Not far from the richest compost piles I have ever seen, KK Haspel introduced her dowsing rods and her Stella Natura calendar that explains when to plant, water, sow, or spray in accordance the zodiac and the planets. ¹ KK Haspel would go onto to claim that her 2 acres of farm land feeds 10,000 people. KK also explained that it is typical for her crops to thrive, even when her neighboring farms may not be. She said it was because of her loyal practice of Biodynamic farming. She implied it was exceptional compared to organic and conventional farming in ways that required great devotion to the land and the heavens. While my sceptical ears popped up, I none the less, could not help but see before me a flourishing healthy farm that stood out compared to the many farms I visited over a three-day weekend in the North Fork of Long Island.

¹ Considered the modern mother of Biodynamic farming, Maria Thun developed the astrological planting calendar and guide, Stella Natura, for Biodynamic farmers to follow.

Biodynamic Farming: Sustainable Solution

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2012

The day is coming when a single carrot, freshly observed, will set off a revolution.
— Paul Cezanne

Standing in the middle of farmer KK Haspel’s Long Island Biodynamic farm on a grey, cold and blustery fall day, I couldn’t help but be taken in by the vibrant sunflowers, tall kale and sprawling lush garden of food that seemed to brighten up the entire day.
Island, New York. Whatever her practices, what she was doing appeared spot on.

When Gro Harlem Brundtland coined the term “sustainable development” in *Our Common Future: World Commission on Environment and Development* in 1987, it gave meaning and subtext to environmental issues that were created in the wake of the Industrial and Green Revolution. At the heart of Brundtland’s report was mindful attention to harmony between humanity and nature. For a select group of farmers in the early part of the twentieth century, such a connection between ecology and man was also recognized, and out of it came the practice of Biodynamic Agriculture.

Biodynamic farming is a cohesive sustainable standard that is proven beneficial to soil health and sustainability. It is organic and more, and dates back to the first conscious movement towards western organic agricultural philosophy. Today it thrives, countering unsustainable industrial agriculture practices around the world. From its beginning, Biodynamic philosophy cultivated tacit knowledge brought forth from the memory of what it means to farm with nature. It contains a spiritual aspect that, for many, is hard to understand and lend it credibility. Through the 1980’s practitioners of Biodynamic were dismissed with contempt by the mainstream agricultural community in the Unites States and Europe as being backwards and unscientific.  

Since the later 1990’s alongside the current sustainable food movement, Biodynamic farming has found itself more accepted amongst the ranks of alternative agricultural solutions. Additionally, the global wine community has taken to its practices, moving it more into the popular mainstream. But for the millions of consumers of Biodynamic food, there is no convincing, its methods provide

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assurance that their choices are of the utmost sustainable.

In this paper, I aim to explain the origins and central Biodynamic techniques that stand out as separate from organic and conventional farming. I will look to case studies on soil and yields that help answer some of the questions regarding Biodynamic efficacy. Questions include: What is Biodynamic farming? How does it differ from organic and conventional farming? Where is it proven and where are there uncertainties, as perceived by mainstream scientific community? Finally, when it comes to measuring yields in Biodynamic agriculture, how do we compare quality and quantity?

**Origins of Biodynamic Farming**

In the 1920’s a group of German farmers were concerned with the modernizing ways of agriculture. Artificial fertilizer, pre-Green revolution, was beginning to be applied in agriculture. Farmers, like this group, were concerned with soil infertility and food quality. They turned to Austrian born philosopher, scientist, botanists, and founder of anthroposophy, Rudolf Steiner, for help.

In the summer of 1924 in Koberwitz, Germany, Rudolf Steiner gave eight lectures on agriculture that became the beginning and foundation of Biodynamic farming. The name “Biodynamic” (“bios” for life and ‘dynamis” for energy) refers to farming with the energies which create and maintain life. Steiner believed that the use of external, artificial and chemical inputs, along with business of modern farming, was removing agriculture from its spiritual and physiological connection to the earth. Steiner said, “In the case of this material age of ours, we lost the knowledge of what it takes to continue to care for the natural world.”

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He believed that the modernization was replacing critical implicit knowledge that had been instinctually refined by farmers for centuries. Steiner emphasised a practice much like how farmers depended on almanacs and close communication with one another to predict and decide best farming applications. Steiner felt the need to renew agrarian farming culture with new processes that were connected to and influenced by the cosmos. He believed that the same principles that govern gravity and tides, the celestial atmosphere, had equal influence and importance on agricultural as it relates to humanity and all of Earth's sentient creatures.

