The 32nd Annual NOFA Summer Conference

by Kathy Litchfield

It’s almost here! That is, your chance to meet people from throughout the Northeast and beyond over delicious organic meals; tour a local farm or greenhouse; dance along the festive parade route to kick off the much-loved Old-Fashioned Saturday Country Fair; bring your own organic seeds to be cleaned for free by the Organic Seed Partnership.

What will organic look like in the next 10-20 years? Participate in the first of a series of national dialogue meetings that will examine national and federal priorities for organic agriculture. This first-ever mini-conference will run concurrently with the NOFA Pre-Conference on Food and Farming Education.

Get your questions answered, share your expertise, learn from others, socialize in a healthy environment, dine upon delicious organic food --- whatever your reasons for attending the 2006 NOFA Summer Conference, let them be known by registering today!

The 32nd annual NOFA Summer Conference, featuring a grand total of 218 diverse workshops this year, will be held from August 10-13, 2006 on the grounds of Hampshire College in Amherst, Massachusetts.

Featured in Hobby Farms Magazine as one of the best conferences for small farmers, the NOFA Summer Conference offers something for everyone through its creative workshops, its themed pre-conference, social events, organic meals and much, much more.

This year’s workshops cover topics including organic farming, gardening, land care, spirituality, health, politics and our place in the world.

Focus on Keynote Speaker Sister Miriam Therese MacGillis

“I can see the possibilities for a flourishing planet, where we choose to restore and heal what we have poisoned and violated. As we transform ourselves, Earth will heal.”

by Kathy Litchfield

The day a high school art student challenged Sister Miriam Therese MacGillis about her views on the Vietnam War was a day that changed her life.

MacGillis, a native of Bayonne, N.J., immediately embarked upon a search to discover her innermost feelings about the war, which shortly led the Dominican sister to begin full time peace and justice work, as education coordinator for the Newark Archdiocese from 1973-1977 and as program coordinator and art editor of the “Whole Earth Papers” from 1976 to 1980 with Global Education Associates.

MacGillis said she realized she was not only against the Vietnam War, but against war as a way to settle conflicts. She was also touched by the crisis of world poverty, and especially the tragedy of world hunger. This passion led her to explore farming, agriculture, and our human connection to the earth. She had been inspired by the work of Anthroposophist Rudolph Steiner and his biodynamic farming methods (in tune with the natural rhythms of the earth) and of Cosmologist and Earth Scholar Thomas Berry, through which she learned about the need to shift our understandings about cosmology.

Northeast Organic Farming Association
32nd Annual Summer Conference

August 10-13, 2006

Hampshire College - Amherst, MA

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This year’s workshops cover topics including organic farming, gardening, land care, spirituality, health, politics and our place in the world.

Sister Miriam Therese MacGillis

“I come very much out of his work,” said MacGillis of Berry, “that the human being is Earth, conscious of itself. Earth is a conscious planet and being self-reflectively aware is what Earth does in the human. Every expression of life, whether a flower, a blade of grass, a worm, a giraffe, or a human – all are expressions of Earth.”

MacGillis has a strong and positive vision for the future of our planet, which she will share during her keynote address at the NOFA Summer Conference: “Holding our Farms in Hope; Keeping Faith in our Farming.” on Friday, August 11th at 7 p.m. inside the Robert Crown Center at Hampshire College in Amherst, Massachusetts.

“I want to affirm the organic farming movement and all the ecological efforts that people carry as they realize that intensely industrialized economies are not good for life. I want to set a plan to build a new way of life.”

The Children’s and Teen’s conferences, which run concurrently with the adult workshops, are organized by separate teachers and administrators. They feature many new and innovative workshops this year as well as tried-and-true events to educate and inspire the next generation of NOFA farmers while providing value to the seasoned NOFA members.

Supervised music, dance, movement, arts, nature journaling and construction workshops will delight children. “Discover your Intuitive Mind,” “Growing your own Multicultural Garden” and “Ecological Footprints” are among the thought-provoking, exciting opportunities for teens.

The theme of this year’s Summer Conference is “Sprouting the Seeds of the Next Generation,” and we organizers hope to be sprouting them like crazy!

Our favorite NOFA traditions will also delight conference-goers this year, whether at the Saturday Country Fair, jam-packed with fun activities for participants of all ages, or during the always-savored and much-anticipated Local Meal, prepared entirely with locally grown and produced organic foods.

This year’s Local Meal menu includes Fresh Tomato Soup, Beef and Vegan Tamales, Red Cabbage and Carrot Salad with Cilantro Dressing, Bread and Cheese, Maple ice cream and fruit crisp and of course the Salad Bar.

(continued on page 41)
Dear Jack and Julie,

I just wanted to send a note to say how much I appreciate your work through The Natural Farmer. I have been a back-to-the-land type since I discovered my first copy of The Mother Earth News in the ’70s, soon to be followed by Organic Gardening magazine. When my husband and I moved to our present country home in 1994, I discovered NOFA-NY (and through them you) in our local Shopper.

I guess what I really want to do is thank The Natural Farmer and NOFA for furthering my “organic” education. Your articles and NOFA-sponsored events have really given me the courage to go express myself in my hometown (and by default, your dada’s.) For example, in addition to growing a large organic garden, we began raising a small flock of chickens last May. And Sally Fallon has been a huge influence. I would never have sought to buy clean organic raw milk from an organic dairy farmer if not for her. I could go on, but I have to go feed the chickens.

Sincerely, Sandy Gorman

Dear Jack and Julie

Love the Natch Farmer. Last issue on Corporate Organic was so informative. Tom’s toothpaste just (continued on page 3)

The Natural Farmer Needs You!

The Natural Farmer is the newspaper of the Northeast Organic Farming Association (NOFA). In most chapters, regular members receive a subscription as part of their dues, and others may subscribe for $10 (in the US or $18 outside the US). It is published four times a year on rural at 411 Sheldon Rd., Barre, MA 01005. The editors are Jack Kittredge and Julie Rawson, but most of the material is either contributed or summarized by us from information people send us.

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

Fall 2006 Organic Potatoes
Winter 2006 Agriculture & Globalization
Spring 2007 Water & Agriculture

Moving or missed an issue? The Natural Farmer will not be forwarded by the post office, so you need to make sure your address is up-to-date if you move. You get your subscription to this paper in one of two ways. Direct subscription, which we send to $10 are not on our database. These folks should send address changes to us. Most of our readers can contact you directly. If you're not a NOFA member, you can still send in an ad - just send $5 along too! Send NOFA Exchange ads directly to The Natural Farmer, 411 Sheldon Rd., Barre, MA 01005 or (preferably) E-mail to Jack@mhof.net.

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

We appreciate a submission in any form, especially if you type your submission more readable and informative. If you have any questions, or wishes of one is usually near the phone: (978) 355-8583, fax: (978) 355-8436. The NOFA-Interstate Council website is www.nofa.org.

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Is Organic Better?

Jack Kittredge

Twenty-some years ago, when Julie and I got interested in organic farming, it was a matter of common sense. You wouldn’t eat toxic chemicals. Why would you spray them on your food and then give it to your kids to eat?

But there weren’t any studies that proved organic food was safer than conventional. The Rodale Institute was just starting its research. All the ag schools marched in lockstep behind the chemical industry line: “We have the safest and most nutritious food supply in the world.” If you challenged that position you did it more on faith than on hard science.

Now things are changing. There is a multi-billion dollar organic industry. Universities, labs and reporters are interested in documenting the effects of organic food and farming. Is it better for you? If so, why? Does it supply more nutrients? Does it protect against cancer? Do those who eat organic have less disease? How about the environment? Is organic better for soil, water or air? Does it conserve fossil fuels?

This issue attempts to begin to answer those questions by presenting some of the hard science that has been coming out of studies on those topics in the last few years. It is a compendium of some of that documentation. We certainly have not printed everything that is available. But we have tried to give you a reasonable selection. In some of these articles the same studies are briefly cited several times. Rather than change an author’s words we have left these small duplications and hope you learn from how the same information is seen through different eyes.)

Not many people develop their opinions on a topic because of scientific studies. This is especially true for controversial questions like what we eat. Most of us come to our beliefs more on the basis of how we grew up, who our friends are, what is being said by others in our social circle. So we don’t expect this issue to change many minds. But we hope you will peruse the studies, remember the gist of them, and when you need specific information return to them. If someone you know, because of their own health or family situation, begins to wonder if organic is indeed better, perhaps you can help them find an answer.

Advertise 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 goods or services. We carry 2 kinds of ads:

The NOFA Exchange - this is a free bulletin board service for NOFA members and TNF subscribers for occasional needs or offerings. 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’re not a NOFA member, you can still send in an ad - just send $5 along too! Send NOFA Exchange ads directly to The Natural Farmer, 411 Sheldon Rd., Barre, MA 01005 or (preferably) E-mail to Jack@mhof.net.

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 Dan Rosenberg, PO Box 40, Montague, MA 01351 (413) 863-9065 and enclose a check for the appropriate size. The sizes and rates are:

Full page (15” tall by 10” wide) $300
Half page (7 1/2” tall by 10” wide) $155
One-third page (7 1/2” tall by 6 1/2” wide) $105
One-quarter page (7 1/2” tall by 4 7/8” wide) $80
One-sixth page (7 1/2” tall by 3 1/8” wide), or (3 3/4” tall by 6 1/2” wide) $55
Business card size (1 1/2” tall by 3 3/8” wide) $15

Note: These prices are for camera ready copy. If you want any changes we will be glad to make them - or type a display ad for you - for $10 extra. Just send us the text, any graphics, and a sketch of how you want it to look. Include a check for the space charge plus $10.

Frequency discounts: if you buy space in several issues you can qualify for substantial discounts off these rates. Pay for two consecutive issues and get 10% off each, pay for 3 and get 20% off, or pay for 4 and get 25% off.

An ad in the NOFA Summer Conference Program Book counts as a TNF ad for purposes of this discount.

Deadlines: We 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 Sep. 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 misrepresentation 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 $200 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 to our advertising manager Dan Rosenberg, PO Box 40, Montague, MA 01351. If you have questions, or want to reserve space, contact Dan at (413) 863-9063 or dan@realpickles.com.
Letters
(continued from page 1)
sold out to Colgate (the true nature of the system we live in!) Much like nature and the climax forest – if you want to be a tree, then you got to be a big one! And when you are a big tree you will take all the water and nutrients you need and not much else will grow around you until you fall. How we in grassroots/community-based cultures keep balance, keep young and open is WORK. The great work of orchards and vineyards, pastures and gardens. (Who planted and cared for the apple tree back in the original garden?) Ah, so many questions, so little time.

Thanks for all the balance and harmony you bring to our thoughts!

Love, Karen Kerney
For NOFA:

Thanks for The Natural Farmer, especially the history of Walnut Acres and the Keene Family. I made the family bread with grains from them. The buy-up of small organic farms is a great danger and I hope you include updates in your publication.

