by Julie Rawson, Co-coordinator

This will be the last year that Jack and I will be in charge of organizing the NOFA Summer Conference. As it is the 24th time we will have performed this labor of love for the organization, parting will be bittersweet. We truly raised our children on the conference. We won’t miss the grind all summer long of dealing with the multiple immediate needs each day. But we will miss the opportunity to have a strong hand in this event that is often the entry point for folks who want to make a real change in the way they live their lives, the place where policy initiatives get a boost forward, the place where growers, both young and old, pick up new tricks of the trade. It might be fun to just attend the conference and make the most of the amazing amount of information, sharing and inspiration that converges for three short days each year. See below for a job announcement.

Though some of the hard core still think we should go back to Hampshire College for the Summer Conference, that door is closed for now. We weren’t able to continue there as we grew larger and came at a time of year when our presence was too much of a stress on their system. We on the Conference Committee are very happy in our new home at UMass where the conference services staff is highly professional and responsive, and for whom our “arrangements” needs are a high priority. It has been a nice marriage of a somewhat counter cultural organization and a large public university. A little learning has rubbed off on both of us. In this our third year with UMass we expect to work out most of the remaining kinks. Many participants hanker for an economical and organic alternative to the dining commons food. We are working on this. Additionally, we hope to further advance the topic of convenient access to parking.

Sally Fallon last keynoted for the NOFA Summer Conference 7 or 8 years ago. Though we have never invited back another keynoter for a second round, Sally is an exception. Her message that whole and traditional foods are of central importance to a healthy diet has broad support, from families of young children to the farmers that raise these foods. Her impassioned support for the consumption of raw milk on one hand supports healthy families and on the other provides a real way out of the dairy crisis from the farmer’s standpoint. Her eminent and fearless leadership on the topic of our right to raise and eat health giving foods makes her an important role model and mentor for all of us who would craft a better world. Finally, her generous spirit that is totally free of the trappings that sometimes attach themselves to powerful and famous people shines through all of her work.

Sally Fallon Morrel, is best-known for her leadership in the Weston A. Price Foundation, and for her ground-breaking cookbook, Nourishing Traditions, which shows through research and recipes how the wise food choices and preparation methods of isolated traditional cultures promoted vigorous good health, longevity and freedom from dental problems and mental disorders. Her basic message is that animal fats, properly prepared whole grains, enzyme-enriched foods and nourishing bone broths kept our ancestors healthy, and that we need these kinds of foods too. Beginning with a presentation of Dr. Weston Price’s unforgettable photographs of healthy traditional peoples, Sally explains the underlying factors in a variety of traditional diets that conferred beauty, strength and freedom from disease on so-called primitive populations.

As a presenter, Sally blends culinary expertise with a finely honed capacity to cut through to the truth about our eating habits and their

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36th Annual NOFA Summer Conference
Set for Aug. 13-15, 2010, UMass/Amherst

by Julie Rawson, Co-coordinator

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(continued on page 39)
Dear Jack,

Thanks for the fine issue on local organic food!

Regarding Ernest Wright’s cold frame design in the letters section of the Fall issue, there is a reason why people do not build cold frames with the floor slanting parallel to the top glazing - watering. The flats of plants in a cold frame need to be watered. If they are on a slant, all the water runs to the bottom leaving the tops plants high and dry.

Peace, Liz Henderson

Why Nutrient Density?
by Jack Kittredge

Julie and I have, for the last three years, been experimenting on our own farm with some of the practices recommended by advocates for nutrient dense or biological farming. This is in large part because our son Dan is such a proponent of these ideas, in part because they make a lot of sense in the abstract and we want to see if they are practical and productive in an operation such as ours, and in part because we are encouraged by the results we have seen so far.

You will have a chance to evaluate Dan’s thoughts yourself because he has written the introductory article in this issue’s special supplement on nutrient density.

I’m deductive and like to look at the big picture. What appeals to me in the abstract about this approach is that it makes so many parallels with what I believe in other things. Human health is only partly about avoiding toxins, predators and accidents. It is also about providing the body what it needs (primarily through nutrition) to fulfill its biological potential. Then its own systems will thrive and protect the body and mind. As Dan points out in his intro, plants and animals (including humans) digest food with the assistance of billions of microbes (for plants they are in the soil, for us in our intestines). It is only if those microbes are healthy and happy that we will be.

Julie tends to be inductive. She looks at results and reasons back up from there. She has noted the complements we are getting from our CSA members who remark that our produce tastes better this year. She thinks perhaps our avoidance of late blight this summer in the tomatoes, and a phenomenal harvest of blight-free potatoes, may in part be due to two years of heavy applications of calcium limestone, fish, and soft rock phosphate with smaller amounts of gypsum, azomite, and humates along with weekly biological drenches and nutrient sprays. Though the year was a tough one weather-wise, as was last year, there is marked progress in yields, appearance and flavor in crops like carrots, beets, all the greens, onions, and all the fruit.

So we are bringing you an issue devoted to discussing some of these ideas and the farming practices they entail in organic systems. Acres, USA has been a major vehicle for publicizing this approach and several of these articles originally appeared in their pages. They are gratefully reprinted with permission. We also include an extensive feature on Mark Fulford, a New England farmer and consultant who has much experience in using biological farming in our region. This kind of farming makes the claim that its results can be objectively measured with simple devices according to scientific principles. So we are running information about how to do just this and get accurate brix readings with a refractometer. And since successful farming involves not only producing a high quality product, but selling it as well, we include a piece on Beyond Organix, a young California company which is starting to market produce based on how closely it meets standards of nutrient density.

This whole area is somewhat new (particularly in the Northeast) and therefore inherently controversial. But there are those in NOFA who feel it is an important source of insight and can help us distinguish our farms from industrial and other organic ones that may be following the NOP standards but are not necessarily producing food as full of health as it might be.

The Natural Farmer

The Natural Farmer is a quarterly membership journal of the Northeast Organic Farming Association. We plan a year in advance so those who want to write on a topic can have a lot of lead time. The next 3 issues will be:

Spring 2010: Organic Animal Nutrition

Summer 2010: Small Farms & Gov’t Regulation

Fall 2010: Organic Farming and Money

If you can help us on any of these topics, or have ideas for new ones, please get in touch. We need your help!

Moving or missed an issue? The Natural Farmer will not be forwarded by the postal service, so you need to make sure your address is up-to-date if you move. Those who regularly send us a subscription fee should send address changes to us. Most of you, however, get this paper as a NOFA member benefit, in part paying your chapter dues and will send address updates to your local NOFA chapter (listed at the end of each issue).

Archived issues from Summer 1999 through Fall 2005 are available at http://www.library.umass.edu/speccoll/digital/tnf/. More recent issues are available at http://www.library.umass.edu/tnf@nofa.org

The NOFA Exchange

The NOFA Exchange - this is a free bulletin board service (for subscribers or NOFA members who get the TNF) for occasional offers or needs. Send in up to 100 words and we’ll print it free in the next issue. Include a price (if selling) and an address, E-mail or phone number so readers can contact you directly. If you don’t get the paper yourself 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 TNF@nofa.org.

Advertisement in or Sponsor 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 subscribers or NOFA members who get the TNF) for occasional offers or needs. Send in up to 100 words and we’ll print it free in the next issue. Include a price (if selling) and an address, E-mail or phone number so readers can contact you directly. If you don’t get the paper yourself 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 TNF@nofa.org.

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 Bob Minnici, 662 Massachusetts Ave. #6, Boston, MA 02118 or BMinnici@nofamass.org and enclose a check (to “TNF”) for the appropriate size. The sizes and rates are:

- Full page (15” tall by 10” wide): $360 $500
- Half page (7 1/2” tall by 10” wide): $185 $260
- One-third page (7 1/2” tall by 6 1/2” wide): $125 $175
- One-quarter page (7 1/2” tall by 4 7/8” wide): $95 $135
- One-sixth page (7 1/2” tall by 3 1/8” wide): $65 $90
- Business card size (1 1/2” tall by 3 1/8” wide): $20 $25

Note: These prices are for camera ready copy on clear paper, or electronically in jpeg or pdf format. If you want any changes we will be glad to make them - or to typeset a display ad for you - for $45 (which includes one revision - additional revisions are $10 each). 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 $45.

Attendees at a workshop at Many Hands Organic Farm use refractometers to measure crop brix.

Frequency discount: we give a 25% discount for year-round ads. If you reserve the same space for four consecutive issues your fourth ad is free! To receive the frequency discount you must pay for all the issues in advance, upon reserving the space.

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

- January 31 for the Spring issue (mails Mar. 1)
- April 30 for the Summer issue (mails Jun. 1)
- July 31 for the Fall issue (mails Sept. 1)
- October 31 for the Winter issue (mails Dec. 1)

Disclaimer: Advertisers are helping support the paper so please support them. We cannot investigate the claims of advertisers, of course, so please exercise due caution when considering any product or service. If you learn of any misrepresented in one of our ads please inform us and we will take appropriate action. We don’t want ads that mislead.

Sponsorships: Individuals or organizations wishing to sponsor The Natural Farmer may do so with a payment of $300 for one year (4 issues). In return, we will thank the sponsor in a special area of page 3 of each issue, and feature the sponsor’s logo or other small insignia.

Contact for Display Ads or Sponsorships: Send display ads or sponsorships with payment (made out to “TNF”) to our advertising manager Bob Minnici, 662 Massachusetts Ave. #6, Boston, MA 02118. If you have questions, or want to reserve space, contact Bob at (617) 236-4893 or Bob@nofamass.org.
Please help us thank these Friends of Organic Farming for their generous support!

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Farmers wanted to form group for purchasing farmland preferably in the Rondout Valley in Ulster County, NY. The larger the group, the lower the per acre price. Email <farmers@earthlink.net>.

**Flower Grower, Tractor Operator, Vegetable Grower, Farm Stand Caretaker and Intern Positions for 2010** at Red Fire Farm, a certified-organic vegetable farm in Western Massachusetts. Located in the vibrant Five-College area, Red Fire is the largest CSA serving the Boston area and the Pioneer Valley, and a provider in local wholesale markets, including our farm stands and farmers’ market. We are seeking experienced applicants interested in joining the crew for longer-term positions. Please visit www.redfirefarm.com for position descriptions and how to apply. Contact Sarah: 413-467-7645, jobs@redfirefarm.com.

2 Vegetable Market tables: Angled with chalkboard backs, 8 feet long, 36” wide. $100 each. 2 Vegetable Market tables

Sarah: 413-467-7645, for position descriptions and how to apply. Contact for term positions. Please visit www.redfirefarm.com for more information.Athletes, efficiency freaks and obsessive-compulsive types sought for variety of farm positions at Full Moon Farm, a 155-acre certified organic CSA in Hinesburg, Vt. Grow Manager/Market Coordinator/Livestock Coordinator/Field-Workers and Apprentices all wanted. Experienced and inexperienced persons sought. On-farm housing available. Live like a farmer: long-hours, low-pay, great food, great company, great location, great views, great mental and physical work-outs. For more info contact david@together.net or view us at www.fullmoonfarminc.com.

Farm manager opportunity, exciting opportunity for Farm Manager to play significant role in defining and developing a new community farm. Start up year responsibilities include: Purchasing seeds, seedlings, farm equipment, Instilling irrigation, Growing herbicide, pesticide-free food on 2 acres, and Harvesting food for onsite farm stand/CSA Share Program. Community farm concept includes education, volunteer and public event components. Non-profit board will manage these components but will ask for feedback from Farm Manager. Goal is to create dynamic team effort with Farm Manager and non-profit board of directors. Contact Heather Scott at hks130@hotmail.com for more information. www.medwaycommunityfarm.org

The FARM Institute (TFI) is an educational working farm on 162 acres of coastal sand plain on Martha’s Vineyard Island, Massachusetts. TFI operates a teaching farm that educates and engages children and adults in agriculture through the operations of a diverse working farm. More info: farminstitute.org or 508-627-7007. Jobs – 2010: Summer Farm-based Educators (15x) (June 6 – August 27, or September 10) education@farminstitute.org, Farm Apprentices (2x) (March 15- November 15) Julie@farminstitute.org, Farm Apprentice (1x) (June 1- August 31), Garden Apprentices (2x) (March 15 – November 15) Kristen@farminstitute.org, Garden Apprentices (3x) (June 1 – August 31)

We custom grow your seedlings: Spring 2010. The Natick Community Organic Farm will grow certified organic annual and perennial vegetables, herbs, and flowers seedlings for you. Contact us for more information. 508 655 2204 or jcbourrut.ncorganic@verizon.net

Help wanted on non certified organic farm. 2 Interns or apprentices for 2010 season April- Nov. in Western NY. 8 acres of field vegetable production plus greenhouse and high tunnel, including work with CSA, farmers markets, and farm stand. Contact Bob at 716-484-7300 or bob@busticidermill.com, www.busticidermill.com

Thanks to all of those who participated in the first ever MA/CT/RI fall bulk order. Information about the spring bulk order will be available 1/1/10. Please contact Cathleen O’Keefe with any questions or suggestions, bulkorder@nofamass.org, (413) 584-6786.

For Sale: Limited quantity of freshly harvested worm castings. Promote soil vitality with beneficial organisms, enzymes, and nutrients. Use for potting mixes, soil amendments, chemical-free lawn care. Mix for foliar spray or brew castings tea. 2 lbs - 5.00, 5 lbs - 12.00, 10 lbs - 20.00, 25 lbs - 45.00 plus shipping and handling or you pick up in Florence, Mass. Better yet, make your own castings. Worm bins and workshops available. Ben’s Bins - 413-586-3699, bins@wehaveworms.com, www.wehaveworms.com

We can and will grow certified organic annual and perennial vegetables, herbs, and flowers seedlings for you. Contact for more information. 508 655 2204 or jcbourrut.ncorganic@verizon.net

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Maine Organic Milk Producers Form Company to Save Farms

Last February, a group of Maine organic dairy farmers thought that their businesses as they knew them had come to an end. Citing a soft organic market, a depressed economy and the great distances to serve depressed farm incomes, the farmers were flabbergasted.

But with true Yankee ingenuity and New England perseverance, a new company has been launched: MOOMilk (Maine Organic Milk Producers). The farmers banded together to find a solution. Each week, a growing number of people buy products made on their farms directly for a predetermined length of time. CSF (Community Supported Fish) culture, a CSF is a shore-side community of people who buy fish and shellfish from local fishermen. At the center of the network is a group of local fishermen called New England Waterfront Fishermen's Cooperative, and local seafood groups, restaurants, and New England Sea Grant.

The Local Food, Farms, and Jobs Act of 2009 directs state agencies to purchase at least 20 percent of the food locally in states and communities. A new Livestock Care Standards Board will do with new state standards. Illinois, home to 76,000 farms and more than 950 food manufacturing companies, is a solidly agricultural state in the heart of America’s bread basket. Fully 80 percent of it is farmland. But, of all the food eaten in Illinois, only four percent is actually grown there. Vast quantities of food are exported to states and countries where Illinois will not have to farm to maintain a healthy food system, the local food movement is gaining momentum. The Local Food, Farms, and Jobs Act of 2009 draws on the recommendations of a 52-member task force asked to determine Illinois’ potential for local food consumption. Illinois, the group found, has lots of local food and lots of people willing to eat it. That’s what’s missing is a way to connect them on a larger scale. The goal is to increase the amount of local food served in public schools. The local food movement is gaining momentum. The Local Food, Farms, and Jobs Act of 2009 directs state agencies to purchase at least 20 percent of the food locally in states and communities. A new Livestock Care Standards Board will do with new state standards.
An Amish farmer of Loyal, Wisconsin is the first American to stand trial for refusing to comply with the state’s mandatory premises registration law. The state enforces a quietly ignored agreement with the USDA regarding NAIS implementation. On September 23 Mr. Miller was taken to Neillsville, WI (Clark County) to a federal court for a preliminary hearing. On October 21 Pat and Melissa Monchilovich were convicted on the same charge in Polk County, despite the admission by representatives of the Wisconsin Department of Agriculture, Trade and Consumer Protection (DATCP) that the program was not of benefit and probably never would be.

source: Acres, USA, November, 2009

Farmers Market Stats Released

According to a USDA survey, average sales at farmers markets in 2005 totaled $245,000 per market, or $7108 per vendor. On average, 25% of a market’s vendors cite farmers markets as their sole source of farm income. Fifty-nine percent of markets accepted WIC Program vouchers, and forty-four percent accepted senior (SFMNP) vouchers. Results are available online at www.ams.usda.gov/farmersmarkets.

source: Kerr Center for Sustainable Agriculture Field Notes, Fall 2009

North Dakota Anti-Corporate Farming Law Upheld

North Dakota’s corporate farming law prohibits ownership of agricultural land and operation of farms and ranches by corporations other than family farming corporations whose principal owners are actively involved in day-to-day operations. In a complex case challenging this law, a state district court judge ruled in favor of the law. Attorney General John Dehnen presented the court with a report from the University of North Dakota on the effectiveness of corporate farming laws in preserving the rural economy and family farming and ranching. The judge concurred that the state has a legitimate purpose in preserving these.

source: Acres, USA, October, 2009

Campaign Starts Against Fake “Organic” Personal Care Products

On November 5, 2009, the NOSB passed a recommendation for “Solving the Problem of Mislabeled Organic Personal Care Products.” The recommendation states that one may make use of any use of the word “organic” on a personal care product is backed up by third-party certification to USDA organic standards. The NOP has long resisted policing the market for organic personal care products. Currently, according to the recommendation, “one may find personal care products such as shampoo and lotions labeled as ‘organic’ with no clear standards or regulatory underpinning for the organic claim - and unless the product is specifically labeled as USDA Organic,” the word ‘organic’ may be used with impunity. Manufacturers of personal care products that contain organic ingredients are hindered by a lack of competing private standards and commit- mution regarding the applicability of the NOP to their products. Transactions lack the regulatory clarity that applies under the NOP to food products that contain organic ingredients."

The Organic Consumers Association (OCA) has begun a “Coming Clean” campaign to rid store shelves of products that are falsely advertised as “organic.” Beginning September 24, 2009, at the Natural Products Expo East in Boston, OCA met with personal care products companies engaged in what it calls “organic fraud” and urged them to sign a contract making a pledge to consumers that they will either meet organic standards or stop making false organic claims. The following brands refused and are now being boycotted: Amazon Organics, Avalon Organics, Desert Essence Organics, Giovanni Organic Cosmetics, JASON Pure Natural and Organic, Nature’s Gate Organics, Organics by Noah’s Naturals.

