

Summer Conference 2001 Set for August 10-12

by Steve Lorenz

Much like our gardens will be by the time you receive this issue of *The Natural Farmer*, the NOFA Summer Conference has largely taken shape, but needs lots of work here and there to ensure it bears beautiful fruit.

Back in the fall, Cathrine Sneed agreed to be our keynote speaker. This was like the goose that laid the golden egg, and it seems many people in NOFA are anxiously awaiting her talk. The environmental and social justice advocate will speak about Growing Community. From all accounts, Sneed and her colleagues at The Garden Project have done a wonderful job connecting incarcerated and formerly incarcerated people to the wider community in the Bay area of California. Her speech is sure to be inspiring and practical for the many people in NOFA who work with prisoners (or who'd like to) and also those who seek to include and value all the members of their community. If you don't want this keynote to include your child(ren), or don't think it should, musician-storyteller Roger Tincknell will be entertaining nearby. He's interactive and funny and sure to be a hit. And the only excuse an adult would have for missing Cathrine Sneed is because they were having too much fun watching Roger.

Cathrine Sneed is coming—now what else? Through the tireless work of Julie Rawson, the workshops have all been finalized (consult your registration form for the complete list) and lots of other work's been done already, but it needs some compost shoveled in here, some weeding done there, and some Helping Hands at the end to make it all come off. It's very simple, but we've had some trouble finding willing people to do it: Work 4 hours at the conference and earn \$25, or \$30 for working with children. If you're interested in making a difference in making things run smoothly and earning back some of your registration fee, call Audrey Cronin at (508) 799-2278, or e-mail her at rabbitnet@worldnet.att.net.

The tireless work of behind-the-scenes program book compiler, typist and patient deadline enforcer Elaine Peterson will bring the program book to you in early June after it gets its layout and design completed by Dre Rawlings.

So, how is the rest of the conference committee's work coming along, you ask? Well, for starters, Dre Rawlings—menu planner and publications person—has come up with as fine a menu as has ever been seen at the summer conference: pesto lasagna (and for vegans, ziti with vegan pesto) and summer minestrone, blueberry pancakes and Swiss chard quiche, roasted baguette sandwiches and summery potato salad, roasted herbed chicken and vegetarian shepherd's pie. Dre has put a lot of effort into making sure the menu is varied, delicious, and—especially important to her—made largely with local ingredients. She's done a great job, I'm sure you'll concede, but you'll have to see in August. The proof, as they say, will be in the pudding (or frittata, if you will).

Speaking of food, for those of you who may not want to attend all the meals or who just want to nibble after your workshop, the NOFA Food Fest will be on hand to accommodate you. Conference committee member Bernard Kirchner has taken on the brand new role of finding a half dozen or so vendors to serve up coffee, sandwiches, jams, nuts, pastries, meals and anything they can think of. He's had lots of interested parties, but only NOFA members Rita Horsey and Gayle Ridgway

have signed on so far. They will be serving sandwiches and more featuring their Echoes of Summer jellies and jams. If you are interested in being a food vendor, please call Bernard at (413) 229-3306.

Details such as the location of all the vendors are still being worked out, but Bernard hopes to have them all fairly close to the main tent, while not dipping in each other's salt. The committee is excited about the vendors and the new flavors they're sure to bring. Look for them at the conference, and while you're sipping a coffee or scarfing down a sandwich, be sure to tell Bernard what a great job he's done.

The old-fashioned Summer Fair is in need of jugglers and clowns to delight the fairgoers. If you can juggle or clown around, or know someone who can, call Dave Getman at (978) 464-7745. Also, for those children of all ages who'd like to be a clown or a warrior, we need one or more face painters (using natural, non-toxic paints, of course) to do the job. Dave also is hopeful that racing armadillos will add to the already festive atmosphere, with Dale Perkins riding his horses, NOFA VIPs going down in the dunk machine, Jim Lyons and Jill Horton-Lyons' cow plopping in whichever square she pleases, children and adults playing games, and folks selling their produce at the farmer's market. As always, anyone who'd like to demonstrate a craft, farm, or rural life skill during the fair will add much to the scene, and will earn a free NOFA t-shirt. The fair gives a glimpse of what communities could be like, and offers all conference-goers a wonderful chance to have some real fun, and even win some prizes. But when it comes to the cornucopia basket raffle and the auction to benefit the scholarship fund, well, you gotta be in it to win it.

This year the Children's Conference is moving to the Crown Center to be closer to the action, and a brand-new Preteen Conference will be held in the Johnson Library lounge, just across the raised walkway. Children's conference coordinators Barbara Cohen and Justine Johnson are hoping the new location will better connect children to the rest of the conference, including the animals and the different varieties of apple trees that dot the Hampshire College campus. It will also allow for children to be in a larger indoor space when they want to, or when weather forces them to be. And, in most cases, parents will have a shorter distance to walk, making them less likely to be late for workshops.

Old or young, single or couple, I implore you to come to the Get Acquainted Party inside the Red Barn after the keynote address. Following that, there will be a contradance outside the Red Barn with Rhubarb Pie again providing terrific music. For all those who've never contradanced, this is your chance to see what you've been missing.

On Saturday, listen to music for the whole family with Clave Mundial or bring an open mind to the debate on the topic "Should any vaccinations be mandatory?" (If you who would like to take part in this debate, call Jack Kittredge at (978) 355-2853.) Later, kick up your heels to the tunes of the zydeco band Dirty Rice. Incite revolution or profess your love at the open-mike coffeehouse.

It's always a delight watching NOFA folks at the summer conference: some are very scholarly, even in relaxed dress; others are very much in carnival mood. Most folks, however, bring an

extraordinary, enviable ability to make the experience edifying *and* fun. That's what makes NOFA people a different sort. And it's most fun when y'all get together. So, register today (before the July 9 early bird deadline) and talk up the conference to your neighbors, friends, relatives, people you meet at the farmer's market, co-op, or CSA site, and even talk it up to your enemies. Seriously, we'd like the rest of the world to know we're here, and would be delighted to be covered in mainstream or alternative newspapers.

Remember, the final deadline for registration for kids and teens is July 29. Adults do not need to pre-register and can simply register on the site when they arrive. We have been unable to secure reliable local bus or taxi service from Amherst Center to Hampshire College, so we will be adding a NOFA shuttle service. It will run between the hours of 10 am and 5 pm on Friday, and 2:30 to 4:00 pm on Sunday. Contact us at least 5 days in advance of the conference to arrange the complimentary ride, and then call us when you get to Amherst and we'll send someone to pick you up. The shuttle back into Amherst will run from the registration tent on Sunday pm. Call Elaine at 978-928-4707, or Julie at 978-355-2853.

If you have a publicity idea call me, Steve Lorenz, at 413-527-1920 or Julie Rawson at 978-355-2853. Also, we are in need of someone to coordinate the videotaping of the conference, which includes all the workshops and the keynote. The pay is \$300. Contact Jack Kittredge if you are interested.

Don't let the field lay fallow: sign up now! See you at Hampshire College.

Inside This Issue

Features

Biotech Bullies	4
Transplant Soil Mixes	39

Supplement on Biodynamics & Permaculture

Biodynamics between Myth & Reality	7
Seeds for the Biodynamic Spirit	9
Demeter Association Action Alert	12
Biodynamic Preparations at a Glance	13
Roxbury Farm: BD Soil Fertility	14
Kimberton, A Biodynamic CSA	18
Permaculture in the Northeast	22
Making a Little Piece of Heaven	24
Doug Clayton and Permaculture	28
Permaculture in the New World(s)	30
A Visit to Tagari	33

Departments

Editorial	2
NOFA Exchange	6
News Notes	6
Book Reviews	35
NOFA Contact People	38
Calendar	39

The Other Organic Systems

The story of organic food over the last 30 years has been an astonishing one. At the beginning of the

The Natural Farmer Needs You!

The Natural Farmer is the newspaper of the Northeast Organic Farming Association (NOFA). All members receive a subscription as part of their dues, and others may subscribe for \$10 (in the US or \$14 outside the US). It is published four times a year at 411 Sheldon Rd., Barre, MA 01005. The editors are Jack Kittredge and Julie Rawson, (assisted by their kids), but most of the material is either written by members or summarized by us from information people send us.

Upcoming Issue Topics - We plan a year in advance so that folks who want to write on a topic can have a lot of lead time. The next 3 issues will be:

Autumn 2001 -	Organic Landscaping
Winter 2001-02 -	Farming and Families
Spring 2002 -	AgroForestry

Moving or missed an issue? The Natural Farmer will not be forwarded by the post office, so you need to make sure your address is up-to-date if you move. You get your subscription to this paper in one of two ways. Direct subscribers who send us \$10 are put on our data base here. These folks should send address changes to us. Most of you, however, get this paper as a NOFA member benefit for paying your chapter dues. Each quarter every NOFA chapter sends us address labels for their paid members, which we use to mail out the issue. We don't keep copies of these, and if you moved or didn't get the paper, your beef is with your state chapter, not us. Every issue we print an updated list of "NOFA Contacts" on the last page, for a handy reference to all the chapter names and addresses.

As a membership paper, we count on you for articles, art and graphics, news and interviews, photos on rural or organic themes, ads, letters, etc. Almost everybody has a special talent or knows someone who does. If you can't write, find someone who can to interview you. We'd like to keep the paper lively and interesting to members, and we need your help to do it.

We appreciate a submission in any form, but are less likely to make mistakes with something typed than hand-written. To be a real gem, send it via electronic mail (JACKKITT@AOL.com) or enclose a computer disk (3 1/2 inch size). We use a Macintosh G3 with Microsoft Word but can with only modest difficulty convert IBM disks as well. Also, any graphics, photos, charts, etc. you can enclose will almost certainly make your submission more readable and informative. If you have any ideas or questions, one of us is usually near the phone - (978) 355-2853, fax: (978) 355-4046

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Northeast Organic Farming Association

1970s a small number of people decided to go "back to the land" (although, as middle class children of the suburbs, most had never been on the land in the first place) and raise food in a manner as close to nature as possible. Guided by such luminaries as Sir Albert Howard and J. I. Rodale, they embraced principles that came to be known as "organic farming".

Although starting as just a few individuals, with virtually no experience, the organic movement was inspired by a vision that has enabled it to endure. As the larger society's personal and ecological health problems became more apparent, more and more people have become interested in organic food as an alternative to the conventional food system.

Now organic food is the fastest growing sector of the food industry, and the major food companies all have an organic product line. This success of "organic", however, may come at the price of its founding principles. These products are largely indistinguishable from conventional food except for the fact that they are produced organically. TV dinners, chocolate bars, flavored coffees and

confections are among the best organic sellers, using ingredients which are raised on an industrial scale, shipped on a daily basis from around the globe, and incorporating a list of synthetic additives and flavors just like their conventional competitors.

Many organic proponents are uncomfortable with this trend. They would prefer to see the growth of a smaller, more diverse local agriculture. Some of these proponents are actively embracing biodynamics and permaculture — two approaches to farming which are compatible with organic production but go beyond strict organic standards. At a time when many NOFA members are worried about whether organic principles can survive the success of the "O word", we thought it would be interesting to focus an issue of this paper on these two "Other Organic Systems".

It has been my great pleasure, in preparing this issue, to visit some exceptional farms that utilize biodynamic or permaculture principles. It has been enough to get me musing about our own operation, seeing new ways to get it more closely attuned to nature and to use our energies more effectively. I hope this issue will get you thinking in new directions as well!

Advertise in The Natural Farmer

Advertisements not only bring in TNF revenue, which means less must come from membership dues, they also make a paper interesting and helpful to those looking for specific goods or services. We carry 2 kinds of ads:

The NOFA Exchange - this is a free bulletin board service for NOFA members and TNF subscribers. Send in up to 100 words (business or personal) and we'll print it free in the next issue. Include a price (if selling) and an address or phone number so readers can contact you directly. If you're not a NOFA member, you can still send in an ad - just send \$5 along too! Send NOFA Exchange ads directly to The Natural Farmer, 411 Sheldon Rd., Barre, MA 01005 or (preferably) E-mail to JACKKITT@AOL.COM

Display Ads - this is for those offering products or services on a regular basis! You can get real attention with display ads. Send camera ready copy to Justine Johnson, 145 LaPlante Circle, Easthampton, MA 01027 and enclose a check for the appropriate size. The sizes and rates are:

Full page (15" tall by 10" wide)	\$240
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One-quarter page (7 1/2" tall by 4 7/8" wide)	\$65
One-sixth page (7 1/2" tall by 3 1/8" wide), or (3 3/4" tall by 6 1/2" wide)	\$45
Business card size (1 1/2" tall by 3 1/8" wide)	\$12

Note: These prices are for camera ready copy. If you want any changes we will be glad to make them - or to type set a display ad for you - for \$10 extra. Just send us

the text, any graphics, and a sketch of how you want it to look. Include a check for the space charge plus \$10.

Frequency discounts: if you buy space in several issues you can qualify for substantial discounts off these rates. Pay for two consecutive issues and get 10% off each, pay for 3 and get 20% off, or pay for 4 and get 25% off. An ad in the NOFA Summer Conference Program Book counts as a TNF ad for purposes of this discount.

Deadlines: We should receive your ad copy one month before the publication date of each issue. The deadlines are:

January 31 for the Spring issue
April 30 for the Summer issue
July 31 for the Fall issue
October 31 for the Winter issue

Contact for Display Ads: Send display ads with payment to our advertising manager, Justine Johnson at 145 LaPlante Circle, Easthampton, MA 01027. If you have questions, or want to reserve space, contact Justine at (413) 527-1920 or JJSL145@aol.com.

Disclaimer: The Natural Farmer cannot investigate the claims of advertisers and we don't vouch for anything advertised here. Readers are expected to exercise due caution when inquiring about any product or service. Different NOFA chapters have different standards for fertilizers, for instance, and a product acceptable in one state may be prohibited in another. Please check with your chapter when in doubt. Remember, however, that advertisers are helping support the paper and, when appropriate, please support them.

Biotech Bullies: The Debate Intensifies

by Ronnie Cummins.

A publication of the Organic Consumers Association
<www.organicconsumers.org>

QUOTES OF THE MONTH

"The hope of the industry is that over time the market is so flooded [with genetically engineered organisms] that there's nothing you can do about it, you just sort of surrender." Don Westfall, vice-president, Promar International, Washington-based food and biotech industry consultants. Cited by <www.btinternet.com/~nlpwessex> (4/5/01).

"Our investigations thus far from the 2000 harvest lead us to believe that virtually all of the seed corn in the United States is contaminated with at least a trace of genetically engineered material, and often more. Even the organic lots are showing traces of biotech varieties." David Gould, Farm Verified Organic, a leading US organic certifier. <www.cropchoice.com> (5/1/01).

Biotech Bullies

The global battle over genetically engineered (GE) foods has reached a new level of intensity. While in Europe and Asia strong resistance continues, and in Africa and Latin America a debate has begun, in North America the gene-foods issue has moved from being a back-burner item for most people to a major topic in the media. Under attack on all sides, frustrated by growing global marketplace and activist opposition, agbiotech corporations and the White House have been forced to go on the offensive.

Regulatory Arrogance - On January 17, the FDA announced a set of highly controversial proposed regulations on genetically engineered foods and crops. The regulations, disregarding the overwhelming sentiment of consumers, require neither pre-market safety testing nor labeling—nor do they require biotech corporations to assume financial liability for damage to public health and the environment. Nearing the close of the public comment period on May 3, the FDA had already received over 100,000 negative comments from irate consumers, but Washington insiders predict that the Bush administration will ignore this avalanche of public criticism and proceed with the industry's favored "no labeling, no safety-testing" policy. Underlining public rejection of the FDA's "Shut Up and Eat Your Frankenfoods" policy, 75% of Americans stated in a poll released by the Pew Charitable Trust on March 26 that they wanted mandatory labeling of all gene-altered foods, with 58% saying they would not buy them.

Propaganda Barrage - The North American mass media recently have spewed out an unprecedented number of stories and fluff pieces on the wonders of "bioengineering" and the willful arrogance of anti-biotech Luddites. Even PBS, the Public Broadcasting System, supposedly the most liberal TV network in the US, aired a biased two-hour special program on April 24 called "Harvest of Fear," which praised the supposed virtues of genetically engineered crops (fewer pesticides, better nutrition) and attacked activist and so-called "eco-terrorist" groups for falsely maintaining that GE foods are unsafe. "Food companies have learned that the [anti-genetic engineering] groups are not intent on having a reasoned debate about biotech or helping consumers find out about biotech," stated Gene Grabowski of the Grocery Manufacturers of America. "It seems that their motive is to scare people."

Suing Farmers - Monsanto has now sued or threatened thousands of farmers across the US and Canada for the "crime" of saving seeds or for having the company's patented Frankencrops growing on their land without paying royalty fees. On March 29, in a troubling and likely precedent-setting case, a Federal Court judge in Canada ruled that a 70 year-old, fifth generation Saskatchewan farmer, Percy Schmeiser, was guilty of growing herbicide-resistant canola in 1998 on his farm near Bruno, Saskatchewan without paying Monsanto.



photo by Jack Kittredge

NOFA-certified organic farmer Frank Albani, of Plymouth, Massachusetts, addresses anti-GMO rally at State House in Boston on April 23, 2001.

Schmeiser, now liable for hundreds of thousands of dollars in fines to Monsanto, claimed the seed for his crop came from his own fields, which were contaminated by genetic drift from neighboring farms. According to a Washington Post story filed on April 30, the Court ruled that Schmeiser was liable for damages, even if he didn't deliberately plant the GE canola. Monsanto's legal victory comes at a high cost however, in terms of enraging the majority of the world's farmers who are not using genetically engineered seeds. A spokeswoman with the National Farmers Union, which represents 300,000 small farmers and ranchers in the United States, told the Post "the organization has been following the Schmeiser case with apprehension. We're extremely concerned by what liabilities may unfold for the farmer, particularly with cross-pollination of genetically modified plants." The National Farmers Union of Canada, where two-thirds of all canola acreage is genetically engineered, has called for a moratorium on all GE crops. Canada previously exported \$400 million dollars of canola each year to Europe. Now that market has been lost, due to EU rejection of GE crops. Analysts warn that Canada may soon lose most of its canola markets in Japan and Asia as well.

Manipulating Statistics - Last spring BioDemocracy News reported on a USDA survey that acreage of the two largest GE crops in the United States was in decline (GE soybeans were down from 57% of all soy planted in 1999 to 54% in 2000; corn was down from 25% to 19.5%). Monsanto and the USDA had previously even claimed that the 1999 acreage of US corn was 33% GE — suggesting a massive decline in Bt and herbicide-resistant corn varieties in 2000. But apparently after hearing from Monsanto, Aventis, and Novartis (now Syngenta) that projections like these were bad for their bottom line, the USDA recently recalculated the figure for last year's GE corn crop — now claiming that GE corn constituted 25% of all corn acreage last year and will amount to 24% this year. The USDA also maintains that GE soya plantings will increase in 2001, even as global export markets shut down.

Before swallowing media stories that biotech is booming, however, it's important to keep in mind that current government or industry figures on biotech crop acreage are all estimates, thereby subject to manipulation. But in the wake of the StarLink debacle, which has contaminated 10% of all the corn in storage in the US, you don't need a PhD to understand that a projected figure of 24% of all US corn acreage in 2001 planted with Frankencorn is ridiculous. The real figure will undoubtedly fall below 15%. Harder to conceal for the USDA and the biotech industry is the fact that Monsanto has ceased production of genetically engineered tomatoes (taken off the commercial market in 1996) and potatoes (earlier this year), and that global acreage of all genetically crops has leveled off. According to the public interest group RAFI, <www.rafi.org>, global "demand for GM seeds almost flattened in 2000 with an increase of only 8% after years of doubling and redoubling. Analysts predicted that, at least until 2003, demand would remain flat or decline." Perhaps even more significant, the two most important GE crops in the pipeline — herbicide-resistant wheat and rice — may never even reach the marketplace, due to global opposition.

Another big lie repeated ad nauseam by Monsanto since

1995 — faithfully regurgitated by the media — is that their genetically engineered recombinant Bovine Growth Hormone (now banned in every industrialized country except for the US) is being injected into 30% of all US dairy cows. Dairy farmers and analysts tell BioDemocracy News that the real figure is closer to 10%. In 1998 Dow Jones reported that Monsanto was anxious to sell rBGH to any company willing to take this product off their hands. There were no takers, however — not surprising since rBGH has been linked to increased cancer hazards as well as to an increase in pus, bacteria, and antibiotic residues in rBGH-derived milk and dairy products.

Fostering Fatalism - The Gene Giants have been forced to change their marketing and regulatory strategy over the past several years. Having utterly failed to convince a significant number of consumers or farmers around the world that genetically engineered foods and crops are safe, "substantially equivalent," or that they have any beneficial characteristics whatsoever, the industry has adopted a new hard-line attitude. Basically the chilling new message is that agricultural biotechnology is inevitable, that genetically engineered crops, food ingredients, and drift are everywhere, and that anyone who labels their products as GE-free is lying. As former USDA Secretary Dan Glickman stated on the PBS special, "Harvest of Fear" (4/24/01) "We will not be able to stop this technology. Science will march forward." Or as John Wichtrich, a top Aventis executive, admitted to a Knight Ridder news service reporter on March 19, "the food supply will never be rid of the new strain of corn (StarLink) that the company genetically engineered." And since the genetic pollution caused by hundreds of thousands of acres of this likely allergenic Bt corn will be permanent, Wichtrich and Aventis have called "for a change in federal regulations to allow some level of the engineered corn, known as StarLink, in human food." With former biotech lobbyists such as Monsanto's Linda Fisher occupying prominent roles in the Bush administration, Aventis will very likely soon get their wish for an "allowable limit" of genetic contamination.

In a front-page article in the Wall Street Journal on April 5, Scott Kilman and Patricia Callahan report that many leading US natural food brands with "GMO-Free" labels are contaminated with significant quantities of genetically engineered ingredients. The WSJ tested top-selling brands such as Yves, Health Valley, Hain's, Clif Bar, Whole Foods, White Wave, and Gerber, and found that they were all contaminated with GE ingredients. As Frank Palantoni, chief executive of the North American consumer-health businesses for Gerber parent Novartis put it, "I don't think anybody in the U.S. can guarantee zero." Gerber, the nation's largest baby food manufacturer, announced in 1999, under pressure from Greenpeace, that they were going GE-free.

The Harder They Fall

The bluster and bullying of the agbiotech industry are, at least in part, an attempt to cover up the fact that they are losing ground all over the globe — not just in the marketplace and in the court of public opinion, but also in terms of mounting scientific evidence that GE foods and crops are unsafe for public health and the environment.

On the political and marketplace fronts agbiotech interests are taking a beating

Asia and Pacific - On April 6, the government of Thailand issued a ban on all GE crops. On May 1, a similar ban came into effect in Sri Lanka. On March 19, a million farmers marched in New Delhi, calling for, among other things, an end to the World Trade Organization and a ban on genetic engineering and life form patents. In Japan and South Korea government inspectors have continued to test for StarLink and other unapproved varieties of GE foods, while importers are steadily turning away from the US and Canada to other suppliers such as Brazil, China, and Australia for GE-free corn, soybeans, and canola. On April 20 consumer groups in Japan called for a halt to all corn imports from the US. In the Philippines, a bitter debate has erupted over field-testing GE rice and corn varieties. Protests against GE cotton have erupted in Indonesia. Mandatory GE labeling laws begin coming into effect in New Zealand and Australia in July, while labeling laws are already being enforced in Japan and Korea. Labeling laws are under discussion in the Legislative Council of Hong Kong, as well as in the Philippines and Taiwan. Perhaps most significant of all was the announcement on April 18 that the government of China was banning the cultivation of GE rice, corn, soy, and wheat-out of fear of losing its major export markets. Monsanto and the biotechnology industry had previously held out hope that China would be the "promised land" for biotech expansion. Despite all the hoopla about how great biotech is doing, the same three countries most heavily promoting the technology, the US, Canada, and Argentina, are still producing almost 99% of all GE crops.

Latin America - A mounting controversy is developing over Cargill and other US exporters dumping genetically engineered corn in Mexico — despite a supposed ban by the Mexican government on the import of GE corn varieties. On March 2 indigenous groups from all over Mexico, spearheaded by the Zapatistas, signed a document calling on the Mexican government to recognize the autonomy and legal control of the nation's 10 million indigenous people over their land and resources, including banning bioprospecting and biopiracy by transnational genetic engineering companies. Hoping to head off a mandatory labeling bill making its way through the Mexico federal legislature, on February 4 the American Farm Bureau and 20 other agribusiness groups sent a letter to US officials urging them to intervene "at the most senior levels" to "prevent this legislation from becoming Mexican law." The letter urged Washington officials to use President Bush's "upcoming visit to Mexico" to pressure the Mexicans. The Farm Bureau and biotech industry warned that "The ramifications (of mandatory labeling) to US farmers, grain handlers, food companies and biotechnology providers would be enormous and threaten our favorable relations with Mexico as an ally and NAFTA trading partner." The letter also warned that labeling "would not only confuse and mislead Mexican consumers about the safety inherent in biotech foods but also create a negative precedent for NAFTA."

In Brazil, the ban on planting GE soya remains in effect, considerably boosting exports to the EU, Japan, and other nations. Meanwhile the press in Argentina has reported that the country is losing corn export markets, as well as soy markets, to Brazil. Corn acreage this year is up 27% in Brazil, partly due to the demand for GE-free corn. A ban on planting GE crops remains in effect in Paraguay. Meanwhile a preliminary but growing debate over GE crops has emerged in other Latin American nations as well, including Ecuador, Chile, Colombia, and Peru. A similar debate is emerging in Africa and Eastern Europe.

Europe - Confronted with growing public alarm about food safety, the European Parliament is preparing to implement a resolution that will impose tough labeling and tracing requirements on genetically engineered foods. Labels will be required for any food item that contains genetically engineered ingredients, even when these GMOs (genetically modified organisms) cannot be detected because of processing. According to William Drozdiak of the Washington Post (4/11/01) these new regulations "could trigger a major trade dispute with the United States and deal a serious setback to the booming biotech industry." American grain and food exporters are increasingly concerned about their apparent inability to segregate out GE and non-GE food ingredients — reflected by the continued contamination of seed stocks and food exports with unapproved varieties of corn, soybeans, or canola. Once strict labeling laws go into effect in the EU, it will become nearly impossible for US food exporters to sell GE-tainted products in Europe, the world's largest agricultural market.

North America - On May 4 the powerful Grocery Manufacturers of America trade association, heretofore

staunch supporters of biotech food, told the Bush administration that new varieties of genetically engineered food should not be approved "unless there is a way to test for them." In a similar vein, the American Millers Association, a trade group representing the nation's grain millers, told farmers in the US in April to stop planting GE seed varieties unless these varieties are approved in the US's overseas markets. According to a story by Anthony Shadid, of the Boston Globe (5/2/01), "Of 16 bioengineered varieties of canola, for instance, 14 are approved in Canada, but only 10 are sanctioned in Japan and three in the European Union. Corn, whose exports earn the United States nearly \$4.5 billion a year, is similar: While 16 varieties are allowed in the United States, only 10 have received approval in Japan and just four in the EU."

Recent corn and soy export statistics reported by the Agribusiness Examiner #109 (3/19/01) by Al Krebs:

*USDA recently lowered its forecast of corn exports for the marketing year by 90 million bushels, a cut private analysts say is largely due to the impact of the contamination of the corn crop by the genetically modified corn StarLink (Des Moines Register: 2/25/01)

* Europe is buying non-GMO soybeans. From 1995-2000, the US has lost 14.3% of its export market share in soybeans, while Brazil's market share has climbed 10.7% (USDA PS&D Database)

* As of the third week in February, the combined total of accumulated U.S. corn exports and outstanding U.S. corn export sales to Japan is 65 million bushels less than at this time last year. (USDA-FAS online, U.S. Export Sales as of 2/22/01)

* In related news, according to the Wall Street Journal U.S. sugar refiners and food companies such as Hershey are telling farmers not to grow genetically engineered sugar beets sold by Monsanto and Aventis SA, even though the seed has been cleared by regulators for commercial planting.

* The Canadian Wheat Board, the world's largest distributor of wheat, reiterated on April 3 that they want the Canadian government to ban the growing of GE wheat for fear of losing overseas grain markets. In a dispute with Monsanto, which is frantically trying to get approval to grow GE wheat in North America, the Wheat Board said that since the industry currently lacks the ability to properly segregate GE and non-GE grains, the government should not allow the planting of GE wheat varieties. In a related story, Monsanto lobbyists in April successfully killed a bill in the North Dakota state legislature that would have imposed a moratorium on GE wheat. Monsanto's aggressive lobbying angered many US wheat farmers, who fear losing their one billion annual export sales to Europe and Japan. "We could create a train wreck in our own markets," said North Dakota Wheat Commission administrator Neal Fisher. "The concerns are mounting, rather than diminishing. There are producers out there, certainly, who are clamoring for the technology. But we can't afford to lose 40 percent of our markets." (Reuters 4/29/01)

* Maryland passed a bill on April 12 that bans the raising of genetically engineered fish in ponds that connect with state waterways. The law requires that fish farms be able to guarantee that GE fish cannot escape from their facilities. The law is the first of its kind in the US.

