

JPI Applied BIODYNAMICS

Spring/Summer 2019

Periodical of the Josephine Porter Institute

Issue No. 95



IN THIS ISSUE

Rose Hill's Transition from Conventional to Biodynamic Orchard

Biodynamic Tools for Weather Extremes

A Biodynamic Farm's Response to Climate Change

From the Editor

Dear Reader,

This month has found me reading Rudolf Steiner's lectures as good medicine for this phase of Earth's transition. His writing has a way of turning my anxiety into activity and helping me to be more conscious of each moment as it passes. Although I have not quite reached the place where I might insert, "What would Rudolf Steiner say?" into a conversation, I am close. Recently a friend stopped by to share travel stories. When our discussion turned, as it often does, to conditions on Earth, he proceeded to admonish me not to be so attached, because there are other worlds "out there."

So this is how it happens, I thought. It all begins so innocently, a little bit of focus on technology, a few daydreams, and soon, too soon, as Steiner might have pointed out, Luciferic forces draw our focus away from our own continued evolution on Earth. Hubris has us thinking we can go somewhere else, even in the very moment when there is no other option but here.

This issue reminds us that as climate changes, this Earth remains our best and only option. Mike Biltonen profiles Rose Hill in New York, whose owners are committed to reclaiming their orchards from years of commercial man-

agement and thus reinstituting health. In this issue, we also conclude our survey of biodynamic farmers, illustrating how climate change is impacting them and how they are responding. We also look at biodynamic tools for weather extremes, as well as one farmer's focus on species diversity in the face of change.

I once and still do grieve Earth changes, though now big storms and similar events make it clear that patterns of use need to change. In a poem that has always comforted me, Wendell Berry says it best:

"When despair for the world grows in me/and I wake
in the night at the least sound/in fear of what my life
and my children's lives may be,/ I go and lie down
where the wood drake/rests in his beauty on the
water,/ and the great heron feeds./ I come into the
peace of wild things/who do not tax their lives with
forethought/of grief. I come into the presence of still
water./ And I feel above me the day-blind stars/ wait-
ing with their light. For a time/ I rest in the grace of
the world, and am free."

—Mary Maruca

Applied Biodynamics

Applied Biodynamics is a publication of the Josephine Porter Institute for Applied Bio-Dynamics Inc. (JPI). The subscription price of \$30.00 (\$20.00 on-line) per year helps support JPI research and development. Back issues are \$7.50 each.

No part of this publication may be reproduced without the written consent of the publisher. Permission to reprint articles or artwork contained in this newsletter may be requested from:

Managing Editor, *Applied Biodynamics*
Josephine Porter Institute
652 Thompson Road SE, Floyd, VA 24091
Phone: (540) 745-7030; Fax: (540) 745-7033
info@jpibiodynamics.org
www.jpibiodynamics.org

Managing Editor—Mary Maruca

Co-Editor—Abigail Porter

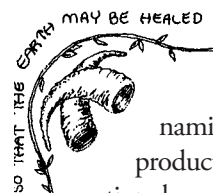
Co-Editor—Mike Biltonen

Layout—Bruce Bumbarger

© 2019 The Josephine Porter Institute for
Applied Bio-Dynamics, Inc.

Front cover: Kevin Clark, Rose Hill farm manager and biodynamic devotee, regularly checks on the apple trees. Catskill Mountains are in the background. Photo by Mike Biltonen

Cover redesign: We are printing in color starting with this issue, thanks to the reduced cost of a new digital process. We welcome suggestions as we continue to make changes.



Mission

The mission of the Josephine Porter Institute for Applied Biodynamics, Inc. is to heal the earth through production of quality biodynamic preparations based on the spiritual scientific discoveries of Rudolf Steiner and to advance education and research in biodynamic agriculture.

Board of Directors

Clay Wesson (McMinnville, OR), President
Bill McCranie (McDade, TX), Vice President
Theresa O'Shaughnessy (Austin, TX), Secretary
Pat Frazier (Hotchkiss, CO), Treasurer

Rose Hill's Transition from Conventional to Biodynamic Orchards: A Work in Progress

Mike Biltonen

In the Beginning

Wilderness advocate and misanthrope, Edward Abbey, may have had it right when he said the greatest mistake humans made was giving up the hunter-gatherer way of life for agriculture. Agriculture got its nascent kickstart when nomadic humans, still hunting and gathering food, realized that some types of plants and animals had superior characteristics or environmental advantages over others.

Recognizing this roughly 10 to 12,000 years ago, these early agrarians began to employ simple farming techniques and adaptations to make lives easier. Over time, these practices advanced and changed until many productive and time saving techniques improved our ability to farm productively and efficiently. Unfortunately, humanity and the planet have been on a downward spiral ever since.

Substantive changes in how we farm began during the Enlightenment (1685–1815), as thinkers throughout Europe and the world questioned traditional authority and embraced the notion that humanity could be improved through rational change. Our knowledge of how to grow crops increased with recognition of the nutritional needs of plants, in particular nitrogen. Further critical innovations during the 19th and 20th centuries allowed us to capture and convert nitrogen for use as plant fertilizers—all based on the indiscriminate use of fossil fuels. Powerful insecticides and fungicides made use of World War II's leftover weapons' industry, and farming has never been the same. Today, climate change, species extinctions, air and water pollution, and soil degradation are stark realities, exposing a fundamental problem with too quickly converting chemically farmed land into organic and biodynamic properties without relying on some destructive external inputs during that transition.



Rose Hill Farm apple orchard with Catskill Mountains in the background

The scenario of poisoned air, water, soil, and food is tenuous for the planet's survival, not to say anything of how difficult it is to transition a farm or orchard from conventional to holistic¹ management under this situation. Young farmers without much experience may find their good intentions for land stewardship severely tested after buying a farm that has been treated chemically for numerous years. How does a young farmer even begin to take on such a task? What protocols should such a farm follow? During the past few years, I have had the privilege of working on just such a project with people committed to making this challenging transition work, and I have come up with a few ideas.

Rose Hill Farm

Rose Hill Farm is located in Red Hook, New York, about 1.5 hours north of New York City in the historic Hudson River Valley. Rose Hill was purchased in 1798 by Peter Fraleigh. Established as a farm in 1812, it now comprises nearly 100 acres of land where fruit crops including cherries, blueberries, peaches, plums, apricots, nectarines, and apples are grown. Bruce and Holly Brittain, and their uncle, Chris Belardi, purchased the farm in November 2015 from previous owners

Dave and Karen Fraleigh. The Fraleigh family had farmed this land for six generations before deciding to sell the property after the 2015 growing season.

Rose Hill Farm is without a doubt situated in one of the most picturesque areas of the Hudson Valley, including a panoramic view of the Catskill Mountains. It has history, orchard, vistas, and ownership commitment to sustainable farming. As the owners state on their web site, "*We embrace holistic, bio-intensive growing practices that focus on plant and soil health and are transitioning to organic over the next number of years.*" I know first-hand that the commitment they've made is genuine. I also completely understand the difficulties they and growers in similar situations face in achieving their biodynamic goals.

The farming traditions of New York's Hudson River Valley region are very old, stretching easily back into the 1600s, not accounting for the Native American agriculture that occurred in the region for many centuries prior to that. For at least 400 years, settlers have been coming and going, bringing anything and everything, including pests of all sorts, from around the world into New York City, only to have them redistributed throughout the rest of the United States. The biological pressures are intense and lead to a high level of difficulty establishing or transitioning to any organic farm or orchard in the area. Rose Hill Farm has not escaped these pressures and, as an orchard with aspirations of organic certification, has faced a severe uphill battle during its transition process.

The first two years I worked with Rose Hill Farm, it operated as it had for years—conventionally—to allow the new owners time to become accustomed to their new lifestyle and learn about farming. It also allowed time to discuss and vet various transition approaches that would allow them to move away from chemically intensive farming toward a holistic approach that embraced organic and biodynamic principles. While we maintained the conventional spray program, we decided to eliminate some of the most toxic chemicals while incorporating some unconventional approaches. During the 2018 growing season, the biodynamic transition began in earnest.

The past few years, after working with a number of orchardists on a transition scheme that had worked well, I felt confident that a similar protocol would benefit Rose Hill. Also, after 30 some years in the orchard business, I had a good handle on what the potential hurdles would be. Everyone at the farm was very enthusiastic and committed to the program, and so away we went.

From Exhilaration To Triage

The first few months went well. The trees looked healthy,



Preparing to prune with the new owners

probably due to the early dry weather and low disease pressure. Apples² and stone fruit,³ face numerous diseases, most of which are fungal in nature, though some bacterial diseases also afflict fruit trees under certain conditions. While these disease issues create serious problems, they also provide clarity and awareness about the health of the whole farm and how years of abuse can impact crops. Our spirits were high initially because everything looked a lot better in mid-June than any of us expected it to, but by late July the proverbial wheels came off and we had to regroup.