Other brands, according to OCA, use USDA certified organic inputs, including Alteya Organics, Baby Bear Soap, Badger, Dr. Bronner’s Magic Soaps, Indian Meadow Herbals, Intelligent Nutrients, Kimberly Parry Organics, Little Angel, Mercola, Nature’s Paradise, Organicare, Organic Essence, Orings Organics, Purely Shea, Rainwater Organic Lotion, Rose Tattoo Aftercare, Seasons of the Soul, SoCal Cleanse, Sensibility Soaps/Nourish, Terres Naturales, Trillium Organics, Vermont Soap Co.

source: Acres, USA, November 2009 and OCA website

Illegal GM Flax Found in Canadian Exports, German Fields

The European Commission has confirmed the containment of Canadian flax exports with GM flax, which has been illegal to grow since 2001 when growers forced the Canadian government to take the product off the market. Meanwhile, Baden-Württemberg officials discovered large quantities of GM flax growing illegally there. The variety grown is not authorized for food or feed use anywhere in the EU. “This is an absolute nightmare for flax growers and why we worked so hard to have the GM flax removed,” said Terry Boehm, a flax grower and Vice president of the National Farmers Union. “This again proves that once released into nature genetically engineered constructs are uncontrollable and cannot be recalled,” said Greenpeace Germany spokeswoman Stefanie Hundsdorfer.

source: The Organic and Non-GMO Report, Oct 2009

Calling All Organic Tomato Growers!

If you grew or tried to grow tomatoes in 2009 and you used organic practices to do it, we want to hear from you about your experience with late blight.

NOFA/Mass is researching organic management strategies that northeast tomato growers - both farmers and gardeners - used in 2009 to mitigate the late blight. The project will be presented at the NOFA/Mass on January 16, 2009, in the Spring 2010 Edition of The Natural Farmer, and on the NOFA/Mass website.

By gathering responses from a significant number of growers on their experiences, NOFA/Mass hopes to contribute to our knowledge and understanding of what organic growing practices for tomatoes were actually applied in 2009 and also hopefully shed light on strategies that may be useful in managing the disease. NOFA/Mass has received a $5,000 grant from Whole Foods Market to support the gathering and dissemination of information for this research project.

To contribute to the collective knowledge about dealing with one of the most destructive crop diseases that has affected our region in recent memory, please find the link to the survey on late blight at the NOFA/Mass website: www.nofamass.org
The Northeast Organic Farming Association of New York welcomes you to:

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NOFA-NJ 25th Anniversary Winter Conference

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Saturday, January 30, 2010

Douglass Campus Center, Rutgers University

Keynote Speaker: John Jeavons

John Jeavons is the Executive Director of Ecology Action of the Mid-Peninsula. He is known internationally as the leading researcher and method developer, teacher, and consultant for the small-scale, sustainable agricultural method known as GROW BIOINTENSIVE mini-farming. He is the author of the best-selling book How to Grow More Vegetables, Fruits, Nuts, Berries, Grains, and Other Crops Than You Ever Thought Possible On Less Land Than You Can Imagine. The comprehensive and sustainable cropping system developed by Jeavons enables people in all regions of the world to grow a balanced diet on a small plot of land.

John Jeavons will also be presenting a 1-Day Biointensive Sustainable Mini-Farming Workshop on Friday, January 29th.

NOFA/Mass 23rd Annual Winter Conference

“Food From Farms For Families”

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Obituary

Frank White
1932-2009

Frank White, an environmental educator and owner of the Holly Hill Farm in Cohasset, Massachusetts, died on September 6, 2009 at the age of 77. After a long career in education, Frank White moved back to the farm that he grew up on and that had been in his family for five generations, with the goal of developing a farm that could promote sustainable agriculture practices, serve as an environmental resource, and provide educational programs for local schools and the larger community.

Frank began by hiring farm manager Martin Gursky who proceeded to grow a variety of organic vegetables that were sold at the local farmers’ market and, with the assistance of Red Tomato, at the Harvest Food Co-op in Jamaica Plain. Currently, managed by Ben and Hannah Wolbach, the farm now grows over 75 different vegetables, flowers, and herbs. Produce is sold out of the 19th century barn in the farmyard and attracts buyers from all over the South Shore.

Frank established the Friends of Holly Hill Farm, a nonprofit organization dedicated to using the farm as a classroom for educational programs for students of all ages. Programming has been developed under the direction of Jon Belber, Holly Hill Farm Education Director, whose outstanding teaching recently won him a Garden Club of America award, and has emphasized creating respect for and knowledge of the natural environment, teaching awareness of sustainable agriculture and local farming, and collaborating with local schools. Last year, Frank co-authored a curriculum manual entitled “A Growing Relationship” designed to integrate the use of hands-on projects in a farm setting with a classroom-based science curriculum.

Miles McEvoy Takes Over National Organic Program

Miles McEvoy, manager of Washington state’s Organic Food Program, has been appointed head of the USDA National Organic Program. In making the announcement on Thursday, Sept. 17, USDA Secretary Tom Vilsack said McEvoy has worked in organic agriculture for more than two decades and has a solid understanding of the challenges and opportunities facing organic growers.

From 1993 to 1995, McEvoy was the founding director of The Food Alliance, a program that blends sustainable farming practices and social welfare components. He also helped establish the National Association of State Organic Programs in 1998 and currently serves as its president. In addition, he helped the Montana Department of Agriculture develop its state organic certification program and has been helping the Oregon Department of Agriculture develop its own organic certification program.

In announcing McEvoy’s appointment, Vilsack also announced that the National Organic Program will become an independent program area within USDA’s Agricultural Marketing Service. Currently, the program is within the transportation and marketing division. Under this change, it will be a stand-alone program in AMS. The program is responsible for regulating the fastest growing segment of U.S. agriculture—the organic industry. U.S. sales of organic foods have grown from $1 billion in 1990, when the Organic Foods Production Act established the program, to a projected $23.6 billion in 2009. Congress increased the program’s funding from $2.6 million during the last fiscal year to $3.2 million this year.

28th Annual NOFA Vermont Winter Conference
February 13-15, 2010
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Keynote Speakers
- LaDonna Redmond, Institute for Community Resource Development
- Jack Lazor, organic dairy farmer

With a special day-long intensive workshop with organic farmer Richard Wiswall, author of The Organic Farmer’s Business Handbook


Winter, 2009-10
The Natural Farmer

LaDonna Redmond,

Frank McEvoy

Miles McEvoy Takes Over National Organic Program

This is excellent timing,” he said. “There’s a lot of support (for organics) from the USDA.”

“From 1993 to 1995, McEvoy was the founding director of The Food Alliance, a program that blends sustainable farming practices and social welfare components. He also helped establish the National Association of State Organic Programs in 1998 and currently serves as its president. In addition, he helped the Montana Department of Agriculture develop its state organic certification program and has been helping the Oregon Department of Agriculture develop its own organic certification program.”

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source: Capital Press, September 24, 2009

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Holistic Sustainable Agriculture from the Soil Up: Interview with Dr. Paul Dettloff on NOFA/Mass Advanced Growers’ Winter Seminar

by Ben Grosscup
NOFA/Mass Extension Events Organizer

On February 2 and 3, 2010, NOFA/Mass will host a seminar for two full days at the Barre Congregational Church in Barre, MA, called “Holistic Sustainable Agriculture from the Soil Up.” The presenter this year is veterinarian and biological agriculture expert, Dr. Paul Dettloff. The event is NOFA/Mass’ second annual Advanced Growers’ Winter Seminar, which was taught in 2009 by the influential agronomist and medical doctor, Arden Andersen.

Dettloff will present a holistic approach to soil fertility, focusing on the nutritional needs of soil microbes, plants, and animals. He’ll teach techniques for raising the nutritional quality of forage, a full range of organically certifiable veterinary tools, management strategies for livestock, and soil fertility principles for growing fruits and vegetables.

Dr. Paul Dettloff received his DVM degree from the University of Minnesota and has conducted a large animal veterinary practice in Western Wisconsin for 35 years. He authored, Alternative Treatments for Ruminant Animals, a premier resource for organic dairy producers. He has pioneered the use of homeopathics and nosodes in the holistic treatment of dairy animals. His focus on the whole system, from the soil to sustainable management, is the result of years of personal study and practical experience.

Dettloff is a consultant and staff veterinarian for Organic Valley Cooperative, consultant to Lancaster Agriculture Products, and owner of Dr. Paul’s Lab.

Interview with Dr. Dettloff

Grosscup: How is the health of livestock related to the health of the soil?

Dettloff: Healthy, balanced soil produces a healthy full-stemmed plant that is well-mineralized and has a lot of proteins. That will fulfill animals’ particularly ruminants’ – nutritional needs. Unbalanced soils or soils lacking minerals or humus produce sick, hollow-stemmed, low-mineralized, low-energy plants. It’s a no-brainer: health starts in the soil.

How can you tell the difference between high quality forage and low quality forage?

First, a refractometer measures the plant’s brix, which is the total dissolved solids in the plant’s sap. Second, leaf analysis can measure the protein, the calcium, the sulfur, and the sugar. In the last 10 years, we’ve expanded our parameters to include many more nutrients in our analysis.

What are the differences for growing vegetables and fruit crops as compared to forage?

The same balanced soil grows good fruits and vegetables as it does seed crops. The vegetable and fruit world will spend more on foliar sprays, which are used to maximize photosynthesis and help make better quality forage means you need less seeds.

Biodiversity in the diet is also important. A ruminant would like to eat 100 different plants every five days. But with monoculture agriculture, the majority of the herds I visited when I was in practice were getting only three or four: corn, soy, alfalfa, and sometimes cottonseed.

What are your concerns specifically about the use of soy in animal feeds?

If you feed soy-based milk replacer to a calf, sheep, or goat, it actually acts as an antigen; the protein in the soy bean will irritate the animal to the point that it forms antibodies. It’s like it’s an invasive protein. You can draw a blood sample on a calf to see if it has been fed a soy-based milk replacer. Soy is loaded with estrogens. A dairy cow that’s getting slammed with pounds of soy beans is also ingesting high levels of estrogen, and it’s a wonder we can get her bred! Although we don’t deal with it in organic, in the conventional world, the milk replacer industry has been slowly taking all of the soy lecithin and soy products out of milk, and now they’re tooting the all-dairy milk replacer. They’re changing because of feedback from people who don’t want soy beans fed to young calves.

Have you worked with any innovations for providing backyard poultry with proper nutrition?

Backyard poultry often lacks calcium, which causes leg problems. A simple and inexpensive thing to do is put out calcium carbonate, which is finely ground hydrate limestone, alongside kelp, and humates in three separate pans, and let the birds free choice it. Those animals will gorge on it for a while, and problems with legs, going down, and cannibalism straighten out.

Besides nutrition, what veterinary tools do you use for immediately addressing animal diseases?

In 1988, when I saw my first organic cow, I had no organic tools. But in the last 20 years, we’ve developed 10 tools in our tool chest, which I’ll cover in detail in the seminar. These are all things that we threw away in the early 1900s, but they’re made by Mother Nature so we don’t have nasty side effects. For example, sustainable and organic farmers have become huge users of tinctures, which are very effective. Another tool is botanicals; here, there’s a uterine pill, a product for respiratory issues a treatment for udder edema and swelling. Another tool, essential oils, have been reinvented in the organic world, but entirely dropped from any conventional treatments. Mastering these tools is the easiest part of going sustainable.

What would you say to a farmer who says that the conventional veterinary tools that they have used are more reliable than the alternatives you teach?

Once you learn how to use the tools and feed the animal, they work very well. There is a lot of science on this. Condemnation without proper investigation keeps one ignorant, and that’s what we’re hearing when they say, “Well, that doesn’t work.”

What skills do you offer small-scale producers for achieving greater success and self-sufficiency?

I want to empower them with knowledge on soils, animal nutrition, and alternative veterinary tools so that they can understand the principles of health and be able to make sound decisions. It’s a matter of gaining knowledge and being able to figure out new situations, and it doesn’t take long. The conventional paradigm is to follow the recommendations and not ask questions. But when you teach a sustainable farmer a few basic and practical principles, they really grab a hold and dig deeper into the ecosystem, and it gets to be fun. I’ve had a lot of people tell me years later that, “Man, I feel like I’m in control.”

Is it a matter of knowing what the signs are – what the soil, plants, and weeds indicate?

Yes, and also the animal! I’ll show slides on reading the hair of livestock. I’ve been a veterinarian for over 42 years, and for 35 years, I blindly ignored the hair. I saw it, but I didn’t have a clue. Once you learn how to read the hair as an indicator of production, health, and how the glands are, you think, “Wow! How come this isn’t known?”

Tell me about your presentation style.

I combine science with observations from years of practice. I use plain talk, and keep it simple. I like interaction with the crowd, and I answer questions as we go. I tend to have a little humor and fun.

What’s your message to the farming community?

As one of my close friends, Dr. Arden Andersen, says, “food is medicine.” But our food has got some nasty things in it. To be healthy, we’ve got to clean up our food and learn how to eat right. We’re not only talking about food production; we’re also talking about personal health.

More on the Seminar

Logistics for the event will be run as same last year’s seminar where NOFA/Mass organizes local members to host out-of-town farmers at their homes for the duration of the two days and where seminar participants are invited to bring a food contribution.

Seminar registration is $165. There’s a $15 discount for NOFA membership and a $10 discount for registration by January 16, 2010. There is a $50 food fee, which is waived if you bring a food item worth roughly that amount; see registration form at the link below for details on food and homemades. Pre-registration is required and seminar enrollment is capped at 100 – first come, first served. Contact: Ben Grosscup, ben.grosscup@nofamass.org, 413-658-5374. All information for the event is available on the website, including registration form, technical bulletins by Dr. Dettloff, and a link to an MP3 audio recording of the above interview: www.nofamass.org/seminars/winterseminar.php.

The seminar provides a great marketing opportunity for sponsors to exhibit before those attending. Because of space limitations, we will be selling only a handful of sponsorships. For more information, contact bob@nofamass.org.
Nutrient Density is the end product of a highly functioning biological system where the crop harvested has a measurably larger quantity of a broad spectrum of different minerals, vitamins, phytonutrients, and antioxidants than its counterparts. These components are also in healthy ratios with each other.

In relation to their same species counterparts, nutrient dense crops have relatively:

- More complex and intense flavor
- Longer shelf life
- Greater specific gravity, or density
- More tendency to desiccate instead of rot
- More disease and pest resistance during the growth phase, and
- Greater yield.

How is it that this apparently ideal list of objectives can be accomplished? Is this not fanciful “silver bullet” thinking that will fall flat in trials in the field? Why is this not already being done if it is so possible and apparently profitable?

The essential premise critical to producing nutrient dense crops is that maximum biological vitality should be the objective of our agricultural endeavors. This means in soil life, in crops, in animals, and in humans. By this we mean full realization of the DNA potential of the species. Essentially all we are working to do is remove the limiting factors to nutrition and production. On this basis the stage is set for nutrient density as the logical outcome.

The question of course is how.

And the answer is by understanding the ideal environmental conditions for our crops and then creating them in our fields.

Plants have, essentially, an external digestive system, as opposed to animals which have internal digestive systems. That external digestive system is still bacteria and fungi like we animals have in our guts, just different species, and attached to the roots and leaves. Plants evolved with a symbiotic relationship to soil life, and can only achieve their potential when there is a soil life community that is feeding that plant what it wants when it wants it.

The first step, then, is to feed the soil life that will feed our crops so that they can give the plant everything it needs. Although this may sound simple in principle, there are a number of parameters that must be understood to achieve this objective. The first challenge is to determine what are the specific biological communities that are symbiotic with the crops we are trying to grow. Then we need to understand what the environmental conditions are that these biological communities need to thrive. Different aeration, hydration, mineralization, and temperature not to mention carbon levels are some of the critical factors that determine what biological communities dominate.

In animal and human nutrition we understand the importance of establishing "healthy" biology in the gut to facilitate health. This is exactly what is critical to do in the soil if we want our crops to thrive and produce the best nutrition for us.

Different soil life communities thrive in different environmental conditions, and the plants that have symbiotic relationships with the soil life that is thriving are the ones that will flourish. If we understand what are referred to as weeds have different soil life symbiotes, then when we see weeds thriving it can be easily determined that we have not established the proper soil life communities for our crops.

Besides increasing organic matter levels through cover cropping, composts, and manure, one of the most critical steps in this process is mineral balancing. Our crop plants and their biological symbiotes have specific mineral ratio and level desires to thrive, and if these minerals are not present in the soil it will be a struggle to bring high quality crops to harvest until they are.

A soil test that shows minerals in a biologically available format is usually helpful in this process. This is because it is the biologically available mineral levels and their balance which determines what soil life communities will dominate. Once the minerals needed in the soil are determined, it is necessary to amend the soil in a manner that will convert the usually unavailable rock minerals into a biologically available form. Coating the rock minerals with materials like humates, powdered fish, kelp, sugar or molasses and adding biological inoculants can greatly facilitate the process of making these minerals available for the soil life and, ultimately, your crops.

This process of coating the basic rock minerals with biological stimulants and inoculants is the most efficient way to get these minerals converted from crystalline form to protoplasmic form because it is providing the food that the soil life will need to do the conversion process right on the materials that we want converted. Oftentimes rock minerals will be applied to a soil and available mineral levels will not change noticeably because they have not been digested by the soil life so as to be available for the crop. This coating process is a nice trick for facilitating that process.

Proper mineralization then, and building of the soil life communities that support our crop plants, is the foundation of producing nutrient dense crops. It must be remembered that the objective of our farming ventures is not to bring crops to market or table, but to make available in these crops all of the nutrition that our bodies need to thrive. A conventional analysis might say that a crop can be brought
to harvest through a solution of 12 or 16 minerals, but that neglects the basic fact that our bodies have been shown to use up to 84 different minerals, if not more. This is well documented in “Minerals for the Genetic Code” by Charles Walters.

Most of these minerals are only used in extremely small quantities in our bodies for things like DNA replication, hormone management, glandular function and in enzymes. These are not unimportant tasks, and often times are the very factors that are causative in many of our chronic diseases.

After basic mineralization of the soil, and inoculation of crop seeds and at transplant, the process of nutrient dense crop production is essentially a process of monitoring soil conductivity and crop brix, pH and conductivity. Through monitoring these factors we can see in real time how the crop is doing, where if anywhere there are deficiencies or limiting factors beginning to affect the crop, what they are, and then primarily through nutrient drenches and foliar sprays mediate these issues before they become problems.

It is only when there are limitations to the function of the plant that diseases will break out or that insects will attack. These basic facts are sacrosanct in conventional agricultural theory, but are well documented and easily understood when a detailed explanation of the principles at hand is given.

Insects, for instance, have simple digestive systems and are only able to digest simple sugars and free amino acids, not complex sugars and complete proteins. It is only when the plant is deficient in specific minerals that it will have simple sugars and free amino acids in its sap. If the plant has access to the minerals it needs it will create complex sugars and complete proteins that insects are physiologically unable to digest.

Fungal diseases attack plants by puncturing cell walls with their hyphae and, essentially, sucking the protoplasm out of the plant cells. The strength of fungal hyphae is such that only when cell walls are weak because they do not have the necessary minerals have they been built well are hyphae able to break through. A plant’s cell walls, when it has access to the minerals it wants, are extremely strong and can easily resist fungal attack.