* Monsanto suffered another major blow in Canada April 26 when it was forced to recall a massive amount of Quest brand genetically engineered canola seed, which was contaminated with an unapproved variety. Last year Canadian farmers planted Quest on 1.2 million acres of farmland. Total canola exports were worth \$1.8 billion. A federal official speaking on condition of anonymity described the Monsanto recall as "a fairly significant development," saying, "this has the ability to compromise exports of the Canadian canola crop." The Canadian Health Coalition compared the recall to "a canary in a mine falling down dead" and said it highlights the lack of control over genetically modified foods. (The Edmonton Journal 5/25/01)

Nature Strikes Back - More Bad News For Agbiotech

Noted biotech expert Dr. Charles Benbrook, of the Northwest Science and Environmental Policy Center, released an explosive report on herbicide-resistant Roundup Ready (RR) soybeans May 2. The report, based upon recent USDA and university research, <www.biotech-info.net/troubledtimes.html> not only reaffirms previous studies that RR soybeans produce less of a yield (5-10% less) than conventional soybeans and that weeds are growing resistant to Roundup, but also that farmers growing the GE soybeans are using

considerably more herbicide than farmers who are cultivating non-GE varieties. As Benbrook points out, RR soybean growers are on the average using one-half pound more of herbicide (in this case Monsanto's broad-spectrum Roundup) per acre — which amounts to 20 million more pounds of toxic herbicides being sprayed this year on American soybean fields. "You just can't say with a straight face that the Roundup Ready system reduces herbicide use if the measurement you're talking about is pounds per acre," Benbrook said. (St. Louis Post Dispatch (5/3/01)

Even more alarming for Monsanto are Benbrook's observations that RR soybean plants, due to damage to an important chemical plant pathway, are more susceptible to plant diseases such as sudden stress syndrome. The American Soybean Association (ASA) immediately attacked Benbrook's report, calling it "sowing seeds of distrust" in a national press release.

Interestingly enough, the ASA had nothing credible to say in terms of disputing Benbrook's central thesis (less yield, growing weed resistance, and more use of pesticides), but rather relied on the well-worn argument that RR soybeans must be great since so many farmers are planting them. Of course the main reason hapless US soybean farmers (who generally receive less money per bushel for their beans from ADM and Cargill and other wholesale buyers than it costs to produce them) are planting RR beans, besides the massive "price support" subsidy the USDA provides to soybean growers, is to save them time. It takes less time to spray several applications of Roundup than it does to spray several of the 15 or so different herbicides which non-GE soybean grower's use. With 88% of the average farm family's income now derived from off-farm employment, soybean farmers are desperately searching for anything that will save them time — which in this case turns out to be genetically engineered soybeans. But, as Benbrook's report indicates, even this "benefit" will likely be short-lived as weeds develop increasing resistance to Roundup and as the herbicide-resistant plants themselves degenerate in terms of hardiness and resistance to disease over time. "There's a clock ticking now for Roundup," Benbrook stated. A press release from the University of Missouri in Columbia 2/5/01 reported that soybean seed germination rates were "down sharply" this year, a likely reflection of the lack of hardiness and susceptibility to disease of genetically engineered plants. Roundup and other glyphosate products made up \$2.6 billion of Monsanto's \$5.5 billion in sales last year.

More Bad News for Monsanto

Bt Resistance in bollworms - The Australian Broadcasting Corporation April 19 reported that insects are becoming resistant to Monsanto's genetically modified Ingard cotton. The New South Wales Department of Agriculture has been monitoring crops and has discovered a noticeable increase in the survival of cotton bollworms this season, indicating the worms are less susceptible to the Bt spliced cotton. Monsanto denies that there is a problem.

Bio-Pharm hazards — the next StarLink disaster - A group of Canadian scientists warned in the Toronto Globe and Mail newspaper 5/2/01, that genetic drift or pollution from plants gene-spliced to produce medical drugs or industrial chemicals is a disaster waiting to happen. The letter — signed by retired Agriculture Canada scientist Bert Christie, former McMaster University science dean Dennis McCalla, McGill University animal-science professor Dick Beames, and Dr. Hugh Lehman, an expert in agricultural ethics at the University of Guelph — warns that there is a "high probability" that a StarLink-type contamination incident could occur because of open-air testing and cultivation of crop varieties spliced to produce pharmaceutical drugs or industrial chemicals. In other words, a person could be eating corn or soybeans or some other common food and instead get a dose of a powerful medical vaccine or drug, or a toxic dose of an industrial chemical.

Aflatoxin levels in Bt corn in Texas - In 1999, researchers in Corpus Christi, Texas were surprised and alarmed to find that aflatoxin levels in Monsanto's Bt corn were significantly higher than in non-GE varieties. Aflatoxins, created by bacteria, appear in warm, humid environments on fungus spores on corn or other grains and vegetables. It is illegal to sell corn or other grains containing toxic levels of aflatoxins, since they are powerful agents for causing liver cancer. One can only imagine, if aflatoxin levels in Texas Bt corn were reaching alarming levels, what's happening with Bt corn in the more tropical and humid environments overseas (the Philippines, Thailand, Latin America) where the biotech industry is working overtime to convince farmers to grow Bt corn.

NOFA Exchange

Blow Your Own Horn!

American Permaculture Directory. \$15.95 plus \$3 or volume discount from Greg Peterson, Shade Tree Marketing, 5515 N 7th St., Suite 5-144, Phoenix, AZ 85014 602-279-3713 or greg@permaculture.net or www.permaculture.net

Wanted: Organic elderberry and raspberry fruit. FOR SALE: Apitherapy raw honey - 60 lb. buckets \$79, and 30 lb. case of 6 jars \$58 delivered to the Northeast. Todd Hardie, Honey Gardens Apiaries, Inc., P.O. Box 189, Hinesburg, VT 05461, tel. 802-985-5852, todd@honeygardens.com

Certified Organic vegetable transplants available for farmers and gardeners. We specialize in tomato, pepper, eggplant, basil and other herbs. Many are heirloom varieties. 2001 CSA memberships are currently available. The Philly Chile Company Farm is located in Salem County, NJ convenient to NJ Turnpike Exit 2, I-295 and Route 55. Call Rob or Amanda 856-358-1431 or visit www.PhillyChile.com or farm@PhillyChile.com

Why pay rent, or make mortgage payments, when you can live rent-free? The Caretaker Gazette contains property caretaking/housesitting openings, advice and information for property caretakers, housesitters and landowners. Published since 1983, subscribers receive 700+ property caretaking opportunities each year, worldwide. We cover all 50 states, and foreign countries. We get hundreds of farmers who need caretakers to take care of the farm instead of selling out to developers. Some estate management positions start at \$50,000/yr + benefits. Subscriptions are only \$27/year. The Caretaker Gazette, PO Box 5887-A, Carefree, AZ 85377. (480) 488-1970. www.caretaker.org

Want to come to the 2001 NOFA Summer Conference but on a tight budget? Try Helping Hands. Work 4 hours and earn \$25 or \$30 for working with kids. Must be registered for the conference or a family member of someone who is registered. Contact Audrey Cronin, 508-450-0791

Garlic - 18 strains from around the world. Hardnecks and softnecks. Vermont grown, acclimatized to northern climates. Great for gardens/farms. Full growing instructions included. \$6-\$7/lb. Call Debbie at Northern Prize Garlic, (802) 933-2820.

Opportunity to share in neighborhood organic growing operation, possibly including livestock, if interested. Small, new-interior 2 BR house available for rent; wall-to-wall carpet, all electric. Stall and pasture for horse if needed. Quiet country setting in the hills, midway between Binghamton, NY, and Scranton, PA. Flexible options. Expressions of interest by fax, please, to 570-434-2144, stating best time to call.

Farm wanted: I am looking for good land (3-10 acres or more) with a house and barn, or just good land, in New Hampshire, for organic operation to conserve heirloom varieties and heritage breeds. Please contact Marie with any leads at 603-382-3815 or mrabideau@mediaone.net.

Internships at Holcomb Farm CSA, West Granby CT. Our 16 acre CSA serves households and social service organizations in the greater Hartford area. We also provide an on-farm education and work experience for at-risk youth. Participate in all aspects of organic vegetable production on a mechanized farm and help coordinate youth and member activities. For more information contact Paul Bucciaaglia, (860) 653-5554, csamanager@hartfordfood.org

Free for the asking... A catalog of biological pest control agents and integrated pest management supplies is available at no charge. This catalog, called the 2001 Green Methods Catalog, is loaded with valuable information. Limit is one catalog per farm, while supplies last. To get a free copy, call The Green Spot, Ltd. at 603-942-8925, fax a request to 603 942-8932, or email at Info@GreenMethods.com.

BCS tractor: 10 h.p. one-cylinder diesel ; one owner, all paperwork; 30" tiller, brand new set of tines & Quick-Hitch tang; 50" cutter bar w/brush & grass blades, new teeth on both, & Quick-Hitch tang. Many spare parts...\$1350 for all, Erik 518-329-0801; ewbdoodle@Juno.com, Ancram, NY (Columbia County)

7 Acres available for farming near Bethel, Maine. Adjoin existing organic farm. Prefer grains or no-till agriculture. Have another eco-friendly idea for this parcel? Try us! Rent, lease or barter. Contact B. May, 203-624-2798

Farmer/Educator - Seeking a full-time year round dynamic farmer/educator to help operate a 22-acre certified public farm. Experience in farming and livestock management with greenhouse, carpentry and mechanic skills. Offers the ability to work with the public to embrace a community farm concept, excellent benefits and salary starting at \$27K. Send resume to NCOF, Lynda Simkins, 117 Eliot Street, Natick, MA. 01760 or email us at ncorganic@aol.com

NCOF Summer Programs - NCOF is offering a variety of summer programs this year for children ages 6 to 15. Participants may sign up for anything from a half day, to weeks of fun on the Farm. For an application and program description send a SASE to NCOF, 117 Eliot Street, Natick, MA 01760 or call us at 508-655-2204.

Land For Cultivation Eight (8) acres of pristine land (no chemical or pesticide used), available for farmer interested in *organic cultivation*. Parcel has slight slope and flat terrain. Located on route 183, Lenox, Massachusetts, between town center and Tanglewood. Contact O. Weiss at (413) 637-3375, or e-mail WEISSOLGA@aol.com

Part-Time Gardening Help Needed - Weekly gardening help needed from now until November for organic property in Lincoln, MA. Weeding, raking, pruning, digging, pulling invasive shrubs, compost turning, etc. 4 hours per week, or 8 hours biweekly. Flexible schedule, but weekdays or weeknights preferred. Good pay. Must be a non-smoker. Call 781-259-3435 between 9 AM and 9 PM.

Experienced Farm Manager Needed — The Town of East Hampton, NY is close to purchasing a 42 acre farm w/fantastic soil and prime location for farmstand. The Town will lease either to a private organic farmer or our highly organized non-profit organization, modeled after the Natick (Mass.) Community Organic Farm, to run an open-to-the public, educational community organic farm, probably with funding from the Town. Good salary and benefits, plus possible affordable housing in our ocean-side, rural town two hours from NYC. For farmer with proven track record raising organic mixed vegetables, animals, possible grain and fruit at this scale. Contact: Eesha Williams, eeshaw@hotmail.com, 54 Valley Rd., Sag Harbor, NY 11963

Heirloom Tomato Seedlings. NOFAMass certified. Web of Life Farm, 508-866-7799

News Notes

compiled by Jack Kittredge

Researchers find no significant difference with biodynamic preparations. Two USDA microbiologists and a Washington State University professor have studied compost made with biodynamic preparations and compared it to normal compost, NPK fertilizers and no nutrient source under field conditions raising lentils and wheat. They conclude that yields obtained with organic nutrient sources can be comparable to those obtained with mineral fertilizers, "but additional benefits to crops and soils from biodynamic compost and field preparations are uncertain in the short run." They do call for longer-term studies, however. *source: American Journal of Alternative Agriculture, Vol. 15, No. 3, 2000*

Biodegradable Paper Mulches. Brown paper coated with vegetable oil is touted as a less costly alternative to plastic mulch by USDA researchers. The oil helps it withstand wind and rain for up to 13 weeks, but then it fully degrades and requires no removal, unlike plastic. *source: Growing for Market, April, 2001*

Turkey surpasses US in organic cotton. During 1999, Turkey became the leading producer of organic cotton at 41% of world's supply, compared to 34% in the US. *source: The Organic Report, March, 2001*

Bees as biocontrol agents. Cornell University scientists have patented a honey bee "footbath" to disperse micro-organisms to strawberry flowers. The insects walk through a tray placed in their hive entrance containing spores of *Trichoderma harsanium*, a beneficial fungus which competes with grey mould in the fruit. The payload carried by the insects is small, bee lovers are reassured, and has no effect on their health. *source: The Economist, September 28, 2000*

Back to healing with leeches? German studies have found that 20 pain-relieving substances exist in the saliva of leeches. The little critters can cut in half the joint pain caused by arthritis! *source: USA Weekend, Jan 26-28, 2001 pg. 16*

Steam Your Weeds! A New Zealand portable electric water heater applies steam via a biodegradable foam (which holds the heat on the weeds) and has been approved by IFOAM for organic use in Australia. It is called the Green Weeder and is available in Chicago at 630-514-0364 or jeffw@waipuna.com. *source: Growing for Market, April, 2001*

Sunrise/set times online. Growing in the winter in a greenhouse? Want to know the exact daylength near you for any day of the year? The National Oceanic and Atmospheric Administration has a solar calculator you will want to see at www.srrb.noaa.gov/highlights/sunrise/gen.html *source: Growing for Market, April, 2001*

Wasps effective against corn borers. According to a Cornell entomologist, a single release of *Trichogramma ostrinae*, a beneficial wasp, at 30,000 per acre when corn is knee high will cut losses to corn borers in half. *source: Growing for Market, April, 2001*

Russian bees said more resistant to mites. The USDA is evaluating the genetic ability of Russian honeybee queens to resist mites. The resistance is said to have evolved because of heavy selection pressure from mite infestations there. The queens are being trialed in Louisiana and will be transferred to the midwest if they show promise. Honeybees now pollinate about \$14.6 billion worth of crops in the US. *source: Acres, USA, April, 2001*

Midwest organic growers form cooperative. A marketing organization, the Organic Farmers Agency for Relationship Marketing (OFARM), has been formed out of efforts by six midwestern farming groups to coordinate production and marketing of organic grain crops. All members must be farmers or farmer organizations. OFARM plans to be functioning for the 2001 season. *source: Acres, USA, April, 2001*

Texas mad cow deaths? A spate of 5 recent deaths from Creutzfeldt-Jakob disease in a 22-county area of northeast Texas has prompted state health officials to launch an investigation. The inquiry comes just after Purina Mills quarantined 1220 cattle and recalled 22 tons of feed at its San Antonio plant. A spokesperson said the company may have mixed cow meat and bonemeal into a feed supplement that was put on the wrong truck. *source: Acres, USA, March, 2001*

Organic processed food regs set. Under the new USDA organic program, foods which contain more than one ingredient are labeled as follows:

- "100 Percent Organic" - must contain only organic ingredients, USDA seal may be used on product
- "Organic" - must contain at least 95 percent organic ingredients by weight, USDA seal may be used on product
- "Made with Organic Ingredients" - must contain at least 70 percent organic ingredients by weight, up to 3 of them may be listed on the front of the package
- Products with less than 70 percent organic ingredients may have organic ingredients listed on the information panel but the word organic is not permitted on the front of the package. *Acres, USA, March, 2001*

Organic Numbers. There are currently about 12,200 organic farmers in the US, according to the USDA. Their numbers are increasing at about 12% a year. *source: Organic Food Business News, March, 2001*

Special Supplement on Biodynamics and Permaculture

Biodynamics between Myth and Reality

by Andrew Lorand

Dancing under the full moon, magic herbal sprays and planting by constellations - are all part of the (sometimes sensational) lore around biodynamics - as are the deep felt hopes for a holistic renewal of farming. Most folks in the alternative/organic farming movement have heard of biodynamics, but not all have really looked into it very closely or have felt that there were barriers in getting to know it better. In many ways a grandparent of western alternative agriculture, biodynamics still maintains a certain mystique and is often shrouded in myth. Here is a brief introduction that hopes to help demystify.

A Metaphor

There are many ways to introduce a friend. Each kind of introduction has its own strengths and weaknesses. I often like to think of biodynamics as a living plant: rooted in its philosophy and history; growing (stems and leaves) through education and demonstration offered by its organizations and teachers; flowering and fruiting uniquely on each individual farm, in each individual garden through the work of each farmer, each gardener. Using this metaphor, I'll try and describe biodynamics as: (1) a theory or philosophy of agriculture; (2) an agricultural movement with leaders, organizations, purposes, etc. and (3) a set of practical methods that are used by individual practitioners.

Roots

As a theory of agriculture, biodynamics owes its beginnings to the spiritual philosophy of Dr. Rudolf Steiner (1861-1925) an Austrian philosopher, educator, social activist and innovator in a variety of fields, such as architecture, childhood development, the fine and performing arts, medicine, economics and of course agriculture. He wrote about 30 books and gave many lectures, some 6000 of which are available in book form. He built buildings, wrote plays, carved statues, inspired a new kind of alternative medical paradigm including new approaches to pharmacopoeia and social therapy; he made efforts to ease the burden on working people and the poor through a deeper understanding of our common social responsibility; he inspired new understandings of the great religions; founded the well known Waldorf School movement as well as several other, lesser known alternative movements *and* he laid greatest value on the freedom of each individual to find their own paths to self-awareness, social engagement and a non-dogmatic spiritual development. He was not a charismatic guru type, preferring a rather modest, hard-working personal style. Twice married and very cosmopolitan, Steiner had early on made friends in a wide variety of



Rudolf Steiner

circles. He studied natural science, technology and philosophy and held a Ph.D. in the philosophy of science. Also a student of the classics and literature, Steiner admired greatly the artistic and scientific work of Goethe upon which he would later build much of his own outlook.

Steiner's philosophy, also known as 'Anthroposophy,' has several distinguishing elements. One of them is the understanding that life is not just physical, but also spiritual. In this case, he did not mean a vague spirituality, but a reality as tangible as the physical and perceptible with our wide-awake mind. Steiner believed in each individual's capacity to understand consciously the spiritual dimension(s) of life and in fact to interact with it practically. Imagine here a kind of physical-spiritual matrix in which the spiritual is the initial cause for and to varying degrees carrier of the physical. Steiner believed that all religions have their place and value. He also believed that the individual has the ability to gain direct knowledge of the spiritual world that is in and around us all the time. Such direct knowledge can be gained by anyone according to Steiner, regardless of race, religion, gender, socio-economic status or formal education. On the other hand, the path of inner development he describes as 'modern' (i.e. based on the freedom of individual choice and initiative) is very disciplined, rigorous, comprehensive and requires great dedication to truth. This path of inner development was also described by Steiner as 'spiritual science' as he ascribes the same kind of empirical, disciplined rigor to the study of matters spiritual as science does to the physical realm. He spent much time in his books, lectures and other presentations describing in detail this particular path, this science of spiritual development. By the time Steiner died in 1925, there were organizations in

many countries, including the United States that promoted Anthroposophy as well as many of the practical activities that he inspired.

Stems and Leaves

Late in his life Steiner was asked by some of his students (who happened to be farmers and gardeners) if he could assist them with their concerns about deteriorating crop and animal health. He began a series of experiments with a small handful of farmers and gardeners around 1922 and in the summer of 1924 gave a more extensive series of lectures and workshops, known simply as the "Agriculture Course." There he laid down some fundamental principles and practices of a new kind of farming system that is both ecological and spiritual, resting squarely on the common sense won from centuries of agriculture, informed by modern science and at the same time infusing new, spiritual perspectives on what makes a farm healthy. A couple of years later, the farmers and gardeners using Steiner's ideas began calling the effort: 'the biological - dynamic method of agriculture.'

Initially a small group, in time the movement grew. Within a few years biodynamics was being practiced in many countries and the movement had regional and international meetings on a regular basis. In 1929 the Demeter Association was formed and created the first certification for alternative foods setting high standards that to this day remain more comprehensive than most. Early pioneers of biodynamics included Ernst Stegeman with whom Steiner had some of his first conversations about new farming methods; Count and Countess Keyserlingk upon whose farm and through whose persistence and support the Agriculture Course was given; Lili Kolisko, who had the first biodynamic research laboratory and was asked by Rudolf Steiner to carry out experiments to verify and explore his indications; and Ehrenfried Pfeiffer, who carried the impulse to the Netherlands, inspiring many people including Lady Eve Balfour (founder of the Soil Association in England), and eventually brought biodynamics to the United States in the late 1930's. It was in Kimberton, PA in 1938 that Pfeiffer started the 'North American Bio-Dynamic Farming and Gardening Association' and the 'Kimberton Farm School' which was to be the first organic farm school in the US. There too, he had a strong influence on several early organic farmers, including Paul Keene of Walnut Acres fame. Although J.I. Rodale visited Pfeiffer and they supposedly had many lively talks, Rodale eventually rejected biodynamics for what he perceived as its 'mystical philosophy.'

Despite this rejection by some of the philosophical nature of biodynamics, which was not

limited to Rodale or to folks in the U.S., biodynamics pioneered the return of many regenerative, biologically and ecologically sound farming practices such as improved crop rotations, cover and multi-cropping, mulching, integrated animal production, and composting. Biodynamics also introduced several new methods, including an emphasis on aligning with natural rhythms, a focus on pest prevention rather than just management and on the use of 'alternative medicine' for the farm as a whole. Fundamental to biodynamics has always been the concept of the whole farm and self-sustainability. Biodynamic farmers look to create all the natural fertilizers and feed necessary to create and maintain a highly vibrant, diverse, and healthy operation.

Today, there are Biodynamic and Demeter associations worldwide, including such countries as Egypt, India, Brazil, South Africa, New Zealand, Australia and the Philippines. However, biodynamics is still strongest in Europe, especially in Germany, where there are over 1300 Demeter Certified farms and gardens producing over 3000 Demeter certified products. In the U.S. there are estimates of roughly 50,000 acres in biodynamic management. Each country, each region has a different relationship to the various organizations and guidelines and there are many practitioners who practice some form of biodynamics without getting certified.

Flowering and Fruiting

The foundation of the actual biodynamic practices still rests in 'good farming practices.' These are practices we would today call sound ecological activities: the reduction and appropriate re-use of wastes; recycling of materials, energy, nutrients; an understanding and protection of natural archetypes (no genetic manipulation, thank you) and their normal metamorphoses through the seasons; perceiving, honoring and supporting 'ecological succession' in nature (think here of the role of weeds, the significance of pastures, fallows and forestation); and seeking of 'dynamic equilibrium'—the optimal state of well being for soils, crops and animals — thus able to find a healthy balance in the face of constant change. These might be referred to as supporting the natural immunological functions in soil, plant and animal.

The 'Bio' and the 'Dynamic'

Biodynamics has methods that seem at least at first glance to be purely ecological, despite their spiritual/philosophical origins, some of which are mentioned above and below. We can attempt to organize these as follows. First, on the 'bio' side:

Biodiversity (multi-cropping versus monocropping as well as the integration of 'wild' and non-productive habitat, emphasis on protecting and growing older, rare or endangered species, emphasis on growing lots of different things);
Soil Fertility (the focused development of persistent, stable humus, not just temporary nutrient availability, through careful soil preparation, mulching, appropriate crop rotations, composts, herbal and mineral preparations/teas);
Integrated Cropping and Animal Systems (the search for farm-wide symbiosis through the integration of domestic animals, their manures and the influence of their biology as well as the reciprocal relationship with the plants that feed them);
Integrated Pest Prevention and Management (emphasis on prevention, least invasive/most natural methods including herbal, homeopathic and anthroposophical remedies)

Some of the more 'dynamic' ideas/methods include:

Understanding the farm not just as a part of a local bioregion, but also as a place between heaven and earth, and itself as a living being: a real, living, distinct, conscious organism with both biological and spiritual qualities.
Learning to observe and work with the rhythms of the cosmos, such as: daily, monthly and seasonal growing patterns; learning to eat with the seasons; observing and researching the influence of the sun, moon, planets and constellations on the growth and health of soil, plants, and animals.
Developing a therapeutic mentality for what Steiner

called the 'farm individuality' including gaining the ability to diagnose health and ill health, recognizing that it is the balance of many qualities and activities that keeps the whole healthy.

Using natural remedies, homeopathy and anthroposophical medical preparations for the farm, such as the manure and mineral preparations and field sprays, herbal and compost teas; bark and vine pastes; alternative veterinary care.

Seeking to strengthen the natural (but also weakening) forces of growth and reproduction on the one hand and ripening/nutritive quality on the other (in plant and animal) through a combination of points 1 through 4.

This last point may seem a little odd at first glance, but a key and implicit (not so obvious) assumption in biodynamics is that not only is the Earth a living being, but that her natural forces are waning. In particular Steiner singled out two sets of complimentary forces needing attention and support. On the one hand we have the growth and reproductive capacities of plants and animals — on the other their ability to mature and ripen and be of nutritive quality for themselves and other species. It was Steiner and his initial student's observation that the fundamental decline in soil, plant and animal health was due to an overall decline in the basic health giving forces in nature. Much of biodynamics is about supporting, restoring, and regenerating those forces, processes, and phenomena in nature using a natural, holistic and spiritual approach.

Social Engagement

A description of biodynamics would be incomplete without a word about social responsibility. Like many people involved with Steiner's ideas, biodynamic practitioners are often searching for improved socio-economic conditions as an integral complement to the natural care and spiritual quality they value. Many biodynamic farms today are directly, closely or at least to some high degree associated with other care giving, social institutions such as homes for the handicapped or the elderly, educational schools for children and adolescents, group homes, colleges, hospitals and clinics and/or other community organizations. In the 60's and 70's biodynamic farms in Europe pioneered new kinds of internal and external socio-economic relations with 'community farms.' In the mid-1980's in the U.S. 'Community Supported Agriculture' was born out of the biodynamic movement and quickly spread to many organic growers. In many cases, like these, biodynamics has renewed healthy methods and or pioneered new ones, both agricultural and social and in its own quiet way 'spread the wealth.'

Myths

Although it is true that biodynamic practitioners make an effort to discern the subtle influences of the universe on the development and health of their soils, plants and animals, it is by no means a wacky group of star-dazed, pie-in-the-sky wishful-thinkers, but a rather sober group of keenly awake agricultural professionals making an effort to be more in sink with the universe. There's a distinct difference worth noting. Naturally, there are always one or two folks who claim to be part of the latter group who really belong in the former. However, the gross over-generalization that one pundit wrote about 'liking biodynamics if your into dancing naked by the moon-light' seems both vicious and revealing: people often dislike and fear what they don't understand. Biodynamics is a serious effort, sustained now for almost 80 years in a wide variety of eco-systems and socio-economic conditions. It is a spiritual philosophy, an agricultural movement *and* available to each individual as a set of farming and gardening methods meant to enhance the quality of life.

The Next Steps

Although some may find the study of anthroposophy akin to studying a new religion, with its complex spiritual ideas and disciplined inner path, unlike most religions, biodynamic practitioners (and anthroposophists in general) don't do much evangelizing or self-promoting. There is a certain, genuine modesty about many if not most biodynamic practitioners. Biodynamics is developing and

evolving slowly as farmers and gardeners find its practical and spiritual value and add their experiences to the mix. One does not need to be an anthroposophist or a serious student of Steiner to begin practicing biodynamics, but over time many will find his ideas helpful, interesting and well grounded...to use a metaphor.

If you are interested in finding out more about biodynamics, there are several opportunities to do so. There is a North American Biodynamic Association, a Demeter Association, several regional and local groups, a few educational centers, some individual teachers, farm advisors and consultants and more recently also an accredited Bachelors and Masters degree program in biodynamics. Many of these organizations and individuals put on workshops or conferences. Below, please find a sampling of these resources, each of which can lead you to yet more sources. Books and magazines are also available and several of the organizations sell these, many of which are excellent. My favorite introductory book is still Wolf Storl's 'Culture and Horticulture.' I also like Peter Proctor's 'Grasp the Nettle' and found Carol Williams 'Bringing a Garden to Life' helpful and delightful. Finally, the best way to get to find out more is to visit a biodynamic farmer or gardener. Ask your local group, the Biodynamic or Demeter Association for a list of folks in your area. These are busy people, but almost all of them are glad to give someone seriously interested in biodynamics a few, good moments of their time.

