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Beyond Organic: An Overview of Biodynamic Agriculture with Case Examples

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Beyond Organic: An Overview of Biodynamic Agriculture with Case Examples

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Abstract

A great deal of research has been done regarding economic and consumer aspects of organic agriculture. A different form of agriculture, called biodynamic agriculture, is emerging, with acreage located across the globe. Like organic agriculture, biodynamic agriculture has a certification process, but it has not received as much research attention from agricultural economists. This paper provides basic background information about biodynamic agriculture. In particular, it gives a count of certified biodynamic farms, by state, in the U.S., and it gives the most common products produced by those farms. Wine grapes are by far the most common biodynamic agricultural product. It also includes three case examples of farms employing this production system and business strategy. The diverse case examples were developed through telephone interviews with certified biodynamic agricultural producers. It is predicted that despite its growth, biodynamic agriculture will become neither a fad nor a trend. Rather, it will remain a background influence on organic and conventional agriculture.

What is biodynamic agriculture?

According to *Wikipedia*, the online encyclopedia, biodynamic agriculture is an ecological and sustainable system of producing agricultural products, particularly food for humans, that professes to respect all creation. “It includes many of the ideas of organic farming, and at the core focus are mystical anthroposophical ideas of the soil and the life on and in it as a living, sentient system.” (*Wikipedia* 2005) According to Diver (1999), “A basic ecological principle of biodynamics is to conceive of the farm as an organism, a self-contained entity. A farm is said to have its own individuality. Emphasis is placed on the integration of crops and livestock, recycling of nutrients, maintenance of soil, and the health and wellbeing of crops and animals; the farmer too is part of the whole.” (Pages 1 – 2.) Biodynamic agriculture could be considered an advanced organic farming system.

History of the method and why is it practiced

The foundation of biodynamic agriculture is the instruction of Rudolf Steiner, especially eight lectures given by him in Silesia, Germany in 1924, shortly before his death. (*Wikipedia* 2005) The series of lectures presented were to European farmers who asked him for advice and help after seeing the degradation of plants, seeds, and land caused by artificial fertilizers. These lectures are now known as the Agriculture Course and published as the *Spiritual Foundations for the Renewal of Agriculture*. At the time, Steiner believed that the introduction of chemical farming was a major problem. He found that seeds had dramatically less vitality and that land that previously grew the same crops year after year now had to rotate crops in order to avoid problems. Plants which formerly gathered their own nutrients and minerals from the earth now had become dependent on the dead chemical fertilizers for their minerals and as people ate these weak plants they also lost their will. (Steiner 1993)

Philosophical underpinnings

Steiner believed the food of his society was degrading, and he thought the causes of the problem were man-made fertilizers and pesticides, but he did not believe this was because of physical (biological or chemical) properties of the materials involved. However, Steiner disapproved of the spiritual flaws of these materials. The biodynamic agriculture developed by Steiner, therefore, is intended to be regenerative in nature, i.e., it is intended to ‘heal’ the earth. It could be considered more beneficial than agriculture that is simply sustainable. Steiner “considered the world and everything living in it as primarily spiritual in nature, the physical and thus chemical or biological processes involved were secondary. He also believed that living matter was different from dead matter, a viewpoint commonly referred to as *vitalism*.” (Wikipedia 2005) Many of Steiner’s writings describe energy flows that radiated from the earth similar to the so-called Odic force. (Steiner 1993)

Another important element of the biodynamic concept is that the entire farm is a living system. For that reason, a farm should be a closed system which the preparations¹ introduced by Steiner nourish. Plant and animal diseases are not to be addressed in isolation, because they are actually better viewed as symptoms of complications with the whole farm system. It should be noted that the term “biodynamic” was not invented by Steiner, but by his supporters. (Steiner 1993)

The biodynamic method today is practiced worldwide with millions of acres under biodynamic cultivation. Biodynamic growers strive to create a self-sufficient farm, growing their own food and animal feed, saving seeds, and so on. Helping form a self-contained organism, or individuality consists of growing the right number and kinds of plants and animals, producing enough manure and compost to spread back on the fields, and creating a closed loop of fertility. (Steiner 1993)

