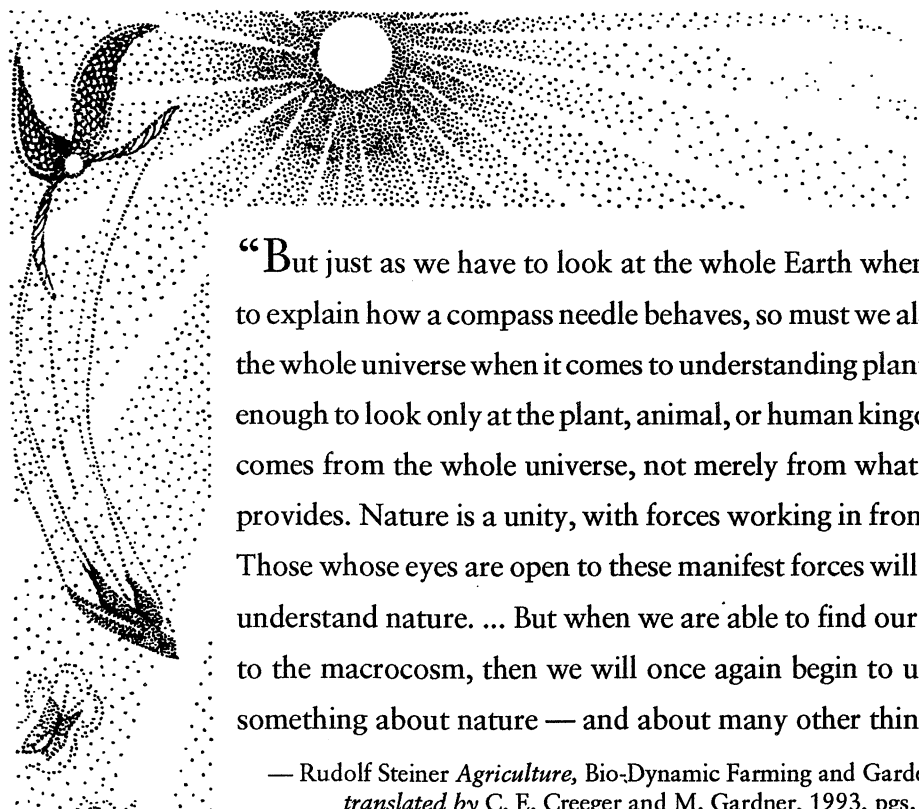




“But just as we have to look at the whole Earth when we want to explain how a compass needle behaves, so must we also consult the whole universe when it comes to understanding plants. It is not enough to look only at the plant, animal, or human kingdoms. Life comes from the whole universe, not merely from what the Earth provides. Nature is a unity, with forces working in from all sides. Those whose eyes are open to these manifest forces will be able to understand nature. ... But when we are able to find our way back to the macrocosm, then we will once again begin to understand something about nature — and about many other things too.”

— Rudolf Steiner *Agriculture*, Bio-Dynamic Farming and Gardening Assoc.
translated by C. E. Creeger and M. Gardner, 1993, pgs. 129 & 130.



SO THAT THE EARTH MAY BE HEALED

The Josephine Porter Institute
for
Applied Bio-Dynamics, Inc.
P.O. Box 133, Woolwine, VA 24185-0133



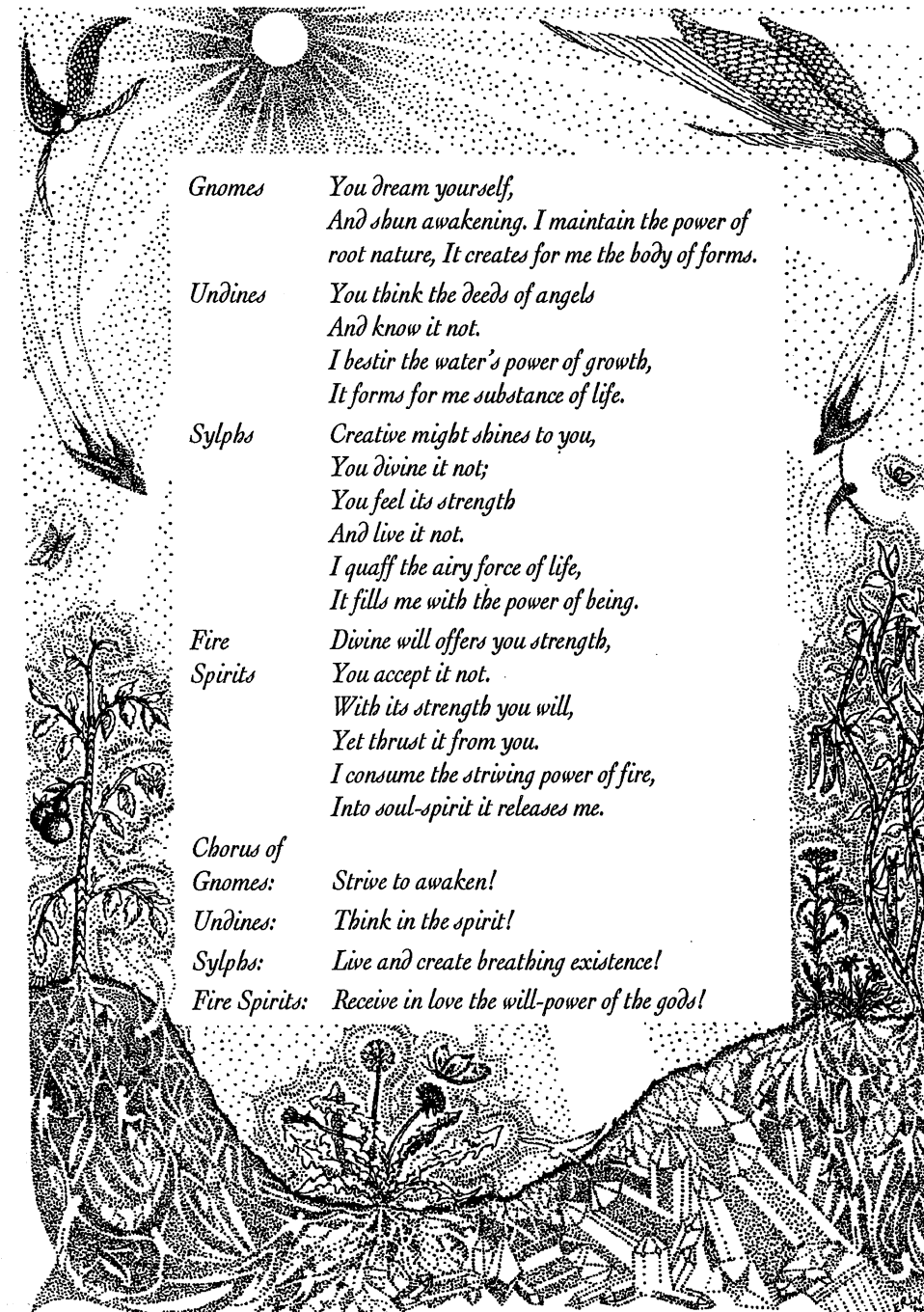
Applied BIODYNAMICS



SPRING 1994

A Quarterly Newsletter of the Josephine Porter Institute • Woolwine, Virginia

ISSUE Nº 7



Gnomes *You dream yourself,
And shun awakening. I maintain the power of
root nature, It creates for me the body of forms.*

Undines *You think the deeds of angels
And know it not.
I bestir the water's power of growth,
It forms for me substance of life.*

Sylphs *Creative might shines to you,
You divine it not;
You feel its strength
And live it not.
I quaff the airy force of life,
It fills me with the power of being.*

*Fire
Spirits* *Divine will offers you strength,
You accept it not.
With its strength you will,
Yet thrust it from you.
I consume the striving power of fire,
Into soul-spirit it releases me.*