The North American Biodynamic Farming and Gardening Association, Inc. (415) 561-7797 or biodynamic@aol.com

The Demeter Association of North America (New York) (315) 364-5617

The Josephine Porter Institute (Virginia) (540) 930-2463

The Pfeiffer Center (New York) (914) 352-5020 or info@pfeiffercenter.org

Michael Fields Agricultural Institute (Wisconsin) (262) 642-3303

Union Agricultural Institute (Georgia) (706) 745-6056 or uai@alltel.net

The Kolisko Institute (California) (707) 578-2085 or info@kolisko.org

The School of Alternative Agriculture at New College of California (707) 578-2085 or agschool@newcollege.edu

Andrew Lorand was trained initially in Switzerland, where he learned about biodynamics in 1973. He holds a Zurich State Diploma in General Agriculture and Swiss Federal Certification in Farm Management. He farmed full-time for over ten years. He also holds a Ph.D. in Agricultural Education from Penn State University's College of Agricultural Sciences and wrote an award-winning doctoral dissertation on biodynamics. Lorand is currently Dean of the School of Alternative Agriculture at New College of California, which offers fully accredited BA and MA degrees in biodynamics, permaculture and ecological farm management. He is also Executive Director of The Kolisko Institute, a non-profit organization dedicated to furthering research and education in biodynamics — which helped to create the School of Alternative Agriculture at New College. He may be contacted at agschool@newcollege.edu or at (707) 578-2085.

Seeds for the Biodynamic Spirit

by Jack Kittredge

The hilly country north of Montpelier, Vermont, on the edge of the Northeast Kingdom, could pass for the Vermont of a generation ago at the start of the back-to-the-land movement. Population densities aren't large enough to support fast food/mall retailing, so small restaurants and stores are still common. The boom which has spawned sprawling mansions in many rural areas of New England hasn't arrived here, so farms and timber still sit atop local crests, enjoying unparalleled views of waterfalls and spreads of mixed pine and sugar maple as far as the eye can see.

Into this bucolic scene moved Tom Stearns, owner of High Mowing, the farm grown biodynamic and organic vegetable seed company. Originally from Gloucester, Massachusetts, Tom went to Northfield/Mount Hermon school. His folks came up to Vermont during the summer, and he decided it was the right place for his seed farm.

Tom bought in Wolcott, finding a 37 acre piece which was almost all wooded. He has cleared some and would ultimately like to open up 6 or 8 acres. He also has a couple of goats and Posey, his heifer. The goats are for milk now, until Posey gets older. Then he'll have her and her offspring for milk, beef, and manure.

"I like to have my own animals," he explains, "because then I know what's in the manure I compost. I like cows better than sheep or goats — both for their manure and the constitution of the animal. You have a much better ratio of stomachs to hooves with cows! I enjoy animals because they are the livelier part of the farm. But I don't think you have to have animals to be biodynamic. Often you can have two farms working together, a dairy farm and a vegetable operation."

Tom operates the company out of a new building on his farm. The upstairs is a big open room and conference center with a library, the downstairs is for cleaning and packing of orders, as well as the office. In the basement is seed storage, along with biodynamic preparations.

'High Mowing' is an old term for high hilltop hayfields. A lot of Vermont farmers still call them 'mowings'. Tom liked the name because it was an old term coming from the time of the heirlooms he sells, and also because it was a regionally specific term for Vermont and the Northeast. The company got started about 5 years ago when Tom was gardening. He used varieties of seeds given him by farmers that he saw weren't available in any commercial seed company in the country. So he got involved in the Seed Savers Exchange and started saving seeds to share with others.

"I put out a small flyer with the varieties I had," he relates, "and realized this would be a way to make a living at something I liked. I wouldn't have to have much land, nor ride around on a tractor growing lots of crops. I could spread my work out during the year and be involved in education that would help others save their own seed for their own locale. I wanted to have that kind of social impact. It's worked out great! I started out sending out mailings to NOFA lists. Not that all were potential customers, but this was the core of my base — people I wanted to know about me and who might ask me to do a workshop or tell someone about me. NOFA has been a great way of reaching people! I feel so lucky and grateful to have this organization of people."

Tom says he is having fun trying to grow High Mowing from a small business selling varieties he likes into a full service seed company. The profit potential is there, he argues. Two acres of plants can produce a lot of seed. In the case of tomatoes, they're so prolific that he gets 3000 packets worth of seed from only 4 plants! While he doesn't keep track of his hours in the field or his time processing the seed, Tom feels it's only a few hours. So he might have a few hundred dollars expenses invested in seed that he can sell for \$6000.

"I don't have to market and sell seed during the same season", he continues. "In the summer I have no harvesting of vegetables, no farmers markets, no CSA deliveries, no restaurant routes. I can focus on growing and weeding. The harvest comes from August through late September. And seeds are not very perishable, compared to vegetables. With my lettuce seed I can harvest it and get it to a certain state of cleanliness, then set it aside. So I know how much I have, whether to put it into the catalog. Then in December I can do final cleaning. Packing goes pretty fast. We do it all by volume, not counting. I know how many seeds of what types are in various measures, so I just pick the right scoop and I load the seeds into the packet. I double check by weight to make sure I'm right on the money. You can fill 500 or 600 packets an hour, or about 6 seconds each, once everything is set up. At \$15 an hour it cost me 5¢ each to stuff them, including the cost of the packet."

This is the first year that Tom will be getting seeds from other growers. He has always grown them himself, before, but this year he has 5 growers who are all certified organic and biodynamic, and within 45 minutes of his farm. They're all people he knows very closely. He puts them through a training program and visits their farms to see how far apart their plots are.

Tom explains his requirements: "All my seeds are open pollinated varieties. I'm particularly interested in varieties that do well here, in New England. That would be short season and resistant to a lot of fungal diseases. If I find an eggplant that can make it up here without black plastic or remay, then I would



photo by Jack Kittredge

Tom displays his biodynamic preparations. They are stored in the basement in jars in a crate filled with peat. They have a woody, rich smell which makes them seem very much alive.

be fine to produce that eggplant in a greenhouse and sell the seed. But I have to be careful. I don't want to grow an eggplant variety that does well in a greenhouse and then sell it to people who aren't going to be having greenhouses to grow them in. I want to be sure that the variety itself is capable of doing it outside."

He also has to be careful when it comes to heirloom varieties. Tom has a lot of them that he has increased to the point where their seeds can be offered for sale. But the garden market, where he has been selling, is different from the farm market he now wants to reach. He can offer heirlooms to gardeners, telling them that one might be a little susceptible to fungus. Gardeners still have enough interest in the variety to work with it. But while farmers might be interested in the variety, economic constraints mean they can't use one that might die from early blight.

A big part of raising varieties for seed is keeping the plants isolated from other varieties that might cross-pollinate them. Tom has three different isolation gardens to keep wind or insect pollinated varieties pure. He doesn't have too much of a problem in his area because there aren't a lot of farmers right around there. But sometimes he's wanted to grow two Crookneck squash varieties in one field. Then he has to bag individual flowers and hand-pollinate them. But that takes a lot of time and the seed is never as genetically healthy, he feels. The insects are flying around and will collect pollen from maybe 20 male flowers to contribute to a female flower. That's a huge amount of genetic diversity as opposed to Tom coming through with pollen from maybe 3 male flowers. So he lets the insects take care of it as much as possible.

Of course growing and harvesting the seeds is only one part of a seed business. They also have to be cleaned. Tomatoes, for instance, have to be fermented and put through a big grinder. The pulp goes on a screen and Tom rinses it with water to get the seeds out. He has bags, buckets, and drying racks all around for different seed removal operations. There are also seed cleaning machines which help separate it from chaff, hulls, husks, etc. Tom has bean threshers, corn shellers, and a fanning mill and other interesting things stored in a barn on a nearby farm. In the office he has a small cleaner. It has a fan and two screens which slide into slots. Turning the handle activates belts that remove big chaff, then the seed falls through a chute, where the fan blows it and various size seeds land in different places. You can control the distance seed will travel by adjust-

ing the air intake of the fan. So you put seed through and adjust it until you get good separation. A new variety requires a new setting, but once you have your settings, you can put a large amount through.

“This is *ageratum*, the flower” he says, pointing. “That right there is the seed. There’s all this chaff mixed in with it. When you’re cleaning you’re working with size and shape and density and all these characteristics to separate out the seed. You use fans and screens and different ways of sorting. It’s pretty tricky. Not everyone enjoys sorting seeds. But I love it. I’d rather clean seeds than work on a computer!”

Germination tests are also a basic part of running a seed company, Tom says — most seed companies have a fulltime registered seed technologist who just does germination tests and purity analysis. He tests every batch of seed he sends out, and finds that they usually will germinate at about 98%. If the end of the year comes and he has a lot of seed sitting in envelopes, he’ll test again. Everything has to have a new germination test after 6 months.

Seeds fall into three main germination temperature ranges: one at 20-30½ Celsius (which is 68-86½ Fahrenheit), one at 15-25½, and one at a straight 20½. Tom runs batches in each temperature range. The test is done in paper towels — special germination paper. The seeds are rolled up in the paper towel which is moistened, set with others in a plastic bag, and put in the germinator — which is like an incubator. Tom uses an old refrigerator with a light in the bottom.

With beans, he says, you need a temperature fluctuation of 8 hours at 68 degrees and then 14 hours at 86 degrees. You do this for 8 days, then you open the towels up and count the seeds which have germinated, do an evaluation of healthy seedlings, and that is the germination rate. The evaluation is of the sprouted seed, by eye. Is it capable of producing a strong and healthy seedling in this soil? Each seedling is examined. He looks at the health of the shoot, the root, the cotyledon, the first two leaves.

Tom sells both mail order through his catalog, and via about 30 seed racks out in food coops and stores. Most people who order seeds through the mail plan and buy seeds for their garden from January through March. But most people who buy from a seed rack are impulse buyers. So he ships seeds for the racks in February for sales in late March and April.

While he can’t afford much advertising, Tom has generated a lot of interest in his seeds by carefully giving some away. Fedco puts a packet in every order, usually tomatoes. Attached to every packet is a return card to build Tom’s list. He also gives free seed to Vermont Public Radio. They give the packets out during their pledge drive, and mention the gifts a few times each hour for a week. Tom says there’s no way he could afford to pay for all that publicity — it would be tens of thousands of dollars — but he can get it by giving seeds, which don’t cost that much.

High Mowing has a unique niche, Tom feels. No one else is doing local, heirloom and rare New



photo by Jack Kittredge

Tom and Eric, his apprentice, operate a seed cleaning and sorting machine in the final stages of isolating small, clean seeds.

England varieties, certified organically grown. He has, however, been working with other small seed companies that sell to small growers to pledge not to carry genetically engineered seed. About 70 companies have signed on. This is a tiny minority, considering that there are 250 retail seed companies in the country and ninety-five percent of these are companies selling to large-scale growers. Only five percent represent seed companies like Johnny’s, Burpee’s, Stokes, Fedco, Parks, Abundant Life and High Mowing, selling to gardeners and small growers.

Tom’s company recently joined with several others to form the Biodynamic Seed and Plant Association. The group formed to serve a need among biodynamic seed growers to develop and select and breed varieties that really know what to do under biodynamic conditions.

“One of the things we talk about in biodynamics,” explains Tom, “is encouraging plants and soil to have an intelligence. For example, one of the things that plants grown and bred under chemical conditions often lack is root hairs that can actively seek out distributed fertility. This is because they have been bred to find fertilizer at the base of the plant in water soluble form. In biodynamic agriculture we want plants which can go out and get nutrients, as opposed to wait for them to be put right there.”

Stearns first studied agriculture with a biodynamic farmer at Prescott College in Arizona, a small environmental college. She was a professor there and ran a CSA. He took a course from her called Principles of Organic Agriculture. It was there that he learned about the 8 lectures on agriculture which Rudolf Steiner gave in 1924, which form the basis of biodynamics.

“I began liking this kind of sensitivity to the farm,”

Tom recalls. “I liked the integrity of having a complete farm with both animals and crops, and a self-contained fertility cycle without bringing in a lot of stuff from the outside. Rudolf Steiner said that bringing in anything from the outside should only be done as medicine for a sick farm. You should try to build enough true health and true fertility that you don’t need to bring anything in. It’s the same with the health of a human being — medicine is an intervention. Our food and work and fresh air should nourish us enough without needing anything else.

“I began to think that this is what organic agriculture was all about,” he continues. “But when I visited organic farms, I realized that many organic farmers just shift from one type of bagged fertilizer to another type. Then I visited most of the farms mentioned by Trauger Groh and Steve McFadden in ‘Farms of Tomorrow’. Most were biodynamic and it really jumped out at me — these were farms that really tried to create their own fertility, had high quality crops, had tractors that were in and under cover, had creative weed control, had a nice balance of livestock and crops. A lot of them had educational programs and involvement with the community. So then I read the Rudolf Steiner lectures and went to workshops on biodynamics. In 1997 I started using the biodynamic preparations myself. I wanted to try them out. In addition to thinking about things differently, I wanted to actually do things differently.”

Tom speaks with awe of Steiner’s childhood as a gifted kid who saw spiritual beings that you only read about in the Bible or in fairy tales, and his work as an adult in political, economic, social, agricultural, medical, and artistic fields. But he feels that some followers of anthroposophy (Steiner’s philosophy) and biodynamics take Steiner’s word as the word of God and turn him into a guru. Stearns feels that Steiner was just one person, like many others, who had incredible insights. He finds comfort in the fact that Steiner himself was the first one to say: “Please don’t just believe this stuff. Test it for yourself!”

Tom is also upset by what he calls the ‘slimy, marketing, economic side of biodynamics.’ As an example he tells of one man over the border in Canada who, after a drought of a month, constructed a device that used beeswax and quartz to make rain. He put it in the wings of a plane and flew 50 miles in one direction. By the time he was ready to return, the story goes, there was a big storm where he had been.

But one legacy of anthroposophy that Tom admires is working with handicapped people. The Camphill villages are communities where mentally handicapped individuals are given meaningful work on biodynamic farms and become valued members of their community. A student of Rudolf Steiner named

Karl König developed the Camphill idea from one of the Steiner lectures. Steiner himself was moved in this direction at the age of 15 when he was a tutor to a handicapped 9 year old boy.

Another idea which Stearns has adopted from biodynamics is the value of the biodynamic preparations. There are 9 preparations: three are used as sprays, six are used in compost to guide it. Tom makes them with a group of biodynamic growers from plant and animal materials. He was amazed at the quality of his compost right away after using the compost preps.

“The life in it,” he recalls happily, “the smell, it was incredible! I haven’t been in one place long enough to say that it grows better plants. But I can say it appears to be a much higher quality compost. It’s just like homeopathy. You are adding a very small amount of something to encourage what is already there. In the case of oak bark, oak grows in very acidic areas, but the bark can contain 70% or 80% calcium. That’s amazing for a tree that grows in soils with a pH of 4 or 5. It’s sort of a dynamic accumulator of calcium. Put in a compost pile it can guide the calcium process there. I think of it almost as an inoculant. Similarly, the other plants used in the preparations are “masters” of a particular process.

Tom also endorses the two spray preparations, 500 and 501. The first is manure that is stuffed into a cow horn, buried, and put through a composting process over the winter. Then it’s sprayed on the soil to help build humus. The second is silicon — powdered quartz. It’s finely powdered, stuffed into a horn, and buried during the summer. That’s sprayed on plants to work with essential oil development, photosynthesis, and secondary plant compound development. People spray horn silica if they’re having fungal problems, or to bring in more light influence.

The preps 500 and 501, as well as two of the other ones, need to be stirred for long periods — sometimes as long as an hour. Some biodynamic practitioners have used mechanical methods to stir the preparations, while others wonder if such long stirring is absolutely necessary. Stearns, however, believes stirring is vital, and that it must be done by hand.

“I think the technique of stirring a preparation is totally necessary,” he asserts. “In my experience and in talking to others, I feel that by stirring the water in one direction for awhile you are aligning all these molecules. You stir until you have this vortex going down to the bottom of the bucket. Then you suddenly change direction. You do that for an hour. You change direction each time the vortex gets down to the bottom. So you’re ripping and stretching these molecules. You’re stretching them open. It’s almost like you’re making the water more wet. What you find is at the beginning it might take 15 or 20 seconds to get a vortex to the bottom, but at the end it might take 8 seconds. When they make stirring machines, which some big biodynamic farms use, you can’t just reverse direction every 15 seconds. They have to take into account this major difference in the water over time.



photo by Jack Kittredge

Animals are important in Tom’s nutrient cycle. They include Posey, his heifer, and milking goats

“In older times,” he continues, “there was more recognition that you, as a human being, have a relation to the health of your plants. I mean independent of what you do physically to care for them. In your consciousness of these plants, caring about them, you are giving them something. In working with the preparations, stirring them, the power of your will has an incredible effect on the outcome. If you are thinking about something else that you did that day, I don’t think the preparations will be that effective.”

Tom believes that this spiritual aspect of life has gotten lost in the materialism of modern times. He sees Descartes and Newton as the originators of this descent into materialism, into a mechanistic world. Prior to them, there was a recognition of spiritual beings, of that side of reality. When Rudolf Steiner came along he tried to point out that the reductionist science of our time is only half the picture. It’s not wrong. It’s extremely valuable — it can put people on the moon. But the other half is all of the qualitative processes that go on and the spiritual side of life. It’s the very ancient belief that every physical thing that happens on the earth has a spiritual double. And likewise for every spiritual act there is a physical fingerprint. These two things are paired all the time.

“What Steiner believed,” Stearns says, “was that although this descent into materialism was necessary for us to break away from our instincts, we now have to reconnect with the spiritual world out of freedom. His mission was to help us realize this and give us the meditative tools to encourage this kind of striving — for the wholeness you get when you fuse the spiritual and physical realms that have gotten divorced over the last 250 years.

Action Alert: Demeter Association Needs Your Help... Time Is Running Out To Change USDA's National Organic Program (NOP)

There is some confusion as to how Demeter Biodynamic certification will fare under the USDA final organic rule which was issued December 21, 2000, will take effect now on April 21, 2001, and will become fully implemented October 21, 2002.

It is a mistake to assume that Demeter Biodynamic certification stands outside the rule. There are several reasons why this is a risky assumption. For one, the present exclusion of Biodynamic and any other eco-label is based on the interpretation of one man, Keith Jones, who is the director of the NOP. Keith Jones will someday be replaced, and that replacement may have a different interpretation, or Jones himself may change his mind. Personal interpretation of the Organic Foods Production Act of 1990 (OFPA) on which the final rule is based is a very tenuous foundation upon which to build a business. Secondly, because Biodynamic agriculture is not well known, many of our growers must use the word 'organic' on their label in order to sell their products. Additionally, some of our growers export to Europe where Biodynamic is regulated under the European organic regulation. And lastly, Demeter operates a purely organic program called Aurora Certified Organic. All things considered, Demeter has to be concerned about the final rule. Our concerns are mainly three-fold.

No additional standards. First, the final rule does not allow any organic certifier to uphold standards that go beyond those of the USDA. The final rule specifically states that a private certifier's seal may not be used to indicate standards other than those of the USDA. The relevant section of the rule is 205.501(b)(2). In one stroke the USDA forbids

certifiers to require additional standards and practices and preempts their private registered trademarks (certifier's seals). There are issues here of commercial free speech and intellectual property rights, both of which are in jeopardy. From now on, no one can define organic, no one owns organic, except the USDA.

This is tricky and confusing because while the USDA has exclusive right to 'organic', they are leaving the door open to many possible eco-labels, such as 'organic pasture fed', 'organic no sodium nitrate', 'organic meets EU requirements', 'organic IFOAM accredited' etc. etc. If this wide-open interpretation stands, consumers will be bombarded by a plethora of eco-labels. Each label will need to establish itself in the marketplace and consumers will need to sort out a much more confusing array of claims than ever existed with the single word 'organic' which was the reason for OFPA in the first place. The solution is for the USDA to abandon its 'no additional standards' interpretation of the OFPA. We believe the US Senate report accompanying passage of the OFPA in 1990 makes it clear that this narrow interpretation was not intended.

Conflict of Interest. The USDA has gone beyond customary interpretations of conflict of interest rules and is requiring that certified growers and handlers not participate in the governance of their organization. The relevant section is 205.501(a)(11)(i). This section strikes at the heart of many grassroots, farmer initiated certification organizations. The intent is unclear, but the result will certainly be to destroy the very organizations which have been the backbone of the organic community over the last

decades. Practically all certifiers have built-in conflict of interest disclosure policies which give adequate protection. These policies meet international accreditation requirements. To deny certifiers the ability to have these committed individuals on our boards denies us access to the most knowledgeable people.

Compost rules. The USDA has come up with an unworkable standard for farm compost making. They sprung this on us in the final rule without the opportunity for public comment. The rule requires at least fifteen days of excessively high temperatures with required turning every 3 days. This will drastically reduce the value of any farm generated manure, not to mention that the required temperatures and turning schedule cannot be achieved by farmers and cannot be verified or enforced by the certifier. The relevant section is 205.203(c)(2)(iii).

Many other things need changing, but these are our Big Three.

What you can do. An apparent oversight by the USDA NOP staff has given us additional time to press our case, but time runs out April 21. Please immediately write to the people listed below. Your letter can be short and simple. Refer to the relevant sections. Ask that the NOP final rule be changed (ask this of Secretary Veneman) or sent back to the USDA for revision (ask this of Congress). Ask of your Congressman that the OFPA be repealed or that the NOP not be funded if the USDA does not revise these provisions.

Secretary of Agriculture Ann Veneman, USDA, 14th and Independence Ave SW, Washington, DC 20250. Or email to agsec@usda.gov.

Your Congressman, The Honorable _____, US House of Representatives, Washington, DC, 20515

Your Senator, Dirken or Russell Bldg, or Senate office building if you don't know, Washington, DC 20510

Send a copy to President Bush, Whitehouse, Washington, D.C., or email to president@whitehouse.gov

Your help is needed and may make a significant difference in the future of organic agriculture in the U.S.

Demeter Association, Inc.
Britt Rd, Aurora, NY 13026
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Demeter Association has been certifying Biodynamic and organic agriculture since 1984.

Biodynamic Preparations at a Glance

Here is a quick summary of each biodynamic preparation: Its name and number, what it is for, how it is applied, how it is made, and its rate of application.

Roxbury Farm: Biodynamic Soil Fertility

by Jean-Paul Courtens

AVERAGE NUTRIENT ABSORPTION FOR VEGETABLES

Roxbury Farm is Located in Kinderhook, NY. It recently relocated to a new 148 acre farm to acquire long term land tenure. The experience of building soil fertility will be applied on this new piece of land. This article describes the activities and the soil types of the old Roxbury Farm. This farm which is currently being farmed Biodynamically consist of 200 acres of land. In 1990 many fields tested at approximately 2% Organic Matter. In 2000 many fields had increased to 3.2 to 3.7% Organic Matter. In this document I describe how I accomplished this. Roxbury Farm is a Community Supported Farm with over 600 members in the NYC area, the Capital District area and at home in Columbia County NY. A similar relationship has been build up with the Omega Institute in Rhinebeck, NY, which serves over 700 meals a day.

Fertility management at Roxbury Farm

When I talk about soil fertility I distinguish four different qualities that determine this. They are very different in their nature and in the correct composition they assure healthy plant growth. Those four qualities are measured in different ways, both qualitative and quantitative:

Chemical fertility: Hayfields

Hayfields are generally self sufficient in nitrogen provided there are plenty of legumes as part of the hay mix. Nevertheless you will see your neighbors using generous amounts of nitrogen as fertilizer. In Holland they use generous amounts of nitrogen as an indirect weed-killer. The only plants that do well with an oversupply of it are the grasses. They have a great ability to choke any other plant if they are supplied with enough water and nitrogen. Needless to say this will include the legumes. Another reason to stay away from a nitrogen fertilizer is that in the presence of plenty of nitrogen the rhizomes will not fix any.

The annual potash requirement for hayfields averages around 110 lbs./acre. The roots and the microorganisms can extract some of this out of the rock content of the soil. The roots of the legumes draw some from the subsoil, provided the soil has no hardpan. An annual gift of 14 tons of cow manure provides 110 lbs. in potash.

The annual need for phosphate is around 25 lbs./acre. Three tons of manure would cover that need (based on average manure samples). No reliable numbers are available to me since most manure analyses are based on a diet of grain and/or feed concentrate that contains high amounts of phosphate.

Trace minerals: Boron

Most problems that I encounter are related to deficiency of the mineral Boron. Crops that are affected are carrots, celery, celeriac, cauliflower, turnips, and beets. To avoid crop-loss Borax is added to the soil at 15 to 25 lbs./acre.

Symptoms:

Carrots:

The leaves turn yellow at the tips and the roots are stagnated in growth.

Celery:

The heart of the plant turns black and eventually disappears.

Celeriac:

Like Celery but the roots turn brown as well.

Cauliflower:

The stem shows a split when cut open. At a later stage the curds have a glazy appearance and eventually turn brown.

Cabbage:

Same split in the stem as cauliflower. Cabbages with sufficient boron yields better and have more vitality.

Turnips:

Glazy spots that later turn brown.

Beets:

Black discoloration or spots on roots surface. Eventually the heart dies off and the plant stops growing.

The need to sustain a healthy hay field can be accomplished by: +/- 550 lbs. of Sul-Po-Mag { \$ 73.00 /acre }, or +/- 240 lbs. of sulfated potash { \$ 48.00 /acre }, and +/- 625 lbs. of rock phosphate. (I have no prices available.)

All vegetables have different nutritional requirements. A rule of thumb is that:

-Most vegetables have relatively low needs for phosphorus.

-Leafy greens have higher than average needs for potassium.

-Most vegetables are selected to do well with high levels of nitrogen.

-Most vegetables need a neutral pH.

From the perspective of the closed farm-organism potash is exported, but very little is newly produced or is coming in with the elements.

Average uptake from vegetables is:

81 lbs./acre nitrogen { available in +/- 8 tons of cow manure }

31 lbs./acre phosphate { available in +/- 4 tons of cow manure }

122 lbs./acre potash { available in +/- 15 tons of cow manure }

The reality is that hay would do very well with an annual gift of 2 to 3 tons of cow manure to the acre, while vegetables need more than what the numbers from a chemical analysis suggest in order to pro-

duce a competitive yield. Vegetables do not support structural and biological fertility and their roots rarely extract minerals from the rock content of the soil.

Physical fertility

There are about 200 acres under Roxbury's management. The way in which those are divided up can be looked at in two ways:

What is cultivated or is growing on it?

34 acres are set aside for vegetable crop production. That only 23 are being used is due to the fact that not all land is being cropped in any given year. Clover strips divide the fields up in sections that contain eight beds. This creates a system of permanent sections that allow for keeping records of where the crops have grown and aid in exact planning of where they will be grown in future years. They also serve as harvest lanes and as pasture for the bees since they mostly contain white clover. This takes up almost three acres of land that needs to be maintained. The remainder is taken out of production for the purpose of soil building, weed management, plant disease management, and diversification of the ecology present in those fields.

Forest and creek take up 40 acres. The water from the creek, a trout stream, is central in the success of

DIFFERENT COMPOSITIONS OF SEVERAL ORGANIC FERTILIZERS

the vegetable operation. The forest that surrounds all vegetable and hay fields provides habitat for wild life, birds, and insects.

126 acres are taken up by open land that is cropped with perennial grasses and legumes.

What do the cultivated crops grow on, in other words, what different types of soil do we work with?

A broad range of soil types can be identified on the 34 acres devoted to vegetable crop production. All land is without slope and contain very few large stones. All land has good drainage and shows no restrictions for root development.

-About 22 acres can be classified as a silt loam. This means that the soil particles are generally very small. This soil is able to hold water and nutrients real well, but warms up a little later in the spring. The most limiting factor are the small amounts of clay particles present. When this soil is worked too wet it will get compacted and therefore form clumps that inhibit the germination of small seeds. But the clay fraction has also positive characteristics. It increases the level of success on crops like broccoli, celery, lettuce and spinach, and melons have higher sugar content when grown on this heavier soil. The virtue of patience is a prerequisite in order to be successful on this soil type. If the sub-soil didn't consist of gravel, which functions as a drain-tile, the plantings of too many crops would be delayed. When treated correctly, the soil structure observed in this field is of the highest ratings. It will then be soft on your hands and feels like a sponge when being walked on. Despite its degree of difficulty, I love this soil-type. And like any love relationship it needs constant maintenance. But the rewards are high. All our crops yield significantly higher in this field.