With plant sap conductivity and pH readings that can easily be taken by handheld tools we can proactively see markers that signify the specific deficiencies that predict disease or infestation. Then if we understand how to mediate these deficiencies we can not only prevent the disease or infestation, but also bring the plant back to a greater level of balance, which corresponds with greater potential to yield.

There are a number of other parameters and factors that when understood can augment plant vitality, function and performance, but this basic outline gives a clear picture of the problem. We have been cropping, tilling and generally disturbing our fields for centuries in some cases, and only when we can bring the soil system to a high level of vitality and functionality can we expect to harvest the highest quality crops.

Every year that we harvest crops off of a field we are basically mining the soil of the minerals that will feed our bodies. If we do not put back in, in some form, all of the minerals that have been removed, and do so up to a level where everything that we want in our bodies is in our crops, we are not doing the job of crop production that we can. Consumers are beginning to understand that they can discern, through flavor and refractometers, the quality of the nutrition that they purchase and put into their bodies. We as farmers and gardeners need to understand how we can maximize the quality of the nutrition that we are producing. It is not only the best that we can do, it is also much more profitable and rewarding.

Dan Kittredge has been an organic farmer for the past 25 years, since the age of 7, and is currently the director of the Real Food Campaign, a project of the non-profit Remarlycy the Earth devoted to bringing nutrient dense crops into the food supply. He is focused on helping as many farmers as possible in the Northeast succeed in nutrient dense crop production in the year 2010 and has year-long work shop sets up in Connecticut, Massachusetts, New York, Vermont, and New Hampshire to achieve that objective. Go to www.realfoodcampaign.org for more information.

Nutrient Density

Nutrient Density is a term that is being used more and more these days. There are a number of ways to use the term, and some are more or less appropriate. Nutritionists use the term to compare different foods, such as blueberries versus watermelon, with an example statement being that blueberries have more nutrition per unit volume than watermelon.

The problem with this distinction is that some blueberries have high levels of minerals, vitamins, anti-oxidants, and phytonutrients and in others they are quite low. These are the basic testable variables that determine the nutrient level of a food, and the variation within individual crops is sometimes greater than the variation between crop species. Environmental (read soil) conditions are the general determining factor in the quality of a harvest, and these are conditions that a farmer or gardener can readily address.

What consumers are looking for is to purchase and feed their family the blueberries that have those high levels of nutrition, not just to know that some blueberries do. Numerous studies have been done to test the relative nutritional levels of organic versus conventional crops and the like, and while some show higher levels of nutrition in organic crops, many are inconclusive. The soil that a crop was grown in is the major factor determining its quality. Up until now there has been no way for consumers to determine what the quality is of the crops that they are buying. This is where the current excitement around nutrient density comes in.

**New from the 2009 NOFA Summer Conference:**

- 0901 Organic Pastured Poultry Raising - Jack Kittredge
- 0902 Starting a CSA - Carolyn Llewellyn
- 0903 Keynote: The Power of Mushrooms for your Farm Stand or CSA members!
- 0904 Luscious Landscape Growing - Lee Reich
- 0905 Gourmet & Medicinal Mushrooms - Paul Stamets
- 0906 Veggie Farm Machinery (Tour) - Ryan Voiland
- 0907 Keynote: On Growing Power - Will Allen
- 0908 Making Cultured Dairy Products - Becca Buell
- 0909 Panel on Late Blight - Michael Glos, Ruth Hazzard, Dan Kittredge, Abby Seaman, Paul Stamets.
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Degraded Soils, Food Shortages & Eating Oil: Restoring Soil Life through Biological Agriculture

by Mike Amaranthus, Ph.D, Jeff Anderson & John Marler

The global urgency to produce food is not expected to lessen. By 2030 our planet is expected to support 8.3 billion people. The United Nations Food and Agriculture Organization has stated that by then, farmers will have to produce 30 percent more grain than they do now to keep pace with hunger. How do we increase agricultural production while fossil fuel supplies decline and costs escalate, restricting their use on the farm? And how do we expand production when desertification, soil erosion, organic matter and nutrient loss are on the increase? It is a paradox: precisely as we are increasing our demands on soil, we are losing it at an unprecedented rate.

The so-called Green Revolution has been anything but green. Initially, through intensive chemical inputs and monocultural cropping practices, the Green Revolution greatly increased the production of chosen commodity grain crops such as wheat, corn, soybeans and rice — but it also greatly broadened the use of weed control, chemical fertilizers and pesticides, thus increasing toxicity levels in the environment and widely impacting the planet’s precious soil and water resources.

In fact, agricultural production has not increased in several decades and high levels of chemical inputs have been needed just to sustain current levels of production. In addition, the escalating use of chemical fertilizers, pesticides, erosion, land clearing, and compaction has had a devastating effect on beneficial living organisms in the soil. Globally, 1.9 billion hectares are significantly degraded.

Now more than ever, we need a real paradigm shift rather than mere incremental changes in the way we grow, buy, and eat our food — and an organic, biological approach to managing the world’s soil provides that much-needed shift.

According to a recently released UN Environment Programme report (www.unctad.org/en/docs/dicted200715_en.pdf), this may be the only way we can solve the growing problem of hunger in developing countries. UNEP reports that organic and biological practices in Africa outperformed industrial, chemical-intensive conventional farming, while also proving environmental benefits such as improved soil fertility, better water retention and drought resistance. This analysis of 114 farming projects in 24 African countries found that organic or near-organic practices resulted in significant yield increases.

Not-So-Green Revolution

Chemically based conventional agricultural practices lead to increased risks to human health. Pesticides have poisoned farm workers and wildlife and created public health problems including cancers and birth defects. The impacts reach both rich and poor countries. In the United States, over 50 percent of the nation’s drinking water wells contained detectable amounts of nitrate and 7 percent have detectable amounts of pesticides.

The United States is burdened with an estimated $12 billion annual health and environmental cost associated with pesticide use, and estimated annual public and environmental health costs related to...
Inoculants

Soil loss, compaction and the use of chemical fertilizers and pesticides have caused tremendous harm to the environment and life in the soil. Part of our strategy to combat this degradation is to reestablish beneficial life in the soil using biological inoculants. Biological inoculants contain organisms that enrich the nutrient and water-holding capacity of soil. The main types of inoculants are nitrogen-fixing bacteria and mycorrhizal fungi. These groups of organisms have a special, mutually beneficial, or symbiotic, relationship with plants in which the partners derive life-sustaining benefits from each other. These symbiotic organisms deliver multiple benefits to the plant host, including improved nutrition, disease resistance, and tolerance to adverse soil and climatic conditions.

Techniques to reestablish beneficial soil organisms have proved to be successful in countries all over the world, and biological inoculants have been used to reduce problems associated with erosion, drought, decreased fertility and increased salinity of the soil.

Mycorrhizae

Mycorrhizae literally means “fungus roots.” In this association, fungal filaments extend into the soil and help the plant by gathering water and nutrients and transporting these materials back to the roots. These beneficial fungi grow on the roots of most plants, and plants that have mycorrhizal fungi growing on their roots survive better after transplantation and grow faster. The fungal symbiont receives shelter and food from the plant, which in turn acquires an array of benefits such as improved uptake of nitrogen, phosphorus and most micronutrients, drought and salinity tolerance, and an overall increase in plant growth and development.

Most plants, including more that 90 percent of all agricultural crops, form a root association with these specialized fungi. Miles of fungal filaments can be present in a tiny fraction of healthy soil. The crop’s association with mycorrhizal fungi increases the effective surface absorbing area of roots by several hundred to several thousand times. Mycorrhizal fungi can increase the yield of an area of land by 30 percent or more. They can readily absorb nitrogen and phosphorus from the soil and pass them on to the plant. Mycorrhizal plants show higher tolerance to elevated soil temperatures, various soil- and root-borne pathogens, and heavy metal toxicity.

Recent research published in the journal Nature (M. Govindarajulu et al., “Nitrogen Transfer in the Arbuscular Mycorrhizal Symbiosis,” 2005) has emphasized the important role mycorrhizal fungi play in delivering nitrogen to crop plants, thus lowering the need for excessive amounts of synthetic fertilizers. With this in mind, farmers may benefit from promoting the proliferation of mycorrhizal fungi through diminished fertilizer input, thereby making more efficient use of the nitrogen stores in agricultural soils. The authors found that beneficial mycorrhizal fungi transfer substantial amounts of nitrogen to their plant hosts.

The researchers also discovered a novel metabolic pathway in which the ammonium form of nitrogen (less subject to leaching losses compared to nitrates) in soils is absorbed by the fungi.

There are well-documented research trials also available on the important role of mycorrhizal fungi with most legume crops. The rhizobia bacteria that form with important legume crops have a high phosphorus requirement to optimize their level of nitrogen-fixation.

Mycorrhizal fungi produce specific enzymes to extract phosphorus from the soil and make it available to nitrogen-fixing bacteria. The synergy effect of a combined treatment with nitrogen-fixers and mycorrhizae can increase yield. In soybeans, inoculation with mycorrhizal fungi has been shown...
structure, increase water uptake, or promote other beneficial microbes. In fact, chemical fertilizers often negatively affect these factors.

Fertilizers can lead to other side effects, such as deteriorated water quality, soil structure and excess soil salinity. The mycorrhizal relationship improves feeder root production, allowing a mycorrhizal plant to better utilize added fertilizer.

**Legume-Rhizobium Relationship**

Nitrogen is plentiful in the atmosphere (air is 80 percent nitrogen), but plants can’t use it in the gas form. Nitrogen uptake is possible in a fixed form, which is facilitated by the rhizobium bacteria present in nodules located on the root systems of certain plants. The bacterium lives in the soil to form root nodules (i.e. outgrowth on roots) in plants such as beans, groundnut and soybean. In agriculture settings, it is commonly added as a powder or liquid biological seed inoculant.

In the “old” days, farmers were careful to rotate crops and incorporate nitrogen-fixing legumes into management practices that added organic matter and fertility into soil. An excellent example is the use of rhizobia inoculant when growing beans, alfalfa, clover and other nitrogen-fixing legume crops on farmland.

Symbiotic nitrogen-fixing bacteria associated with the roots of legumes are capable of processing substantial quantities of the vast pool of atmospheric nitrogen and converting it to an organic form usable by plants. A good cover crop can add 200-300 pounds of nitrogen per acre to the soil.

These nitrogen-fixing organisms evolved millions of years ago and helped pioneer plants to colonize the land. As these early plants gained a foothold on rocky ledges surrounding primordial seas, they helped build soil on the land surface. From ancient times until recent decades, these soil organisms were essential partners in building soil productivity.

Until recently, these organisms were among the most important tools in maintaining the productivity of the farm. Now, the escalating monetary and environmental costs of chemical-based nitrogen fertilizer are making biological or “symbiotic” approaches increasingly attractive to farmers.

**Carbon Sequestration**

Soils are also a potentially powerful sink for accumulating carbon in the form of organic matter. Atmospheric CO2 can be recaptured by the soil under a variety of conditions, including activities that slow soil decomposition rates, introduce greater amounts of plant biomass, reduce soil erosion, and produce glomalin derived from mycorrhizal activity. Land management practices such as no-till, winter cover crops, biological inoculants, perennial crops, manure and compost inputs are being studied for their ability to increase soil-stored carbon.

Of recent interest has been the discovery of glomalin in 1996 by Agricultural Research Service scientist Sarah Wright. Produced by arbuscular mycorrhizal fungi, glomalin permeates organic matter, binding together silts, sand, and clay particles. Not only does glomalin contain 30 to 40 percent carbon, but it also forms aggregates that create soil structure and keep other stored soil carbon from escaping.

Studies have shown glomalin can represent up to 30 percent of the total carbon in soil and can last 40 years.

The only sources of glomalin are arbuscular mycorrhizal fungi, found living on plant roots around the world. Wright named glomalin after *Glaumales*, the taxonomic order to which arbuscular mycorrhizal fungi belong. Unfortunately, numerous factors such as erosion, organic matter removal, compaction, cultivation, fallow, and the use of certain chemical fertilizers and pesticides have reduced or eliminated these glomalin-producing mycorrhizal fungi from large expanses of managed lands.

**A Better Way**

Over the last few decades we have learned much about how soils in natural areas remain extremely productive without inputs of chemical fertilizers,
pesticides and irrigation. The system can work. 

The use of organic amendments and biological inoculants such as mycorrhizal fungi has been proved in thousands of University studies. Quality mycorrhizal inoculum is now available at a fraction of the per-acre cost farmers typically pay for chemical soil supplements. 

For millions of years the powerful combination of organic amendments and soil biology has demonstrated its natural success and today we are beginning to see these benefits on large-scale farming. In North America both large-scale conventional and organic farmers are applying mycorrhizal fungi to wheat, corn, flax and soybean. Many will also use fish fertilizers, compost and compost tea to stimulate and inoculate their soils with beneficial biology, improving nutrient retention and uptake. In India, farmers are using mycorrhizal inoculation to decrease their fertilizer use by 50 percent without any loss of yields. Large U.S. companies such as Pennington Seed are using mycorrhizal fungi to coat millions of pounds of grass seed to save water and fertilizer. 

Clearly, we stand at a crossroads. We must feed the world today without destroying future generations’ ability to produce enough food. To do this we need to launch an organic, biologically sound strategy to manage the world’s soils — a strategy that makes basic changes to the way we grow our food. We need an approach that maximizes agricultural production while restoring clean water, protecting the environment, building soils, and sustaining soil resources. 

Such a strategy marks a dramatic change from reliance on unsustainable, energy-intensive, potentially toxic fertilizers and pesticides to benign, organic farming systems. This new paradigm utilizes proven agricultural practices developed over thousands of years and age-old natural relationships within the living soil to sustain and improve the health and survival of our soil, environment and world population. Our approach is an organic, biologically based strategy for managing soils. It is an approach that improves rather than degrades the productive capital of soil. 

Scientific studies substantiate that the use of organic fertilizers, biological inoculants, such as nitrogen-fixing bacteria and mycorrhizal fungi, appropriate cover crops, green manures, compost and compost tea, can maintain or increase crop yields with reduced chemical inputs. Furthermore, yields can continue to increase over time in stressed agricultural environments without the detrimental effects of soil erosion, loss of organic matter and environmental degradation.


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Farming for Health: Food Quality, Nutrient Density & Crop Brix

by Dr. Arden Andersen

As the 21st century begins, obesity, cardiovascular disease, diabetes, cancer, Parkinson’s and Alzheimer’s have become household names, affecting over 50 percent of the American and Americanized population. Crime, deviant behavior, callous communities, fear, hatred, suicide, depression and anti-social behavior have become so common that much of society is completely desensitized to such behavior.

Rudolf Steiner nailed it well in 1922 when questioned by Ehrenfried Pfeiffer as to why, in spite of all the teachings, seminars and lectures espousing a holistic approach to life and health, so few people grasped these concepts. Steiner’s response was succinct: food today does not contain sufficient nutrition to allow the brain to work with a more spiritual/ holistic awareness. Dr. Charles Northern, a gastroenterologist, read into the Congressional Record in 1936 that the nutritional value of our food correlated to nutritional decline in the soils and to the disease states experienced by the consumer. In fact, nutrition in our food has steadily declined since 1922, as evidenced by USDA food-testing data. The total number of calories consumed by Americans has increased significantly, but the actual nutrition consumed has declined. Americans are eating hollow calories.

The organizations Beyond Organix and Real Food Campaign are working to evaluate food for actual nutritional quality. This means having your food product tested by any lab of your choice, the same test done on a standard tissue or petiole analysis, but for which the farm should strive. Unfortunately, testing costs money, time and labor, but a very simple and inexpensive field test for nutrient value of a crop is the brix reading of the sap or juice measured with a refractometer. This is a test that can be done daily and correlates well to crop nutritional quality. Every farmer should have a refractometer and use it regularly, know what his/her crops are running, and if the brix values are not improving, then change the fertility program.

There are those, including some consultants, who do not understand what the sap/juice brix reading means or how to feed a crop to get brix to increase. They tend to believe that the soil test prevails over all else and seek to find the perfect soil test report. As a result they cannot seem to grasp the brix principles. Brix measurements using a refractometer for sap/juice is about fundamental biochemistry, fundamental photosynthesis unique to plants. Only plants take in carbon dioxide and water in the presence of chlorophyll and sunlight to manufacture sugar.

Everything the farmer harvests comes from this sugar — every bushel, ton, box or carton of yield. This is basic, elementary botany. The farmer’s task as a health promoter largely rests on raising crop brix values to the good or excellent range as defined by Dr. Carey Reams (these values are available at www.aglabs.com or www.highbrixgardens.com).

Moving from a standard chemical system to a biological system can initially be as simple as following a universal recipe to establish some base fertility — but to move from this base to superior quality, yield and profitability, the “art” of farming must be employed to raise crop brix values (12 or above for the growing crop). This means mid-season soil and crop testing, field assessment and prescription nutrition specific to crop needs, growth, and physiology.

Farming For Health

Growers who think foliar applications are not valuable are missing a huge opportunity for crop improvement. Plants in nature are not limited to root feeding. The poorer the soil nutritional balance, functionally, the less efficient will be the foliars. The better the soil nutritional balance, functionally, the more efficient will be the foliars. Therefore if foliars aren’t working for you, either change your

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Food—real food—is grown on rich and fertile soil. Restoring crop of year after year, rapidly depletes the soil. Simplest replacement of the NPK (nitrogen, phosphorous, potassium) does NOT replenish the soil and only leads to the sad insipid excuses so commonly stacked high on supermarket shelves. On the other hand, balancing the soil—fully mineralizing it to an ideal state—allows the production of fruits and vegetables of superb flavor and taste—it is your royalty: YOUR family.

There are farmers out there who know how to do the right thing. Demanding the farmer’s best helps them. A refractometer can help lead you to the topnotch growers already doing the job. On the other hand, balancing the soil—fully mineralizing it to an ideal state—allows the production of fruits and vegetables of superb flavor and taste—it is your royalty: YOUR family.

“Can you believe that you can take pretty much identical-looking hay from neighboring fields, feed 50 pounds a day to two cows and have her drop in milk production and get sick, and feed half as much from the other field and have the cow rise in production and be healthy? What is the difference between the two samples of hay? QUALITY!”

---Dr. Harold Willis “How To Grow Great Alfalfa”

Quality; this, indeed, is the needed revolution in Agriculture. In 1970 the author “inherited” a large garden that had belonged to a long time J. I. Rodale devotee. As spring rolled around, the next door neighbor, Mike had belonged to a long time J. I. Rodale devotee. As spring rolled around, the next door neighbor, Mike dropped over and asked if I had a sprayer. Mike dropped over and asked if I had a sprayer. Hearing that I did not, he said, “Well, you've got to...”

In 1987 I bought 16 acres that had been chemically farmed. The crop the following year was again tasteless and the quality of the fruits seemed to busy themselves elsewhere. The farmer’s job is simply to remineralize and fertilize in such a way that the plants, properly fed, can develop higher performance.

