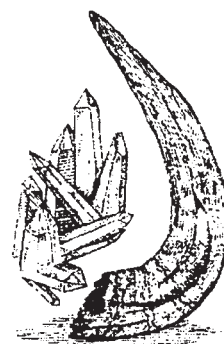


Applied BIODYNAMICS[®]



Summer, 2012

Newsletter of the Josephine Porter Institute • Woolwine, Virginia

Issue No. 77

Keys to Good Farming with Jim Barausky

Interviewed by Hunter Francis

Jim Barausky has over forty years of experience as an organic/biodynamic farmer and gardener. His expertise includes a wide range of large- and small-scale projects as well as teaching and public outreach. Jim has managed commercial organic farms, market gardens, small land holdings, and developed educational and service programs for three colleges. He has worked with students and apprentices in many capacities including establishing a farm and biodynamic training course at Camphill Village Kimberton Hills (PA). With his wife, Cheryl Mulholland, he has also created a K–12 on-farm-based curriculum. His business, Goodfarmers Services, was created to answer the need for design and consulting for all sizes of land-based projects from backyard gardens, working farms to sustainable land trusts. More information about Jim and his business can be found at www.goodfarmers.org.

Hunter Francis: *In thinking of the title of your business, I'm compelled to ask what, in your opinion, makes for a "good farmer"?*

Jim Barausky: You know, the ideals of the agrarian or the yeoman go back to the founding fathers, especially Jefferson. Jeffersonian democracy had all sorts of notions of what the farmer should carry. One of them was the sense of a general civic responsibility. Jefferson felt that farmers would carry the high moral virtues of the society. Part of it was that they would be good soldiers, but it was more than that. So, there is the idea that farmers would do quite a bit more than just grow vegetables; they should be an integral part of the culture. In Europe, entire institutions came out of the farm culture, such as farmers' credit unions. Today, there is not much that a farmer has left in terms of overall responsibility. The destruction of the farm culture is well outlined in *The Unsettling of America* by Wendell Berry. I think the point is that farmers should be an important



Jim Barausky stirring preps

part of the local citizenry, just as much as the banker or insurance broker.

HF: *I understand an important part of your work is educating youth. Do you try to bring ideas like these into education?*

JB: I like to talk about the big picture, which after all, is part

continued on page 3

Editor's Note

Dear Readers,

As you can see, we have a lot of content for you in this issue of *Applied Biodynamics*! Our feature articles present science, observations and insights from two gentlemen who have many years of experience studying biodynamics and working with biodynamic practices in different hemispheres – John Bradshaw in Australia and Jim Barausky, who is currently working in Colorado (though he has worked in Europe and across the US).

As we approach the summer solstice at the time of this writing, it is noteworthy that Bradshaw and Barausky both refer to biodynamic pioneer Alex Podolinsky and his emphasis on the role of the sun in plant growth. Aside from photosynthesis, Bradshaw points out the role of the sun in the uptake of nutrients from humus in his fascinating discussion of the transmutation of elements. Jim Barausky suggests that the silica preparation should be sprayed more often to mediate the strong light forces in the high altitudes and continuous sunshine in Colorado. Most biodynamic farmers I have spoken with over the years agree they should be spraying more silica preparation, but waking up at sunrise often conflicts with the busy lives we lead. Reading the interview with Jim Barausky has inspired me to focus more on this preparation, and make a commitment to spray more BD #501 this summer.

Applied Biodynamics

Applied Biodynamics is a quarterly publication of the Josephine Porter Institute for Applied Bio-Dynamics Inc. (JPI). The subscription price of \$30.00 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:

The Editor, *Applied Biodynamics*
P.O. Box 133, Woolwine, VA 24185, U.S.A.
Phone: (276) 930-2463; Fax: (276) 930-2475
info@jpibiodynamics.org
www.jpibiodynamics.org

Managing Editor – Christy Korrow
Co-Editors – Hunter Francis and Abigail Porter
Contributing Editor – Hugh Courtney
Layout – Bruce Bumbarger

© 2012 The Josephine Porter Institute for Applied Bio-Dynamics, Inc.

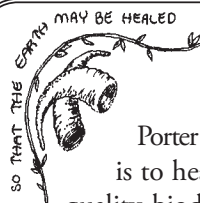
In his article, Bradshaw also refers to Alex Podolinsky's biodynamic preparation, "Prepared" 500. JPI makes and sells this preparation for those of you who might like to give it a try. The "Prepared" 500 is comprised of finished biodynamic horn manure wherein the contents are emptied from the horns, placed in storage, and compost preparations BD #502–507 are added (at a rate of 4 sets of compost preparations to 15 gallons of finished BD #500). The mixture is ready for use in six weeks. The resulting preparation is stirred for one hour before it is sprayed onto the soil. Anecdotal evidence shows substantial increases in topsoil development after multi-year use. Alex Podolinsky's books, *Biodynamic Agriculture* Volumes 1, 2 and 3, are considered required reading for those with a serious interest in biodynamics. Podolinsky's *Living Agriculture* and *Biodynamics: Agriculture of the Future* are also recommended. All titles are available from JPI.

In his "Anecdotes and Antidotes" column, Hugh Courtney also answers questions about biodynamics, such as using rose quartz to make BD #501, the best time to use BD #501 for fruiting shrubs and trees, and the best use of BD #508 for blight. Many people write to JPI with questions about how and when to use the preparations in specific circumstances or to remedy disease or pest issues. Hugh always takes the time to provide a thorough answer, and many of those exchanges make their way into *Applied Biodynamics*.

Our goal with this newsletter is to support you in your biodynamic practice by publishing articles and information that increase your understanding of how to use the preparations, and that show ways biodynamic agricultural practices can be deepened. We gather this content by tapping into experienced growers who have taken up biodynamics with earnestness and are producing successful outcomes.

Wishing you a prosperous growing season!

Christy Korrow



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

Gena Nonini (Fresno, CA), President
Bill McCranie (McDade, TX), Vice President
Hugh Courtney (Woolwine, VA), Secretary
Laurie Mollin (Calloway, VA)
Abigail Porter (Berkeley Springs, WV)

continued from page 1

Keys to Good Farming with Jim Barausky

of what biodynamics tries to do. In the Waldorf movement, there is a striving for truth, beauty and goodness. All of those things should play a part in understanding the role of agriculture. Of course, understanding agronomic practices is important. You must know how to perform the needed tasks. Yet, in some ways, there is a broader quest for knowledge behind farming. For Aristotle, knowledge was a quest for truth. I like to go back to early Western thought; some of it is still seminal.

HF: *How did you get into farming yourself?*

JB: I was trained as an engineer during the Viet Nam War and decided to become a conscientious objector. I did alternate service at the Camphill Village in Copake, New York, where they were doing biodynamic farming among other things. After that, I decided to study biodynamics. I thought it would be more interesting to learn about living systems than engineering systems.

HF: *Was it then that you decided to go to Emerson College in England?*

JB: Yes. Herbert Koepf was there at the time writing his book, *Biodynamic Agriculture*. Herbert Koepf was trained as a soil scientist. He was a researcher and a sound thinker when it came to the soil. In fact, he was probably the most serious scientist serving as a successor to Ehrenfried Pfeiffer's early work. So, there was the opportunity to learn from him, and also to pursue other anthroposophic studies. Emerson was a thriving center for adult education at that time, with people from all over the world. Originally, the focus was to train Waldorf teachers, but the founders added education for the arts, drama, agriculture, etc. Studies in agriculture were supported by collaboration with working biodynamic farms and gardens in the area.