Cheers to you, Dorothy Weaver
Dear Jack and Julie,

I just wanted to drop you a line about the last issue of The Natural Farmer. Wow. What a great job you did. It is so true that all the small organic companies are getting swallowed up faster and faster by the big guys. Reading about Walnut Acres nearly broke my heart. It is too bad that money always seems to be the deciding factor. So many people still don’t “get” what organics is all about – even some of the people in the organic industry! Does organic mean only not using pesticides or does it mean nurturing the land and the people and creatures (both plant and animal, both wild and domestic) for the sake of the almighty dollar.

I truly believe that we cannot love and care for anything on a grand scale. Only small farms and small processors can ever truly know the land and care for it well and produce truly healthy food. It saddens me that so many of us have forgotten what really matters in life – and money is not it.

To change the subject, thanks for your advice about caring for rabbits. As fate would have it, I recently read an article by Joel Salatin in the ALBC newsletter (I think it was reprinted from Acres.) It was really about parasite control on the farm, but he mentioned his son’s rabbits in passing. He said 20 years ago when they switched to raising rabbits on pasture they lost half their stock.

Half! By selectively breeding the stock that did well on pasture they now have an extremely low mortality rate two decades later. So that answers my questions. It explains why conventional rabbit wisdom says no grass ever and no greens for rabbits under six months. I suppose it is a case of fitting the animals to the farm – a long and careful process.

Thanks so much for all you do at Many Hands and for NOFA. I can think of few types of work more indispensable to the world. Happy Spring and hope to see you around soon, I’d love to make it to the Summer Conference this year.

Fondly, Erin Matica

Dear Sandy, Karen, Dorothy and Erin,

Wow! Thanks for the effusive words about NOFA and the paper. Julie and I feel much the same way. When we discovered NOFA in 1984 we felt we had finally found a community of peers with whom we share interests and values. Since then we have remained grateful to NOFA for providing us with ways to support ourselves while working at home at something we believe in. Where else but for this paper can you actually get paid for sticking your nose into how other farmers do things?

Our four kids are now grown and have so far managed to resist the temptations of the corporate world, for which we feel blessed. We are particularly happy to see so many new, young families coming into the organization and watch the generational transition that is taking place in it!

Jack Kittredge

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Jack Kittredge
**NOFA/Mass is seeking a Press Coordinator.**

The hourly pay rate for this job is $11/hour. The job will take place approximately 40-50 hours per month. All NOFA/Mass consultants and staff are required to be a member of NOFA/Mass, attend the annual one-day staff meeting in October and the two-day board/staff retreat in February. Please send resume and three references to Julie Rawson at julie@nofamass.org or 411 Sheldon Road, Barre, MA 01005. Phone: (978) 335-2853. Email applications are encouraged. Deadline for applications is June 15, 2006. Work will start by July 1. By October 1 the pay rate will go to $12/hour.

**Optimistic At Organic Dairy Farm, Simsbury, CT.**

Seeking Assistant Farm Manager for small, organic dairy farm with on site processing and retail store. Position includes field work, milking and processing milk, yogurt, cheese, etc. Opportunity to become Manager on site housing available. Call Bill Walsh at 860-658-5362 or email resume to TownFarmDairy1@aol.com. Also visit www.townfarmdairy.org. Farm is assisted by non-profit, community group, Friends of Town Farm Dairy.

**Seeking certified K-8 teachers for earth literacy public charter school. Ridge and Valley Charter School, in NW New Jersey, seeks experienced teachers with strong team building and leadership skills to work as part of an energetic and collaborative team mentoring students in an experiential, multi-age setting. Our mission is to connect children to the natural world through an innovative outdoor experiential, project-based curriculum, with an integrated ecological and sustainable living focus. All teachers and students spend significant time outdoors. Seeking to add a 4th grade, and a middle school. Contact: Toll free number: 1-877-334-4665 or 908-362-1114 in NJ. E-mail: yarndyer@comcast.net. Call 603-472-6174**

**Old-style life skills series - a new educational program created by the not-for-profit Motherhouse to foster self-sufficiency, neighborly interdependence and sustainable agricultural practices. Held at the Motherhouse in Derby, Connecticut. Staff meeting in October and the two-day board/staff retreat in December. This position entails approximately 50% learning/training/field labor and 50% research tasks to be presented in the form of a grant application. The ideal candidate(s) for this position would have coursework related to agricultural research and/or prior research experience. Careful attention to detail and strong interpersonal skills are a must. Please submit a resume and cover letter to Julie Rawson at julie@nofamass.org or phone 603.786.2366.**

**Equipment - Skid mounted PTO Hale FW2000 Blower 250 gallon propane tank for medium irrigation duties-$1100. 2% Tico irrigation pipe with #38 Rainbird on 6, Riser #53/length, 3-Komet Irrigation guns on Hi Stands like new-$300 each. Hi Pressure Greenhouse Sprayer $200. hose. Ready to work-$850. Front mounted window turner for strawberry or perennial crop demulching–$375. 5’ medium duty 3 pt bush hog, good condition-$500. 200,000 BTU Modine propane furnace for shop or barn only-$100. Miscellaneous greenhouse barn fans and louver-$25-100. Plainfield, NH 603.298.8391**

**Blow Your Own Horn**

For sale: former monastery turned organic farm on 10.7 acres abutting hundreds of acres of conservation land - horse trails, hiking, hiking, hiking, country skiing, located 60 miles west of Boston in Petersham. 4500 sq ft house, including large “chapel”/sun room. 30:30 2-story solar barn with electricity and water, stocked pond, hundreds of established rare perennials: fruit trees, nut trees, berries, vegetables, culinary and medicinal herbs. A splendidly private property just 24 miles from Ithaca. Cross bridge over year-round creek to driveway. A mile down secluded forest road and travel a bit for right new home. $75 Call Ellen at 585-525-5039 or 411 Sheldon Road, Barre, MA 01005. Phone: (978) 335-2853. Email applications are encouraged.

**E-mail yarndyer@comcast.net Call 603-472-6174**

**Hudson Valley Natural Building Workshop Series.**

Earth plaster, Fine Clay and Milk - Based Paints, July 15-16. Learn to make beautiful custom finishes from scratch with locally harvested materials. You will leave workshops feeling confident about mixing and using the materials for a variety of projects and applications. Space is limited to 7 people. Sliding scale $75-125. Pre-registration is S/C. Lunch, tea, coffee, and snacks. Jonah (518) 434-8010 or jonah@hvnbr.net.

**Help wanted at Real Pickles.**

We are a small business in Western MA producing raw, naturally fermented foods from local, organic vegetables. Work includes all aspects of production, including preparing fresh ingredients for fermentation and packaging finished product into glass jars. Work is physically demanding. Applicants should be hard-working, reliable, and able to lift 50 lbs. Seeking people available 3 days/wk from July thru Nov (or beyond), but willing to consider other schedules. Work location: Greenfield, MA. This is a great opportunity to learn the ancient art of lactic acid fermentation! Hiring ASAP. Addie and Dan at 413-863-9063.

**Foundations of Herbal Healing - First Steps on a Lifetime Journey to Knowing the Plants and the Earth Within Us.**

Offering intelligence, enthusiasm, friendliness, and love. Highly trainable, loves people and the outdoors, and would fancy being a companion for someone who works outside in a workshop, and loves to hike and travel. Must have intelligence, enthusiasm, and some years of college experience.

**For a Green Adventure that will immerse your heart, mind, and soul in the world of healing herbs! Our program consists of two sessions of five practice days here at our working herb farm in northern New Hampshire. The dates for the 2006 first session class are Wednesday, July 19 through Sunday, July 23. Learn more at www.HerbsAndApples.com or write Nancy & Michael Phillips, Heartsong Farm Healing Herbs, 859 Lost Nation Road, Groveton, NH 03582.**

Seeking employment and meaningful human companionship, 4 year old male Australian Cattle Dog Mix seeks a job to do and space to run. Offering intelligence, enthusiasm, friendliness, and love. Highly trainable, loves people and the outdoors, and would fancy being a companion for someone who works outside in a workshop, and loves to hike and travel. Must have intelligence, enthusiasm, and some years of college experience.

**A new educational program created by the not-for-profit Motherhouse to foster self-sufficiency, neighborly interdependence and sustainable agricultural practices. Held at the Motherhouse in Derby, Connecticut.**

**Summer, 2006**

High Mowing Seeds Research & Development division welcomes one apprentice at a time for a 3 to 6 month position. Positions for April and Dec. 1st. This position entails approximately 50% learning/training/field labor and 50% research tasks to be presented in the form of a grant application. The ideal candidate(s) for this position would have coursework related to agricultural research and/or prior research experience. Careful attention to detail and strong interpersonal skills are a must. Please submit a resume and cover letter to Julie Rawson at julie@nofamass.org or phone 603.786.2366.

The U.S. Department of Agriculture (USDA) is requesting nominations to fill four (4) upcoming vacancies on the NOP. The positions to be filled are: Organic handler (1 position), scientist (1 position), consumer public interest (1 position), and an environmentalist (1 position). The Secretary of Agriculture will appoint a person to each position to serve a 5-year term of office that will commence on January 24, 2007, and run until January 24, 2012. USDA encourages eligible minorities, women, and persons with disabilities to apply for membership on the NOSB.

DATES: Written nominations, with cover letters and resumes, must be postmarked on or before July 14, 2006.

ADDRESSES: Nominations should be sent to Ms. Katherine E. Benham, Advisory Board Specialist, USDA-AMS-TMP-NOP, 1400 Independence Avenue, SW., Room 4008-So., Ag Stop 0268, Washington, DC 20250.

FOR FURTHER INFORMATION CONTACT: Ms. Katherine E. Benham, (202) 205-7806; E-mail: katherine.benham@usda.gov; Fax: (202) 205-7808.

The OFPA of 1990, as amended, requires the Secretary to establish an organic certification program for producers and handlers of agricultural products that have been produced using organic methods. In developing this program, the Secretary is required to establish an NOSB. The purpose of the NOSB is to assist in the development of a proposed National List of Approved and Prohibited Substances. The NOSB also advises the Secretary on other aspects of the National Organic Program. The NOSB is composed of 15 members; 4 organic producers, 2 organic handlers, a retailer, 3 environmentalists, 3 public/consumer representatives, a scientist, and a certifying agent.

Selection criteria will include such factors as: Demonstrated experience and interest in organic production and handling. Individuals desiring to be appointed to the NOSB at this time must be either an owner or operator of a certified organic handling operation; an individual with expertise in areas of environmental protection and resource conservation; an individual with expertise in the fields of toxicology, ecology, or biochemistry; or an individual who represents public interest or consumer interest groups.

The NOSB is a 15-member board that is responsible for developing and recommending to the Secretary a proposed National List of Approved and Prohibited Substances. The NOSB also advises the Secretary on other aspects of the National Organic Program. The NOSB made recommendations to the Secretary regarding the establishment of the initial organic program. It is anticipated that the NOSB will continue to make recommendations on various matters, including recommendations on substances it believes should be allowed or prohibited for use in organic production and handling.

The purpose of the NOP is to assist in the development of a proposed National List of Approved and Prohibited Substances and to advise the Secretary on other aspects of the National Organic Program. The NOSB made recommendations to the Secretary regarding the establishment of the initial organic program. It is anticipated that the NOSB will continue to make recommendations on various matters, including recommendations on substances it believes should be allowed or prohibited for use in organic production and handling.

