Biodynamics and Roxbury Farm

Introduction

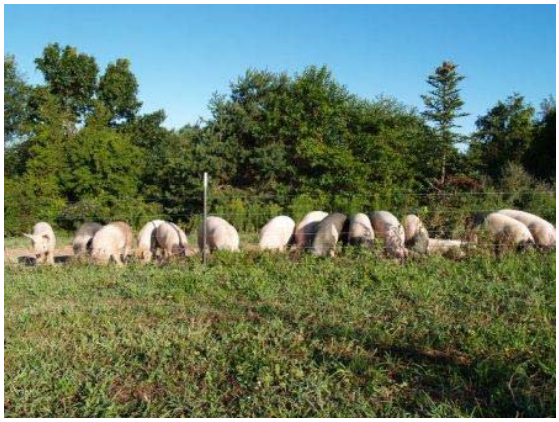
With this article I will try to describe the agricultural, social and economic aspects of a biodynamic farm. This is done best by describing the farm, and how my personal development made me realize that everything is interdependent.

Part 1

Integrity

Rudolf Steiner, the father of biodynamic agriculture, viewed the farm as a self contained individuality. His advice was to develop a personal relationship to everything in farming. Steiner's advice touches upon the core of biodynamic and organic agriculture. Through my 25 years of farming and feeding people I have come to the conclusion that:" *Through developing personal relationships with everything in farming we can maintain the integrity of organic agriculture*". It was a sense for integrity that gave birth to both organic and biodynamic agriculture. There was a sense of trust between the customer and a farmer who chose to farm organically. Later on standards were developed that were needed as the relationship between customers and farms became impersonal.

I will be using the word *integrity* in my description of the agricultural, economic and social aspects of our farm, so let me define the word; you can find a description of the word *Integrity* in most dictionaries as the personal inner sense of "wholeness" deriving from honesty and consistent uprightness of character. The word relates to the Latin adjective *integer* which stands for whole and complete. We can find the origins of the word in the French and Latin meanings of intact, integrate, integral, and entirety. The concept of integrity means that the whole is working well.



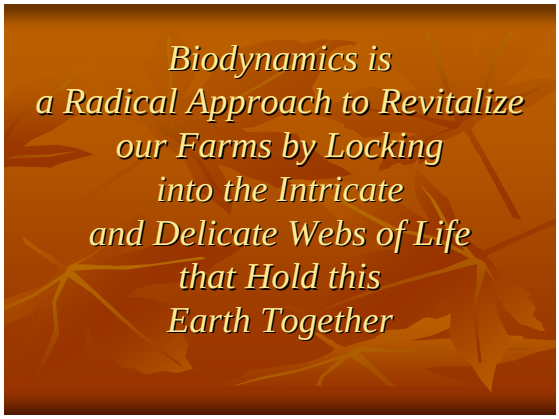
An essential aspect of biodynamics lies in the understanding of the interconnectedness of all the living organisms on our farm. Steiner said: *"Farmers must understand something about fostering insect life and bird life, because everything in nature is interdependent-everything. I have to emphasize this again and again"*. Most

organic farmers will agree with this in their heart but as the market place is taking a front seat we forget to pay attention to non economic components of our farm. Biodynamics is part of the history of organic agriculture as the founders of organic farming assumed the same principle: "*Everything in nature is interdependent; everything*". This sentence could have come directly out of The Agricultural Testament by Sir Albert Howard. He understood that we needed to look in nature for models of agriculture. Like Goethe he perceived nature to be perfect. A close to perfect agriculture only has to mimic what we already find in the perfect natural world.

Organic agriculture is struggling in maintaining those original principles. Biodynamic farmers have their own struggles like the concept of certification as they seek some recognition in the market place. What describes a biodynamic farm is at the heart of those questions.

A biodynamic farm

When we talk about the farm as a living individuality, we put it in the category of other living organisms that have their own integrity. Every living organism is described best by its ability in maintaining a form of integrity and its ability to separate itself from the world. Living organisms have an inner and an outer world separated by a membrane. The moment you take it apart, it dies. Therefore the biodynamic farmer refers to his farm as a self contained individuality.



A biodynamic farmer strives to create a kind of integrity on the farm that is similar to a living organism. A biodynamic farm is comprised of many living things working together like one great symphony orchestra. A biodynamic farmer allows a great diversity of living organism on his or her farm to thrive as those systems have proven to be most efficient in harboring life and storing energy. Every aspect of the farm makes its own unique contribution to the whole. When a farm is biodynamic it is transformed from a factory, producing food and generating profit, to a being that has its own characteristics with associated strengths and weaknesses that are honored.

