem geared to producing food-controlling pests through biological means, using the waste from animals to fertilize fields and even growing one crop amidst another. "Organic farming is a very knowledge-intensive farming system," Seufert notes. An organic farmer "needs to create a fertile soil that provides sufficient nutrients at the right time when the crops need them. The same is true for pest management."

An [advertisement](#) for a Biodynamic Plant Breeding and Seed Production Workshop by the branch of the Permaculture Association based in Nailsworth also prompted me to write to the Association main office based in Leeds to ask if the Permaculture Association endorsed biodynamics. The reply included the comment "Yes I would certainly say that permaculture endorses organic farming. Occult preparations are not commonly associated with permaculture - this is not something that is usually taught on a Permaculture Design Course."

The publication of the Schumacher Society, Resurgence, also appeared to endorse biodynamics by advertising [The Biodynamic Food and Cookbook](#) by Wendy Cook.

I have tried to commit myself to the organic approach, but confess to resorting to chemical slug killers. Also, in a small way, I have assisted an inspirational Organic Farming Training Centre in the Cameroon and Environmental programmes in schools reflecting agro-forestry and organic farming methods and have produced booklets describing their activities.

Does biodynamics provide any benefits at all for crop growth? The reader must judge for him or herself.

What is biodynamics?

Nick Nakorn offers the opinion that "Biodynamics is a bogus system of agriculture that has taken basic organic methods and overlaid its own mystical tradition. In itself, that is not too much of a worry since organic methods work regardless".

Nakorn also outlines the racism of some early founders of the Soil Association and links with Fascism. I am not sure that these arguments are particularly relevant to an analysis of biodynamics as practiced today nor to those who have put its methods into practice. As with other aspects of the practical outcomes of Steiner's I believe that practitioners have been motivated by good intentions, even though those outcomes have been often negative and generally based on irrational and bogus ideas.

Linda Chalker-Scott, Washington State University, outlines some of the myths perpetuated by proponents of biodynamics that it was the first alternative approach to agriculture and is synonymous with organic agriculture in scientific and popular literature.[In fact organic farming must have been the common practice in the centuries before oil and natural gas were discovered and not even organic farmers would claim that it was innovative].

She refers to the overview by Kirchman (1994) of Steiner's ideas on the subject. Steiner proposed what he called biodynamic preparations that would stimulate vitalizing and harmonizing processes in the soil through cosmic and terrestrial forces. Initially Steiner proposed eight preparations, two of which involved packing cow manure (preparation 500) or silica (preparation 501) into cow horns, then buried for a number of months before the contents are swirled in warm water and then applied to the field. Cow horns are utilised as antennae for receiving and focussing cosmic forces, which are transferred to the materials inside. The other six compounds(preparations 502-507) are extracts of various plants either packed into the skulls or organs of animals (i.e. deer bladders, cow peritonea and intestines) or into peat and manure, where they are aged before being diluted and applied to compost. The chemical elements contained in these preparations were said to be carriers of terrestrial and cosmic forces and would impart these forces to crops and thus to the humans who consumed them.

"These processes were not developed through scientific methodology, but rather through Steiner's own self-described meditation and clairvoyance. In fact Steiner declared that these spiritualistically-determined

methods did not need to be confirmed through traditional scientific testing, but were 'true and correct' unto themselves (Kirchmann, 1994). The rejection of scientific objectivity in favour of a subjective, mystical approach means that many of Steiner's biodynamic preparations cannot be tested and validated by traditional methods. In practical terms, this means any effect attributed to biodynamic preparations is a matter of belief, not of fact."

The idea that biodynamics is synonymous with organic agriculture is reflected in an [article by Jeff Boshart](#) about 'biodynamic farming pioneers' exporting organically grown bananas from the Dominican Republic. Although 'biodynamic bananas' are mentioned in this article there is no description of biodynamic preparations and the article appears to be purely about organic methods. Why are they not just referred to as 'organic bananas'? This article appears under the auspices of the Rodale Institute as does an [article by Kyle Holzhueter](#) about a biodynamic farm and the Camphill Village Kimberton Hills. Camphill communities, involving care for people with disabilities, are another practical expression of Rudolf Steiner's ideas. However, there is no indication on the [web site of the Rodale Institute](#) that it has any connection with biodynamics. It appears to only reflect organic farming practices.

However, from the standpoint of comparing yields from organic (rather than biodynamic) agriculture with those from chemical agriculture, a [30 year study](#) by the Institute appears worthy of consideration (However, this study does appear to make claims for organic agriculture that are far more favourable than are concluded in the studies by the McGill University in Montreal and the University of Minnesota). The Institute claims that "After 30 years of side-by-side research in our Farming Systems Trial, Rodale Institute has demonstrated that organic farming is better equipped to feed us now and well into the ever changing future". Its facts summary indicated that (i) organic yields match conventional {chemical} (ii) organic outperforms conventional in years of drought (iii) organic farming systems build rather deplete soil organic matter, making it a more sustainable system (iv) organic farming uses 45% less energy and is more efficient (v) conventional systems produce 40% more greenhouse gases (vi) organic farming systems are more profitable than conventional. The trials did, however, record a decline in organic yields in the first few years of the trial and then it rebounded to surpass that of the conventional agriculture. Also the trial did focus rather narrowly on corn and soybean production because of the large amount of land devoted to these crops in the USA.