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Selection criteria will include such factors as: Demonstrated experience and interest in organic production, organic certification, support of consumer and public interest organizations; demonstrated experience with respect to agricultural practices produced and handled on certified organic farms; and such other factors as may be appropriate for specific positions.
Cocoa Mulch Toxic to Pets. Cocoa mulch, which is sold by Home Depot and at other Garden supply stores, contains an ingredient called “Theobromine” which is a xanthine compound similar in effects to caffeine and theophylline. It smells like chocolate, and attracts dogs, but it can be lethal to them and to cats who ingest it. Check what you are using in your garden.


Wal-Mart Goes Organic. The world’s largest retailer is throwing its weight behind organic products. A new Supercenter that just opened in the Dallas suburb of Plano features over 400 organic foods, a part of that store’s offerings, which are the kinds of products and interior decor can grab the interest of upscale shoppers.

MCI Still Fighting on Country Hen Case. Massachusetts Independent Certification, Inc., the Massachusetts organic certifier, has asked federal judge F. Dennis Saylor IV to reject efforts by the USDA to dismiss MCI’s lawsuit. After losing two administrative appeals within the USDA, MCI has now taken its case to court. In late 2002 the organization was ordered by the NOP to certify Hubbardston, Massachusetts egg producer The Country Hen despite the fact that the company’s bird never went outdoors. MCI refused and instead sued the Secretary of Agriculture.


Campaign to Pressure Starbucks on rBGH Milk Begins. Food & Water Watch has started a campaign urging Starbucks to stop using milk produced with recombinant bovine growth hormone. As the industry leader in coffee, they figure a Starbucks switch to rBGH-free milk would have an enormous impact on the dairy industry. The group is undertaking a Starbucks Week of Action June 19th-25th. People all across the country will flyer Starbucks, asking them to buy better milk. You can sign up to coordinate or participate in an event at: http://www.foodandwaterwatch.org/food/dairy/starbucksactions.


source: FWW press release

Food Industry Launches BestFoodNation Web Site to Refute Schlosser. A consortium of food industry associations has launched a new Web site to respond to “Fast Food Nation,” which launched to counter a new book from “Fast Food Nation” author Eric Schlosser.

Source: FWW press release

Modern Seeds and Diabetes. Red Elk, a Sioux Indian, has been gardening in the back yard of the Science Museum of Minnesota, nurturing Indian, has been gardening in the back yard of the Science Museum of Minnesota, nurturing newer breeds as they were bred for size and sweetness.

source: www.Meatingplace.com


Organic Farming Better for Wildlife. A five-year British study published in the Royal Society journal “Biology Letters” has concluded that organic farms benefit many forms of wildlife, including wild flowers, beetles, spiders, birds and bats more so than conventional farms. The benefits result because organic farms have more wildlife-friendly management practices.


Michigan Passes Bill Blocking Local Regulation of GE Seeds. In late April the Michigan House passed a bill pre-empting local government from adopting ordinances which regulate or ban the growing of genetically modified organisms without the approval of the bipartisan Commission of Agriculture. The Senate already adopted an even stronger version of the bill.

source: Organic Broadcaster, May/June, 2006

Irish Reject GM Potato Trial. Ireland’s Environmental Protection Agency, which received from 96 groups and individuals relative to a proposal by BASF to conduct a 5-year trial of GM blight-resistant potatoes in County Meath. Ninety-five of the objections were against the project, one came from the Irish Bioindustry Association.

source: Agra Europe Weekly, March 24, 2006

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Organic Eruptions Available. A web-based database research on organic topics accepts scientific papers, articles, reports, and other information and makes them available to anyone with access to the internet.

source: www.orgprints.org


Half of Scottish Babies Eat Only Organic Food. A recent survey found that more than half of Scottish children under the age of 2 years exclusively consume organic food, even in cases where their parents do not. The 805 mothers surveyed reported “less risk of illness” and “no additives” (70%), and “no GM” rating next (84%) and “no additives” (80%) coming in third.


2005 Warmest Year Yet. According to NASA, last year’s average global temperature of 58.3°F was a new record since 1900. The average global temperature has risen over 0.6°C since 1970, making it the warmest year on record. The 1970s were previously considered to be the warmest decade. The 1970s were warmer than any other decade, but the 1990s are warmer than any other decade.

source: Growing for Market, March, 2006

Better Roads, Through Science. The Dole Food Co. is trying to engineer “the perfect rose,” red, with a three-week vase life, fewer thorns and a better flavor. They are giving North Carolina State University $1.4 million for a three year study of how to genetically engineer such a rose. Flowers are valued for 4 percent of the companies $5.3 billion in revenues.

source: Growing for Market, March, 2006

Cocoa Mulch Toxic to Pets. Cocoa mulch, which is sold by Home Depot and at other Garden supply stores, contains an ingredient called “Theobromine” which is a xanthine compound similar in effects to caffeine and theophylline. It smells like chocolate, and attracts dogs, but it can be lethal to them and to cats who ingest it. Check what you are using in your garden.


Wal-Mart Goes Organic. The world’s largest retailer is throwing its weight behind organic products. A new Supercenter that just opened in the Dallas suburb of Plano features over 400 organic foods, a part of that store’s offerings, which are the kinds of products and interior decor can grab the interest of upscale shoppers.

MCI Still Fighting on Country Hen Case. Massachusetts Independent Certification, Inc., the Massachusetts organic certifier, has asked federal judge F. Dennis Saylor IV to reject efforts by the USDA to dismiss MCI’s lawsuit. After losing two administrative appeals within the USDA, MCI has now taken its case to court. In late 2002 the organization was ordered by the NOP to certify Hubbardston, Massachusetts egg producer The Country Hen despite the fact that the company’s bird never went outdoors. MCI refused and instead sued the Secretary of Agriculture.


Campaign to Pressure Starbucks on rBGH Milk Begins. Food & Water Watch has started a campaign urging Starbucks to stop using milk produced with recombinant bovine growth hormone. As the industry leader in coffee, they figure a Starbucks switch to rBGH-free milk would have an enormous impact on the dairy industry. The group is undertaking a Starbucks Week of Action June 19th-25th. People all across the country will flyer Starbucks, asking them to buy better milk. You can sign up to coordinate or participate in an event at: http://www.foodandwaterwatch.org/food/dairy/starbucksactions.


source: FWW press release

Food Industry Launches BestFoodNation Web Site to Refute Schlosser. A consortium of food industry associations has launched a new Web site to respond to “Fast Food Nation,” which launched to counter a new book from “Fast Food Nation” author Eric Schlosser.

Source: FWW press release

Modern Seeds and Diabetes. Red Elk, a Sioux Indian, has been gardening in the back yard of the Science Museum of Minnesota, nurturing newer breeds as they were bred for size and sweetness.

source: www.Meatingplace.com


Organic Farming Better for Wildlife. A five-year British study published in the Royal Society journal “Biology Letters” has concluded that organic farms benefit many forms of wildlife, including wild flowers, beetles, spiders, birds and bats more so than conventional farms. The benefits result because organic farms have more wildlife-friendly management practices.


Organic Eruptions Available. A web-based database research on organic topics accepts scientific papers, articles, reports, and other information and makes them available to anyone with access to the internet.

source: www.orgprints.org


Half of Scottish Babies Eat Only Organic Food. A recent survey found that more than half of Scottish children under the age of 2 years exclusively consume organic food, even in cases where their parents do not. The 805 mothers surveyed reported “less risk of illness” and “no additives” (70%), and “no GM” rating next (84%) and “no additives” (80%) coming in third.


2005 Warmest Year Yet. According to NASA, last year’s average global temperature of 58.3°F was a new record since 1900. The average global temperature has risen over 0.6°C since 1970, making it the warmest year on record. The 1970s were previously considered to be the warmest decade. The 1970s were warmer than any other decade, but the 1990s are warmer than any other decade.

source: Growing for Market, March, 2006

Better Roads, Through Science. The Dole Food Co. is trying to engineer “the perfect rose,” red, with a three-week vase life, fewer thorns and a better flavor. They are giving North Carolina State University $1.4 million for a three year study of how to genetically engineer such a rose. Flowers are valued for 4 percent of the companies $5.3 billion in revenues.

source: Growing for Market, March, 2006
Meanwhile, the market has grown from a small major share of the nation’s organic milk supply. As USDA fiddles, keeping the controversy unresolved, the mega operations have captured the growing season. According to the Cornucopia Institute, an organic watchdog group in Cornucopia, WI, it’s just a few players – mega-scale dairy operations, known as CAFOs (Confined Animal Feeding Operations), produce the bulk of the organic milk supply, with Dean Foods’ Horizon the largest, holding about a third of the market.

The mid-April drive to western Pennsylvania reset my northern Zone 5 climate clock by a welcome week-and-a-half. Springing forward in degree days, yellowy tree leaves were popping open and thick new grass was gleaming bright green. Once you get past the precipitous Poconos, Interstate 80 opens up into a long, lush valley punctuated with family-scale dairy farms. Pennsylvania is the nation’s 3rd largest dairy state after California and Wisconsin, with New York (because of their larger herd sizes) not far behind.

Amazingly, it’s been awhile since I’ve seen dairy cows outside on pasture. I’d forgotten how good and natural it feels to see grazing cattle roaming freely in their element. What dairy remains here in upstate NY is all confinement operations – where logy, dock-tailed cows are packed into loafing sheds and enlisted a certifier who will agree with them. In the absence of definitive NOP action, these giants have allowed this situation to persist. The program’s citizen advisory group, the National Organic Standards Board (NOSB) has voted twice, in 2002 and again in 2003, to require organic management systems for-raising chickens were tested at labs at Utah State University and in Portland, Oregon. The results compared with nutrient data provided by the USDA for eggs from confined systems. The free range eggs had up to twice the Vitamin E, four times the omega-3 fatty acids, and two to six times the level of beta carotene. They also averaged half the cholesterol of the conventional eggs.

Gaming the System

The intent of this definition has been clear as day to the vast majority of the dairy operations producing certified organic milk in this country – and, indeed, their cows are outdoors grazing on quality rotated pasture for a significant portion of their feed during the growing season. According to the Cornucopia Institute, an organic watchdog group in Cornucopia, WI, it’s just a few players – mega-scale dairy operations all – who have exploited ambiguities in the definition. Taking advantage of USDA’s lack of specific, enforceable pasture regulations, Horizon established a 4,000 cow operation in Idaho in 1994 with others in California (a 7,000 cow split operation with 3,000 organic animals) and Arizona. With some of the same investors, Aurora Dairy created a larger 5,700 cow facility in Colorado in 2003 on dry land acreage that even with irrigation could not possibly support such large herds on pasture.

As USDA fiddles, keeping the controversy unresolved, the mega operations have captured the major share of the nation’s organic milk supply. Meanwhile, the market has grown from a small niche to $15 billion industry. These, and other large companies, systematically gaming the system. By selling off their surplus organic stock, out of the business. They also save on providing expensive certified organic feed to the growing heifers. The market for conventional replacement animals is cheaper than organic replacements and serves to put organic dairy producers at a disadvantage. According to the Institute of Food Technologists (IFT), colostrum from replacement heifers has a much higher level of beta carotene. They also averaged half the cholesterol of the conventional eggs.