Roxbury Farm

With this article I intend to describe to you about the integrity of farms from both a natural and economic perspective. I will do this by describing Roxbury Farm, how we operate it, and how my background in biodynamics laid the foundation for the understanding that everything around us is interdependent.

Since this topic is highly personal I need to tell you who I am and where I come from. First of all, Roxbury Farm consists of two people assisted by a wonderful crew of people. My wife Jody and I share the responsibility of our farm, and since she joined me Roxbury Farm has experienced a phenomenal development. Jody deserves all the credit for this as she has brought in a high level of professionalism and integrity. Jody grew up in rural Iowa exposed to farming since a young age as her family raises corn and soybeans and livestock on a large scale. As a child she spent many summer vacations hoeing beans, as a teenager de-tasseled corn and through college she raised flowers.

I on the other hand grew up in concrete and have only been farming since I was 18. I studied agriculture at the school for biodynamic agriculture "Warmonderhof". Warmonderhof is a four year state sponsored school for biodynamic agriculture. The school gave me a thorough training in all aspects of biodynamics and modern agriculture and stimulated new ideas regarding social justice and spirituality.

Warmonderhof

I will need to share with you some of the most important things I learned there besides the obvious of being educated as a farmer and learning about anthroposophy and biodynamics. First of all the teachers were as good at asking questions as giving clear instruction. Teachers that ask questions teach their students to think for themselves. I had the honor to read the Agriculture Course with the dean of our school, Jan Diek van Mansvelt. He was the absolute master in asking the right questions and had our heads spinning at times. I was also very excited about our soil science classes as it opened up many new insights into the secret world of our soils. One of our soil science teachers Pieter van Blom did not just teach us out of books, he also took us on a week long bus ride through the country. He made us dig holes whenever he thought there might be an interesting soil profile. When the farmer appeared, Pieter would waive his university credentials around, which did not always prevent us from getting chased off the property.

Another soil science teacher, Gerard Oomen once asked us why biodynamic grain farmers had fewer weed problems than biodynamic market gardeners.

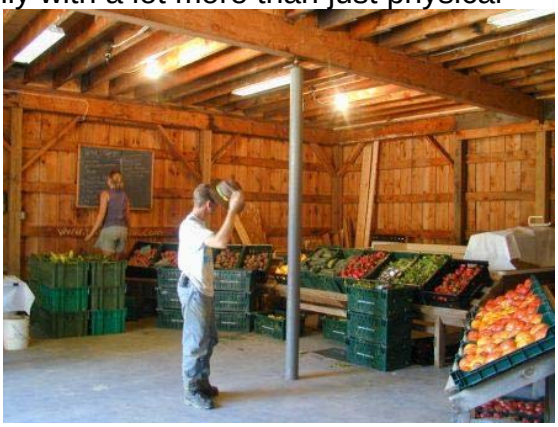
That one question has had a profound influence on how we raise vegetable crops.

Another profound influence has been my teacher in economics, Douwe van de Werf. He also understood the art of asking all the right questions which at times enraged my classmates. He taught us about money, and about people, and lots of his instruction was based of the lecture series of Rudolf Steiner's "World Economy". His advice in the end was plain and simple. He warned us to not make the mistake of trying to save up money to buy a farm. *"A farm, he said, is a good place to lose a lot of money in a very short amount of time. He encouraged us to become good at whatever we were passionate about; and to never worry about money. All we had to worry about was developing good ideas and to become good at what we like doing most. Money, he said, flows like water to good ideas and to people who truly work for others. Become a good farmer he said and others will buy you a farm. Buy a farm from your savings and lose it if you don't have the resources to manage it or the connections to sell your products".* I learned from him that a sound economic operation is mainly about good ideas, good implementation, and good connections. In other words get to know your world, yourself, and your customer before you go into business.

After school he offered a six week course on economic relationships between producers and customers. One main component of this course was the aspect of "the conversation". During those mock conversations we took the role of both the customer as well as the producer. As a producer we were asked to find out what products were needed, while, when taking the customer role, we needed to learn to express what our needs were about.

We made some important discoveries during those mock conversations. We realized that in order to serve the customer well, we needed to gain a better understanding of them as a whole human being. When we would sell them a stove for instance, we learned we were selling them not just a source of physical heat; we were asked to get to the essence of what this product would provide. When we buy something, we purchase a product that reflects something about who we are. In the case of a stove you need to start thinking of Christmas night with the whole family bundled up in front of the stove, and you don't need a lot of

imagination that this stove provides this family with a lot more than just physical warmth. Actually homes with a fireplace sell for a lot more than homes without and this has little to do with the heat such fireplaces generate. As a customer we learned to negotiate a fair price by gaining a good understanding of the production and distribution process and its associated cost both financial as social. Once we had a good understanding of the true cost of a product we were more willing to include the support of fair wages even if this means that the price was slightly higher than a competing brand. As customers we realized that we could have an impact on the way a product was manufactured. We found the essence of the products we were buying. As farmers we realized what food represents in people's lives. Food provides people with health, pleasure, true nourishment. I realized that in order to be successful as a farmer, I would need to get to know the people that will eat the food I produce. People needed to recognize the efforts of the farmer that provided them. After this course, I vowed that I would not grow anything, unless someone requested it from me. If I needed to get a fair price for my product; I needed to initiate a conversation with the customer. You understand that this course laid the foundation of what type of CSA Roxbury Farm would become later on.