According to Steiner, a renewal in agriculture was necessary in order to find a way to revitalize the earth so that cosmic energy flow strongly into weakening soil. Biodynamic maintenance of soil life would become vital in order to protect it from erosion and to create, improve, and supplement the humus content. He introduced the practice of making preparations based on cow manure, silica, and a variety of herbal plants. In the years to come, Steiner’s students and colleagues would begin to develop more concrete applications.

**Organic vs. Biodynamic**

To many, Biodynamic farming is considered “beyond organic.” Certified Biodynamic meets all the requirements of organic, but certified organic alone would not meet the requirements of Demeter, the certifying Biodynamic body. Demeter was created in Europe in 1928 to ensure the Steiner influenced standard in farming was being upheld - a strict certification process that, today,

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6 Ibid.
requires annual recertification. According to Demeter International, its certification marked the beginning of the modern sustainable agriculture movements.\textsuperscript{11} In 1997 Demeter-International was created to oversee all nation-state chapters and ensure closer cooperation in the legal, economic and spiritual spheres of Biodynamic farming.\textsuperscript{12} Today they have 16 member organizations around the world from Europe, the United States, Africa and New Zealand, and are affiliated with more than 4,500 Biodynamic farms in 43 countries on over 145,000 hectares globally\textsuperscript{13} As Ehrenfried Pfeiffer, Steiner’s student and Biodynamic cultivator responsible for bringing the practice to the United states, stated:

The Biodynamic Method is more than just another organic method. It stands for a truly scientific way of producing humus. Not, merely the application of nothing but organic matter in a more or less decomposed from is intended, but the use of the completely-digested form of crude organic matter known as stabilized, stable or lasting humus. In this aim the method differs from what is commonly called ‘organic farming’. In the latter, any collection of any organic matter is apt to be called compost. In the B.D. Method the organic material to be used as a basis for compost is transformed either by means of the Biodynamic Compost Preparations, or by means of the B.D. Compost Starter (Pfeiffer’s formula)….\textsuperscript{14}

The main difference, then, is that the Biodynamic method adds eight specific “preparations” to their soil, crops, and composts.\textsuperscript{15} The most significant aspects of Biodynamic agriculture are the humus, preparations, composting, and the planting calendar. Unlike organic farming, total self-reliance is also strongly emphasized. That is, no external inputs, even if sustainable. This is why animal husbandry is also critical, to provide the

\textsuperscript{11} Demeter United States Branch. Retrieved from: http://demeter-usa.org/

\textsuperscript{12} Demeter International. Retrieved from: http://www.demeter.net/


proper manure without depending on inputs outside of one’s own farm. Today however, a Biodynamic farmer can purchase certified horns and preparations as well. Additionally, today, like in the case of KK Haspel, some farmers will accept outside raw materials for compost that meet their Biodynamic standards. In this way, and as Steiner emphasized, the practice was meant to provide freedom to make such choices, so not to restrict the farmer, giving him the opportunity reconnect with the natural rhythms of farming while adding new Biodynamic methods.\(^{16}\)

Steiner intended this process to harmonically return the modern farmer back to his connection between the celestial, the zodiac, the animal, the human, the plant life and the soil. As Herbert H. Koepf, Biodynamic farmer and writer, states, “One learns to comprehend how the life of the plant is connected with their environment in the wildest sense.”\(^{17}\) This wildest sense relates to the outer workings of the cosmos, and their effect on the inner life of the plant. For many in popular culture, this with some of the preparation techniques, becomes the area that is most criticized in the research and scientific field. While many discount this aspect as the mystically unquantifiable part of the process, much research, dedication and time has been given to the scientific method of astrology and agriculture in one.

The Preparations

In essence, the preparations specific to Biodynamic farming are used to enhance the bacterial, fungal and mineral processes that are found in the organic farming system.\(^{18}\) After his third lectures, Steiner spoke of the radiation power of the compost preparations in a

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\(^{18}\) Biodymaic Of India. Retrieved from: http://www.biodynamics.in/preps.htm
manure pile. In using the term radiation, Steiner was inferring to the Sun’s affect on soil and plant. Peter Proctor, widely known as the father of modern Biodynamic farming, claims, “These [the preparations] enhance all the bacterial, fungal and mineral processes that are found in the organic farming system.” The maintenance of soil vitality is crucial in order to protect it from erosion and to create, improve, and supplement the humus content.