Current status and extent of biodynamic agriculture, emphasizing U.S. production

Biodynamic agriculture has spread around the globe. Van der Zee (2005) states “In Germany there are 1,331 biodynamic farms, in Canada about 30, in New Zealand 42, in Switzerland 215, in Italy 250, and in the UK 122.” According to data provided by Demeter U.S.A., there are a total of seventy-six separate entities that are either certified as biodynamic or in conversion to biodynamic. (Demeter U.S.A. is the sole entity authorized to certify farms as biodynamic in the United States. It is described in detail in the following section about certification.) A total of four of these are listed as being in conversion. Of the remaining seventy-two entities, ten appeared to be affiliated with other entities that were listed.² So, for the purposes of this paper, there are sixty-two independent entities that are certified by

¹ The preparations are described in a subsequent section.

² One reason for this conclusion is that six entities had the same contact person listed as six other entities. In addition, six entities had the same contact address.

Demeter U.S.A. as biodynamic. As indicated in Table 1, farms³ that are certified as biodynamic by Demeter U.S.A. are located in sixteen U.S. states and two other countries.

Table 1: Locations of farms certified by Demeter U.S.A. as biodynamic (as of 5/06). (Data for table was provided by Demeter U.S.A.)

<i>State</i>	<i>Number of farms</i>
California	29
Oregon	6
New York	5
<i>Summary for states/countries with one or two certified biodynamic farms</i>	
States with two certified biodynamic farms	Idaho, Iowa, Hawaii, Nebraska, Pennsylvania, Washington
States with one certified biodynamic farm	Arkansas, Connecticut, Illinois, Michigan, Missouri, Montana, Wisconsin
Countries (besides the U.S.) that have one farm each that is certified as biodynamic by Demeter U.S.A: Costa Rica and Mexico	

Farms that are certified as biodynamic by Demeter U.S.A. produce a wide variety of products. The types of products produced by biodynamic farms are listed in Table 2.

Table 2: Common types of products grown by biodynamic farms and farms in conversion to biodynamic certification. (Data for table was provided by Demeter U.S.A.)

<i>Product</i>	<i>Frequency</i>
Wine grapes	23
Other fruit and fruit products	21
Vegetables	21
Herbs/spices	16
Hay	9
Flowers/cut flowers	5
Fluid milk	5
Wheat	5
Beef (on hoof) and beef products	5
Pasture	4
Wine	4

The fruits, vegetables, and herbs/spices are not broken down because the way the data was provided did not allow for this. That is, it varied in how detailed the products were listed for each producer. Note that other products were also listed in the Demeter U.S.A. product list, but were omitted from the table because they were mentioned fewer than four times. These products included spelt, sunflowers, eggs, dry beans, and various small grains. A couple of

³ Note that in addition to a small number of wineries that are certified as biodynamic, two traders of biodynamic products are among the entities that are certified.

points should be made regarding Table 2. First is the diversity of products produced by biodynamic farmers. Practically every kind of product imaginable is available as a certified biodynamic product. Even within farms, there was a lot of diversity of products. The second point is the predominance of wine grapes in this product list. Clearly, wine grapes are far and away the most common certified biodynamic products. According to Fullmer (2006), approximately 20% of certified biodynamic acreage is made up of vineyards.

Certification process

Demeter U.S.A. is the certifying organization for biodynamic agriculture in the United States. It is a part of an international assembly of Demeter organizations. (Demeter is the name of the ancient Greek god of fertility.) The Demeter Production Standards manual is available on their web site, <http://www.demeter-usa.org/>. This manuscript, which is 32 pages long, lists the requirements for a farm to become certified biodynamic. (In the case examples that appear later in this paper, individual producers describe and evaluate the certification process.) According to Fullmer (2006), there are currently eight inspectors who evaluate farms for biodynamic certification. In order to qualify as a Demeter biodynamic inspector, the candidate must first complete training required to be an organic inspector. There is also additional training beyond what is required for organic inspectors, to become a qualified biodynamic inspector. Demeter U.S.A. is affiliated with a separate company called Stellar, Inc. that performs organic certifications. Firms who want both organic and biodynamic certifications have to complete two separate applications, however, and there are two separate decisions regarding these two certifications.