America

I came to this country in 1985 after I graduated from Warmonderhof. I spend one year at Camphill Village Minnesota working under the guidance of Hartmut and Gerda von Jeetze. I also worked for three seasons at Hawthorne Valley Farm with Christoph and Annelien Meyer. Christoph asked me to develop a vegetable operation as there was a clear need for biodynamically grown produce both at the newly build farm store as well as at the Greenmarket in NYC. I was able to have my first exercises on developing new and innovative economic relationships as a provider of the Farm store with Gary Lamb as the farm store manager. He and I would sit down discussing what a fair price for each vegetable was; Gary representing the customer willing to support a farmer, while I as a farmer was willing to nourish the customer in the most cost effective way. Now Gary and I did not always agree on price, so it became a way to find out which crops made sense to grow in the Hudson Valley and which ones were more trouble than they were worth to Gary as a customer or to me as the producer. You can see that when a transaction is

the result of a personal relationship between a producer and a customer the idea of the economy as a living thing is not so far fetched.

The Economy

Viewing the economy from a living perspective means that you see the economic process as an activity of any living organism. If the economy would be part of a living organism it would be where substances are exchanged. The most fundamental exchange in nature is between oxygen, carbon dioxide, water, and carbohydrates. In nature it is all about giving and taking. Breathing in and breathing out. You can only breathe in as much as you breathe out. The point is that in nature the two are interdependent. I might be oversimplifying things here, but once we recognize that the producer and the customer are interdependent and part of equal exchanges we can move away from a competitive marketplace. The one serving is dependent on the one consuming and vice versa. That is why Trauger Groh called the CSA phenomena: CSA/ASC: "Community Supported Agriculture/Agriculture Supported Community. This process happened when Gary and I had our conversation, and it happened when we started our CSA, so let me talk about this for a moment.

The customers and the Farm

In 1990 I started Roxbury Farm. Shortly after this I was approached by Jonathan Hilton of the Center for Anthroposophy in NYC. Jonathan had organized a lecture at the Center about CSA given by Rod Shouldice. Rod was at that time the executive director of the Biodynamic Farming and Gardening association. After the lecture the group expressed a need to develop a CSA; but, where to find a farmer and a farm? One of the members of this group had met me at a biodynamic conference and suggested Roxbury Farm. I met with the group and decided to jump into a collaboration we both knew very little about. Our initial members had a difficult time convincing other New Yorkers to join. What does it mean? You first pay and then you trust the farmer to deliver the produce. Now there was a novel New York concept they had not heard before! You can only imagine the lack of success this conversation had with people outside the Center. A year later though, the Committee for Peace and Justice in the Capital District, impressed with what the Center had initiated, started their own CSA

program with Roxbury Farm. Having the blessing from the bishop, which we literally did, boosted the membership from 30 to 200 in 1992.

On our farm, it is our goal to serve the CSA members with truly nourishing food, by employing the best agricultural methods and selecting the best varieties for flavor, vigor and nutritional content. We also give our members an opportunity to visit the farm, visit the source of their food so to say, which adds a whole new dimension to eating. We also maintain a fair share price by employing the most efficient farming practices and means of distribution. The CSA has become a tool to meet the needs of the members of our farm in their whole body as we see them as more than just a customer. We humanize the transaction by fulfilling their needs in their minds, their hearts and their will. We know we have a member for life once the food has made a change in their body, it has affected their will. People will proclaim that the food has affected them health wise, or it has opened them up to a new appreciation of food. This is a kind of commitment that is hard to find anywhere else in the marketplace. Which business receives thank you letters almost on a daily basis from their customers? Our products have a real impact on them.