In the absence of definitive NOP action, these giants have gone ahead with their own interpretations and enlisted a certifier who will agree with them. Instead of milking herds born and raised on organic farms, for instance, replacement cows are bought/rented/leased from outside conventional growers, where they may well be raised on the standard industrial diet of dried blood milk replacer, GMO grain, antibiotics and growth hormones. Periodic outdoor access and grazing is reduced to a “stage of production”, defined as young stock and dry cows only while the lactating cows are kept confined. Cornucopia insists these factory farms are systematically gaming the system. By selling off 100% of their calves, for instance, Horizon’s Idaho farm frees up an estimated $700,000 to $1,000,000 of organic milk to sell a year that would have gone to feed them. They also save on providing expensive certified organic feed to the growing heifers. The market for conventional replacement animals is cheaper than organic replacements and serves to put smaller scale dairies, who earn extra income selling their surplus organic stock, out of the business. Cornucopia also addressed the larger scam question – what do consumers think they are buying and what are they really getting for their (top) organic dollar in the marketplace?

Time for more study

Pesticides and You

The Minnesota Supreme Court has ruled that land owners who spray pesticides on their property can be held liable for damages to neighboring apiaries. The landmark decision overturned prior opinions which found that foraging bees could be considered “trespassers” – and rules that land owners with knowledge of or notice that foraging bees may be present are responsible to provide reasonable care in the application of pesticides.

We Spend More on Fast Food than Education

According to the Institute of Food Technologists (IFT), colostrum from replacement heifers has a much higher level of beta carotene. They also averaged half the cholesterol of the conventional eggs.

Minneapolis Star Tribune

MOFGA's Eric Sideman testifies to the NOSB (front) with the NOP staff in the background. CAFOs (Confined Animal Feeding Operations) produce the bulk of the organic milk supply, with Dean Foods’ Horizon the largest, holding about a third of the market.
time conducting a Pasture Symposium, complete with panels of experts, commissioned consumer studies and public testimony. The huge conference center at the Ramada near Penn State University in State College, PA was set up with tables up front for the 14 NOFA members (a consumer position is yet to be filled due to the withdrawal, under pressure, of the General Mills candidate) and side tables off to the right for the 7 NOP staffers, including Associate Deputy Administrator Mark Bradley; Barbara Robinson, Deputy Administrator of Transportation and Marketing and Valerie Francis, Executive Director. People who signed up to testify stood at a microphone to address the groups for their carefully monitored 5 minute segments.

NOF ended up getting an earful. Despite the meeting being scheduled during the busy spring season, the hot and newly spiked gasoline prices, the Northeast Dairy Producers Association (NODPA) turned out their members in force.

Contingents of organic farmers, handlers, certifiers, consumer organizations, trade representatives, industry lawyers and advocacy groups came from all over the country, even with heavy representation from the New England and Pennsylvania areas. \&nbs

Some explanations concerning NOP's continuing inaction were revealed at the meeting of the National Campaign for Sustainable Agriculture, NOFA, NOFA-VT led the discussion calling for the NOFA-VT to bring the issue to the forefront. NOFA-VT was subsequently endorsed by dairy groups ending up endorsing the 120 days/30% for 150 days/50%). From a certifier's perspective there wouldn't be additional onerous record-keeping otherwise if given a true choice.

He also maintained that lameness (from walking and standing) experience on the enforceability of market expectations were covered in a

The Symposium was held at the NOFA conference site in Barre, MA. The NOFA Video Project is located there, with the NOFA office, and the NOFA members have been putting in an extraordinary amount of time and effort to organize the event.

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Organic Foods Enhance Human Health

“A number of recent studies show that there is solid scientific basis for the theory that organic culture practices produce crops that prevent cancer and modulate toxic responses.”

by Prof. Joe Cummins

The following review focuses on scientific studies that have been published after 2000. The review will focus on information related to the health consequences of consuming organic food and will not deal with the many reports on people’s preferences and beliefs about organic foods. However, the growth in demand for organic food is driven by people’s beliefs about the benefits of organic food and the fact that organic foods generally taste better than conventional foods.

The general reviews comparing organic and conventional foods focus on comparisons of gross composition of organic foods as compared to the gross composition of conventional foods. Those studies show that organic foods contain low to undetectable levels of pesticides, lower level of nitrates and levels of microbial toxins about the same as conventional foods. However, those reviews have not yet dealt with comprehensive data on the health of those consuming organic foods in comparison to those consuming conventional food. The current review will deal with evidence that organic foods are richer in cancer fighting secondary metabolites, on evidence that lower pesticide levels are beneficial and on evidence that microbial toxins are not substantially elevated in organic food as has been claimed by those opposing organic food.

New studies showing that organic strawberry extracts inhibit growth of cancer cells are a landmark in scientific research, showing that organic food provides a defense against cancer. Two recent reviews from Harokopio University, Athens, Greece have been skeptical about the value of organic food in comparison to conventional food. The most consistent difference was the low level of nitrate and elevated vitamin C levels in organic as compared to conventional food. Numerous other measurements such as mycotoxin level or environmental pollutants were not different in the two types of food. Even though pesticide levels were much higher in conventional foods than in organic food those elevated pesticide levels were deemed acceptable (1, 2).

Christine Williams of Reading University, UK pointed out that there are no studies in the literature of controlled intervention studies on human subjects and comparisons of people habitually consuming organic as compared to conventional diets are flawed by confounding factors. Older animal studies are poorly designed and give conflicting results (3).

The above reviews failed to consider the importance of health promoting secondary metabolites that accumulate once synthetic plant protection agents are eliminated. Bengt Lundegardh and Anna Martensson of the University of Agricultural Sciences, Uppsala, Sweden stressed the benefits of organic culture in (a) an activation of the plant defense mechanisms by excluding synthetic plant protection agents, (b) an active soil life where plants and microbes interact, exchanging certain metabolic compounds and (c) a balanced mineral nutrient uptake where excesses of easily available nutrients are avoided (4).

Bioactive compounds in foods, especially the plant phenolic antioxidants, are well known to prevent cancer and cardiovascular disease (5).

Of course, phenolics are present in many crops, particularly fruits, but it has grown very clear that organic foods are richer in cancer fighting antioxidants (6, 7).

Strawberries have been studied extensively for their cancer fighting ability and those berries have also been used to emphasize the cancer preventing advantages of organic fruit cultivation. Extracts of five organic and conventional cultivars were compared for their ability to inhibit proliferation of human colon and breast cancer cells. The anti-cancer extracts were rich in vitamin C and plant phenolics, the extracts from organically grown strawberries had a higher antiproliferative activity than the conventionally grown berries for both breast and colon cancer cells (8).

Compost as a soil supplement increases the level of antioxidant compounds in strawberries (9).

Strawberry extracts were found to interfere with mitogen-activated protein kinase (MAPK) signaling cascade and to suppress cancer cell proliferation and transformation (10).

Plum and clover extracts induced apoptosis and contributed to reduced cell viability in human liver cancer cells (12).

Rats fed conventionally grown wheat had a higher risk for lymphocyte function than those fed organically grown wheat. Lymphocyte proliferation represented an animal’s response to toxicity (13, 14).

A number of recent studies show that there is solid scientific basis for the theory that organic culture practices produce crops that prevent cancer and modulate toxic responses. Along with the benefits of organic culture in providing secondary metabolites that are beneficial to humans, the absence of pesticide residues in food and feed provides a tangible benefit from organic food. The “green revolution” has provided a high level of food production in developing countries through the deployment of high levels of pesticides and fertilizers. Investigators with the Centre for Rural Development and Technology, Dehli, India studied residues of organochlorine, organophosphorous, carbamate and pyrethroid pesticides in conventionally grown wheat and rice and found that organic wheat and rice have little or no detectable pesticide. Wheat and rice production under conventional systems was higher than organic but this higher production is at the cost of health risk and also poses other hazards to flora and fauna (15).

Dietary exposure intake is the major source of pesticide exposure for infants and children in the United States, this exposure may account for increased pesticide related health risks in children.
compared to adults. Direct controlled experiments showed that children consuming an organic diet provided dramatic and immediate protective effects against organophosphorous pesticide exposure (16).

In Denmark a 1999 study on human sperm and semen quality in relation to dietary pesticide exposure and organic diet was published. A group consuming mainly organic food was estimated to have a reduced pesticide intake based on the pesticide levels measured in their food. The authors of the article concluded pesticide intake in the diet did not entail a risk of impaired semen quality (17).

However, the article reported that the group of men without organic food intake had a significantly lower proportion of morphologically normal sperm. Abnormal sperm is normally considered predictive of pregnancy outcome representing DNA damaged or defectively packaged DNA in the abnormal sperm (18, 19). It is not clear why the significantly damaged sperm did not impair semen quality in the opinion of the Danish investigators.

Mycoxotins are toxic metabolites produced by fungi. Mycotoxin poisoning has been known since the beginning of agriculture and has taken a large toll on humans and farm animals consuming contaminated crops. Mycotoxins cause immunological effects, specific organ damage, cancer, and in some cases, death. Agricultural workers may also suffer from skin and respiratory exposure during crop harvest and storage. Mycotoxin poisoning is a worldwide problem associated with maize, rice, tree nuts and peanuts along with fresh fruits and vegetables. Recently, pro-GM scientists in academia and biotech corporations have been claiming that organic food and feed is more heavily contaminated with mycoxotins than conventional and genetically modified foods, on grounds that organic production does not use chemical fungicides, and are hence modified foods, on grounds that organic production does not use chemical fungicides, and are hence associated with maize, rice, tree nuts and peanuts along with fresh fruits and vegetables. Recently, pro-GM scientists in academia and biotech corporations have been claiming that organic food and feed is more heavily contaminated with mycoxotins than conventional and genetically modified foods, on grounds that organic production does not use chemical fungicides, and are hence more likely to be infected. But the United Nations Food and Agriculture Organization (FAO) states that, “studies have not shown that consuming organic products leads to a greater risk of mycotoxin contamination.” Peer reviewed publications showed that organic foods are not more hazardous sources of mycoxotin than conventional foods (20).

References


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The Benefits of Organic Food

“Organic food has significant health benefits because it has negligible chemical residues and pathogens and higher nutritional values when compared to conventionally farmed food.”

by André Leu

Many people purchase organic food because they believe it is healthier than conventionally grown food. The organic industry is constantly told that there is no evidence to support these claims. This article looks at published information that shows that organic food is substantially healthier than conventional food. Two comprehensive studies have been published that compared the differences between organic and conventional foods. Both studies analyzed around 40 previously published studies. One study was conducted in the United Kingdom and the other in the United States, each independently of the other. Both studies came up with similar conclusions that there is overwhelming evidence that organic food is more nutritious than conventional food. One of the authors stated, “On average our research found higher vitamin C, higher mineral levels and higher phytomutagens—plant compounds which can be effective against cancer. There’s also less water in organic vegetables, so pound-for-pound you get more carrot for your carrot.” It is no coincidence that consumer demand for food supplements has grown as the amount of minerals and vitamins has declined in conventionally farmed food. Many people cannot get the necessary quantity and quality of nutrition from food grown with synthetic chemicals.