Another thing that came were customer raves when you prefer the doctor treat the lab tests or treat you, the patient? The same holds for soil tests and crop nutritional quality. The brix is high, the taste is superb and the insects are gone. A refractometer can help lead you to the topnotch growers already doing the job. On the other hand, balancing the soil—fully mineralizing it to an ideal state—allows the production of fruits and vegetables of superb flavor and taste—it is your royalty: YOUR family.

I predict, will be a reality within three years in the Midwest. Crop brix, the measure of the sap sugar, correlates significantly to yield. Yes, we have a lot of human health and environmental challenges before us in the 21st century. Every one of them is directly or indirectly connected to food quality, which really means nutritional value of the food — and this nutritional value is a changeable, correctable challenge. Crop brix, I think, can help us achieve this.

The farmer’s job is simply to remineralize and fertilize in such a way that the plants, properly fed, can develop higher performance. I’ve studied much agriculture since then. Clearly, the conventional farmers should not use toxic chemicals to rescue crops that are obviously sick—and then sell them to you. However, they can’t be blamed: so much of their education comes via the chem company grants. On the other hand, I’m often baffled by organic growers who simply substitute dangerous organic insect controls for the synthetic plants. It was time to do some serious research.

Dr. Arden Andersen’s treatise on ecological agriculture suggested obtaining a refractometer to test one’s output. I did, and small-scale farming has never been the same for me since. The mystery of that situation—every one of them is directly or indirectly connected to food quality, which really means nutritional value of the food — and this nutritional value is a changeable, correctable challenge. Crop brix, I think, can help us achieve this.

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poisons. Very few people seem to understand what the word quality truly should mean.

There is a simple process where YOU can test quality at the point of sale. There is a way to test a small sample of any given produce and then make a fully informed decision. YOU decide if that produce is what YOU want to feed yourself or your family.

The Origin Of The Word Brix
Professor A. F. W. Brix was a 19th Century German chemist (b.1798, d.1890). He was the first to measure the density of plant juices by floating a hydrometer in them. The winemakers of Europe were concerned that they could not predict which of various grape juices would make the best wine. Being able to judge quality ahead of actual bottling was of immense importance in an industry where a bottle of the best wine might sell for hundreds of times more than a bottle of everyday wine. Professor Brix was greeted as a great hero when he emerged from his laboratory to claim his most generous prize. He was also honored by having the measuring process named after him.

Hand Refractometers
Professor Brix’s hydrometer worked, but it was cumbersome and required a tall graduate of juice to actually conduct the measure. This was OK for the vineyard wine cellar, but a nuisance to the grower in the field who wished to squeeze perhaps a single growing grape to judge its potential quality.

A refractometer is an optical device that takes advantage of the fact that light passing through a liquid bends or refracts. Thicker, i.e., more dense, liquids refract more. Solids dissolved in a liquid will cause it to exhibit a refractive index in direct relation to the amount of solids. A refractometer substitutes a calibrated prism and an etched screen for the liquid. Refraction is extremely exact and no modern chemist wishes to be without a refractometer.

Table model refraction measuring devices date back to the 1600’s. Although lost to antiquity, it appears that some scientist, or perhaps artisan, developed a workable portable model sometime in the latter 1800’s. By the 1920’s, rather bulky “hand” models were in use in many vineyards.

Although complicated in construction, a modern hand refractometer is extremely easy to use.

Today’s hand refractometer we are discussing looks almost like a small 5” or 6” long telescope, but it has a prism at the end opposite the viewfinder. A calibrated hand refractometer allows determination of a reading or degree brix when you place a drop of juice on the prism and flatten it with the attached cover plate.

You may sometimes find that you have to use a leaf (where the leaf is not the plant part you eat) to get your test drop. While this may help you determine the better of two plants, the majority of data in the quality charts refers to the eaten part.

In Nature, the plant has a single goal: to reproduce. However, it is obvious that the plant must survive to maturity if it is to achieve that goal. In a perfect world, the plant develops 12 or better brix in its leaves. This resource, this goodness, this BRIX is transported to the roots and shared with the healthy bacteria growing in the root rhizosphere. The bacteria, using this gift of energy, “bloom” profusely and create many substances from soil minerals—substances critical for the plant to complete its life cycle.

Later, assuming the plant was successful in defending itself against pests and disease, it will start favoring the parts needed for that primary directive: reproduction. In other words, say, any apple tree will proceed to produce the very best apple that it can. The best tasting apple is the fruit most likely to be selected by an apple lover. Of course, the apple lover also takes the seed that is inside the apple—along with the possibility that those seeds may possibly be planted elsewhere.

A Gentle Warning
A first natural inclination for many people is to test the fruits of their labor from their garden. Bruised feelings are common when their personal pride and joy indicates less than high quality. Be happy that YOU now have the knowledge needed to inspire you to grow higher quality fruits and vegetables.

And you may rest assured that judging the quality of your neighbor’s garden as anything less than “good” or “excellent” will cause difficulty. Another phenomenon I often encounter is where the new brix convert starts rejecting produce that doesn’t measure “excellent.” The strange thing is that they will reject items that they would have eagerly bought back when they could not tell good from bad. Please let the refractometer guide you toward better food. For instance, if you have unknowingly used poor grade spinach to make salad in the past I would suggest you now look for average or good spinach with an eye toward pinpointing excellent spinach at some future time.

The Stages Of Testing As A Consumer
1. First, Calibrate Your Instrument
   * Place a drop of distilled water on the prism and flip the plate down (if you have a plate model). Flip the hinged prism shut if you have a double prism model.
   * View through the instrument toward a light source (a clear sky is best).
   * Adjust the focusing ring until you see a razor sharp image of the brix scale. The demarcation line where the light and dark fields meet should CROSS AT ZERO.
   * ATC models (Automatic Temperature compensated) are calibrated with the adjustment screw to read ZERO. This adjustment is rarely needed. Standard (non-ATC) models may require temperature correction.

2. Run A Test
   * Select a soft fruit from your refrigerator or fruit bowl and squeeze a drop from it onto the prism.
   * Flatten the drop with the prism.
   * Hold it to the light.
   * THE READING IS EXACT! (many instruments read to 0.2 brix)

Rex Harrill farms and gardens in Maryland He was inspired by reading Arden Amndersen and wrote his own book on using a refractometer and measuring brix, from which this excerpt was taken.

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Mark Fulford: Nutrient Density and Teltane Farm

by Jack Kittredge

The town of Monroe is in Central Maine, far enough from the coast that development pressure is not intense, but close enough to Belfast and it’s many summer ocean visitors that farmers can find a good market there.

Mark Fulford, a Pennsylvania native, found his way to coastal Maine after high school, drawn by his love of boating and the chance to work for Outdoor Bound. But there were not many affordable land lots on the coast or islands. So eventually, in 1979, he settled in the Monroe area. With some friends he created a small land trust that bought a parcel from an older couple. Mark and his wife Paula, as well as five other households, now live there. Together, he and Paula built a lovely home while living in an old camp that used to be on the grounds. They slowly peaked away, clearing land, sawing logs, and doing whatever was necessary for 12 years until the house was done.

Together they operate Teltane Farm there. The land is a silt loam, quite legdy and shallow. Fulford says water will pond under it, though the more humus they build into the soil the less trouble they have, even when it is wet. Occasionally they hire help, but mostly work the farm themselves.

Fulford gets his love of growing things from his parents. “They had a huge garden and loved to work in it,” he says. “There are four of us Fulford boys. We played hookey from school and spent the day in the garden. It was never a chore. It was always a real luxury. Our parents would encourage us to take a silt loam and play in the garden. It helped put food on the table.”

Mark has farmed and gardened since he settled in Monroe. “This is the first year since 1979,” he remarks, “that I haven’t sold produce on a 3-day a week delivery. I used to do farmers markets, but since 1982 I’ve sold produce to one coop store, right here in Belfast. It’s a half hour from home. Most of the coastal towns move a lot of summer people. I’ve done restaurant runs, too.”

In addition to raising produce, Mark and Paula run a seasonal seedling and nursery business. Greenhouse seedlings keep them busy for two months in the spring, and they grow a lot of odd and medicinal plants. They have a number from Siberia that do well at Teltane because they love Maine’s climate.

Consulting

These days Mark is away about half the season, doing consulting with growers and companies about improving crop quality. His thinking about farming has evolved with his experience, and he has a number of unconventional ideas in which many other farmers are interested. Some of his clients have farms in the northeast – Maine, New Hampshire, Vermont, and Massachusetts – but also some are from the south, Canada, Asia and Australia. His natural curiosity and years of experience have given him a good foundation in soil biology and plant nutrition, even without credentials from a university.

“I pick up information by attending agricultural seminars and conferences in the US and abroad with other agronomists,” he says, “and I borrow from all these places where this stuff is being studied. Acres, USA is a great source for information. Their conferences and events are very helpful. ATTRA was also very good at looking at these issues. I’m not sure how active they are now. Some of the SARE research has been good. They are particularly good at getting farmers to try these ideas out in the field. All the work we do in the puzzle. The more open-minded organizations are the ones least affiliated with institutions!”

“There are good people working in the University system with the Extension,” he continues, “but they are embedded in it and are not as flexible. Someone working for an agency is receiving their check not based on results but because they simply check in and log hours, whether the crop passes or fails. A salesman makes his or her income by selling the product. A really good salesman spends a lot of time educating themselves in the farmer’s environment. New England is not like most of the world for organic farms. It’s not like we have an Earthbound Farm here. We don’t have a single organic fruit producer. On these big farms often the operations are contracted out – planting is one person’s contract, the crop spraying schedule is a whole different group of applicators coming in licensed for that. But here we have so many small, diverse ones. It is good for farmers and gardeners to get as much information on their table as they can, even if it looks like it is conflicting. Too many farmers abandon that responsibility to the Universities or the seed company or fertilizer company salesmen.”

Fulford first got started doing stuff ‘outside the system’ (as he puts it) in 1984. He was frustrated by going to MOFGA (Maine Organic Farmers and Gardeners Association), when it was young, or to the extension service, and trying to get answers to difficult problems.

“You would get to a certain point,” he recalls, “and they would say ‘use this poison’. But I wanted to know what in the system wasn’t working. In the wild things are working. Plants are in equilibrium – you don’t see huge waves of insects attacking plants that are naturalized in a region. If you go out to a field and take a weed inventory, you have a crop out there that is always suffering but the weeds are healthy. There is something going on which is favoring the weeds. Usually the weeds are growing by their own choice. They evolved in a place and they occupy it until something changes. Like gene pool will dominate a burned out hayfield. A lot of the elements that make good grass or hay have been drained out of the soil and what is left is calling another plant to do repair work.”

Fulford thinks most farmers have neglected investing in their soil. We take too much out and put too little back in. “People who are deep into the world of fertilizer,” he says, “some of them know this. Very few people would think of going out of the house in the morning without their breakfast. They would run out of energy. Crops are the same way. If they run out of energy they just quit.”

He has been investigating substances like biochar, paramagnetic rock, biological inoculants and various mineral compounds as ways to provide plants with all the materials they need to thrive. “The more ways we can put this energy and these attractive substances in the energy zone of a crop,” he feels, “the more exciting the results are. If we can stack some of these biological, chemical and energy components into agriculture we are going to start solving more and more of our problems. When farmers use some of that physics to trap energy and store it to get a crop, interesting things start to happen. Biochar can store chemistry and biology, paramagnetic rock can store electromagnetic fields, and elements of different charge on the periodical table can attract each other. That is really at the heart of nutritional agriculture.”

Garlic

Mark has come to many of his ideas about soil nutrition and crop management from experience on his own farm. One of Teltane’s major crops is garlic. They sell a lot of it as seed on the Internet and at the Common Ground Fair in the fall. They grow an acre of it in several fields. Mark doesn’t have a lot of growing space and is pretty happy with what he calls a ‘single year rotation’. It allows him to plant garlic in the same spot every year.

“We find it hard to find a weed free compost,” he explains, “so we have become much more aggressive with cover crops. The initial tilliing is done by machine. After that, the whole garlic operation is done by hand. We plant with a gang dibble. It allows us to punch 7 holes – one for each clove – in the row. So we have garlic 7 deep in the row.

“When we pull the garlic,” he continues, “we sow a cover crop and spin on fertilizer at the same time. The act of pulling the garlic settles the seed down into the disturbed straw. In the beginning of November we plant garlic again right into the standing crop – usually oats and either clover or peas, sometimes buckwheat. During the growing time of the oats we will do everything we can to feed them as if they were the money-making crop. We want to store the nutritional capacity of the garlic in the bodies of the oat plants. Then they will servr, provide straw for us, and nutrition for the garlic.”

Fulford figures they spend about $2000 an acre for soil fertility for the garlic. This year, because of all the wet weather in the beginning of the summer, that...
Mark and Paula have just started to pull the garlic in this field. They cut the bulbs off in the field and bring them to their greenhouse to dry. The stalks are left in the field.

included drenching with biological inoculants so the garlic wouldn't get diseases.

“We tried to coat the plant with a colony of biologicals on a regular basis,” he explains, “so that diseases wouldn't get the upper hand. The place disease spreads in the field. The more we have been able to build soil quality the less disease we have. We used commonly available things such as Actinovate and Serenade, and nutritiorial products. They are sprays or drenches, and some can be done both ways. Most pathogens in the garlic world are soil borne. Some are foliar borne. In the soil we have a couple strains of fusarium which attack the bulb, we also have botrytis which is an air borne fungus. It gets inside the bulb but comes from the leaf down. It has a soil phase, too.

“The organisms in a really good drench,” he points out, “can often be sprayed on with a lot of extra water and it will run down the stem into the soil by the base of the plant and give us a whole lot more protection and control. There have been a few times out here where I’ve sprayed twice a week with a 50-gallon sprayer. We’ve put an awful lot of material on!”

Fulford grew 18 garlic varieties this year; some are sprays or drenches, and some can be done both ways. Most pathogens in the garlic world are soil borne. Some are foliar borne. In the soil we have a couple strains of fusarium which attack the bulb, we also have botrytis which is an air borne fungus. It gets inside the bulb but comes from the leaf down. It has a soil phase, too.

His most productive garlic variety is Old Russian Red. It has the largest bulb to seed ratio – about 10 to 1. But he doesn’t like to have too much of any variety planted as disease will just find it that much easier to get a start.

Diseases

Diseases are a constant worry for Mark, especially in a wet year like 2009. “This is the most fearful year we have ever had,” he says. “Garlic and water don’t get along, especially late in the season. In wet years you have more fungal problems because you have lower light levels. Ultraviolet restricts fungal growth. Also the leaf surface is wet and cool – meeting the ideal temperature and moisture conditions of the fungi, and when the plants experience less sunlight their brix is lower, indicating their immune system is less active. All across the board the nutrition of the plant is compromised in a cloudy, wet year. That’s one of the reasons for putting so many more biological helpers in the picture. When these beds are sown in the fall I put in about 400 pounds of mineral mix per bed, in beds that are 225 feet long. The field is wet, but so far we are doing well. We haven’t found much disease.”

Holding back rot and spoilage in an acre of garlic is quite a trick. But garlic is Teltane’s single biggest crop and they depend on it for at least half of the farm income. Because they sell it as seed, a nursery crop and they depend on it for at least half of the farm income. Mark is in touch with a number of growers who are experiencing it.

“It’s been a terrible year for blight,” he agrees. “A lot of farms have just given up - all the tomatoes, all the potatoes have it. You can deal with blight, but you have to do it before you ever see any evidence of it. The conventional growers I deal with are pretty much spraying 24/7, day and night. But they’re not keeping up with it.”

I ask him about the idea that adequate plant nutrition can bring crops to such a state of health that their own immune resistance will protect them from blight.

“you can do something with drenches and foliar sprays.” Fulford asserts, “but it takes a high bar of nutrition to deal with a disease which is that aggressive! You have to have that nutrition working and in order long before the disease gets in the landscape. It’s not possible with resistant varieties of tomatoes or potatoes to avoid it. But it takes a lot of planning ahead to get the brix and sap pH in order.”

He feels the National Organic Program does not give organic growers adequate options to deal with problems like late blight: “Unfortunately, the NOP doesn’t allow any chemical, or conjugate, or oxidate. The potatoes can handle peroxide and oxidate, but the tomatoes turn all rusty brown from the oxidation. With copper, you have to have that on a week before the spores show up. It’s too late to catch it after you have the disease. The organic

generous soil supply, with a full cupboard of all the trace elements, and lots of humus do great for a few years until they have mined it out. They’re not aware of replacing it. You have to have an eye for what you manure in the soil and the plant would look before you see it – you can do sap testing with a refractometer, and read the amount of energy exchange in the soil with a conductivity meter.

“If you see signs of fungal diseases,” he continues, “you need to go after them before you reuse the field for garlic. For white mold we use Con- tans, which is a predatory fungus that eats the white mold. It will hunt down any pockets of sclerotia which are in the soil from the white mold. We will spray it in September while the garlic is in dorm- ant. Out of all the diseases of garlic, sclerotinia is the worst! It’s the most destructive, hardest to stop. It’s air borne. But it’s also soil borne and they can’t get knell unless they know how to control it. We’ve seen it from time to time, especially when we buy a new seed variety from someone else. We’ve gotten it in compost before and it walks across the crops all across the state. You will see beans with a white mold on them – a cottony white mold. That’s sclerotia. Rather than go under I like to make sure the controls are available in case it shows up. Sometimes I think the companies are making a killing on us – they are so damn expensive.

“By water, and don’t use copper, you can use hydrogen peroxide or oxidate, followed by some- thing like Actinovate or Serenade – which seems to challenge botrytis. But the effects of these only last an hour or two. Say you put hydrogen peroxide or oxidate on in the morning, to clean the crop. Then you water it after a sunny day, in the evening. So you get the organism on the crop for a week in it’s new, clean state. More of that stuff is coming on the market. It is difficult enough to separate out one particular organism and patent it. But if you want to put together a range of organ- isms, the problem is compounded. Compost tea was wonderful if people knew how to make it. But the National Organic Program (NOP) doesn’t allow it now because of the pathogen fear from E. coli in the manure. There have been some bad batches, no question, but growers who knew how to make it could throw away their anti-fungal materials! Grow- ers working outside the NOP system, of course, spread billions of tons of raw manure on agricultural land!”

Late Blight

My visit to Teltane is in late July, right after the spread of late blight throughout the northeast has become recognized as a major problem. Mark is in touch with a number of growers who are experienc- ing it.

“It’s been a terrible year for blight,” he adds. “A lot of farms have just given up -- all the tomatoes, all the potatoes have it. You can deal with blight, but you have to do it before you ever see any evidence of it. The conventional growers I deal with are pretty much spraying 24/7, day and night. But they’re not keeping up with it.”

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The Natural Farmer
program is too much of a top down pyramid, and it’s the farmers who suffer because they don’t have enough tools to use in a tough year. So now everyone is abandoning the landscape with copper, but there are a lot of people who can’t get within a hundred feet of a bag of copper. They’ll get sick. It’s very poisonous stuff.”