1200 Families

Today our membership has grown to over 1200 families, and some would argue that it is quite difficult to have a personal connection with each family these days. But I believe it is not so important that Jody and I have a personal connection to each member as it is important that each member is able to develop a personal connection to the farm. It is also not too important to serve each member with their particular wishes, but we have a pretty good idea what their needs are. Our members are part of the farm because they want fresh, high quality, organically grown, local produce from a place they can visit. We hold a survey once a year to make sure we are still in touch with our members and those results have impact on the kind of vegetables we grow, the content of the newsletter, etc. There has been a lot of talk about true and not so true CSA's but I think everyone is making a mute point here. A CSA is a place where people can obtain fresh, high quality produce on a real farm. As soon as a farmer opens him or herself up to the public either through a CSA, farmer's

market, or roadside stand, he or she enters into a different kind of relationship than the farmer who loads his or her crops onto a truck without knowing where it will end up. The farmer that grows for a distributor grows rock hard tomatoes that will store and ship well. The farmer that deals with the public will be in search of the best tasting tomato right off the vine. The old paradigm of farming is to produce, while the new paradigm is to serve. CSA is the culmination of this new paradigm because the customer enters into a partnership with the farmer. We need to open ourselves up and see what exiting places this approach might take us.

Finding the balance

Over the years we have tried to find the correct economic balance between the farm, the farm workers, and the farm members. It was through discussions that most of us educated ourselves and each other to alternatives of the present market system that we recognized are abusive to farm, farm-worker and customer. What particularly excited me about the process was that people with different disciplines were able to come to similar conclusions and solutions. This would happen as a conversation twice a year at the farm as core members from each community would meet with each other and listen to the farmers. Each season we would focus on what we had determined to be the weakest link within the farm as an organism. This cooperation between the farmers and members made it possible to add resources to make our farm more sustainable. It was clear to the core members that the farm could only become sustainable if the farmer was able to earn a living wage, allowing for proper housing for himself his family, and workers, while also able to re-invest in the farm business.

One year we decided to increase our beef herd. Many vegetarians were first appalled and then compelled to introduce meat in their diet after understanding the importance of having a diversified farm that makes an attempt to produce its own fertility. This would never have happened unless there was the opportunity to have a conversation about the needs of the farm.

Land Tenure

Our ultimate resolve was the purchase of a new farm. To many this was a great stretch but a very productive transition was made in 2000.

Now all of this would not have been possible if it wasn't for Chuck Matthei and Ellie Kastanopoulis of Equity Trust who encouraged me to start looking for land and even gave me a blank check to purchase it with. There was a deep friendship and trust that was the foundation of this generosity but there was also an almost unfounded confidence of Chuck that the members would pay Equity Trust back with charitable contributions. Chuck had his own reasons for this generosity, as he was deeply concerned with land tenure issues on CSA farms. His fear was that even though CSA is a great model it would easily disappear if we refused to deal with the lack of land security. He felt that some farms needed to set an example. Besides Roxbury, he was also working with Gloria and Steve Decatur from Live Power Farm in California.

Chuck asked the founding members if they were willing to raise the money needed to purchase a new farm. They all said "yes", even though they had no idea if we would be able to deliver. But we did. We realized that Roxbury Farm members were willing to put their money where there mouths were. Many commented that they could not imagine their lives without Roxbury Farm. They were not talking about a physical place at this point but all the activities our relationship had generated. People had made a personal relationship with the farm on a social economic level while the food had become its physical manifestation. The paradigm of a business that operates out of service and trust (as opposed to self interest) became as important to us as applying the organic/biodynamic farming methods. This trust resulted from the personal relationship that the core members and other supporters had developed with the farm over many years. It was never about us personally although trust is something we generally attribute as a process between people; it was about securing a piece of land that nourished them and the activities it generated.

Conclusion

I realized my teacher had been right all along. I had followed my passion, produced a product that was deeply longed for, biodynamic vegetables and meat, and the money manifested itself like crystals out of a saturated solution. What had looked like a crisis became an opportunity to find solutions for issues around land tenure. Out of this we were

forced to look at questions surrounding land and house ownership, equity, and affordability. After many years of negotiations we came up with the following conclusions: “My wife Jody and I have a 99 year renewable lease on the 150 acre farm that is held in trust. We own the house and barns but not the land underneath them. Those are subject to a re-sale restriction to make sure the next farmer can afford it and are tied to the 99 year lease. When we retire, we can devise this lease to our children or a successor and sell the house and barns at an affordable price. We created an environment where a proper balance of ownership exists between the individual, the public, and the environment. We discovered that having the fate of land decided by private ownership is like practicing mono-culture.