Pathogens

In the recent past there have been a number of media stories claiming that, because organic foods are grown with manure, they contain higher levels of dangerous pathogens. On investigation, all of these stories were proved to be false, and most of the media presenters apologized publicly for promoting inaccurate and misleading stories. It is a requirement of UN Food and Agriculture Organization certificates that either that animal manures be composted or that pathogens be killed by the time the food is served. Animal manures are grown with manure, they contain higher levels of dangerous pathogens. On investigation, all of these stories were proved to be false, and most of the media presenters apologized publicly for promoting inaccurate and misleading stories. It is a requirement of UN Food and Agriculture Organization certificates that either that animal manures be composted or that pathogens be killed by the time the food is served. Animal manures

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Food Additives
The use of antibiotics, antimicrobials, and hormones or other growth promoters is prohibited in organic production. Where animals are treated with veterinary chemicals, they are not allowed to be sold as organic. Similarly, the use of synthetic chemicals as preservatives, colorings, antioxidants, etc., is prohibited in the processing of organic foods. There is an increasing body of concern about these synthetic compounds in the diets of humans and animals used for human food.

Chemical Residues
Many studies show that most conventionally farmed foods have pesticide and other chemical residues. Repeated tests show that many of these foods can carry a cocktail of synthetic poisons. A growing body of scientific evidence is showing that repeated exposures to cocktails of small amounts of synthetic chemicals produce a range of adverse health effects. A recently published study shows that as little as one-tenth of a part per billion of one commonly used herbicide can damage reproductive systems. In addition, many scientists believe these exposures to minute quantities of agricultural chemicals are very significant for children. A study by the U.S. Centers for Disease Control found a cocktail of many toxic chemicals in the blood and urine of most Americans that they tested. Other studies show that most living organisms carry a cocktail of synthetic/maimade chemicals. Only now are scientists beginning to understand the detrimental effects of minute amounts of these artificial toxins.

Peer-reviewed, published research has demonstrated that many of these types of chemicals are known to disrupt the hormone, nervous and immune systems. The escalating increase of certain types of cancers such as lymphoma, leukemia, breast, uterine and prostate cancers are linked to agricultural and other synthetic chemicals. Similarly, a good body of scientific research also links these chemicals to dramatic increases in autoimmune diseases such as asthma and chronic fatigue syndrome. Non-Hodgkin’s lymphoma has gone from being one of the rarest to one of the fastest growing cancers among people exposed to agricultural chemicals.

A detailed scientific analysis of organic fruits and vegetables published in the peer-reviewed journal Food Additives and Contaminants showed that organic foods have significantly less pesticide residues than conventionally grown foods. Most important, scientific studies are beginning to show that eating organic foods results in lower levels of these pervasive chemicals in humans. A study published in the peer-reviewed journal Environmental Health Perspectives found that children who eat organic foods have lower levels of one class of agricultural pesticides in their bodies. The University of Washington researchers who conducted the study concluded, “The dose estimates suggest that consumption of organic fruits, vegetables, and juice can reduce children’s exposure levels from above to below the EPA’s current guidelines, thereby shifting exposures from a range of uncertain risk to a range of negligible risk. Consumption of organic produce appears to provide a relatively simple way for parents to reduce their children’s exposure to OP pesticides.”

Nitrates
The use of soluble chemical fertilizers has resulted in high nitrate concentrations in many conventionally farmed foods, especially in fruits and vegetables. Leafy vegetables can have the highest concentrations. The leaching of these fertilizers has also resulted in high nitrate levels in some drinking water systems around the world.

High nitrate content in food and drinking water can be converted to carcinogenic nitrosamines. Nitrates can impair the ability of the blood to carry oxygen and may pose a risk of methemoglobinemia, a condition that can occur in infants and adults with a diminished capability to secrete gastric acid. A rise in the pH in their digestive system allows bacteria to proliferate, increasing the transformation of nitrate to nitrite. When this nitrite is absorbed into the bloodstream, it oxidizes iron in the hemoglobin of red blood cells to form methemoglobin, which lacks hemoglobin’s oxygen-carrying ability. In severe cases this can be one of the causes of Blue Baby syndrome, however in most cases the symptoms would be tiredness, lethargy and a general feeling of being unwell. The nitrate content of organically grown crops is usually significantly lower than that of conventionally grown products. The governments of Germany and France have encouraged conversion to organic farming in certain areas in a bid to improve water quality, particularly in relation to its nitrate content.

Conclusion
The FAO states the case very succinctly: “It has been demonstrated that organically produced foods have lower levels of pesticide and veterinary drug residues and, in many cases, lower nitrate contents. Animal feeding practices followed in organic livestock production also lead to a reduction in contamination of food products of animal origin.”

The facts show that organic food has significant health benefits because it has negligible chemical residues and pathogens and higher nutritional values when compared to conventionally farmed food.

Andre Leu has been involved in the organic industry since 1972. He currently owns a certified organic farm in the lower section of the Daintree River valley in North Queensland, Australia. He grows organic tropical fruits from part of the farm, with the balance being retained as tropical rain forest. Andre is the Chair of the Organic Federation of Australia, the peak organization for the organic industry in Australia. He is also chairperson of the Far North Queensland Lychee Growers Association and Vice President of the Australian Lychee Growers Association, where he has the responsibility for developing export markets. Andre runs workshops on organic production in Australia and other countries and teaches horticulture and environment at Tropical North Queensland Institute of TAFE. This article was originally published in Organic Valley Resources.
Organic Food Quality and You

Organic food isn’t a luxury. It’s how food’s supposed to be, and a valuable part of any regime intended to maintain, improve or restore health.”

by Shane Heaton

A growing number of consumers, and especially those dealing with chronic illness, are switching to organic foods. A key motivation for consumers using this is a simple belief that it’s better for them. But is it true? Official Food Agencies around the world are trying to find out to what extent organic foods provide nutritional benefits over non-organic foods. There is a large body of research to support the idea that organic foods are better for you. Higher levels of, say, vitamin C or antioxidants in organic foods are often used as evidence of a nutritional difference. Yet another careful and thorough review of the science comparing organic and non-organic foods reveals that collectively, the available evidence does not support the consumer belief and industry claim that organic food is safer, more nutritious and better for you than non-organic food.

Higher nutrients

It’s often claimed that “a large number of studies have found no difference in the nutrient content of organic and non-organic crops.” It’s true there have been more than a hundred studies comparing the nutrient content of organic and non-organic produce. Higher levels of nutrient in organic crops are often cited as evidence that organic food is better for you. Yet, after repeated attempts to refine comparisons, for many nutrients the differences between organic and non-organic foods are too small to be meaningful.

Better health outcomes

Organic food, in addition to being healthier, is also better for the environment. Organic fertilizers produce lush growth and swells conventional plants. This eliminated 72% of comparisons as invalid. The results of these spurious studies were either dramatic, inconclusive, non-significant or inconsistent, as would be expected, and served only to obfuscate the clear trend in the valid data. This is because the majority of studies are of poor quality, being either agriculturally or analytically flawed. I reviewed the literature using clear validity criteria to ensure relevant nutrients were being compared in properly matched organic and non-organic crops. This eliminated 72% of comparisons as invalid. The results of these spurious studies were either dramatic, inconclusive, non-significant or inconsistent, as would be expected, and served only to obfuscate the clear trend in the valid data. This is because the majority of studies are of poor quality, being either agriculturally or analytically flawed. I reviewed the literature using clear validity criteria to ensure relevant nutrients were being compared in properly matched organic and non-organic crops. This eliminated 72% of comparisons as invalid. The results of these spurious studies were either dramatic, inconclusive, non-significant or inconsistent, as would be expected, and served only to obfuscate the clear trend in the valid data.

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increase in fruit and vegetable consumption that was hitherto unachievable.

Chris Ashton of the UK-based Nutritional Cancer Therapy Trust asserts that “Those concerned with the fight against disease know that our bodies are designed to overcome disease processes before they become established. Our systems are readily disrupted by toxins and an absence of sufficient quantities of nutrients.” Recommending organic food is a simple way to reduce an individual’s toxin burden of pesticides and food additives, increase their nutrient intake, and perhaps alter their consumption patterns away from less healthy choices.

Organic food isn’t a luxury. It’s how food’s supposed to be, and a valuable part of any regime intended to maintain, improve or restore health.


Brandt K and Molgaard JP. Organic agriculture: does it enhance or reduce the nutritional value of plant foods? Journal of the Science of Food and Agriculture 2001;81:924–931.


Brandt K and Molgaard JP, 2001, ‘Organic agriculture: does it enhance or reduce the nutritional value of plant foods?’. Journal of the Science of Food and Agriculture 81, p 924–931


Porter WP, Jaeger JW, Carlson IH. Endocrine, immune, and behavioural effects of aldrin (carbamate), atrazine (triazine) and nitrate (fertiliser) mixtures at ground water concentrations. Toxicology and Industrial Health 1999;15:133–150.


Organic Foods, Nutrition and Health

A predominantly organic diet:
- reduces the amount of toxic chemicals ingested;
- totally avoids GMOs [genetically modified organisms];
- reduces the amount of food additives and colorings;
- increases the amount of beneficial vitamins, minerals, EFAs [essential fatty acids] and antioxidants consumed;
- appears to have the potential to lower the incidence of common conditions such as cancer, coronary heart disease, allergies and hyperactivity in children.

by James Cleeton
Policy Projects Coordinator, Soil Association

Pesticides

The routine use of synthetic pesticides is not allowed under organic standards. Currently, over 400 chemicals are used in conventional farming to kill weeds, insects and other pests that attack crops. For example, Cox’s apples can be sprayed up to 16 times with 36 different pesticides. 7 Only four chemicals are allowed in restricted circumstances under Soil Association standards.

“Organic food contains fewer residues of pesticides used in conventional agriculture, so buying organic is one way to reduce the chances that your food contains these pesticides” (Sir John Krebs, Chair, Food Standards Agency, Cheltenham Science Festival, 5th June 2003).

“Consumers who wish to minimize their dietary pesticide exposure can do so with confidence by buying organically grown food” (Baker et al 2002).

Organophosphates

The most dangerous chemicals used in farming, such as organophosphates [pesticides], have been linked with a range of conditions such as cancer, decreasing male fertility, birth abnormalities, child leukaemia, syndrome in children and Parkinson’s disease. 8, 9 Pesticide residues have been ranked among the top three environmental cancer risks by the American Government. 10

Pesticide Residues in Food

In recent years, UK Government research has consistently found pesticide residues in a third of food, including residues of more than one chemical in apples, baby food, bread, cereal bars, fresh salmon, lemons, lollies, peaches, nectarines, potatoes and strawberries. 11 Not all foodstuffs are checked; instead a small number of different products is tested every 3 months and the results published by the Pesticide Safety Directorate (PSD).