Most of this land is considered a flood plain. Occasional flooding happens during the spring months when the melting snow makes the creek rise. Rye as cover crop, seeded in September, is required to prevent soil erosion. Another alternative that has proven to work well is a seeding of Sorghum-Sudan or Japanese Millet in July with Hairy Vetch mixed in. These crops are mowed no later than August so the long stalks can function as a silt catcher. Another factor limiting production is the fact that this land is a basin for cold air to flow to. In the spring, cold air from higher elevations sinks down into the plain, which can result in possible frost damage.

Some of the other vegetable land is on a sandy-loam. These 5 acres are also in a flood plain. There is no clay fraction in this soil. Nevertheless, this soil can be damaged if worked too wet. The silt particles provide water and nutrient holding capacity to the soil. On the other hand when the soil is worked too wet, it can cause compaction by sticking all the particles together. Tools like rototillers can break up those clumps again. But this tool fractures the soil-aggregates into its individual components. The silt fraction, separate from the other soil particles, will, after heavy rain, crust on the surface and cause all kinds of problems like inhibiting small-seeded plants from coming up, or causing the soil rapidly to dry out. This soil tends to be a little earlier, but because the land is low it also receives the cold air from the fields higher up. It is excellently suited for carrots and parsnips or other root crops. Some of the best tasting sweet corn has come from this field. This land needs frequent irrigation during the hot summer months, since the sub-soil is made up of gravel.

The third kind of soil is lighter in structure again than the previous one. All of this land {7 acres} is about 70 feet above the flood plains. Half of this acreage is gravely sand and the other half is a very fine loam. The loam feels like powder and has wonderful capacities as vegetable land. It doesn't have much capacity to hold organic matter though. Compared to the silt loam, it doesn't have much integrity. Here we need some of the highest import of compost and mulches to maintain a high production level. All our early tomatoes, peppers, egg-plant, cucumber, squashes, and melons are being grown here. Because the main limiting factor on this land is water, all crops are grown with drip irrigation.

Most of the hayfields are on deep, well-drained soil that consists of gravely sand to gravely loam. It produces some of the best alfalfa.

A good portion of this land has enough slope that it is vulnerable for erosion. A good use for this land would be fruit production. The higher elevation, good drainage, and open character create favorable conditions for apples and pears.

Structural fertility

When I talk about structure of the soil, I am speaking of the way soil-particles are ordered and connected. The way I can see an order is by looking at how the soil particles are spaced to one another and how many and how large the spaces are in between them. The connection between the soil particles becomes an issue when it is being worked on. Can it afterwards stand up to a heavy rainstorm or will it collapse and erode? Soils that have stable aggregates are therefore more stable soils. Some soils don't have the physical ability to create stable aggregates. In that case the only remedy is adding organic matter.

A good structure will have:

- An equal distribution between mineral particles and pores.
- Good ability for roots to penetrate.
- Good ability to hold water.
- Good ability to drain excessive water.

Hay fields and pastures are in general self sufficient in creating good soil structure. Their root system supports many microorganisms that feed directly on plant matter or live off the conditions created by them during growth as well as decay. And in general, most grasses create a surplus of carbonaceous materials. Organic matter always increases when a parcel is put in perennial grasses. This can help connect the soil particles. The microorganism that feed on the decaying organic matter also work throughout the soil as well. In this process complicated aggregates are created.

The extensive root system of the grasses helps the way in which the soil particles are ordered. They leave many pores and effectively hold the soil together.

Vegetables do not support soil structure very much. Their root system is usually not very well developed. And there is rarely a net gain in organic matter. Strategies to support good structure are:

- Supply high amounts of organic matter that contain humus formative particles.
- Add Calcium as building block for clay soils.
- Avoid breaking up the soil beyond natural breaking points
- The use of root activity of cover crops.
- The use of preparation 500.
- Frost as an action to fracture compacted soil.

In general a tillage tool should not fracture the soil more than what we can accomplish by dropping it from a height of three feet. This will put a demand on how we treat the soil during the season. The main principle that I apply in working with the soil is to use tillage equipment that has a similar action like a hand-fork. This tool will by its nature fracture the soil at its own breaking points. A spade, by its nature of slicing the soil, tends to damage the aggregates. This can be seen by the coloration of the soil particles at the back of the spade.

Further I make a distinction between three different purposes of tillage:

- Aeration of the soil. {Depth anywhere between 8 and 18 inches}
- Incorporation of organic material. {How deep do you want to put your organic material?}
- Creating a seed or plant-bed. {How smooth and level does this have to be?}

Conventional equipment rarely combines all three tasks. Only a spading plow with secondary attachment will accomplish this, but it will aerate at the same depth as it puts the organic materials.

For primary tillage I use a Chisel plow. In order to incorporate cover crops with this tool the use of a shredder or flail-mower is necessary. The chisel

plow does not turn the soil and leaves a lot of debris on the surface. After the primary tillage a Perfecta II Cultivator is used to smooth out the field. This is a tool that consists of a combination of several "S" tines, a leveling bar, and a set of crumbling rollers. It leaves the soil level and smooth enough to plant: cover crops, cole crops, potatoes, squash, and even lettuce-plugs. For crops that have small seeds and that require extremely level ground with no clumps or stones on the surface a Buckeye bed former is used. This tool leaves a trench every 72 inches, creating a soil surface that resembles raised beds. The planting surface of the bed is 54 inches wide and allows for three rows 18 inches apart. The trenches have proven to be very successful in allowing the crops to stay dry much longer during periods of heavy rain. The combination of better drainage and the level plant bed prevents bottom rot and creates conditions for successful mechanical weed control.

Biological Fertility

When I talk about biological fertility, I distinguish between three areas of importance:

- The cycles in nature that include decay and decomposition of organic matter.
- The creation and maintenance of soils.
- The nutritional value of cultivated plants.

At Roxbury Farm this is addressed with the following measures:

Compost and Manure.

Roxbury Farm works closely with the company Terra Nova. This company was formed with the help of the state of New York to research the possibility of keeping organic materials out of the landfill. Right now Terra Nova operates in cooperation with Roxbury Farm and collects produce from supermarkets, horse bedding from farms, pulp from canneries, and even mice droppings from a mice-breeding facility. These materials are mixed with a Sandburger compost turner and carefully monitored for temperature and moisture. This machine is also utilized to make compost from the cow manure generated at Roxbury Farm.

The process:

During the winter the cows are kept in a free stall setup. The hay is fed in the form of round bales inside the free stall and placed on top of the packed manure. The cows are kept dry by applying bedding on a regular basis. This can consist of old hay, straw, or wood chips collected from horse barns. If an adequate source is available, I would at that time mix in some form of rock dust, like Basalt meal.

After six months the packed materials are about three feet deep. In May the manure gets removed with a bucket loader. The piles are initially built with a manure spreader and given their final shape with the Sandburger. At that point the biodynamic preparations are placed into the pile. The importance of having a variety of materials in a manure-pile is to allow it to be mostly self-sufficient in the process of transformation. A combination of aerobic and semi-anaerobic bacteria develop in a pile that has a variety of materials in it. The piles heat up to approximately 120 degrees Fahrenheit and stay at that point for quite a few weeks. A specially designed cover is placed over the piles to shed any excessive rain and to keep the moisture in. The cover functions like a skin. It protects the pile from the elements without restricting it from breathing. A pile acts like any other organism on the farm: it breathes, consists mostly of water, and has body warmth. The piles are turned only once and, if necessary, water is added. The whole process of composting takes about 6 to 8 weeks. The compost is considered raw but stable when it is applied. The ideal time of application is on a cloudy day with plenty of rain in the forecast. After application the ground is chiseled and a fall crop of vegetables is grown or alternatively seeded down with sorghum Sudan. The spring vegetables are either grown on the residual activity of last year's compost or get a fresh application of compost acquired from Terra Nova. Manure handling can be the weakest link in the farm's fertility cycle. At Roxbury I work hard to keep nutrient losses as low as possible.

**AMOUNTS OF ORGANIC MATTER OF DIFFERENT CROPS REMAINING
AFTER HARVEST IN SAME YEAR AND FOLLOING.**

All numbers in lbs./acre

Over the years I have learned to observe what role the different fibers play in the composting process. Most fibers are "used up" at the end of the composting process. Hay and straw are good examples of being good energy providers for the microorganism. Their presence is vital in the process, but I also include materials that contain lignin. They take a longer time to break down, and this kind of carbon compound is not readily available as an energy source for the microorganism. But at the end of the composting process they contribute to the formation of humus at a much higher rate than fibers do. All carbonaceous materials have a different ability to become humus. The materials with high lignin fractions, like peat moss, sawdust, and leaves have what we call a high humification co-efficient. They alone cannot provide the micro-organism with enough energy to start the decomposition process. So sometimes hay, straw, or green material has to be added to the pile to jump-start the process. The manure contributes nitrogen and other building blocks that are needed for the micro-organism to grow and multiply. By adding soil or rock dust to the manure, we create conditions that can occur only under ideal circumstances in very good soil. The humus can then turn into a clay-humus complex. This aggregate represents the most stable soil component, which has a very high capacity to hold nutrients and water.

The eventual goal in applying good compost to the land is to increase the overall health of the soil. Its organic matter content can reveal the health of the soil. I prefer to apply the compost in a relatively raw stage, when it still contains two kinds of organic matter:

Humus, which is the most stable form of organic matter that:

- Has the ability to absorb both nutrients and water. Humus can hold up to four times as much water than clay, and the nutrients are available to plants but cannot be washed out by excessive rain fall.
- Increases a stable structure of the soil.

Fresh organic matter is important to add to the soil because:

- It feeds the micro-organism. There is a lot of energy left in a pile, which is not fully decomposed.
- It keeps the nutrients in a cycle.
- It creates a better structure of the soil by acting like glue to the soil particles.

At this stage an application of approximately 20 yards of compost per acre are needed for vegetable crops to guarantee a competitive yield. This amount contributes to overall soil and plant health. The raw materials are a combination of our own cow manure and imported compost from Terra Nova. If Roxbury aimed to be fully self-sufficient, the ratio of acreage between hay and vegetables would be around 18: 1. {Without taken into consideration the need for additional acreage for pasture}

Here is what the numbers look like at Roxbury:

Hay: 80 Acres {generating 250 yards of compost}
Pasture: 80 acres {biologically self-sufficient}
Vegetables: 23 acres {total needs are 460 yards of compost}

In order to maintain a healthy and productive 80 acres of hayfields, 160 tons of manure should be recycled back. {In my experience 1 ton of manure makes approximately 1 yard of compost} This will leave 90 tons of manure, generating 90 yards of compost. This amount can fertilize 4 _ acres of vegetables. The idea has always been that the vegetables eventually will need only 10 yards of compost once the soil is built up. The reality is that all the compost is returned to the vegetables and the hay fields are biologically self-sufficient. Their needs are addressed in different ways.

Cover crops

Other means of increasing biological fertility are the several cover crops being grown. For greatest uptake of carbon, Japanese millet and sorghum-Sudan are favorites. As a winter cover crop, rye and hairy vetch are most effective. Plowing these crops down is important for soil-life, though the humification co-efficient is very low. Soil life is greatly

benefited by the mere fact that the ground is not left exposed. The roots of the cover crops after breakdown form the very important capillaries for drainage as well as water uptake.

The roots of the legumes live in symbiosis with micro-organism called rhizomes. Look at the roots of the legume to find out if nitrogen is being fixed: if the roots have nodules, which are red or pink colored inside, it has active rhizomes. If the roots do not show nodules, find out if the soil pH is too low or if the particular rhizome is in your soil. Many legumes live in symbiosis with different rhizomes.

Here is what we seed what month:

April: Oats, Rye with Dutch white clover, {the rye will not form a seed head}

May: Rye with Dutch white clover, Sweet clover, red clover over seeded in the oats

June: Buckwheat after spinach or other early crop, Sweet clover, red clover over seeded in the sweet corn and winter squash, mixed in.

August: As in July

Sept: Rye with Hairy Vetch, Oats.

Oct: As in September.

Nov: As in September.

Another benefit of cover crops is the diversification of the farm ecology. Most insects feed off the pollen of the grains and grasses. In some instances the cultivated crop acts as a beneficial host. The pollen of the sweet corn is a good example. For that same reason I leave some parsnips in the ground. The flowers that are formed in the following spring provide a habitat for the trichogramma wasp. Dill, which is another Umbelliferae, serves the same function. After the dill is cut, the plants remain alive and produce flowers at a time when the parsnips have gone to seed. The white clover in the harvest lanes feed the bees, and the sod serves the purpose of a cover for the eggs of many insects. This is not always beneficial since the flea beetle

and carrot-fly take advantage of this environment. One major setback of having grains grown close to the vegetable areas is that when we cut the grain, say for straw, the thrips that made their home in the grain jump almost immediately onto the onions. The result can be devastating.

Crop rotation.

The rotation of the vegetable families serves the purpose to break cycles of diseases that need a host plant to survive.

At Roxbury the different plant families are:

Apiaceae or Umbelliferae: carrots, parsnips, parsley, celery, dill, etc

Asteraceae or Compositae: all the lettuces, escarole, certain cutflowers.

Brassicaceae: all the cole crops including broccoli, arugula, turnips, etc.

Chenopodiaceae: all beets, chard and spinach.

Convolvulaceae: sweet potatoes

Cucurbitaceae: all cucumbers, melons, squashes etc.

Fabaceae or legumes: peas and beans.

Liliaceae or Allium: all the members of the onion family

Poaceae: all grains including sweet corn.

Rosaceae: strawberries

Solanaceae: all nightshades, including eggplant, peppers, tomatoes, etc.

There are a few vegetables, herbs, or cut flowers that are adopted in another family because they are relatively insignificant. A rule of thumb in any crop rotation is that no family follows itself in less than four years. Another guideline to use is to have plants with opposite nutrient requirements follow each other. And lastly, crops that show great weed pressure in the summer are alternated by crops that see this pressure more in the spring or fall. This is done to offset the cycle in which those plants go to seed.

Use the following as an example:

Mulches.

Whenever possible, I like to see the ground covered. If this cannot be established with living mulch like in the sweet corn and squash with clover there is always the option of dead material for mulch.

Garlic:

After we plant the garlic, the beds are covered with about six inches of leaves, which are brought in by the local highway department. Six inches is a sufficient amount if you don't like to weed at all the following year. The garlic pops right through in the spring so this system works quite well for me given the fact that perennial weeds are not a problem any more.

Peppers, eggplant, tomatoes, cucumbers, melons, summer-squash:

Whenever they are grown in black or IRT plastic, the open space between the plastic is covered with rye straw. All the straw is grown on the farm and is in fact a fringe benefit by using it as a cover crop. We need to cut and bail about 10 acres to cover 4 acres with mulch. The mulch is applied by simply rolling out the round bales from one end of the row to the other. This thick swat covers about four wheel tracks and is put in place with hayforks. One note on the use of any dead mulch: great efforts should be made to have the land as clean as possible regarding weed seeds.

Biodynamic preparations.

Within the management practices of the biodynamic preparations we can distinguish between two different kind of applications.

The compost preparations. - The central thought behind the compost preparations is to give the compost a memory. When you make compost, the original material will transform into something completely new. Even chemical analysis can not determine what the original material consisted of provided the original materials were of organic origin and the process of composting was done correctly. The word organic does include all compounds that are of organic origin, including chemicals.

There are six different compost preparations:

The *oak bark preparation* is made of finely ground-up oak bark that is put inside the skull of a freshly slaughtered cow. Great care is taken when the brains are removed to make place for the oak bark. Some people use a garden hose to flush out the brains but most likely, even though it appears to be gentle, it has the effect of flushing the essential membrane out as well. The membrane should be left intact, since the working of this membrane has the desired influence on the transformation of the oak bark. The skull is then placed in water that is preferably mucky and moving. This preparation will, if made properly, give the capacity to the compost to make the plants, grown on the composted soils, resistant to disease.

The *chamomile preparation* is made of dried chamomile flowers that are briefly soaked in lukewarm chamomile tea. This substance is then placed in freshly obtained intestines of a cow. Again, we see people clean these intestines out a lot with water, but we recommend leaving them the way they are to avoid damage. An intestine free from grass is ideal, but avoid any intestine from a cow that was grain-fed. The stuffed, so-called sausages are then placed in the soil and kept there

over the winter. Great care is taken in what location the preparations are buried. The ideal location is where snow usually accumulates. The intestines will help the chamomile transform into a substance that will give the compost the ability to work in the processes in which potash and calcium are involved. The manure treated with the chamomile preparation shows greater stability of its nitrogen content.

The *yarrow preparation* is made with dried yarrow flowers that are briefly soaked in lukewarm yarrow tea. This substance is placed in the bladder of a stag that is enlarged by simply having it blown up like a balloon. This little bag is hung up on the south side of the barn during the summer months. In the fall it is buried the same as the chamomile preparation. The yarrow preparation gives the treated manure the ability to work in the soil in such a way so that it is capable of adsorbing minute quantities of trace minerals.

The *nettle preparation* is the easiest to make and can also be used as a foliar spray. The nettle is harvested before the flowers go to seed. It is then directly placed in the earth, but not in direct contact with it. We place a layer of peat moss between the nettle and the moist earth. It is left there for a full season {summer and winter}, and is then dug up and used as a preparation in the compost pile. Nettle does not need an animal organ. The nettle preparation has a strong relationship to the iron processes in the plant.

The *dandelion preparation* is made from the dried dandelion flowers. The flowers are picked in the morning. Only the flowers that have not yet fully opened are useful. When they are dried, the flowers that are too mature would enter the seed stage. When we make this preparation in the fall, we start by soaking the flowers in lukewarm dandelion tea. The next step is to place this substance in little bags that we form out of the mesentery of a cow. The mesentery should be free of fat since that would inhibit proper transformation once it is placed in the soil. Also, when the bags are too large, there is a chance that the substance will turn into silage. A good size is about the size of a tennis ball. These pockets are then buried like chamomile. The dandelion preparation is working through the compost in giving wisdom to the soil. All the positive influences from stream, pond, forest, meadow and fields become available to the plant through the composted soil, giving the plant the faculty to attract these influences.

The last is the *valerian preparation*. Here the flowers are collected and the juice is pressed out. We are not blessed with having any significant amount of it grown around us, so I don't have any personal experience with making this one. But I can describe how to make it. First of all, make sure you have the real *Valeriana officinalis*. I have seen people using plants that look just like the valerian, but if it is not the real thing, it will not do what we are expecting. What you are after is the juice of the flowers. You can use a press to squeeze the juice out of the flowers. There are two variations available: one is fermented, which I prefer, and the other is bottled up the way it comes out of the press. The

smell of the fermented valerian is absolutely wonderful. This preparation is made without an animal component like the nettle. The finished tincture is diluted in lukewarm water, stirred vigorously and sprayed onto the compost pile. The valerian acts like a skin and contributes an element of warmth to the pile. In the spring I take advantage of this ability by spraying the valerian tincture on tender plants to protect them from early morning frost.

The field sprays: - The *horn-manure and horn-silica* preparations are both made with the horn of a cow. The horn of the bull is too soft. This is one of those interesting phenomena that Darwinism has no satisfying answer for. In the fall we make the horn-manure preparation. The manure from a lactating cow is selected. The manure should have enough form so that the shape of the intestines is somewhat visible. But avoid using pies that start looking like sheep-manure. We place the manure into the horns and then bury them with the points of the horns sticking up to avoid rainwater from collecting in them. In the month of May this preparation is dug up. The substance in the horns has by then become odorless. If there is a smell to it or if it still looks like manure, then you know that it has not been properly transformed. Before this preparation is applied to the fields as a spray, we have to dilute it in lukewarm water. About a tennis-ball size quantity per thirty gallons of water is sufficient. This is stirred vigorously in one direction until a vortex is formed, then the direction is reversed and stirred in the opposite direction to create another vortex, etc. The total time of stirring is one hour. The solution will now start smelling again, not like manure, but definitely alive. For filtering the liquid I found paint bags to be the best, the ones painters use to filter their paint. We do the filtering to avoid wasting time in the field cleaning spray-nozzles. Our Solo backpack sprayer covers about one acre if filled up. This is about three to three and a half gallons. This preparation is sprayed directly on the soil. If the soil has been worked, it can readily adsorb the positive influences of this preparation. Horn manure directly influences the way organic matter is transformed in the soil. Its positive influences are similar to what organic matter does to the soil. In general, we notice that horn manure works on germination, root development, and growth. To me horn manure makes me think that the organic matter level of my soil is a lot more than the 3% I am really dealing with.

The Horn-Silica preparation makes use of a cow-horn again and finely ground Silica. This is then placed in the ground during the summer months. A much smaller quantity than the horn manure, no more than a pea-size amount, is stirred vigorously in 30 gallons of water for one hour. This solution is sprayed directly on the plants. The Horn Silica has a strong connection to the light and warmth forces of the summer. Its positive influences are similar to what the summer sun contributes to the plants. It slows down growth but increases the overall plant mass. Plants treated with this preparation will have better taste and keeping qualities. All preparations with the exception of Horn-Silica should be stored in peat moss, in a dark, cool and damp place. Horn-Silica is left in a glass jar in a windowsill.

Kimberton CSA: Biodynamics as Practiced

by Barbara & Kerry Sullivan

by Jack Kittredge

The area just north of Philadelphia, Pennsylvania, is struggling to maintain its identity. Suburban development has driven up land prices and a strong economy has created a ring of corporate parks and upscale shopping malls on what used to be open space. The Valley Forge National Park has managed to hold off development on a few thousand gently rolling green acres, and the Kimberton biodynamic community has managed to protect almost a thousand more.

In the 1930s and 1940s the area was still farms. A disciple of Rudolf Steiner and his Anthroposophical movement bought up a number of them and put together 800 contiguous acres on both sides of a stream. He started a biodynamic school, in which noted soils researcher Errenried Pfeiffer taught for awhile. They ultimately had a falling out and Pfeiffer moved on, but a Waldorf school was organized there. Eventually 400 acres were bequeathed to that school and the other 400 acres to a Camphill community.

Waldorf schools are usually organized with agriculture as a central focus, and often are associated with farms. In this case the Kimberton school ran a dairy farm for many years on its land. When that finally became unprofitable, they leased the land with a requirement that it be farmed biodynamically. Seven Stars Yogurt now uses the land for their biodynamic yogurt business. Seven Stars, in turn, leases out 10 acres and provides manure to a biodynamic CSA run by Kerry and Barbara Sullivan.

Barbara went for a year and a half to Antioch College, then spent two years at Humboldt College in California. Kerry went into farming right out of high school. They met in 1976 when they both went to apprentice at Alan Chadwick's place in California, learning the double digging system. From there they went to work at the Mother Earth News, in North Carolina. It was while they were in North Carolina that they became interested in biodynamics.

"We prided ourselves on our compost," says Barbara. "But we met a guy who urged us just to try the biodynamic preparations on our compost, so we did. We made one with the preparations, one without. The difference was amazing — it smelled different, broke down differently! We used the compost in soil mixes and noticed a big difference in root growth. We started noticing more flavor, a deeper sweetness."

From North Carolina, the Sullivans decided to go to Emerson College, in England, to study more about biodynamics. Emerson is an Anthroposophical school so the Sullivans learned about art and dance as well as getting to visit farms all over Europe.



photo by Jack Kittredge

A number of biodynamic preparations involve use of cow parts: horns, skull, intestines, and inner membranes. This cow was killed just one day prior to the farmers gathering to make preparations.



photo by Jack Kittredge

Kerry and Barbara show some of the brassicas they raise on their 10-acre, 200-member CSA.

They planned to go for 9 months, but ended up staying two and a half years. Returning to the US committed to biodynamics, Kerry and Barbara heard about the opening at Kimberton and applied. They have been running the CSA ever since, 14 years now.

"We have about 200 families in the CSA," says Kerry. "It goes from late May to early December — about 30 weeks. Members pay about \$650 on the average — roughly \$20 per week. About 7 of our 10 acres are under cultivation, so we do as much tractor agriculture as we can, to reduce labor. The members also do a lot of uppick — they do all the paste tomatoes, the cherry tomatoes, the beans and peas, the berries, and the cut flowers. The flowers and fruit really bring people in! The garden is open 24 hours a day for uppick, and Tuesday and Friday are pickup days for what we harvest. Members have about 24 hours to pick up their share."

Most members come from within a 10 mile radius of the farm, although some are from Philadelphia, which is about 30 miles. The CSA doesn't deliver, so members must get to the farm each week. Part of the impulse of the CSA in the beginning, Barbara reflects, was to educate people about how much it costs to grow food. Coming out to the farm and helping with picking makes the work involved much clearer to members.

The glaciers stopped two counties north of Kimberton, she adds, so there are hardly any rocks in the rich soil. The land isn't quite as good as Lancaster County, which is next door, but Barbara says some of the Amish over there are getting interested in farms near Kimberton — it's getting cramped for them because they keep having kids and have to divide their farms.

Kerry and three interns, one of whom is part-time, run the farm. He says there is increasing interest among young people in learning farming, even though some of them are "turned off" by raising animals. Kerry keeps one or two hives of bees for pollination, as well as hens. He has had good results with formic or oxyalic acid in the hives for mites.

The chickens are certified by Demeter under their organic label, not their biodynamic one — the Sullivans don't raise their own chicken feed, so the animals aren't part of the circular farm system required for a biodynamic certification. But the couple wanted to have an animal influence in their garden. So they bring the chickens right into the beds via moveable housing (moved every 7 to 10 days) which can be closed up every night. Hawks have never presented a predator problem, but foxes

will get in if the electric fence stops working or grounds out. The eggs sell for \$3.00 per dozen and people fight over them. They used to be priced at \$2.50, but Barbara figured they were losing money at that price because of the high cost of organic grain.

Most of the seed Kimberton uses comes from Johnny's or Fedco, but they have an excellent beet, Detroit dark red, the seed of which they have been saving and selling to other biodynamic growers. Barbara says they have decided against raising corn or potatoes, because they don't do well in their soil and take up too much space — members far prefer the berries which can be grown in the same space! The farm has also had great success with filberts, which they get as plugs from Badgersett Farm in Minnesota.

Thirty or forty percent of the CSA members are connected to either the Waldorf school or the Camphill community, estimates Kerry. That aspect of farming for a supportive community was part of what attracted them originally to Kimberton.

"A farm can be an ideal community," Barbara feels, "and people touched by it can be really affected. When we came here we came to work with the farmers at the dairy farm. We were going to do vegetables in connection with a dairy farm. But by the end of the year all the farmers there had left. A new farmer took over the dairy farm, but he didn't want to work with the CSA. We never wanted to work on our own. People need to learn to work together. I don't think a family farm is the model for the future for a number of reasons — economic and that you never can get away, it's hard on people. Unless you specialize you can't make it, and if you do you become an employer. So I think the future will need specialists who can work together to develop the farm as a mental and spiritual activity."

Barbara contends that Biodynamics is the only farming system which recognizes this reality, because it is based on the premise that there is a spiritual world behind the material world that we see. Clairvoyant people, she says, are able to communicate with this spiritual world and bring back knowledge. Rudolf Steiner was born clairvoyant but put himself through rigorous scientific training. As a result he was able to do spiritual research and tell us what is the true nature of the world.

"People used to have a connection to the spiritual world naturally," she says. "But with our intellectual development, that has been cut off. So we're now focused on the material world and its expression in

natural science. But through his spiritual research, Steiner was able to get spiritual insights and bring them back. He says he tried to put spiritual truths in a form that is appropriate for modern western minds. Steiner was very educated. He was chosen to edit Goethe's works. But he grew up among peasants. He said he was glad that, when he was young, he had grown potatoes and herded pigs. He had a lot of love for farmers.

"Someone," Barbara continues, "gave me the agricultural lectures of Steiner. I thought this guy was out of his mind! Then, over time, as I gathered more practical experience and met more people who were biodynamic, I went back to it and got a fuller understanding. I had been doing organic farming, and it seemed like the next step. We're working a lot with life forces, here. If you think of the difference between a stone and a plant, a stone has a material existence but no life. A plant, however, has something that makes it grow and change. Life forces come from the universe and are poured into the earth. We have to make everything receptive to them since that's what animates the whole earth. If you are a materialist, you handle the substances but don't think about the life force they are filled with. In biodynamics we are trying to learn about handling these life forces directly."

The biodynamic preparations described by Steiner in his lectures are sprays and compost enhancers which, the Sullivans believe, are extraordinarily filled with life force. As soon as you start to work with preparations, Barbara says, you see things changing: "I can't put that down as scientific proof. But I see the vitality, the connection people have to food in this garden. People by springtime have a hard time staying away."

Kerry adds: "Rudolf Steiner could see these things directly, but we need a way of testing our preparations. Some methods have been developed to take actual pictures of the life force in a drop of water. You can take highly enlivened water (actively stirred according to biodynamic principles), and compare it to well water, which is very pure but not filled with life force. You will get two completely different pictures. This is unexpected, given they are both water molecules."

The Sullivans get together with neighboring farmers and make biodynamic preparations each fall. The event usually revolves around the slaughter of a cow because several of the cow's organs are needed — the skull, horns, small intestine and mesentery, a membrane enclosing all of a cow's inner organs.