Early intense issues like cedar apple rust (apples) and brown rot (cherries) caught us off guard, creating some management issues, but they also illuminated the confounding reasons why good horticulture is also a basis for successful biodynamic farming. For example, numerous red cedar trees grow on the Rose Hill property, obviously serving as the primary inoculum for cedar apple rust. Fruit mummies leftover from the previous season served as the primary inoculum for brown rot on cherries. Fungal apple diseases like scab were also present, though of lower concern except in a few blocks.

Insect pests also were not very prevalent early on, though plum curculio caused damage to a fair number of fruits,



Apple scab

which snowballed into other issues later on (primarily fruit rots). Insect issues like oriental fruit moth, codling moth, and apple maggot added insult to injury by the season's end.

The heat, humidity, and rain that occurred throughout the summer didn't help the situation either, so the diseases expanded and defoliation increased. By mid-July we saw many more foliar diseases in apples—black rot, white rot, Marssonina leaf blotch, cedar apple rust—and some premature defoliation. Fruit size was small; insect damage had increased; and trees grew poorly due to a lack of photosynthetic capacity (i.e., reduced or damaged leaves). This occurred in spite of a very intensive and expensive spray program that included organic materials, biodynamic preps, effective microbes, optimal nutritional sprays, and immune boosting products. By the end of August, we were forced to reintroduce some synthetic chemicals just to save the crop and get the trees back to some degree of good health. It was an agonizing decision, but the right one. It took several sprays to stop the infections, reduce insect pest activity from spreading, and salvage what remained of the crop.

What had started out as a good looking inaugural year ended up a few steps from a disaster and, in the end, glaringly illuminated the problems associated with



Cedar apple rust

transitioning from conventional to organic or biodynamic without a strong baseline understanding of the health of the land and a subsequent transition strategy. The entire team at Rose Hill is solidly committed to a future of organic and biodynamic farming, but, after 2018, they are treading a bit more cautiously. We're all asking ourselves, "What does a good transition approach look like?"

heal itself. Certainly, we can implement certain practices—plant pollinator gardens, encourage mycorrhizal communities, and provide optimal nutrition, for example—but we also need to allow the land to rest, recover, and revitalize on its own terms. Forcing anything will only result in failure, as will farming with a lack of patience or intention. I think of this process as similar to realigning one's chakras.

*"Dr. Steiner told the writer [Ehrenfried Pfeiffer] that plants themselves could never be diseased in a primary sense, 'since they are the products of a healthy etheric world.' They suffer rather from diseased conditions in the environment, especially the soil; the causes of so-called plant diseases should be sought there."*⁴

Planning For Transition

How do we get there from here? How do we assist the land in achieving its own higher level of consciousness, a higher, more balanced energy level? The immediate practical steps are obvious—improved biodiversity, optimal nutrition, elimination of toxic chemicals, and plenty of available clean air and water, among other tangibles. But what about the things we can't see, measure, or manipulate through typical farming practices? As guides or stewards of the land, how do we get in touch with the unseen forces for health and not only comprehend a farm's quantum imbalances, but understand the steps required to help rebalance them? It's important not to think we are so smart that all that's needed is a clever trick, technological doo-dad, or different spray material. Degraded farms do require time and a nurturing hand to rebalance themselves—much like humans, animals, or plants that have gone through life-challenging events. Essentially, like an orchestra conductor, we have the ability to shift things in the right direction, but to shift them well we have to have an idea of where to start.

Taking a traditional analytical approach to farm health is an artifact of a limited way of thinking that not only do humans have the power to detect problems, but that we also can fix them. The reality is that in conventional terms we don't have the power to do much more than measure and analyze situations with metrics and superficial observations before trying out so-called rational solutions.

We do have an ability deep inside us to transcend these limitations, however, if we can shift our perception away from thinking that we can fix anything to recognizing we are only guides or conductors at best, assisting the land to

Without a doubt, farms and orchards need as much energetic support as they can possibly get. But knowing what to do—without just trying everything—is the key. Connecting with the land—listening to the land and its trees, plants, and animals—is a good place to start. Use tools like soil and tissue tests, water tests, dowsing, and, most importantly, your powers of observation to "feel" what's going on. When I am scouting a farm, orchard, or vineyard, I am not just looking for insect, disease, or nutritional issues. I am "sensing" the land, too. If I am on a conventional farm, the low energy levels are immediately apparent. There are few birds, insects, or signs of other life. Also, there is a low vibrational feel to the land. It just feels "dead." But when I am on a holistic farm, signs of life abound and the land feels alive. Connecting spiritually with a piece of land is a sacred practice and is certainly much more than a rhetorical exercise. It provides that critical link between the seen and unseen, which helps us to understand what the land requires to heal. Connection is critical as it provides us with clarity and direction to know what we as stewards of the land need to do—and that really is the point after all, right?

In Transition—Where does A Farmer Begin?

Transitioning a perennial orchard or farm under any circumstances is not the same as transitioning a farm growing annual produce. With perennial crops (orchards or vineyards), there are legacy issues that don't simply go away because you've decided to farm organically—no matter how much you want it to work. They linger, and, unless properly considered and dealt with, they continue to harangue your efforts until you can eradicate them or dismantle the orchard.

From a biodynamic perspective, the right path is a blend

of intention, good horticulture, and innovative biodynamics rolled into farming practices that address whole-farm health. But one must understand the fundamental issues of transitioning first before doing anything. This is accomplished by assessing the health and vitality of the orchard, monitoring its revitalization over time, while leaving the door open for some distasteful heavy lifting, and allotting enough time and patience for recovery. The following are the keys to a successful transition.

1.) **Understand the pest complex⁵ of the farm and your local bioregion.** For the Hudson Valley, it's no secret that the pests one encounters are generally the same throughout the region. For apple and stone fruit diseases, it's the aforementioned fruit and foliar afflictions, and various fruit rots. For insect pests, various lepidoptera, plum curculio, apple maggot, brown marmorated stinkbug, and borers are on the list. Blueberries—another main crop at Rose Hill—are a lot easier to manage organically, though spotted wing drosophila is a major pest most years. This doesn't account for new invasive insects, like spotted lanternfly, or diseases that may spring onto the scene in any given year.

For example, Marssonina leaf blotch is a disease of

certain tree species, including apples, which has been known in the Hudson Valley for years, though the disease has not been significant in apples until recently. In 2018, we saw an explosion of this disease that resulted in massive defoliation, weakened trees, and general orchard malaise. There are no sprays, conventional or otherwise, registered for use against this disease, though the literature suggests that certain conventional fungicides are effective against it when applied legally for other apple diseases. The questions still remain—why has this blotch suddenly become more apparent and what can farmers do about it? Are conventional sprays becoming less effective? What of organic or biodynamic sprays?

Although this disease has a similar cycle to apple scab in that the inoculum overwinters on infected leaves from the previous year, its life cycle runs later in the season than average, potentially resulting in high inoculum loads at the end of the season. And though environmental conditions ultimately dictate infection periods, heavier inoculum loads could mean more severe infections under milder conditions.

The issue of invasive species is an important one to highlight here. In the last 20 years we've seen a number of



invasive species—insects and diseases—enter the scene. They are probably not new to the region, but their population increase suggests that environmental conditions are increasingly more conducive to their success. In no case has there been a quick fix, not even with conventional insecticides or fungicides at ready. But if growers are focused on ecosystem health instead of a clean, manicured orchard the trees should be better able to withstand these devastating impacts more effectively.

- 2) **Assessing the health of your orchard ecosystem.** As biodynamic farmers have always known, an orchard is more than just the trees they grow fruit on. It is the soil, air, water, non-crop plants, beneficial insects, microorganisms, *and* the farmer. We know that natural forest ecosystems are strongest and most resilient when they are at their most diverse.⁶ In order to achieve this diversity, farmers need to encourage a healthy environment to help other life forms thrive. This could mean dredging a “dead” pond or streams, planting beneficial plant species, removing detrimental ones, introducing or encouraging beneficial insects and pollinators, using bio-accumulators to remove toxins from the soils, cover cropping, or simply giving the land time to rest and revitalize itself at its own pace.

Assessing the health of a farm's support system goes beyond simple metrics. There are ways to measure biodiversity that aren't really practical for farmers. Thus it becomes important to use and sometimes grow our powers of observation to recognize imbalances and devise a strategy to help the land rebalance itself. In my region, for example, if I see too many cedar trees on a property, I know they present a clear and present danger to an orchard and need to go. If a property has excessive Japanese honeysuckle, the threat of spotted wing drosophila is high, so you need to remove the honeysuckle. Also if your ponds are stagnant and overgrown with algae, they need to be reworked for proper water flow.⁷

This is the case at Rose Hill and has opened up whole new avenues for revitalizing the farm beyond working directly with the crops or conjuring some innovative new spray. The land tells us what it needs and, in turn, we need to listen before we act. All too often we get caught up in measuring things quantitatively and fail to notice the obvious signs of imbalance that are right in front of us.