Biodynamic Preparations Legend

BD #500 – Horn Manure

BD #501 – Horn Silica

BD #502 – Yarrow

BD #503 – Chamomile

BD #504 – Stinging Nettle

BD #505 – Oak Bark

BD #506 – Dandelion

BD #507 – Valerian

Compost
Preparations

BD #508 – Horsetail (*Equisetum arvense*)

HF: *What did you do after Emerson?*

JB: I went to work at a farm in northern Germany. Trauger Groh was at a community farm north of Hamburg with four other farmers working with youth at risk. I worked there for a couple of years in dairy and vegetable growing. Trauger was using the farm as a vehicle for rehabilitation for young men who had gotten into trouble with the law, and as a way to provide them with a career path. The farm, Buschberghof in Fuhlenhagen, was about 400 acres and is still very successful as a CSA (community supported agriculture program). It was really the first CSA farm; part of the impetus of the CSA model was born there out of the ideas of a local banker, Mr. Barkoff.

HF: *When was that?*

JB: It was somewhere in the years 1973–1975. Trauger Groh is now in the US also (in New Hampshire) and did much to spread the CSA concept in this country. There's an interesting idea in the German constitution that every citizen should be responsible for the German homeland. You are legally required to care for your motherland. In a way, a CSA is an extension of that idea. If you can't care for the land yourself, you should find someone who can help do it for you. If you get some vegetables or a loaf of bread out of that arrangement, that's great; but your real responsibility is to care for the land – as a civic duty.

HF: *Since you've returned to the US, what have been some of your most significant formative experiences?*

JB: When I came back, I worked at Kimberton Hills. There was a conventional dairy farm that we converted to a highly diversified biodynamic farm. We also started a training course there. I discovered that when you have to teach something, you really start to learn it. So, that was an important part of my training. Since, I've tried to stay connected with people in their twenties. That's important, because they always have new questions, which means you're always learning things.

HF: *Have you noticed anything in particular about the current generation of young people?*

JB: I think there is a new crop of young people who want to be empowered, who want to be self-reliant. In many ways, I think they are struggling to find places to work at that might have been set up in the 60s or 70s. A lot of those places were destroyed when the New Age went commercial and corporate. But many youth are seeking to learn practical skills, either by taking Permaculture courses, working on farms, or starting their own farms. There is interest in living more communally, where they have the support of their colleagues. There is a huge resurgence of not just "back to the land," but back to essentials of food, clothing and shelter. If you look objectively at the current

global situation, it seems the older generation has made a mess of the world. I think many young people recognize that and want to change things. They are looking for tools that can help them do that. It varies by region, and there are distractions and hindrances (such as land prices), but there is a movement.

HF: *What is your situation now, in Colorado?*

JB: I do consulting, but I'm in between major projects. I have always left my life open in the sense of being able to go where I am called, which is dynamic, but that also means there are lulls. At the moment, I am doing some consulting locally and working with an incubator farm project called Everybody Eats. I'm doing a series of courses for them. I'm very interested in farmer mentor training and I work with the BDA (Biodynamic Farming and Gardening Association) on that a bit, through the North American Biodynamic Apprentice Training Program. And, I do some consulting at a market garden, where I have about an acre I can do field trials on. I'll also be working with Turtle Tree Seeds, now in Nebraska. I'm very interested in seed development.

HF: *It's obvious you have a remarkable breadth of experience, having worked in so many settings. In all of your work, what stands out in regards to your work with the preparations? Are there any particular revelations you have garnered through experience?*

JB: BD #501 is particularly applicable to work in the high dry desert, as here in Colorado. The quartz preparation helps mediate light metabolism. The light here is so aggressive, it can actually fry up the plants and the fruits, so BD #501 is a big help here. You have to remember, most of the energy the plant gets is from above the ground. 95% of the nutrients come to the plant from above through light, air, and atmospheric moisture. So, it is really important to use several sprayings of BD #501. I even saw that in Pennsylvania. You can encourage grain growing if you start using BD #501 at a young stage, even pre-tillering, but certainly pre-boot stage. Hugh Courtney is correct in thinking the BD #501 is underutilized. People haven't developed an appreciation for light. There needs to be more understanding of working with light.

HF: *How would you characterize the light of a Mediterranean climate, such as Southern California, where you have also worked?*

JB: It has a wide palette. I worked at Tierra Miguel, in the Pauma Valley in San Diego County. You could do incredible things there; there were such possibilities to produce high quality produce. The diversity manifested in temperature ranges throughout the day, and also in the gradations of light that permeated the valley from dawn to dusk. So, there was a wide range, whereas some places

feel more mono-chromatic or narrow. Some studies have been done on the perception of light. People have different capacities, and there is indication that women may have more sensitivity to different varieties of light – of different internal qualities. But it is an undeveloped sense in most people. Appreciating soil quality is a more tangible thing. It is easier for people to recognize the effects of BD #500 in improving soil, which you can feel and smell. Light is much more subtle, but working with it is required. Alex Podolinsky tried to address cultivating this type of sensitivity in his book *Active Perception*.

HF: *So, how exactly does the BD #501 mediate the light?*

JB: You'd like the plants to be in harmony. Pfeiffer's main goal was to try to balance the soil regulatory functions. He was trying to get soil life into balance, with the compost starter, and so on. It's a big task. Compost isn't just "stuff." In a similar vein, there are some landscapes in which a healthy balance of light is needed. Here in Colorado at 6,000 feet, for instance, the light can be brutal. It almost feels destructive to cultivated plants. So, you need to understand how carbon moves around the plant, different types of carbon, photosynthesis, the dark process, etc. To do this, we either have to have more information or else some perceptive quality that leads us to judgment. It's not just about protocols or formulas that we are so apt to make – or, for example, "what day do I spray the BD #501... should I spray it on a root day?" We have to rely more on our perceptions, and we have to cultivate them for the given circumstance. In some ways, we've gotten off track by relying so heavily on the various calendars.

HF: *Isn't timing an issue, though? Are there any guidelines?*

JB: Observing the dawn is a traditional practice, and observing the plant in its plant group. Fundamentally, we should remember that the two principle means that Steiner wanted us to use to develop new plants were the BD #500 and the BD #501. It really wasn't the use of the calendars. It was the polarity of the two principle preparations, which help us to develop higher quality nutrition and even to develop new varieties. The real basics are using the BD #500 and BD #501, after we have applied biodynamically prepared compost. There is also the idea of the farm organism – the ability to manage the farm as an entity, which is hard to do in some places, especially when it comes to farm animals. The key is to build up healthy farm organisms with the help of horn manure and horn silica, and to work with the plants – recognizing that the form of the plant can tell us if it requires more of one or the other (of the two basic preparations). Place, of course, will impact that work. Each place has its own geographic signature and its own needs.

HF: *How about the compost preparations, and BD #508?*

JB: I know Hugh Courtney is very interested in *Equisetum* as it's expressed in the BD #508. I've used it quite a bit in greenhouses, even as part of a regular, weekly watering system. I've also used it to grow hard wheat in Pennsylvania. It's very difficult to get a high quality baking wheat in a hot, humid climate, and the BD #508 helped with that. It helps heal fungus and mildew and those sorts of things. It brings a silica force to the plant, allowing it to metabolize more light. It works against too many moon forces, you could say. Overall, I'd say it, like the horn silica, is underutilized.