"All this sounds really gory," Barbara agrees, "but when you're on a farm dealing with animals every day, it's not a big deal. What I like about biodynamics is that you're tied into living matter. You understand it has spirit, but you work with the matter. With a cow, to understand the spiritual nature of her you have to look into the functions of her different organs in the natural world. The mesentery goes around the internal cavity, but it also folds and encloses each intestine. It's intricately laced with blood vessels, it's beautiful!"

The Sullivans use all the biodynamic preparations, the 6 in the compost and the two sprays, as well as horsetail, which some people don't count as a preparation. It is not really prepared by fermenting or packing into an animal part for burial; it is just dried.

"The preparations all have a number." Barbara explains. "I don't know why. I guess it helps to have a number if you are ordering them. Preparation 500 is horn manure. Cow horns are stuffed with fresh cow manure and buried over the winter. If you have animals which are fed on silage, their manure doesn't turn as well as manure from grass fed animals. You want manure which isn't real runny, or it will turn into something completely different. We dig it up in April or even as late as May. A quarter cup of this per acre is mixed in water and sprayed on the soil. Five hundred really works on root growth and humus formation and forces under the soil. From what I heard, using 500 made a dramatic difference in the soil quality in a short time in Australia. In the spring we put ground quartz crystal in the horn and bury that over the summertime. That



photo by Jack Kittredge

Wendell, a Camphill resident holding the horns to be used for horn manure, stands in front of the Pennsylvania style barn where the farm's preparations are made. Wendell goes home to his mom in New York City for holidays.

is the horn silica preparation, number 501. Silica is a forming, maturing agent. Silica goes in a fine mist on the leaves. The horn manure preparation goes in large drops on the soil. Both horn preparations are stirred into water and used as sprays. The other ones all go on the compost pile. You can use these preparations with whatever compost materials you have — manure and straw or grass clippings, leaves and vegetable waste.

"From this cow's mesentery," she continues, "will be made the dandelion preparation, buried in the earth for the winter. A teaspoon of this in compost is plenty. The small intestine will be filled with chamomile flowers and buried. Oak bark goes inside the cavity of the skull — there are different ways of doing it. If you get a skull earlier you put it in the compost pile and the flesh disappears. Inside, where the brain is, there is a membrane which some people feel is important to keep in the skull. The oak bark is scraped from the tree with a rasp, crumbled into fine particles, and the skull cavity is filled with it. You pack it in, then place the skull in a watery, slimy area where moisture trickles through all winter. So here we use a rain barrel which has some organic matter in it. We've also buried it in mud at the edge of a river. The final product has an anti-fungal effect on the compost, as well as helping with calcium.

"There are some preparations which don't use cow parts." Barbara concludes "We squeeze the juice from valerian flowers, ferment it in the bottle, and spray it over the compost pile. The flowering stinging nettle plant is buried in the ground. A stag's bladder is filled up with yarrow blossoms in June or July. A teaspoon of this is enough for 10 or 20 tons of compost, along with the other preparations."

Barbara and Kerry make plenty of preparations each year with interns, Kerry says, more than they need, and give a lot away. Usually the preparations work as a group on compost. But some people are experimenting with them singly as seed baths, teas for seeds, or individually on trees. Farmers also sometimes make barrel compost which is manure, layered in barrels or pits, with the preparations sprinkled over each layer. That is then mixed in water and sprayed. It is usually used over new land, before you have enough compost to cover it, to get

the effect of compost preparations. The 500 and 501 sprays work better, many feel, if you already have the effect of compost preparations in the soil.

The horn preparations, and the Valerian one for compost, need to be actively stirred in water — valerian for 15 to 20 minutes before application, and the horn preparations for an hour each. The stirring is supposed to be done in one direction for awhile, then the other, to set up reciprocal vortices. Experienced stirrers say that after long periods of stirring, the water moves into vortices more easily. According to Kerry, "Water droplets are like onions. They are composed of sheet upon sheet upon sheet. Whenever those sheets move against each other, a vortex is formed."

The Sullivans use a flowform to energize water. Flowforms, which are usually masonry structures through which water flows, are designed to set up vortices in moving water. They are used a lot in New Zealand, and are considered a close second to hand stirring. The one Kerry and Barbara use is set up to make vortices in both directions, and to continually recycle the water. A sculptor developed their form after studying water in its natural settings. They simply turn it on and use it to stir preparations instead of doing it by hand.

Burying the preparations has to be done carefully, Kerry says, to make an effective preparation: "You only go down a few inches, in good soil — the more humus the better. If you bury preparations in tissue which has too much fat in it, they don't turn — you take them out in the spring and they just stink. It insulates the preparations from the forces involved. But if you do it right, there won't be any skin left when you dig it up. You have to really mark the spot. We put stones over it, and mark the spot with stakes. When you dig it up you need to go in with a spoon to get the preparations out. We usually dig it up in April, around Easter. We dig up a horn first to see if it's finished turning. If not, we leave the others in for awhile. If you leave them too long, and it gets too warm, worms can get into the preparations."

Kerry stores his preparations in his distribution shed. The walls are thick and well insulated, and he uses the shed for storing root crops in the winter.



photo by Jack Kittredge

Apprentices make one of the preparations by stuffing dried chamomile flowers into cow intestines. The resulting "sausages" are buried and then applied to compost piles.

During the summer he can turn on an air conditioner to cool it, if necessary. He stores the preparations in containers placed in bins full of peat. Peat is reputed to have the ability to stop radiation and keep the preparations energized with the life-forces they picked up while underground. If left just anywhere, he says, preparations can dry out and lose a lot of their power.

Even if you make preparations well, Kerry says, if you try to put them into a poorly made compost pile, they won't help it. Most biodynamic farms would try to have at least some cow manure as the basis of their compost. The Sullivans get their manure from the Seven Stars Yogurt operation next door. They get a lot when the barns are cleaned after the winter, then a trickle during the spring and summer when the cows are in for milkings, then another flush when the cows go back in for the winter. They pay an annual price for it each year.

Normally the preparations are placed in little holes in the manure pile. Kerry pokes a hole in the pile at an angle about half the way in, opens it up, and places some preparation into a ball of compost, which he throws down the hole. He does that every few cubic yards, sprays valerian over the top, covers it, and that's all. The cover helps regulate moisture levels if there are sudden rains, but the pile also can dry out, so Kerry puts drip tape along the top so he can water them. The effect of the preparations spreads out from each hole for several yards. Normally, Kerry says, if it's built right, it doesn't need to be turned. It just takes a little longer. Kerry does check with his thermometer to see if it is going well. When it's finished heating, he uses it.

Besides using the preparations, the Sullivans also plant by the biodynamic calendar originally developed by Maria Thun. Thun spent years researching and testing crops planted under various heavenly influences. Some who have tried to replicate it don't find the same results, so it's a controversial aspect of biodynamic agriculture.

But the Sullivans feel it makes sense. As Barbara explains it, "the Anthroposophical world tries to integrate spiritual science, natural science, and personal spiritual development for the benefit of the individual and the society. In biodynamics, for instance, we don't ignore natural science. We take all the best natural science we can. How to treat the soil? How to recognize insects? How to select plants? But there is another side which comes from spiritual science. How do you work with the cosmic rhythms? A lot of biodynamic people plant by the

calendar because certain constellations are out. We know how powerful sunlight is for plants in nature. But the moon, planets, stars are all radiating influences down as well.

"The basic idea that the other heavenly bodies influence the earth is a Steiner idea," she continues. "But the specifics of planting a root crop at a certain time, different from a leaf crop — I don't think Steiner ever said that. You're not required to use the calendar to be certified as a biodynamic farm, for instance. Some don't use it and think it's hokum, while others are blown away the first time they use it."

Biodynamics has always had a big connection to social issues like education, therapy, and community. Steiner stressed that you can't farm in a vacuum, away from larger issues. The biodynamic community at Spring Valley, for instance, has a Fellowship Foundation which takes care of elderly people with a nursing home and a big farm. The dairy farm at Kimberton includes a Camphill community — a biodynamic community which takes care of the handicapped.

"There's 100 to 150 people living there in different houses," Kerry explains. "They're adults and live in households. The villages are all handicapped but there are many co-workers or houseparents as well. Camphill had it's own approach to farming. The farm isn't the main thing. It's taking care of handicapped people in an agricultural setting. The residents, who are mentally handicapped, work in the dairy and the garden. Some Camphill farms are self-supporting but this one is not. It refuses to take any government support, so that's why they're struggling."

"The families of the handicapped people," He continues, "are local or move to the area and often help to support the community. The Kimberton Camphill village is for adults. They are unpaid volunteers, but the community will take care of them. It's a nice life — they're included in the administration to the extent they can participate. They use some machinery, but not as much as many farms in order to keep the work accessible to the workers. Some of the workers can drive tractors."

The Anthroposophical worldview, which comes out of the work of Rudolf Steiner, has led not only to biodynamic farming but also to Waldorf education. The Waldorf School at Kimberton is known as a good private school, graduating competent, creative students. They use music, paintings, sculpture, and theater in the learning process, as well as more traditional disciplines. It has about 25 kids per class, kindergarten through 12th grade.

"Parents will drive 30 or 40 minutes to get their kids here," Barbara says. "There's a core of parents who are into biodynamics, but many are not. Some feel it is important enough to have their kids enrolled in a



photo by Jack Kittredge

Finished preparations ready to bury. The sausages are chamomile sewn into intestines. The rounded bundles are dandelion wrapped in mesentery.

Waldorf school that they move nearby. The cost is pretty steep, but they give you a break if you can't afford it. It used to be \$3000 or \$4000, but now I'm sure it's more."

"We don't farm for the school," notes Kerry. "They have their own garden program, but the third graders will often come to our fields to help out with the harvest, or go to the dairy farm and help with milking and cleaning the barn. The ninth graders get sent away to organic farms all over the east coast."

The biggest problem Barbara and Kerry experience with Kimberton is that it is too developed. Life is very suburban, oriented to cars and shopping malls, and community values and rural culture are not respected. Barbara has her heart set on moving to a place like Vermont where, she feels, she will be more comfortable. Kerry is skeptical, wondering if it makes sense to leave the long growing season of Pennsylvania for the cold of New England. But Barbara finally got an ag science degree last year, at 49, and thinks this is a good time to make the move.

"You can always make a mistake over wishful thinking," she says. "But this has been hard for me to ignore. We have no kids, just apprentices. I feel like it's a destiny to go."

However that decision plays out, Kerry and Barbara are determined to continue their connection to biodynamics with its stress on community. As she says: "We have a world view of how earth and humanity has evolved, and what our future destiny is. Our consciousness at one point was much more clairvoyant, more connected to the spiritual world. The whole practical life was derived from the religious life in times past. But the Western world evolved away from this, stressing the independent individual. Now we can start evolving back and bringing those strong egos together in communities of strong individuals."



photo by Jack Kittredge

Kerry prides himself on the high quality compost he & Barbara make adding BD preparations to the manure on the adjoining dairy farm.

Permaculture in The Northeast

by Eric Toensmeier

What is Permaculture?

One of the most common questions I hear is “What is Permaculture?”. Some dedicated enthusiasts will claim it is the solution to all the world’s problems. Some practical farmers will tell you it is a pie-in-the-sky philosophy for people who want waterfalls on their hobby farms. It seems to me that while Permaculture is certainly not going to answer all of the problems faced by those of us in the northeast food system, it is a valuable design tool that more people could be taking advantage of.

Developed in Australia by Bill Mollison, David Holmgren and others, Permaculture is a set of design principles which can be used to develop sustainable systems to meet human needs for food, shelter, and energy. Permaculture does not have a monopoly on any particular kind of production. Like Holistic Resource Management, it is a tool which you can use to improve the management of your farm. It’s not about your chicken strawyard, or your vegetable garden, or your orchard. Permaculture is about how you tie all of these elements together to create an elegant, integrated, lower-maintenance system.

Principles of Permaculture

Permaculture design is based on a set of principles. In theory these principles can be applied in any climate to develop sustainable systems. Here is a sampling of my favorites.

Design for Multiple Functions. Through careful observation of the elements of a farm, we can discover multiple function of each individual element. For example, sheep produce meat, wool, dairy products, more sheep, and manure. When managed in a rotational grazing system, they can also improve pastures.

Design for Redundancy. Just as each element of a Permaculture system should have multiple functions, each important function should be carried out by many parts of the system. At Rocky Mountain Permaculture in Basalt, Colorado, keeping the greenhouse warm on cold mountain nights is important. Jerome Osentowski designed an elegant, low-maintenance system to heat the greenhouse with minimal fuel needs. The greenhouse is designed to maximize solar gain, through south-facing orientation and insulated west and north walls. Water tanks along the north side act as a thermal mass, absorbing heat during the hot high desert days and radiating it back at night. The north side is partially dug in to the mountain side, and receives more insulation from compost piles which are built against it. A chicken house is built against the west side. When the chickens come in to roost at night they add a significant amount of body heat. Low-power fans pull hot air during the day into perforated pipes under the beds which heats the soil — providing more thermal mass, and keeping the plant roots warm. Finally, there is a wood-fired sauna built against the north wall. On cold nights when the greenhouse needs supplemental heat, the farm crew probably does too! After you are nice and warm, you can open the vents to the greenhouse and let the heat warm the plants for the rest of the night.

In this way, a number of low-cost and low-energy systems all work together to meet the desired goal of keeping the greenhouse warm at night. If any one strategy fails, many more will carry the load.

Relative Placement. Everything has an effect on its environment, be it a pond, building, chicken, or tree. The key is to place them in such a way that by doing what they do best, they benefit the rest of the system. For example, mulberry trees drop lots of berries. This can stain sidewalks, clothes, or cars a dark purple color - generally not a desirable outcome. The same tree growing over a chicken run, though, becomes a free source of chicken food.

Resources and Pollutants. The products of any system element will become pollutants if they are

not utilized. Feedlots and industrial poultry farms, by removing livestock from the context of an integrated system, have created enormous pollution problems. Well-managed manure is an excellent source of nutrients and organic matter for soil building.

Work With Nature as Much as Possible. If you have farmland which is highly acidic, you will have a hard time growing many crops. You could go to the trouble and expense of amending the soil, or you could work with the land and start a pick-your-own blueberry farm.

The Permaculture Design Process

Permaculture strives to meet the needs of the land as well as the needs of the humans who occupy it. This begins with goal setting, just like business planning and Holistic Resource Management. Once the general goals for a given site are clear, you set out to learn as much as possible about the site, using soil maps, climate information, topographical maps, vegetation analysis, and other forms of research and observation. This process can teach you what the land has to offer. Now begins the actual designing - where you try to find how to manage the land in a way that meets its needs as well as yours. The design principles can be helpful stimulants of ideas during the design process.

Following is an overview of the design process, with examples from our design work at the Institute for Social Ecology (ISE). ISE is an alternative educational institution dedicated to radical politics and ecological design in Plainfield, Vermont, which has been engaged in developing and implementing a design for its 40 acre site over the last four years.

Goal Setting. Goal setting should look at a number of factors. This phase of the design process asks you to back up and see what is behind your desire to work with a given site. Is this a commercial agricultural venture? A labor of love to restore a damaged ecosystem? A dream of creating a backyard paradise? Permaculture design can be helpful in meeting

Site analysis, a hallmark of Permaculture thought, has been around a long time. This map from the UMass Amherst campus in 1901 shows site analysis results. It includes topography, soils, drainage, vegetation, buildings and land use.

from *Agriculture; Volume II: “Manures, Fertilizers and Farm Crops* by William P. Brooks

all of these goals. The more explicitly they are spelled out, the better.

Goals of the ISE include developing a demonstration site showcasing integrated sustainable buildings, agriculture, and appropriate technologies. Their goal is that all agricultural and forestry projects on site “maintain or increase soil fertility and ecosystem health”. My particular role at ISE has been in development of an edible forest garden, integrating an orchard with berries, herbs, and perennial vegetables. We set several goals for the forest garden. We wanted: at least three stories of edible plants; as much crop biodiversity as possible; as low-maintenance a system as we could achieve; and plantings which were appropriate for the seasonal nature of site use. This last goal included lots of fresh berries for students to graze on in June, July and August (peak season for programs on site). Other fruiting species could be cooked and frozen for use the next summer in cherry pies, pear tortes, applesauce, etc.

Site Analysis & Assessment. After determining the needs of the humans who will be involved, we try to discover the needs of the land. Factors which are analyzed include climate, landform (topography, slopes, aspect [i.e., the direction slopes are facing]), water, soils, vegetation, microclimates, access, existing buildings, and more. In site analysis, observations are value-free. In site assessment, these observations are compared with the desired uses of the land to determine suitability. “Part of the site is a rocky hillside” is analysis; “that would not be a good place for our vegetable field” is assessment.

At ISE we have been fortunate to have the assistance of groups of students over the course of several summers to do site analysis. We primarily looked at climate, landform, soils, vegetation, and microclimates. First and most importantly, Plainfield, Vermont gets extremely cold in the winter - this site is on the border between zones 3 and 4, meaning low temperatures between -30 and -40 F. That’s very, very cold. There is also a very short growing season. This is not going to be a site for peaches or persimmons. The site is on the western slope of a small mountain (with a beautiful view). The eastern side of the site is sloped, while the western half is flatter. Soils are fairly well suited to agriculture, but somewhat on the sandy and acid side. There were several wetland areas. Five acres are fields which have been mowed, hayed, or grazed for many years. Most of the rest of the site is forested.

After analyzing the site with value-neutral observations, we began to assess it to see how the needs of the land and the needs of the ISE could be wedded. The ISE’s other goals for the site included more buildings, places to play frisbee and meet outside, and areas for annual agriculture. All of these uses lent themselves well to the flatter areas. The sloping area had good air drainage, and well-drained soil, as well. Many students began to identify the slope as a potential orchard site - due to frost protection, good sun, and the fact that no other uses were proposed for the site. On closer examination, the slope proved to have apple and wild cherry seedlings already growing on it - evidence from nature that the plants would likely succeed well on the site. Walking up the dirt road with a group of students, we found wild apples, wild cherries, wild plums, beaked hazelnuts, wild grapes, and junberries. Here were relatives or analogs of virtually all of the species we had already decided we wanted to plant.

Design. When we look at the site through the lens of our goals during site assessment, designs begin to suggest themselves. Appropriate and inappropriate uses for certain areas become clear. What remains is to arrange the desired elements of the farm (buildings, pastures, fields, access roads) in such a way as to maximize beneficial interactions between them.

At ISE we knew after site assessment where we wanted to locate the orchard. Our cold climate gave us a limited range of potential species. We chose to lay out the trees on the contour of the slope to minimize erosion during planting on the steep slope. We also decided to graft local heirloom apple varieties onto some of the wild apple seedlings. From there, we used design principles to determine

layout. For example, using the principle of relative placement we made sure that all fruiting trees were next to at least one siberian pea shrub, so that our crop trees could benefit from the nitrogen fixed by the pea shrubs. We planted a great diversity of species and varieties to ensure a long season of harvest and to minimize pest problems, in accordance with the principle of redundancy. By choosing cold-hardy and relatively low-maintenance species and varieties, we are working with rather than fighting against the climate.

State of the Movement

In the tropics and subtropics, an active Permaculture movement has demonstrated the economic, ecological, and social viability of Permaculture systems. Here in the U.S. Permaculture activity is mostly concentrated in the arid southwest, the west coast, and the mountain southeast. The southwestern and west coast climates are similar to other climates where Permaculture has flourished. A strong network of teachers and institutions has helped to build Permaculture in those areas. In mountainous Tennessee and North Carolina the climate is similar to ours. I strongly encourage aspiring Permaculturists to take courses in the southeast.

Currently in the Northeast and through much of the US Permaculture is mostly practiced by homesteaders and ecological radicals. There is also great potential for implementing Permaculture design for organic farms, gardens, and in sustainable regional planning efforts.

Most of the people interested in Permaculture in the northeast are not commercial farmers. At times some of us have been critical of the practices of both conventional and organic commercial farmers.

Permaculture enthusiasts can learn a lot from the time-honored practices of New England agriculture, seeing the sustainable thought behind such practices as grazing on hillsides, diversified direct-market operations, and season extension. By the same token farmers have much to gain from learning about Permaculture and developing designs for their farms. Farmers should take the wild visions of Permaculture with a grain of salt, but also give it a try as a valuable planning tool. Finally, all of us need to remember that economic pressures on farmers are a tremendous impediment to experimentation with sustainable practices. There is an important role for gardeners and homesteaders, freed from the financial constraints of commercial production, to play in testing out and developing new Permaculture approaches which could be of use to farmers throughout the cold climates of the world.

References & Resources

Institute for Social Ecology, 1118 Maple Hill Rd, Plainfield VT 05667 (802) 454-8493, <www.social-ecology.org>. *Ecological design course incorporating permaculture principles this summer.*

The Permaculture Activist, PO Box 1209, Black Mountain NC 28711 (828) 298-2812, <www.permaculture.net> *The voice of North American permaculture. magazine featuring articles, book reviews, and upcoming events.*

Permaculture, a Practical Guide for a Sustainable Future; Bill Mollison. *Textbook sized manual of design. Inspiring but overwhelming. Available from the Permaculture Activist.*

Introduction to Permaculture; Bill Mollison and Reny Mia Slay. *Excellent overview, recommended. Available from the Permaculture Activist.*

Making a Little Piece of Heaven

by Jim Schmitt

PERMACULTURE - PERMANent agriCULTURE - could be described as the best possible marriage of soil, water, sun, shade, plants, animals, nutrients and shelter to protect the environment forever. There should be maximum use of perennials and enough level or terraced land to raise annuals without erosion. The animals and plants should be able to utilize each other's residue with composting to complete the cycle.

That probably describes the original Garden of Eden and there isn't much of that going around these days. I didn't even know what PERMACULTURE was until a lecture at Rutgers University made me aware that I had perhaps one of the most ideal examples on my eight acres here in N.J. I purchased the land in 1979 and designed almost everything from scratch - even including the passive solar house sitting in the center of this little paradise.

My life has been a succession of good fortunes beginning with my roots on a general farm in Southern Illinois. My father dabbled in cattle, horses, pigs, wheat, oats, corn, soybeans and the Chicago Board of Trade - the volatile commodities market. Due to some impressive losses on the latter, the Great Depression and Prohibition all at once, he went into one of a very few survivable cottage industries. He ultimately employed about thirty farmers in the production and distribution of some of the best rye whiskey in the state and was quite successful but opted to remain in farming after that interesting era came to a close with the repeal of prohibition.

Meanwhile, I was attending a tiny parochial school where I had already decided to become a pilot at age six. This, to the slight detriment of my grades, was not an approved vocation. The nuns thought all good little boys should be priests and all good little girls should enter a convent. Alas, I was not a good little boy and eventually squeaked thru the University of Illinois before getting my fighter pilot training for the Korean War (that ended a month before my USAF training was completed). Continuing down the road to ruin, I flew various fun fighters - P-51 Mustang, F-84F, F-86 Sabrejet and F-100 - for the Air National Guard. In 1956 my longtime hopes were realized when I was hired as a copilot by TWA. For 27 years I had the privilege of flying first as a copilot, then as captain on Lockheed Constellations, Boeing 707s and 747s to Europe, Asia, Africa, the Orient, and even an Around the World trip which took twelve days with stopovers. This gave me ALMOST enough money to get back on the farm. There is never REALLY enough money for that...



photo courtesy Jim Schmitt

Air view of house, taken from a hot air balloon, looking northwest.

I should mention that all thru my youth I wanted to fly airplanes and all thru my flying career I wanted to eventually get back to a farm. You can take the boy off the farm etc..... Or, as they say about pilots - when they're around airplanes they talk about girls and when they're around girls they talk about airplanes...

Anyway, in the most remote part of Monmouth County in the center of N.J. I found that 8 acre dream. It had SOIL (had been in soybeans, etc.), WATER (never underestimate the power of a mostly dry ditch - this one drained twenty acres and was more than sufficient to build a pond), SUN and SHADE (a bit of woods and a small grove where I've held some giant pigroasts). All it needed was a PLAN, then animals, fruit trees, living quarters, and of course the work - and fun - that never ends.

I read a stack of books to decide on the type of house to build - underground, above ground, totally or partially solar, etc. The first thing I learned was that an architect will design HIS house, but not YOUR house. So I designed my own on graph paper and had a contractor friend build it. He was aware of some of my idiosyncrasies in the beginning and many more by the time we took possession. It is passive solar, partially underground and only went about \$100,000 over estimate. Today, twenty years later, I hate to leave it, especially in winter with the big solarium registering 90 degrees

F. when it is sunny and 20 degrees OUTside. My yearly heating has never required more than 250 gallons of oil and the eight foot earth berm on the north - which used up all 2500 yards of fill from the pond digging - keeps first floor warmer in winter and cooler in summer. I think that conservation of ALL natural resources should figure in to permaculture and there certainly is lots of room for that in the residence.

Meanwhile back on the land, I had to get a permit to build a pond (it is 'messaging around' with someone else's water). It is almost foolhardy to consider 8 acres with only well water or city water. Both of those will fail when they are really needed. I have seen water collection systems that fill cisterns in dry areas of the world but a POND is the greatest. Not only that, the fishing is good sport and a lot of food in the form of bass, bluegills and channel catfish comes out of my irrigation project. It cost \$6000 but also gave me landfill for the berm behind the house. Its best to build on a south facing hill - I had to MAKE my hill on a flat piece of land! Oh, yes, to deal with 'dog days' - the heavy algae growth that comes in the heat of summer, clogs the pond, cuts off the oxygen and is frequently removed by POISON - I stocked thirty fingerling grass carp. Originally imported from China, they are sterile, requiring fast running cold water for reproduction, and they just keep growing. My thirty are down to six, each weighing over twenty pounds, and they are beautiful to watch as they laze across the surface like a sextet of giant minnows. If anything, they are TOO efficient because they eat much of the algae needed by the other fish. There is some question today as to their legality in N.J. - but we grass carp owners suspect this is a move by the chemical companies in order to continue selling their pond poisons .

Next project was fruit trees, nut trees, bushes, vines, and five acres of blueberries. My feeling about trees is that most of them should produce SOMETHing of value besides shade. I learned a lot about trees in twenty years! Plums get curcullio, nectarines require massive applications of poison, grapes get mildew and mold, apples get worms, apricots freeze every spring, pecans grow maybe an inch a year, peaches are OK but only live a few years, etc. I did find some winners - pie cherries may need a little protection from the birds but have no diseases here. I pick a few caterpillars off every twentieth blueberry bush in summer and the birds are UNforgiving, but with lots of plants I get SOME for myself and the U-Pickers. Blueberries produce some of the most nutritious food in the world (the birds must know that, too!) and they live seventy years or longer. I planted them far enough apart so a commercial picking machine COULD come thru and



photo courtesy Jim Schmitt

Inside greenhouse in autumn.

harvest if necessary. One MUST consider how his stuff is going to be harvested AND sold - even here in one of the biggest markets of the world. Man-power ain't cheap in N.J. and, unfortunately, how are we going to keep all our sons down on the farm after they have worked at McDonalds? I have thornless blackberries which can be a lucrative, bird-free crop if one has a sales outlet. Folks will make blueberry pies out of a \$1 pint of blues, but think twice about a BLACKberry pie at \$2 a pint... I also have an increasing supply of chinese chestnuts, pears, apples, hazelnuts (NEVER the size they are in the seed catalog pictures), and persimmons.

Let me say now that you MUST plan your perennials carefully. If they don't do well, stop wasting your time and money. I have pee'd away thousands of dollars and half a lifetime trying to raise a few figs, apricots, almonds, nectarines, english walnuts, etc. in an environment that is UNfriendly to them. In my stubbornness I'm still trying to raise some Siberian Exotics, kiwis, etc. and mostly just kidding myself. Raise what you CAN raise, easily, without chemicals and heroic measures, and buy or barter for the stuff that doesn't like your conditions. Most folks aren't bothered by a little DDT flavored fruit from Mexico, anyway....

A pond is fine but a pumping system is necessary - you are not going to carry water for long. I rented a ditch witch and laid several hundred feet of 2" PVC pipe three feet underground to a hydrant in each garden. The gasoline pump at the pond pressurizes the system and voila! I have water for fire hose AND garden hose, right there where I need it. Forget about pumping water thru hundreds of feet of garden hose - that only makes the plant more thirsty! It takes TONS of water to get perennials thru their first year, and there's the garden and the chickens and maybe even a car to wash while the pump is running. One of my sons put in a row of evergreens all along the northwest side of the property and now at twenty foot heights this row actually mitigates the dessicating action of our strong winds here. It is another water conserver, gives me a 'microclimate corner' and furnishes nesting areas for many many birds - probably the same ones that attack my blueberries!