- 3) **Assess the health of your orchard—from the ground up.** You've got a good sense of what's wrong with your farm's ecosystem. Now you need to consider the orchard itself. What are the varieties and rootstocks? What are their natural susceptibilities and resistances? How old

are they? How healthy are they? Do they harbor any active or latent disease or insect pest issues? How productive have they been the past few years? How healthy has the fruit been? What about the root system? How healthy are the soils?

There are ways to measure the relative health and fertility of soils. A simple soil test will give you basic nutrient levels, while a more complex test will tell you about the soil's physical, chemical, and biological (including pathogen pressures) characteristics. A combination of the two every few years will allow you to monitor benchmarks and ensure that some basic metrics remain constant, or will let you know when they need to be adjusted. Consider pH, soil organic matter (OM), cation exchange capacity, cation balance, and micronutrient levels, as well as basic nutrient levels. It's important to know and understand these factors, but they're not the end of the story.

For too long, farmers have been encouraged to myopically manage soils for pH, NPK, and some micronutrients with little regard for soil biological activity. Rarely are they encouraged to manage nutrient ratios and interactions, or to understand how nutrition (especially micronutrients) drive more important phytochemical biochemistry. These elements, in addition to soil biology, drive the entire system.

- 4) **Consider the pest management program of the past few years.** Was it, as in the case of Rose Hill Farm, a conventional farm? Or was it IPM? Were any organic or biodynamic tactics employed? How severe was the program—were toxic chemicals used indiscriminately? Years of conventional chemistries can have lasting effects on established resistances in pest species, beneficial insect populations, accumulations in soils and plant tissue, and, I believe, the basic energy imbalances of the entire farm. The spray and fertilizer program influences overall energy levels and balance throughout the system to the degree that reestablishing balance likely means ensuring sufficient time (up to 7 years according to Harold Hoven), using techniques such as bio-accumulation to remove persistent toxins in the soil, or even removing debilitated trees from the orchard.
- 5) **Assess the energy levels of the farm or orchard.** Understanding the energy levels on your farm is one of the most important issues to consider when contemplating a transition. Apart from the obvious indicators or metrics, there are the unseen aspects that need to be understood before they can be addressed.

As we're all aware, matter is simply energy, clouds of electrons flitting around, banging into each other. The patterns of this energy movement define how alive and



healthy an ecosystem is. When these energy patterns are in disarray or the energy levels dampened, then certain subatomic processes can't take place or don't happen appropriately. But how do we understand the energy levels of our orchard? And if we do understand it, what do we do about it?

The first step is to assess the energy levels of your farm. The second step is to do something about it. Given that assessing the energy levels of your farm is a very deep subject and one that requires more space than we have here, I'll hold off on this and revisit this topic in a future issue of *Applied Biodynamics*. That said, I believe that for the overall health of the planet, as well as many debilitated farms and orchards, we are better off applying the practice of sequential spraying that Hugh Courtney developed years ago. This topic has been written about previously in *Applied Biodynamics*,⁸ so I will only reflect on why this is an incredible practice for rebalancing the energy systems of your farm.

The sequence is alternating sprays of preps with downward activity, sprayed in the afternoon, and upward

activity, sprayed in the morning. The first spray is barrel compost sprayed in the afternoon, followed by 508 sprayed in the morning. The third spray is 500 sprayed in the afternoon, followed by 501 sprayed the following morning. These sprays balance each other and restore the rhythmic daily atmospheric movements of moisture. Together, they are known as an energy balancing procedure.

Hugh Courtney further suggested following up the above sequence with sprays of milk and honey. Milk and honey suggest abundance and nourishment both physically and spiritually. Milk is associated with lime and downward activity, and so should be sprayed in the afternoon, like BC or 500. The honey on the other hand is associated with silica and upward activity, and so should be applied in the morning, like 508 or 501. Milk should be applied 1 pint/3.5 gallons water and honey at a rate of 1 ounce/3.5 gallons water. Normal prep stirring and application process applies.

While this was developed during a period of drought in the late 1980s, the potential to rebalance other, non-weather associated energy dysfunction on an unhealthy farm is

quite clear. However, we still need to better understand energy imbalances, their sources, and impacts, so the appropriate preps can be applied.

There are various techniques for assessing energy levels of an ecosystem, however I want to start with the easiest and most obvious: our powers of observation. If we simply go onto the farm or orchard with the intention of “being one” with its life force, then we can sense the energy in the land by using our eyes, ears, nose, taste, and touch. This may manifest itself in pragmatic ways, such that the soil smells alive, or the water tastes pure, or the bird song is clear, or simply that life is abundant all around us. Developing a deeper sense of “knowing” is key to revitalizing and stewarding any farm.

Transitioning a farm from conventional management is not for the faint of heart. The road can be treacherous, one intended only for those with a deep desire to heal deep wounds inflicted on the land and to grow food of the highest quality. But with unswerving devotion, intention, awareness, and no small amount of patience, it can be done. My hat is off to the folks at Rose Hill Farm—forward ho!

Notes

- 1) Holistic is a term I will use that includes organic, biodynamic, and variations thereof.

- 2) E.g., Scab, powdery mildew, cedar apple rust, and fire-blight.
- 3) E.g., Leaf spots, brown rot, bacterial canker.
- 4) Preface by Ehrenfried Pfeiffer to the *Agriculture Course*, Rudolf Steiner, (Adams translation), p. 5
- 5) The following discussion is abridged since there is neither time nor space to discuss each and every pest in detail.
- 6) I don't mean just sheer numbers. Different species, populations, interactions, balance, and resilience all make up a diverse ecosystem.
- 7) Using a flow form or creating a vortex when mixing preps, you are oxygenating and structuring the water for higher energy levels and to improve the influence of the preps. The same is said of natural water flows. A body of water is at its lowest energy potential when it is stagnant.
- 8) Sequential Spraying—adapted from Issue #6 of *Applied Biodynamics* (Winter 1993). See also Hugh Lovel's *Quantum Agriculture*. Hugh Courtney has refined the protocol for sequential sprays since his initial experimentation. The sequence above ending with 501 is now used for conditions that are too wet. To balance droughty conditions, the position of 508 and 501 are exchanged so the last spray would be 508.

Biodynamic Tools for Weather Extremes

Abigail Porter

Our planet Earth has changed significantly during the past hundred years. As a result, the tradition of applying biodynamic preparations twice a year may no longer be sufficient to maintain soil and plant health. Micro-organisms in the soil as well as plants and other living systems are being compromised by persistent chemical and radioactive contamination in water, air, and rain (in the southeastern United States, glyphosate is in 75 percent of the rain).

Indeed, natural cycles, human destruction of the earth's ecosystems, and deliberate manipulation of the weather with geo-engineering, including plans now to “dim” the sun, are all contributing to more extreme and unpredictable weather. While some parts of the country are experiencing extended periods of excessive rains and flooding (1000-year floods that come more often), other regions have experienced prolonged heat and drought. Out-of-season temperature shifts have resulted in 80- to 90-degree days in winter when trees should remain dormant, or 50- to 70-degree temperature drops in spring, resulting in frosts after the growing and blossoming season has begun. These unusual conditions, in addition to

pollution and the destruction of larger natural cycles and ecosystems, stress food crops while increasing their vulnerability to disease and pest infestation. As growing food has become more difficult, using all of the preparations more often (monthly or more frequently as needed) may be required to prevent, moderate, and remediate the current onslaught of health compromising situations.

Gone are the days when we can plan our planting and spraying schedule at the beginning of the year and more or less adhere to it. Now, in many parts of the country, we have been forced to adapt and be much more spontaneous—planting or spraying when there is a window in the weather (sometimes a month later or earlier than usual), applying remediating preps following unexpected extremes, harvesting either much earlier or later than usual. Since unpredictable weather conditions likely will continue, taking preventative measures with all the preparations earlier in the season or pre-season may help build soil and plant resilience. For frequent, consistent, and practical application of all of the preparations, take a look at the unconventional

approach that Steven Adams has been using (see *Applied Biodynamics* issue 94).

Fruiting Trees and Bushes

Instead of applying the biodynamic tree paste only once a year, try two applications, which may help to moderate the effects of winter weather extremes and protect from pests. The first application in late fall after leaf drop helps protect trees from insect hibernation in the loose bark and may help protect trees from freezing, as well as maintain cooler trunk and branches when unseasonable warm spells occur. The second application in late winter when trees are pruned helps heal and protect the wounds, while also keeping the tree cooler and potentially preventing early bloom.