**Compost**

Mark is a strong advocate of compost as the easiest way to get large amounts of carbon into your soil. Most farmers can’t make enough themselves, he feels, but at the same time they need to be wary of commercial compost that often are not fastidious about keeping out contaminants such as weed seeds. Also, the power of compost can dissipate rapidly if its nitrogen is not trapped in some form.

“When a compost is young and when it has heat,” he says, “that is when the most valuable part of compost is plant available – ammonia. If you can trap that in some rock powders or old compost overtop of that newer pile, and wait out the 90 or 120 days (NOP waiting period before using compost on edible crops) you will have tremendous grow power. As it degrades from NH4 it goes to NO3, which is nitrate nitrogen. Nitrate is a lot more stable. But there is a phase in that transition that is fairly short during which there is a huge amount of energy released for crop growth. If a compost pile is turned too often you use up all that energy. Or if a compost is too sharp and stinky, it means there are not enough humus elements to trap and hold that ammonia as a fertilizer.

“Good composting practices build humus really fast,” he continues, “as do good cover cropping practices. You might grow two or three cover crops back to back in one year. As long as each cover crop can fully decompose, instead of leaving dry residue on the surface – so you’re turning in a young, green compost – you can provide a lot of fresh nitrogen energy. When you get a tall, heavy, older cover crop like flax, alfalfa, or grass or almost milk stage peas, then you are building a lot of carbon reserve in the soil. A winter eye crop that is flail mowed and turned into the ground has a huge amount of atrophic, spheric carbon dioxide stored in the mature plant. It takes more energy to break it down in the soil, but that is the role of a wide range of microbes that can digest cellulose. If it is more complex and ligneous like wood chips or sawdust, then it won’t be giving much back to the crop until that is broken down.”

**Soil Testing**

Fulfords finds that looking at what grows in an area is the best way to find out about the soil there. Lab-based soil tests are less reliable because they are limited to tiny portions of a field, and there are a variety of methods by which labs do soil analysis.

“You can inventory a whole field,” he asserts, “and then you have a much more detailed soil test about what is there. Most all the universities use the mining assay soil test. They use chemicals that are not natural to our environment to take the mineral and elemental components out of the soil sample. But those are usually extremely harsh acids – caustic materials that don’t exist in nature. That was borrowed from the mining industry where they are drilling oil or finding bedrock. Plants don’t experience the world the way they experience it much more through soil biology, weak carbonic acids which are the exudates of microbes or plant root hairs. That’s what they call the old fashioned Morgan extract method of testing soil. It’s works similar to nature to evaluate your soil’s release rate.

“All soil tests are valuable,” he continues. “There are not a lot of labs that do the old fashioned availability tests. But International Lab does, and the folks at Lancaster Ag Products in Pennsylvania will do both kinds. It used to be that AgEnergy in Illinois would do it, but they are no longer in the soil testing business. I think there are two or three others that will use the Morgan extract method using gentle acids. If you see on a soil test that it used Melik 3, that means it used the strongest extraction method you could imagine. There are two or three others that use that. Also, if you go to the University of New Hampshire and you take a soil sample they will burn it, weighing it prior and post the burn just to tell you how much organic matter is in the soil. But it is not really a fair test because there is more than one form of organic matter.”

Mark says a farmer can get three different answers, depending on whether the soil test is sent to U/Mass, U/Maine at Orono, or U/NH. If you are a farmer it is hard to make fertility decisions based on such diverse results looking at a small window of chemistry. It is wiser, he feels, to take into account what your plants think about your soil, what insects, diseases, and weeds think about the nutritional density of your crop. While it is certainly good for farmers and gardeners to get as much information on their table as they can, even if it looks like it is conflicting, too many farmers ultimately abandon that responsibility for analysis to the Universities or the seed company or fertilizer company salesmen.

**Plant Nutrition**

When thinking about how crop plants function and how growers can do a better job of bringing them what they need, Fulford says it helps to categorize them according to their appetites and needs, or the phase the crop is in.

“You have plants that are vegetative,” he says, “from which you are harvesting the leaf or the stem. You have other plants that are reproductive where you are interested in the flower, fruit, or root. There are a few crops in between. Many crops need a period where they are vegetating and grow very strong, and then switch over to reproducing – a tomato or potato. In the world of fertilizers, whether liquid or dry, there are some components which are strictly feminine or reproductive: phosphorus, sulfur, manganese just to name a few. In their raw simple form they are not usually good so we use a phosphate form of phosphorus – it has an extra oxygen, is more reactive in the environment without burning something. Sulfur is in the sulfate form. Calcium is better as calcium carbonate with atoms of carbon attached, as well as oxygen.

“Those things are key triggers to getting reproductive crops,” he continues. “If it is manganese you only need a tiny bit, but manganese is necessary for the embryo of the seed to finish. So if you are a grain grower you want a high germination record. But when you are growing a grain type that goes to feed livestock, you want the grass and don’t want it to go to seed. So you would have a very different recipe. It would be a nitrate form of nitrogen, rather than ammonia. Ammonia is reproductive, nitrate is growth.”

According to Mark, organic growers can do this analysis using composts and manures. But it is complicated. Calcium, for instance, is both for growth and reproduction. It has an unusual role compared to everything else. He compares it to the plate on which you stack the food. It’s the most important element for all cell walls of plants. Silica gives you the webwork inside – sort of like rebar – and the calcium is the concrete. The silica has to be soluble enough, approachable enough by soil biology, that the plant can use it to build itself. You can have a beach of sand, for example, which is all silica – but very few plants know how to access that.

“Say you have beds of lettuce, spinach, and chard,” explains Fulford. “You want to always keep them heavy leafy growth. You would want lots of calcium, a little magnesium because magnesium is the key to the chlorophyll molecule. You would use potassium. That builds bulk. But if you blast these leafy plants too early with sulfur or phosphorus the plant will bolt and be kaput for your use. It will think its mission is done – it has to do its reproductive work. If you had calcium, potassium, and nitrate you would be a great hay grower, but you wouldn’t be growing hay seed. If you wanted to grow hay seed you would make darn sure there were sulfur, phosphorus, and manganese in your mix.”

**Soil Building**

When it comes to organic matter, Mark says, there are important differences among the types you can add. There’s the organic matter that is not decomposed. It’s carbon, but it is not providing anything for the plant or the soil microbes at the time. It has to decompose and in the process often ties up plant growth nutrients like nitrogen. After it is fully decomposed it becomes like a storage battery. That’s humus. There are different levels of humus. At the very bottom of the decomposition strata you have humic acid, fulvic acid, olmic acid. These are the real powerhouse components of soil.

“When we are making a recipe for soil,” he explains, “we talk about humic acid all the time. We are borrowing carbon from the dinosaur age to hold in place our fresh rock minerals like calcium, gypsums, and phosphates in a much more plant and microbe friendly fashion. Otherwise, if we don’t have that humus, every spring we have to go out and jumpstart it – put the paddles to the soil and give it a big jolt of energy with soluble salts like nitrogen or manures. But it doesn’t last very long unless we have the carbon component. Some of the organic material is very good at getting people to understand cover cropping, manuring, and composting to build that carbon reserve in a humus form. You must have that to hold the energy. But a lot of soils have no digestibility capacity. They are over-tillied or materials that are put on for fertilizers (or even organically approved copper) will shut down the decomposition cycle very quickly and bring that soil building pattern to a halt.”
Fulford points out how to judge the soil’s tendencies by doing a plant inventory in a place where you are not tilling and the weeds have taken over. If the weeds are broadleaf weeds, you can be certain that potassium is quite high and available phosphorus is also ‘Weeds: Why They Grow’ by J. McCaman. Acres also sells that. He’s an agronomist and farmer. He began compiling all the behaviors of weeds and plants and then getting the soil testing done. Lo and behold, there was a solid pattern. You can’t really fool the plants – they grow where they like to grow and can be nutritionally invited in to a field.”

Calcium and Phosphorus
Two of the key elements we need to address in the Northeast are calcium and phosphorus. According to Fulford, New England soils have a dearth of both. He says soft or colloidal rock phosphate is a good source for adding phosphorus, especially in the company of humic acid or compost. If you can get soft rock phosphate, high calcium lime, carbon as compost or biochar or humates and sulfur in the gypsum form and put them together, almost in equal amounts, you will get a wonderful mix. The carbon keeps the peace – without it the calcium and phosphorus want to lock up and become a rock again. But it is the energy between them that makes them grow crops. The carbon holds that energy in check.

Again, Mark stresses the crucial role of calcium. “Calcium, of all the elements, is the one most needed but least moveable. Other things like to bond to it, it likes to leach, it likes to sink down into the soil. A year like this is a great year to apply foliar calcium. I’d recommend Limestone F; which has extra magnesia. I don’t think it has been through the OMRI (Organic Materials Review Institute) channels, however. It is accepted by Baystate Organic. - ed] The company that makes it doesn’t care. Another could be coral calcium, made from dryland coral. It is usually processed for human nutritional use as supplements. They harvest it where they dig out a house site. You can use common calcium carbonate, which is high calcium limestone. If you have a reproductive problem you can use gypsum or especially colloidal phosphate will work. Gypsum is not a very good form of calcium, however. It works better in the company of a much richer calcium source. Gypsum’s claim to fame is that it is calcium sulfate, and sulfates are very important for soil bacteria.”

Paramagnetism
Fulford has been conducting experiments to determine what effect materials that are strongly paramagnetic have on crop quality. Paramagnetism is a type of magnetism that occurs in substances with a positive magnetic susceptibility. It is caused by the presence of at least one unpaired electron orbital (i.e., an unpaired spin) in the atoms, molecules, or ions of the paramagnetic material, and results in these substances being weakly attracted by a strong magnetic field. Paramagnetic materials are normally more strongly attracted than diamagnetic ones, though far less so than ferromagnetic materials. Examples of

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paramagnetic materials at room temperature include aluminum (Al), manganese (Mn), platinum (Pt), oxygen (gas and liquid), and rare earth ions.

“Paramagnetism is not like ferromagnetism,” Mark explains, “where you have a piece of iron and a magnet is attracted. Instead, with paramagnetism you have a piece of rock and a magnet is attracted anyway. There is very little iron at all in the rock. The magnet represents living organisms in the soil, which are diamagnetic, while the rock is paramagnetic, so the two are attracted to each other. That is just another form of energy, just like calcium and phosphorus have a chemical attraction for each other, which you can use to grow a plant.

“The only materials that are truly paramagnetic,” he continues, “are ones that were volcanic in their last lifetime, so they were molten, liquid rock. Common limestone has never been exposed to heat. It is just a sedimentary stone so it has no paramagnetic charge. But if it is exposed to a tremendous amount of pressure and heat, it becomes marble. Marble can become paramagnetic simply through the act of heating it. Vitrrification turns a sedimentary particle into a crystal. Common household clay, potters clay, has no charge at all. Once vitrified in the oven it becomes paramagnetic. So bricks and ceramics all have some paramagnetic charge. It’s not strong, but it is there. The rock recognizes a diamagnetic substance that could be a bunch of microbes in some soil, especially if high in humus. The more humus, the more the paramagnetic charge of the rock is released. What happens in cropping, however, is that soil microbes reproduce at a much much higher rate in the influence of that field. The paramagnetism in rock will diminish over time as it is given off to soil and organisms. When you get into a granite quarry, the oldest tailing pile will be weak if it is left for a few decades, but the newer stuff from deeper strata resulting is run trials of new products which companies are interested in introducing. He’ll spray a swath of a product across a grain or hay field, or put it in the potato planter and plant certain rows with it. He also runs controls, where he doesn’t use the product. If a product is really functional, he says, the results are like night and day. But the best approach is not to rely on visible yield differences, but to measure the harvest itself. Then you have a real sense of whether the product worked for you.

In his experiments, Mark is treating crops with paramagnetic basalt dust from New Brunswick to see how it affects various ones, each of which is in a separate row, identified with little sticks. The local soil has a paramagnetic reading of from 0 to 10, Fulford says, while the basalt comes in at about 4000!

Mark stands by his raspberry patch. He uses these mostly for home eating and barter.

His capacity is the final decisive factor. The human being, who guides and directs the beginning, the course and the end of the natural growth process, is the strongest force of nature. His capacity is the final decisive factor.

Sometimes he will match farmers he knows with companies interested in testing a product. But the matching has to be carefully done to be sure the farm has the right equipment to use the product. Mark will test products whether they are designed for organic systems or not, but he prefers to deal with nutritional or biological products, rather than ones that kill something. He deals a lot with humic acid or a fulvic acid combinations with fish or seaweed trace elements and micronutrients to feed a plant in distress to get its immune system back in order.

“One of the other things Fulford does besides consulting is run trials of new products which companies are interested in introducing. He’ll spray a swath of a product across a grain or hay field, or put it in the potato planter and plant certain rows with it. He also runs controls, where he doesn’t use the product. If a product is really functional, he says, the results are like night and day. But the best approach is not to rely on visible yield differences, but to measure the harvest itself. Then you have a real sense of whether the product worked for you.

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“We do rows of potatoes or greens or grain,” he says, pointing to an area of his farm. “We will go halfway up the row with a 5 gallon bucket and a wa-
tering can and put on a drench. Then we stick a stick in the ground so we can see where the recipe begins and stops. We’ve learned more by doing that than by anything else we’ve ever done. Then there are products out there which are just junk. They either don’t work or you don’t have enough information to get them to work right.

“The carrots beyond those stakes had no basalt,” he continues. “In the closer carrots, there is one pound of basalt powder every 50 feet. It’s a light dressing. This is a funded experiment where a company hired me as a third party to try a product. Even the wheat next to the carrots got a little of it, and you can see they look a little taller before the stakes. I’ll be measuring brix in the leaf and brix in the root to determine the difference this basalt makes. I’m looking for overall sugar content, as well as yield. I’ll apply beneficial nematodes to the whole thing, because we have a little bit of carrot worm in the area. I don’t want that to throw any of the numbers off. At harvest a 10 or 20 foot section of each row will be harvested and all the sizes and categories of carrots will be washed and weighed. We’ll do the brix reading then, before and after the sticks. Using rock dust you don’t sometimes see the difference the first year, but you certainly taste it.”

Biochar

One of the ideas generating a lot of excitement right now among growers is that of using biochar to build soil fertility. Pre-Columbian Amazonian natives made biochar (European settlers called it Terra Preta de Indio or “black soil of the Indies”) by smoldering agricultural waste in pits or trenches. The resulting high-carbon, fine-grained residue not only adds great productivity to the nearby soils, but it can sequester carbon in the soil for hundreds to thousands of years. Fulford is excited about its potential and uses it on at Teltane.

“I like working with the biochar idea,” he says. “Biochar is exciting because it is so old! It is such an old technology. It is all based on the terra preta of the Amazon and some little bit in the Congo area of West Africa. Usually the charcoal was made in pits underground, lit from one end like a cigar. For
centuries multiple cultures were able to thrive and build those soils up to a maximum productive capacity. Obviously they understood something about building the soil’s carbon capacity. I know when we use char here in our potting soils at the rate of 5% or 10%, whether we make it ourselves or buy it as lump wood charcoal, the plants in those potting soils outgrow everything else hands down! They require almost no feeding throughout their greenhouse cycle. We feed them when we mix the potting soil. We mix in worm casting, fish and seaweed, a biological inoculant with many species, calcium for nutrition, and char which allows us to get a huge amount of growth power in that soil. When you lift a char amended potting soil out of its pot, you shake all the soil off, the root hairs are still clinging to little pieces of charcoal. They won’t let go of it! Why would they want it? When you examine the char in a microscope you find it is largely hollow, colonized by mycorrhizal and other freely associated organisms in a thick colony of microbes.

“We’ll buy common lump wood charcoal,” he continues. “It is made from lumber tailings from the hardwood flooring industry. Right now the market for activated charcoal is the brewing industry and the chemical filtration industry. But a backyard gardener could build a char or smoulder pit, throw in some junkwood trees, and make their own char.”

Organic Certification

Teltane used to be certified organic by MOFGA until the NOP came into law and the process became federally controlled. Mark opted out of the program because he felt he would no longer have any opportunity to make changes to the rules. Right now about half the farms he works with don’t care about organic certification.

Once the federal government took over certification, the whole process became more difficult for small farmers, he feels. He says MOFGA was no longer able to be quite so helpful in getting small growers up to speed after they started certifying under federal accreditation.

“Every time a company comes up with a line of products that actually work,” he complains, “there is usually a big bottleneck at OMRI so you can’t get it approved there for two or three years. You should be able to go to any third party approval group and get your product reviewed in a reasonable time and for a reasonable fee. But if certifiers won’t honor them, or won’t work through them, then farmers can’t use their products on organic operations. Right across the border I can get a biological wetting agent that works great because it’s made from corn, vegetable oil and cane sugar that has been reduced to a nanosize particle so it is very slippery. It carries all kinds of other nutrients. You can add it to fish, you can foliar spray it on the plants. Yet you can’t use it here until it has that OMRI label. It’s made in the US, but most of it is sold overseas in Asia. It’s approved for organic agriculture in all those other countries.”

Mark is trialing various varieties of wheat in an effort to re-grain New England.

“They had to be more concerned about upholding the NOP rules,” he sighs. “A certifier cannot come to a farm in Maine and make suggestions. It’s always been a problem. Certifying agencies can’t advise, but farmers don’t like salesmen. Where do they get advice?”

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Another thing that Mark is investigating is raising grain. The public wants local grains, he believes, and there is a growing interest in re-graing the New England states. Many old notions about grain production are no longer valid.

“As a country,” he says, “we adopted grain farming practices based on a huge scale of production right away. As we went west the scale grew – several teams of horses working in tandem in vast fields. But until the late 1800s New England was self-sufficient in grain. I’m trying to find a way to get the subsistence farmer to be able to deal with the grain issue at home again. If you could grow an acre of wheat it would make all the bread your family could want, plus your livestock, especially if you sprouted it for chickens. Everybody deals with raising grain at home in Asia, but nobody does here unless they have a combine. With our poorer and poorer weather systems, who can afford a combine? Let alone, get one out of a field of rye?”

The economics, Fulford says, make grain raising possible again. “Now grain prices are almost four-fold what they were four years ago. When the grain prices shot up and the market became strong again, the New England grain production picture began looking strong again, especially organic grains and odd varieties that have some ancestry or heritage to them. If you did everything from start to finish, and you had a rare variety for which there is already a demand, it would make all the bread your family could want, plus your livestock, especially if you sprouted it for chickens.

“Poultry can handle dry grain better than other animals,” he says, “but they get more nutrition if it is sprouted. Dairy animals would rather have all their feed in the green form. The best pigs are those grown on milk-stage oats, peas, cut and wrapped like silage. Dry grain conversion is hard for a pig, compared to a grain that has already been sprouted. All lactating animals prefer it if there is chlorophyll in their system instead of lots of grain. The enzyme range of a dormant seed as opposed to a growing seed changes the nature of its nutritional value.