*Chorus of
Gnomes:* *Strive to awaken!*
Undines: *Think in the spirit!*
Sylphs: *Live and create breathing existence!*
Fire Spirits: *Receive in love the will-power of the gods!*

SEED SOAKS WITH THE BIODYNAMIC PREPARATIONS

by Hugh Courtney

One very valuable technique to use in getting off to a good start in the garden is that of using the appropriate biodynamic preparation as a seed bath or seed soak prior to planting the seed. Such a treatment is especially useful where one must use bought-in seed, almost all of which comes from a chemical background. However, even seed from organic sources has, so to speak, lost its connection to its cosmic archetype or “blueprint.” If you already have biodynamic seed, and keep in mind it takes several generations to reconnect the seed to its cosmic forces, and you have the time to seed soak, it will be well worth the effort. A soaking of the seed with the most suitable biodynamic preparation helps to re-establish this connection to the cosmos from the moment of germination. Where seed baths are used with diligence, two principle benefits can be noticed. The first benefit is that germination rates are much higher. Advantage number two is that fruit set is significantly greater. This improvement in fruit set is easily observed in the case of legume crops. As is apparent from the article “Spring in the Biodynamic Garden” in this same issue, this seed bath technique is very much under utilized by biodynamic growers in this country.

In an effort to increase the use of this technique, we have gleaned information from several different sources and have compiled them in a convenient tabular form. Unfortunately, at this point, all these sources are secondary and the original research done in Europe has yet to be translated into English. We will be hoping to remedy this

Rudolf Steiner: *Man as Symphony of the Creative Word*, Rudolf Steiner Press, 1993, p. 144.

SEED SOAKS (continued on page 8)

LETTER FROM THE EDITOR

Dear Reader,

The artwork and verse on the front page of this issue are provided to remind gardeners and farmers of our call to work with the elemental kingdom! In Appendix B, p. 254-5, of *Agriculture*, Bio-Dynamic Farming and Gardening Assoc., Inc., Kimberton, PA, 1993, a report is made of a conversation that took place August 12, 1920, between Rudolf Steiner and Kurt Walther. Here Rudolf Steiner speaks of the elemental kingdom, the gnomes, undines, sylphs and fire spirits, and says that they help to build up and form the plants. He calls for human beings to familiarize themselves with the elementals and to try to connect with these spirits and influence them in such a way that they will continue to assist in the growth of plants. It is reported that in this conversation Steiner went so far as to say "If human beings are able to cultivate these kinds of forces in themselves, they will become priests as farmers. If it is not possible to bring about such a connection, then in a few decades human beings will have to experience that the yield and quality of the products of the fields are diminishing . . ."

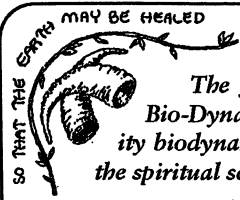
Adrian Anderson, in his book *Living A Spiritual Year*, Anthroposophic Press, Hudson, NY, 1993, p. 32-60, provides insights into the great significance that the elementals are living beings that bring about the "tangible, sense-perceptible processes of nature . . . not distinguishable by our physical vision;" (p. 32). They are active in the various seasonal processes of nature and in plant life via the four elements, which are each expressions of the etheric formative forces. Anderson explains that the forces are brought into activity by the four kinds of elementals and that each has tasks significant to the growth of plants and therefore to the success of the gardener and farmer.

EARTH	LIFE ETHER	GNOMES	ROOT
WATER	CHEMICAL ETHER	UNDINES	LEAF
AIR	LIGHT ETHER	SYLPHS	FLOWER
FIRE	WARMTH ETHER	FIRE SPIRITS	FRUIT

As you will read in the article "Spring in the Biodynamic Garden," the interviews with gardeners reveal that the use of the biodynamic preparations certainly impacts the yield and quality of the products of the field and garden. Is it not possible that the forces of the biodynamic preparations, (not distinguishable by our physical vision), draw elementals to their significant work in forming the plants? *We at the Josephine Porter Institute believe that the use of the biodynamic preparations brings the necessary forces to the elementals which allow them to release their powers in a life giving way.* If human beings fail to take up this task we doom the elementals to work solely in a deadening, mechanistic way, hastening the dying of the Earth.

We hope the frontispiece will help to familiarize and connect you with the gnomes, undines, sylphs and fire spirits. They are truly friends of the gardener and farmer.

Striving to awaken,
Candace Coffin, *Editor*



MISSION

The Josephine Porter Institute for Applied Bio-Dynamics, Inc., was founded to produce quality biodynamic agricultural preparations based on the spiritual scientific research of Rudolf Steiner.

It serves as a living memorial to Josephine Porter, a biodynamic pioneer for this work in America.

The mission of JPI also includes education and research in biodynamic agriculture.

JPI undertakes these tasks so that the Earth may be healed.

ANNUAL JPI BOARD MEETING
"REALIZING THE MISSION"

The annual JPI Board meeting took place in Woolwine, VA, on December 10th and 11th, 1993. It had been a little over a year since the Josephine Porter Institute assumed the sole responsibility for the production and distribution of the biodynamic preparations, and for provision of the sheath materials for making the preparations. It was an appropriate time to reevaluate the status of these responsibilities and to address the present and future needs of JPI in light of the fulfillment of our mission. Working together, the Board and staff members determined that to ensure the continuation of quality preparations and to provide for future growth, a permanent home for JPI was necessary. The following tasks will be addressed this year in order to begin this project: 1.) restructuring of land ownership; 2.) hiring an Assistant Director; 3.) finalizing the not-for-profit status with IRS; 4.) implementing a computer accounting system; 5.) marketing new products such as the Pfeiffer Compost Starter, Pfeiffer Field Spray, BD tree paste; 6.) procuring an architectural study for land usage and building needs.

The preliminary JPI building needs include a facility: for the production and distribution of the preparations; for education workshops and prep making festivals; and for research and development projects. The Board and staff determined that all capital improvements would need to be paid for through donations and/or grants. It is hoped that an architectural model can be created so that presentations can be made for the procurement of donations for a building fund.

The Josephine Porter Institute, as an organism, is growing. It is in the spirit of enthusiasm and joy that we work toward meeting future growth needs and in fulfilling our mission. It is through the nurturing and support of each of you that our mission can be realized. We will keep you abreast of our plans. It is certainly exciting to be aware that the need for the building plans comes out of the increase in growth of the production and distribution of the biodynamic preparations!

As an aside, you may be interested to know that the JPI Board members are all biodynamic practitioners. The President, A. Lee McWhorter, is a biodynamic herb gardener and owner of la dama maya Herb Farm in Luray, VA. The Vice President, James Marquardt, is a biodynamic orchardist and owner of Maracah Orchards in Winchester, VA, growing 50 different varieties of apples. The Secretary, Candace Coffin, is a biodynamic gardener at Cranberry Creek Community in Dugspur, VA, and editor of "Applied Biodynamics." The Treasurer, Hugh J. Courtney, is Executive Director of the Josephine Porter Institute, and, of course, a biodynamic gardener.