However, "In the past 3 years of the trial, genetically modified (GM) crops and no-till treatments were incorporated to better represent farming in America today. The different systems in the trials were (i) organic manure (ii) organic legume (iii) conventional synthetic (iv) no-till). With respect to crop rotations the studies found that "organic systems are more diverse than in the conventional systems, including up to seven crops in eight years (compared to two conventional crops in two years). While this means that conventional systems produce more corn or soybeans because they occur more often in the rotation, organic systems produce a more diverse array of food and nutrients and are better positioned to produce yields, even in adverse conditions".

There was no mention of trials comparing organic agriculture with biodynamic agriculture and hence no indication of whether biodynamic preparations provide any benefits at all.

Roger Rawlings provides a [detailed analysis of biodynamics](#) and its irrational elements.

As with Steiner's other ideas with regard to art, social reform, education and medicine, he combines his irrational esoteric beliefs with those that can be subjected to rational and scientific verification. Linda Chalker-Smith suggests that "It would be an interesting experiment to compare conventional farms to conventional farms with biodynamic preparations without the organic practices to see if a difference exists." She also points to the dangers of not challenging ideas such as Steiner's pseudoscience - "...when published research is not held to an acceptable standard of scientific rigour and when junk science is not challenged, pseudoscience creeps closer towards legitimacy in the public eye."

Reference: Kirchman, H.1994. Biological dynamic farming - an occult form of alternative agriculture? Journal of Agricultural and Environmental Ethics 7: 173-187.

According to vineyard owner and wine producer, Stuart Smith, biodynamics vineyard owners are even claiming that the wine produced from their grapes is superior to other wines and that this is causing dissension in the industry. He quotes from the April 2010 NorthbayBiz magazine by Kevin Morrisey, president of Ehlers Estate Winery to illustrate this superior attitude "Does it make better wine? Of course it does - not because it is certified organic but because organic and biodynamic is being used . By ridding the vineyards of chemicals, pesticides, herbicides and synthetic fertilizers and by building healthy soil... we grow healthier and more balanced vines which, along with other terroir, gives us better wine." Stuart Smith with the bitter observation that "But what I really resent is that biodynamic farming is attempting to divide our industry, an industry that I love and have spent 40 years of my life working in, just to get a market edge. Its shameful!"

Sadly I have found this superior attitude reflected by other proponents of Steiner's ideas with never any scientific evidence to back up their claims. Claims by Saffron Rouge are an example of this "Organic and biodynamic are very similar; both are grown without chemicals and GMOs. However biodynamic goes one step further. It is a holistic practice where all things are considered living inter-related systems - animals, plants, and the solar system. Biodynamic practices create healthier plants and heal the earth by replenishing the soil and adding vitality to the plant, soil and/or livestock...Biodynamic agriculture also incorporates astrological influences. Rudolf Steiner, the founder of biodynamics, believed that much like the moon affects the tides, so does it affect the growing phases of planting and harvesting. Complex stellar calendars chart the influences of the moon and other planets for gardeners and farmers to follow. For example, Weleda and Dr Hauschka harvest their Calendula flowers by hand early in the morning when the energy of the plant is most intense and vital.

With the over-processing of soil, plants are losing their nutrients, minerals and vitamins. Biodynamic farming creates plants that are more vital and nutrient rich. When we eat these plants we are consuming this vitality and feeding our cells with it, or in the case of skin care - applying this vital energy to our skin. Healthy skin care begins in the garden with plant ingredients. By using Dr Hauschka, Weleda and Primavera skin care products you are ensuring you are ensuring the highest quality of healing and protection for your skin and the environment".

The preparations are claimed to be similar to those used in homeopathy many of whose methods, in common with anthroposophic medical treatments, are further examples of pseudoscience.

A important question arises from the analysis I have presented above. Is there any evidence to show that biodynamics provides any additional benefits at all over those obtained from using organic methods alone? A study by P. Jayasree and Annamma George 'Do biodynamic practices influence yield, quality, and economics of cultivation of chilli (*Capsicum annum* L.)?' indicated that the 'biodynamic calendar and preparations generally failed to impact yield and net returns.

I thought this study to be rather limited, however, and I would welcome information about any comprehensive studies on this question.

Michael Thomas

Biodynamic agriculture is derived from the ideas of Rudolf Steiner (1861-1925), a self proclaimed Austrian clairvoyant, who founded a movement which he named anthroposophy in 1913 after he split from the occult Theosophical Society.

ANTHROPOSPHICAL MEDICINE --- CAMPHILL COMMUNITIES --- WALDORF-STEINER SCHOOLS