Technical characteristics, including biodynamic preparations and control of insect pests and weeds

Steiner prescribed nine different preparations for fertilizers that were allowed for use in biodynamic agriculture, and gave great details of how these were to be prepared. The substances used for preparing fields and making compost are numbered 500 through 508. Biodynamic growers use these medicinal, herbal, compost, and mineral preparations to liven up the soil and stimulate plant growth. The biodynamic preparations are all used in small, almost homeopathic quantities. A handful of carefully made biodynamic preparation, stirred into three gallons of water can treat a whole acre. All of the biodynamic preps are easy to use and are inexpensive. With a few hours work, all nine biodynamic preparations can be applied to the applicable land.

The following extended excerpt from Diver (1999) characterizes Steiner's biodynamic preparations.

“The original biodynamic (BD) preparations are numbered 500-508. The BD 500 preparation (horn-manure) is made from cow manure (fermented in a cow horn that is buried in the soil for six months through autumn and winter) and is used as a soil spray to stimulate root growth and humus formation. The BD 501 preparation (horn-silica) is made from powdered quartz (packed inside a cow horn and buried in the soil for six months through spring and

summer) and applied as a foliar spray to stimulate and regulate growth. The next six preparations, BD 502-507, are used in making compost.

“Finally, there is BD preparation 508 which is prepared from the silica-rich horsetail plant (*Equisetum arvense*) and used as a foliar spray to suppress fungal diseases in plants.

“The BD compost preparations are listed below:

- No. 502 Yarrow blossoms (*Achillea millefolium*)
- No. 503 Chamomile blossoms (*Chamomilla officinalis*)
- No. 504 Stinging nettle (whole plant in full bloom) (*Urtica dioica*)
- No. 505 Oak bark (*Quercus robur*)
- No. 506 Dandelion flowers (*Taraxacum officinale*)
- No. 507 Valerian flowers (*Valeriana officinalis*)

“Biodynamic preparations are intended to help moderate and regulate biological processes as well as enhance and strengthen the life (etheric) forces on the farm.” (Page 3.)

To use the biodynamic compost preparations, growers must insert a small quantity of the finished preparation into a compost pile of up to fifteen tons. Rudolf Steiner emphasized the importance of always staying within the living realm in agricultural activities. An example of this concept would be obtaining calcium from the outer bark of a white oak tree rather than using high-calcium lime that mostly leaches into the subsoil and becomes unavailable for plant use. All of compost is made by processes that stay in the living realm as opposed to the mineral realm. (Marian Farms 2005)

Popularity of biodynamic agricultural/food products among consumers

There is anecdotal evidence that biodynamic foods are becoming more popular among consumers. (See, for example, Harte-Davis, 2004; Nelson, 2005; and van der Zee, 2005.) No secondary data could be identified that indicates the past sales volume of biodynamic food products. Likewise, according to Fullmer (2006), no studies have been implemented to determine the demographic characteristics of consumers of biodynamic food products. These are areas for potential future research, perhaps to be funded by the biodynamic trade association that is currently being formed in California. It is likely, however, that consumers of biodynamic food products are more affluent than average consumers. This is due to the high cost of biodynamic foods (van der Zee 2005).

As indicated above, the range of biodynamic agricultural and food products available is vast. The consensus of key industry informants is that the product showing the greatest growth is biodynamic wine. A cursory search of the Internet indicated the availability (and implied popularity) of a wide variety of biodynamic herbs, spices, and medicinal supplements.

Case examples of biodynamic agricultural producers

Following are three case examples of biodynamic agricultural producers. The cases were chosen so that they would be geographically diverse, and diverse in terms of products produced. They are based on telephone interviews conducted by the lead author in May, 2006. The source of the information in each case study is the producer listed. Thus, while some sentences begin with “X stated,” or “according to X,” the rest of the information in the respective paragraphs can also be attributed to the producer being profiled.⁴

Biodynamic Case #1: Gena Nonini of Marian Farms

Gena Nonini has an 80 acre operation called Marian Farms in Fresno County, California (<http://www.marianfarmsbiodynamic.com/>). She has been involved with agriculture since she was born, in 1963. She is a member of the Biodynamic Farming and Gardening Association. She grows grapes on 45 acres. The grapes are utilized as follows: fresh market (i.e., table grapes), raisins, and high-proof alcohol. The alcohol is primarily used in the medicinal herbal tinctures and body care/perfume industry. The remaining 35 acres are dedicated to almond, orange, and lemon trees and vegetable (Community Supported Agriculture⁵) production. In the future, Gena plans to add an animal unit to her operation. Specifically, she plans to add beef cattle, and perhaps seasonal milking. She recently constructed a winery/distillery to convert grapes to high-proof alcohol.