HF: *Have you had interesting insights with any of the other preparations?*

JB: The compost preparation plants do pretty well where I live. I can grow them here, even the valerian. I've generally encouraged even beginners to get the plants used in the compost preparations in their gardens as a powerful influence for the garden, and to site them in the garden as you would site organs in the garden. See them not simply as points of geography, but as powerful individuals that you bring into a garden to focus energies. I always urge people to get the plants growing in their gardens and on their farms in a specific place. In some landscapes they can be naturalized. In our case, this is appropriate for dandelion, valerian, *Equisetum* and yarrow. Nettle is such a beneficial plant that even though one can develop a nettle patch, it should have a prominent place in the garden. If nettle is related to this jack of all trades, for instance, a species that emanates that type of energy, where do you need that? What part of your farm needs that kind of a force, this taming of iron that has a kind of heart-like quality? If you look at the study material of Bernard Lievegoed, a correspondence is made between the human organs and the plants.¹ If you use the image of the farm to reflect that of a human individuality, then there is a liver function of homeostasis. You want to have dandelion alive and working on your property to help serve that function, even if you have to cultivate it. Dandelion has a silica role. All of this comes from Steiner's *Agricultural Course*.

It's a matter of trying to lift the plants up – as medicinal plants. That approach is being explored in plant homeopathy. There is the thought now that some plants have affinities to other plants and can influence healing in them. They are keyed together. I like to put specimens of all the preparation plants in the garden even if I can only naturalize some. They are like the domestic animals and should be brought into our care, into our household. In fact, there is a huge amount of healing that can be done by having the proper plants in a growing space, and there is a great sympathy now for understanding the



Jim Barausky working with his irrigation system

effects of medicinal plants. Develop a relationship to the living, growing plants and to the atmosphere around them – arrange their leaves in space and watch how they develop through contraction and expansions. Observe what their gestures are throughout their developments and throughout the day. The preparation plants all have specific soul qualities, as well as specific physical properties and one can also discern around each of them a specific spiritual essence or perhaps a principle of being. Just having the plant there in the garden is a huge first step.

HF: *What do you see as the influence of chamomile?*

JB: Chamomile is a sun plant and has a special connection to calcium and the regulatory functions of calcium. Calcium acts as a catalyst and has to be there for certain blood functions and certain metabolic functions. It has a soothing, childlike innocence to it and it's a wonderful plant to have in your garden. It's also related to the digestive processes, and that's how it's used medicinally. Very often you see that traditional herbalism got the medicinal use of the plants right. They saw the signature of the plant.

Similarly, yarrow is used for bladder and bladder problems and there is now a lot of information on how it is connected to the eye and the whole realm of light and its refinement.

I think we ought to work to understand these characteristics of the plants and pay attention to the qualities they enhance when they are put into the garden. It's better to do that in a personal, living way than merely to repeat traditional companion planting recommendations, which many of us have no actual experience with. We shouldn't just follow them blindly. Perhaps that can be said of many things in biodynamics. We should strive to sharpen our own personal insights and bring them into farming in a living way.

HF: *A good point. Do you have any personal goals for the future?*

JB: Yes. Given my interest and life's work in biodynamics, I have begun to write articles on the subject, which I hope to compile into a book someday.

HF: *We'll be looking for it! Thanks, Jim.*

Notes

1. Lievegoed, Dr. C.B.J. 1951, *Study Material Issued by the Experimental Circle of Anthroposophic Farmers and Gardeners: The Working of the Planets and the Life Processes in Man and Earth*, Broome Farm, Clent, Stourbridge, Worcestershire.

Annual Fall Preparation Making Workshop at JPI Wednesday, October 31 through Sunday, November 4, 2012

Space is limited for this five-day intensive hands-on workshop, so register early. You will have the opportunity to deepen your understanding of biodynamics by participating in all phases of making the fall preparations – from the honoring and sacrifice of the cow, to harvesting and preparing the sheaths, to stuffing and burial of the preparation materials. The importance of the bovine in biodynamics becomes apparent when observing the intricacies of the digestive system, especially the four stomachs, first hand. The focus of the workshop is on making the chamomile, dandelion, and oak bark biodynamic compost preparations

as well as the horn manure and Biodynamic Compound Preparation (barrel compost). All other preparations will be addressed through observation and study of Rudolf Steiner's *Agriculture* lectures. Here are some comments from the 2011 participants: "...enjoyed all the hands-on making of the preps, the classes and discussions... wonderful experience... well organized... good energy... appreciated the honoring of the cow... good food... dedicated staff... committed students..."

For more information on this workshop and others, go to www.jpibiodynamics.org/workshops.

Call for Pre-Proposals and Collaborators for Biodynamic Research

The Biodynamic Association is seeking creative, relevant and innovative research projects that will advance the understanding and practice of biodynamics that the organization can pitch to various funders who are interested in biodynamics.

By making this Call, the BDA hopes to spark a new direction and impetus for biodynamic research through a broad idea sharing process. Projects are invited that address any aspect of biodynamics, following any relevant method or approach (natural scientific, spiritual scientific, Goethean, social scientific, artistic, other). Authors of the strongest submissions will be invited to a gathering of researchers to be held November 14–15, 2012 in Madison, Wisconsin, just prior to BDA's biannual Biodynamic Conference. Read more at www.biodynamics.com/biodynamic-research.

Submissions need to be emailed or postmarked by July 27, 2012. If you have any questions about the Call, or are not sure how it fits with you, feel free to contact the Research Coordinator, Sarah Weber, at sarah@biodynamics.com or phone (262)649-9212 x10.

PLEASE NOTE: This is not a competitive grant program. The BDA is not offering grants but will actively fundraise for some or all of the proposals developed through this process. The BDA already has one foundation interested in funding biodynamic research and will be cultivating others.

The Call for Pre-Proposals and Collaborators is one aspect of the BDA's new Biodynamic Research Development Program.

Why Biodynamics Works

John Bradshaw

Conventional agriculture uses artificial water soluble fertilizers to feed plants through the soil water. Organic/biodynamic agriculture uses composts, manures (though never direct on food crops) and green manures with the addition of non-water soluble fertilisers when necessary, and aims to feed plants naturally through the soil humus. In addition, biodynamic agriculture uses the biodynamic preparations, which powerfully develop microbial activity, root growth, and humus production in the soil, and one of which enhances light metabolism in the leaves. The experience of thousands of growers using the Australian Demeter Biodynamic method (worldwide) has been that they require far lower fertilizer inputs than equivalent conventional or organic farmers. Indeed there have been cases where no fertilizer inputs have been used on BD farms for decades, while production continues at high levels. Why is this so?

The plant stands in the midst of Cosmos and Earth in the most complex and refined system of interrelationships imaginable. In nature, this most highly organized system has obviously enabled plants to thrive, since time immemorial, without any human intervention at all.

When humanity was at the hunter-gatherer stage, we simply harvested the bounty that nature provided. When, later (particularly led by the great inspirer, Zarathustra), we began cultivating plants and herding animals, the development towards settled societies and the growth of great civilizations became possible. As farmers, we still essentially supported and worked with the natural system of plant growth.