Part 2

The Land

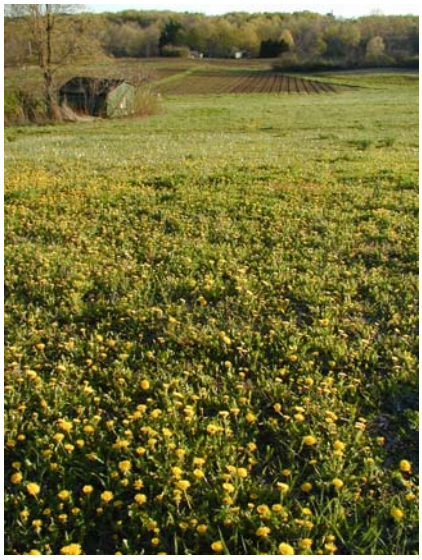
When we moved to new land in 2000, the new farm consisted of three pieces that had been farmed conventionally by three different farmers. One farmer had put the tillable acres in continuous corn. The tillage practices consisted of a disk, never working the soil deeper than 6 inches. The organic matter, nutrient and pH levels were low. This piece was inundated with quack grass, foxtail, and crabgrass and the soil was restricted by a hardpan 6 to 9 inches deep.

The second piece had been farmed in a four years alfalfa followed by four years of corn rotation. Some minerals that were removed were returned, which resulted in a decent pH, soil structure, and organic matter level. The tillage practices included a chisel plow and harrow. This was one of the first pieces we were able to put back into vegetable crop production.

The third piece was in a potato, corn rotation, farmed by someone who believed a little extra fertilizer can’t do much harm. His main tool was a gigantic rotovator. He thought and acted like most vegetable farmers; he drowned the crops in minerals and water to ensure a good production. Soil tests revealed excessive amounts of potassium and phosphorus, and low amounts of Calcium. I could tell that its vitality had been greatly depleted as the soil appeared dead. There was no active organic matter for the soil life to consume. The excessive amount of potassium and phosphorus had turned some of the ponds on the property green with algae. Even

after six years of farming this land organically, the results of the soil tests still show elevated numbers for both minerals. We did not have any perennial weed problems on this piece, but in the fall of 1999 the potato hills were completely covered with purslane. This was within the context of a chemical control program.

A personal approach



Each field within those three larger pieces needed an individual approach. Hillsides had been plowed up for corn that should never have been plowed up to begin with. The farm needed to expose its needs and our task was to watch her unfold her potential to us. One hillside that had been planted in corn we decided to let all the weeds take over. It was completely counterintuitive as a farmer, but it just did not feel right to loosen the soil again in order to create a cover. Given the erosion that had already occurred I did not want to create conditions that might result in more mudslides. Nature would provide a cover by itself and I wanted to find out what species would evolve without us interfering in the process. The very first year we sprayed horn manure preparation on those fields to help them recover from the abuses of the past. During an event our members helped apply this preparation onto this field. Since then the field has been left on its own; except that we cut it once a year to make sure the trees won't take over.

In the beginning it appeared that only dandelions, thistles, and loosestrife thrived with this Spartan approach to healing. But after five years it has turned into a beautiful field and the thistles, loosestrife and dandelions co-exist with species even stronger than them. There is a good balance between clovers, grasses, and wild flowers that is a pleasure to watch when everything is in bloom. The hairy vetch thrives, helping to bring nitrogen into the soil as a result of the symbiosis of nitrogen fixing bacteria that live around the rhizomes. Red clover, trefoil, and white clover are also prolific. The grasses are tall and green and provide a nice rest for the birds to sit on. The birds happily nest in the field as we usually do not mow until mid July or August. As a result, it has become a bird watcher's paradise. Several of our apprentices have observed bobolinks in this field. The bobolink is an endangered bird species that prefers a habitat of tall grasses. This field has also become a source of beneficial insects that control pests in the surrounding

vegetable fields or become a destination for some of the harmful insects. Leafhoppers and thrips appear to prefer this field for a new home after they lost theirs in a surrounding hayfield after mowing, at times in lieu of our potatoes or onions right next to it. One hot summer evening the field gave us another surprise. As we were driving home from turning off the irrigation pump, the field was alive with twinkling lights. Fireflies found something pleasing in the field and lit it up like a starry sky. All the surrounding fields were much darker, as this field held what the fireflies were looking for. As a stark comparison, the vegetable fields had almost no fireflies in them at all. It was an amazing sight and I have never seen anything like it. It was as if someone was confused about what month it was and decided to light up a few million Christmas lights. It was a reminder to me that the archetype of a healthy landscape is a prairie. This field had a memory of what it could become again. The fireflies, the birds and many other insects were there to confirm my conclusion.

I can continue about many other places on our farm that each needed to find the proper use. As we have been there for seven seasons we have been able to allocate a use for almost each place. We have divided the larger fields in many smaller plots as each field had several optimum ways to be used. I can't go into each detail so I will limit myself to the bigger picture of one of the guiding principles in getting there. One main theme was to protect the land again from unnecessary erosion or over exposure. Even completely flat land is protected on all four sides by grass strips as the weather in NY State can be violent.