Gena is the primary person responsible for production and marketing in her operation. She said she works between 70 and 80 hours per week. She employs a sales representative, and has 1.5 people who assist her with the farm (i.e., field work). She also has a stable of consultants who assist her with special projects. She gave some hints for producers who are thinking about starting a biodynamic agricultural operation. She stated, “First, you have to be willing to change your mindset from reductionist thinking to a more holistic thinking. Second, have faith in working with substances that you don’t necessarily understand how they work, but one can see the ends/results. Three, there is a difference between *agribusiness* and *agriculture*. *Agriculture* factors in the human component. It factors in living systems. *Biodynamics* is *agriculture*. Conventional and ‘input substitution’ organics⁶ are *agribusiness*. When money becomes your driving factor, then compromise is not far behind. We live in a materialistic world. Most science is devoid of spirit and of life. When something is alive, it is

⁴ It was felt that it would improve the readability of the case examples by providing a general attribution to the producers being profiled, rather than starting every sentence with “X stated,” or “according to X.”

⁵ Community Supported Agriculture (CSA) is a method to organize agricultural production. Typically, shares in the harvest are sold to subscribers prior to planting. Subscribers (i.e., shareholders) receive a weekly allotment of the harvest at the end of the season.

⁶ Gena, along with other biodynamic agricultural producers, point out shortcomings of today’s organic agriculture. She says that many in organic agriculture have a mindset similar to that of conventional agriculture, especially, too much emphasis on N – P – K. She said that ‘input substitution’ organic growers have a general attitude of, “Just show me something on the approved organic inputs list that will take care of my problem, and I will use it.”

constantly evolving and changing. Agricultural science seeks to prove things through experiments, and then it repeats the experiments with the expectation of similar results, proving the science of the matter. But with living systems, you may get different results when you repeat the test. That's because the system is in continual evolution. And fourth, there are two types of people. Some people are drawn to spiritual things. They will have a greater opportunity to be successful in biodynamics. The other type of people is intimidated or challenged by spiritual things for whatever reason. These folks will have a more difficult time with biodynamic agriculture. You have to have an open heart." Gena emphasizes that producers need to use all nine of Steiner's preparations, plus preparations introduced by Pfeiffer and a few others. She is of the opinion that a lot of producers don't do enough biodynamics, meaning they don't use enough preparations. Many only use the bare minimum. Also, biodynamic producers need to understand the rhythms and cycles of nature. Many have yet to learn the celestial rhythms and their importance to raising biodynamic farming to an art level.

Her operation is certified biodynamic by Demeter U.S.A. She first received certification in 1995. She made the following comments regarding certification. "It is cumbersome. It takes more time than I want to give, but necessary. Demeter has streamlined the process somewhat, however. I am certified by Stellar (organic), Demeter U.S.A. (biodynamic), IMO (European Union), and kosher. The first three are handled by the same group, but kosher is totally separate. The kosher certification is primarily for my packing operation, that is, the raisins."

When asked what makes her operation and/or products special, Gena mentioned that her operation is certified by Demeter as biodynamic, and that she has refined the biodynamic concept to an art form. She pointed out that there are a number of people who claim to have biodynamic operations, but are not certified by Demeter.⁷ There is another group that is certified biodynamic by Demeter. Finally, there is an even smaller group that has made an art form out of biodynamic agricultural production. She includes herself in the latter group.

Gena grew up around conventional agriculture. When she came of age, she farmed with her brother for one year. At the time, at her request, her parents split up the farm, so she got her own land. She also read a book entitled *Secrets of the Soil*. Gena said that this book touched her heart. Thus, she came into biodynamics through the 'spiritual door.' (In contrast, many people who are getting into biodynamics now are led by their heads, rather than their spirits, according to Gena. They see the results, which is high-quality end product.) When she started implementing biodynamic agricultural principles, she read Steiner's lectures. She had two teachers. The first one was Peter Proctor from New Zealand. The second was Hugh Courtney from the Josephine Porter Institute. She still counsels with both Courtney and Proctor.