After pressure from NGOs [non-governmental organizations] such as the Soil Association, the PSD has begun testing for multiple pesticide residues in its samples because evidence suggests that when acting in combination, the effects of pesticide residues may increase. The Government has recognized that “...ignoring the cocktail effects during risk assessment will lead to significant under-estimations of risk”. 12

Combinations of low-level insecticides, herbicides and nitrates have been shown to be toxic at levels that individual chemicals are not. 13-16 It is clearly an enormous task to test all possible combinations of the 400 permitted pesticides currently in use. It is clear that not enough is known about how combinations of pesticides affect our health, and the Government’s Committee on Toxicity has expressed disquiet about the risks involved. 17

Pesticides and Cancer

Women with breast cancer are five to nine times more likely to have pesticide residues in their blood than those who do not. 18 Previous studies have shown that those with occupational exposure to pesticides such as those of the breast and prostate, may be via endocrine disrupting chemicals [EDCs] - compounds that artificially affect the hormone system such as 2,4-D and Atrazine (both herbicides, now banned or about to be banned). The Royal Society [the UK’s main scientific organization] recommends that human exposure to EDCs (especially during pregnancy) should be minimized on grounds of prudence. 63

Effects of Pesticides on Children

Children may be particularly susceptible to pesticide residues as they have a higher intake of food and water per unit of body weight than adults and their relatively small size makes it difficult for them to limit their exposure. They may have limited ability to detoxify these substances. 22

In a study of children aged 2 – 4 living in Seattle, concentrations of pesticide residues up to six times higher were found in children eating conventionally farmed fruit and vegetables compared with those eating organic food. 23 Whilst the presence of pesticide residues in children eating conventional food has been confirmed, the full effect of such pesticides is unknown.

Food Additives

Food colorings and additives can cause a range of health problems in adults and children. For example, tartrazine (the yellow food coloring E102) and other additives have been linked to allergies, headaches, attention deficit hyperactivity and hyperactivity in children. 24 – 27

Although around 300 additives are permitted in conventional food only 30 are allowed under Soil Association standards. Some additives found in organic food are for legal reasons including iron, thiamine (vitamin B) and nicotinic acid (vitamin B3) in white flour, and various vitamins and minerals in different types of baby foods. All artificial colorings and artificial sweeteners are banned in organic food.

Specific ingredients and additives not allowed in organic food are monosodium glutamate, aspartame, phosphoric acid and hydrogenated fats. In each case their use has been banned because of evidence that they can be damaging to health. For example, hydrogenated fats (known as trans fats) have been directly linked with increased rates of heart disease, cancer and skin disease. 28, 29, 30, 31 The FSA [Food Standards Agency] acknowledges that they have no known nutritional benefits and increase the risk of coronary heart disease. The FSA website advises that people should try to cut down their consumption of hydrogenated fat. 32

Genetically Modified Organisms

Genetically modified organisms are banned from organic food.

The potential health effects of GM foods are unclear. Michael Meacher, the former Minister for the Environment, recently stated that “We have had no systematic clinical or biochemical trials of the effects on human beings of eating GM food”. A paper in Nutrition and Health supports Mr Meacher’s position. The authors state that there have only been a few studies of the health effects of GM food and that the quality of some of these was inadequate. Over half were done in collision with the GM food (fully or partially) and these found no negative effects on body organs. The others were done independently and looked more closely at the effects on the gut lining; in several, evidence of harmful effects were found which remain unexplained. 33

Similar effects on the gut lining were found in an unpublished animal feeding study on a GM tomato. In addition, a study by Newcastle University sponsored by the FSA found that the transgenes [genetically modified organisms] transfer into gut bacteria at detectable levels after only one GM meal. The health effects of these transgenes are unknown and until they have been properly tested people are, in our opinion, wise to avoid eating GM food.

Essential Vitamins And Minerals

UK and US government statistics indicate that levels of trace minerals in fruit and vegetables fell by up to 76% between 1940 and 1991. 34, 35 In contrast, there is evidence that fruit and vegetables generally contain more nutrients than non-organic food.

The Soil Association conducted a systematic review of the evidence comparing the vitamin and mineral content of organic and conventionally grown food. It was found that, on average, organic food contains higher levels of vitamin C and essential minerals such as calcium, magnesium, iron and chromium. 36

An independent review of the evidence found that organic crops had significantly higher levels of all 21 nutrients analyzed compared with conventional produce including vitamin C (27% more), magnesium (29% more), iron (21% more) and phosphorous (14% more). Organic spinach, lettuce, cabbage and potatoes showed particularly high levels of minerals. 37

Antioxidants

A high antioxidant intake has been shown to be associated with a reduced incidence of coronary heart disease and some cancers. Such antioxidants include certain vitamins (vitamin E and beta-carotene) and substances known as phenolics. Researchers have recognized the growing concern that levels of some phenolics may be lower than is optimal for human health in conventionally grown foods. 38 Phenolics are generated by a plant when attacked by pests.

Generally, organic crops are not protected by pesticides and research has shown that organically produced fruit contains higher levels of phenolic compounds than conventionally grown fruit. 38, 39 Danish researchers have found that organic crops contain 10% to 50% more antioxidants than conventional crops. 40

Essential Fatty Acids

The essential fatty acids (EFA), omega 3 and conjugated linoleic acid (CLA) play an essential role in metabolism [chemical changes which take place in our bodies to utilize food and eliminate waste materials, especially in the prevention of coronary heart disease and high blood pressure]. 41, 42, 43. Omega 3s also reduce the risk of neurological disorders including depression 44, 45, 46 and ADHD [Attention Deficit Hyperactivity Disorder] in children 47, 48, 49, 50, 51, 52. Furthermore, CLA has been demonstrated to help reduce prevent cancer 53, 54 and reduce the chance that some phenolics may be lower than is optimal for human health in conventional crops. 38, 39 Danish researchers have found that organic crops contain 10% to 50% more antioxidants than conventional crops. 40

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Allergies

In a study of Swedish children, the prevalence of atopic disorders [allergies] from two different groups of children was measured. The study compared 295 children aged 5 – 13 years from two anthroposophic schools [schools with an alternative approach to education] with 380 children from two neighboring state schools. The anthroposophic school children ate a predominantly organic diet, used antibiotics restrictively, had few vaccinations and their diet usually contained live lactic bacteria [a friendly bacteria found in the upper intestinal tract of humans and in some yoghurts and in unpasteurized milk]. It was found that the

Summary, 2006
A NOFA DREAMER
Young widower seeks organic land west of Quabbin Reservoir in Massachusetts
Proposed Land Use

- Orchard: diverse as possible, either established or I will establish
- Nursery: organic practices only, low volume, high quality, non-invasive, specimen plants
- Green House: propagation of trees and shrubs, year round salad greens
- Composting Site: small scale, compost tea brewing center
- Tree and Landscape Business: small scale, organic practices only

Areas of Interest

New Salem
North New Salem
Wendell
Lake Pleasant
Montague
North Leverett
Moore's Corner
Locks Village
Shutesbury
Leverett
East Leverett
Pratt Corner
Pelham
West Pelham
Dwight
Belchertown

As an Arborist, I am used to going out on a limb to get done what needs done and I understand that entertaining the public is a natural part of it. So, once you have had your little chuckle about my ad, would you please consider that I have invested some hard earned money to get your attention. I am serious about relocating to the West Quabbin Area.

Bottom line: I deeply appreciate all who are willing to assist me in making this dream a reality.

P. S. A warm thank you to everyone who responded to my previous ad.

A trustworthy soul,
Kevin Stitt

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Home: 781-932-3828
Cell: 781-983-4086
Email: info@organicsoilcare.com
Web Site: www.organicsoilcare.com

References
1) http://www.foodstandards.gov.uk/science/sciencetopics/organicfood/
11) Pesticides Residues Committee (various years), Annual Report of the Pesticides Residues Committee, Pesticide Safety Directorate, DEFRA.
12) www.foodstandards.gov.uk/science/ouradvisors/toxicity/COT/wg/wg/stakeholder
21) Oho G. (1999) Endocrine disrupting chemicals and...
32) http://www.foodstandards.gov.uk/healthiereating/asktheexpert/
d2nd edition, Harper Collins, UK
35) USDA, H. Department of Agriculture, Food and Consumer Service. (2003) ‘Coronary and Diabetic Care in the UK 2004” This is a summary of an article published in “Coronary and Diabetic Care in the UK 2004” by the Association of Primary Care Groups and Trusts (UK). Please see the Soil Association website library, http://www.soilassociation.org/library, for more information
40) Brandt K and Molgaard JP (2001), ‘Organic Agriculture: Does it enhance or reduce the nutritional value of food plants’, Journal of Science in Food and Agriculture, 81, p. 924 - 931
60) www.agsci.dk/index_uk.shtml

This is a summary of an article published in “Coronary and Diabetic Care in the UK 2004” by the Association of Primary Care Groups and Trusts (UK). Please see the Soil Association website library, http://www.soilassociation.org/library, for more information

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Summer, 2006

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Organic milk ‘higher in vitamins’
Organic milk has significantly higher levels of vitamin E, beta carotene, omega 3 essential fatty acids and antioxidants

Reprinted from the BBC News, January 7, 2005

Drinking organic milk has more health benefits than drinking non-organic, a study has suggested. The research was presented to the Soil Association’s annual conference in Newcastle.

It showed organic milk has higher levels of vitamin E, omega 3 essential fatty acids and antioxidants, which help beat infections. But nutritionists said people who drank non-organic milk would be getting these nutrients from other sources.

The research was carried out by a team from the Danish Institute of Agricultural Research, which is part of the University of Newcastle’s Quality Low Input Food (QLIF) Congress.

Milk was tested from cows who were farmed organically and conventionally. The study found cows farmed organically produced milk which was, on average, 50% higher in vitamin E than conventionally produced milk.

Organic milk was also 75% higher in beta carotene, which is converted into Vitamin A in the body.

It was also two to three times higher in the antioxidants lutein and zeaxanthin.

Antioxidants are the naturally occurring substances in plants that protect the body from free radicals - ‘bad’ chemicals in the blood. Free radicals alter cholesterol in a process known as oxidation, which is thought to speed up the hardening of the arteries.

Higher levels of omega 3 essential fatty acids, which are believed to help provide protection from coronary heart disease, were also found in organic milk.

The study concluded that drinking a pint of organic milk a day would provide 17.5% of the required daily intake of Vitamin E for women, and 14% of that for men. The researchers suggest it also provides as much beta carotene as a portion of vegetables, such as broiled sprouts. They say organically-reared cows benefit from having more room to graze than conventionally-reared cows.

Professor Carlo Leifert, QLIF project leader, told the conference: “Clearly, to convince the scientific community as a whole we need further evidence and the EU Quality Low Input Food project is very much focused on confirming and explaining the differences in milk composition shown in these studies.”

Patrick Holden, director of the Soil Association, added: “This new research adds to a growing body of evidence proving the health benefits of organic food. A number of schools are now serving organic milk, and there is now a strong case for the government to ensure that such initiatives are extended across the country.”

Swiss Study Finds Organic Farming More Efficient

“If there is less stress caused by fertilizers, caused by pesticides, the microbe community works more efficiently,”

by Maggie Fox

Organic farming may produce lower yields, but in the long run it is more efficient and is much easier on the environment, Swiss researchers reported in the journal Science (vol 296, p 1694). Organic farms have more fertile soil and a higher biodiversity, both of which have been shown to increase efficiency.

Paul Mader of the Research Institute of Organic Agriculture in Frick, Switzerland and colleagues at the Swiss Federal Research Station for Agroecology and Agriculture in Zurich spent 21 years comparing conventional farming to organic farming, which uses no synthetic pesticides or fertilizers.