The most basic of farming systems, slash and burn, relied on nature to progressively rebuild humus levels in soils as they reverted to a natural state after one season's or one year's cultivation had depleted the soil humus. Floodplain farming relied on the annual deposition of humus-rich silt by flooding rivers. As populations grew, more sophisticated farming systems were developed. It took some time for the level of sophistication to develop, and where soils were pushed too hard, and humus levels declined, problems occurred. Where soils became too depleted, deserts encroached and civilizations fell.

The culmination of agricultural development before the artificial fertilizer age was the most careful, intelligent peasant farming of Europe. All wastes were recycled and returned to the land, either fully composted or spread on melting snows to be incorporated into soil humus before crops were sown. Highly sophisticated rotational systems were developed to ensure that soils were maintained in a humus-rich, fertile state. Ploughing was done with me-

ticulous care and sensitivity, to preserve and improve the vitally important soil structure. From the many monastery records available, we can see that productivity was high and that pests and diseases were of minor significance.

With the development of science, understanding of how and why things worked became more and more important. In the late eighteenth century, German agronomist Albrecht Thaer (1752–1828), advanced the idea that soil fertility was based on the level of soil humus, and that humus constituted plant food. He regarded humus as a biological-functional performance of the earth that should be viewed holistically. He believed that inorganic salts were unnecessary for plant nutrition.

In the 1840s, Justus von Liebig showed that, in fact, plants could only absorb nutrients in a water soluble state. This discovery led to the development of water soluble (“artificial”) fertilizers, and the hasty and ill-considered disregarding of humus as a critical factor in plant nutrition. In fact, von Liebig realized this mistake late in life and wrote of the critical importance of humus. However, neither scientists, excited by the newly discovered facts of plant nutrition, nor those involved in the fast developing artificial fertilizer industry, paused to consider Liebig's later realizations.

At first, soluble phosphates applied to soils seemed to produce dramatic results. Crop yields increased. As the years passed, the early growth boost from soluble phosphates declined, while problems with pests, diseases, animal health and seed vitality increased. Phosphate application rates had to be progressively increased to get the same response from plants. Soluble forms of nitrogen were developed and later, potassium, and progressively more trace elements were added to the repertoire to keep crop yields up. Humus levels, meanwhile, progressively declined.

Agricultural scientists repeatedly claim that organic crops have serious problems with pests and diseases, but the reverse is actually true. It is the artificially fertilized crops that are attacked by all manner of pests and diseases, and have to be sprayed with insecticides and fungicides to survive. It is common knowledge amongst biodynamic growers (and many organic growers), that their crops are not generally troubled by pests and diseases and do not require protection. It is also common knowledge that animals on biodynamic farms are healthier and more fertile.¹ Consumers and retailers know that food produced on biodynamic farms (and good organic farms) has a much longer shelf life than that from conventional farms. Should this not make agricultural scientists rethink their whole system, and question whether perhaps it has some major flaw?

How Plants Grow in a Natural System

As Alex Podolinsky puts it “Plants are children of the sun, scientifically speaking, and not of earth.”² It is the sun that sustains all life on earth, through the sun-inspired photosynthesis of plants. The soluble nutrient theory of plant feeding ignores the role of humus and the sun’s role in directing plant nutrient uptake from humus.

No one disputes the fact that plant roots can only absorb nutrients in solution, but the overall picture of plant feeding is very different depending whether the source of the nutrients is water soluble fertilizers or water soluble nutrients contained in colloidal humus.³

Colloidal Humus

In a natural system, the teeming life of the soil works to convert organic matter into colloidal humus. Any minerals in soluble form are also incorporated in colloidal humus. Organic matter consists of dead roots, leaves and other plant material, manures, and the dead bodies of soil fauna and flora. Colloidal humus (a colloid is between a suspension and a solution. Other colloids include butter and jelly) holds minerals in a soluble form, but will not allow them to leach out. It can hold up to 75% of its own volume as water, and dries out very slowly. Plant roots can access the soluble nutrients held within the humus colloid, and in fact can take in the colloidal humus completely.

The plant has no warmth mechanism as have animals, and is entirely dependent on the sun’s warmth to tell it when to feed. When sun warmth indicates, fine hair feeder roots take in nutrients from colloidal humus in the soil. Plants need to take in water to replace that lost in transpiration from the leaves. The water is taken in mostly by larger, thicker roots, and the water taken in is relatively free of dissolved minerals (because no soluble fertilizers have been applied, and because the teeming soil life works constantly to build organic matter and any soluble minerals into colloidal humus). Thus nutrient uptake matches the sun warmth directive, and a healthy nutritious plant results. The plant is, in general, not attractive to insects, and is resistant to disease. This is the result when plants are fed from soil humus according to nature’s design.

By contrast, when water soluble fertilizers are applied, the minerals dissolve in and spread throughout the soil water. The plant is forced to take up nutrients when it takes up water, no matter whether sun warmth is present or not. The plant thus takes in more minerals than it needs metabolically. Cells become overfull with mineral salts. The plant tries to take in more water to dilute these minerals but only succeeds in making matters worse. Plant cells become distended with too much water and salts. Water movement in the plant is

hampered, and the photosynthetic shutter cells on the leaf stomata cannot open and shut freely, resulting in lowered photosynthetic activity. An altogether unnatural plant. These plants have poor nutritional quality, poor flavor, are more attractive to insects, more susceptible to disease, and rot more quickly after harvest.

Soil Life

A myriad of living organisms work together in the soil to break down organic matter and transform it into stable colloidal humus, the ideal plant food. Other organisms work together with plants to fix atmospheric nitrogen and to assist plant roots in finding and absorbing nutrients. The primary function of soil life is to assist plants to feed naturally, as directed by the sun. It is awe-inspiring to consider the immensely intelligent organization of Nature. Without this teeming, well organized and coordinated soil life, nature would simply cease to function.

SOIL ANIMALS – soil animals range from the tiny microfauna, such as protozoa, through the mesofauna such as mites, collembola (springtails) and nematodes, to the macrofauna such as ants, earthworms, beetles and termites. Soil animals break down or shred organic matter, increasing its surface area, allowing micro-organisms to work on it more effectively. They help aerate the soil and assist in the formation of soil aggregates. Their excreta contribute to soil fertility.

EARTHWORMS – are among the most important of the soil animals. French scientist and ecologist André Voisin referred to earthworms as the “foundation of all civilization.” They eat dead roots, leaves and other organic matter, together with large amounts of soil, fungi and bacteria as they tunnel. Their tunnelling aerates and mixes the soil, and greatly increases its overall volume and water holding capacity. Earthworms can reduce small stones (up to 1.25 mm) to paste, and break up clods. Their worm casts are pure colloidal humus, and contain five times the nitrogen, seven times the phosphorus and eleven times the potassium of the surrounding soil. Worm castings are almost neutral in pH. Worm tunnels are lined with humus rich substances, and plant roots can use them to delve deeper in the soil absorbing the humus lining as they go. When a root dies (as for example when pasture is grazed down in a rotational system), a worm will eat it and re-establish the tunnel, or build a new tunnel where the root was.

SOIL FUNGI – are very effective at breaking down dead cell walls, cellulose and lignin. They are very active in the early stages of organic matter breakdown, as seen in the healthy white fungal activity in the early breakdown stages in a compost heap (as distinguished from the white material

associated with overheating and “burning” of compost). Once the early stages of organic matter breakdown are completed by the fungi, bacteria become predominant.