Tree paste may also be used during the fruiting season for fruit tree boring insects. The bark is scraped as one would normally in the dormant season and any exudates are removed. Full strength tree paste concentrate, or concentrate with added fermented horsetail tea, is applied to the damaged areas. For large orchards, tree paste thinned to a consistency that can easily be applied with sprayer equipment and is then sprayed on the trunk, scaffolding branches, and foliar canopy in the spring, and during codling moth flights discourages moths from laying eggs on the small developing fruit. Unlike spinosaids, tree paste is not harmful to pollinators. Keep tree paste on hand for emergency situations when bark has been damaged by hailstorms or removed either by rodents or rutting deer.

Excessive Moisture/Rain/Humidity

When conditions are too moist, plants become “watery” — vulnerable to fungal disease and insect damage. We can help strengthen and bring the plant back into balance, using the biodynamic preparations and nutritional plant teas. Silica in the form of BD 501 (horn silica) and BD 508 (*Equisetum*/horsetail tea) are most commonly used to bring balance and strengthen plant boundaries (skin). Cultivating and weeding in the morning when the earth is breathing out helps evaporate excessive soil moisture also.

Equisetum arvense, horsetail tea (BD 508)

- **Fresh tea as a foliar spray.** Simmer 1 unit (1 cup/1.5oz dry weight) chopped dry horsetail in one gallon of rain or spring water for 20 minutes. Let cool, strain, and spray straight or diluted on foliage either at sunrise or in the evening.
- **Fermented version.** Simmer 1 unit (1 cup dry) in one gallon of water for one hour. Cool and pour into glazed clay crock or vessel, or a gallon glass jar and cover with a plate or loose lid. Store in a cool, dark place (e.g., base-

ment) away from electrical fields and allow to ferment for 10 to 14 days until the characteristic sulphur/rotten egg smell develops. Strain and store in a glass jug in a cool, dark place until ready to use. It can be stored six months or more and not lose effectiveness.

- **To use.** Dilute one part fermented tea to 9 parts water. Stir for 20 minutes in alternating directions creating a vortex, in the usual biodynamic way. Spray onto the soil in the evening when the earth is breathing in. One unit of fermented horsetail will treat up to three acres. It has also been used in the evening as a foliar spray.

Horn Silica (BD 501)

Sprayed in the very early morning when there is absence of sunshine and warmth, and too much moisture, as well as spindly growth, or excessive leafy growth and delayed blossoming or ripening.

Barrel Compost and/or Pfeiffer Field Spray

As foliar and soil nutritional spray for stressed plants (too wet, too dry, or frost damaged) and as a soil drench to bring back plants whose leaves have been stripped by hail.

Oak Bark prep (BD 505)

Strengthens plants to resist disease and pests.

Milk and Honey

A spray of milk or milk and honey has been shown to be beneficial when plants are stressed from insect damage. The basic formula is one (1) part milk to nine (9) parts water, and one (1) part honey to ninety-nine (99) parts of total liquid. The mixture is stirred for 20 minutes in the usual biodynamic fashion.

Plant teas

Nourishing and remedial teas are helpful in extreme weather, as well as more normal conditions. For more extensive use of plant teas, as well as pest treatments see Maria Thun's books, *Gardening for Life* and *The Biodynamic Year*.

- **Yarrow blossom tea** can be sprayed to prevent and treat powdery mildew.
- **Chamomile tea** prevents damping off in young, tender plants.
- **Nettle tea** is a foliar nutritional spray for both too wet and too dry conditions.
- **Fermented teas (nettle, dandelion, and/or comfrey, and other weeds)** are powerful nutritional and fertilizing teas made by chopping up fresh plants and putting them into a food grade, white plastic, five-gallon bucket or glazed clay vessel (one-third to half full) and filling with

rain or spring water. Cover with a loose lid, stir a little daily, and let it ferment in the shade until it becomes stinky (1 to 4 weeks depending on temperature). Strain and dilute one part to anywhere from 9 to 40 parts water, depending on fertility needs for soil application. Fermented nettle tea helps transplanted plants get a good start. Fermented teas may also be used as foliar sprays if they are very highly diluted (at least 1 part to 30 or 40 parts water, depending on your initial concentration of fresh leaves).

Prolonged heat and drought

Building pre-season health and resilience by using all the preparations is the best approach to help plants withstand the stress of future heat waves and lack of moisture. In areas where summer droughts have become more routine, extra sprays of 500 and Barrel Compost or Pfeiffer Field Spray (which contains 500 as well as all of the other preparations) early in the season stimulates deep root growth and strengthens plants so they fair better when the weather becomes too dry. Foliar sprays of Pfeiffer Field Spray or nutritional teas also help when plants become stressed. Use of row covers and shade cloth help retain moisture and protect plants from sun damage. Avoid cultivating in the morning, which dissipates moisture accumulated during the night. Moisture retention is increased when soil is cultivated or hoed in the evening as the Earth is breathing in and dew is falling.

Sequential spray

Spraying all the biodynamic preparations on leaf/water days over the course of two or three consecutive days has been used to attract needed rain. For complete instructions see *Applied Biodynamics* spring/summer issue No.89 or see “Sequential Spray of Biodynamic Preparations for Weather Extreme” under “Preparation Info” (jpibiodynamics.org).

Seed soaks

Soaking or spraying seeds with 500 or Pfeiffer Field and Garden Spray, which stimulate good root growth, has been shown to increase plant resilience to drought

- **Equisetum tea.** Frequent sprays morning and evening can help attract moisture.
- **Compost and cold “brewed” plant teas.** Use as a foliar spray or soil drench to give plants a boost during hot, droughty, stressful conditions. Use barrel compost as a base and add other ingredients such as fresh horsetail, nettle, comfrey teas, molasses, or mycorrhizae, and brew (oxygenate) 24 hours or more in a vortex brewer or use a fish tank pump in a five gallon bucket.
- **Frost Protection.** For tree fruit, spraying valerian (BD 507) on

the evening before predicted frost and again in the morning, if frost has been severe, can spare blossoms and fruit from damage and loss. Early leafy annuals are also protected from light frost with valerian. On unseasonably cool summer nights, warmth-loving plants (e.g., tomatoes, corn, strawberries, and figs) benefit from evening sprays of valerian.

Potentizing valerian to a 1:10 dilution and pre-treating seeds with a seed bath for winter greenhouse cultivation ensures extra protection during variable, prolonged cold temperatures. In Taos, NM, at 7000 feet of elevation, Melinda Bateman of Morning Star Farms has successfully increased yield of greenhouse grown salad greens by 50 to 100 percent, using this technique. In Western Colorado, apple, peach, cherry, and plum crops have been lost due to unseasonably warm winter temperatures and late spring frosts. Valerian sprays have successfully saved orchardists as much as 50 to 100 percent of crops that would otherwise had been lost to these climate change stimulated events.

For more detailed information on the use of preparations go to jpibiodynamics.org; back issues of *Applied Biodynamics* are available also through the website (see index), as are Maria Thun’s books, mentioned above, and Monty Waldin’s latest book, *Biodynamic Gardening*, which provide more information on plant teas.

Available from JPI

- BD Sequential Spray Kit 1 (use for drought or excessive moisture) \$24 (1 unit each BC, 500, 501, and 508)
- BD Sequential Spray Kit 2 Pre-potentized. \$26 (1 unit each BC, 500(X), 501(5X), and 508)
- BD Barrel Compost (BC) Kits (includes biodynamic compost preparations, and basalt—you provide the manure and eggshells.)
BC Biodynamic Compound Kit 1 (single batch \$31)
BC Biodynamic Compound Kit 2 (double batch \$62)
- Valerian (frost protection) \$3.25
- Biodynamic Tree Paste Concentrate (recommended after pruning) quart—\$30/ gallon—\$100/ five gallon—\$350

See our product catalog for preparations: <https://jpibiodynamics.org/wp-content/uploads/2018/05/JPI-Catalog-2017.pdf>



Black mulberry fruit ripe and ready for picking

A Biodynamic Farm's Response to Climate Change

Stefan Hagopian*

Climate change is a vast topic that seems dominated by the voices of the largest institutions and policy makers. The individual biodynamic farmer stands juxtaposed—as always—between his or her own (relatively) small agricultural practices and the products and influence that result from the farmer's operations. Whether these occur through nutrition, education, love, or other beneficial radiations, the potential exists for many responses to climate change in and around a biodynamic farm. I have found some specific examples of this in action. A reduced “carbon footprint” is one environmental benefit when a farm is limiting its inputs and outputs. Biodynamic farms are ideally organized to develop the property as an intact ecosystem (or living organism) that is self-fertile, self-regulating, and self-correcting. Decreasing inputs such as fertilizers and pest controls or decreasing outputs of waste products leads to less transportation and less carbon emissions released to the atmosphere. Also, fewer petrochemicals are burned for fuel or fertilizer distillation or for construction of alternative power sources. A so-called “closed system” farm also offers less oppor-

tunity for contamination or the spread of diseases to or from the farm. This is especially important when diseases appear or increase under the stress of climate change. The smaller size and greater diversity within a biodynamic farm also offers advantages for responding to climate change. A smaller farm can be more nimble and find easier ways to adapt to sudden changes in climate and water supply (or market demands for that matter). The presence of diverse plantings or animal species already on the farm can greatly increase a farm's viability in times of sudden change, which impact productivity and economic sustainability.