Next was shelter for the animals. You can have worms, chickens, rabbits, goats, cows, horses, llamas, etc. The worms WILL process some of your waste but even they need protection as they are a favorite for mice. But worms aren't cuddly like rabbits or even a friendly chicken, so you may want to move up the ladder. Back in Freehold I raised lots of rabbits almost inside the city limits. I kept the smell down by supplying the close neighbors with an occasional dressed fryer rabbit. Here let me say that you MUST try to befriend all your neighbors. Many of the things we organic people do are considered silly, stupid, or maybe even illegal. Silly or stupid doesn't hurt, but ILLEGAL can divest you of your chickens - or at least the roosters - rather quickly, with malice remaining on all sides... I also kept goats in Freehold for a time but they grew faster than my daughter and were a bit too playful. I wouldn't even CONSIDER putting a horse on eight acres as the erosion factor would be frightening. A cow requires twice daily milking and I saw too much of that. My DEEP appreciation and condolences to all those folks who supply me with milk, butter, yoghurt, cheese. My degree at the U. of I. was in Dairy Technology but I left for greener fields, if you know what I mean.

So I have chickens - partly because my kids got very tired of rabbit cooked ANY way. The dinner question was "Dad, is this RABBIT we're eating???" Chickens offer an infinite variety of cooking possibilities. Mine are range run and get probably 75% of their food from bugs, worms, weed seeds, even field mice. I have a unique way of raising them. I have two large gardens, fenced four feet, and each spring I alternate raising perhaps 80 chix in one garden while using the other for annual vegetables. The day old chix arrive by priority mail, spend 3-4 weeks in cardboard boxes under 60 watt bulbs in the garage and then move out to the old rabbit cages on a sled in the fallow garden. They spend the nights locked up (much to the chagrin of the owls, raccoons and opossums) and the days cleaning and fertilizing next year's vegetable plot.



photo courtesy Jim Schmitt

Pond, house, fruit trees to left and right.

The sled is moved daily to spread the manure and allow them to glean lost feed. Eventually I let them out with the big chickens and in the fall train the layers into the chicken house. The roosters have had a wonderfully free life of about six months and then go into my freezer with as little trauma as possible. Chickens fit well into permaculture because they will eat almost anything including banana peels and styrofoam (much of it is made from soybeans or corn these days...).

The chicken house is a large permanent affair raised about a foot off the ground on six treated posts. This gives them instant shelter from rainstorms and a place where they can dust themselves in hard wintertime. Raised floor also means no ROTTING floor - and I've dealt with that problem back on the family farm. I think a general farm background is the greatest education in the world - yet in the city schools the farm kids are treated like bumpkins! I use a couple bales of straw for bedding and nest boxes and will toss the 'croutons' with the straw to give everyone a clean surface daily. It works for me - and the quarterly cleaning goes on the asparagus or berries or whatever. I begin with maybe fifty hens in fall, hope to have thirty or so left by next season. There is road kill, varmint kill, old age, occasional just - death. Chickens are great fun and they lay every day including Sundays. Kids of all ages LOVE to gather eggs and sometimes I even put a few back for the next batch of gatherers...

LOCATION LOCATION LOCATION... The pond of course is at lowest level of property. That also reminds you every day of your life that all spillage from the car, from cleaning, whatever, goes into it and loads the fish with whatever, for you to consume later. Back when my neighbors did more farming, one put a heavy dose of herbicide/pesticide on his cabbage and a toadstrangler rain hit within a day. Very soon about 1000 of my beautiful fish floated belly up and the pond smelled of chemicals for weeks. We didn't eat fish from there for about a year. Most of that twenty acre watershed is now 4 acre homesites with no emphasis on 'show lawns'. Its nice to SEE the pond from the house - I have no trees blocking the view. My woods and grove is across the pond, effectively blocking out neighbor homes and giving more privacy.

The blueberries surround the house so I can monitor U-pickers and also enjoy that pretty red foliage and bare bush colors in fall and winter. They have to be grouped for easy picking, but my other fruit is dispersed as much as possible. I had read that a conventional orchard makes it really easy for the insects to go from one tree to another - kind of like a buffet lunch. I have a peach tree near the pond, away from everything else, which is very seldom discovered by the bugs. My other trees are spotted around the property with good diversity BUT I keep the cherry trees close to the house. First of all, they are things of beauty when loaded with ripe fruit. Then I can monitor the birds a little easier and



Pear tree at edge of stream.

photo courtesy Jim Schmitt

sometimes clap my hands to shoo them away. Also I remember filching a few pecans from a neighbor's tree on my way home from school. He would have kept more nuts if it was planted closer to the house!

Land along the ditch is almost wasted so that's another good place for trees. My mulberries are far from the house - gotta keep those seasonal purple droppings away from the clothesline. My two butternuts (cousins of black walnuts) are isolated by the road, where their mild poisons will not affect plants. Don't bother planting them unless you're under forty - it took me twenty years to get a bushel which must be shucked, dried, then hammered open and picked out laboriously to yield maybe a pint of nutmeats. They are more delicious than macadamias but sixty years ago we had no TV nor decent radio nor internet and didn't mind picking out nutmeats in the evening. The trees WILL make beautiful wood - for my grandkids...

Continuing the recipe of working with what works, I have 40 persimmon trees coming along nicely. They are NATIVE to this area and seem to have no pests, not even the birds, yet... Not only that, the fruit hung nicely on the trees till November last year, waiting patiently for me to return from a pleasant trip in the Pacific (We called it the Spam Capitals of the World - Hawaii, Guam, and Okinawa). After harvesting they kept for many weeks in the fridge, drying out a bit, getting sweeter all the time. They are gnarled and ungainly looking - not at all like the California

beauties in the store - but I think I will find a market as I produce more. The persimmon is one fruit that ripens long after the insects are frozen. I even have a couple trees of seedless which might propagate. Damn, I wish I had another forty years or so - that's the only bad part of being almost 73 at the moment! The GOOD NEWS about my fruit trees is that the apples and peaches seem to be developing more resistance to insects and disease so perhaps my all-organic methods are finally having an effect. My chickens have ELIMINATED the Japanese Beetles from my property (the neighbors get loads) and I can't even find a grasshopper for fishing.

I left a fire lane to the pond - it might be MY house that's burning.... Also it's neighborly to offer emergency water to the fire company if the pond is large enough. BE NICE TO YOUR NEIGHBORS - they are the ones who will shut you down before your time! Remember - we are considered WEIRD, mostly, and must continue to justify our existence to them, the news media, and ultimately the whole country.

The henhouse occasionally has odors so it is a distance from the house but in view from my bedroom window. Noises can emanate from that area and they are not always chickens. From my room on the front corner of the house I can survey the driveway, road, henhouse, both gardens, pond, mailbox and much of the property. It's my transplanted 'cockpit'. I have a small slight curve in the

driveway so no one can really see who is visiting - who is parked in front. The bamboo grove hides that area. I have no trees near the house because of the greenhouse glass and the occasional hurricane warning. I HAVE traded off some summer coolness for that, but there is always a price.

Oh, yes, a heavy duty mower is needed on large properties - a scythe is handy for corners, ditchways, etc. I spend an inordinate amount of time on my mower and continue well into the night on hot days. Leave space for this, remove lower tree branches, and allow time for a monthly chiropractor visit in the summer. I even clear the pond bank in winter on the mower when the ice is solid and I'm not going to possibly submerge the machine.

Permaculture means not wasting ANY farm products. Wintertime pruning gives me firewood, tomato and bean poles, branches for the pea patch, and finally a pile of twigs that usually just rots. My wood chipper is becoming too difficult to manage so it sits in the garage. I do make some mulch but that also becomes harder and harder work as I get older. When the tree trimmers come by I give them blueberries or eggs and get a couple truckloads of goodstuff and I have a friend who supplies organic horse manure for unlimited blueberry picking rights and a dozen young layers every summer.

My significant other who became my wife last year has given me many esthetic considerations. I had a woods but no one could walk thru it - why not cut trails? It didn't take long to remove poison ivy, brush, overhangs, etc. and it's wide enough for an occasional mower trip. Not content with that, she suggested pretty flowers instead of the monotony of woodweeds and a few jacks-in-the-pulpit. Of course I left them but have put in some bulbs and shadelovers. WHY NOT? One of these days I'm even going to learn how to select edible mushrooms or die trying...

The borders between woods, grove, water, ditches, trees, chicken house, home, driveway - all offer marvelous opportunity. My parking area by the house is masked by evergreens and a bamboo grove. I grow my own fishing poles - a few of them have reached seventeen feet! Following the idea of the woods, I even cut a trail thru the bamboo so one might imagine himself in Jamaica or Indonesia for a few minutes. Bamboo shoots are good to eat, grow a foot a day sometimes, and are very invasive - we HAVE to eat them when they head toward the garden!

Speaking of gardens - a four foot fence is mandatory. An occasional chicken invader gets her right wing clipped so she is like a plane with a couple engines out on the right. Don't do both wings or she will rise up again. My perennials are asparagus and rhubarb. Jerusalem artichokes replant themselves after I dig the tubers in March and chix don't bother them, either. Garlic takes care of itself after October planting. My other main crops are blue potatoes (my B&B guests are impressed with blue homefries), tomatoes, peppers, eggplant, squash, melon, beans, chard, and lots of lambs quarters (wild spinach). I do peas, lettuce, carrots, radishes in the spring, also some cauliflower, broccoli, cabbage, kohlrabi, and whatever else I can plant. I get VERY busy in the summer and the garden may deteriorate to tomatoes and peppers and not much else. I surround everything with lots of onions and am remarkably insect free - even on the potatoes.

My home is my castle. REALLY! Everything is oriented to the south, the first floor underground on north side, three feet below on the south, so the chickens and guineas can walk right up to the window. There is no basement because sooner or later there will be water damage. It's just as cheap to build a room above ground as below. I miss having a root cellar but do have a reasonable facsimile in the pump room in the garage. I have lots of south facing windows, nothing but glass block on the north. South windows bring in an impressive amount of heat in winter, and I have a roof overhang to reduce heat exposure in spring and fall. There is lots of mass to store heat in winter, coolness in summer, and first floor is all wheelchair compatible with no steps and all three foot doors. There is a gigantic 48" house fan in the attic which was my

sole cooler for second floor for many years. Today I have a couple wall units for cooling upstairs as B&B queries from Virginia and south - but not Vermont and north - are prefaced with 'Do you have Air Conditioning' ???

There are TWO greenhouses - solariums - because I mess around with plants and potting in one and enjoy the other with breakfast or dinner or entertaining. That little feature took about \$40,000 of airline money but is worth every penny. There is an inlet to the furnace in each greenhouse so when the temperature is 90½ I turn on the furnace fan and preheat the entire house for the night. It was 16 degrees F. this morning but I used no heat for the past twenty four hours. It did get down to 60½ in the house but I live with that and cheat with a small electric heater in the bathroom if I have no guests. By 8 A.M. today the greenhouses were increasing thru 75½. Without sunshine, of course, I use furnace heat but my oil refill last fall was only 249 gallons for the year to heat 3200 square feet of house AND two solariums...

My homegrown food for the year beginning in January might include sprouted alfalfa (does well atop a fridge) autumn apples, squash, lots of canned, frozen, and some dried fruit and vegetables. Its a good time for making lots of soup with fresh stuff that is fading fast plus dried and frozen vegetables. I don't raise rice or grain so must purchase. February is more of the same and in March I dig the Jerusalem artichokes - sunchokes - and cure them a bit for storage in the fridge up to nine months. April may bring some lambs quarters outside, a few dandelions, fiddlehead ferns to go with asparagus and fresh fish from the pond. This spring is VERY late so I may not see produce till May. May brings more of the same plus lettuce, early peas, kohlrabi greens, and whatever else. June is for cherries, strawberries picked elsewhere (too much work, too much soil disturbing...), and first blueberries. July more of the same plus garden produce, peaches, raspberries, plums... LOTS of good stuff. August is more of the same (I try to have different varieties of everything for continuous fruit AND those buffet-loving insects) plus blackberries, edible Chinese Dogwood, wild cherries... September sees a slowdown - late peaches, grapes, a few blueberries, apples, Chinese Chestnuts, bok choy, long keeper tomatoes - if I got around to planting them - turnips, broccoli, cauliflower, late season garden. I am heavily into butchering chickens and filling the freezer by that time. October is more of the same and maybe a few persimmons. I harvest the hazelnuts for what they're worth (not much!) gather and shuck walnuts, butternuts, hickory nuts - and hope they will be used eventually. November brings persimmons for sure and not much else. December is quiet time except for a little gleaning.

Of course we have fresh eggs always. In November and December I might be converting stored frozen tomatoes into juice and sauce. When I get seven quarts of anything that can be canned I will try to can it. So I stay busy all year.



photo courtesy Jim Schmitt

Henhouse, surrounded by fruit trees

I have a simple way to recycle many gallons of gray water. Material needed - a bucket and a plastic bowl about the size of a WWII Helmet in the bathroom. In fact I GOT the idea from a little military exercise where we were given a helmetful of fresh water every morning to do all our essentials... I warm up the tapwater brushing my teeth - all in the 'helmet'. Then I continue washing, shaving, rinsing, and, as the helmet fills, I dump it into the five gallon bucket. I even grab the first shower water - the COLD stuff - and dump that into the bucket. I may even dip some of the bathwater into the bucket where about three gallons will flush the toilet. That is gray water AT THE SOURCE, LEGAL, and my only regret is watching that last half gallon of bathwater go down the drain for the first time. IT WORKS. Also, you probably will have enough for your first flush after the power outage, when your electric wellwater pump has ceased to function...

Another ENERGY SAVING TIP that I have used for decades comes with the tomato harvest. When they are ripening its sometimes a bushel every other day and at one of the busiest times of the year. I let them ripen completely, cut out stems and bad spots and freeze them. This is IMPERATIVE - so that one day later I will have a plastic bag of frozen tomatoes with skins on, in the freezer. This bag of jewels will keep a day or a week or three years without much damage other than getting in my way in the freezer. So, later in the fall, or in the dead of winter, I pull out enough to fill a big cookpot. With a bit of warm water the skins slip off like magic, and I dump all those red rocks into the pot to thaw overnight. Next day I have quarts of PURE, UNCOOKED, DELICIOUS tomato juice covering a bunch of tomato carcasses. I dip out the juice and save - up to three days fresh, or forever again in the freezer, or can it for adding to soups later. I take the raw carcasses, put them thru a blender and cook maybe fifteen minutes for really fine puree or tomato sauce,

depending on how thoroughly I removed the juice. This I use fresh, can, or freeze when I have seven quarts - the capacity of my stove-top canner. The resulting product is fresh tomato juice with NO vitamins removed by cooking AND tomato sauce or puree that has NOT been subjected to hours of boiling away the vitamins, again. Yes, the pulp has seeds, but I've never seen any advantage in straining out this valuable food product. It all makes sense to me, uses MUCH less energy, and allows me to use MY energy to finish the product when I have the time.

As I mentioned, we travel frequently in the winter and sometimes for up to four weeks. I am retired airline, have a son with United Airlines, and a good twenty in the military. We are twenty minutes from McGuire AFB and near enough to Newark, Philadelphia and JFK Airports. With the B&B feature we can usually find a housesitter to pet the dog, feed the chickens, gather the eggs and the mail for the free stay.

Yes, it is a very fortunate, very UNreal life style. Without a good second income I could not afford to squat on land worth upwards of \$30,000 an acre and pretend to make a living. But it is a HEALTHY lifestyle. I have spent only one night in a hospital in my life - and that was with a smashed heel. I produce a lot - but not nearly ALL - of our food. Just working the farm and making beds & breakfast in the B&B keeps me walking, digging, cutting, bending, stretching and generally doing the things most of the townfolk pay to do in other ways.

I love it. Come see us sometime. The sermon is no extra charge.

Jim Schmitt's B&B is at Earth Friendly Organic Farm, 17 Olde Noah Hunt Rd., Cream Ridge, NJ 08514

Doug Clayton: At Home with Permaculture

by Jack Kittredge

If you wanted to test the usefulness of Permaculture principles in designing a family homestead in the northeast, it would be hard to find a better location than southwestern New Hampshire. The soil is rocky and thin, the elevation is high, the climate is cold, the terrain is rolling. The area has no natural agricultural advantages to start with, so good design is crucial to fashioning a successful homestead. And that is exactly what Doug Clayton, in the town of Jaffrey, New Hampshire, in the shadow of Gap Mountain, has done.

The land he is on was a commons years ago. Just to the north of Doug rises Mount Monadnock, a chunk of schist left behind by the glaciers. On the slopes of the mountain, in days gone by, locals freely ran their stock. The particular piece Clayton is on was left as a small land trust of 100 acres. He and his wife, Kyung Kim, hold one of the four current leaseholds there, with most of the land held in common.

Doug had majored in design and minored in natural resources in college, then gone on to California's Farallones Institute (now the Occidental Arts and Education Center). He went as a student but stayed as staff, helping them experiment with designs for everything he was interested in: solar homes, organic gardens, composting toilets, greywater systems. By 1980 he was looking for a place to put his studies to work, and found a piece of south-facing slope he liked at the land trust.

"I started here with rocks and nothing else," he recalls, "except some nice big pine trees to build a house out of. It was sheltered from the wind and had a great exposure and view of Gap Mountain to the south. In 1981 I was sketching on paper. In 1982 we cut the opening you see here. In 1983 we built the house out of the trees. In 1984 we moved in and started gardening. In 1986 I planted the trees and the perennials."

Although Clayton studied permaculture, he is modest about seeing his homestead featured as a good example of the design system: "It's embarrassing that an article would be written about this place. There is a lot of intention here, but I keep looking for places where it all is further along. What I've done here just satisfies me — I like to putter around."

In fact, Doug makes his living puttering around. Everything that he does as a homesteader he also does for others. He designs, builds, and helps people with energy efficiency and housing additions. Six wealthy individuals nearby are his primary clients, for whom he does everything — landscaping, carpentry, and repairs. Fortunately for him, they're the kind of people who will make a 20-year investment if it will ultimately pay off and is kinder to the earth. So he has the option of looking for ways to do things using appropriate materials and long-term solutions.

"The beauty of permaculture," he stresses, "is that it thinks about whole systems. It suggests ways that you can act which might make a difference. I started by reading all those permaculture books. Mollison emphasizes perennials and self-seeding crops and low-maintenance ones. Fukuoka's *One Straw Revolution* was crucial in my development. It got me off the track of trying to figure it out scientifically. He said: 'You can't know nature.' So for me, it's just a big playground. Over the years I've gotten to thinking of anything that volunteers as a friend. I've brought things here that tend to be weedy and that spread on their own: asparagus is one. I have it popping up all over the place. Or Echinacea, or anise hyssop — what a weed that is. Everything that I have has survived benign neglect. I have so many things going on that I never get it all done."



photo by Jack Kittredge

Much of Doug's house is made from salvaged or recycled parts. The big greenhouse glass panes are from glass slider replacements. The small ones around the bottom and on the upper right of the house are storm door panes. The panes, slightly etched by water getting between the panes, were thus unsaleable.

One hallmark of Doug's permaculture training, however, is that he tries to collect most of the building materials he uses in his own homestead without ever buying anything. He used the trees on his land for building the structure, and its rocks for terracing and containing the landscape zones around the house. He also kept his eyes and ears open over the years and found plenty of used building materials being thrown away that could be reused.

You have to know a little bit about material science, however, to use old things wisely, he cautions. Glass, silicone and steel, for instance, work well together. But aluminum and glass don't, because aluminum expands and contracts with temperature so much more than glass. Nevertheless, by recycling materials and doing without many conventional amenities, Clayton was able to put up his house very inexpensively.

"When we moved into the house," he recalls, "we had spent \$12,000. It was insulated and drywall was up, but there was no interior finish. There wasn't any septic system and there wasn't any well, because I wasn't going to need those."

For water Doug installed a 3500 gallon cistern under the main floor, next to the root cellar. The cistern has ventilation above it so it won't rot out the floor overhead, and is filled from rain water piped through a system of gutters from the roof. A shallow well pump brings water from the cistern to the pressurized house system.

Instead of a septic system, Clayton built a mouldering toilet. (It's not a composting toilet because the material doesn't really get hot enough to compost.) He got the design idea while at the Farallones Institute in the 1970s, studying with a radical professor of architecture who had a composting toilet based on an ancient Japanese design. Doug adapted the design to New England's colder climate.

The privy has two chambers. Each is large enough that it takes five years for Doug and his wife to fill one. The chambers are designed to work aerobically, so he doesn't use them when urinating (he uses those occasions to fertilize some garden bed or other.) Each time after using the privy, Doug throws in some wood shavings. He knocks the cone of material in the chamber down every once in awhile through an outside access door, and makes sure it's

wet enough for red wiggler worms to survive. They eat the material and turn it to humus. Once one chamber is full Doug and his wife switch to the other privy seat and start filling the second chamber. The volume in the original chamber decreases by about two thirds before the worms die out. Once it is fully decomposed, Clayton goes in and digs it out.

"Odor is prevented by good aeration," Doug says. "The reason it doesn't smell is that there is a mesh at the bottom of each chamber supported on blocks. I put hay and leaves on the mesh as a bedding when I start a side. That way there is air under the pile and nothing is down in anaerobic muck. Excess liquids can evaporate. When it's time to clean it out, I just take it as humus in wheelbarrows down to put around the trees."

Clayton managed to get a permit for this toilet so he could avoid putting in an expensive septic system. A lot of people are frustrated in this situation, but he was able to get around the bureaucracy by going directly to the head of the state sanitation board under a liberal New Hampshire governor. Unlike most bureaucrats when confronted with a strange design, he was willing to take responsibility and wasn't afraid of making a decision.

More than half of the downstairs area of Doug's house, as befits a permaculture advocate, is practical space for his shop, greenhouse and privy. His building principles are simple: Put most of your glass on the south. Isolate your gain so you can get the sun in certain rooms and close them off or open them up as you want, so you don't lose it. There is a grilled floor above the greenhouse so heat can rise from it into the second floor, and there is enough ventilation in the gables on the south, north and east ends of the house to dump excess heat. You just open a manually operated trap door in the ceiling under the south gable to send it out.

As for cooling, a fan with an automatic sensor brings cold air into the pantry. If it's colder outside than inside, the fan turns on; if it gets near freezing, the fan turns off. So the pantry stays near 40 degrees just running on the air temperature. Root crops like carrots and beets are stored in buckets in the root cellar. It stays 40 degrees there from September on.

Clayton originally designed the house with a mammoth icebox in the basement, and used to cut ice for it down at the neighbor's pond. His rationale

was that it was cheaper to spend a day cutting ice than run a refrigerator for a year. But refrigerators are many times more efficient now, (as well as using a freon which isn't a threat to the ozone layer) and he also gets paid more per hour than he used to! So, despite originally trying to can and dry everything, he broke down a few years ago and bought a little freezer. He found he likes frozen food!

During the summer, Doug and Kyung cook on electric burners and heat their water with electricity. Come winter, however, they fire up their wood cookstove. At 1400 feet in elevation, Jaffrey easily gets down to 20½F below zero. But people are always logging in the area, so Clayton can usually get firewood just by gleaning and it takes only a couple of cords to get them through the winter, given the fact that the walls are 10 inches thick with an insulation of R30. The roof is R60. Water in the winter is preheated by a tank getting sunlight from a skylight in the roof of the house, and brought to final temperature by a coil carrying heat from the back of the stove.

Some of Doug's most interesting work has been focused around managing water. "In permaculture design," he says ruefully, "water is where you're supposed to start. It's been my biggest failing. Mollison would always design into the system a high pond on a hill or in a saddle. That would store water and then gravity would feed it out. For years I imagined I'd do that, and imagined windmills and solar pumps. But I'd have to do major clearing for that. Instead, for irrigation water I pump out of a wet area, and for domestic water I use rainfall. The reason I put a metal roof on the house is to collect water — of course, one third of it doesn't drain into the cistern. I couldn't find a way to get the downspout to return to the cistern. I should have made a shed roof with a simple line, but I didn't like the look of it. So I made this complicated roof! "

Clayton has a charcoal filter for the whole house and a bacterial filter for the tap at the kitchen sink. The water from the 3500 gallon cistern below the house is pressurized with a well pump. It has run dry only twice since 1984. He figures that running dry is a blessing, however, because it gives him a chance to go into the cistern to clean and recoat the walls with sealant.

His long term plan is to put in a dug well down at the bottom of his long slope, where it's already seasonally wet and he has his pears. Then he figures to have a solar panel drive a small direct current pump which would bring a constant trickle of water back up to the house. Just a fraction of a gallon a minute is all he wants, to keep the cistern topped. The overflow would be piped into a pond he is

digging just to the southwest of the house. The pond overflow, which also would include all the roof water, would then go back downhill to an infiltration bed to recharge the well.

"For years," he muses, "I planned to do this with a steam pump. I met a guy who did third-world applications for steam. He had a collector focussing solar energy onto a black pipe in a glass tube. It generated steam that drove a single piston pump hooked to a flywheel. It was a solar-driven steam engine pump! You could build it out of hardware store parts, instead of high-tech engineering. But I got into photovoltaics for other people and now I'm not afraid of it. So I may go that way.

"I'll keep the pond clean," Doug continues, "by diverting runoff with a swale, or fore-bay. Nutrients and silt should be dumped in a depression ahead of the pond where the cattails can grow, where a backhoe can easily reach and muck it out. The overflow from the fore-bay then runs into the pond."

He feels it's important to avoid sudden water renewals — depending on the terrain, he says, a two-inch rain coming into a pond can replace most of the water and kill your fish. While he's not planning to grow tilapia or coy, and it's not going to be big enough for bass, he does plan to have minnows and crayfish to eat. But he'd like a wetland transition area, and a greenhouse dome over part of both the garden and the wetland and pond, to keep a spot of water open which won't freeze. He estimates it will approximate the climate of Virginia.

Rocks and sandy soil, however, which is what Clayton has to work with, are among the hardest things in the world to seal up against water. He plans to use a rubber liner for the bulk of the pond bottom, but will use Bentonite clay for the edges so he doesn't have to hide rubber liner edges with rocks.

Once the house was built, Doug turned his attention to raising as much of his own food as he could. His land occupies a long slope to the south, with the road accessing the high ground. He built his compost piles on the highest ground, then down from them his house and intensive garden areas, then down from that he has planted fruit and nut trees.

He is a big believer in organic matter — compost and mulch — for fertility. Most of his compost ingredients are hay and manure. He stays away from leaves in the pile because he feels they tend to compact, not letting air in and generating fungus. But he uses leaves as mulch, which he applies heavily and everywhere.

"I have places," he says with pride, "where you could stick your hand 18 inches into the ground. My whole technique is just 'lay on the mulch'. If I want Echinacea somewhere new I'll put down newspaper and compost on top of that, and scatter seed into it. That's how I make a bed. Right on sod or weeds or anything. The newspaper is worm food — it rots — and the plant finally roots in the soil.

"Mollison was not a big fan of compost," Clayton continues, "but he was dealing in the tropics. He was a sheet mulch guy — not just mulch, but put down newspaper/cardboard/carpet first as a base to smother everything. He said you could just pick up the mulch, throw a dead cat under it, and it would be gone in a day (he hated cats). But I like compost. I collect stuff up here on the high ground, by the road, and then just wheelbarrow it down to the garden. I'm trying to get away from imports, but how can you turn down wood chips and leaves from the town? Also I buy hay and truckloads of manure from local farmers. Ideally I wouldn't have to do that — I'd be raising enough nitrogen-fixing plants."

Doug plants dynamic accumulators like stinging nettles and comfrey around his compost piles to capture any nutrients that might be leaching away. Comfrey, for instance, captures calcium. He tries to cut these and other weeds before they make seeds, and then puts them in the compost pile or makes manure tea out of them — just putting them in a barrel and letting them rot.

Over the years he has applied so much mulch and compost that the original sloping land in permaculture zone 1, the area around the house where one is likely to be most frequently, now is level and he is having to make rockwork terraces to contain it. It has flowers and herbs — gooseneck, lovage, agrimony, hollyhocks or malvas, mustard greens, grapes, raspberries, and asparagus — in an edible landscaping area with things that don't need any work.

Clayton plants potatoes when he opens up new land, since they do well in rough soil. Then he lays down mulch which gets broken down by worms into castings. Once there is a rich network of worms, he never disturbs the soil. In a bed where he had corn, beans and squash, he just picked the crop, cut the stalks down and mulched the whole area over. Worms quickly dealt with the roots and stalks.