MYCORRHIZAL FUNGI – are specialized fungi that form mutually beneficial associations with plant roots. There are four main types of mycorrhizal fungi. The most common type is the vesicular arbuscular mycorrhizae or VAM. They can form beneficial associations with most plants. The mycorrhizal fungi penetrate plant roots, and extend very fine hyphae out into the soil. They receive nutrients such as carbohydrates from the plant roots, and bring nutrients from the soil to the plant roots. They help form soil aggregates, help the plant resist drought and are very effective at finding phosphorus and many trace elements in deficient soils. They also help the plant resist soil-borne pathogens.

SOIL BACTERIA – single-celled organisms which can reproduce and proliferate extremely quickly when conditions are right. Most soil bacteria live close to plant roots. Most beneficial bacteria are aerobic, meaning that they require oxygen. Anaerobic bacteria do not require oxygen, and tend to cause putrefaction of organic matter rather than its healthy breakdown to humus.

Of the many, many classes of bacteria in soils, some of the most important are: actinobacteria, which play a crucial role in the transforming of organic matter into humus, and give healthy soil its earthy aroma; independent nitrogen fixing bacteria, which convert ammonium (from decomposing proteins) into nitrates which are incorporated in the soil humus; azobacter, free living bacteria that convert atmospheric nitrogen into forms usable by plants; and rhizobia, a group of bacteria that form symbiotic relationships with the roots of leguminous plants and take nitrogen from the air, converting it (using an enzyme called nitrogenase), into a form of nitrogen usable by plants. They are called nitrogen fixers. Depending on the type of plant, the rhizobia bacteria enter the plant root either directly through the root surface, or by the fine root hairs curling around the bacteria to help them enter. Once inside, they multiply, as do the root hair cells. Nodules are formed. Within the nodules, nitrogenase is protected from oxygen (which hampers its activity) by another enzyme, leghaemoglobin, which takes the oxygen away to respiratory sites. It is leghaemoglobin that gives the inside of the nodules their characteristic pink coloring.

SOIL ENZYMES – Soil enzymes (and co-enzymes) play an important, and as yet only partly understood role in the functioning of the soil/plant ecosystem. They are synthesized by plants, animals, mould, fungi, yeasts and bacteria, and are in a never-ending cycle, being constantly synthesized, concentrated, de-activated and decomposed. They

are involved in many biochemical processes and play a key role in the breakdown of organic material and its conversion to colloidal humus, the cycling of nutrients, and the building of soil structure. Some enzymes active in the soil ecosystem include amylase, arylsulphatases, β -glucosidase, cellulase, chitinase, dehydrogenase, phosphatase, protease and urease. There are many more, and many more are still to be discovered.⁴

Biological Transmutations

It is becoming increasingly clear (though not yet accepted by many mainstream scientists) that, in a living biological system, elements can transmute into other elements. This is the inescapable conclusion of much meticulous research and many observations that are inconsistent with the generally accepted view that an element is a substance that cannot be broken down by chemical means.

Research that supports this idea includes: in 1799, Vauquelin found that a hen excreted five times more lime than it ingested; in 1822, Prout discovered that limestone in an incubating chicken egg increases overall; in 1831, Choubard found that germinated seeds contained minerals that were not present originally in the seeds; in 1844, Vogel found that, after germination, watercress contained more sulphur than was in the seeds.

How is this possible? Conventional understanding is that elements can combine in chemical reactions to form molecules, and that molecules can break down into individual elements, but that elements themselves cannot normally change.

A chemical element is a pure substance composed of one type of atom. Elements are distinguished from one another by the number of protons (positively charged particles) in the atomic nucleus. The lightest element, hydrogen, has one proton in its nucleus, giving it an atomic number of 1. Uranium is the heaviest naturally occurring element, with 92 protons and therefore the atomic number 92. Biological transmutation occurs when an element merges with another element, combining their protons in a single new nucleus thus becoming a third element, or conversely, when an element breaks down into two new elements with separate nuclei.

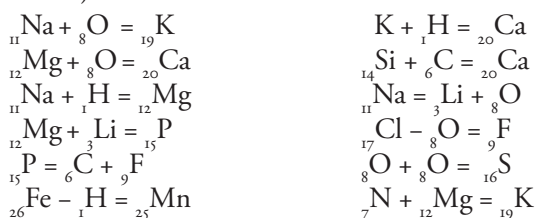
It is accepted by mainstream science that in certain circumstances elements can change: when a cosmic ray neutron (electrically neutral particle) hits a nitrogen atom (7 protons), it breaks down into carbon (6 protons) and hydrogen (1 proton). Isotopes (variations in the number of neutrons in an atomic nucleus) are involved but we won't go into that here.

The element uranium breaks down (very slowly) in nature

in the following sequence (again involving isotopes): uranium to thorium to protactinium to uranium (different isotope) to radium to radon to polonium to lead to bismuth, and, after fluctuating between various isotopes of lead, bismuth and polonium, eventually decays into a stable form of lead.

Professor Louis Kervran (University of Paris) began publishing the results of his experiments on what he called biological transmutations in 1959. He found that the most important and abundant biological transmutations occur amongst the first twenty elements of the periodic table and to a lesser extent with the next ten. Many transmutations have been established. Although the exact mechanism of biological transmutation is still to be discovered, Professor Kervran suggested that enzymes are probably integral to the process. Scientists who have confirmed some of his findings include: Dr. Hisatoki Komaki, Japan, Professor Baranger (France), and J.E. Zundel (Switzerland).

Leaving aside the issue of different isotopes, and expressing the atomic number only, some of the biological transmutations that have been discovered (many of which are reversible) include:⁵



This is only a sample of the many reactions which have been shown to occur.⁶ The implications for farming, diet and medicine are intriguing. Instead of trying to replace elements that appear to be lacking we might be better to consider biological transmutations carefully. For instance it may well be (there is some evidence) that calcium deficiency in humans could be better treated with magnesium or organic silica (both of which can biologically transmute into calcium), than with calcium supplements. In agriculture, potassium can be formed from transmuted calcium (in combination with hydrogen), and so on.

The very idea of "soil analysis" is called into question, when dealing with the biologically active soils found on biodynamic and organic farms and gardens. Where soil life is abundant, there are many active cycles occurring. Nature is constantly trying to achieve balance, to redress imbalance, so that healthy plant growth can continue. A soil test is a snapshot in time. One hour after the "snapshot," the situation may have changed considerably. In 2004, the Australian Soil and Plant Testing Council sent standardized soil samples to eighteen laboratories across the country. The results for nitrogen, phosphorus and potassium varied so dramatically that laboratory standards were called into question, even

though the same testing methodology was used. Could it be that, once the samples were divided up, variations in temperature, elevation, pressure, microbial and fungal content, or other factors, could have caused the wide divergence via biological transmutation?

It would appear to be much more sensible for a farmer to look at the whole living system on his/her farm to assess the needs of the plants, including how well or poorly things are growing, the predominance of particular weed species, the health status of animals etc., than relying on an unscientific and inaccurate soil test.