Applied BIODYNAMICS

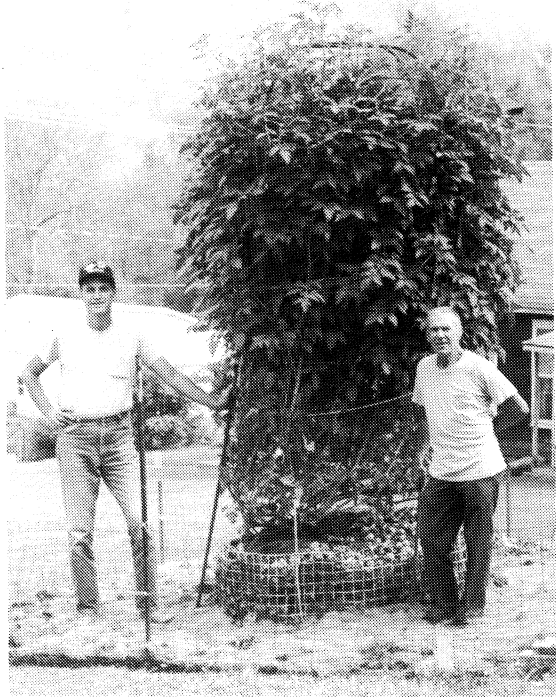
Applied Biodynamics is a quarterly newsletter of the Josephine Porter Institute for Applied Bio-Dynamics, Inc.

The subscription price of \$35/yr. helps subsidize JPI research and development.

Editor: Candace Coffin Artwork by: Erin

CHERRY TOMATO (continued from page 10)

plant with soil still on the roots, or cut low to the ground) next to each plant, watering the roots of the plant only. Add fresh dandelions and water frequently to the bucket until there is too much vegetable matter. At that point empty the whole bucket onto the tomato hill and begin again with fresh water and dandelions.



L. A. Rotheraine and King O'Connell with 12' Selke BD Tomato Plant. Photo courtesy of "The Bradford Journal."

Never, never, never ever water — *never water leaves of a tomato plant!* Water enough so that the hill is always moist— up to five gallons a day in dry weather. Continue to throw table scraps/organic refuse on the hill, in large quantities, throughout the growing season, and cover refuse with soil,

leaves or grass clippings — up to 6" to retain the nutrients you are adding in the hill rather than losing some of the nutrients to the atmosphere. The more garbage/organic refuse you add on the hill, the larger and more productive the plant. **DO NOT PULL SUCKERS OFF THE PLANT!** Tomatoes resent being handled and suckering will decrease production.

This hilling system works for all tomato varieties we have tried and is especially effective with the Selke Biodynamic Cherry Tomato†. If you saw the Jan/Feb 1994 issue of *Biodynamics Magazine* you will be interested to know that Mr. King O'Connell (see photo) used upwards of 250 gallons of organic refuse, of which well over 100 gallons were dandelions, to produce his 12 foot, 2500 plus yield of Selke B.D. Cherry Tomatoes.~

*Biodynamic Compost Starter: Dr. Pfeiffer's Biodynamic Compost Starter can be purchased from the Josephine Porter Institute. (Cost: \$7.00/unit plus \$5.00 postage & handling; one unit treats up to 1 1/2 tons of raw organic material.) For further information regarding this starter see "Applied Biodynamics", Winter 1993, Issue#6.

†Stella Natura Calendar: A planting calendar based on actual celestial events. The calendar can be purchased from the Josephine Porter Institute. (Cost: \$9.75 plus \$2.00 postage & handling.)

‡Selke Cherry Tomato Seeds: Can be purchased from Evergreen Elm at \$4.00 for 10 seeds. Make checks payable to: Horticultural Therapy Program, Evergreen Elm, Inc., Room 804, Hooker-Fulton Building, Bradford, PA, 16701.

EVERGREEN ELM SQUASH HILLS: Hills for summer and winter squash and the technique for using the Biodynamic Compost Starter water are the same, except you can flatten the top of the hill to about 20" and plant 2 squash per hill, about 15" apart, or build smaller hills for one squash per hill. We use this system in our adjunct garden where we don't have our beds raised as high as the Elm Street Garden. Do not throw raw garbage on the squash plants throughout the summer, use the garbage on the tomato plants only.

Attention Readers!

We now have the following newly acquired books which may be of interest to you. Add a \$2.00 handling charge with order and mail to: JPI, P.O. Box 133, Woolwine, Virginia 24185 or call (703) 930-2463.

AGRICULTURE
by Rudolf Steiner

The 1993 edition of the original course of lectures given in 1924 has been carefully revised and professionally translated. It contains a great deal of previously unpublished material, including useful footnotes, personal memoirs of people attending lecture courses, and Steiner's notes.
Cost: \$22.50, hardbound, \$17.50, softbound.

PASTURED POULTRY PROFITS
by Joel Salatin

Joel has developed techniques for pasturing poultry in a sustainable and appropriate way based on his many years of observing the behavior of poultry. Cost: \$28.00

THE ETHERIC FORMATIVE FORCES IN COSMOS, EARTH AND MAN
by Dr. Guenther Wachsmuth

Basically, if we want to understand the etheric formative forces, this is the starting point. Dr. Wachsmuth was appointed by Steiner to the Vorstand (Executive Committee) of the Anthroposophical Society. (A photocopy reprint.) Cost: \$20.95

THE SELKE BIODYNAMIC CHERRY TOMATO AND EVERGREEN ELM RECIPE FOR PLANTING USING B.D. COMPOST STARTER

By L. A. Rotheraine
Master Gardener at Evergreen Elm

Editor's Note: This report was promised in our Summer 1993, Issue #4, at the end of the article: "Selke, Courtney, and Evergreen Elm." The Evergreen Elm Biodynamic Community Garden is a gardening therapy program for the "mentally handicapped" in Bradford, Pennsylvania.

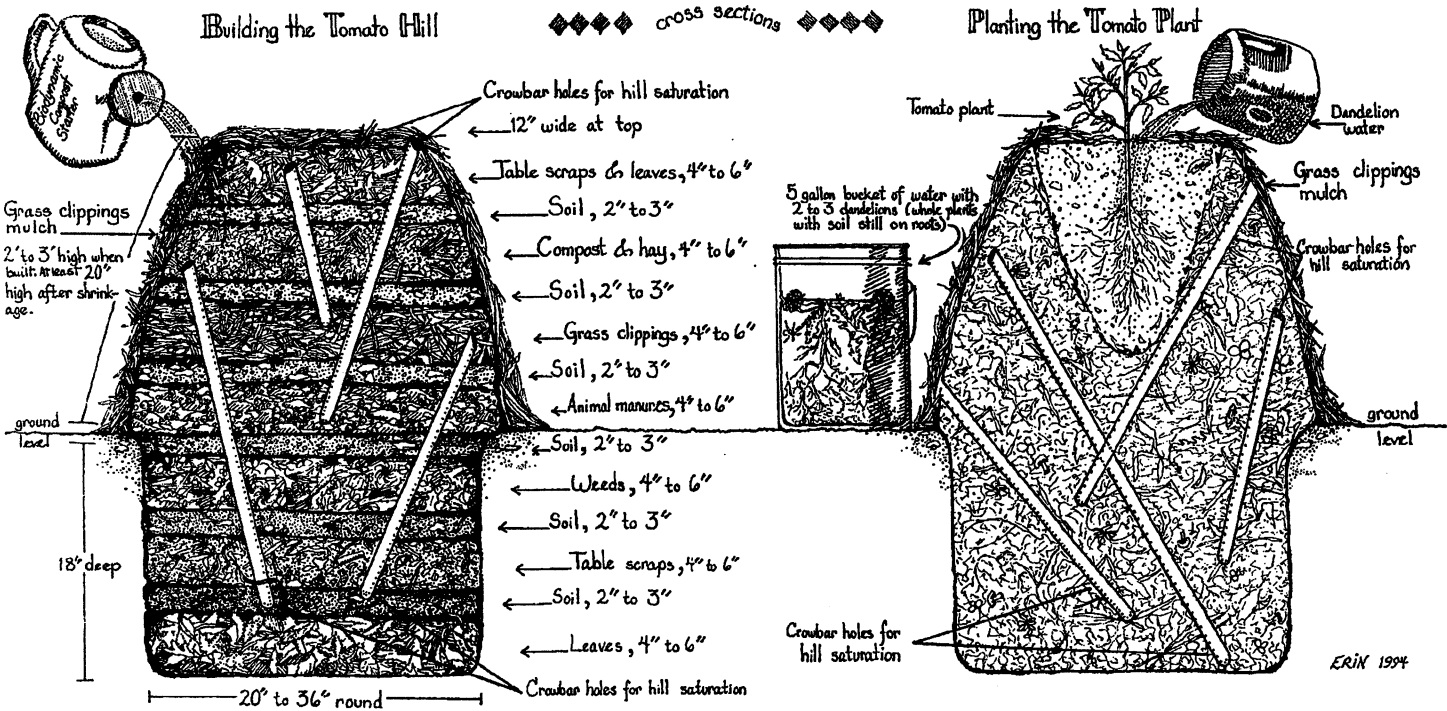
Dig a hole 18" deep x 20"-36" round, in a spot that gets at least 8 hours of sunlight. Put soil around the circumference of hole for later use. The hill can be built immediately if you have enough organic refuse (table scraps, weeds, grass clippings, animal manures, etc.) or slowly in layers. If you're building in layers, the layers should alternate between 4"-6" of organic refuse and 2"-3" of soil. Continue building the hill until it is at least 2'-3' above the ground level, (see illustration). The tomato hill should be at least 20" above the ground at the time of planting (after shrinkage) and at least 12" wide at the top. If you have enough garbage and/or manure available you don't have to layer, just mix 60%-70% garbage/manure with 30%-40% finished compost (biodynamic compost, of course), or soil. Table scraps are best! One may use everything from chicken wings, pepperoni pizza and cheeseburgers, to all plants and animals. If you might be plagued by animals trying to dig up the additions to the hill, do provide proper fencing.