Regarding the future of biodynamic agriculture, Gena thinks it is the 'farming of the future.' At the same time, she doesn't think that biodynamic methods will be used on mega-farms in her lifetime. Following are some more predictions and observations Gena made. As more

⁷ Note that Demeter U.S.A. has a trademark on the term "biodynamic." For that reason, firms and individuals are restricted from using the term biodynamic to describe any products that do not come from an operation that use biodynamic practices.

people (i.e., consumers) recognize the shortcomings of conventional and ‘input substitution’ organic agriculture, they will be looking for what’s next: namely, biodynamic agriculture. Food that is currently being produced is devoid of ‘life force.’ When she said that, she mentioned that she wasn’t referring to food from McDonald’s. The ingredients for food these days are ‘low in vitality,’ essentially ‘dead;’ it doesn’t matter how you prepare them. There are a lot of symptoms of problems in the food system. These include obesity, cancer in children, and type II diabetes in children. (Of course, not all of these problems can be attributed to food/diets. Other culprits include stress and related societal problems, air and water pollution, and electromagnetic fields. But, a major contributor to these problems is the food people eat.) People’s bodies are getting very little from breaking down the food they eat. Gena anticipates that growth in biodynamic agriculture will be consumer-driven. She is creating and presenting educational programs to help growers to make the switch to biodynamic agriculture. She believes that opportunities for biodynamic producers are huge, and the opportunities are all over the board. Her business is currently sold out of everything. Her priority is taking care of her existing customers. She is having a difficult time producing enough products to meet the demand.

Gena mentioned some developments within the biodynamic agricultural industry. As a group, they are in the process of forming a trade organization. Part of the challenge is to educate people about what biodynamic agriculture is. Gena has always been up front with identifying that her products are certified biodynamic. She doesn’t try to hide behind the word ‘organic.’ The industry’s greatest challenge will be developing reliable and high-quality supply lines.

Biodynamic Case #2: Ernie Harvey of Lifeline Farm Inc.

Ernie Harvey has a 500 acre agricultural production operation called Lifeline Farm Inc. (<http://www.lifelinefarm.com/>). It is located in Ravalli County, Montana. A major component of this operation is his dairy enterprise, which consists of 70 Brown Swiss milk cows. Ernie processes the raw milk into fluid milk, cheese, and butter. He raises all of the calves produced in this enterprise. The heifers are used for replacement of the milking cows and the steers are raised for beef. Ernie also has a small hog enterprise, with three or four breeding sows. These hogs are given whey from the dairy processing operation for feed. The breeding sows usually have 2 litters per year. The feeder pigs are raised for organic pork. Ernie produces at least 80% of the forages (hay and pasture) for the dairy and beef cattle and the hogs. In addition to Ernie, there is a couple who are co-owners of Lifeline Farm Inc. (Ernie called them partners.) This couple is responsible for producing vegetables, bedding plants, and sheep. Ernie’s enterprises are certified as biodynamic by Demeter U.S.A., and he has been practicing biodynamic agriculture since 1978. His enterprises are also certified organic. The enterprises run by the co-owners are not certified biodynamic this year, however. All of the products are marketed locally. According to Ernie, local customers are not knowledgeable about biodynamic agriculture. Quality and ‘organic’ are what matters to these customers.

Ernie stated that he is devoted to biodynamic agriculture. At the same time, he feels that some of the requirements to be certified as biodynamic are not realistic for large producers.

He said he has a working relationship with the Demeter inspectors who perform certification audits, and that they are pretty good to work with. Ernie said that the fact that his operation is certified as biodynamic makes it special. In addition, his products are special because of their high quality and flavor. He is a strong believer in local foods. About three-fourths of his products are consumed within Montana.