Vitality

To explain my enthusiasm for seeing a field completely protected from the elements I need to refer to a metaphor that was made by Rudolf Steiner in the agriculture course. Steiner refers in both the fourth and the seventh lecture to the tree as mounded up soil. In the fourth lecture he describes the virtues of raised beds and in the seventh lecture he mentions

it in context of explaining the importance of birdlife on the farm. He asks us to imagine the trunk as mounted up soil, while the twigs and the leaves are compared to annuals and perennials. The cambium, which is the most alive part of the tree, the place where new cells are formed, is in this metaphor compared to topsoil.

Now what happens if we turn this picture around; how does this picture work if we treat the soil as if it were a tree? If we want to get a better understanding of a tree by comparing it to mounded up soil, then we can also get a better understanding of the soil by comparing it to a tree. To do this we need to add another important element to the tree, which is the bark. The bark is like a skin, it protects the cambium from losing its vitality, as it forms a protective layer. Without the bark the tree dies. In this metaphor, what the bark is for the trees, is the dead remains of roots and leaves for the earth. Think of sod in grasslands or leaf litter in the forest. And yes, it is true to say that when we remove the bark of the tree it is similar to what happens when we plow up a hayfield.

When the Native Americans saw the white man use a plow to open the earth it must have been like us watching our neighbors pulling the bark of their trees. Of course this process of losing vitality works much slower than when we pull the bark of a tree. When we started plowing up the prairie about a hundred years ago the soil had an organic matter level of 18%. Nowadays it has dropped to about 5%. This is an indication of the lost vitality of our soils. It is fair to say that our soils are slowly dying unless we change our management.

Equal Exchange

At another point in the seventh lecture of the agriculture course we can find some other insights about the effects of tillage on our soils. Steiner quoted Goethe: "*Everything in nature lives by giving and taking*". Goethe referred with this quote to our metabolic system as it breaths in and out. Steiner reminds us there that Goethe referred with his quote to plants representing giving in nature, while animals take. Plants breathe in carbon dioxide and breathe out oxygen while animals breathe in oxygen and breathe out carbon dioxide. When we grow vegetables we use this principle as increased activity also promotes a quick break down of organic matter. Over time this principle causes a reduction of soil structure, organic matter, and mineral contents as there is no raw organic matter left to build new soil life. Within the

context of a farm as a self contained individuality, crops that are removed from the farm become takers. Steiner confirms in the agriculture course that plants are like parasites to the soil. They only become soil builders when they die and decay in the soil, effectively becoming food for the microorganism.

The reduction of both organic matter and nitrogen is caused by the increased digestion of the animals below the ground. The temporarily increased microbial life devours the available carbon, and as their dead bodies break down release free floating nutrients. The nitrogen that is discarded in the process is utilized to produce abundant cash crops. Unfortunately, freely floating nutrients are not held very well by the poorly developed root systems of the vegetable plants creating losses in the process. On top of this we remove the above ground parts of the plants depriving the increased microbial life from its nutrition. This process is similar for a hayfield where manure is not returned to close the cycle.

When we grow cover crops like cereals, beans, vetches, peas and clovers and plow these under we bring in nitrogen and carbon and turn them into the soil as food for the animal life in the soil. I like to think that I am feeding my herd of earthworms when I turn in a crop of oats and peas. You have to realize that the metaphor of the soil as a tree only holds up so much as at times we can enliven the earth by plowing. Plowing can alleviate compaction (which is often caused by human error in the first place). But some soils are dense and oxygen needs to be introduced to ensure proper breakdown of organic matter which allows the animals in the soil to breathe and eat.

Now, healthy soil should have lots of animal activity, lots of carbon exhaled, otherwise we have a bog. In a perpetually plowed soil the balance between creating carbon and burning it up can tilt dangerously to the latter, leaving a slightly depleted soil behind. So each time we plow, we starve the earth a little bit at a time, allowing this energy to be used up, by our cash crops. The challenge of a biodynamic farmer is to balance the process of burning organic matter and allowing plants to create it again.