“Often if you are growing wheat for feed,” he says, “livestock want higher protein numbers. Not just nitrogen, but real protein. The ultimate test is to get grain from a rock dust-treated field in front of a dry grain conversion experiment and a silage one. Compare their preferences for grain because they are much more attuned than any soil lab is.”

Grain Research

Fulford is researching several varieties of grains. Some crops can handle fairly dense spacing as long as they have enough nutrition in the soil, he has found. Others are more sensitive and want elbow room in order to be productive.

“I’ve seen some densely planted grain crops this year,” he says, “in experiments in Asia that opened my eyes to different ways of doing things. They were getting significantly greater grain yields by having fewer plant populations, and less pest problems. That is counter to what we would think, but I have an experiment to demonstrate some of that here.

“Here is a spring wheat trial,” he continues. “They’re staggered along with onions so there is a little bit of pollinating space to maintain seed lines. On the end is a wheat that is one plant per square foot. Each square straw produces a head. The idea is to get the crop to tiller out and produce far more straws, therefore more heads, but all from one root crown.

“This is Turkey Red wheat,” he continues, “a Russian strain of a winter wheat. It should be down in mid-August, go through the winter and be ready to harvest in the spring. Each tuft grows from a single seed. The average number of stems in each single seed tuft is over fifty. This is the same spacing and pattern that they are learning to grow rice in the Philippines. Rice is a little more generous but a wheat just like this is grown in northern India. It’s going to take some time to get worked out here, but since there are so many other countries doing small grains successfully, it will work here – a wide spacing, thinly patterned cropping system. Over there, if one farmer does it in a village, next year everyone does it in the village. It’s survival.”

He says that if his results look like there is anything exciting, he’ll publish them on his website (www.lookfar.org) and send them around to people who are interested.

Nutrient Density

Mark’s research in building soil nutrition and maximizing crop quality is sparked by what he feels is a lack of attention to soil conditions. “Up until recently,” he remarks, “food brands were farm names. Certain farms were always known for their produce or their milk or their meat. It is the same with our superstores. In other countries have trained their staffs to use a refractometer to accept or deny a shipment of vegetables. Instead of testing the leaf in the field to monitor plant growth, they simply use it on the grape. Anything below a certain reading they will refuse because they know the grower skipped out on a few elements. If the grower is smart and wants to make a fruit or vegetable section with wines or poultry, they will always pick produce with a high brix reading. It’s a higher caliber fruit of vegetable. Repeat sales will be based on flavor. A good grocery chain might take the time to educate their customers. One chain that was trained in a seminar with Arden Andersen and Graeme Smith is doing that. And the Japanese are doing it.

“In some countries,” he continues, “marketing on nutrient density as measured by brix has already happened. Some of the supermarket chains in Australia, New Zealand, South Africa and a couple of other countries have trained their staffs to use a refractometer to accept or deny a shipment of vegetables. Instead of testing the leaf in the field to monitor plant growth, they simply use it on the grape. Anything below a certain reading they will refuse because they know the grower skipped out on a few elements. If the grower is smart and wants to make a fruit or vegetable section with wines or poultry, they will always pick produce with a high brix reading. It’s a higher caliber fruit of vegetable. Repeat sales will be based on flavor. A good grocery chain might take the time to educate their customers. One chain that was trained in a seminar with Arden Andersen and Graeme Smith is doing that. And the Japanese are doing it.

Fulford makes the point that nutrient dense crops are an economic choice for the farmer, too. “When you put pencil to paper and calculate costs, in maintaining a square foot of soil, you realize you might as well put much nutrition into one acre as you normally would for two or three. That way you will have one third more heads, and be able to handle it without heavy equipment. You can also keep a tighter eye on it so if something goes wrong you can get in there quick. My larger field clients who have a lot of land are spread pretty thin. Everything has to be done by tractor. But here at Teltane it is about as tight and dense as I would like to see it.”
Healthy Soil Grows Healthy Food

by Michael Martin Meléndrez

It’s interesting to note that if you look back in history at any photo with a large number of people, almost everyone is slim and trim. I was recently reading a pictorial essay of Albuquerque, New Mexico, with images from the early to mid-1900s, and found this to be true. Today, however, if you look at any typical crowd, obesity is everywhere.

There are many reasons for this situation, but I feel certain that the eating of empty calories, food produced on poor soils, and the long-distance transport of these compromised groceries are a major culprit. The diet of those earlier years was more likely composed of foods loaded with vitamins, enzymes, minerals, and low in corn syrup based ingredients. Therefore people did not eat empty or “hollow calories” (the FDA’s term, not mine) and their foods had a high Satiety Index (a system to measure different foods’ ability to satisfy hunger), so they did not overeat in order to feel satisfied. Today our diet is dominated by empty (hollow) calories low in minerals, vitamins and enzymes and which have a low Satiety Index, so we overeat and get fat.

Even before the processing of our food strips its nutritional value, there’s a bigger problem: the world has been losing its precious topsoil, the humus fraction that defines a healthy soil, for the past 7,000 years. The Fertile Crescent of the Middle East, which today is a desert, was at one time rich in topsoil and had forests of oaks protecting the watersheds from erosion. But farming ruined the soil, as it continues to do today, regardless of where the farm is found. The problem has accelerated in the past 60 to 80 years, as agriculture became distracted from the importance of humus, the generic term for a product of soil chemistry that is more correctly referred to as humic substances.

The distraction was the invention of manufactured fertilizer when it was discovered that soluble acidic based N, P and K (nitrogen, phosphorus and potassium) could stimulate plant growth and increase yield. But no longer was there a pipeline of humic formation taking place in soils thus treated, nor were the 19 essential plant nutrients being replaced, as they were being mined from the land each time a crop was harvested. The result: empty calories, poor nutrition, hunger and overeating to compensate for our poor diets.

It’s important to understand that the presence of these “humic substances” constitutes the definition of a topsoil, and that they are not organic matter in the true sense, rather they are more correctly called bioorganic molecules. In the Journal of Chemical Education (vol. 78, December 2001), it is said that these humic substances, composed of chemical fractions such as humic acid and fulvic acid, are highly functionalized molecules that can act as photosensitizers, retain water, bind to clays (which will improve the tilth and porosity of soil), act as plant-growth stimulants, and scavenge toxic pollutants. It also claims that these substances are remarkable products of soil chemistry that are essential for a healthy and productive soil. I don’t know about you, but I find this information about

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the humic substances remarkable, refreshing and exciting!

An even more critical issue I’ve been concerned about for the past few years is that of population growth and our ongoing loss of farmland across the globe. Every reference I can find, from the USDA to the coffee-table periodicals (such as National Geographic, “Where Food Begins,” September 2008) all say the same thing — we are not gaining farm land, we are losing farm land at an alarming rate. The population of the world will grow by at least 6 million people in the next 12 months, and according to the USDA it takes six acres to provide enough food/calories to feed each person. This figure is confirmed by work done at Sandia National Labs of the Department of Energy, where a project I’ve had connections to has created an “Ecological Footprint Assessment” model that shows the same problem. If true, we will need an additional 36 million acres of new farmland to accommodate this population increase. That’s 56,000 square miles of land, almost half of the State of New Mexico, needed to feed the population growth for this year!

It is my opinion that time is of the essence in the effort to change how we farm. We must begin priming and supporting the soil development process so that humus can once again be a product of soil chemistry on our farms, and we must remineralize our soils so that our food is not just empty calories. Furthermore, if you are not making humus in your soil, you need to be adding it, as the research is clear that the benefits are extraordinary and will move us in the right direction.

On a final note, with all the talk about global warming and excessive dumping of carbon into our atmosphere as we consume fossil fuels, it is the process of humic substance formation in our soils that can sequester more carbon than all the trees and oceans of the world combined. The benefits will be long-lasting, as components of humus are molecules of aromatic carbon rings and aliphatic carbon chains. The mean residence times (how long they last in soil) of these organo-mineral complex aggregates based on radiocarbon dating, using extracts from non-disturbed soils, is from 1,140 years to 1,235 years, depending on which humic acid fraction is being tested. In other words, unlike compost and decomposing soil organic matter, which are “rapid cycling carbons,” the humic substances will last a long time, and therefore tie up carbon for that same period of time. The end result will be healthy soils growing healthy food.

Michael Martin Meléndrez is the founder and managing member of Soil Secrets, LLC, and Soil Secrets Worldwide, LLC. He’s also a nurseryman, founder and owner of Trees That Please in New Mexico, a tree production farm and retail nursery. For more information, visit www.soilsecrets.com or call 505-550-3246.

The Framework of Biological Dairy Farming

by Gary Zimmer & Becky Brown

Biological farming is a dynamic system of farming that works with natural principles. Its purpose is to make a profit by growing healthy, mineralized foods that are nutrient-rich and of maximum quality for people. To achieve this, all stages of production — including soil, forage, crop, animal, business, and lifestyle management — must be healthy and interdependent.

The biological cycle begins in the soil and is based on a healthy population of balanced microbiology (bacteria, fungi, protozoa, earthworms, etc.), which require soils with an adequate supply of properly balanced nutrients including, but not limited to, nitrogen, potassium, phosphorus, calcium, magnesium, sulfur, iron, manganese, copper, and zinc. To accomplish this, we need to take soil samples every three years because tests themselves are often incomplete. That said, we monitor with both tests and observation, the more complete picture of improvement we get, although tests are only calculations — as such, they may not be adequate in the plant — the goal is a 1:1 ratio at around 2 percent in feed tests). Just because the soil pH is within the ideal range (6.5-7.7) does not mean you will automatically have high plant uptake of calcium, that additional calcium does not need to be applied, or that the soil doesn’t need lime. Providing a diverse supply of calcium sources is highly beneficial, even if pH is at a good level.

There is no one-size-fits-all when it comes to different sources of calcium for different soil situations. However, smaller amounts more often seem to work well on most soils. Field-grade lime is insoluble and performs well with low pHs.

Calcium sources include calcium nitrate, gypsum, Bio-Cal, Organical and HumaCal, rock phosphate (if you also need phosphorus), burned lime and acti-vated calcium (note that not all of these are organic — choose the right source for the situation). Often, supplying a humate source with calcium yields good results.

Spraying on a few ounces of a plant-stimulant calcium may help by serving as a short-term fix, but it won’t do in the long run. Remember, an alfalfa crop removes 250 pounds of the available soil calcium.

Boron and calcium seem to work together. We like to call calcium “the trucker of all minerals,” and boron “the steering wheel.” Boron is needed in relatively small volume but governs carbon uptake and sugar movements, both critical factors in producing more plant energy and plant pectins (the highly digestible carbohydrate that is closely associated with calcium). Boron is relatively easy to get into the plant and to make available. It’s an anion (meaning that it is negatively charged), so it’s a highly soluble/leachable mineral, and thus readily plant available. In our Midwestern soils, we normally add one pound per acre each year to fields, and sometimes more based on soil type.

Phosphorus at high levels in the plant is a great indicator of healthy, biologically active soils. Phosphorus exchangeability and organic matter are needed by the plant at high levels, but large amounts of non-plant available phosphorus are often tied up in the soil. Commercial phosphorus dumped on the ground does not simply get sucked up into the plant or broken down and put into the soil. As a result, spraying on soluble phosphorus has a negative effect on plants’ symbiotic interaction with mycorrhizae, the soil fungal group that aids in getting phosphorus into the plant.

We like to use natural rock phosphates, certain plant species, and biological activity to extract the phos- phorus and convert it into a leachable and available form. Phosphorus and magnesium are synergistic team-mates, and should be at 0.35 percent or higher on feed tests. These are energy minerals, both vital to plant production through photosynthesis and also to transportation. These two minerals are extremely difficult to get into the plant.

Magnesium is an indicator of many things, a major storyteller of soil balance and health. Magnesium levels can be high in the soil and yet low in the
plant. Magnesium carbonate (dolomitic lime) isn’t plant-useable unless something breaks it down such as soil biology acids, plant extraction, or sulfurs.

One more issue to keep in mind: there is an inverse relationship between potassium and magnesium. The higher the soluble soil potassium, the less magnesium the plant takes up. In order to get high plant magnesium, you can’t overdo potassium. Good biological activity along with a variety of plants to feed soil life is part of the success of getting magnesium into the plant.

Sulfur is needed to make proteins and build humus in the soil. Our Midwestern Bio-Ag consultants have suggested that we should really talk about “The Big Five” rather than The Big Four, because sulfur should be added to the list. However, in order to get magnesium uptake in the plant, sulfur needs to be in good supply, so you can’t get ideal levels of The Big Four without good sulfur levels.

Each year a minimum of 25 pounds of sulfate sulfur needs to be added to most soils. If you are foliar spraying, adding Epsom salts (MgSO4) is a good idea on most farms.

Quality Forage

Cows are designed to eat a variety of forages (not grain), so utilizing more and diverse nutrient-dense, high-quality forages for an extended grazing season is the focal point of biological farm management. We want to assist cattle in production with high-quality forages fed at the right level. We’re not interested in pushing that cow into high production with lots of grain at the expense of the cow’s health and the health of the consumer.

Dairy nutritionists have parameters for keeping a cow producing well. What is missing from the forage has to be supplemented, quite often at a substantial cost, in order to meet the cow’s requirements. Because it takes time to get soils minerally balanced, extra supplementation to a cow’s ration is likely needed until that soil is balanced. Once quality forage production is achieved on the farm, more minerals and nutrients are provided through

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those plants and less supplementation is required. Quality, nutrient-dense forages offer more energy due to improved digestibility of the plant carbohydrates, resulting in more sugars, pectins, hemicellulose and other materials that are more digestible by the rumen bacteria.

Many farmers notice a difference with biologically fertilized crops, saying that they feed better although they may or may not test differently. We also find that we can get better utilization of the minerals in these feeds as they break down during the digestive process. Also, with the newer, improved Relative Forage Quality (RFQ) test, we believe that we have moved a step closer to an accurate assessment of feed quality.

Keep in mind that there are flaws associated with the current protein test techniques. For example, true protein is not measured as nitrogen — it is then multiplied by 6.25, and the resulting number is assumed to indicate protein levels. In truth, proteins are made up of amino acids — carbon-chain compounds with nitrogen attached, and some also carry sulfur and other minerals. If these minerals are lacking and nitrogen is in excess, the amino acids can’t be made, and thus you have incomplete proteins. On the other hand, if extra nitrogen is available from nitrogen over-application or too much manure, then free nitrogen can get into the plant. The test can’t tell the difference; this free nitrogen is calculated as protein, but in fact it may not be.

Quick Cow Management Guidelines

Do everything you can to get the livestock healthy and comfortable. Whether she harvests her own forages or you harvest and store the feed for her, quality forages and cow comfort are the key to healthy and productive cows and profitable, successful dairying.

- Cow science is cow science, whether you graze or produce milk cow feed and dry cow feed are not the same.
- Corn silage and good “dry” hay help match high-energy, low-fiber, high-moisture, out-of-balance forages and early spring pasture growth.
- Corn is essential. Cows are designed to eat forages. Having a minimum of 60 percent of the diet in forages is essential.
- Ration balancing is difficult with grazing. Corn silage does fit our program to help lower total protein and some of the mineral balance, some charcoal, yeast, kelp, direct-fed microbials, enzymes and vitamins.
- Quality protein, energy, minerals, vitamins and effective fiber are essential in forages, but whatever is missing from your forages is what needs to be supplemented to the cows. Starting nutrition in the soils can improve forage quality over time, but you have to earn the right to not supplement the cows.
- Free-choice minerals are another good idea. This is not in place of trying to add minerals known to be short in the soil/feed such as calcium, magnesium and traces. The minimum free-choice mineral program starts with a good, natural salt (we also like to free-choice kelp alone or mixed 50/50 with salt), a 1:1 mineral, a high-calcium mineral such as CharCal and finally, a buffer. We also use a montmorillonite clay called Dyna-Min.
- Adding carbon to the cow diet (dried molasses, some grain, plant charcoals) helps absorb the extra free rumen nitrogen. Also make sure sulfur is used in soil fertility programs for quality proteins.
- Corn silage and good “dry” hay help match high-protein, low-fiber, high-moisture, out-of-balance forages and early spring pasture growth.
- Corn is low in minerals and protein. It can be up to half shell corn on a dry matter basis and does dilute out unbalanced feeds.
- Milk cow feed and dry cow feed are not the same. Grow special forages for each group. Get an excellent dry cow program in place in order to rebuild the cow. If you don’t have low-potassium “good” grassy hay, buy it. It’s your cheapest investment of the year.
- Feeding the extras — vitamins, selenium (in many areas), yeast, kelp, direct-fed microbials — is certainly beneficial for many farmers. Your job is to do everything you can to make that cow healthy and comfortable. Some additions don’t have immediate visible paybacks, but health and breeding improve when the whole program is implemented.
- Water is essential: clean, fresh, and available in adequate amounts.
- Our ration: Due to our forages’ higher protein content, we haven’t used much supplemented protein for many years. Corn silage does fit our program to help lower total protein and some of the minerals. Our ration this winter was about 25 pounds corn silage as is, 15 pounds high-moisture shell corn, a couple of pounds of dry hay and the rest a mix of the haylage bales. We may feed one or two pounds of roasted soybeans along with the mineral balance, some charcoal, yeast, kelp, direct-fed microbials, enzymes and vitamins.

We have one group total mixed rations (TMR) for the whole herd, and offer free-choice minerals.

Our summer ration is keeping the corn silage and grain levels similar, but we may supplement oats and other small grains for some of the corn. We graze as much as possible starting with cereal ryes in the spring and then moving on to established pasture, summer annuals, new seedings, and ending in the fall with oats, peas and brassicas. We do use some straw, dry hay or dry baleage in the TMR for effective fiber.

Managing Nutrients

There are two nutrient areas to consider:

- Soil correction: Soil balance is achieved by supplying nutrients that are lacking, based on a complete soil test.
Crop fertilizers: These inputs are above and beyond soil correction inputs. These are specific blends for the crop you are growing and the soil type you have. A crop fertilizer doesn’t correct soil deficiencies and should be a balance of all nutrients, not just NPK.

The nutrient sources we are often managing on a grass-based dairy are manure, compost and fertilizers (nutrients).

Nutrient sources: Fertilizers are sold on water solubility and price per unit. What about fertilizer’s effects on soil and soil life? How plant-available is it? Are the nutrients stable, or will they leach away before the plants can use them? You can do things to enhance the nutrients and the fertilizers, such as adding carbon and balancing the soluble to the slow release types, which provides timed release of nutrients.

Composting manure with lots of carbon stabilizes the nutrients, changing manure from a soluble to a slow-release nutrient source.

With liquid manures, a light application of lime prior to manure application and a surface aeration is a good idea. Smaller, more frequent lime additions are more beneficial than larger doses. On low-phosphorus soils adding rock phosphate to liquid manure is a beneficial practice.