You are now ready to use our unique method of application of the Pfeiffer Foundation Biodynamic Compost Starter* (meticulously produced by Margrit Selke). Add one teaspoon of Biodynamic Compost Starter to an equal amount of unchlorinated water. (Chlorinated water left standing in sunlight for 1-2 hours loses most of its chlorine.) The amount

of water should be sufficient for the Biodynamic Compost Starter to appear as moist coffee grounds. Let the activating Biodynamic Compost Starter sit in a warm, dark, dry spot for 12-24 hours to become completely activated. You are now ready to make your Biodynamic Compost Starter Tonic. Mix active Biodynamic Compost Starter in 4-5 gallons of water(unchlorinated) in a bucket. Please check Stella Nature Calendar to make sure that you are doing this during a fruit period only! Stir as you would stir BD 500 (horn manure) or BD#501 (horn silica), that is by creating a deep whirlpool (vortex) in one direction and then reversing the whirlpool, approximately 7 times — you only have to stir 1 or 2 minutes, but you must re-stir if you let the Biodynamic Compost Starter sit for awhile. This tonic of Biodynamic Compost Starter must always be equally suspended in water when you pour into your tomato hill. On the day you plant the tomato, poke about a dozen holes throughout the tomato hill with a crowbar or stick at different depths and saturate the hill (3-5 gallons per hill) with the Biodynamic Compost Starter Tonic. Bury 1/2 to 3/4 of the tomato plant in the center of the activated hill and water the roots of the plant with the Biodynamic Compost Tonic again — about 1/4 of a gallon of water. Then mulch the plant with grass clippings, leaves, sawdust or hay, and keep the hill moist, watering with unchlorinated water saturated with dandelions — with or without flowers. We always keep a five gallon bucket of water with 2 or 3 dandelions (whole

CHERRY TOMATO (continued on page 11)

Evergreen Elm Tomato Hills

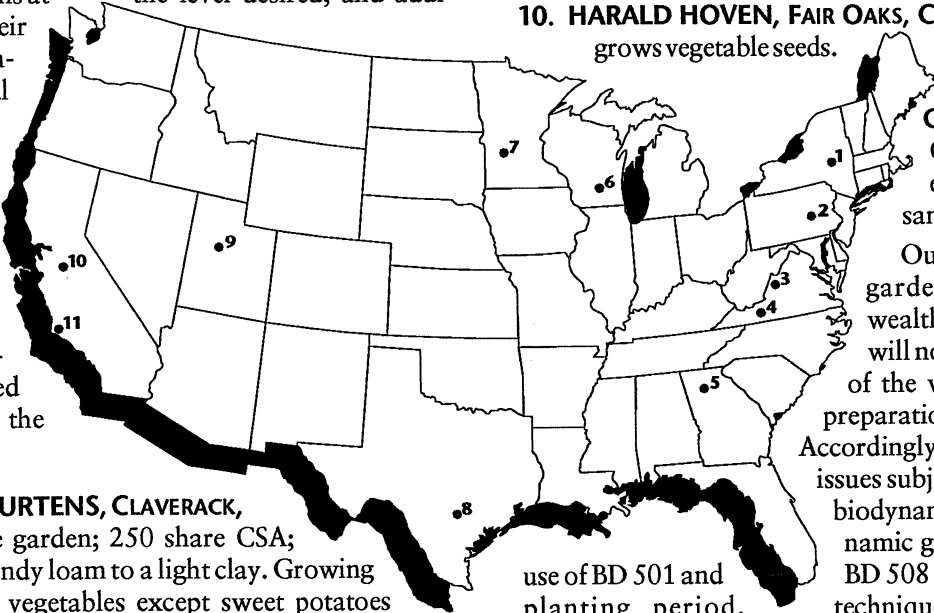


SPRING IN THE BIODYNAMIC GARDEN

by Hugh J. Courtney

In order to live up to our name, "Applied Biodynamics", we decided to survey some of the top biodynamic gardeners in the country regarding their use of the biodynamic preparations. Before the survey was completed we had recorded conversations with 11 different gardeners. We were pleasantly surprised that the responses from that many gardeners included such a variety of practices with regard to the use of the preparations. Although their biodynamic practices may be varied, they all are committed to biodynamics, most especially because of the quality obtained. However, they all expressed some frustration over the lack of time to fully implement the use of the preparations at the level desired, and additionally, some of their practices were constrained by financial limitations. So, time and money prevented them from being as fully biodynamic as they desired.

First, let us introduce you to the gardeners we interviewed and locate them on the map.



1. **JEAN PAUL COURTENS, CLAVERACK, NEW YORK.** 10 acre garden; 250 share CSA; soils range from a sandy loam to a light clay. Growing virtually all garden vegetables except sweet potatoes and okra. Two hoop houses: 1 @ 17'x48' and 1 @ 14'x40'.
2. **KERRY SULLIVAN, KIMBERTON, PENNSYLVANIA.** 7-10 acre garden; CSA; soils: PA silt loam, a heavy soil, mostly silt, but with good nutrient holding and water retention capacity. Full range of vegetables plus soft fruit. Hoop houses/grow tunnels.
3. **ALLEN CLEEK, BOLAR, VIRGINIA.** 2 acre market garden, mainly lettuces, beans and flowers. Zone 5, 2400 ft. elevation. Sandy soil with good drainage yet holds moisture well; lacks structure. Garden located in bottomland. Hoop house.
4. **POLLY HIESER, CHECK, VIRGINIA.** 3 acre market garden and 54 member CSA. Soils: varied, mostly silt loam, some clay and some sandy soils. Greenhouse.
5. **HUGH LOVEL, BLAIRSVILLE, GEORGIA.** 6 acre market garden & CSA including eggs & cheese. Soils: Talledega clay loam; red clay (was 7 years ago), borderline laterite soil; now a good crumbly rich brown clay loam. Entering his 7th year of the CSA. Hugh directs the Union Agricultural Institute.
6. **RUTH ZINNIKER, EAST TROY, WISCONSIN.** Vegetables and flowers, Ruth has been a biodynamic gardener for 32 years! Soils: silt loam, gravel underneath; Kettle Moraine area (glacial moraine); glacial soil.
7. **CLAIRE HALL, WABASHA, MINNESOTA.** 3 acres in annual crops; 2 acres in perennials (orchard, vineyard, asparagus,

raspberries); 15 acres in hay and slow rotation of small grains. Soils: silt loam; heavy clay soil; reddish brown.