“Mean yields are 20 percent lower, that’s true, depending on the crop,” Mader said in a telephone interview. For instance, organic wheat yields are 10 percent lower, while there is a 40 percent reduction for potatoes.

“But mean energy input per hectare (2.4 acres) was about 50 percent higher (in conventional plots). As a consequence, energy input per crop unit is lower in organic.”

Energy input includes fuel used to produce fertilizer and pesticides, and the actual ingredients of such chemicals. Mader’s team found 34 to 51 percent less nitrogen, phosphorus, and other nutrients were added to the soil in the organic systems than in the conventional ones.

But, because the crop yields from the organic systems were 80 percent as large conventional yields, the organic systems use resources more efficiently, they concluded.

Farmers reap the benefits. In Europe, Mader said, consumers are willing to pay 10 percent to 30 percent more for organic produce. They also often get government support.

At the start of the study, only 1 percent of Switzerland’s farms were organic, but that has grown to 9 percent, Mader said. “There are farmers converting to organic.”

Overall, he said, 3 percent of all farms in the European Union are organic, and the numbers are increasing by about 25 percent each year. In Italy, 10 percent of farms are organic.

Mader said he believed the study to be free of bias, although he works for an organic institute. Government scientists also worked on the project, he said.

“Of course, I try to have an objective view,” Mader said. “But I have become a big fan of organic because I have seen the positive effects of organic.”

Some of the processes that make organic more efficient are going on at the microbe level, he said. “The microorganisms in organic plots work more efficiently than in conventional plots,” he said.

These tiny organisms make carbon into a form that can be used by plants, for instance.

“If there is less stress caused by fertilizers, caused by pesticides, the microbe community works more efficiently,” he said. Mycorrhizae, root-colonizing fungi that help plants absorb nutrients, fared better in organic systems as well. Such fungi were also at least partly responsible for the more stable physical structure of the organic soils, the researchers said.

Insects such as pest-eating spiders and beetles flourished in the organic systems. Earthworms and weeds, which can often be beneficial, also were more common in organic farms.

Organic soils also decomposed more efficiently, which makes the soil more nutritious for plants.

Maggie Fox is Health and Science Correspondent for Reuters

This article appeared on May 31, 2002

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Allergic Diseases and Sensitization in Steiner School Children: A Cross-Sectional Study in Five European Countries

“Certain features of the anthroposophical lifestyle are associated with a reduced risk of allergic disease in children.”

by Helen Flötotto et al.  
Journal for Allergy & Clinical Immunology 2006; 117:59-66

The prevalence of allergic diseases has increased considerably during the past decades and the search for causes, as well as for protective factors, is taking place on a broad scale. The EU-supported and recently finished PARSIFAL Study studied more than 14,000 children in five European countries and combined the possible protective factors, found in two studies, published in the nineties. One of these was the Austrian-Swiss-German Alex Study, showing a protection for children growing up on a farm. The other was a Swedish study that showed a protective influence for children growing up in an anthroposophic lifestyle. The anthroposophic lifestyle comprises factors like a restrictive use of antibiotics, antipyretics and vaccinations as well as a high consumption of biodynamic foods. The influence of the individual factors was unclear, but the more these so called “Steiner units” occurred, the more the protective influence was.

The PARSIFAL study intended to investigate the single factors more in depth. The study, coordinated by the Karolinska Institutet in Sweden, was a cross-sectional multi-centre study, executed in Austria, Switzerland, Germany, the Netherlands and Sweden. Studied were schoolchildren between 5 and 13 years of age, from anthroposophical lifestyle upbringing, expected to be found at Steiner schools, children from farms, and controls. The assessments were by extensive questionnaires, and in subcohorts by bloodsampling and spirometries. Next to this housedust samples were analyzed.

The results from these groups are published separately, the present publication about the group with an anthroposophical lifestyle being the first one to appear.

This group covered 6,630 children, 4,606 from Steiner schools and 2,024 from reference schools, being the largest study ever conducted among Steiner school children, and comprising the heterogeneity of the anthroposophic lifestyle in Europe.

Results

The prevalence of several studied outcomes was lower in Steiner school children than in the reference group. Overall, there were statistically significant reduced risks for several allergic symptoms like rhinoconjunctivitis, atopic eczema, and atopic sensitisation, with some heterogeneity between the countries. The use of antibiotics during first year of life was associated with increased risks of rhinoconjunctivitis asthma and atopic eczema. Early use of antipyretics (to reduce fever) was related to an increased risk of asthma and atopic eczema.

Food choices were grouped in three categories: 1- biodynamic(bd), 2-conventional and 3-any other mixture of organic, partly organic and bd, partly organic and conventional, etc. In the crude model, children with a diet mainly based on biodynamic food had a reduced risk of all studied health outcomes compared to reference children with a diet based on conventional food. This association was no longer present in the fully adjusted model.

The biological diet was chosen as to be typical for the anthroposophers. From the group with a mixed food choice it was not possible to subtract the organic consumers. This can be considered a weakness in the study design.

Conclusions

Certain features of the anthroposophic lifestyle are associated with a reduced risk of allergic disease in children.

For the full article, contact m.huber@louisbolk.nl

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Summer, 2006

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Fungi play vital roles as decomposers, breaking down all kinds of organic matter from roots and leaves to crop residues, wood, and dead animals. The decomposition process releases the nutrients stored within organic matter. In short, fungi help make it possible for one generation of life to sustain the next.

Most fungi pose little or no risk to humans and some are delicacies, including morel and chanterelle mushrooms. Patches of fungal spores create the distinctive flavor and blue splotches in blue cheese, and without fungi, there would be no beer or wine. Penicillium and Streptomyces fungi produce antibiotics widely used in treating bacterial infections in humans and animals.

However, a few fungi are poisonous, even deadly, to humans. Others produce molds and mycotoxins that can trigger human allergies and induce asthma. Most fungi thrive by attacking plants, trees, or insects and slowly consuming their tissues. Others break down the intact cell walls, causing damage that can prove fatal.

There are more than 300 species of fungi with the ability to produce mycotoxins. Mycotoxins are secondary metabolites produced by fungi in response to environmental conditions. Fortunately, only about 20 mycotoxins produced by five genera of fungi (Aspergillus, Penicillium, Fusarium, Alternaria, and Claviceps) are found periodically in food at levels posing threats to people. Still, mycotoxins cost American agriculture between $630 million and $2.5 billion annually, largely because of market rejection of grain that contains mycotoxins at levels above either government or company standards.

Some individuals and organizations critical of organic farming claim that organic food and animal feed are more frequently and heavily contaminated with mycotoxins than conventional food and feed. Those making such arguments typically highlight a few, isolated instances where mycotoxins were detected in organic or “naturally” grown food at levels higher than in other foods. They explain the differences by pointing out that organic farmers are not allowed to apply synthetic fungicides.

Mycotoxins have also become part of the global debate over the benefits of genetically engineered (GE) crops. Studies showing that GE, insect-protected field corn is less prone to mycotoxin contamination than corresponding conventional corn are frequently cited as evidence that organic farming poses greater mycotoxin risk than “modern” agriculture that utilizes genetically engineered seeds.

This review analyzes the basis and validity of these assertions. It reviews the relatively few well-designed studies that have compared mycotoxin levels in conventional and organic foods grown under similar circumstances. Factors unique to organic farming systems that impact mycotoxin levels are highlighted.

When a fungal spore comes into contact with organic material, it sends out filament-like structures called hyphae, which help attach the fungus to its new home.

When the fungus senses conditions are right, it initiates the decomposition process by secreting enzymes into its new food source. These enzymes break down complex organic molecules in the host tissues into simpler molecules that are more readily available to the fungi, as well as to other microorganisms.

The secondary metabolites produced by fungi during the course of digestion are mycotoxins. Fungi produce these biochemicals for a wide array of reasons. Mycotoxin production tends to increase when fungal growth rates slow down. The purpose of the mycotoxins might be to combat the factors reducing the growth rate of fungi.

Alternatively, fungi may produce mycotoxins to protect dormant fungi and fungal spores from other, surviving fungal species and bacteria. This report focuses on the mycotoxins that appear most frequently in food: aflatoxins, ochratoxin, fumonisins, deoxynivalenol, patulin, and the ergot alkaloids.

Weather, Grain Handling, and Farming Practices

The moisture level of grain when it is harvested is a critical variable driving mycotoxin formation. Wet conditions, followed by hot and dry periods, can stimulate mycotoxin production, especially aflatoxin.

Several studies have shown that plants experiencing stress from excessive heat are more vulnerable to fungal and mycotoxin infections. In tomatoes, fungi can proliferate in sun-damaged tissues, causing black rot lesions and producing a number of mycotoxins.

Drought conditions coupled with some insect damage, followed by wet, humid weather near harvest optimally set the stage for fungal infections and mycotoxin production. Many studies suggest that organic and sustainable farming systems that increase organic matter levels in soil lessen the severity of heat stress, thereby reducing the frequency and levels of mycotoxin contamination.

The extensive evidence linking fertilization methods to mycotoxin levels is important because of differences in how organic and conventional farmers supply plant nutrients to crops. In general, conventional farmers apply high rates of nitrogen in readily available forms early in the crop year to eliminate any chance that a shortage of N might limit crop yields. In most years, farmers apply N well in excess of crop needs as a sort of insurance policy.

Organic farmers focus on enriching the soil by building up soil organic matter and increasing the pool of nitrogen that is cycling through the soil. They use nitrogen-fixing legumes, cover crops, manure, compost, and relatively slow-release natural fertilizers to meet crop needs. In most crops, markedly lower levels of N are applied per acre on organic farms compared to nearby conventional farms. While this is a clear benefit in terms of mycotoxin formation and water quality, a lack of N on organic farms does periodically reduce yields, especially in years when climatic conditions support vigorous plant growth.

Regulation of Mycotoxins in Food

Many developed countries have established standards or guidelines governing mycotoxins in food. At this time, there are no widely acceptable international standards for mycotoxins in any specific food.

The official status and impact of “guideline levels,” in contrast to “allowable levels,” or “standards,” varies around the world. The United States is among a set of countries that have established unenforceable “guidance levels” that are intended to trigger actions by private companies if and when the levels are exceeded.

With the exception of patulin in apple juice, European Union (E.U.) standards for mycotoxins in food and feed are two to fifteen times stricter than those in the United States.

Frequency and Levels of Mycotoxins in Conventional and Organic Foods

In a search of the peer-reviewed literature, nine studies were identified that report 24 direct comparisons of mycotoxins in conventional and organic foods purchased and/or grown in a given year, in the same region. Two assessed patulin in apples, one focused on ochratoxin in milk, and 21 assessed four mycotoxins in grain-based products. All these studies were carried out by European research teams and reflect food production in the 1997 through 2002 seasons.

The absence of similar comparative studies in the United States is a reflection of the lack of consumer awareness of mycotoxin risks and government policies and priorities. No U.S. government agency routinely tests food for mycotoxins. Public funding invested in the development and promotion of GE foods has grown dramatically over the last decade, while support for food safety research has grown modestly, if at all.