Foliar feeding with fish, molasses, kelp, magnesium sulfate and/or micronized minerals is not a bad idea. This is an extra or short-term fix, however, not a replacement for a good soil mineral management program. Remember to include Epsom salts in your foliar program.

Nitrogen and highly soluble salt fertilizers can stimulate a “big pile” of low-nutrient feed, but we also need to consider energy and cow performance on these kinds of feeds. What impact do these materials have on soil life, root development and plant health?

You have to earn the right to reduce or eliminate nitrogen from your fertilizer program. As a biological farmer, you can “grow” nitrogen. If you set the conditions, then in time (on most soils) purchased nitrogen won’t be needed. Healthy soils with nutrient balance and plant species balance have good nitrogen:carbon balance naturally. Keep in mind that calcium favors legume production while nitrogen favors grasses.

Tillage

We believe that careful, properly timed, shallow tillage is vital. Improper tillage can do severe damage to the soil structure and microbes. When major soil corrections with lime/minerals or improvements in soil structure are needed, pouring things on the surface will have limited effect. Sometimes you need to till to apply soil correctives and till to re-establish pasture species. For our crop farming, we like to shallow incorporate nutrients and plants and, if needed, subsoil to loosen compacted soils and allow deeper root growth.

Zone tillage, shallow incorporation of plants and residues, and deep ripping work well on many farms. We do believe that subsoiling with a Yeoman plow (along with deep-rooting annuals and a good fertility program) has a place on a grazing farm and does a lot to relieve compaction, which often is a much bigger problem than realized.

Management Bottom Line: You can’t let the soil put limits on the plants by limiting the type, quality or amount of forage grown. You can’t let the cow put limits on the plant, either, whether through grazing or soil compaction.

Gary Zimmer is a well-known consultant and speaker on biological and organic farming as well as the president of Midwestern Bio-Ag, a consulting and products company that works with thousands of farmers. He is being assisted by Rebecca Brown in establishing the Otter Creek Foundation. They are developing the BOSS (Best Organic Sustainable Systems) plan, which aims to define the parameters that must be followed for successful production in diverse farm systems, ranging from organic dairying to pastured pork, poultry and beef to permaculture and vegetable production. Visit www.midwesternbioag.com for more information.

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Beyond Organix has a standard for nutrient density from food rather than buy vitamins. People get healthier, and realize more, "bang for their buck". Whole foods and consume food packed with nutrients. Farmers can be a key to reversing this trend by learning how to grow food that is nutrient-dense. This type of food is full of measurable ingredients that provide consumers with food that nourishes the body and soul. Beyond Organix consults with growers on how to grow fruits and vegetables for nutrient-density as well as helping retailers put together sources of nutrient-dense fruits and vegetables. Consumers are the ultimate beneficiaries of this system as they can purchase flavorful retailers put together sources of nutrient-dense fruits and vegetables. Consumers are the ultimate beneficiaries of this system as they can purchase flavorful foods that are proven in the field, look to Covering all facets of organic/sustainable agriculture, Acres U.S.A. makes the connection between the soil and human and animal health. Our book catalog contains over 400 titles to help you improve your farm and your life.

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Gary F. Zimmer. This is the farming consultant's bible. It schools the interested grower in methods of maintaining a balanced, healthy soil that promises greater productivity at lower costs, and it covers some of the pitfalls of conventional farming practices. Zimmer knows how to make responsible farming work. His extensive knowledge of biological farming and consulting experience come through in this complete, practical guide to making farming fun and profitable. Softcover, 352 pages. #648 — $25.00

SCIENCE IN AGRICULTURE

Arlon B. Anderson, D.O., Ph.D. By ignoring the truth, ag-chemical enthusiasts are able to claim that pesticides and herbicides are necessary to feed the world. But science points out that low-to-moderate crop production, weeds, disease and insect pressures are all symptoms of nutritional imbalances and inadequacies of the soil. The progressive farmer who knows this, and adds a measure of common sense, will grow bountiful, disease- and pest-free commodities without the use of toxic chemicals. A concise, down-to-earth book that makes up-to-agriculture all clearly explained. Both farmer and professional consultant will benefit from this important work. Softcover, 376 pages. #4080 — $30.00

These Honey Rich Apricots are marketed by Beyond Organix from Mark’s family ranch, Nakata Farms Inc. Apricots are 70% apricot, and 30% plum. When grown and ripened properly, they will test at about 18 brix, with low acid. They ripen in mid May.

The standard is proprietary at the moment, but will eventually be made public. The need for a standard comes from a desire to assure retailers and consumers that they are buying something better.

Over the last half a century we have seen the advent of medical science, and the positive and negative effects of it. We here in the United States have created large agricultural companies that have led the effort to feed our people as well as the rest of the world. Yet there have been negative effects as well. Chief among them, but not commonly talked about, is the falling nutrient levels in our food. The U.S.D.A. has tested 23 fruits and vegetables for 13 vitamins and minerals every ten years since the early 1900’s. Since 1960 the nutrient levels have fallen 40-65%. Today we need to eat double the amount of food in order to get the same level of nutrients as we got in 1960!

Today’s retail landscape is changing quickly. As large retailers scramble to boost sagging sales, and consumers struggle to find enough money to pay bills, the word “saving” has become the top priority for most of us. Consumers have by necessity become more aware of what they are getting for their food dollar. Cartoon characters and glitzy sales gimmicks are not as effective now that there is not the “elasticity” available in food dollars in most households. There are a multitude of issues facing the produce industry today. Here are a few of them.

Retailers will soon be required to display not only country of origin labels, but nutrition labels for produce. When this happens, there will be a tremendous upheaval as most conventional and some organic produce will not achieve the stated levels of nutrition on the label. Large retailers will do independent testing, and smaller retailers will probably buy most of their produce from large shippers that can provide reliable test data.

In today’s marketplace, food safety is the number one issue. With all the recent food scares, and the emphasis being placed on the grower’s ability to ensure a safe food supply, it is imperative that growers become adept at selling safe food. Many retailers are placing heavy pressure on growers to find solutions to the food safety issue. It is interesting to note that there are direct connections between plant health and the ability of pathogens to grow on or in that plant. Pathogens only grow under a specific set of conditions. If you introduce or culture a competing biology, often the pathogen will stay dormant and not survive. Growers do have the ability to reduce the risk of food-borne illness beyond what they think.

Innovative packaging that provides a safe, clean, properly labeled unit for sale will become paramount for many retailers as they try to conform to the new rules. Growers that use innovative packaging...

I am often asked about the name Beyond Organix. The founding members of Beyond Organix (BYO) chose the name on purpose. We feel there is an important standard that has not yet been defined that combines all of the best in organics and the need for nutrition in food. As many people are becoming more aware of the falling nutritional value in food, the ability to find food that has good nutritional value has become more important. Many so-called (processed) foods are full of fillers and man-made compounds that add fat, or toxins to the body. Unfortunately this phenomenon is becoming increasingly evident in our ever-expanding waistlines. Obesity in school-age children is at an all-time high in spite of an increased emphasis on physical education. Doctors are seeing the effects of our unhealthy diet in an increase in obesity, diabetes, and stress related disorders. Farmers can be a key to reversing this trend by learning how to grow food that is nutrient-dense. From this book, ecologically appropriate farming is explained—from the smallest molecular building blocks to managing the soil—in terminology that not only makes the subject easy to learn, but also makes it practical. Sections on BMPs, carbon exchange capacity, composting, Brix, soil life and more. Eco-Farm truly delivers a complete education in soil biology, weed and insect control. This should be the first book read by everyone beginning in eco-agriculture... and the most shop-worn book on the shelf of the most experienced. Softcover, 476 pages. #6850 — $30.00
Apriums are packed and marketed by Beyond Organix (BYO) in boxes like these.

The fresh fruit and vegetable industry is facing some very challenging issues to say the least. On top of the above-mentioned issues is increasing competition from foreign producers. The more we sell our innovations, or U.S. firms move operations over-seas, the better our competitors get. So how do we survive?

Beyond Organix believes the answer lies in nutrient-density. It has spent the last four years working on innovations at the farm level as well as marketing innovations that will usher in the next great food wave to hit the U.S. The Beyond Organix system uses a field to fork approach to create maximum benefit innovations that will help increase sales for retailers that buy from Beyond Organix and its partners.

There are several keys to marketing nutrient-dense organics. Identifying your “target animal”, identifying the markets that serve your “target animal”, and exceeding the expectations of your “target animal” are vital to developing a marketing plan. Once these questions have been answered, a plan can be established. Beyond Organix is expanding its network of growers and retailers to merchandise it, both growers and their retail customers win. In general, customers that want nutrient dense product are more sophisticated in their buying habits, and understand what good health really means. The ability to test to a standard that is significantly higher than the current U.S.D.A. standard is a huge advantage from a marketing perspective as long as the advantage can be exploited at the retail level. The new labeling laws that are being implemented.

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The ability of the grower to achieve nutrient density is a key to success at the retail level. The new labeling laws that are being implemented.

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at the retail level are a great opportunity to demonstrate the difference in nutritional content between nutrient-dense organic and conventional product. The flavor profile, however, is the most important aspect to most customers. Once the product has great flavor, great nutrition adds tremendous value, and a consumer becomes a customer. Without great flavor, the consumer will try something else. Where Beyond Organix has achieved nutrient density, the demand for product has exceeded supply. We believe this tremendous demand is due to meeting or exceeding the expectation of the consumers. It is constructive to note that the demand for available product rises significantly when nutrition levels increase.

Many people have heard that fruit and vegetables tasted better, “back in the day”. Well it was true. The U.S.D.A.’s own data shows that nutrient values have dropped since chemical farming really started to grow. To be sure, plant-breeding to improve appearance or shelf-life played a role, but chemicals are by far the biggest culprit. Growers can avoid those problems associated with chemical farming by growing heirloom varieties organically. Then if they use current technology to grow their plants, success can be obtained. The ability to achieve nutrient-density however is a step above this level. Beyond Organix has learned how to fight pests and diseases through the use of nutrients as well as provide nutrients for plants. Additional benefits of growing strong plants are increased production as well as increased quality of appearance of the product. Both of these benefits increase the number of salable units of product for the grower. At retail, the difference in appearance, shelf life, and repeat sales are obvious.

Ultimately, achieving nutrient-density opens up a whole new world to growers. It represents a paradigm shift in thinking at the grower level, but brings that same shift to retail sales also. The ability to increase value to the consumer on one hand, and cut pest and weed control costs on the other hand is huge. The increase in production realized is the topper.

As the volume of nutrient-dense product increases and stabilizes, the potential sales increases are tremendous. Doctors are the, “practitioners”. In essence, they are the, “farmers of medicine”. “The only difference is they deal with human beings, not plants. But just like with plants, the better the food, the stronger the patient. This is why healthy eating is so important to athletes. In order to perform at the highest level, they MUST eat right. Pregnant women also must eat a healthy diet to improve their chances of having healthy babies. Plants also must get great nutrition to maximize their potential. Doctors and farmers must put to practical use the lessons learned in the lab. As such, they see first-hand the problems associated with a poor diet. Most doctors would much rather have their patients eat nutrient-dense food than vitamins. The problem lies in the ability to steer their patients to a store where the patients can buy nutrient-dense products. By giving doctors and health-care providers a list of locations and nutrient-dense indicators (packaging), sales of nutrient-dense products should increase dramatically.

Eating nutrient-dense food is probably the easiest, fastest way to lose weight and improve overall health. It is up to the marketers to sell this difference as real, not a marketing gimmick, or hype. Many marketers try to sell sizzle, or gimmicks. Nutrient-density needs to be sold for what it is, a way forward to a better future for all Americans.
We are still working on our second keynoter for the conference. Our short list includes Kathleen Merrigan, Fernando Funes and Mark Kastel. As soon as we hear, we will let you all know. Keep an eye on www.nofasummerconference.org for regular updates regarding all aspects of the conference.

The NOFA Summer Conference is looking for enthusiastic presenters to lead workshops for teens. Each year the teen portion of the Summer conference offers young adults the opportunity to meet and learn about topics such as the environment, livestock farming, alternative health care, social justice, organic farming and the arts. While it is a great opportunity for someone who enjoys sharing knowledge with a dynamic group of young adults, it is also your chance to be inspired by this next generation of farmers and change makers.

We are looking for workshops on alternative energy, ecology, yoga or tai chi, making herbal products, alternative schooling choices, farm dog training, street theater and homesteading skills. We are also open to your ideas. Workshop presenters receive free conference registration and a $50 honorarium for presenting a 1 1/2 hour workshop. We are accepting proposals until Jan.25. Please contact Jennifer Caron at Jenn@xf69@gmail.com or (978) 544-5646 with any questions or ideas. Those interested in presenting adult workshops should contact Ben Groscup at bengroscup@nofamass.org. (413) 549-1569. For children’s workshops contact Valerie Watson at aallspice@aol.com; (978) 689-0716.

Here are some sponsorship and advertising opportunities that provide businesses and farms with a wide array of exposure for their products and services, including a logo and website link placement on the NOFA Summer Conference website for six months. Here’s a link to last summer’s sponsors: http://www.nofasummerconference.org/sponsors.html. Larger sponsor levels also receive exhibit space and pre-registration. The NOFA Summer Conference Coordinator is welcomed to simply exhibit and advertise in the Program Book. For more information, contact Bob Minneci: bob@nofamass.org or 617-236-4893.

Seeking NOFA Summer Conference Coordinator for 2011

After 24 years of coordinating the organization of the NOFA Summer Conference, Julie Rawson and Jack Kittredge will be stepping down after the 2010 conference (August 13 - 15 at UMass/Amherst). The Northeast Organic Farming Association/Massachusetts Chapter Inc. seeks a highly organized, independent, energetic, hardworking Conference Coordinator who will oversee and organize the regional event, with over 200 workshops, keynotes, entertainment, vendors/educators and more, drawing over 1,500 people from throughout the Northeast annually.

The Summer Conference Coordinator position is a 600 hour per year job with a pay scale to be determined, depending on experience and education qualifications. Our organization is a member of NOFA/MASS in good standing. Previous attendance at NOFA Summer Conference is a plus. Applications will be received until the best candidate is hired and will preferably be received by July 5. Interested candidates should send a cover letter of interest, a resume and three letters of recommendation as an application. Send materials to Julie Rawson at julie@nofamass.org or 978-352-2853.
a piece of land for his seedlings. His father let him use a steep and rocky parcel that was so unproductive he only scythed it once a year. Sepp moved his transplants there, and surreptitiously began bringing in more rocks and stirring them about. When his father finally came to cut the hay, he broke the scythe handle on the stones and was so angry he vowed to try no more. They were again. The boy quietly expanded his plantings.

At eleven years of age Sepp bought a lamb and a kid to raise. His father said he would have to do all the work involved, which included raising the grain and beets for feed. With wire from the barn Sepp built a cableway to transport dung to his rocky slope in order to have enough fertility to raise crops to feed his sheep. Thus the lad learned to harvest yields from even the poorest soil.

During his adult years Holzer has been able to buy up nearby land for his endeavors. Such acreage has generally been considered unproductive and is taxed very lightly. As a result of his ideas and work, however, his fame spread and ultimately the tax authorities came to visit. They examined his permaculture methods on walks and a stove four years and a half later.

Because varroa also killed off 95% of feral honey bees, because of the economic devastation beekeepers were facing, and because of cheap imported honey, more beekeepers got into pollination business. Jacobsen tells how some larger honey bee keepers moved into the migratory pollination business. Some bee keepers move their bees via tractor trailer from Texas to California for almond pollination in February, Washington apples in March, South Dakota sunflowers and canola in May, then back to Texas in the fall. On the east coast it’s Florida for citrus, Maine for blueberries in June, back down to Pennsylvania for pumpkins in July, and then back home.

While the economic boom helped the bottom line, it hurt the bees. Most beekeepers describe that it added one more problem to the bees and that was STRESS! How would you like to be cooped up with 60,000 others in a wooden box, driven thousands of miles to work in unknown territory, and fed high fructose corn syrup while you were in transit? Well, the bees didn’t like it. With more than half the bees in the United States spending the year this way, that’s a lot of stressed out bees.

Meanwhile a new type of pesticide was developed: neonicotinoids “…which mimic nicotine, a natural insecticide...” that is highly concentrated in tobacco but is found also in tomatoes, potatoes and green peppers. They work on an insect’s neurotransmitters. It’s a nerve poison. A little won’t even hurt a bee. As Jacobsen says, however, “The land is more soiled in pesticides than we ever thought.” In fact, he says, if you add one more problem to the bees and that was STRESS! How would you like to be cooped up with 60,000 others in a wooden box, driven thousands of miles to work in unknown territory, and fed high fructose corn syrup while you were in transit? Well, the bees didn’t like it. With more than half the bees in the United States spending the year this way, that’s a lot of stressed out bees.

The “storm” first hit in Florida and Pennsylvania in late 2006. The bees simply started to disappear. They flew out of their hives and never came back. Not by the thousands - or millions for that matter - but by the hundreds. The phenomenon was called “The Gray Spring,” or “Gray Spring,” or “Gray Spring.” It’s all to AIDS, i.e., the immune system of the bees totally collapses. In a chapter entitled WHODUNIT Jacobson explains how the bee experts and scientists eliminated one cause after another until “The only thing everyone could agree on was that CCD must require a combination of triggers.”

The scientists also found that bees, like humans, have viruses and other pathogens in them. We don’t have effective treatments for those in humans, much less for bees. Varroa, stress, poor nutrition, pesticides, viruses, and maybe some other things that haven’t been discovered yet, all came together to weaken the bees. It was a “death by a thousand cuts.” The cumulative effect is the collapse of the honey bee.

China, the Himalayas, Brazil, Mexico, and Hawaii have all lost some of their pollinators in what Jacobson calls a ‘fertility crisis’ where pollination is done by hand and not by insects. Jacobsen believes “…there is a spotlight on the broad of colony collapse disorder…many people now understand that agriculture depends on the honey bee.

With three quarters of the world’s staple crops needing insect pollination, that’s a big dependency. In the US, 80% of the flowers, fruits, vegetables and nut crops are pollinated by honey bees. On most large farms (almonds and blueberries are two) almost 100% of the pollination is done by honeybees.

Jacobsen ends the book with a choice: continue along, wipe out our pollinators and hire poor people to hand pollinate our crops; or change and choose a world that “...flourishes” with honey bees in an Epilogue Jacobsen states that it is his belief that honey bees will make it through all this but things for them are going to get worse before they get better.

I enjoyed the book and suggest its reading to understand what we’re doing to the environment whether you’re a bee keeper or not.

Berleunjung and his wife, both ‘big city’ kids, keep honey bees and have lived off-grid in Groton, VT for the past three years.

Cooking Close to Home is the latest cookbook to target the localvore crowd. With sumptuous color photographs and rich descriptions (would anyone like a Grilled Carrot and Butternut Squash with [Candied Apples]?) the book made my mouth water the first time I picked it up. However, while my tastebuds were set as I leafed through its pages, the experience was more like reading a menu at a fancy restaurant than getting inspired to fire up my cast-iron skillet.