Simply planting for species diversity may be one of the most effective biodynamic farming practices to encourage survival as the climate changes. Encouraging diversity within the farm ecosystem provides a dynamic platform that enhances the adaptive potential of all living beings served by the farm. If a crop fails due to climate or weather changes—or if market demands shift—the biodiversity inherent to the farm can provide the multi-year testing and learning curve that tends to be prohibitive in mono-crop operations that follow the local community model of “growing whatever grows well here.”

Even centuries-old crop selection experience may not be as pertinent in times of rapid climate changes.

Demeter certification requires the maintenance of a healthy ecosystem, including the non-crop wild animals, birds, plants, insects, microbes, and elementals. A farm's planted crops, herds, and flocks generally reflect less diversity than exists among the wilder natives, but any amount of extra diversity on a farm can provide a valuable platform from which the farmer's selection can take place. And of course the well-established biodynamic practice of seed saving provides the further benefit of natural selection for characteristics that change from year to year, because these changes are usually slow enough for annual crops like vegetables to adapt and provide succeeding generations of a species with characteristics better suited to the ways climate may be changing in that location.

At Skyline Organic Farms, diverse planting gave me some of my best responses to unexpected market changes and increasing drought in Southern California, although increasing diversity had not been my reason for these actions. I had originally planted mulberries for their abundant fruit to provide food to attract birds and feed their attraction to berries to "protect" some other nearby fruiting crops. I further planted several different varieties of mulberry to extend their harvest season, as some ripen in different months of spring and summer. Four pleasant surprises resulted:

- 1) Customers had great interest in a fresh, local berry crop, which at first was unfamiliar to them but, thanks to an extended harvest (i.e. not all fruit ripens simultaneously) I was able to offer at market for a longer window of time. Typically these berries do not store or ship well, and are usually unavailable in mass markets or from large-scale producers.
- 2) Some local chefs and I discovered several valuable applications for the sweet, low-acid berry that is relatively high in fiber without containing big, obvious seeds.
- 3) As water became more expensive during our extended drought, mulberries became a more appropriate crop because carefully pruned mulberry trees can be very productive without much irrigation.
- 4) Excess leafing branch growth after the fruit harvest was gradually "green-pruned" and provided a welcome fresh green fodder for chickens and sheep in the mid-late summer and fall when annual grasses and leafy forage had withered and dried quickly during our recent lower rainfall years. We also found that fruiting bushes and trees that require more warmth than typically occurs in our climate zone.

*See *Applied Biodynamics* Spring/Summer issue 91 for a related article by Stefan Hagopian.

Climate Change on Biodynamic Farms: Survey Responses

We continue the climate survey started in the 2018 Spring/Summer issue with responses from other parts of the country not previously included. We thank all of you who have responded, giving us a picture of how various parts of the country are being affected. Most farmers are experiencing either hotter and dryer conditions or much wetter weather, with some locations experiencing a combination of both extremes. If you are interested in sharing your experiences, please respond to the same questions in the survey below and send your responses to the managing editor at m.maruca@verizon.net.

1. Provide some history/background: Where are you located and how many acres do you farm or garden? Crops? How long have you been farming in your current location?
2. How long have you been using the biodynamic preps in this location? Which ones? All of them? How frequently? Do you make any of your own preparations? Which ones? Do you have animals? What kind?
3. Has climate change and weather extremes affected your farm? In what way?

4. Have you had to change your routine farming/gardening practices (e.g., timing of working the soil? planting? harvest? what you plant? Water usage? any increase in disease or pest infestation?)
5. Have you increased or changed your use of the biodynamic preparations to compensate? How and what ones?
6. Have you noticed any differences in resilience on your farm when compared to conventional farms nearby and in your region?

Northeast—Deb Soule, Avena Botanicals Herbal Apothecary, West Rockport, Maine

Background: Demeter-certified Avena Botanicals and biodynamic farm are located eight miles from Penobscot Bay. Avena farms 2 ½ acres of medicinal herbs. Deb Soule has been farming for 33 years, and has been using BD 500, 501, compost preps, and Three Kings Prep for 20 years. Avena makes 500, nettle, valerian, and horsetail, and maintains a few beehives.

Weather changes: The past 5 to 7 summers have been dryer and hotter, with more heavy rains in winter and less reliable snow cover.

Changes in farming practices: Since we do not irrigate, the annual crop of calendula is affected by less rainfall. We hand-gather more than 200 pounds of fresh flowers to meet our needs, and are now growing two plantings: 1,000 seedlings are transplanted in late May and another 700 in late June. The size of the calendula flowers from the first planting have diminished considerably because of the lack of water, which is why we do a second planting.

Changes in prep use: With the increase of heat and dryness in summer, we sometimes only spray 501 once in late June. We are considering spraying 500 more and possibly doing sequential sprays as needed.

Southeast—Jeff Poppen, Long Hungry Creek Farm, Red Boiling Springs, Tennessee

Background: I have been farming in this location since 1984, using all of the biodynamic preps about twice per year, and I make all of my own preparations. We have 8 acres of vegetables, hay fields, and 40 head of cattle. Although we have not had to change farming practices or preparation use, I feel compelled to discuss our ability to reverse climate change with proper land management, which frequently takes me away from the farm to go to conferences and give lectures. [Known as the Barefoot Farmer, Jeff has hosted the *Southeast Region Biodynamic Conference* on his farm for many years. For more information, see his website, barefootfarmer.com]

Midwest—Brian Wickert, Viroqua, Wisconsin

Background: I have been farming here for 15 years, growing 3 to 5 acres of mixed vegetables, using all of the preparations annually. We make all of our own preps: BD 500, 501 508, BC, and compost pile preps (502–507)

Weather extremes: Who really knows what can be considered normal weather patterns? We are here on this earth for such a short period (75 years) of time compared to cosmic time (thousands of years), so how would we know what is normal weather on a cosmic timeline? In my short period of farming, I have experienced what I would say are extreme fluctuations in weather in the form of large amounts of rain in short periods of time. Yet the yearly rainfall has remained constant. Temperatures have been in the range of what would be called normal. Unlike other parts of the United States, this area has not had long-term (2 to 5 year) droughts.

Changes in farming practices: We adapt each year to past weather conditions. I do not have knowledge of the com-

ing year's weather so we spread out the risks of variable weather by planting multiple types of crops.

Changes in prep use: I have increased use of BD preparations to improve and balance the soil so it can be more adaptable to the variability in the weather.

Differences in resilience on your farm when compared to conventional farms: Of course. My soil seems to have more water holding capacity. This has two benefits: 1) less erosion and 2) more soil moisture during dry periods, which reduces plant stress.

Pacific Northwest—Wali Via, Winter Green Farm, Noti, Oregon

Background: We are located in the Coast range foothills of Oregon, 35 minutes west of Eugene. We manage 171 acres, with 22 acres in vegetables and 105 acres in grass-fed cattle. We also have horses and sheep. I have been farming for 45 years and have been using all of the preparations since 1976. We make all of our preparations (500–508 and Prepared 500) and apply them multiple times a year.

Weather changes: There are more extreme events. Also, there is less rain in both summer and winter. Springs are milder and drier, and fall is drier.

Changes in farming practices: No changes thus far, though we have been able to work our ground earlier in the Spring. We have not changed our use of preps.

Pacific Northwest—Marjory House, Singing Creek Farm, Cottage Grove, Oregon

Background: We are located on a 7-acre property in the southern Willamette Valley. We have 2 acres of apple trees (about 450 dwarf trees), and 2 acres of mixed vegetables and other fruit. Currently, our farm has ducks, rabbits, and a resident Canada goose. We have grown seed for a local seed company three out of the five years we have been in this location. This year we have a contract to grow CBD hemp seed. I grew up with family gardens and have been farming and/or gardening in the Willamette Valley since 1995. I started using all the preparations in 1999 and I joined the Oregon biodynamic group in 2006 and have been making all the preparations with them ever since. Separately, I make barrel compost, valerian, nettle, equisetum (508) preps, and tree paste, on the farm. In 2000 I started a fruit tree pruning business, so have used 508 and the tree paste, with either 500 or B.C. in it

I almost always use two sets of preparations for my compost piles, one when it is built and one after the first turning. I also use barrel compost every spring mixed with 500. I have made concoctions of my own using B.C. 500, 501, 508 and fermented fresh seaweed all together with honey or molasses. My farm and plants love this mix!