8. **CHARLIE TOWNSEND, WHITNEY, TEXAS.** Israeli melons and peas: English, black-eyes and purple hull. Soils: black gumbo; sandy loam; red and yellow clay.

9. **JENNY ERICKSON, COALVILLE, UTAH.** Herbs, perennials, annuals, salad crops, fresh cut flowers; compost business. 2 acres in combination; 2 greenhouses, 1 @ 100'x20' and 1 @ 50'x20', double plastic; smaller greenhouses to grow vegetable and herb seedlings. Standardized soil. Altitude-5800 ft., 100 days of growing season, annual rainfall is 13 inches.

10. **HARALD HOVEN, FAIR OAKS, CALIFORNIA.** CSA, 1 acre; grows vegetable seeds.

11. **STEVE MOORE, CARPINTERIA, CALIFORNIA.** CSA, orchard; 120 chickens/eggs for CSA. Soil: sandy clay loam.

Our discussions with these gardeners revealed such a wealth of information that it will not be possible to cover all of the wide ranging use of the preparations by these individuals. Accordingly, we will defer to future issues subjects such as formulas for biodynamic potting soil, biodynamic greenhouse practices, the use of BD 501 and BD 508 beyond the initial Spring planting period, techniques of dealing with insect and pest problems during the growing season, and other specialized applications of the preparations. We will not include information on seed soaks or seed baths in this article since it is covered elsewhere in this issue (see SEED SOAKS beginning on page 1). We thought it most important to examine how each gardener uses the biodynamic preparations in his or her initial Spring garden work. Accordingly, what follows is a description of the practices of each biodynamic gardener.

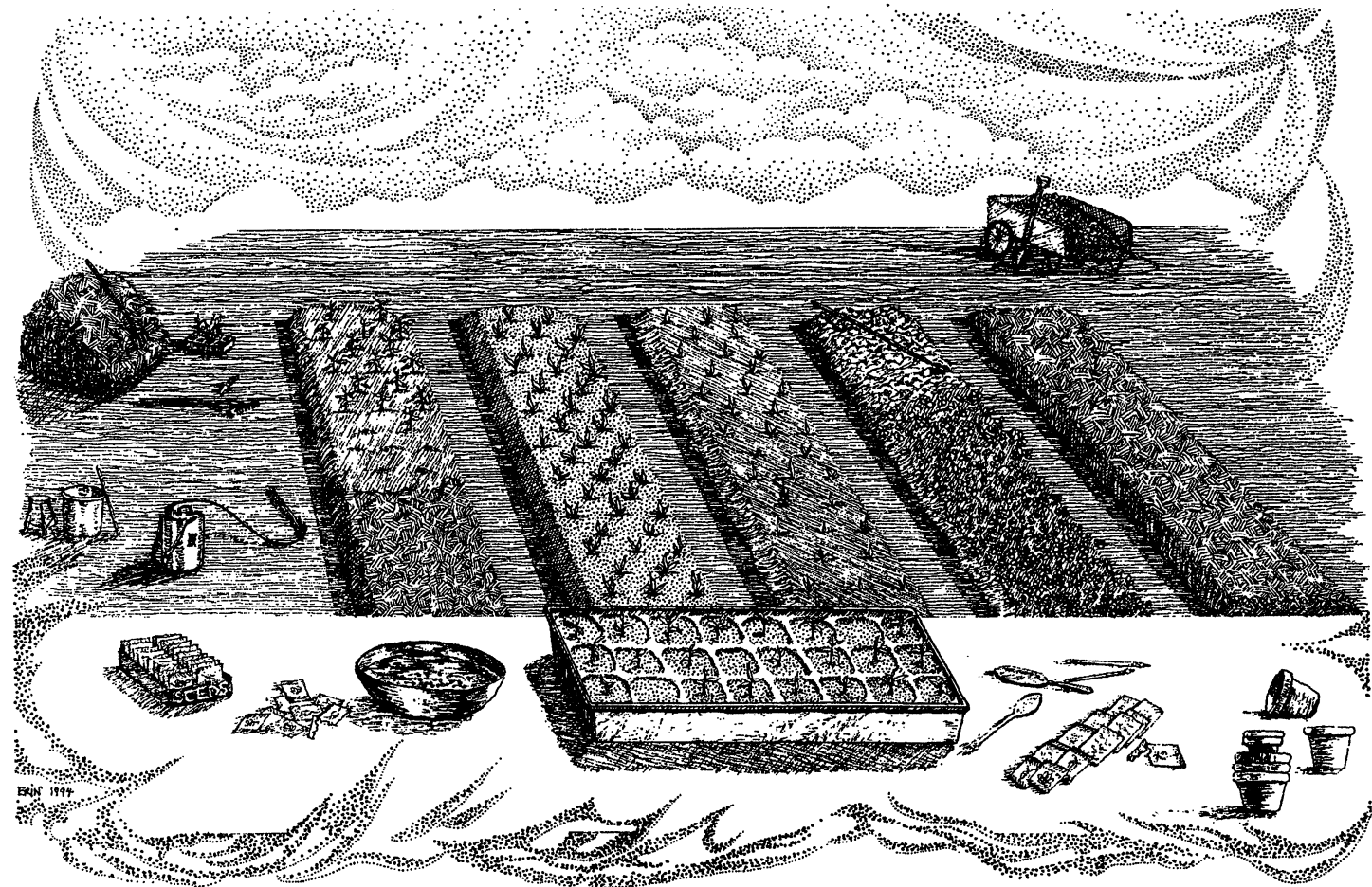
Jean Paul Courtens sprays BD 500 on all 10 acres in one day. Within a period of 10 days of this BD 500 spraying, he spreads all of his biodynamic compost, a total of about 80 tons. Where heavy feeding crops will be planted, a field of 1 1/2 acres may receive up to 25 tons. Brassicas receive less mature compost while squash crops are given only well rotted compost. Lettuce, beans, carrots, and peas receive no compost. Onion crops will be given nothing unless they can be given only well rotted compost. Barrel Compost is subsequently applied to the fields and the plants in the greenhouse as the opportunity presents during the growing season. Virtually all plants are started in the greenhouse, but Jean Paul noted that when winter squashes are direct seeded they are much stronger than when transplanted. Use of the planting calendar is limited to the cash crop of carrots, taking care to sow them just before a full moon. The pressure of managing gardens for such

a large CSA does not permit Jean Paul the luxury of observing all indications of a planting calendar. At best, he does avoid so called ‘null’ periods or blank days.

Further south in Pennsylvania, Kerry Sullivan, beginning in mid-February, sprays BD 500 on all beds and in the greenhouses, finishing by early March. A second application of BD 500 is also made during the Spring months. On occasion, Barrel Compost will be added to the BD 500 the last 20 minutes of the stirring process. In early Spring, BD 507 (Valerian) may also be added to the BD 500 the last 20 minutes to enhance the warmth effect. BD 508 is used on flats in the greenhouse to prevent damping off, but is not necessarily applied over the whole garden. BD 508 is reserved for specific application, for instance tomatoes, where fungus problems

Every effort is made to follow the planting calendar strictly, but flexibility is used if the weather dictates.