Sun and Air

In discussing plant growth we tend to focus on soil factors, and forget that without sun and air there would be no plants at all. The sun provides the primal energy for photosynthesis, the only truly original manufacturing process on Earth. Air provides the carbon dioxide necessary for photosynthesis to occur, as well as nitrogen that is brought into soils by independent azobacter bacteria, and rhizobia bacteria in conjunction with plants. We must also remember that plant leaves can take in other nutrients from the air – all elements are present in air, in minutest quantities. We still don't understand how relevant this is to plant nutrition, although the fact that leaves can take in nutrients has been abused by proponents of foliar feeding, who apply nutrients via foliar sprays, thus subverting the natural, sun-directed plant feeding process.

Biodynamics

Professor Kervran makes the point that in agriculture, for biological transmutations to work, the soil must be alive, rich in microorganisms, and that adequate humus must be present. He also comments that all plants are different. For instance, some plants can make their own calcium in a calcium deficient soil whereas others can not. The same applies to other major and minor elements. Each plant has different root types and structures, and releases different exudates from its roots. Each plant lives in, fosters, and is fostered by, a unique community of bacteria and fungi.

We simply don't know how many different species of living things are in the soil or understand the complex interrelationships that exist, or how they vary from plant to plant. We don't know the full range of enzymes and coenzymes that are produced by plants and soil macro- and micro-life or the biological transmutations they, the micro-organisms and possibly creatures such as worms might foster.

There is no question that the correct use of properly made and stored biodynamic preparations enormously enhances soil biological activity. Organic matter levels in soils rise significantly. Microbial activity is greatly enhanced,

root growth fostered, and colloidal humus formation promoted.⁷ As a direct result of this enhanced activity, soil color darkens progressively, and soil structure improves. It is actively growing roots, in conjunction with soil biology that create and develop soil structure. Soils become deeper, even heavy clays becoming friable soil in time. Such dramatic soil changes, which soil scientists have stated would take nature alone thousands of years to achieve, have only been achieved through the use of the biodynamic preparations.

The soil spray BD #500 is a very concentrated source of microbes, as are the six compost preparations which are used in compost heaps and added to BD #500 to make the even more potent “Prepared” 500. Dr. Erenfried Pfeiffer, who was entrusted by Rudolf Steiner with researching the best ways of making and applying the biodynamic preparations, discovered several novel microbe species in them. Sprayed on moist soil that is not too cold, the biodynamic preparations have a unique and dramatic soil enlivening effect. The conditions for a rich soil ecosystem are well and truly established by their correct use.

Hand in hand with the use of the biodynamic preparations goes a wide range of agricultural practices that have been developed since the late 1940s by Alex Podolinsky and the farmers of the Bio-Dynamic Agricultural Association of Australia. The whole focus of the Australian Demeter Biodynamic method is to foster the development of soil conditions that best enable the soil ecosystem to work at optimum effectiveness, resulting in the most vibrantly healthy, nutritious and delicious food. Some of the main biodynamic agricultural practices are:

Rotational Grazing of Biodiverse Pasture

Pasture is divided up into many paddocks, at least five on a small farm, or up to thirty-five or forty on a dairy farm. Stock are rotated regularly so that after a pasture is eaten down, it has time to grow back to an optimum height before again being grazed. After each grazing, many plant roots die, and are devoured by the soil life. Worm tunnels are created, which are again occupied by roots. The pasture roots go progressively deeper under rotational grazing, hand in hand with soil structuring and aeration. After grazing by cattle, pastures are harrowed (usually with split truck tire “smudgers”) to spread the valuable manure, a form of “sheet composting.” The thinly spread manure is quickly digested and incorporated in soil humus by worms and microbes. Harrowing is not necessary if dung beetles are active, and is avoided when soils are wet enough to risk compaction by tractor tires.

There is no doubt that permanent pasture is the best use of land for the development of the soil in terms of biological

activity, soil structure, depth, and humus development. Peter Andrews, in his book *Back From the Brink*⁸ describes a visit to one of the top racehorse stables in England in the 1960s. He complimented the manager on his pastures saying that they appeared to be free of weeds. The manager was obviously upset by this,⁹ and Peter later discovered that traditional English horse breeders considered that a good horse breeding pasture should contain at least eighty species. If the pasture had less than forty species, it was considered to be in decline. When Peter had a closer look at the pasture he found many species of weeds there, in large numbers. The other essential was that pastures should never be plowed, as experience had shown that when a pasture was plowed, it would be no good for young horses for five years and would not produce a Group 1 winner for ten years. During the Second World War, English horse studs were compelled to plough their pastures to grow vegetables. When the militia arrived at this particular stud to make them comply, father and son stood at the front gate with shotguns until they relented.

Biodynamic pastures are composed of many species, the more the better, and weeds are generally regarded as useful contributors to the overall nutrition and biological activity of the pasture. Many “weeds” that would cause digestive disturbances or be avoided by animals on conventional farms, are relished and easily digested by animals on Biodynamic farms. Native grasses are also encouraged. Each plant species (including the “weeds”) brings a different quality to the soil, and benefits to the animals that graze. The large variety of species, each with its own unique biological activity, its own community of fungi and bacteria, enzymes and coenzymes, gives nature a sufficiently varied palette to work with, to fulfill its aim of developing colloidal humus and bringing a balanced supply of nutrients to plants. Photosynthesis brings carbon in the form of sugars into plants and in turn into the soil. Legumes, in partnership with their co-working rhizobia, bring atmospheric nitrogen into the soil. Various herbs and “weeds” concentrate particular elements – for instance, heliotrope will flourish when copper becomes scarce, and is known to accumulate copper. Whether this is obtained from deep in the subsoil, or is in fact the result of a biological transmutation enacted by heliotrope in conjunction with its specific community of microorganisms and enzymes, is as yet unknown, but the fact is, it accumulates copper. In a bio-diverse pasture, with a rich soil ecosystem and good humus levels, the transmutation of elements goes a long way towards providing a balance of nutrients to plants, and even though hundreds of tons of produce may leave a farm each year, taking nutrients with it, soils can continue

to be productive for many years, despite no or only very low fertilizer inputs, as new elements are constantly being created from others.

There are limits however. Under current conditions, farmers have to export large amounts of produce to make a living, in contrast to European traditional organic farming of one hundred and fifty years ago, whereby all farm wastes were conserved, and much of the production was retained to feed the extensive farm families. Only relatively small amounts were exported from the farm. Also, the European climate is much gentler and more conducive to no-input biological farming. In Australia, long drought periods depress biological activity and lower organic matter and humus levels. In practice, Australian biodynamic farmers do generally have to import some non-water soluble fertilizers from time to time, albeit at considerably lower levels than do organic farmers, and vastly less than conventional farmers.

Soil Structure

Open, crumbly, friable soil structure is a fundamental aim of biodynamics. Soil life (whose role is to turn organic matter into colloidal humus) functions best in a well-structured, well-aerated, well-drained soil. It is soil life that creates well-structured soil, through root activity, humus development and the creation of soil aggregates (grown crumbly lumps). The proper use of well-made biodynamic preparations is instrumental in the creation of well-structured, humus-rich soil. Without biodynamic preparations (also the use of poor quality preparations or the poor application of good preparations) soil development is far slower, and more fertilizer inputs are required to compensate for the less developed soil life, humus levels and structure.

Where existing sub-soil compaction exists, deep ripping (as first developed by Alex Podolinsky in the 1950s) is used in semi-dry soils to crack the subsoil and relieve the compaction, allowing roots and soil biology to extend well into the subsoil.