Doug almost never exposes bare soil. Most of his garden is either from seed scattered directly into mulch, or from volunteers. "I don't plant alyssum, dill, cilantro, thyme," he says. "Even lettuce volunteers for me. If you don't disturb the soil you get



photo by Jack Kittredge

The mouldering toilet is a two-hole variety (the other toilet seat is under the wooden chest). Each chamber takes Doug and his wife about 5 years to fill. Air intake vents supply fresh air to the piles.



photo by Jack Kittredge

These two black pipes create a chimney effect for the two piles, preventing any odors from backing into the room by drawing air in through the vents, down around the piles, and then up the pipes to an exhaust vent.



photo by Jack Kittredge

These doors below the arbor give access to the mouldering piles at clean-out time. Every 5 years Doug takes a few wheelbarrows worth of humus-like material to place around the trees in his orchard, and covers it with wood chips.

great volunteers. Mollison said that to till the soil to plant is like cutting into your mother's breasts for milk! I've not had to buy new strawberries in 15 years. I just take the new plants produced by the runners and replant them in a new bed."

He tried initially to plant things that attracted hummingbirds and beneficial insects. He consulted a book called *Landscaping for Wildlife* out of the University of Minnesota which had great tables with all the traditional perennial flowers, ranking them by how good they were at attracting beneficials. He chose the ones that were both very good attractors and also easy to grow, such as motherwort or columbine, and started scattering those around.

He is also a big fan of reemay for crops like strawberries and garlic that need a higher temperature and more photosynthesis than is easy to attain under a heavy mulch. He mulches his garlic to a depth of just an inch or so, and then covers it with reemay.

Clayton has an extensive orchard and is a member of the North American Fruit Exchange, but hasn't found a way to raise a good crop of apples or plums without using Imidan to control plum curculio. He grafts all his trees, buying root stock and then grafting on the varieties he likes using scionwood from friends or from trades. For stone fruit (except European plums) he plants prunus root stock in the spring and then in August bud grafts on a plum, peach or nectarine variety. His favorite peaches are Eden, a white peach, as well as the popular Reliance and Madison. He doesn't spray peaches as he does plums and nectarines. Somehow, he figures, their fuzzy skin protects against curculio. For anyone interested in learning more about grafting, Doug recommends the 50 year-old "The Grafters' Handbook" which matches root stock and plant varieties.

Doug has also tried nut trees on his property, in spots where they won't shade the dwarf fruit trees. He has butternut, heartnut, walnut, chestnut and hazelnut/filbert crosses. He alternates nut trees with nitrogen-fixing plants, either Autumn Olive or Black Locusts. His original concept was multiple functions: to plant the locusts in order to fix nitrogen now and ultimately get fence posts. But now he doesn't think he'll ever get the posts. They always die before they're big enough. Autumn Olive, which Clayton thinks is an example of a nitrogen fixer that



photo by Jack Kittredge

Clayton's homestead is spread over a south-facing slope. The house and gardens (zone 1) are near the top with the orchard on dwarfing rootstock spread out in arcs below the house. As Doug continues to plant he clears further and further down the hill. He grows kale, chard and other greens in the greenhouse, visible to the left, all winter.

isn't a legume, has edible berries, but it can make nasty thorns. For growers interested in learning more about nuts, he recommends "Nut Tree Culture in North America" by Richard A. Jaynes

In permaculture thinking there is a lot of stress on the edge, the area between zones. Diversity happens on edges. Doug has kiwis and hazelnuts on his edges. But now he's starting to move his hazelnuts down into the sun. They're touted as an understory, he says, but they do better in the sun. He has found, to his surprise, that plums do well on the edge and has started to plant them where they get only a half a day of sun.

Although permaculture theory includes animals as part of the overall system, Clayton doesn't keep any animals. He wants to be able to take off to visit relatives when he feels like it without troubling his

neighbors to milk his cow or feed his chickens. He figures he lives in a community where he can get milk or eggs from his neighbors, anyway. He does, however, recommend that those who keep chickens grow Siberian peas on the edge of their yard, as forage. The birds really like the leaves, he says.

As for the future, Doug says he is a pessimist: "Mollison was a doom and gloomer, bigtime! He said we have to make these changes now or in 20 years we're all over. That 20 years is over now! That was my motivation from the beginning. *Silent Spring* and *The Population Bomb* affected me when I was a kid. It's why I don't have any children. People who have children have to be optimistic about the future! I believe now I'll get to the end of my life before the big catastrophe hits. But it's going to hit!"

Permaculture in the New World(s)

by Susana Kaye Lein

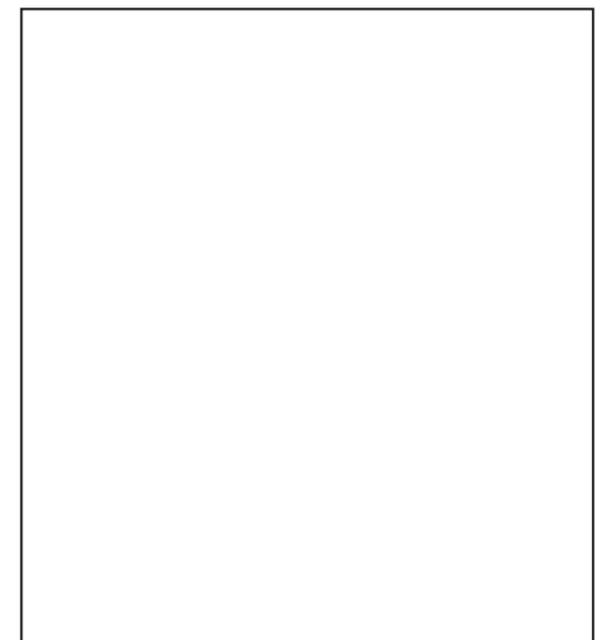
Many folks have vague notions about what permaculture is, and often believe it to be another alternative agricultural system—along with organic, biodynamic, agroecology, forest gardening, IPM, conventional or industrial agriculture. Often the misconceptions arise from thinking we choose one over the other. Organic farmers can benefit greatly from applying permaculture principles in all aspects of our work, our farms and communities. The aim of permaculture—a permanent culture—is to utilize science and technology based on a wholistic understanding of natural systems to create locally-sustained farms and communities.

This winter I had the opportunity to lecture and visit permaculture friends and sites in Australia and New Zealand and I spent some memorable days with David Holmgren and Su Dennet on their farm and teaching center in Hepburn Springs, Victoria. In the mid-1970's David developed the permaculture design system with Bill Mollison as a product of his research at the University of Tasmania. Reading their book, *Permaculture One: A Perennial Agriculture for Human Settlements* and seeing it in action at the New Alchemy Institute on Cape Cod, changed the course of my life in the late 1980's. I'd worked much of the 80's as a landscape architect/planner for fat-cat developers in Boston. Following my conversion, I went on to spend most of the 1990's running an organic farm in Guatemala, teaching campesino permaculture there and in other Central and South American countries.

One of the impressions of permaculture is that it is more appropriate for "3rd World" countries rooted

in traditional subsistence farming practices. In Latin America I found that permaculture indeed fits well with the realities of the campesino because it builds on traditional wisdom and practices. The inaccessibility of external resources in less developed countries makes it a necessity to take responsibility for developing and caring for one's resources—not just an ethical choice. Otherwise, your cow may die from lack of forage during the long dry season, or the cornfield may wash down the mountain in a heavy rain. Peasant farmers can rarely choose to ignore the consequences of their actions; the permaculture principle that each element of the environment affects everything else is self-evident to them.

In reality it is our "New World" countries [i.e. USA, Australia, New Zealand] that most need a permaculture framework for applying ecological design principles to our living and working environments and our communities. The agricultural and living practices in our countries lack roots in time-tested patterns of cultivation, building traditions and wisdom established in older societies. As Holmgren says, "Permaculture is a new synthesis of biological and cultural resources rather than a restoration of traditional sustainable cultures." Our agriculture and consumer society was established on the industrial model, which is structured to disconnect each aspect of our lives from everything else. By separating the ethics, sources and energy expended for our resources from the local results, we've not learned to truly see how each element affects everything else.



The author with permaculture pioneer David Holmgren and partner Su Dennet at their Hepburn Permaculture Gardens, Victoria, Australia.

A Permaculture Design Framework

Permaculture's strength is as a design framework that connects our ethics with our actions, giving us a process for making decisions that will support both ourselves and our environment. It gives us a way to design our living and working environments based on ecological principles. We do this by actually reorganizing our lives, to make our systems more productive using less external resources and less

protracted tedious labor, while generating more creative, meaningful labor in our communities.

Because food is central to the survival of any culture, agriculture is an ideal starting place for permaculture design. But a self-sustaining, permanent culture involves more than agricultural traditions. The Permaculture Design System Flower [below*] is taken from David Holmgren's new book to be published this summer on Permaculture Principles (for more information, see www.spacountry.net.au/holmgren).

{Insert *ATTACHMENT B-flower diagram}:



Salamander Springs Farm, Berea, KY, October 2000.

Constructing intensive no-till garden beds on contour. To build these no-till beds, I start with plain, non-colored BIG sheets of cardboard (furniture & appliance store dumpsters are ideal sources); I remove tape, staples and stickers I then cover the area of untilled grass overlapping each piece of cardboard at least 6" to block all sunlight to the dying and composting herb layer below—which contributes excellent organic matter. I cover the cardboard with about 3" of compost and manure (a "waste" problem from a nearby farm), then rotted hay or straw. Paths between the terraced beds are removed of sod and topsoil, which is shoveled onto the garden beds to compost under the cardboard. I then cover the paths with 2 thick cardboard layers covered by wood chips (another surplus "waste" product in this area). The terraces in the photo were staked-out on contour with a simple 'A-level.' The lower side of the terrace was built with rot-resistant black locust posts and limbs from clearing my house site, alternately live comfrey barriers stabilize the lower edge. Built in the fall, these beds are beautifully ready to plant in the spring. My first year in Kentucky I made 1/2 acre of garden beds (on flat land) with this no-till method in about one week of evening hours and a few truckloads of cardboard and manure. They have become more productive each year. Areas with special weed problems have gotten the cardboard treatment a second year, but generally once constructed, the beds are only "put to bed" in the fall by adding a 1-2" layer of compost and mulching with straw or dry leaves.

The Permaculture Design System starts with land stewardship and evolves through progressive application and integration of all 7 domains necessary for a sustainable culture: the built environment, tools & technology, culture & education, health and welfare, finance & economics, land tenure & governance. Permaculture's ethical and design principles form the nucleus. Let's take a closer look at these principles (adapted from the references listed below):

Core Permaculture Design Principles:

1) Thoughtfully observe natural systems and consciously design environments which mimic the patterns and relationships found in nature.

a-Diversity. One of the most important patterns we see in nature is that diversity is health and stability—diversity in our diet, in our community busi-

nesses, our energy sources, polycultures vs. monocultures, etc. Many organic farmers are put off by the diverse "mess" of permaculture gardens and orchards. Diversity and production are mutually beneficial goals. When one crop fails you can fall back on others. We must integrate and work with complexity, rather than segregated forced simplicities. Complexity requires us to design small-scale, energy-efficient intensive systems rather than large-scale energy-consuming extensive systems.

b-Continually work with change and plant succession, using plants and animals to improve microclimates and soils. Permaculture utilizes perennial, self-seeding and native species as much as possible. As our "natural capital" of plant, animal and energy resources grow and mature, we increase our self-sufficiency and production. I'm currently establishing a perennial poultry edible forage system, fruit & nut orchards, and improved pasture on Salamander Springs Farm in Kentucky; until these plant resources mature, my current production focuses on annual crops in intensive gardens and a grain field. A permaculture farm and its caretakers must co-evolve.

c-Build Soil UP and Keep it Covered. Nature's "weeds" (often useful plants) constantly remind us to keep the soil covered in order to store and protect the nutrients from the sun, wind, erosion and drought. Similarly, natural systems build up the soil instead of plowing into it, disturbing soil structure and loosing nutrients in the process. The short-term gains of mechanical cultivation demand a lot of external energy. One alternative is below {*D}

d-Produce zero waste. There is no waste in natural systems—one organism's excretions are another's food. We call this closing the loop. We can learn from the collapse of previous societies which didn't. The Roman Empire's 'advanced' sewage system efficiently pumped it's effluent out to sea. A previous Natural Farmer article (pasted on my abandoned toilet) connects its one-way nutrient flow with the desertification of once fertile soils of North Africa which Rome conquered to feed its empire. A quiet revolution this past year has left abandoned

or rarely-used flush toilets all around Berea, Kentucky, replaced by recycled 5-gallon buckets fitted with seats, sawdust and special backyard compost piles. After reading Joe Jenkins' Humanure Handbook these cohorts could never flush a toilet with indifference again. The waste solutions we need extend well beyond the 5-gallon bucket or composting toilet, but t'ain't no excuse to not start there.

2) Provide and recycle energy/nutrient needs on the farm or within the community. Design and develop local resources over external ones.

David Holmgren calls it capturing and storing the sun's energy to build "natural capital" locally. We do this with perennials, cover crops, mulch, with our own "waste" and compost, with livestock, with solar and wind energy, with wise and sustainable use of our forests. Often we jump from the ethics to what we think are ethical actions and practices—when in fact we may be doing almost as much damage to our environment and resource base in the long run. Are we using more energy to produce organic food than the energy the food produces—by using resources that travel long distances, are produced with high-energy use or unethical practices?

a-Convert problems into opportunities and resources. As permaculture founder Bill Mollison says, the problem is the solution. The high cost of organic chicken feed is a problem for organic chicken farmers. Yet 50 years ago farmers used poultry to recycle nutrients on the farm and produced flavorful meat and eggs with very little outside expense. Lambsquarters are a problem annual weed but one of the most nutritious greens we can eat, and their seeds are high protein chicken feed. They're also an asset when fermented into a manure tea, along with other noxious weeds like ragweed and thistle that are a problem in the compost. The result is a wonderfully balanced liquid fertilizer.

Similarly, the noxious duckweed is a constant source of high-nutrient garden mulch. In a contained pond, duckweed is easily scooped out and thrown on a tarp to dry; after a couple hours in the sun it makes high-vitamin 40% protein flakes for



Valle Patal Farm, Tactic, Alta Verapaz, Guatemala, July 1996.

To keep tropical soils covered, protect and build fertility in cornfields, we built on the traditional practice, the 3 Sisters: Corn provides stakes for Beans which fix nitrogen in the soil while Squash covers and protects the soil. Here we used a vigorous legume, Dolichos lablab, which covers the ground completely after the corn is harvested. Lasting throughout the dry season, this prolific cover crop keeps the soil soft and weed free, very efficiently fixes nitrogen from the air, and produces an incredible amount of organic matter for the soil or forage for livestock during the dry season.

winter poultry feed. The problem becomes an asset when you work with, not against nature.

b-Every situation is different. Apply principles, not formulas. One of the tenets of modern industrial agriculture is that it is the same formula everywhere. Often organic farmers unthinkingly copy the “formula” model. When we take into account differing climates and landforms, different local resource availability, economic circumstances, traditions etc., we realize that maybe a solution that fit for one farm or region—the chicken feed, the cob house, the blood & bonemeal fertilizer or seaweed—is a big energy sink in another situation.

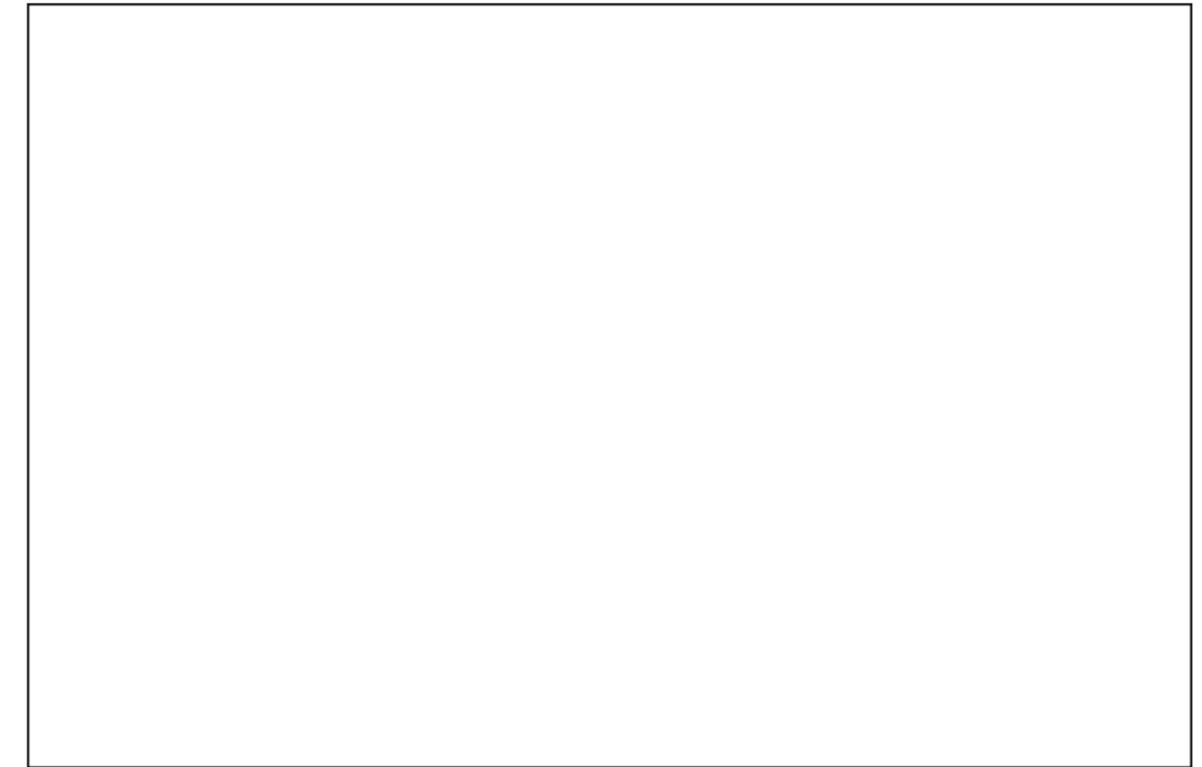
c-Circulate money, labor and resources within the local community. The principle of recycling energy locally extends beyond the farm. It integrates all 7 domains of the permaculture design system shown in the diagram on the previous page. A community’s wealth lies in the goods, services, and skills of its people. Permaculture is of limited benefit without applying its principles to a productive result that benefits the wider community—be that an organic or CSA farm, local business or service or education.

In November 1999 a group of us in the Berea, KY area began monthly amish-like work parties, to supply needed farm and construction labor while learning from each other. Hosted at a different farm/community each month, we average 25 people/month. Berea has a local farmer’s market and 3 CSAs in, but to connect more community members to local resources, several of us started an informal barter system by exchanging our produce and goods. We’ve begun coordinating this barter exchange with the pick-up dates for our monthly bulk food Buying Co-op. For example, I have veggies in season, and make pasta sauces, salsas, yogurt, butter and bread; in exchange I’ve gotten honey, pottery, lumber, maple syrup, shiitake mushrooms, furniture, labor. This can evolve into a LETS local money system like in Ithaca, NY, which opens more possibilities than direct bartering: if I want a haircut, but the haircutter doesn’t need my goods, I can use ‘points’ earned from other folks who bought from me to get my haircut. (For more info on LETS systems, see www.lightlink.com/hours/ithacahours).

Australia has taken LETS much further than the USA. I saw 4 thriving LETS systems run through local co-operative credit unions. Regularly updated listings of goods and services available for trade are posted in villages with thriving small businesses and shops. To sustain our local communities, we must find creative ways to supply local needs with local sources, to keep money circulating in the local community instead of exporting it to global corporations.

Permaculture “down under” has made real impacts integrating the “7 domains” of community design. I spent most of January with a permaculture design course at Crystal Waters Permaculture Village near Maleny, Queensland, which was designed and established in 1987 and is now a village of more than 200 people. Crystal Waters has many home-based businesses—milk, eggs, honey, meat, and cheese businesses, bamboo and sustainable timber, garden & seed catalog business, healing arts practitioners and an eco-tourism company. They also have an income-generating café and dining area, a certified kitchen which can be used for home-based canned goods businesses, educational center for courses, and visitor camping area.

CERES community environmental park in Melbourne, Australia, provides a shining example of the impact of permaculture design in the urban community. CERES turned a “problem” city wasteland area under a high-voltage line into a productive and popular city oasis. Almost every Melbournite I talked with has been to CERES. Accessible by bike path and city tram, there are many reasons: to grow food in the city allotment gardens, to buy plants at the nursery (photo) or the weekly farmers’ market, to eat in the delicious café, attend Friday night music events, take a course, or to work on the farm “for the dole.” Unemployment training programs provide much of the labor at CERES. School groups and the public come see the



Valle Patal Farm, Tactic, A.V. Guatemala, 1995

Terraced gardens established on denuded pasture (as seen in background). Terraces covered with living mulch of alfalfa/clover (here seen with cole crops). At right, nitrogen-fixing Pidgeon Pea hedge serves as live barrier for terrace, chicken feed, and many other functions.

livestock, to learn about organic farming, environmental issues, grey-water recycling, composting, renewable energy. A renewable energy institute and grid-interactive station is housed at CERES, including solar, wind and hydro power, and provides much more electricity to the grid than it receives from the electric company.

In early March I was a guest speaker for the thriving Saturday Green Market café in Kaiwaka, New Zealand, where every week hordes of local people get together to sell their wares—organic produce, crafts, bread, eggs, herbal remedies, natural fertilizers, clothes, seeds & plants, to eat at the café and listen to a guest speaker. This was started by folks at nearby Koanga Gardens community where I stayed, who also developed a store selling similar products on the main highway below their beautiful and productive permaculture farm. Koanga employs 8 people in the community with a nationally-known heirloom seed & nursery business and a wetlands design service. They also run an array of well-attended courses on their farm every month.

3) Utilize each element (plant, animal, structure, etc.) in ALL of its functions, rather than treating each as separate elements in a single product system.

A good method for understanding this principle is to use the example of the lowly chicken:

a-Each element of the system performs many functions. Poultry fulfill many needs in a permaculture designed system besides eggs, meat manure & fertilizer providers—in the right situation they can be roto-tillers, weed/seed eaters, pest controllers, grass mowers, heat producers for a greenhouse space and providers of CO2 for plants, methane producers, alarm clocks, composters and nutrient/waste converters of kitchen, orchard and garden ‘waste.’ Poultry feathers also provide good insulation; I used feathers from several of my meat birds to insulate a simple solar box cooker...

b-Each need can be provided by many elements in the system. Food is a basic need for poultry. In Guatemala, I incorporated many perennial and annual food sources for my poultry which also served other functions on Valle Patal Farm: as soil-improving nitrogen fixing live barriers for soil conservation terraces, wind and sun breaks (alley cropping), beneficial insect and livestock forage, mulch and compost material, beauty, human food, living fences...

4) Design for Relative Location: connect related elements on the farm to provide the most efficient, beneficial interchanges of functions and needs of each element (i.e. house, plants, animals, ponds, living fences, chickenhouse, greenhouse..)

This principle introduces the design methodologies of permaculture: zone and sector planning, relative location—to our analysis of each element (from

Principle 3) and of the site. This is the subject of another article, or a study of the texts below.

5) Share what we learn with others. A common thread of stable, old societies is that traditions and principles learned have been passed from generation to the next, taught by hands-on experience. It’s of little good to have an idyllic organic haven that’s an island in a dying community. To create truly self-reliant communities this is one of the most important permaculture principles, one that is manifested in the crucial work of NOFA and [The Natural Farmer](#).

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Susana Lein lives in the Appalachian mountains near Berea, Kentucky where she co-founded Salamander Springs Farm community in 1999. She is also currently a consultant directing the Phase I implementation of a Eco-Industrial Park on the former army ammunition base in Minden, Louisiana, a permaculture project designed by the Permaculture Research Institute in Tyalgum, NSW, Australia (see <http://mwllcc.com> and <http://permaculture.org.au> for more information). Susana will be teaching 2 workshops at the 2001 NOFA Summer Conference and showing a documentary film on her permaculture work with ALTERTEC farmers in Guatemala.

Tagari : A Visit to Bill Mollison's Experimental Farm

by: Claude Genest,
Green Mountain Permaculture

Three years ago my life changed as a result of taking the Permaculture Design Course in North America's pioneering eco-village, "Earthaven", in the Blackhills of North Carolina.

Last year my fiancée and I, hungry to deepen our knowledge of the incredible and timeless wisdom embodied in Permaculture, set out for Australia to study and apprentice at Tagari, the 50-acre experimental farm designed by Permaculture's founder, Bill Mollison.

Nestled in the caldera of an extinct volcano at the foot of Mt. Warning, Tagari's lush vegetation, thriving gardens and abundant wildlife belie its recent past as degraded pasture land.

From the elaborate earthworks (in the form of swales, dams and ponds) and thriving food forests, to the experimental chinampa systems and chicken tractors, there was much to absorb indeed.



photo courtesy of Claude Genest

Ditches dug on contour, called "swales", catch and divert water to a series of ponds.

The word Permaculture is a contraction of the words "Permanent" and "Agriculture".

However, since, as Mr. Mollison points out, "No culture can survive for long without a sustainable agricultural base and land use ethic", the word may just as well mean "Permanent Culture".

The subject of Permaculture is design - specifically the design of sustainable, beautiful and economically viable human habitats. With its holistic approach to the whole design, Permaculture at once culls from and provides a framework for the diverse "specializations" that achieving true sustainability will ultimately require.

Of equal importance to the information provided during the 72-hour design course is the transmitting of PC's Core insight - "that we can move from dominance to harmony with nature for beneficial relationship with place" - a paradigm shift very much in evidence at Tagari !

Practically speaking, Permaculture design concentrates largely on the RELATIVE LOCATION of the various elements that comprise a garden, farm or village, and seeks to make as many FUNCTIONAL connections between them as possible.

For example, much thought has gone into the energy-efficient design of, say, a kitchen. It would be irrational to put the refrigerator, stove and sink in separate rooms because of the extra steps that would incur, yet it is quite common for, say, the garden, chickens and compost to be distanced from one another and largely unconnected.

As many a gardener has found out, having to go "out back" for some lettuce and "over there" to care for the chickens soon becomes tiresome and increasingly discouraging.

The PC design curriculum teaches us, in an intensely practical way, to recognize the intrinsic value of everything that surrounds us. If we know that a pond, for example, stores the sun's heat while reflecting its light, where might we place it in relation to, say, the greenhouse?

And if that pond is to benefit the ducks, how might that nutrient rich water benefit the garden?

The Food Forest

An excellent example of PC in action is the Food Forest, and the best one I have seen sits right out front of Mr. Mollison's former residence at Tagari.

Permaculture seeks to mimic nature, the best and only example of "sustainability" there is, by recreating systems that have nature's resiliency, strength and diversity. Indeed, it is the strength of her diversity that provides her resiliency.

A food forest, then, is comprised of beneficial assemblies of plants, or "guilds" that, consciously chosen to compliment one another, create a synergistic effect wherein the whole is very much greater than the sum of its parts.

The classic example of this is, of course, the Native American "Three Sisters Guild" of Corn providing vertical "trellis" for nitrogen-fixing beans while the squash grown along the ground acts as a living mulch.

A Food Forest uses all seven layers, or "stories" of a forest: The tall canopy layer, dwarf varieties below that, then the shrub layer, followed by the herbal layer, ground level plants, the rhizosphere (tubers and bulbs) and the oft-neglected vertical layer (climbing vines and berries).

As the picture below shows, the resulting exuberant growth makes it difficult to see the trees for the forest!



photo courtesy of Claude Genest

"Designer as Recliner" The ten year old food forest in front of Bill Mollison's old house. That's a 20 foot coffee bush in the foreground.

Only ten years ago, the area pictured above was degraded cow pasture. Even more unbelievable is that the house peeking out from behind that 20 foot coffee bush has been inhabited only sporadically over the last several years, and the food forest is almost totally untended !

A goal of Permaculture is to create largely self-sustaining "Cultivated Ecologies", resulting in "The designer as recliner". Any doubts I harbored about the reality of this vision vanished as I marveled at the abundance of food dripping from the trees.

Walking through this veritable Garden of Eden was a sensory delight we'll not soon forget! All in all, some fifty species of fruit and nut trees comprise the upper canopy layers.

Witnessing enormous coffee trees right beside fruit-laden lime and mango trees, in the shade of riotous avocado and macadamia trees, dwarfed under the canopy of immense Jackfruit trees, forced me to reconsider the preconception that all these plantings "need" plenty of elbow room and sunlight - *These plantings had neither, were left entirely to their own devices, received no outside inputs whatsoever and were absolutely dripping with food !* Needless to say, we were impressed!

The Chinampa System

Chinampas, pioneered in Pre-Spanish Mexico city, perhaps the most productive system of sustainable agriculture ever devised, are being enthusiastically revived at Tagari and other Permaculture sites.

Fundamental Permaculture principles include Working with Nature, and turning Problems into Solutions.