Regarding work load, Ernie works between 70 and 80 hours per week, which is currently kind of a sore spot with him. He said that he is not the primary person responsible for production and marketing, instead, these responsibilities are shared. He has quite a few employees, three of whom are milkers. He employs a cheese maker, whom he trained. The operation also has a delivery truck and driver. Lifeline Dairy⁸ bottles milk two times per week, which requires a crew of four employees for five to six hours each time. There is a bookkeeper and a part-time secretary. There is also a retail store at the front of the creamery. This store doesn't have a designated employee; rather, it is staffed by the workers at the creamery. The couple that runs Lifeline Produce (i.e., the co-owners) has two apprentices.

While he is always changing his operation, Ernie says it is fairly stable now. He recently downsized the herd of milk cows. This brought production even with demand. He hopes to build a new milking facility within the next five years. A major goal is to stabilize the land base. Much of the land he currently farms is leased. Some of the owners of the leased land are getting old, which concerns Ernie. He would like to purchase some of the leased land, and secure a long term lease for the remainder. Ernie expressed the desirability of establishing a land trust from which he could lease land.

For producers who are thinking about starting a biodynamic agricultural operation, Ernie had some suggestions. Individual situations are quite varied. Producers should look at their respective communities, and determine what the community members need. Then, the producer should look at what he/she is capable of producing. The producer should design his/her farm organism from there. The goal should be to create a self-sustaining organism. A producer should balance the needs of the local community with what the farm organism can do. According to Ernie, a common mistake made by biodynamic producers is to not integrate animals into the farm organism. Also, a common mistake is to not value grass and pasture to their full extent. He perceives that some biodynamic producers place too much emphasis on the preparations, and not enough focus on the local food issue.

Many years ago, Ernie was a member of an 'intentional community' group. An individual joined the group who got Ernie interested in biodynamics. Ernie was taken with Rudolf Steiner's concept of anthroposophy, which seeks to unify science and spirit. He became interested in connecting with other spheres of life. Ernie spent a year working with an individual who was trained in biodynamic agriculture. He further developed his skills through practical experience, and through reading and studying. He attended a lot of seminars related to biodynamic agriculture. He got to know other biodynamic agricultural producers, visited their farms, and got help from them. Ernie is on the board of the

⁸ Lifeline Dairy and Lifeline Produce are the two distinct parts of Lifeline Farm Inc.

Biodynamic Farming and Gardening Association, so he has access to all of their educational materials and resources.

Ernie thinks that the future will be good for biodynamic agriculture, and following are some observations and comments Ernie made. He feels that it is the most economical form of organic agriculture. Of course, it could be that biodynamic agriculture will not be recognized. The movement is currently focused on gardening and small farms, rather than large-scale production. For that reason, it may just be a ‘background influence’ on agriculture. Ernie believes that this has happened with Community Supported Agriculture (CSA) and including animals in agricultural enterprises. He also believes that opportunities are tremendous for biodynamic producers. He specifically identified the following types of enterprises as providing a lot of opportunities for biodynamic producers: dairy (milk and processed products), vegetables, and vineyards producing wine grapes. The organic market is the fastest growing sector of the food industry. Biodynamic agricultural enterprises can produce organic products, with good quality, and do it economically. Ernie also believes the CSA movement has gotten big. He indicated that establishing a CSA operation is a good way for an interested person to get started in agriculture. With a CSA, not as much up front investment is required by the producer.⁹ Ernie feels that the biodynamic agricultural industry needs to keep evolving, and that it needs to become more practical for large-scale production. Efforts should be undertaken to develop all of the different aspects of biodynamic agriculture, including: land trusts and land availability, the CSA movement, and certification.

Biodynamic Case #3: Lavinia McKinney of Elixir Farm Botanicals

Lavinia (Vinnie) McKinney operates a 100 acre farm in Ozark County, in southern Missouri. Most of the acreage is devoted to hay farming, with 3 acres for the production of various types of seed, such as for vegetables and medicinal plants (more specifically, Chinese medicinal plants). She is a member of the board of the Biodynamic Farming and Gardening Association. She engages in commercial production for the following customers: Johnny’s Selected Seeds, Seeds of Change, and Turtle Tree Seeds. The hay is fed to animals to provide manure and compost for on-site fertility. Vinnie feels that with her practices, she can grow anything she wants. Her products are top quality, too, with no disease or insect damage. She has two greenhouses and two shade houses. She has donated her seed banks to a nonprofit group called One Garden (<http://www.one-garden.org/>). She currently engages in commercial growing of seeds as well as personal growing of seeds. Occasionally, she produces some mixed vegetable crops. Vinnie is the primary person responsible for production and marketing, and she currently works about 20 hours per week on her operation. She has two part time employees and a few other residents of the farm work on the operation. She has been operating this particular farm for 34 years. In the next few years, Vinnie plans to move more into food production. She anticipates more local interest in locally grown foods. Her