Weather Extremes: Only in recent years have I noticed such extreme heat in Willamette Valley summers. Recent hot dry summers have made us concerned about low water supplies and fire danger. I have also noticed decreased production in certain crops such as tomatoes, potatoes, and cucumbers because of extreme heat. Timing for anything, whether it is working the soil, planting, harvesting or spraying preparations is tricky with extreme or erratic weather. It is not unusual to have several weather patterns in the Willamette Valley on a given day especially in the spring. One moment it's raining hard, the next it's sunny, and the next it's snowing. So we have become rigid weather watchers, checking numerous extended reports and planning accordingly. It used to be that one could reliably plant peas on President's day and potatoes on Saint Patrick's Day, and have knee high corn by the fourth of July! Nowadays you're lucky if that's the case! My new saying is that September is the new August, because most years now things don't even ripen till August, and then September is long and hot.

Changes in farming practices: For the most part I haven't changed practices, though for the past six years I have started peas a month earlier. Long wet springs have delayed planting and transplanting of other crops. We have a few well-drained areas on the farm where we can work the soil sooner than the field, so if we have a wet spring, I have ended up changing my crop layout. We mulch with compost, leaves, or straw in summer but not too much in winter. In my experience, too much mulch can cause problems with rot or burrowing pests such as moles, voles, and gophers. As far as pests go, there is always something! I don't see a huge change in pests other than if winter is mild we see an increase in moles, voles, and slugs/snails. Fungal disease in

the Willamette Valley has always been an issue because of the long wet winters. I have been using 508 equisetum for a very long time to balance out fungal issues and I certainly notice its benefits.

Changes in prep use: There are a few changes to spraying preparations that I have made in the last few years. I use more equisetum in wet springs, spraying both the apple trees and the soil in the garden. In the last two years I have not used 501 (horn silica) in the orchard for ripening or increasing warmth by spraying in the air but rather have sprayed it on the ground mixed with 500. It has been so hot that I have not felt the need to use it in the traditional way, as indicated by Steiner, but have felt that the trees still need the silica for absorption of nutrients in the soil. Once I sprayed 507 (valerian) in the greenhouse when we had a deep freeze, along with covering plants with remay, to keep salad greens from freezing. I now keep valerian preparation on hand in case we have a late frost after bud break in the spring. It has come close but I have not yet had to use it.

Difference in farm resilience compared to conventional farms: I have noticed increased plant resilience to pests and disease and improved water holding ability in my gardens and farm, compared to neighbors and farms not using biodynamic preparations. Particularly our farm stays green and holds moisture in the hot dry months. I have noticed this with other biodynamic farms also.

Note: After Marjory responded to the survey, in late February, three feet of snow fell on her farm in an area with a Mediterranean climate and average snowfall of 3 to 5 inches a year.

Permadynamics: JPI's Marriage of Permaculture and Biodynamics

Pat Frazier

What's Happening At JPI?

Spring promises to renew creativity and aid future planning for the farm at JPI. Since we acquired the property in 2016, we have made the improvement of critical infrastructure our top priority, so as to support our preparation making and distribution operations.

That phase is now complete, with the remodeling of the barn to support our technology and processing needs, and our move back to the land from our former offices in Floyd, VA. At last we are able to focus on a whole farm design that will carry us into the future. We plan to begin this process with our spring workshop.

We will address whole farm organism design at the spring

workshop, using the marriage of permaculture and biodynamics as our design foundation. This approach will help us design a farm dedicated to biodynamic preparation making, research, education, and small-scale demonstrations.

A Little Background

"Permaculture," coined by Australian Bill Mollison in the 1970s is a design methodology following the wisdom of nature's systems, while employing various principles and design strategies to instill similar wisdom in the design of farms, gardens, intentional communities, villages, and cities. Drawing on multiple disciplines (e.g., architecture and



Josephine Porter Institute farm in Floyd, Virginia

green building; water engineering and conservation; key-line plowing, swale building, water catchment and storage; waste, recycling and prudent composting), permaculture seeks to care for Earth and people by promoting a sustainable, renewable farm or garden organism. In Steiner's original lectures that comprise the biodynamic method practiced today, Lecture 7 eloquently describes what constitutes many of the principles of permaculture.

Why Is This Important?

In 1924, when the agriculture lectures were given, farmers were struggling with what was then the beginning of the world we know today. They had begun to experience the impact of industrialized conventional agriculture, even though the traumas of electromagnetic and nuclear technology had not yet been experienced, and fossil fuels were not then equated with greenhouse gas accumulation. Nevertheless, they recognized the symptoms of decreased soil productivity in crop yields; decreased animal fertility and associative breeding problems; and decreased vigor of germination in seeds. Their questioning led to Steiner's lectures, offering a more enlivened approach to agricultural methods.

These lectures predicted much of what we are experiencing today—decreased soil health, animal productivity, food vitality, and genetic diversity. To heal these and other forces, Steiner proposed operating from an organism perspective,

working with planetary influences on certain plants and trees, as well as recognizing the general characteristics that comprise a farm organism. He suggested maintaining the edge effect of meadows and forests; allowing a diverse array of plant choices within forests to foster communication between the species and the cosmos; and integrating animals for those balanced “organs” of the farm. He also suggested integrating the insect and bird worlds, with the astral qualities they bring to the communication between plant, animal, and human species. Most important, Steiner suggested the maintenance of a “wild” area of all farm and garden organisms.

An examination of the contemporary discipline of permaculture today brings the obvious similarities into sharp focus. However, permaculture lacks the intention to bring the whole cosmos into the act of design. Also, it does not bring the depth of anthroposophy and spiritual science to the discipline. The marriage of biodynamics and permaculture—bringing these two strong forces together—seeks to unite those intentions: to bring cosmic influences to life, while delivering a practical, contemporary design discipline to farms, gardens, intentional communities, and cities.

How Does This Apply To JPI

We will be working with these principles at JPI this spring. The spring workshop will include a hands-on practical design exercise to introduce permaculture design, while incorporating

biodynamic management of a farm organism. The workshop will feature local permaculturalist and permaculture instructor Leaf Myczack of Floyd, Virginia, with biodynamic farmer and permaculture instructor Patricia Frazier (JPI board member and Colorado farmer). Other guest lecturers may include herbalists, beekeepers, green builders, and farmers in the area.

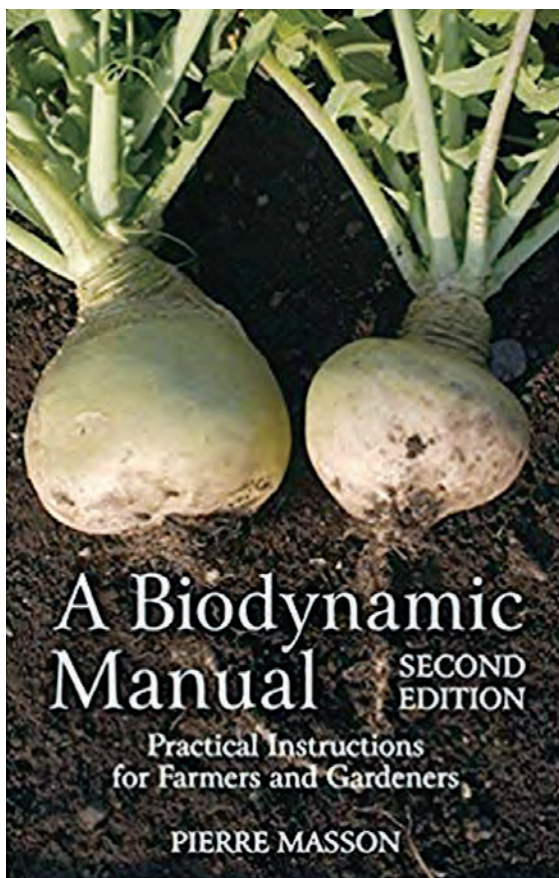
The JPI farm totals 26 acres—small enough to be managed

through a diversified permaculture design, large enough to represent multiple strategies of regenerative farming consistent with permaculture principles, and grounded enough in biodynamic principles to incorporate whole farm organism ideals. We will be exploring all of this in the spring workshop, which will run for a full week in early June. Specific schedule and dates will be posted on jpibiodynamics.org.

Pierre Masson, August 8, 1944–July 22, 2018

Last summer, Pierre Masson—author, farmer, educator, elder, and overall large spirit in the field of biodynamic agriculture—crossed over, leaving behind a significant legacy of biodynamic inquiry for those whom he mentored and who follow after him. One of France's leading biodynamic consultants, especially to vineyards, he served as a board member of Demeter and also the Biodynamic Association, working with biodynamic researchers around the world.

Author of the foundational *A Biodynamic Manual*, Pierre, along with his wife, and later his son, Vincent, deeply studied the biodynamic preparations, regarding them as remedies for the Earth. During his last years struggling with bone cancer,



he gained strength from treatments provided by anthroposophical medicine to continue and complete work that had inspired his curiosity throughout his life.