Swamps and Wetlands, a personal passion of mine, are more often than not viewed as a problem, and the "solution" is to work against nature and drain them, often for nothing more productive or benefi-

cial than corn or hay. Chinampas provide hope for a real, ecologically beneficial and financially viable alternative.



photo courtesy of Claude Genest
Chinampas being “chicken tracted” at Tagari.

Chinampas, like food forests, are also largely self-sustaining and require only periodic maintenance. Specifically, the nutrient rich muck from the channel's bottom is occasionally scooped onto the neighboring land where it fertilizes and mulches the crops.

The water provides a yield of fish and a warm micro-climate that staves off frosts.

Feed for the fish is provided in a variety of ways, including up trellises, arbors and hoops.

Duckweed, nitrogen-fixing azola, and other floating plants like water hyacinth provide food for the ducks, which are periodically allowed onto the crop land to “tractor” it, glean the residue and patrol for pests (A famous Mollisonian saying is “You don’t have a slug problem, you have a duck deficiency”)

The water borne plants also shield the water from evaporation and filter excess nutrient from the duck and fish poop. An elegant symbiosis indeed!

And, as the illustration above shows, the chinampas also provide an effective (and enjoyable!) way to harvest and transport crops.

Catfish and Yabbie (a native Australian crustacean resembling a blue lobster) prowl the bottom, while Tilapia and Gambusia “Mosquito fish”, compete for the top and middle. Using screens and nets to keep the predator species from its prey allows populations to be controlled and a beneficial “guild” of fish to co-exist.

Chicken Tractors

One of the better known examples of Permaculture in action is the chicken tractor - whereby a phalanx of virile poultry is harnessed to a plow and...just kidding !

Actually, it's another example of working with nature and functional connections. Since a chicken's natural behavior is to scratch up the ground, eat pests, and fertilize the soil, why not put those to good use?

In exchange, the Permaculture chicken is liberated from the hell of a battery system, the garden benefits from pest patrolling, a “waste product” is converted to primo fertilizer, the chicken gets healthy free food, and we get wholesome eggs - Such a Deal!



photo courtesy of Claude Genest
A domed “Chicken Tractor” is rotated over form fitting garden beds. Mt. Warning's peak is in background

In practice there are two kinds of tractors,
1) “mobile”, where the “tractor” is placed over garden beds, or into areas that you might wish



photo courtesy of Claude Genest
One of the paddocks in the “fixed tractor”. Poultry is brought in to the various “pens” at appropriate times. Notice use of vertical space on left. Frequently plucked greens are planted up front, longer term crops like squash are planted in rear.

to convert into garden beds, and
2) stationary or “fixed tractors”, where the animals (this system is applicable to a variety of animals, from rabbits to cows, pigs, horses etc.) are rotated into fenced “paddocks” at appropriate times.

Epilogue

Between its ethical basis and its positive solutions to seemingly intractable problems, Permaculture has a magical way of inspiring those exposed to it.

Personally, our time at Tagari was so motivating that we went on to Willingly Work On Organic Farms (or WWOOF as it more commonly is known) at a variety of Permaculture designed and Biodynamically run farms throughout Australia and New Zealand.

On many occasions we found ourselves shaking our heads in disbelief that these practices are not more widespread back home. Over and over we saw practical, beautiful and do-able examples of sustainable living in action.

Today, we are committed to spreading Permaculture locally, keenly aware of the relationship between food production, local economies, and the global ecosystem.

Our burgeoning endeavor, Green Mountain Permaculture, is entering its second full year, offering introductory courses, and basic consultation services. Like many a PC site before us, we are heavy on design ideas and light on manpower and cash! And though we'd like to spend all of our time developing our site and working the gardens, we recognize the pressing need to follow Mr. Mollison's advice and teach the teachers who will teach the teachers who will hopefully make Permaculture a commonplace ethic in our collective efforts to keep our culture from disappearing.

Dreams have to start somewhere... What better place than your backyard ?

THANKS FOR A GREAT 5% DAY!!!

by Karen Franczyk

After the stormy weather the last weekend of March, Wednesday April 4th dawned bright and clear and warm. It felt like spring might really be just around the corner, and proved to be a great day to go shopping. And shop many of you did, at local Whole Foods Markets or Fresh Fields or Bread & Circus stores. I am still amazed by the number of NOFA members who made it out to shop that day just to support NOFA. So many of our volunteers who staffed the stores that day told me how many NOFA members they met, many for the first time, and how many customers said they were shopping for NOFA that day. Each store has its own marketing coordinator, and these people worked hard for NOFA ahead of time, helping to advertise our 5% Day so customers could come and support us. They made up signs to put by registers, they put out the posters we made, and they changed receipt tapes, all to remind customers of our day. Many team members (employees) thanked me for coming out to talk at their store meetings ahead of time, so they could know more about our organization and what we do. It was truly a cooperative effort, and helped to raise the \$48,507.99 that Whole Foods gave us, along with raising the awareness of many people in between. George Purtill, from NOFA Connecticut, was in the Bellingham MA store that day, and found that the staff at the store were very knowledgeable and incredibly helpful, even to "non customers like me – in fact, I felt like I was part of the 'team'", he commented. George also found that most of the customers already knew what NOFA was or had heard of it, and at least 1/3 of those who engaged him in dialog actually belonged to NOFA and of those, most had driven a long way to get there!

Each of the 18 stores in the region had anywhere from 2-8 NOFA members there all day from 10 AM to 7 PM to talk to customers and team members about NOFA and how we try to educate farmers, gardeners and consumers alike. Many customers were not interested in conversation, but took the brochure anyway to look at, and were thanked for any purchases they made that day. One customer at the Cambridge store told me as she left, "I just came in to buy broccoli, but ended up spending \$43!" I thanked her very much, as I and the other volunteers thanked so many customers that day. There were people who had questions about GMOs and certification, and many customers were concerned about food safety.

I want to take the time to thank each of the volunteers who went to the stores that day. Many gave up a lot of time, between driving to the stores and staying for anywhere from 2-9 hours. Volunteers are at the heart of NOFA, and I can't tell you all how much I appreciate you. Thank you to John Cleary, Imadres Bien-aimee, Jose Texeira, Colleen O'Brien, Sarah Coblyn, Paul Harlow, and Anne Burling, all from NOFA-VT; Jeanne Chapman, Isabel Barten, Dave Peterson, Kurt Von Dexter, Pat McNiff, Carlton Merrill, and Catherine Wojtowicz, all from NOFA/RI; Mike Nadeau, Erin Amezzane, Bill Duesing, Laura and David McKinney-Blyn, Joanne Sezon, Johan van Achterberg, Tom Kemble, Rob Durgy, George Purtill, and Nelson Lamonica, all from NOFA Connecticut; Rex and Connie Farr, Don and Loise Langlieb, Cathy Casa, and David Harrington, all from NOFA-NY; Gail Trautz, Anthony Lo Pinto, Stephanie Harris, John Krueger, Alex Adams, Rick Sisti, and Leslie Parness, all from NOFA-NJ; Polly MacNicol and Margi Wood from NOFA/NH; Christine Oliver, Jane Duderstadt, Jack Kittredge, Julie Rawson, Alix White, Ellen Parsons, Bettina Brown, Elaine Peterson, Jen Mix, Amy Doe, Tom Johnson, Kristine Keese, Jacqui Marsh, Cheryl Hill, Randy Jacobs, Rich and Priscilla Williams, Dave Petrovick, John Blanchard, Chris Yoder, Frank Albani, Mike Finch, Sarah Little, Carol Krentzman from Natick Community Organic Farm, Pat Stewart, Rita

Horsey, Gayle Ridgway, Ray Lamothe, Jean Cahill, Michael O'Bannon, Jeremy Barker-Plotkin, Jonathan von Ranson, Ed McGlew, Mary King, Scott McGinley, and Betsy Corner, all from NOFA/Mass. That's over 70 people, who all gave their time to NOFA!

I'd also like to thank the marketing coordinators from each store, for all they did to help us get the word out. They kept the awareness up among all the team members, so everyone was able to encourage customers to come back and shop on April 4th. Chris Mesarch from the Fresh Pond (Cambridge) store, which was the #1 store for that day, did an awesome job on the press release that went out about one month before the 5% Day. And Bonnie Frechette from the Bellingham store put in almost as many hours on this day as I did! She helped with everything from laminating pictures and putting together posters to writing the brochure. The other marketing coordinators I'd like to thank are Miriam Sadofsky from Bedford, Laura Derba from Brighton, Charlotte Davis from Cambridge, Ann Walsh-Sullivan from Hadley, Pat Kauffman from Newton, Mary Rudser from Newtonville, Stephen Hengst from Manhattan, Susan Goldthwaithe from Edgewater, Julie Williams from both Montclair and Millburn, Chris Ivers from Manhasset, Chuck Olivieri from Symphony, Pirjo Silen from Wayland, Nancy Kearns from Wellesley, Elizabeth Pasternack from Providence, and Elena Bucher from Greenwich.

I'd like to pass on a few of the comments that some of the marketing coordinators made to me afterwards, because they say so much about NOFA and its members. Nancy Kearns from Wellesley had high praise for "Farmer Frank" Albani, and was particularly amazed by the work Sarah Little did ahead of time to help publicize the day. Sarah got articles put into the paper on behalf of the 5% Day and arranged a meeting with a large group of people involved with environmental health, which Nancy attended to promote the NOFA 5% Day! Some great partnerships seem to be evolving or strengthening, which is wonderful to see! Nancy also reports that not only were people mentioning that they were shopping specifically because they'd heard of the 5% Day, but they also had customers calling asking for cases of various products – again, to support NOFA on our 5% Day!

Mary Rudser in Newtonville MA was making ladybugs with kids in the store and found many of the parents were shopping in support of NOFA. Chuck Olivieri from the Symphony (Boston) store said "Farmer John Cleary from Vermont can sit in my store any day anytime. He was very knowledgeable and friendly as were the folks from the farm project in the afternoon." Pat Kauffman from the Newton store not only went out of her way to put up special signs advertising the 5% Day ahead of time, but also spent the day sampling (and selling) lots of organic foods, and found Colleen O'Brien from Vermont "a real joy". Colleen was there all day, and organized the volunteers from Vermont, as well. I'd like to thank her and the other state coordinators, for helping to get the word out in their state and also getting volunteers for the day. Johan van Achterberg did an amazing job (as usual!) for Connecticut, getting staffing for the Greenwich CT store as well as the Edgewater NJ and Bellingham MA stores; Elizabeth Obelenus from NH, who got staffing for the Bedford MA store; Gail Trautz from NJ, who arranged staffing for the Montclair and Millburn NJ stores; Jeanne Chapman from RI, who took care of the Providence store while going to the Bellingham MA store herself, and also worked hard at getting me pictures for the 36 posters we made for this event (which are now available for other events); and Sarah Johnston, who got staffing for the Manhasset and Manhattan NY stores. Thank you all for a very successful day!

Book Reviews

The Resources of International Permaculture, Volume VIII

A Directory of Groups Working for Sustainable Habitation of the Earth

Dan & Cynthia Hemenway, editors

Published by Yankee Permaculture

PO Box 52, Sparr FL, 32192-0052

Email: YankeePerm@aol.com

117 pages, looseleaf with 3-ring binder

Reviewed by Jack Kittredge

NOFA readers may remember Dan Hemenway, who hailed from New England 15 years ago. He is the inspiration behind Yankee Permaculture, the Barking Frogs Permaculture Center, Elfin Permaculture, the International Permaculture Solutions Journal, an inspiring number of permaculture design papers, and this directory (TRIP VIII).

TRIP VIII contains about 2000 listings spread throughout 10 regions of the world. The listings range from national research agencies dealing with some aspect of the environment to green political parties to alternative colleges to environmental groups of all stripes. NOFA is in here, for instance, as well as **The Natural Farmer**. Besides listing groups by region, indexes also list each group alphabetically, and by 17 categories of interest — alternative economics, water issues, forests/trees, sustainable food systems, and the like.

A directory of this sort is a major effort, and can be a very valuable resource. But its value is largely a function of how much time and energy is spent keeping it updated, annotated and indexed as new issues come along and people move from place to place. Unfortunately, TRIP VIII falls short in this area. Glancing through the listing of publications I came across "The Organic Farmer", a Vermont journal which went out of business 10 years ago, and "New Farm", the Rodale paper which bit the dust probably 5 years ago. If these US publications which are fairly easy to check out are still included, it makes me very skeptical about the thoroughness of the editors in checking out the listings from Burkina Faso or Bangladesh.

In fairness, in a preface to the directory Hemenway admits that he cannot maintain accurate updated information on all these organizations, and solicits the reader's help in informing him of needed changes. But the reliability of the data is not the only barrier to making this directory useful. Only occasionally does a listing include a descriptive line which tells what that organization actually does. With most, you have to figure it out from the organization's name or even its initials. Equally frustrating, listings include only postal addresses, the least helpful form of address in this telephonic and internet-oriented age. Finally, all Hemenway's publications are printed in small print (for tree-saving purposes) and many appear to have been originally created on a defective desktop printer. They are hard on aging eyes and do not copy well if you want to send a page to a friend interested in a particular topic or part of the world. (Although photocopying is a violation of copyright and expressly forbidden by the editors, it is hard to imagine not sharing this valuable information with others. The only practical way to do so, unfortunately, is to photocopy a page and send it.)

Given all my quibbles, my hat is off to Dan for the expanse of his appetite in taking on this task. To have the information in such a directory, were it up-to-date, more detailed and more readable, would be a real boon for travelers, researchers, teachers, journalists, and anyone else concerned about sustainable habitation of the earth. He has shown us a valiant beginning. It is a task which environmental groups ought to support in a consistent way, and which foundations ought to subsidize to the extent of an occasional update.

The Gap Mountain Permaculture Mouldering

Toilet: A Gap Mountain Permaculture Technical Bulletin

by Doug Clayton and David Jacke

Reviewed by Jack Kittredge

This book is now out of print, but I wanted to take this opportunity to review it to publish the design schematics in it for the mouldering toilet which Doug Clayton built (see article on page 28 of this issue.) It's a excellent design and makes an simple, low-cost, non-polluting human waste disposal system. Figures 1 & 2 on this page show a cross section and an exploded view of the design. Enjoy!

Christopher Lloyd's Garden Flowers: Perennials, Bulbs, Grasses, Ferns

by Christopher Lloyd

Timber Press, 2000

384 pages (plus 64 pages of color photographs)

ISBN: 0-88192-492-X

\$39.95 hardcover

Reviewed by Justine Johnson

The New York Times Book Review called this book a "highly distinguished abecedarium," which—for those without a dictionary—translates loosely into "really good alphabetically arranged book." *The Avant Gardener* called it "a monumental and lively report," and *Gardens Illustrated* deemed it "invaluable."

But, please, don't believe everything you read.

I suppose it's a matter of personal taste, but for me—a novice organic flower gardener always on the lookout for inspirational and informative gardening reads—*Christopher Lloyd's Garden Flowers* is just a bit much. And I'm not talking about price, either—though for the same money (\$39.95), I could surely start a nice little perennial bed out back.

Figure 1: In-House Privy #1, Exploded Isometric**Figure 2: In-House Privy #1, Section**

What I mean by "a bit much" is sentences like this one from the (very basic) introduction: "A few paragraphs on the mechanics of looking after perennials may not come amiss." Huh?

Sentences like this one aside, by most accounts Christopher Lloyd is Britain's most esteemed garden writer. In 1979 the Royal Horticultural Society conferred on him its highest honour, the Victoria Medal of Honour. In *Garden Flowers*, Lloyd—who is now 80 years old—records his personal assessments of more than 360 perennials, bulbs, grasses, and ferns. From *Acanthus* to *Zigadenus*, he bases his spirited opinions on a lifetime of experimentation in the garden. Some entries are a few pages long, some just a paragraph.

If you're into overly wordy, somewhat stilted plant descriptions and have a knack for remembering Latin names, perhaps this would be a good reference book to add to your collection. (Surely it's not for the first-time garden book buyer.) But keep in mind that Lloyd lives and gardens in Great Britain, which doesn't mean much to NOFA Northeasterners. For example, *Cirsium rivulare* is "grown with the greatest ease in Scotland"—but will it thrive in your garden? You'll have to plant it to find out, because Lloyd offers next to nothing about climate preferences or hardiness. I was also vexed to find there is no index cross-referencing plants' common names. (Although Lloyd finds it "repulsive" that gypsophilas are known in the USA as baby's breath, I—alas, an American—would have appreciated being able to look it up as such.) And, while there's no talk of boosting growth with chemicals, there's no mention of doing things organically, either.

One saving grace is the book's lavish photographs, from which I did make some new discoveries and glean some inspiration. But again, it would have been helpful to match up the photos with the text entries, rather than clustering them throughout the book.

In conclusion, I'll leave you to ponder another insight from Lloyd's introduction: "A plant has no business to be dull in company—same with humans."

And same with books.

The Greenmarket Cookbook

Recipes, Tips, and Lore from the World Famous Urban Grower's Market by Joel Patraker and Joan Schwartz, photographs by Marry Kim
 Viking Press, 256 pages, \$29.95, ISBN: 0-670-88134-1

Reviewed by Steve Lorenz

Here's a confession: Often when I'm telling a story to my children, my characters seem to come from another time. They don't worry about traffic, they find "toys" in nature, and they almost always meet people at the farmer's market. So, aside from my affiliation with NOFA, that tells you why a cookbook based on farmer's market experience caught my eye.

Among the recipes and tips, there is a generous sprinkling of stories of market people that are quite interesting, even if you don't know them. But therein lies part of the problem I have with *The Greenmarket Cookbook*: it's commanding a hefty price (\$29.95) for something that with some time, effort, and ingenuity could, at least in its essence (in other words, without the photographs, which *are* beautiful), be produced by folks at *your* farmer's market, which would be much more meaningful. Also, playing no small part in my negative reactions to the book is its New York-centricity and its reliance on big-name N.Y.C. chefs and food writers for the recipes. Although I think it's laudable, if kind of a no-brainer, that Michael Romano of Union Square Cafe and others go to the Greenmarket (although there are 28 in the five boroughs of N.Y.C., the one at Manhattan's Union Square is mentioned most often) to get the freshest fruits, vegetables, herbs, cheeses, and meats, many of their recipes in this book are a bit too fancy. And then, there's also the obvious exclusivity of their establishments — that surely closes them off to many of the other customers, and probably most farmers, pictured in the book. Some more recipes from regular market buyers could have been solicited and used, and would have been welcomed.

Many of the executive chef-types' recipes have multiple parts, that if not exceedingly difficult to prepare, are time consuming beyond most people's expectations. Or, although most recipes use ingredients that can be found at the market (in the season it's listed under), there are a few that call for having vanilla beans or Grand Marnier on hand. Beware the names, too: Poached Rhubarb with Goat Cheese Mascarpone and Vegetable Pot au Feu with Ramp Vinaigrette are two of the more inaccessible sounding dishes (both from Spring), though neither requires advanced skills to prepare. Conversely, Chile Pumpkin Soup (from Fall) doesn't sound that tough, but you better check your calendar before embarking on it.

Still, the book is fun to flip through, and the bits of history it gives about Greenmarket (now over 25 years old) are very interesting. The markets help foster the human connection between rural grower and urban consumer that is absolutely necessary to create a better, more agriculturally sustainable world. Co-author Joel Patraker (Joan Schwartz is the food 'expert') seems

to be a genuine advocate for farmers, for eating in season, and for the cause of farmer's markets everywhere (though his list of farmer's markets at the back is far from complete). By Patraker's account, his was a true and complete conversion. A "city boy", he humbly recounts his first job at Greenmarket, and his encounter with an old-time grape farmer from Dundee, NY and all that he learned from him. Through Patraker's writing, the simple importance of food and its history, and its enormous diversity becomes apparent. "I soon learned that nothing beats beginning a fall day with freshly pressed juice from Diamond grapes," he says.

In Patraker's hands, particularly when he's writing about market people, or in his very detailed, helpful charts on tomatoes, apples, and potatoes, food and the people who grow it and eat it attain a preeminence that is sweet and rare. At times, the combination of text and photos produced in me Proustian recollections, or even a wished-for "remembrance" of tastes I have not (yet) experienced.

Though there are some mentions of organic growers and photos of organic grower's stands, there is no distinction or preference made for organic over conventional, probably because as spokesperson for Greenmarket, Patraker is not at liberty to do so. But the book is organized by season, and, with a detailed description of most of the book's ingredients, it can empower the average market-goer to eat locally throughout the year. Of course, \$29.95 is not a very 'empowering' price for the average market-goer. It's certainly worth a look at the bookstore or if your library can get a hold of it, though. Better yet, write one yourself.

Advanced Home Gardening: Cutting Edge Growing Techniques for Gardeners

by Miranda Smith

published by Creative Homeowner

24 Park Way, Upper Saddle River, NJ 07458, 201-934-7100,

www.creativehomeowner.com

\$24.95, 320 pages, paperback, 650 photos and 100 illustrations

Reviewed by Jack Kittredge

Those who know Miranda Smith know her as an organic enthusiast who has been around awhile, growing and writing about growing for 30 years in the Rodale circuit. Her prose is always clear and informative. She never preaches, instead encouraging you to try things out for yourself.

This book claims to be for the grower who has been at it a few years, but I think any thoughtful gardener, even a novice, would be well served to read it. The organization is simple: nine chapters focus on preparing the garden, plant basics, flowers, specialty flowers, vines, vegetables, herbs, fruits, and the ubiquitous weeds, pests and diseases. The actual text is straightforward, narrating you through these areas with a few paragraphs on each step.

What I liked about this book, however, is the effective use of photos, drawings, charts and tables to convey information. Beautiful color photos abound on every page — but they do more than look pretty. They always illustrate a point which is reinforced in the simple caption (such as how to build a compost bin, prune for various tree shapes, or "block up" to larger sizes with seed blocks). Drawings are used lavishly as well — from showing simple garden implements and their names to illustrating how grasses reproduce to clarifying how topography creates microclimates to providing the cross section of the mother of all garden protection fences (trenched chicken wire at the bottom, then 6 feet of rigid wire grid fencing topped by a foot and a half of loose fencing, plus a separate 3 foot deer fence composed of posts and electric wire with occasional aluminum foil pieces coated with peanut butter wired for shock.)

Charts and tables convey succinct packets of information in a useful way so that you can compare items quickly by the parameters you are interested in. Examples are: Nutrient content of common soil amendments and fertilizers, companion planting attract/repel features, yields per bed foot for most garden vegetables, and starting schedule for common vegetables in zone 5. Illustrated plant-by-plant directories of herbs, fruit trees, annual, biennial and perennial flowers, and vegetables also give basic identification and information about spacing, culture, days to maturity, seed-saving, pests and diseases.

There is much here for a beginning or advanced gardener to ponder, as well a little which may inspire him or her. Although a production farmer would probably laugh at the perfectionism which infuses this book, beginning farmers will also find a lot of handy information here which can help them design their cropping layout, plan their rotations, schedule their seeding and transplanting, and perhaps even deal with issues of fertility, disease and pests. Altogether, it's a great gift book for a gardening friend (and before you wrap it up browse a bit to see if you might like one too.)

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Transplant Soil Mixes

Please note: I am not an agent for Sungro, Sunshine mix or McEnroe Farms. I am not being compensated in any way. NOFA-NJ is not endorsing these companies, products or distributors. I have had success with some of these products and want to share my experiences with other growers.

There has always been a bit of a dilemma for the Certified Organic Grower when it comes to choosing a soil mix for the greenhouse. Until recently there has not been a commercially available "approved mix" that is readily accessible to us. Most growers I spoke to used a common formula: Sunshine Mix #2 and mushroom soil or compost. This mix works but has some flaws and I was never quite proud of my transplants. I couldn't effectively get them the proper nutrients they needed and I always had weed problems. Using this was further complicated when it became evident that a NOFA-NJ decision no longer allowing Sunshine #2 for organic transplant production was imminent due to its "wetting agent".

Last year (2000) we experimented with a mix from McEnroe Farms, a NOFA-NY certified farm. They make the mix from a high-temperature compost made on the farm that includes: horse and cow manure, organic vegetable waste and other ingredients: Sphagnum, Sand or Perlite, Blood Meal, Clay, Gypsum and Rock Phosphate. The results were excellent! We had no weed problems, our transplants had the food they needed and I was proud of our quality. One problem was that the mix was too heavy for even germination. We used the "Premium Organic Growing Mix" last year. This year we are experimenting with the "Premium Lite Growing Mix" for germination. The difference between the mixes is that the "Lite" has perlite instead of sand. These products are not OMRI listed but allowed by NOFA-NJ.

When we first decided to try the McEnroe mix we thought that we would drive up to the farm in Millerton, NY. We like visiting other farms and thought we could learn something while we were there. It wasn't worth the 4-hour trip and our pick-up wasn't thrilled about the 1-ton load we brought back. (1 skid = 20 bags, approx. 2000 lbs.) We were there in the winter and the farmers were nowhere to be seen. The composting operation was big and heavily mechanized and we didn't learn much. We ordered our next two loads from North Slope Farm. This year, in an effort to save shipping costs I ordered a trailer load (400 bags) directly from McEnroe. Four other NOFA growers went in on the load and we saved over \$2.00 a bag in shipping costs. We have some left that we are selling at cost if anyone is interested.

Sungro has come out with a new "OMRI" listed mix currently called "Sunshine Organic Planting Mix". It is just like the #1 or #2 in consistency. It has a new OMRI listed wetting agent and an OMRI listed nutrient charge. Sungro states in its press release (dated 1-19-01, but unavailable until 3-2-01) "[the mixes] are made from high quality raw materials including an organic fertilizer starter charge to provide a base level of plant nutrients and an organic wetting agent to improve the initial wetting of the mix." I have ordered this product and it arrived today (February 26). I have not used it yet and have no information about its effectiveness. Penn State Seed said that they got a trailer load of it last week and it's almost all gone.

Rob Ferber & Amanda McCutcheon
Visit our web site at www.phillychile.com
The Philly Chile Company Farm
235 Swedesboro Rd.; Monroeville, NJ 08343
856-358-1431

Calendar

Saturday, July 14: Diversified CSA with Heirloom Vegetables/Free Range Livestock and Strawbale Ag Buildings Farm Tour, Four Winds Farm, Gardiner, NY *for more info: 845-255-3088*

Saturday, July 22: Intensive Herbal/Agroforestry Cultivation and Marketing Farm Tour, Hollow Hill Herbs, Cobleskill, NY *for more info: 518-234-3510*

Friday, August 10 - Sunday, August 12: NOFA Summer Conference, Hampshire College, Amherst, MA *for more info: 978-355-2853*

Friday, August 24 - Sunday, August 26: 14th Annual Women's Herbal Coinference, Peterborough, NH *for more info: 802-479-9825*

Saturday, September 8 - Field Day: Disease Resistant Open-Pollinated Vegetable Varieties for the Northeast, Ithaca, NY *for more info: 518-922-7937*

Sunday, September 9: Transitioning Farm and Marketplace Organic Greens Farm Tour, Equinox Farm, Sheffield, MA *for more info: 413-298-0076*

Saturday, September 22: Longevity and the Small Goat Dairy Farm Tour, Rawson Brook Farm, Monterey, MA *for more info: 413-528-2138*

Friday, October 19: Seminar on Diseases of Herbaceous Perennials, Cromwell, CT. *for more info: 860-345-4511, lpundt@canr.uconn.edu*

Friday, December 7 - Sunday, December 9: Third Northeast CSA Conference, Claryville, NY *for more info: send postal address to bholtzma@together.net*

NOFA Membership

You may join NOFA by joining one of the seven state chapters. Contact the person listed below for your state. Dues, which help pay for the important work of the organization, vary from chapter to chapter. Unless noted, membership includes a subscription to The Natural Farmer.

Give a NOFA Membership! Send dues for a friend or relative to his or her state chapter and give a membership in one of the most active grassroots organizations in the state.

Connecticut: Individual or Household:

\$35, Business/Institution: \$50, Supporting: \$100, Student (full time, supply name of institution) \$20

Johan van Achterberg, 359 Silver Hill Rd., Easton, CT 06612-1134, (203) 261-2156 (home), vanachj@concentric.net

Massachusetts: Individual: \$30, Family:

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New Hampshire: Individual: \$25,

Student: \$18, Family: \$35, Supporting: \$100
Elizabeth Obelenus, 4 Park St., Suite 208, Concord, NH 03301, (603) 224-5022, nofanh@quest-net.com

New Jersey: Individual: \$35, family/organizational: \$50, Business/Organization: \$100, Low Income: \$15* *does not include a subscription to The Natural Farmer
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New York: Student/Senior/Limited Income

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Vermont: Individual: \$30, Farm/Family:

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Summer, 2001



photo by Jack Kittredge

Kerry and Barbara Sullivan squat in the angelica in front of their flowform. The device helps to energize water to be used in biodynamic preparations on their CSA in Kimberton, Pennsylvania.

News, features, and articles about organic growing in the Northeast,
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