⁹ It should be noted that there are many different variations on the CSA concept. A general feature, however, is that CSA members purchase shares in the harvest of a particular CSA operation. Members pay for their shares at the beginning of the season, which provides the producer with needed operating capital. It also shifts the risk of low yield to the consumer.

farm is located in an area with a high poverty rate. There are many two-income families in her area.

Her operation has been certified by Demeter U.S.A. as biodynamic for more than 15 years. Vinnie believes that Demeter's certification process is excellent. Demeter has moved its headquarters to Oregon, and Vinnie feels they are doing a fantastic job. There aren't many biodynamic farms in Missouri or Arkansas. According to Vinnie, biodynamic agriculture is setting the standard for regenerative agriculture, and its representatives are providing lots of education to producers. Vinnie decided to become certified as biodynamic because Demeter makes a concerted effort to help growers find their way.¹⁰ She said that the forms required to apply for Demeter certification are helpful in guiding producers and not too difficult to keep current. All forms can be submitted electronically now. Demeter has established standards such that many types of farms can be certified.

Biodynamic practices are what make Vinnie's operation and products special. She said that it is not so hard to implement these practices. "When you feed the soil and tend to fertility issues, you don't have insect damage or disease," Vinnie said. "I made a good match between the capacity of my land and what grows well in this climate . . . I would've failed if I would've tried to produce apples. I am in a rural, remote area. Seeds are non-perishable. They are well-suited for my distribution situation. In the past, the Internet has helped my operation by facilitating sales."¹¹

For producers who are interested in starting a biodynamic agricultural operation, Vinnie had some suggestions. She said it would be helpful to read Steiner's work, especially his work on agriculture. They should attend seminars on biodynamic agriculture, talk to practitioners, and visit biodynamic farms. Vinnie advises such producers to look at the farm from a holistic perspective. The goal is to create a closed system, and to avoid using imported inputs. Producers need to manage fertility and to manage water resources. They need to pay attention to the planting calendar, and to use the preparations. She also noted that being close to markets is necessary for food producers. It is difficult to create a Community Supported Agriculture (CSA) operation that is more than an hour from a city. It requires leadership from the producer to recruit the members of a CSA. Vinnie identified Angelica Organics as an example of a successful CSA. Angelica Organics is a 100 acre CSA operation with 1,000 members/shareholders, located in northern Illinois (<http://www.angelicorganics.com/>). Vinnie also recommended seeing a film titled "The Real Dirt on Farmer John," which details the conversion of a farm to what would become Angelica Organics.

According to Vinnie, when she purchased her farm, it was "an overgrazed cattle farm." It has sandy soil, and the soil was compacted, like concrete. She began using field sprays that were developed by Pfeiffer. She has never used any pesticides or other chemicals on her farm. Vinnie learned biodynamic agricultural methods through reading, study, and trial and error.

¹⁰ In contrast, Vinnie said that the inspectors under the National Organic Program (NOP) are not as helpful. These inspectors try to find violations and don't make an effort to guide growers to a deeper understanding of how to improve their situations.

¹¹ This is a paraphrased quote.

She noted that being certified as biodynamic has some commercial benefit. Growers are guided throughout the certification process. The Demeter certifiers require growers to use the preparations and use crop rotations including green manures. She currently does intensive growing in greenhouses. She has stable humus with no harmful insects. She said that seed production is an art form. To do this, you have to learn about timing, cross-pollination, and insects. It involves some deep concepts, including astrological influences on when to plant and when to harvest.