Among these accomplishments were a study initiating a basis for regenerating grape vines and his keynote address at the biodynamic agricultural conference in Dornach, February 2018, in which he referred to the preparations as the bond between Earth and the Cosmos. If you can translate from French and German, you might be interested in that presentation at: <https://www.youtube.com/watch?v=gSC7gd8cyos>. Also, he is part of a beautifully filmed documentary titled *Wine, the Green Revolution*. The trailer may be viewed by searching on the title.

Masson often used the word “terroir,” meaning sense of place. As explained by those who knew him, the word means far more than simply earth or soil, rather the entire organism—“the light and heat . . . without which grapes cannot ripen.” In a similar way, Masson merged with and helped to strengthen the larger terroir of biodynamics.

Did You Know?

- **Scientists intend to spray particles into sky to block sun in 2019.** Harvard researchers announce plans for a Stratospheric Controlled Perturbation Experiment (SCoPEX) to dim the sun to counter global warming. (*Healthy Holistic Living*, January 9, 2019)
- **Fishermen Sue Big Oil For Its Role In Climate Change.** In November 2018, fisherman in California and Oregon filed suit against 30 oil companies, holding them accountable for the the failing Dungeness crab fishery due to warming conditions that have led to toxic algae blooms, making the seafood unsafe to eat. (NPR, December 4, 2018)
- **Adults may seem inactive in the face of climate change,** but not the children. Simultaneously heartening and depressing, children took the stage at the United Nations climate talks in Poland. Specifically, 15-year old Swedish activist Greta Thunberg took the adults to task for their inaction in the face of changes that deprive these young ones of a future (earther.gizmodo.com/the-time-for-talk-is-over-kids-stage-major-strike-at-u-1831107203).
- **“As well as sequestering carbon,** regenerative organic and agro-ecological systems can mitigate the chaotic effects brought about by climate change, such as flooding. Healthy soils have structure that allows them to retain large quantities of water. This structure not only holds soil in place, preventing erosion, it also allows plants to be more tolerant of weather extremes,” writes Elizabeth Kucinich for the *Huffington Post*. She further notes that conventional practices have produced a 30 to 75 percent loss of original organic soil carbon but that climate can be reversed by the way we grow our food. (www.huffingtonpost.com/elizabeth-kucinich/the-way-we-grow-food_b_5634675.html?ncid=engmodushpmg00000003).
- **California’s Silcon Valley once was known for more than its technological advancements.** Google and other tech giants now occupy lands that once contained premiere fruit trees. Fortunately C. Todd Kennedy, cofounder of Abo-reum Company, has been distributing vintage fruit trees for more than 40 years. Thanks to Kennedy, half of the national collection of old stone fruit cultivars are still available, and the U.S. National Plan Germplasm System contains the material that has been saved from disappearance (atlasobscura.com/articles/growing-collecting-rare-fruit).
- **Trees are having a harder time than most people may realize.** Articles in major papers have cited surprising recent deaths of trees that previously had lived for thousands of years until our era. The baobab, a tree sacred to Africa and in existence since the world was young is one example. The article notes that one of several reasons for the death of these trees is the essential extinction of the large animals once responsible for distributing their seeds. (*The Guardian*, June 13, 2018)
- **Another iconic tree, the cedar of Lebanon,** reported to have been used to build Solomon’s temple and referenced in the epic of Gilgamesh, is increasingly hemmed in by expanding land use and drought caused by global warming. The trees need moist cool winters to reproduce and, much like America’s own ancient bristlecone pines, are finding this sustaining weather either not at all or increasingly at higher elevations where they are not located (*New York Times* online, July 7, 2018).
- **The Galapagos Islands sit at the intersection of three ocean currents** and are vulnerable to the increased ocean warming sparked by El Nino events. In ways that Darwin could never have imagined they once again are critical habitat, testing the impacts of changing weather patterns (*New York Times* online, December 18, 2018).
- **Although trees are suffering in many parts of the world,** this *National Geographic* story suggests that the intention to positively change the environment and planting trees to accomplish this may be the first step for recovery. At least it has been that way for Kokota, off Tanzania, which has planted more than two million trees since 2008, its first step to successfully confronting climate change. (*National Geographic* online, December 2018)
- **Planting 1.2 trillion trees could cancel a decade of CO₂ emissions.** There is enough room in the world’s existing parks, forests, and abandoned land to plant 1.2 trillion additional trees, which would enable the CO₂ storage capacity to cancel out a decade of carbon dioxide emissions, according to new analysis by ecologist Thomas Crowther and colleagues at ETH Zurich, a Swiss university. (*Yale Environment 360*, February 20, 2019)
- **Groundbreaking study reveals immediate benefits of eating organic foods.** A study, led by researchers at UC Berkeley, UC San Francisco, and Friends of the Earth found that in just six days levels of all detected chemicals dropped an average of 60.5% on an organic diet with a range of 37 to 95% percent depending on the compound. The most significant drops occurred in a class of nerve agent pesticides called organophosphates. (*Organics Matters* blog, February 12, 2019)

The Seed Underground: A Growing Revolution to Save Food

By Janisse Ray

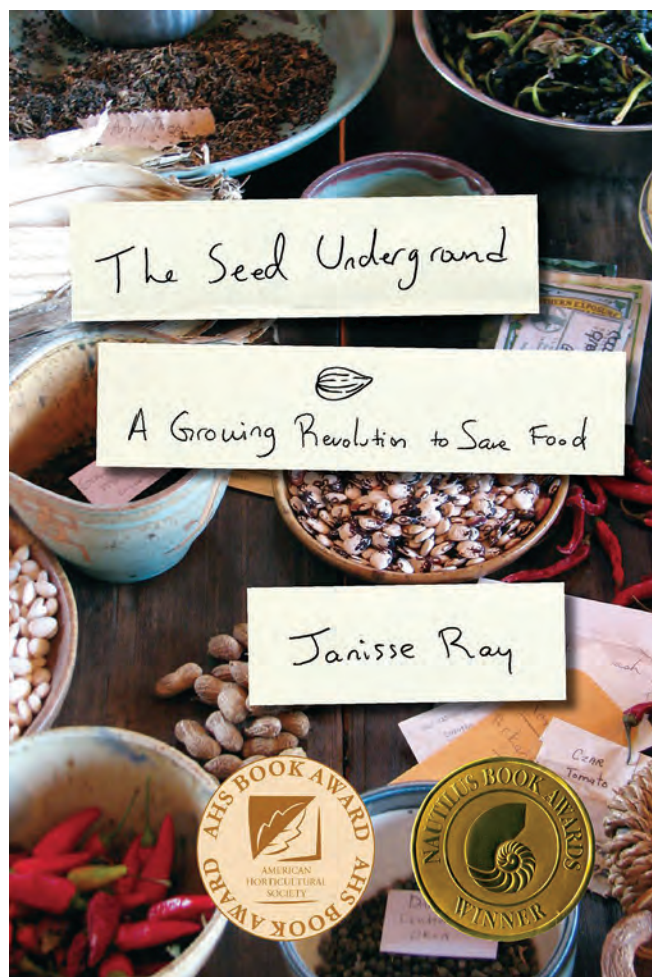
Reviewed by Mary Maruca

Written in 2012, Janisse Ray's book catalogued the critical need to save seeds seven years before *Applied Biodynamics'* Summer/Fall issue 94 on seedsaving mentioned some of the very same people and organizations: Baker Creek Seeds, Seed Savers Exchange, Sierra Seeds, Fedco Seeds, High Mowing Seeds, Turtle Tree Seeds. If I hadn't already been convinced that the future of Earth requires open pollination, I am now after reading this book. Janisse Ray, a favorite nature writer of mine, has in a single book also become a favorite farmer. Although she doesn't specifically speak of biodynamics, her love of right action toward the Earth sings in every line. Part of *The Seed Underground* recounts acquisition of her own farm in southern Georgia, and her activism for the seeds she brought there. Every seed has its story, and some of those stories she shares.

She also covers the bad news that most of us already know—the growth of industrial ag and its seed takeover; the roles of Dupont, Monsanto, and Syngenta; loss of biodiversity, and, indeed, loss of landedness (in 1900, 41% of Americans farmed for a living but, in 2012, less than 2%). However, there also are the stories that make you want to turn the next piece of naked earth you come across into a jungle of fertile food plants after reading about the sweet potato lady in North Carolina who grows more than 40 extraordinary varieties; the man who grows his family's corn that averages corn ears nineteen to twenty inches long, but with only one per stalk; and the champion pie pumpkin whose seeds Ray won at the Vermont Gilfeather Turnip Festival by guessing the number of chocolate kisses in a jar.

These stories remind us that, as humans are creatures of story, so are seeds. The author writes: "Over millennia as humans became dependent on food that we domesticated, the food became dependent on us, a symbiosis of epic proportions. "And so the stories of the seeds—how they came down through time to the farms and gardens where they grow—are our stories too.