The question of weed control

So, I had learned from the little experience on the hillside, from Goethe's observations about breathing in and out, and from Steiner's observation that a tree is like mounded up soil, that I needed to find the proper balance between the plants above the ground and the animals below the ground. Biodynamic and organic vegetable farmers tend to keep their land exposed for much longer period of times than biodynamic grain farmers. The loss of minerals, organic matter and soil life tend to be much higher. As a remedy, vegetable farmers import high amounts of compost that can create chemical imbalances of our soils leading to excessive weed problems. The different species of weeds I found on the three different farms were a direct result of the tillage practices and the fertility programs of the previous farmers. The high potassium and phosphorus on one farm led to outbreaks of purslane and chickweed. The high bulk density and low calcium on another piece led to outbreaks of foxtail. By taking a closer look at the rotations biodynamic grain farmers apply we answered Gerard Oomen's question. "Why do biodynamic grain farmers have fewer problems with weeds than biodynamic vegetable farmers"? Biodynamic grain farmers use compost sparingly and rely on cover crops for their soil fertility. The land is covered for most of the year as cereals, grasses and clovers quickly cover the earth after planting. Raising cover crops allows us to be less dependent on compost and other farm inputs, ensuring that the soil does not contain excessive amounts of nutrients, while maintaining the soil structure and organic matter much better than cash crops alone. Simply put, if a prairie is the archetype of a healthy eco-system, then the problems we face as vegetable growers is due to the further drifting away from it than a biodynamic grain farmer. Grain farmers that employ rotations with lots of grasses and legumes allow for a period of rest of their land, so organic matter balance and soil structure can be restored. Land has a memory of what it wants to become. Vegetable farmers tend to violate this principle by keeping the soil exposed for long periods of time. We need open land to create the best environment for our cash crops. The best we can do is to create a system that resembles the rotation of a biodynamic grain-farmer.

Crop Rotations

Today the rotation at Roxbury farm integrates grains and clovers with cash crops on a one to two year basis. We balance our needs for additional organic

matter with the use of compost while we correct our calcium levels through the use of lime and gypsum. This means that we do not take a crop of half of our land at any given time but simply raise the fertility levels of the soil.

To most farmers it seems counterintuitive to take good land out of production. Many farmers tell me that it costs them too much to take their land out of production; my reply to them is that it would cost us too much to leave it in production. The savings on labor due to less weed pressure as well as the higher quality we harvest due to fewer culls increases the margin between operating cost and income. A good example of this is how we grow summer planted kale, broccoli and cauliflower. During the previous year we test the soil for nutrients like potassium, calcium and trace minerals. While lime is applied during the previous season the other amendments are spread before the oats and bell beans are planted (which are inoculated with a myccorhiza). In late June we spade in the oats and bell beans providing lots of activity in our soil. The kale, broccoli, and cauliflower have no need for any other inputs beside some control for cabbage worms. Flea beetles tend to be absent within such a system which can only be explained by the high numbers of beneficial nematodes that live in our soils. Spring planted cash crops are raised after fall planted oats and peas or after a full year of red or sweet clover spaded in one to two weeks prior to planting. Bringing in compost is still part of our system as the majority of our land was in a very deprived condition. Holistic soil health assessment by Cornell University indicates that our soils are in good condition again. The countless earthworms and the bountiful crops confirm this report.

Living off the wind

Growing cover crops that bring nitrogen and carbon into our farm is like practicing alchemy. It is like living off the wind. It is the only place I can think off where we produce something without first extracting something else from the earth. As we have fine tuned our rotations we discovered that while we are farming double the acreage, our profit margins have gone up. Tom Zitter, a plant pathologist from Cornell University is exited when he visits our farm as he sees the physical evidence that good rotations can give a farmer a high rate of control over problems like weeds, diseases and insects. From our own perspective our rotations are important since we have been able to

decrease our costs per acre. Now it is much more sensible to reduce production costs as opposed to increasing production. Decreasing production costs allows us to pay better wages, buy better equipment and meet our goal of supporting my children's college tuition in a few years.

Conclusion

So what I touched upon with you in a nutshell is the concept of the workings of a biodynamic farm. I emphasized the parts of biodynamics that I believe are approachable to anyone. Biodynamics is a worldview that has radically altered the way we interact with the world around us. This world view is based on Goethean Science. Goethe perceived the world in a different way than other scientists of that time. Goethe realized that we will never fully understand nature if we do not to view her in a living context. Goethean science is the real gift behind biodynamics. Biodynamics is a radical approach to revitalize our farms by locking into the intricate and delicate webs of life that hold this earth together. By tacking on to the webs of life, we make nature work for us while simultaneously improving the world around us.

Biodynamics is about the creation of the farm as a living organism. And any living organism has integrity, otherwise it dies. As we begin to see the farm as a living organism in relationship to her broader surroundings, it will develop its own individuality, and as you learn more you adjust your approach. It works the same in relationships? If you attempt to see people for who they really are; when you become interested in their biography; it gets a lot harder to have a strong opinion of them and a whole new dimension in your relationship opens up. It gets personal as the integrity of the other is revealed to you. At that point it is not anymore about what the other person can do for you but what you can do for the other person. You start looking out for them.