In Bolar, Virginia, Allen Cleek will apply BD 500 once in the Spring and once in the Fall each year. When a crop like peas is planted before the Spring application, he banks on the forces of the BD 500 application from the Fall. Later, the peas will receive the BD 500 when the rest of the garden is sprayed. Application of BD 508 is made to the soil at the first visible sign of Spring growth. Allen feels that the garden location, adjacent to creeks, warrants the use of BD 508 to counter the high moisture conditions in his situation. Then comes the Spring application of BD 500 with Barrel Compost following soon after. Barrel Compost may be applied once more prior to actual sowing of a bed when time and energy permit. His



may be expected, and it is applied to the soil just prior to planting. Kerry applies 50-60 tons of biodynamic compost, every year, with some Fall application, but most of it is applied as early in the Spring as possible and worked in with a tiller. He employs a most interesting, and worthwhile technique with his tomato crop. Compost is applied in the Fall of the year on tomato beds, which are then planted with a hairy vetch cover crop. In Spring, the cover crop is mowed and the tomatoes are planted directly into the cover crop residue with a bulb planter. This virtually eliminates weed problems. He uses the technique also on peppers. The planting calendar is used for greenhouse sowing and overall garden planning.

compost is in short supply, so much of it goes into the actual planting hole for crops such as tomatoes and other transplants. Otherwise, a thin layer is spread on top of the planting beds and is raked into the soil. Allen also employs Chamomile tea (with good success) on the planting flats in the hoop house as a damping off preventative. (Allen’s formula is: a strong cup of Chamomile tea, diluted with 3 cups of water, and misted over the flats with a small hand sprayer.) At times BD 508 may also be used when damping off prevention is indicated. Allen follows the planting calendar diligently for sowing but is unable to observe it strictly for harvesting and cultivating.

ment of potatoes, especially in *Bio-Dynamic Farming Practice*, are so extensive that I must also refer the reader to that source for the exact details.

In general, a seed bath with BD#500 would benefit virtually all crops especially as far as root development is concerned. However, in the research done in Europe, principally by Martha Kuenzel and Franz Lippert, individual preparations were found to enhance plants in a more effective way than was the case when a compound preparation, ie. Barrel Compost, was used.

Although cereals especially seem to each have a preferred preparation, my own experience with seed baths has led me to evolve a “quick and easy” thumb rule to remember which preparation goes with which seed. The table provided will readily identify the exceptions to the following thumb rule:

SEED SOAKS WITH BIODYNAMIC PREPARATIONS			
CROP	PREPARATION	CROP	PREPARATION
CEREALS		celeriac	507
wheat	507	celery	507
rye	502	chard	500
oats	505	chicory	507
barley	504	collards.....	503
rice	?	cucumber	507
corn (maize)	507	eggplant	? (likely 507)
millet	?	garlic	? (likely 507)
linseed	503	kale	503
COVER CROPS		kohlrabi	503
alfalfa	503	leek	507
clover	503	lettuce.....	505
grasses	502	melon	? (likely 507)
FLOWERS		mustard greens	503
sunflowers	Barrel Compost	okra	?
other flowers	?	onion	507
HERBS		parsley	?
herbs	?	parsnip	?
VEGETABLES		peas, English	503
artichoke	?	peas, field	503
arugula	?	peanuts	? (likely 503)
asparagus	?	peppers	507
beans	503 (505 for bush beans)	potatoes	See Sattler and Wistinghausen, <i>Biodynamic Farming Practice</i> , pgs.175-180, or other pertinent references.
beets	507 or 507 + Barrel Compost or 1 part BC + 4 parts water + 5 parts whole milk, let stand 24 hours, stir another 5 minutes prior to use.	pumpkin	507
broccoli	503	radish	503
brussels sprouts	503	rutabaga	? (likely 503)
cabbage	503	scallion	507
cantaloupe	507	spinach	500
carrot	507	squash	? (likely 507)
	or: BC/water/whole milk soak (see beets)	sweet potato	? (500 ?)
		turnip	503
		tomato	507
		watermelon	? (likely 507)

Legumes & Brassicas — BD#503(Chamomile preparation); Lettuce crops — BD#505(Oak Bark preparation); Fruit crops (other than legumes) — BD#507(Valerian preparation).

An analysis of the recommendations in the table will quickly reveal that preparations #501, #506 and #508 are not among those listed. Several years ago, in a “seat of the pants” seed bath experiment with corn (maize) which I never replicated, I felt that I obtained the best results with the plot that had been treated with a combination of #501 and #506. That particular plot had a higher yield and almost no corn ear worm damage in comparison to the several other plots that had received a variety of different treatments. Much more experimentation seems desirable in this area of seed soaks.

thought process, I suggested that he water-in the plants with a strong dose of #504 and #505 in combination. Subsequently, after receiving the preparations, he stirred one unit each of #504 and #505 together for 20 minutes in 6 gallons of water and treated each plant with this generous quantity of “medicine”. He followed with a second treatment a few days later. As it turned out, the prescription was on target, the plants managed sufficient leaf regrowth and passed the photography audition with flying colors just a few days after the last application of this special potion.

However, the most remarkable part of this tale occurred a number of days after the photography session, when a killing frost hit the garden L. A. has in Lewis Run, PA. This garden is at a considerably higher elevation than the Evergreen Elm gardens in Bradford, PA and consequently experiences earlier Fall freezing. Sure enough, near the end of September, the killer frost came and wiped out the Lewis Run garden with one major exception —the Selke Biodynamic Cherry Tomato plant that had received the watering-in treatment of the combined #504/505 potion. Needless to say, when L. A. relayed this quite astounding information to us, we felt obliged to try it out for ourselves. Accordingly, we took several pairs or groups of plants and treated them with the #504/505 potion. Unfortunately, we experienced a totally unexpected killing frost during the night following our mid-afternoon dosage with the #504/505. While all plants showed significant frost damage, it was quite clearly apparent that the treated plants withstood the freeze far, far better than the untreated plants. Two pepper plants adjacent to each other in the Hill garden were the most explicit example, and the treated plant was still growing quite healthily three weeks

SEED SOAKS (continued from page 1)

shortcoming in the future. In the meantime, we have used three different sources which deal with this subject —

1. Castelliz: *Life to the Land*, Lanthorn Press, 1980.
2. Koepf, Pettersson & Schaumann: *Biodynamic Agriculture*, Anthroposophic Press, 1976.
3. Sattler & Wistinghausen: *Bio-Dynamic Farming Practice*, Bio-Dynamic Agricultural Association, 1992.

What appears in this article subsequently is largely a synthesis of what was learned from these three sources.

To employ the preparations for use as a seed bath, one should stir the preparations in the biodynamic fashion for the usual time: the BD #500 for its usual one hour period and the #507 for the recommended 10 to 20 minutes, depending upon one’s preferred stirring time “authority.” When the compost preparations #502-506 are used, although the one hour stirring time could be employed, a more “user friendly” method is suggested by the sources mentioned above. For smaller quantities of seed, one unit of the selected preparation is placed in one or two pints of water, stirred vigorously for up to 5 minutes and then allowed to stand for 20 to 24 hours.

after the initial frost while experiencing several additional frosts. The untreated plant, while not totally dead yet, never quite recovered from the initial frost and experienced further damage from the subsequent frosts, even though they were less serious than the initial frost. Groups of cucumber and squash plants also clearly demonstrated that the treated plants were far less damaged than the untreated plants. We have speculated that if the treated plants had had a few more hours to totally absorb the #504/505 potion throughout all extremities of the plant, they may have exhibited even less damage, and perhaps none at all.

Once again, while we can draw no absolute conclusions from these observations with respect to the #504/505 potion, we will certainly be looking to put this to further “experiments” in the future. While BD #507 is traditionally used in biodynamic agriculture to give some protection from the possibility of frost damage, it may be that it could be better supported in this possibility by use of this #504/505 potion. It is also possible, that some even better combination of the biodynamic preparations can be discovered for future use. Should any of our readers decide to try this #504/505 potion to achieve a little frost protection, we would greatly appreciate hearing about your observations whether they are favorable or unfavorable in supporting our own observations.