Ray mentions the global seed bank in the frozen northern regions of Scandinavia, also noted in the last issue of *Applied Biodynamics*, and the chuckle it drew from a local farmer who observed the greater need was "to decentralize society's entire relationship to agriculture, seeds, food production, and food security." Ray comments, "Seed cannot be kept forever like stacks of gold ingots [but] must be conserved in situ, on farms and in gardens."



For those who already know about the critical role of seeds to our food life, this book may not be as critical as a seed catalogue from one of the biodynamic seed growers Ray lists, but it is a warm confirmation of the path that many are walking or starting to walk, preserving the tastes and colors and stories of the past in the soil of today's farms so that they may still be available for replanting on the farms of the future.

Humans and Seeds

L.A. Rotheraine*

In *Agriculture*, Dr. Rudolf Steiner states: “Strange as it sounds to the chemist and biologist of today, your human and personal relation to seeds (corn seeds in this case) is undoubtedly important. If you examine it thoroughly you’ll find it makes a difference to the growing of corn (or any seed) whether the sower simply takes the corn seed out of a sack and throws it down roughly or whether he has the habit of shaking it a little in his hand and then gently sprinkling it on the ground...”

This quote appears at the end of the book and is not part of Steiner’s actual lectures. Rather, it appears as a report he wrote after a conversation with a farmer about the harmful influences of artificial mineral manures.

In an article for the *Bradford Journal* titled “Energy Exchanges,” I wrote: “The symbiotic relationship between the Earth and the surrounding universe (cosmos) has been forgotten by contemporary agriculture. Electromagnetism plays an important role in this relationship.”

All human beings create their own electrical energy. This is called electromagnetic force. This human electricity creates a unique electromagnetic field in and around the human being. Just as people have their individual fingerprints, we all have unique and easily identifiable electromagnetic fields.

This relationship is even more intensified if the gardener saves his own seeds from his own plants. Steiner’s statement seems to answer the question I raised at the end of that article: “When the electromagnetic energy of a human interacts with the electromagnetic energy of a seed or plant, is the positive or negative outcome a result determined by the unique energy pattern of the gardener?” I believe Steiner’s statements support this view.

For more information, view the YouTube video “Tomatoes and Charles Darwin” or go to <http://rotheraine.com>.

*Renowned Pennsylvania biodynamic gardener L.A. Rotheraine has generously offered to share tomato seeds from his famous, hardy biodynamic Selke cherry tomato Free if you send a SASE addressed to him at Highlands Star Seed, PO Box 990, Bradford, PA 16701.

Books Added to JPI Catalog

- *Lost Knowledge of the Imagination*, Gary Lachman, \$29.95
- *Meditations for Harmony and Healing*, Rudolf Steiner, \$14.00
- *A Precautionary Tale*, Philip Ackerman-Leist, \$19.95
- *The Biotime Log*, Maddy Harland, \$18.95
- *The Fruit Forager’s Companion*, Sara Bir, \$29.95
- *The Occidental Arts & Ecology Center Cookbook*, The Occidental Arts & Ecology Center, Olivia Rathbone, \$40.00
- *Matter & Desire*, Andreas Weber, \$20.00
- *The Community Food Forest Handbook*, Catherine Bukowski, \$24.95
- *Meditations for the Dead*, Rudolf Steiner, \$14.00
- *Meditations for Times of Day and Seasons of the Year*, Rudolf Steiner, \$15.00
- *Cosmology Reborn*, Star Wisdom Volume 1, Lindisfarne Books, \$25.00

Visit jpibiodynamics.org for a description of each book and to order.

Visit www.jpibiodynamics.org for:

- Educational articles
- Biodynamic preparations
- Pfeiffer products
- Books and back issues of Applied Biodynamics
- JPI e-News sign-up
- Updates and upcoming events

Biodynamic Preparations Legend

BD 500—Horn Manure

BD 501—Horn Silica

COMPOST PREPARATIONS

BD 502—Yarrow (*Achillea millefolium*)

BD 503—German Chamomile (*Matricaria chamomilla*)

BD 504—Stinging Nettle (*Urtica dioica*)

BD 505—Oak Bark (*Quercus alba*)

BD 506—Dandelion (*Taraxacum officinale*)

BD 507—Valerian (*Valeriana officinalis*)

BD 508—Horsetail (*Equisetum arvense*)

Cow Horns Available NOW!

Make Your Own

500

Small or Large Quantities

\$8/horn for orders over 100 horns



Contact:

Brian Wickert (608) 606-1275
bwickert@frontiernet.net

www.viroquabiodynamicsupplies.com



Dandelion Blossoms Sought

JPI welcomes your contributions of dandelions, chamomile, and yarrow for our preparations. Now is the season to collect dandelions! Your efforts ensure an adequate supply of BD #506. Thank you to all those who have contributed in the past. Would you like to harvest dandelion or other preparation materials for JPI? If so, please contact JPI for collecting and drying information.

100% Open-pollinated Biodynamic Seed
ORGANIC AND HEIRLOOM VARIETIES!

★ ★ ★ ★ ★

TURTLE TREE SEED

BIO-DYNAMIC
 open-pollinated
 flower-vegetable & herb seeds



Over 350 Varieties

The Biodynamic Seed Initiative of Camphill Village Copake, NY

Order Now! WWW.TURTLETREESEED.ORG

Free Catalog 518-329-3037 turtle@turtletreeseed.org

Subscription Information

Annual subscription for *Applied Biodynamics*: \$30.00 (Print)
 \$20.00 (PDF)
 Collection of back issues for your library: 1992–2015 (Nos. 1–86), \$265 plus shipping



KNOW YOUR ROOTS

From Orchards to Herbs, *Know Your Roots* provides biodynamic consulting, mentoring, education and guidance for orchardists, farmers, and herbalists.

Know Your Roots. We Do.

www.knowyourroots.com
 (845) 674-5124 ☎ (845) 249-3440
 info@knowyourroots.com

Save the Date

April 27: Conscious Beekeeping

Pfeiffer Center, Chestnut Ridge, NY, (<https://www.biodynamics.com/calendar>)

May 3–5: Global Earth Repair Conference

Port Townsend, WA (<https://earthrepair.friendsofthetrees.net>)

June 1–2: The Promise of Biodynamics

Mike Biltonen at Midsummer Farm, Warwick, NY (www.knowyourroots.com)

June: Permadynamics (JPI Works with the Farm Organism Through Marriage of Permaculture and Biodynamics)

Floyd, VA (See jpibiodynamic.org for details)

June, 2019–August, 2020: Sustainable Biodynamic Beekeeper Training

Floyd, VA (https://spikenardfarm.org/store/sbbt_2018-2019/)

June 20–22: Spikenard Summer Festival

Floyd, VA (<https://www.biodynamics.com/calendar>)

June 24–July 6: Foundation Course in Goethean Science

Ghent, NY (<http://natureinstitute.org/educ/nature/index.htm>)

August 10: Biodynamic Workshop: Focus on the Preps

Mike Biltonen, NY (www.knowyourroots.com)

October 4–6: 33rd Southeast Regional Biodynamic Conference

(<http://barefootfarmer.com/southeast-regional-biodynamic-conference/>)

November 20–24: North American Biodynamic Conference

Lake George, NY, (<https://www.biodynamics.com/calendar>)

For additional listings of events, classes and workshops see the Biodynamic Association calendar at www.biodynamics.com/calendar.

ONGOING

Biodynamic Association Webinar Series

For a small fee, the Biodynamic Association offers ongoing webinars on pertinent topics. <https://www.biodynamics.com/webinars>

Chesapeake Biodynamic Network (CBDN), College Park, MD

Contact Michael Judge at mjudge2000@gmail.com.

The Pfeiffer Center, Chestnut Ridge, New York

Workshops and trainings. <http://www.pfeiffercenter.org>

Spikenard Farm Honeybee Sanctuary, Floyd, VA

Classes in sustainable beekeeping and biodynamics. Apprenticeship/internship opportunities. Please visit www.spikenardfarm.org

White Rose Farm: Taneytown, MD

For details, visit www.whiterosefarm.com.



2019 North American BIODYNAMIC CONFERENCE Lake George, NY November 20 - 24

EXPLORE biodynamic farming & gardening * soil
seeds * social justice * animal husbandry * economics
research * health & spirit * community & culture

On-farm field days, in-depth workshops, intensives,
opening celebration, 40+ breakout workshops,
delicious food, music, art, and much more!

www.biodynamics.com/conference

“We must gain new knowledge in order to enter again into the whole Nature-relationship of these things. Mankind has no other choice. Either we must learn once more, in all domains of life—learn from the whole nexus of Nature and the Universe—or else we must see Nature and withal the life of Man himself degenerate and die.”

Rudolf Steiner, *Agriculture Course*, (Adams translation), p. 39



Non-Profit
Organization
US Postage
PAID
Floyd VA
24091
PERMIT NO 33