A whole farm approach is all about building personal relationships; you can choose to do this with or without the preparations, with or without the calendar, as these are highly personal options available to every farmer. The point is that you have to start looking out for the soil, the animals, and the people that live off that piece of land. I don't know how you should do this; I just described the things that we have done. No one

can tell you how you should run your farm. It is up to you to develop your own personal relationships to your markets, your land, and your workers. All you can do is to maintain and support the integrity of that relationship. You make choices on your farm which organism you favor and which you don't. You create the environment that is most beneficial to you, the workers, the plants, animals, and the people eating from it.

How do we know if we are working towards the creation of integral systems on our farm, and when do we know when the broken pot is whole again? Sometimes we intuitively know what is wrong with a situation but we can't describe it in a way that makes sense. We are so smart about making excuses for why we are willing to cooperate with something we know is inherently wrong. One thing has become crystal clear which is that we will lose the integrity of organic agriculture when we immerse ourselves too much with the free market economy. The market place as it exists today will continue to force farms to specialize into very few products and therefore move away from a whole farm approach. So, I oversimplify things here, but what if I tell you that the original meaning of the word *diabolical* was to take things apart; to compartmentalize? These days we have associated the work of the devil with the word diabolical, while we forgot what the devil was really doing. Goethean science is the opposite of the devil's work; it allows us to develop a framework to see that everything around us is interdependent.

Working towards integral systems does not imply that you know everything that is going on above and below the soil, or that you need to develop an infinite knowledge base. Our continued study of developing a personal relationship to our farm can be furthered by talking to our fellow farmer friends, researchers, and your customers. Invite them on your farm, and tell them what you do, ask them for advice. Together you can become a better student in biodynamics. By focusing on the integrity and uniqueness of every relationship, the rest will follow. It is a process that demands patience as all the energy is upfront. Slowly our paradigm changes and we arrive at a place where we can say like Conrad Vispo of the Farmscape Ecology Program: "We should perhaps think of Agriculture not as humanity's dominion over Nature,

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Postscript

I have a few recommendations for farmers that want to explore developing personal relationships with everything in farming:

- ✓ **Ask the correct questions** as a tool to develop a better relationship to our farm, our markets, and our co-workers. To understand what the real issues are leads us to knowing what to do. Tools like Holistic Resource Management are great to begin with as they help develop a framework in asking the right questions. As we begin to see the shortcomings of our farm the correct solutions will come to us. As I said before about my teachers, they held back some of the information as it was more important to look at the world from a wondering perspective. Answers often shut us off from finding new solutions. Never say we have tried this as we might have tried it with the wrong tools and the wrong understanding. Let your fellow farmer friends and your customers ask some hard questions. At times it takes an outsider to see your failings in a split second.

- ✓ **Work systematically.** To work towards the development of a farm as a living organism, we need to understand what our farm is capable off, what our markets demand, what level of complexity our crew is capable of dealing with. If we ignore this, our farm system is going to crack somewhere. Our farm is not a machine and we need to design it on a highly personal basis. Each farm will have its own set of circumstances and solutions in making it highly productive. There is not one right way

but there are many wrong ways. The wrong ways will show themselves as they will leave a path of destruction behind, either physically in terms of eroded soil structure and less diversity, or socially in terms of broken relationships. The right way will show itself by decreased inputs, increased production, greater diversity and greater symbiosis between all the living organisms on the farm. When marketing our products we will be looking for transactions that are based on trust. We need to develop relationships with people who have a vested interest in our success. At the same time we need to make sure that we deliver what we promised them, we need to be trustworthy to earn their trust.

- ✓ **Be realistic**; we can only do as much as we are capable of; there are no shortcuts. It is good to admit what we don't know, instead of faking a deeper understanding based on book wisdom or the use of esoteric language. We need to develop partnerships with others as we realize that we can't do it alone. Land tenure issues, nature observations, soil health assessment, market access, etc. are areas farmer need help with these days as the burden of keeping a farm viable keeps us focused on short term goals. The recognition of what we don't know is as important as the discovery of what we do know. Organizations like Farmscape Ecology can be important assets to biodynamic farmers as we do not have the time to count salamander eggs, or observe the turtle population on our farm. Without the proper interpretation we miss the correlation between the different species that inhabit our farm. Remember when it comes to observation that you can be your own worst enemy as we often see what we want to see. To interpret our soil health, Cornell soil health team developed a holistic soil health assessment test so we can monitor which crops or rotations develop good soil structure, soil life, and which take away. When it comes to marketing we are not taking on the beast, we will just do our best to ignore the free market as much as we can, instead of trying to conform to it. We are not asked to change the system, but we need to be careful to what extent we allow ourselves to get sucked in. Be extremely careful in taking on debt.

If we succeed, biodynamic agriculture will be an inspiration in helping to maintain the integrity in organics that some farmers feel we are losing right now. Ten years from now it might be that organics is just another form of kosher food, while biodynamics can become the stronghold for a new agrarian culture. The choice is ours.