We will hope to share more observations in future issues, and trust that those of you out there who have also experienced unusual results from your use of the preparations will forward your observations to us as well. We will plan to publish at least a few of these practical observations in each issue of the newsletter in the months to come.

Another brief stirring is done just before the actual seed treatment. Some crops are treated with “manure water” (prepared manure, or manure treated with #502-507), or with “birch pit concentrate”, both of which are akin to Barrel Compost in their effects. When such instances arise, we will cite Barrel Compost in the table. In one or two instances, whole milk is suggested as an additional ingredient in the seed bath. The length of time recommended for soaking is generally 10-15 minutes. Seeds with a hard coating, such as parsley or carrots, could be given a longer bath. However, with such seeds as peas or beans, a longer soak will cause them to slough off the seed coat and lose their germinating capability. Seeds can be drained by using a kitchen strainer or else they can be suspended in the bath solution in a cheesecloth bag. Once removed from the solution they can be spread out on bath or paper towels for relatively rapid drying. It is best to plant out the treated seed within 24 to 48 hours after treatment. For field planting of larger quantities of seed, a somewhat different technique is employed. Any one of the three sources cited can provide an adequate description of the technique, so I must refer the reader to those. Recommendations for treat-

Allen is one of the gardeners who obtained particularly effective results with seed baths. (See *Seed Soaks* article which begins on page 1.)

Further south in Check, Virginia, Polly Hieser sprays BD 500 and Barrel Compost in the early Spring. What she prefers to do is to spray, then cultivate, and then spray again. This process is used separately for both the BD 500 and Barrel Compost sprayings. When time is of the essence, the Barrel Compost and BD 500 may be stirred together and the spray, cultivate, spray technique followed. Barrel Compost and BD 508 are also used in the greenhouse, Barrel Compost for health and BD 508 for fungus and damping off prevention. BD Compost is applied in the Spring, as early as possible, using a 1-2 inch layer on the raised beds. Additional compost may be added just before planting, with a thick layer applied down the row. For planting tomatoes, compost is placed in the planting hole itself. She maintains flexibility when observing the planting calendar. Polly also reported use of seed soaks.

In the Blue Ridge Mountains of Georgia, Hugh Lovel employs the sequential spraying technique 3 times during the growing season, initially in February or March, secondly in April or May, and lastly in June or July. The sequence he uses starts with BD 500 in the evening, then BD 501 the next morning, Barrel Compost that evening, and finishes with BD 508 the next morning. The earliest sprayings are applied on bare soil and Hugh observes that the BD 501, rather than being a detriment, appears to help dry the soil out in the very moist Georgia Springtime. Early crops, such as peas, onions, cabbage, and potatoes, will already be up when they receive a sequential spraying. When cover crops are involved they are mowed with a sickle bar mower, tilled in several times over a 3 week period, first with a power-tined tiller and then with a spring-toothed harrow, with compost added preceding harrowing. Additional tillage may be needed to kill all cover crop roots. All garden beds are separated by grass covered paths, spaced at tractor wheel width, thus reducing soil compactions in the beds. This bed spacing with grassy paths allows Lovel the luxury of working his garden between Spring showers without creating a mud problem. For planting beds not involving a cover crop, Hugh prefers to apply compost in the Fall, and in any case, at least 2-3 weeks before planting. The compost is tilled in to the top 1-3 inches to achieve a mellow seed bed. Most crops are direct seeded, although early brassicas and celery will be started as bedding plants under row cover in March and transplanted out in April. When actually making compost, Hugh chooses to put the Valerian into the pile, full strength, without stirring, and he also spreads horsetail herb over the compost pile itself. (*N.B.: This horsetail is the hyemale variety, which he harvests in quantity in Louisiana.*) The diversity of his operation permits him to make pig manure compost, which is used for potato and onion crops; cow manure compost for green crops and corn; and chicken manure compost for tomatoes and peppers. Seed baths are limited to use of BD 500 for bought-in seeds, and for potatoes, which are also treated with hydrogen peroxide. For some time Hugh Lovel has been saving a significant variety of his own seed, with the exception of potatoes. The poor quality of seed potatoes available makes it necessary, he feels, to treat

them with hydrogen peroxide. Growers may wish to contact Hugh Lovel (Union Agricultural Institute, Rt. 4, Box 4635, Blarisville, GA, 30512) about the availability of some of his biodynamic seed. The planting calendar is taken into account where the pressure of the operation permits.

Moving on to the midwest, Ruth Zinniker sprays BD 500 in her garden, 4 times, when crop fields are also sprayed. With her northern climate, this is begun at the end of April; and is applied once a week up to the middle of May. Every effort is made to cultivate after spraying. At times, Barrel Compost is added to the BD 500 during the last 20 minutes of stirring. Ruth creates two different types of compost piles for her gardening needs. Her garden compost is made from kitchen scraps, weeds from the garden, and in the Fall, leaves, stinging nettle, and up to 1/3, by volume, of cow manure, covered with straw and prepped. Her manure compost consists of cow manure with some bedding, to which the preps have been added. All compost is at least one year old before using. The garden compost is used on flower beds and manure compost on heavy feeding crops. Regrettably we were unable to complete this interview in time for this issue, and so have no information on her use of the planting calendar. Ruth is well known for her reliance on stinging nettle teas for fertilizing her garden, a subject which we will hope to cover thoroughly in a future issue.

Claire Hall, in Wabasha, Minnesota, is also a grower who uses both garden compost and manure compost. Much of the garden compost (maximum 5% manure) goes into her potting soil mixes used to start 15,000 plants in the greenhouse every year. Manure compost goes on the garden. BD 500 is applied in April on everything. All transplants are set out in early Spring and sprayed with BD 500. Routinely, all planting soils are tilled, sprayed with BD 500, and raked the evening before planting or the day of planting. Barrel Compost is used prior to BD 500 when turning under cover crops to help the digestion process. Carried over from her organic days, Claire admits to using seaweed dissolved in water to minimize shock when watering transplants. Claire uses the planting calendar for all cultural works, especially harvesting.

Deep in the heart of Texas, Charlie Townsend deals mostly with direct seeding, thus avoiding the work of transplanting. Barrel Compost and BD 500 are applied at the beginning of March. Charlie has a real problem obtaining compost materials and relies heavily on Barrel Compost. Comfortable with his Senior Citizen status, he enjoys the convenience of using #(X)500 and Barrel Compost stirred together for 20 minutes and sprayed before cultivation. Because of his climate, he has two major planting periods, April 1st to May 1st, and the last week of August through the last week in September. Charlie intends to use seed soaks this year for the first time. He had a very harsh drought last year and plans to use the sequential spraying should conditions this year dictate. Charlie uses the *Stella Natura* calendar for all his planting.

With a 5800 foot elevation, 13 inch annual rainfall, and a short growing season, Jenny Erickson, in Utah, relies heavily on her greenhouses for her herbs, perennials, salad crops and

cut flowers. BD 500 is applied on everything, garden beds and in the greenhouses, on May 31st, and again in late September. When cover crops are tilled in she sprays Barrel Compost. With a composting business, Jenny is producing a lot of BD compost, most of which is approximately 50% cow manure. With her rainfall conditions irrigation is a way of life in her operation. High altitude and only 100 days in the growing season contribute to significant frost problems. Last year she got frost every 10 days, even through the summer. Under such conditions, she has employed BD 507 (Valerian) extensively with substantial success. A unit of Valerian is added to approximately 3 gallons, stirred for 10 minutes, and then sprayed in the early evening when frost is expected to be severe. Her hardy plants are often protected down to 18 degrees Fahrenheit. She utilizes many and varied biodynamic techniques in her greenhouses, but these will be covered in a future article. Like Allen Cleek, Jenny also uses a Chamomile tea as a damping off preventative. (Oops, we neglected to ask Jenny about use of the planting calendar.)