The ability of roots to search widely and deeply in a well-structured, well-drained, biologically active, humus-rich soil, is a major factor in the ability of BD farmers to produce high yielding crops year after year with minimal or no inputs. It also explains the fact that BD crops stay green for many weeks longer than conventional crops in a dry spell, often producing a viable crop in a drought whilst conventional neighbors' crops fail.

Soil Cultivation

When soils have to be cultivated, the focus is on taking great care to disturb the soil structure as little as possible, and to avoid the creation of hardpans, or subsoil compaction. Soils should be slowly "broken" rather than cut. To this end,

implements are chosen carefully: in general, tined implements are preferred (such as the Rehabilitator plow¹⁰, chisel ploughs, agro-plows, scarifiers, etc.). Disc harrows or plows are acceptable if used with care in certain situations. Rotary hoes are very dangerous for soil structure, and require a high level of care and understanding. They are generally best restricted to shallow "chip hoeing," to, for instance remove a dense grass mat before cultivation for a crop. Moldboard plows can be used, but conventional moldboards tend to create a hardpan, by cutting a "table top" under the soil. They are much better for the soil if a downward pointing tip is attached, to break the soil rather than cutting it. The Rehabilitator plough, made by Michael Fix (Victoria) is the state-of-the-art biodynamic plough, gently breaking and lifting soil, with low horsepower requirement.

Soils should never be overworked, but left in a rather rough state, only fining the top few centimeters if fine seeds are to be sown. Soil should never be worked too wet or too dry, and should always be worked slowly (no faster than a horse walks). Soil should never be "chucked," or dust created. Tractors should be of as low weight as practical for the particular farm needs. Even when caterpillar tracks or balloon tires reduce the weight applied to the topsoil per square centimeter, this is illusory, as the overall weight still presses as a whole on the subsoil, and can cause compaction.

Green Manuring

Green manuring is an invaluable way of providing humus for subsequent crop growth, whether it be vegetables, grains, berries, or in orchards or vineyards.

In Biodynamic green manuring, as in pasture composition, we aim to include a very wide range of species, with the *leguminosae* and *graminaceae* (grain) families predominating. Each plant species brings its own unique qualities to the mixture, its own associated community of microbes and fungi, its own root exudates, and associated enzymes. Each plant brings a different composition of elements and a different capacity to concentrate different elements, whether through biological transmutation or by the roots and associated soil life seeking out particular elements. One of the finest examples of Australian Demeter Biodynamics in Europe, Agrilatina Cooperative, Italy, uses up to ninety species in its summer green manures and up to thirty in its winter green manures.

Alex Podolinsky has suggested that there may well be a qualitative difference between an element contributed by one species and the same element contributed by another species, just as there is a qualitative difference between the C sharp played by a trumpet and an oboe in an orchestra. The richness of a very diverse green manure may contribute more to

the soil and to humus in a qualitative sense than simply the sum of the elements it provides, just as an orchestra provides a richness and diversity of sound even when the same note is played by all instruments.

When the green manure is ready, it is cut up as finely as possible (best by a mulcher), and worked into the soil (best with a Rehabilitator plough, several times), where it undergoes in-situ composting, with the assistance of a “Prepared” 500 spray. The following crop is planted or sown when the green manure has been broken down and converted into colloidal humus. The more diverse the green manure, the better-balanced nutritionally will be the colloidal humus that results.

Weeds as Green Manure

Pioneered by Western Victorian biodynamic farmer, Barry Edwards, this technique recognizes that nature will always try to bring balance into the soil. The ground is left to grow whatever wants to come, until the weeds, herbs and grasses reach their optimum development. While the plants are still green, they are incorporated in the soil, are broken down and converted into humus by the soil life. The subsequent crop always flourishes, as Nature has ensured that the wide array of plants that constituted the green manure would bring whatever elements were lacking in the soil. An additional benefit is that, as the weeds grew there to balance a deficiency, once that deficiency is rectified, they don't need to grow there again for some time.

Under this system, Barry Edwards only needs to apply 3kg (6.5 lbs) of phosphorus (non water soluble) per hectare per crop (2.5 acres) (two crops in five years) compared with the 12–20kg (26.5–44 lbs) (water soluble) applied by conventional growers. His crop yields are generally comparable with his neighbors' conventional crops.

Biodynamic Compost

Is the perfect plant food, being 100% colloidal humus, and is an invaluable input in many situations, from home gardens to market gardens, orchards, berry farms, and dairy farms. It contains a wide variety of elements brought by the manure of grazing animals and the varied plant material used, and is a rich source of beneficial microbes.

We have here only considered factors involving the soil, air and sun. There is much evidence that plant growth and nutrition are also influenced by the moon, planets and zodiac star groupings. Some of these factors are employed to good effect by biodynamic gardeners and farmers. However they are beyond the scope of this article.

The reason biodynamics works so well is that every aspect of the method, based on scientific understanding, meticulous experiments and extensive field trials, is focussed on building and

protecting the essential soil life, whose collective function in nature is to convert organic matter and any free soluble elements into stable colloidal humus, which feeds plants as nature intended, under the jurisdiction of the sun, not indiscriminately through the soil water. The biodynamic preparations are the most powerful (and unique worldwide) stimulators of biological activity in the soil, and, when combined with associated biological agricultural practices, enable farmers and gardeners to produce food of the highest quality with absolutely minimal inputs.

Notes

- 1) The freedom from pests and diseases and the health and fertility of biodynamic animals have been established by published research papers, and are repeatedly confirmed in farm interviews such as those published in this magazine.
- 2) *Bio-Dynamic Agriculture, Introductory Lectures*, Vol. 1, Alex Podolinsky, 1985, Gavemer Publishing, Sydney p. 28.
- 3) The overall picture of natural plant feeding was first clearly seen and described by Alex Podolinsky over 50 years ago.
- 4) See Selected soil enzymes; Examples of their potential roles in the ecosystem, Makoi, J.H.J.R. and Ndakidemi, P.A. in *African Journal of Biotechnology* Vol 7 (3) pp. 181-191, Feb. 5th 2008 for a very interesting discussion of soil enzymes.
- 5) C=carbon, Ca=calcium, Cl=chlorine, F=fluorine, Fe=iron, H=hydrogen, K=potassium, Li=lithium, Mg=magnesium, Mn=manganese, N=nitrogen, Na=sodium, O=oxygen, P=phosphorus, S=sulphur, Si=silicon.
- 6) See *Biological Transmutations*, Professor C. Louis Kervran, Happiness Press, California, 1980 for more examples.
- 7) Paul Madder, the main soil researcher at FiBL (Forschungsinstitut für biologischen Landbau – Research Institute of Organic Agriculture, Landbau, Switzerland) found that biodynamic roots are more active towards creating humus than organic or conventional roots.
- 8) ABC Books, Sydney, 2006.
- 9) The manager was also shocked when Peter asked if he used superphosphate, exclaiming “What!”
- 10) See *Biodynamic Growing* No. 9, Dec. 2007, pp. 34–36.

Reprinted with permission from *Biodynamic Growing Magazine*, www.bdgrowing.com.

Visit www.jpibiodynamics.org for
Catalog of Biodynamic Preparations
Pfeiffer Products
Books and Back issues of *Applied Biodynamics*
Upcoming Events at JPI
Sign up for the JPI e-News!