Vinnie believes that the future of biodynamic agriculture will be great. There will always be people interested in high quality food for their own use. She said she would love to see a world where biodynamic agriculture was integrated in communities and rural areas. She said it is like that in Europe.¹² Vinnie also mentioned that there is a trade association for biodynamic agriculture forming in California. There is starting to be a critical mass of biodynamic producers, especially producers of wine, which will be able to work together. She said that successful biodynamic producers currently have no problem marketing their products, e.g., dairy, vegetables, wines, etc. Vinnie also noted some challenges facing biodynamic agriculture. There is a land trust for biodynamic farms. There are some succession issues looming. Some biodynamic producers are older, and they may not be able to farm for much longer. It will be a challenge to keep the land in biodynamic production. Vinnie called this connecting the dots.

There are some organizations that Vinnie mentioned that do a lot for the biodynamic agricultural industry. One of these is the Michael Fields Agricultural Institute (MFAI), which is a non-profit located in East Troy, Wisconsin (www.michaelfieldsagainst.org/index.html). The MFAI is a learning center that is involved with research, educational programs, and technical assistance. She also mentioned the Josephine Porter Institute for Applied Biodynamics (JPI) (<http://www.jpibiodynamics.org/>). Located in Woolwine, Virginia, JPI is another non-profit organization. They are dedicated to conducting biodynamic agricultural research and education programs, and to making biodynamic preparations. Producers may purchase preparations from JPI by credit card. Vinnie said that the goal is for biodynamic producers to make their own preparations. If producers can't do this, however, it shouldn't slow down their implementation of biodynamic agricultural practices. They can purchase biodynamic preparations from a supplier (like JPI), and grow into it.

A feature of biodynamic agriculture that was emphasized by Vinnie is the diversity of biodynamic producers. She noted that not everybody who is engaged in biodynamic agriculture is an anthroposophist.¹³ Implementing biodynamic agriculture is a spiritual journey. She believes that Steiner's body of work, especially that which addresses agriculture, is extremely valid. She said that Steiner's ideas help people to be good observers, to understand cycles of growth, and so forth. For many, this takes them on a life journey.

¹² She specifically mentioned the prevalence of biodynamic agriculture in Germany and the U.K.

¹³ An anthroposophist is a follower of the philosophy/belief system called anthroposophy, which was developed by Rudolf Steiner.

Is biodynamic agriculture a fad or a trend?

The food industry is often subject to fads, and occasionally affected by real trends. For example, the Atkins diet and other low-carb diets peaked in about 2004. Companies were introducing a large number of low-carb products at this time, and some companies that produce food products high in carbohydrates (e.g., baked goods) were concerned about their long-term viability. The low-carb craze has since waned, and although it still has a small influence on the food industry, can be considered a fad. In contrast, consumers' desires for improved health and nutrition, as well as convenience, are best viewed as trends.

The question to be addressed is whether biodynamic agriculture is a fad or a trend. Currently, the level of publicity and public knowledge of biodynamic agriculture and biodynamic food products are too small for this to be considered a fad. There simply is not enough media buzz for this phenomenon to be considered a fad. While it is always risky to try to predict the future, it does not seem that biodynamic agriculture will rise to the level of a fad in the U.S., at least not in the near term. Also, because biodynamic agriculture is such a small segment of the agri-food system, it does not appear that it will be a trend, either. At the same time, biodynamic agriculture has been around for more than 80 years, and will likely exist for many more. Its adherents are extremely committed to the concepts and practices, which implies that they will continue to participate in this form of agriculture. The most probable future scenario for biodynamic agriculture is one introduced by Ernie Harvey above. That is that biodynamic agriculture will continue to exist and act as a background influence on the larger agri-food system.

Final thoughts and acknowledgements

Researching this topic has given the authors a new respect for biodynamic agriculture: the farmers, the lifestyle, and beliefs. Learning the reasons why this industry exists, and the concepts behind it made us realize that biodynamic farmers are not like other farmers we come into contact with today. These are a group of people who grow plants, fruits, and vegetables with beliefs that they have a special connection to the earth. They cultivate with the intention to fulfill their souls. In other words, biodynamic farmers don't consider their crops as items of consumption, but rather as agriculture grown by stimulating their spirits which are bonded to the environment. Biodynamic foods do not compare to conventional foods because they are not produced with the same care. Obviously this is an agricultural system with beliefs in quality over quantity and moral growth above traditional market value.

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