I was impressed by the number of recipes for difficult to utilize vegetables. Cute kohlrabi, for example, always win me over with their good looks, but no matter how good they look, they always end up at the back of the fridge and ultimately the compost pile. Fennel, tomatillos, parsnips, and celery are fit in this category as well. I was intrigued by ‘Winter Kohlrabi and Cherry Salad,’ an enticing ‘Carrot and Roasted Fennel Soup,’ and even a ‘Hot and Sour Spinach and Dandelion Greens Soup.’ I was also impressed with the number of recipes seeking to spice up those cabbages, potatoes, beets, carrots, and turnips that get so boring part-way through winter.

However, don’t mistake this cookbook for a survival guide to the Eat Local Challenge. Olive oil figures in to most recipes. After all, how can you make it without it? While the book does make it into the book by containing a tablespoon or two of maple syrup. Some recipes even go so far as to feature kiwis or chocolate or ginger.

But my main beef with this seasonal cookbook, however, is the complexity of the recipes. I should put a caveat in this review: I’m the first to admit that I’m no gourmet chef. I tend to cook vegetable suppers that take less than an hour to prepare. Most of the main-dish recipes are heavily meat-centered and lean towards the complicated side. There are a full 2 pages on how to butterfly a pork tenderloin and, while the Wild Leek and Mushroom Ravioli recipe sounds delicious, most people I know simply don’t have time to make homemade pasta.

Simple recipes I tried were honestly a little flat. The Ginger Black Bean and Pumpkin Cakes with “Harissa” is packed with flavor, while the Maple Oatmeal Pecan Cookies with Dark Chocolate, despite a whole teaspoon of nutmeg and a whole cup of dried cranberries, didn’t have any zing.

Cooking Close to Home should be lauded for its work featuring the fresh fruits, vegetables, and meats of the farms of the northeast. However, with its creativity in featuring these familiar foods in a new light comes the complexity of transforming them into gourmet entrees. If Diane and Richard open a restaurant with food as gorgeous as their photos, I’ll be first in line. Just don’t expect it out of my kitchen any time soon!
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Nutrient Density Crop Production Workshop Series for 2010

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Series $270
Per Workshop: $65

or more details:
Contact: Dan Kittredge
Email: dan@danifoodcampaing.com

For Registration see danifoodcampaign.com

For links to the series you want to sign up for.

by Renee Ciulla

Early rays of sun were warming the walls of the Eastland Park Hotel in Portland, Maine when I arrived for the New England Association of Resource Conservation and Development Areas’ annual three-day fall conference held October 29-31. This year’s theme, Feeding Ourselves, joined together farmers, teachers, business owners and non-profit employees to discuss the importance of New England becoming more self-reliant by growing and processing its own food supply.

Friday morning began with a focus on the state of Maine, well known for supplying brown eggs, maple syrup, wild blueberries, potatoes, and of course, lobster. But where are Maine residents getting most of their food on their table, including loaves of bread, meat, and vegetables? Alison LePage from the Eat Local Foods Coalition asked the timely question, “Can New England feed itself, or more importantly, can New England feed itself again?” She is correct in pointing out that during the Civil War and earlier, Maine was a net food exporter and joined other states in feeding their own people. But another result surprised even Marada. She had an Amish farmer that was making artisan cheese and decided he wanted to sell it to a directly to a few of the same stores as Crown O’Maine. Understandably, at first Marada was befuddled at this tactic but soon discovered that sales were increasing significantly. In 2003 occurred because when he delivered the cheese himself, he was able to attach a story to the product that the store owner passed on to the customers (such as the traditions they followed for cheese making and cutting the ice for the icehouse when it was stored). The moral of the story is that even in this digital age, it is still important to leave the farm because only they can tell their own story. In relation to sustainability, both Marada and Martha try to be as efficient as possible by bringing things like fertilizer to the farms when they go to pick up items (some farms are part of a buying club).

After a full morning of inspiring stories about local food connections, we were ready for an early meal. Maine potato salad, a complete sandwich buffet and Maine sweet potato soup awaited the crowds of hungry conference-goers. While sipping on soup, we were treated with a truly special guest, Deputy Secretary of Agriculture, Kathleen Merrigan. She began her speech by stating her belief that “…not every family is a lawyer or an economist, but every family is a farmer.” Lucky for her, she is in regular contact with the First Lady and she spoke about Michelle Obama’s genuine passion about the organic White House garden. Visible to everyone that walked past the lawn, it is a real galvanizer for national and international discussions about growing our own food.

The garden had a bumber harvest this fall and they are currently planning to use a hoop house for season extension and plant a cover crop. Merrigan spoke about the initiative (Knoke cover crop, Know the Knoke’s, Know the Knoke lingo) and how she is working to increase the visibility of the program’s benefits as well as setting up webinars to help applicants work through the complexity of the applications. She emphasized the need to reach out to the youth of America and has several trips planned to Universities to stimulate them about the importance of agriculture and our food supply. When the time for asking questions arose, my hand shot into the air and I was fortunate to be one of two selected inquirers. I asked Merrigan about the weaknesses of New England to feed itself with a more localized food system. Merrigan responded that what is regional and local in each area will be different, emphasizing that this is OK! Areas that need more attention are season extension (such as is being done by Eliot Coleman), assisting young people with new business plans and more value-added products. Directly after the speech, Merrigan went to Borealis Breads in Portland where she announced a $1.3 million grant from the USDA to increase farmers’ capacity to produce high quality organic bread wheat. Demand for locally grown wheat from millers and bakers has been steadily increasing and there is now an incredible opportunity for regional farmers to begin growing grain again.

Afternoon sessions included workshops on alternative farm financing mechanisms and educational efforts to help consumers understand the importance and benefits of a local food system. However, I opted for the experiential learning of a tour around Portland’s urban farming paradise, strengthening the local food supply. The first stop was the Boyd Street Urban Farm in Bayside, one of Maine’s poorest neighborhoods housing many refugees. Craig LaPine, the executive director of the farm was our tour guide, explaining the Portland community seems to embrace this urban farming paradise and Maine farmers, teachers, business owners and non-profit employees to discuss the importance of New England becoming more self-reliant by growing and processing its own food supply.

The second workshop offered Marketing or Distribution presentations. In the distribution class, Marada Cook from Crown O’Maine Organic Cooperative and Martha Putnam with Farm Fresh Connection shared the floor while speaking about the similarities of their operations and different aspects. The focus is mainly on commodity crops such as potatoes, cranberries and blueberries. Recently she has been studying the feasibility of supporting the Maine school system since there is a potential to feed 2,400 people two meals/day! When asked about what her biggest challenge, a common resounding answer was “how to change the food system. She emphasized the need to reach out to the youth of America and has several trips planned to Universities to stimulate them about the history of the farm with an infectious smile and enthusiasm that I’m sure is felt by all those he inspires to grow food on the plot. Craig works hard to make sure the youth that participate aren’t just seeing food grow, but are also learning to cook and enjoy it. In addition to feeding the community, the farm has recently tested the lead levels were extremely high (1,200-20,000 ppm and EPA cites 200 ppm as safe) because of the paint on the houses that had been knocked down years ago. Using phytoremediation as a solution, sunflowers, mustard greens and spinach were planted since they take up lead in the soil. Amazingly, by the end of the second summer the lead levels had reduced to 100 ppm! The Portland community seems to embrace this urban farming paradise and Maine favorite.
College of Art students are currently building a cold frame for the farm to extend their growing season.

As our group hit the streets again we trekked past several eateries including a French bistro, Italian sub shop, pizzeria and even a book store selling only food related reads. Our final destination was Cinque Terre, a beautiful restaurant specializing in Italian cuisine made from local ingredients. As we opened the doors, we were greeted by proprietor, Lee Skawinski, donning a John Deepe cap and directing Martha Putnam (already back at work with Farm Fresh Connection) on where to place boxes of Brussels sprouts, eggs, tomatoes and squash. Skawinski is known for his commitment to the Farm to Table approach and believes strongly in applying principles of small-town Italy to his restaurant. He currently has a long list of Maine farmers producing quail, lamb, livestock and cheese for diners at Cinque Terre. When he meets with farmers during the winter months, they discuss various Italian vegetable varieties that could be grown in Maine. After working in dozens of conventional restaurant kitchens, Skawinski can testify that there is not too much of an economic loss when purchasing local ingredients, and in fact the difference is balanced when considering the longer shelf life and flavor quality. Comparing cooking to playing, this animated chef left us with the quote, “Portland is like a chef’s playground. There is always someone knocking on your door asking, ‘Hey can I bring you heritage turkeys? Jam? Honey?’

Another important Portland landmark we visited was the Public Market House on Congress St. When the original marketplace closed in 2006, a hardcore group of four vendors gathered together to create a petition for a new location. Their efforts paid off when they moved into their current location across from the new Portland Public library. They are excited to announce that a second floor is soon to be opened above the market where three new vendors will rent space overlooking the common. The Community kitchen downstairs has given several entrepreneurs a chance to try making food of their dreams and young businesses are also able to rent tables for $15/day to try selling their items in the market. Public Market House will also be part of the Friday Art Walk giving them the sense that they are finally offering a public space again.

I left Portland with a smile and a freshly baked loaf of Big Sky Bread, made with grains grown across our country in the state of Montana. During my drive home to NH, while chewing on soft bites of bread, I pondered whether the next time I visit the market. Public Market House will also be part of the Friday Art Walk giving them the sense that they are finally offering a public space again.

Renee Ciulla, a NH native, is an Agroecology Master of Science candidate with the Norwegian University of Life Sciences in Aas, Norway. Last year she studied organic agriculture and food systems in Italy, Germany and Norway and is currently writing her thesis on the feasibility of a more localized food system in New England. She can be contacted at: begreen618@hotmail.com
NOFA Organic Land Care’s Ten-Year Anniversary: Reporting Healthy Growth

by Kathy Litchfield

Much more than compost tea is brewing for enthusiasts of the NOFA Organic Land Care Program! Now in its tenth year, the program includes almost 500 NOFA Accredited Organic Land Care Professionals (AOLCPs), practicing in 18 states, and over the last 10 years, expert scientists and land care professionals have taught more than 1,000 students the practical methods to care for landscapes organically and sustainably.

The mission of the NOFA Organic Land Care Program (NOFA OLC) is to extend the vision and principles of organic agriculture to the care of the landscapes where people carry out their daily lives. Through urban and suburban landscapes and gardens, organic principles are used to promote and enhance biodiversity, biological cycles and soil health; minimize inputs; and use management practices that restore, maintain and balance ecological harmony. The program educates professionals and the general public about landscaping and gardening practices that eliminate synthetic pesticides and fertilizer use and improve the health and well-being of the people and web of life in their care.

We are pleased to report on healthy growth and several new initiatives for the program throughout the Northeast and beyond.

Advanced Hands-On Workshops

This summer, we hosted three highly popular “Advanced Hands-On Workshops” in compost tea brewing, intensive pruning and organic invasives removal. At these courses students performed the specific work and the hosting site reaped the benefits. The Beardsley Zoo, for example, was grateful for the beautiful, trim new look of its many public plantings that students pruned.

Online Searchable Database

The new online searchable database, “AOLCP Search” enables the public to find nearby accredited professionals who provide the organic landscaping services they seek. Professionals customize their own web presence on this site, and our tracking data show that this feature has been widely used since its inception six months ago. Visit www.organiclandcare.net and click on “AOLCP Search” to find a professional near you, or AOLCPs – to update your listing!

OLC Homeowners’ Campaign

Newly hired Clara Buitrago of West Haven, CT is coordinating a new “Hom-

ewers’ Campaign” that includes workshops, a website re-design, monthly press releases and tips for “do-it-yourselfers” in organic land care. This work is funded in part by grants from the Quinnipiac River Fund, the Watershed Fund, the Long Island Sound Futures Fund, the Wellesley Natural Resources Commission and Newman’s Own Foundation. As part of this work, the website will include a professional peer-to-peer forum and public social networking as well as homeowner resources. To sign up for an email service with seasonal organic landscaping tips and reminders, contact Clara at clara@organiclandcare.net.

Update: AOLCPs on the Move

Geared to the program’s AOLCPs but also open to the public, the annual Update Course will be held Tuesday, Dec. 8th, 2009 at the Starbridge Host Hotel in Sturbridge, MA. Keynoter Bill Cullina will explore the world of plant efficiency and complexity during his presentation “Sugar, Sex and Poison: Shocking Plant Secrets Caught on Camera.” Additional topics presented that day include “Biochar as a Climate Change Mitigation Strategy & Soil Amendment,” “Cues, Signals, and Tree Response to Pruning,” “Mile-A-Minute Vine Research Update;” and “Organic Products Research Update.” Register by calling (203) 888-5146 or by visiting www.organiclandcare.net.

5-Day Accreditation Courses

If you’re not already accredited, or you are and want to brush up on your skills and knowledge, you’ll love the 9th Annual NOFA 5-day Accreditation Course in Organic Land Care, to be held in four states in 2010:

Newburyport, MA

January 13, 14, 15, 19, 20

New Haven, CT

January 21, 22, 25, 26, 27

Westchester County, NY

February 10, 11, 12, 15, 16

Providence, RI

February 22, 23, 24, 25, 26

This five-day intensive educational course is designed to provide professionals with the education needed for an understanding of organic and sustainable landscaping from design to maintenance. The curriculum is based on Standards for Organic Land Care: Practices for Design and Maintenance of Ecological Landscapes, written by NOFA’s Organic Land Care Committee. These standards, first published in 2001, are the first of their kind in the country.

Course faculty include respected scientists and experienced organic land care practitioners, who instruct the following classes: Principles and Procedures; Site Analysis, Design, and Maintenance; Rain Gardens/Storm Water Infiltration; Soil Health; Soil Biology & Ecology; Fertilizer and Soil Amendments; Composting; Lawns; Lawn Alternatives; Planting and Plant Care; Wetlands; Pest Management; Wildlife Management; Disease Control; Water Management; Mulches; Invasive Plants; Client Relations; and Running a Business. Four hands-on case studies are also included in the course.

At the end of the course, students who pass the accreditation exam can become NOFA Accredited Organic Land Care Professionals, able to use the NOFA Organic Land Care Logo, to be listed on the www.organiclandcare.net website and in the annual NOFA Guide to Organic Land Care and will have the opportunity to represent NOFA at organic land care events.

Over 1,000 land care professionals from 20 states have taken NOFA’s course. These professionals include landscapers from large and small firms, landscape architects, garden center employees, arborists, municipal groundskeepers and property managers. Small business owners, entrepreneurs, homeowners, land trust and conservation organization staff and many others have also found the course extremely valuable.

For more information or to receive registration brochures, visit www.organiclandcare.net or contact Ashley Kremser at (203) 888-5146 or akremser@ctnofa.org. Visit www.organiclandcare.net for more information or to register online.

You Can Help

If our mission resonates with you, help us spread the word about upcoming events! You can request paper brochures anytime for distribution at garden centers, cafes, libraries or other venues by calling the OLC Program office at (203) 888-5146 or emailing Program Manager Ashley Kremser at akremser@ctnofa.org. Share the info with organizations, websites and organic and mainstream forums you’re a part of, tell your local cooperative extension university staff, college professors and local land trusts of these opportunities, and of course tell your colleagues, friends and family members!
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* Marion Griswold, Bookkeeper, 30 Hollow Rd., Woodbury, CT 06798, (203) 263-2221, mariner@ctnofa.org

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### Interstate Certification Contacts

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* Carol King, 840 Front Street, Binghamton, NY 13905, (607) 724-9851, fax: (607)724-9853, certifiedorganic@nofany.org

* Eric V. Bremer, c/o VT Dept. of Agriculture, PO Box 330, Trenton, NJ 08692, (609) 984-2235 erich.bremer@state.nj.us

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### 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.

**Connecticut:** Individual $35, Family $50, Business/Institution $100, Supporting $250

* Contact: CT NOFA, Box 164, Stevenson, CT 06491, (203)-888-5146, or email: ctnofa@ctnofa.org or join on the web at www.ctnofa.org

**Massachusetts:** Low-Income $20, Individual $35, Family/Farm/Organization $45, Business $75, Supporting $150

* Contact: NOFA/Mass, 411 Sheldon Road, Barre, MA 01005, (978) 355-2853, or membership@nofammass.org or join on the web at www.nofammass.org

**New Hampshire:** Individual: $30, Student: $23, Family: $40, Sponsor: $100, Basic $20*

* Contact: Elizabeth Obelonus, 4 Park St., Suite 208, Concord, NH 03301, (603) 224-5022, info@nofanh.org

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### New Jersey

* Student/Intern $20*, Individual $40*, Family/Farm $70*, Business/Organization $150*, $10 additional per year for subscription to The Natural Farmer.

* Contact: 334 River Road, Hillsborough, NJ 08844, (908) 371-1111 or join at www.nofanj.org

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### New York

* Student/Senior/limited income $20, Individual $40, Farm/Family/Nonprofit Organization $50, Business $115, Patron $125.

* Contact: Mayra Richter, NOFA-NY, c/o Bill Walker, NOFA-NY, PO Box 880, Cobleskill, NY 12043, Voice: (607) 652-NOFA, Fax: (607) 652-2290, email: office@nofany.org, www.nofany.org

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### Rhode Island

* Student/Senior: $20, Individual: $25, Family $35, Business $50

* Contact: Membership, NOFA RI, c/o Abbie Barber POB 86 Shannock, RI 02875 (401) 364-7557, shannockorganicfarm@hotmail.com

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### Vermont

* Individual $30, Farm/Family $40, Business $50, Sponsor $100, Sustainer $250, Basic $15-25*

* Contact: NOFA-VT, PO Box 697, Richmond, VT 05477, (803) 434-4112, info@nofavt.org

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Mar 27, 2010: Beginning a Vegetable Garden

Apr 17, 2010: Raised Beds workshop

Apr 23-24, 2010: Organic Beekeeping Workshop

Jun 5, 2010: The Role of the Horse in the Farm Organism

Jul 17, 2010: Continuing the Vegetable Garden for more info: 845-552-9202 x20, info@pfliegercenter.org, www.pfliegercenter.org

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**Jan 30, 2010**: CT-NOFA Getting Started in Organic Farming conference, New Haven, CT, for more info: 203-888-5146, deb@ctnofa.org

**Mar. 6, 2010**: NOFA-NH Annual Winter Conference, Concord, NH, for more info: WinterConference@NOFANH.org, 603-654-7595, www.NOFANH.org

**Mar. 6, 2010**: CT-NOFA Cultivating an Organic Connecticut Conference, Manchester, CT, for more info: 203-888-5146, deb@ctnofa.org

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Maine Farmer Mark Fulford stands among his garlic. Besides farming, Fulford is also a consultant heavily involved in the movement toward nutrient dense crops.

This issue contains news, features, and articles about organic growing in the Northeast, plus a special supplement on Crop Nutrient Density.