Out in sunny California, with its year round growing season, Harald Hoven uses BD 500 for his first major planting

on each bed and every two months throughout the year. BD 508 is sprayed on all seed start flats. Barrel Compost is used only where there is a green manure crop to be turned under. Compost is applied to each bed with every planting, and plantings may be anywhere from 2-4 times per year. Beds are prepared, compost is applied 2 inches thick, then seeds are sown or transplants are put in. He uses 3 year old compost in all seed flats and experiences no damping off problems. For transplants, a less mature, one year old compost is used. BD 508 is applied on seed flats on an every other month routine during winter months (wet season in California). Other than to check for ‘null’ or blank days, Harald does not consult the planting calendar. All seeds, whether started in flats or direct seeded in the garden, are planted just before a full moon.

Very near the Pacific Ocean, in southern California, Steve Moore uses BD 500 followed by BD 501 on his gardens at the same time he is spraying his lemon and avocado orchards in February. He uses a unique rhythmical approach with his

SIDEBAR

Biodynamic gardeners and farmers struggle with explaining biodynamics to the public consumer. JPI Board member and biodynamic orchardist, James Marquardt, provides the following handout when asked “What is biodynamics all about?” You might find it of interest.

BIODYNAMIC AGRICULTURE

Biodynamic Agriculture originated out of the spiritual scientific research of the Austrian seer, scientist and philosopher Rudolf Steiner, the founder of Anthroposophy, and Waldorf education among other things. In 1924, when asked by German farmers, soil scientists and veterinarians to elaborate on solutions to a number of problems being experienced in agriculture, Steiner presented a series of 8 lectures now published as *Agriculture*. Even as far back as 1924, the use of chemicals in agriculture was causing concern with respect to viability of seeds, deteriorating food quality, and greater difficulties for the health of both livestock and crops.

Biodynamic agriculture is essentially a way of fertilizing soil and plants using special herbal preparations which are used to inoculate compost. The herbs (chamomile, dandelion, yarrow, stinging nettle, valerian and oak bark) are placed in animal parts (intestines, stomach lining, stag bladder) and buried in the earth for certain times of the year to absorb specific cosmic energies. These prepared herbs help to balance the limestone/silica forces in the soil. Additional spray preparations are also utilized in the biodynamic approach and include cow manure and silica processed in a cow horn, as well as horsetail herb.

The purpose of this soil balancing is to provide truly nutritious food. To understand the importance of these procedures one must rethink traditional ways of looking at both agriculture and nutrition. The conventional model

portrays agriculture and nutrition supplying the soil and our bodies with certain substances: so many pounds of nitrogen (N), phosphorus (P), potash (K); so many grams of carbohydrates, fats, vitamins and minerals. However, the body receives its nutrition from the forces assimilated by fruits, grains and vegetables, assimilated from the soil, water and air which in turn have been permeated by forces of the sun, moon and other planets. Given the current scientific paradigm and its inflated view of its truth value (similar to the current medical profession’s disparagement of homeopathy), the notion of forces as a central factor in growing and nutrition requires rethinking and an open mind.

Growing and eating organic produce is an important first step in improving one’s nutrition by recognizing that the chemicals used by growers are detrimental to health and the environment and are used primarily so the consumer has cosmetically perfect looking produce. Biodynamic growers are organic growers who provide another dimension to nutritious food, the kind of food essential to those seeking spiritual advancement.

If you would like further information on this subject, I would be more than willing to discuss what little I know.

Maracah Orchard
 (James Marquardt)
 315 Glengary Rd.
 Winchester, VA 22603
 703-888-3728

vegetable beds on a year round basis. When a vegetable bed is finished it is planted to a cover crop. When the cover crop is sufficiently matured it is used as pasture for the cows. Following the cows the pasture is grazed with the egg-mobile chickens. When the chickens are taken off the bed, Barrel Compost is applied, the bed is cultivated, turning in the cover crop and chicken manure residue; the bed is then planted to the next vegetable crop. The egg-mobile houses 50 chickens which provide his CSA members with excellent eggs. Pest problems have been substantially reduced by using only tined cultivating tools for deeper tillage and limiting rototilling to only the top 1-2" of the vegetable bed. The least amount of tillage for a proper seed bed is his practice now. Since a great deal of available manure is applied more or less directly to the garden beds, Steve composts only the chicken manure from his chicken shed which houses another 70 birds. The only other

compost produced is Barrel Compost made from cow manure gathered from the orchard when cows are grazed there. BD 508 is applied in late Winter and early Spring routinely and at other times when fungus is a problem. The 1993 growing season was a particularly difficult year for tomato blight in his area. Regarding the planting calendar, Steve follows it closely in terms of sowing and attempts to avoid ‘null’ or blank days.

While the information in this article is by no means exhaustive, it is hoped that our readers will receive some benefit from learning about the practices of these fine biodynamic gardeners located throughout the country. Future issues of “*Applied Biodynamics*” will cover other subjects appropriate to the seasons.

N.B. Where compost is mentioned it should be understood that compost made with the biodynamic compost preparations is meant, as all gardeners interviewed assured us.

PRACTICAL OBSERVATIONS

by Hugh J. Courtney

During the past year and a half, JPI has initiated a newsletter and put into practice the concept of the Associative Contract. One of the beneficial side effects of both those moves has been a greater exchange of information between those of us here at JPI and a number of biodynamic practitioners. This has permitted sharing observations and has even led to a few “experiments.” While none of these observations and “experiments” should be taken as anything but interesting anecdotes, we would like to share some of them with our readers in case others might wish to try some “experiments” of their own during the next growing season. Perhaps at some point in the future, one or more of these observations may deserve the attention of a more rigorous scientific evaluation when we have some additional anecdotal observations that confirm the original ones.

This year, in our South Garden, because we were not set up to irrigate, we ended up practicing what I referred to as “dry land” gardening. On July 30, the scarcity of rain finally led us to do some watering-in of the tomato plants in the South Garden. The potion for watering-in was 12 gallons of water into which we put 4 units each of Barrel Compost (Thun recipe), #(x)500 and BD #507. After stirring for 20 minutes, each plant was watered with 1/2 gallon, more or less, of this potion. Since this quantity was not sufficient to treat all of our tomato plants, a second batch was stirred, but, I failed to include the 4 units of #507 in this second batch. The following morning, I noticed a most interesting phenomenon with respect to the two different groups of tomato plants. Prior to treatment, all plants had been experiencing a severe infestation of flea beetles. On the morning after treatment, the first

group of plants which had received the #507 in their potion had nothing but dead flea beetle carcasses on them, whereas in the second group of plants, the flea beetles, although moving quite sluggishly, still were alive. Observations a few days later revealed that the flea beetles had essentially disappeared with respect to both groups of plants. Since our treatment of the tomatoes may have actually coincided with the natural cycle of the insects, one can not draw any absolute conclusions from such a one time experience. Needless to say, however, we will be looking at the watering-in route in the future, and will be especially attentive to include #507 as part of the treatment. Incidentally, although credit must be given to other treatments as well, we had possibly the best tomato crop we have ever experienced.

On September 6, 1993, I received a call from L. A. Rotheraine (See article in Issue #4 of “*Applied Biodynamics*,” p. 5) who requested some help in solving a problem. It seems that in his zeal to produce an even more impressive fruit set on his Selke Biodynamic Cherry Tomato plants, he had overdone his applications of BD #501 and BD #507 which he had used in combination in more than 5 different applications during the growing season. While the fruit set was indeed impressive, one serious side effect was that the plant was losing leaves. Since he was expecting photographers from both the local newspaper as well as the *Philadelphia Inquirer*, he was looking for something to restore some of the leaf growth to the plants so as to have a more photogenic appearance. After pondering the question for a bit without particularly resorting to any logical