Labelled 500-507, they are:

500: Cow manure fermented in a cow horn, 501: silica fermented in a cow horn,
502: yarrow flowers fermented in a bladder of a stagg, 503: chamomile fermented in a cow intestine,
504: stinging nettle fermented in a fermented in the soil, 505: oak bark fermented in a the skull of a domestic animal, 506, dandelion heads fermented in a cow mesentery and 507: pressed valerian juice

Like homeopathic techniques, very small doses are diluted and mixed with large amounts of water. Preparations 500 and 501 are applied directly to the crops, and the remaining are applied to composting. Steiner himself admits this is a key place of ridicule by critics who protests that “plants cannot possibly be influenced by high dilutions.” According to Biodynamics, farm manure and compost are the most valuable inputs on a farm. These preparations ensure the retention and renewal of a healthy soil within the specific storing of manure in composts heaps covered with earth.

**Biodynamic Soil and Crop Efficacy.**

Biodynamic farming poses controversy because of both its spiritual application and the use of the Biodynamic preparations that are not traditionally used in agriculture. Hundreds of studies have been preformed to explain the effects of Biodynamic preparations on humus, and ultimately farm fields and crops. Some, however, are more scholarly than others.

In 1994 John P. Reganold, a professor of soil science at Washington State University, filtered and compared scores of scientific Biodynamic soil and yield case studies throughout the international community in Sweden, Germany, Austria, Australia, New Zealand, the United States, and the Canary Islands. The dates of the studies ranged from the 1970’s to the 1990’s. Some studies were conducted over a few years, while others were performed over decades. Each study either compared a combination of Biodynamic farming to organic and conventional, or just conventional. Overall, Reganold concluded that the studies showed that “the Biodynamic farming systems generally have better soil quality, lower yields, and equal or higher net returns per hectare than their conventional counterparts.”

Additionally in two studies he compared between organic and Biodynamic soil, it showed that the Biodynamic preparations improved biological soil properties. Across each study are indications that the Biodynamic soil contains a greater degree of nutrients and over all soil vitality.

In 2004, another eight year study by Zaller and Kopke compared the effectiveness of the Biodynamic preparations in comparison to organic soil cultivation. The study found significant alterations in favor of Biodynamic preparations when examining soil PH, basal respiration, metabolic measurements, and even earthworm communities. They found

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that the Biodynamic composting process creates a higher temperature than organic composting. This creates a more efficient microbial turnover. Yet, in the end, Zaller and Kopke suggests that they are still scientifically unclear how the low dose Biodynamic preparations could influence these results. But what is clear from all studies above, is that the soil is renewing itself and having great affect on the quality of the crops.

As for yields, both papers here indicate that while Biodynamic crops yield as much, if not more that organic, it does not come near to the net amounts of conventional farming. That said, one report by Goldstein, et al points out that “28 different experiments in Germany showed that the use of the Biodynamic sprays increased crop yields (cereals and vegetables) on years where yields were low (Raupp and Koenig, 1996).”

Back on KK Haspel’s farm, she made clear that during times when her neighbors crop yields were low, hers were the same, if not greater. She attributed this to the preparations, dowsing techniques and planting calendar that she followed.

**What’s in a Yield?**

The studies here indicated that Biodynamic farming does in fact create and renew soil with greater enzyme and microbial activity than the organic or conventional systems. By looking at the production of soil alone, Biodynamic can be seen as truly optimal, viable and sustainable. As for yields, overall, with a few exceptions, they are lower than conventional crops. Yet, the studies do not say whether the Biodynamic crops are compared to mono-cultures or poly-cultures. Farms produce different yields depending on their soil viability, the age of the farm, what year it may in if transitional, etc… These variables alone make it difficult to measure and compare two separate farm systems.

Mostly, however, I would like to

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ask: Why so much popular attention goes towards proving yields in alternative farming practices? The present sustainable food movement is heavily preoccupied with proving that sustainable agriculture can yield like conventional does. Instead, perhaps focus should be on viable solutions that manifest nutrient dense soils that can create many small farms, that combined, total the yields of large scale farming. Looking forward, it seems imbalanced to measure Biodynamic (and even organic) yields against conventional ones. Conventional farms, dependent on artificial inputs from pesticides to fertilizers and genetically modified seeds, create super crops that are designed to produce food on a large scale. They have an unfair and unnatural advantage that out classifies Biodynamic and organic farming from the start.