Anecdotes and Antidotes – Biodynamics at Work

Hugh Courtney, founder of JPI, answers reader's questions

Q: *I live in the Black Hills of South Dakota and we have rose quartz all over the hills. I have gone on the internet to see why you use ground rose quartz as part of your planting. Many of us have rose quartz stones in our homes and gardens but not ground, could you please tell me what the benefit of our lovely rose quartz has in the garden?*

A: The biodynamic preparation BD #501, also called horn silica, is made from finely ground silica from sources of quartz, feldspar, and/or orthoclase. While the rose quartz you are talking about could be used as a source to make the BD #501, it does not happen to be something that we have ever used here at JPI. The reason the silica is finely ground is because the grinding releases or awakens energies that are not available with simply placing a quartz crystal (be it rose or milky or whatever quartz crystal or other silica source) in a garden. Those forces in biodynamic terminology are deemed to be cosmic or originating from sources other than the Earth. When BD #501 is applied as a very fine spray (at the rate of 1/2 teaspoon per acre of the ground silica stirred in 3 gallons of water) to plants and the atmosphere around plants, the nutritive value, visual beauty, and keeping quality of those plants is much enhanced. Plants so treated can better absorb the energy of the sun as well as energies from other bodies within our solar system which we do not presently recognize in agricultural circles. A crop of wheat so treated is far less likely to experience “lodging” and will likely experience more “tillering,” but will have increased protein content in the long term when grown biodynamically, and especially when BD #501 is used.

A modest handful of rose quartz crystal, when finely ground and processed by being put in a cow horn and buried

for the summer months would yield enough horn silica to treat hundreds of acres, so we would be having very little impact on the total availability of your rose quartz even if we used it exclusively to make all of the horn silica we produce here at JPI.

In another context, Rudolf Steiner indicated that by breaking up rocks, vast numbers of elemental beings (gnomes) would be released from “enchantment” or in other terms, imprisonment (for enormously long periods of “time”) within a single rock. These beings, gnomes, have the responsibility to take the physical essence of the Earth into whatever the future holds, and may be deemed of extreme importance to the future evolution of human beings as well. Since the present materialistic outlook of human beings with few exceptions would totally discount the existence of elemental beings, such claims as made in the last few sentences would be dismissed as complete nonsense. Suspend disbelief, and consider that there may be enormous truth in those statements.

I hope that my efforts to explain why one might choose to use even your lovely rose quartz crystals to make the BD #501, horn silica, will allow you to find such a practice somewhat more acceptable.

Q: *I vaguely remember something regarding when NOT to spray BD #501 on fruit. Should I avoid spraying during blossoming or once fruit is started?*

I want to spray strawberries (already have green fruit), raspberries (some are blossoming) and apple (fruit is set).

I do remember that after applying BD #500 you can spray young plants with BD #501 when about 4" high (at least four leaves).

A: Avoid spraying fruiting plants/trees when in bloom with either BD #501 or BD #508. After fruit is well-formed it is fine to spray, then further along another spray on the ripening fruit, then again just before harvest. Some folks apply BD #501 after harvest to set the buds for the following season. One observed problem with BD #508 on apples at blossom time was too much fruit set—meaning all smaller apples. Others have experienced something with BD #501 that actually might serve to thin fruit when spraying in late bloom, but all this needs to be examined a lot more carefully before going out and ruining a crop. Katherine Castelliz in *Life to the Land* observes that spraying strawberries every nine days or so (that is in Fruit periods according to the biodynamic planting calendars) allowed persons with an allergy to be able to eat strawberries without any problems, but skipping the BD #501 spraying schedule allowed the allergy problems to resurface.



BD #501 (horn silica) at JPI

Q: Please confirm the best use of BD #508 for tomato and potato blight. Specifically, is it sprayed on both the ground, and on the plants? Should one spray on the waning and descending moon?

A: The fermented version of BD #508 is preferred.

1. Bring 1 unit of BD #508 (1.5 ounces by weight of dried herb) to boil in 1 gallon H₂O, and simmer for 1 hour.
2. Cool and transfer to crock or glass container.
3. Store in cool place and let ferment for 10 – 14 days until starts to smell.
4. To use add 1 part BD #508 tea (fresh or fermented) to 9 parts water, (rainwater or if chlorinated, expose to sun for a day).
5. Stir for 20 minutes, reversing direction once deep vortex has formed. (about 1–2 times per minute).
6. Spray on ground with larger droplets on day pertaining to the crop according to the biodynamic planting calendar. (Fruit for tomato; Root for potato, etc.) Specifically for blight, one still wants to spray the preparation on the ground, but it is fine if it is sprayed on foliage as well.

Thank You for the Blossoms

Thank you to all who collected and contributed dried dandelion blossoms to JPI! Your efforts ensure an adequate supply of BD #506. Would you like to harvest dandelion or other preparation materials for JPI? If so, contact JPI for details on how to harvest. Thanks to your good efforts, as of press time, over 45 pounds of dried dandelion have been harvested! A record amount!

Amanda Aston – Meadows of Dan, VA

Curtis Belcher – Woolwine, VA

Mary Bethune – Hillsborough, NC

Sharon Carson – Delmar, DE

Jim Fealy – New York, NY

Timmy Foley – Woolwine, VA

Myrna Fox – Morgantown, WV

Michelle Foxx – Altadena, CA

Harlan Holmes – Oxford, VA

Barbara Martin – Newton, PA

Andrea Martone – Durango, CO

Don Morrison – Powell River, BC Canada

Mary Beth Mueller – Boone, NC

Katherine Rose-Plum – Stuart, VA

Eugenia Scott – Rimersbury, PA

White Rose Farm – Taneytown, MD

Mary Yorder – Fairchild, WI

Adding, either with the BD #508 or separately, an application of BD #505 (oak bark preparation to counter plant diseases) is helpful.

Applications of BD #501 and BD #507 (valerian) should also be made in the regular course of treating the crops.

Regarding the moon phase in which to spray, this is less important than paying attention to the plant organ and the corresponding indication per the biodynamic planting calendar.

Save the Date!

August 18: Annual Open House at JPI

Begins at 10 am. Refreshments will be served. Contact JPI for details or to register.

September 29: Making BD #500 and BD #504 at JPI

Workshop runs from 9:30 AM–4:30 PM. Cost is \$85 and lunch is included in the price. Contact JPI for details or to register.

October 4–7: Biodynamic Conference at Long Hungry Creek Farm, Red Boiling Springs, Tennessee

Contact www.barefootfarmer.com for information.

October 31–November 4: Annual Fall Workshop at JPI

Experience harvesting of sheaths and making the biodynamic preparations. Cost is \$600; meals are included. Contact JPI for details or to register.

November 15–18: Annual Biodynamic Farming and Gardening Conference in Madison, Wisconsin

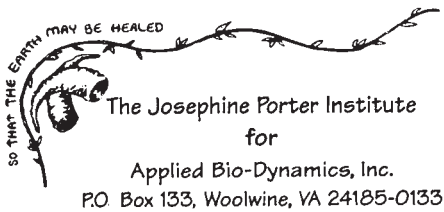
Contact www.biodynamics.com for complete information.



Cow horns for prepmaking at JPI

“We must vitalize the earth directly, and this we cannot do by merely mineral procedures. This we can only do by working with organic matter...”

Rudolf Steiner – *Agriculture*, p. 89 (Adams translation)



Non-Profit
Organization
US Postage
PAID
Woolwine VA
24185
PERMIT NO 1