Koepf states, “If life on earth and the future generations is to be provided for, the task must be carried out with an eye to the totality of natures growth. “27 This totality begins with the health of a sustainable soil that conventional cannot provide. Post Green Revolution, it has it is now proven that ecological impacts like soil erosion, groundwater contamination, of misuse of natural resources is the inherent by-product of focusing on the short term high producing conventional yields. 28 The dependence on artificial inputs distracts us from the greater issue, global sustainability. It can be argued that Biodynamic farming is owning up to this responsibility with a progressive method that can create healthy soils in the future, while creating quality crops. Perhaps regional, as opposed to global or local, infrastructures could be implemented. As a whole, systems would be responsible for feeding less people, relieving the stress on yield

28 “Putting Meat on The Table Industrial Farm Animal Production in America.” A Project of The Pew Charitable Trusts and Johns Hopkins Bloomberg School of Public Health A Report of the Pew Commission on Industrial Farm Animal Production. 2009. 3
expectations. More farms, Biodynamic and organic, could yield enough to support regions. So in essence, less large scale output and more small scale providers. More quality small farms, rich in soil and crop variety, that provides less by volume as one, but equal or more in sum. In their article on food regionalism, Clancy and Ruhf write,

An ideal regional food system describes a system in which as much food as possible to meet the population’s food needs is produced, processed, distributed, and purchased at multiple levels and scales within the region, resulting in maximum resilience, minimum importation, and significant economic and social return to all stakeholders in the region. This is known as “self-reliance”—as opposed to “self-sufficiency” wherein everything eaten is supplied within the target area.29

This self-reliance is exactly what Rudolf Steiner intended. The key here is social return. This, too, is what Steiner’s

Biodynamic theory would preclude as a major requirement for a sustainable future. In recent years, Peter Proctor has guided India’s struggling farm sector towards creating over 250,000 compost piles throughout India’s struggling farmland.30 Proctor sees the viability of providing provable nutrient dense methods that can restore and enhance the soils to create agricultural independence.

The emphasis, as prescribed by Steiner, would be of quality as opposed to quantity. While such uncertainty and skepticism surrounds Biodynamic farming, it is none the less proven to create restorative soil that a damaged earth greatly needs. All the case studies identified here indicate a lack of understanding and quantifiable answer to the results. Perhaps this is because convention currently cannot accept alternative modes like homeopathic preparations and planting according to

29 Kate Clancy and Kathryn Ruhf. “Is Local Enough? Some Arguments for Regional Food Systems” *Choices: The Magazine of Food Farm and Resource issues.* 1st quarter 2010. 25(1)

30 Peter Proctor. One man One Cow One Planet. Documentary. Cloud south Films. 2007
astrological data. Quite simply, scientific study doesn’t know how to process the perceived immeasurable information. Perhaps it was put best by one anonymous reviewer of the M. Turinek, et al report,

My personal perspective is that the authors do not need to ask whether BD (Biodynamic) can be regarded as a scientific category, or even point out that part of this scientific community looks at it with skepticism and marks it as dogmatic. There are over 4200 farms around the world that are certified as BD and so it is clearly worthy of study…BD includes the all the key components of ORG (organic) so what is true or ORG is true for Biodynamic. 31

Steiner argued that amidst the industrial revolution of his time, modernizing society was loosing its inherent relationship to Earths biology. 32 That is, a personal and instinctual relationship that is applied to farming, as influenced by the zodiac, the planets, and the celestial atmosphere. Biodynamic farming, above all sustainable practices, appears to stand out as the most committed to the restoration and preservation of the earths soil, and with that, human and planetary health. According to the Biodynamic Farming and Gardening Assoc., “Biodynamic farming and gardening combines common-sense agriculture, an understanding of ecology, and the specific environment of a given place with a new spiritual scientific approach to the concepts, principles, and practices of agriculture.” 33 Biodynamic has the potential to restore soil integrity and farmer communities around the globe, while producing sustainable, healthy, and abundant food. In many ways, it’s a form of social resistance that, as KK Haspel has shown, is done with a quite and bountiful confidence.

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31 M Turin, et al. Biodynamic Agriculture Research Progress and Priorities. Faculty of Agriculture and Life Sciences, Institute for Organic Farming, University of Maribor, Pivola 10,2311 Hocˇe, Slovenia.


Ryan, M. 1999. Is an enhanced soil biological community, relative to conventional neighbours, a consistent feature of alternative (organic and biodynamic) agricultural systems? *Biological Agriculture & Horticulture* 17 (2): 131-44.