In the nine comparative studies that have been published in peer-reviewed journals, mycotoxins were detected 1.5 to 3.2 times more frequently in conventional samples compared to organic samples. The levels of mycotoxins found in conventional and organic samples can be compared in 20 of the 24 cases. Across the 20 cases, mycotoxins reported in conventional food exceeded those in organic food by a factor of 2.2.

Many conventional farming systems control fungal infections by applications of one or more of over 40 registered fungicides. For many low-value crops, there are no cost-effective fungicide treatments. On fruits and vegetables, however, fungicides are frequently used to prevent disease losses. Often two or four different fungicides are applied up to 10 or more times.

The degree of reliance on fungicides is a major difference between conventional and organic farms. Organic farmers have few fungicides to choose from – those containing copper and sulfur, and biopesticides manufactured from naturally occurring plants, fungi, and bacteria. The opportunity to rely on fungicides to deal with plant pathogens, including fungi, allows conventional farmers to select and manage varieties for maximum yield, even when yield-maximizing management strategies make crops more susceptible to disease.

Organic farmers have to place a premium on prevention. A variety of tactics on organic farms are typically woven into Integrated Pest Management systems. Depending on the crop, location, and levels of disease pressure, these practices include selection of resistant varieties, crop rotations, and limited applications of readily available sources of nitrogen.

Fungicides often dramatically reduce fungal infections, yet do not decrease mycotoxin levels to the same degree. Some fungi can actually utilize fungicides and insecticides as food sources. In one study, the concentration of the mycotoxin nivalenol increased 16-fold in wheat treated with a combination of two fungicides, despite reducing the severity of Fusarium infection. Treatment of grain fields with the strobilurin fungicide azoxystrrin can increase mycotoxin levels, even though it reduces Fusarium infection rates.

Breaking the Mold

Organic Farming Can Enhance Food Safety by Lessening Risk of Mycotoxin Contamination

by Chuck Benbrook

The Natural Farmer Summer, 2006

Fungal hyphae on a leaf.
Sub-lethal applications of fungicides are known to stimulate mycotoxin formation. This likely occurs because the fungi are stressed, but not killed. The production of mycotoxins is a normal response to stress in many fungal species.

Organic farmers tend to promote greater diversity in microbial communities and strive for more complex plant nutrient and microbial food webs.

One goal is to create what scientists call a “disease suppressive” soil—a soil characterized by low and largely inconsequential levels of root and plant disease, despite the presence of virulent pathogens and a susceptible host crop. Common practices to accomplish these goals include application of compost and animal manure, the planting of cover crops, and diverse crop rotations.

Ongoing competition among fungal species on organic farms, and between fungi and bacteria, helps keep any one fungus from reaching dangerous levels. In addition, low levels of mycotoxins in some crops can actually promote the biological control of some fungi. Deoxynivalenol (DON), for example, has significant biological activity against other plant pathogens, some with potential to control of some fungi. Deoxynivalenol (DON), for example, has significant biological activity against other plant pathogens, some with potential to produce other mycotoxins.

Findings and Conclusions

Several research teams in Europe have carried out comparative surveys of the frequency and levels of mycotoxins in conventional and organic foods, leading to nine peer-reviewed studies reporting results and/or assessing levels of risk. The results are surprisingly consistent.

Averaged across 24 direct comparisons of mycotoxins in conventional and organic foods in published studies, mycotoxins were detected in mycotoxins in conventional and organic foods. Averaged across 24 direct comparisons of mycotoxins in conventional and organic foods in published studies, mycotoxins were detected in conventional and organic foods. Ten of the comparisons involved organic foods. Ten of the comparisons involved organic foods. Ten of the comparisons involved organic foods. Ten of the comparisons involved organic foods.

Mycotoxin levels in conventional food averaged a little over twice as high as in the corresponding organic food. Conventional food about 50 percent more often than in the corresponding organic food. Conventional food about 50 percent more often than in the corresponding organic food.

Mycotoxin-producing strains are favored. These fungi are usually completely and repeatedly suppressed fungal pathogens and allow farmers to push yields higher, but routine and repeated applications can lead to problems associated with resistance. Fungicides can also trigger shifts in the population mix of fungi such that mycotoxin-producing strains are favored.

Conventional farming systems increase the risk of fungal infections through a lack of diversity and reliance on monocultures, and because of heavy use of fertilizers that deliver plant nutrients in a readily available form. Applications of fungicides often dramatically suppress fungal pathogens and allow farmers to push yields higher, but routine and repeated applications can lead to problems associated with resistance. Fungicides can also trigger shifts in the population mix of fungi such that mycotoxin-producing strains are favored.

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Organic farming systems reduce the prevalence of serious fungal infections, and hence mycotoxin risks, by promoting diversity in the microorganisms colonizing plant tissues and living in the soil; and by reducing the supply of nitrogen that is readily available to support plant – and pathogen – growth. Resiliency within diverse fungal and bacterial communities lessens but does not eliminate the risk that mycotoxin-producing fungi will become dominant. An excessive supply of nutrients almost always disrupts ecological communities in ways that favor certain fungi and can trigger or augment the production of mycotoxins.

The advantages of organic farming practices equal if not exceed any disadvantages in terms of mycotoxin prevention on well-managed organic farms. The evidence is strong that organic production of small grains, especially wheat, can reduce the frequency and severity of mycotoxin contamination compared to conventional farms, even including conventional wheat farms treated with fungicides.
Fossil Fuel and Agriculture

Few people realize that an enormous amount of energy is required to produce our food. In fact, 17% of all fossil fuel used in the U.S. is consumed by the food production system.

As a result of the industrialization of agriculture, most food is now produced at large-scale, centrally-located facilities which use energy-intensive farming practices. Large amounts of fossil fuel are required to power heavy farming machinery, to process foods, to refrigerate foods during transportation, to produce packaging materials, and to manufacture and transport chemical inputs such as fertilizers and pesticides. Fertilizers containing nitrogen are particularly fossil-fuel-intensive. Moreover, more diverse organic farming operations have been shown to use 60% less fossil fuel per unit of food than conventional industrial farms.

As a consumer, you can also help reduce agriculture-related energy consumption by simply choosing to buy foods from local farms – this drastically reduces the distance that food is shipped, thus conserving fuel, reducing pollution, and protecting human health.

What can you do?

* Buy foods grown locally - this saves energy by eliminating the need for lengthy food transportation. You can buy foods from your local farmer at a farm stand, at a farmers market, or through a food co-op or Community Supported Agriculture (CSA) system.
* Ask your grocery store to supply locally-grown produce.
* Don’t eliminate food transportation energy consumption entirely! Plant a garden and grow your own fresh produce!

Transportation

A tremendous amount of energy is also used to transport our food. As a result of the development of centralized industrial agricultural operations and the corresponding disappearance of local family farms, food is now shipped extraordinarily long distances before it reaches your dinner plate.

According to the U.S. Department of Transportation, food and agricultural products (not including imported or exported foods) were transported 566 billion ton-miles within U.S. borders each year, constituting more than 20% of total U.S. commodity transportation. 7 In 1969, the U.S. Department of Energy estimated that, on average, food traveled 1,346 miles. 8 Another study conducted in 1980 determined that fresh produce traveled 1,500 miles! 9

Furthermore, an increasing quantity of food is now being transported internationally; in 1998, a total of 172 million tons of food were transported outside of the U.S. 10 In 2001, the U.S. imported 39% of all foods, 12% of vegetables, 40% of lamb, and 78% of fruits. 11

This excessive and unnecessary food transportation requires the consumption of large quantities of fossil fuel, thus polluting the environment and damaging human health. Lengthy food transport also generates additional energy expenditures by creating the need for increased packaging, processing, and refrigeration. It also forces the government to spend more of our tax dollars repairing, constructing, and maintaining an extensive system of roads and railways.

Energy Conservation in the Agriculture Sector

Given the damage to human health and the environment caused by the use of fossil fuels, it is clearly in our best interest to reduce our consumption of this source of energy whenever possible.

Fortunately, a number of agricultural techniques can be used to decrease our dependence upon fossil fuels. One effective method is to reduce or eliminate tillage (plowing the soil); a Canadian study determined that implementation of a modified no-till system reduced the use of diesel fuel from 7.9 gallons to 1.1 gallons per hectare. 12 Another study indicated that total CO2 emissions generated by a no-till system were 0.2% lower than emissions from conventional tillage. 13 Fossil fuel consumption could also be decreased by reducing fertilizer use, by using manure more efficiently, and by practicing certain types of crop rotation (for example, including legumes in crop rotation). 14

Although these techniques are usually difficult to implement on huge mono-crop industrial farms, many sustainable farms already practice these energy-saving production methods. In fact, small-scale, less mechanized, more biodiverse organic farming operations have been shown to use 60% less fossil fuel per unit of food than conventional industrial farms. 15

As a consumer, you can also help reduce agriculture-related energy consumption by simply choosing to buy foods from local farms – this drastically reduces the distance that food is shipped, thus conserving fuel, reducing pollution, and protecting human health.

Did you know?

* The U.S. emits almost twice as much fossil fuel-generated CO2 per person as the average citizen of the world. 16
* Frozen peas require 150% more energy than fresh peas due to packaging and refrigeration. 17
* In the U.S., the average prepared meal includes ingredients produced in at least 5 other countries. 18
* Transporting 1 lb of asparagus from Chile to New York uses 73 lbs of fuel energy and releases 4.7 lbs of carbon dioxide into the atmosphere. 19

For more information:

* Visit the Clean Air and Energy website created by the National Resource Defense Council (NRDC) at: http://www.nrdc.org
* Check out the Buy Local section of Sustainable Table.
* Visit GRACE’s Sustainable Energy Project website at: http://www.grace-sfe.org
* Visit the Clean Air and Energy website created by the Natural Resources Defense Council (NRDC) at: http://www.nrdc.org


4. Horrigan, Leo, Robert S. Lawrence, and Polly Walker. “How Sustainable Agriculture Can Address the Environmental and Human Health Harms of Industrial Agriculture.”


6. Horrigan, Leo, Robert S. Lawrence, and Polly Walker. “How Sustainable Agriculture Can Address the Environmental and Human Health Harms of Industrial Agriculture.”


9. Ibid.


14. Ibid.


published by Global Resource Action Center for the Environment (the Meatrix People) on http://www.sustainableat.org/energy/energy/
Organic foods are required in a number of alternative treatments, including several alternative cancer therapies, yet is widely assumed that any benefit derived from organic foods is due to an absence of pesticide residues. However, prior to the widespread use of pesticides, those in the health care community who advocated organic foods claimed that these foods contained a better arrangement of nutrients as a result of the superior soil management and fertilization practices used by organic farmers. As a corollary, they cautioned that food grown with chemical fertilizers caused deteriorating health in animals and humans (Chesire Panel Committee, 1939).

Despite these warnings about the health effects of chemical fertilizers and pesticides, farmers abandoned the labor intensive practices used in organic agriculture in favor of these easier to use chemicals. Prior to World War II, agricultural chemical usage was very limited. By 1995, more than 45 million tons of chemical fertilizers and 770 million pounds of synthetic pesticides were used in U.S. agriculture alone (Terry, 1999; Aspelin, 1999). Ninety-five percent (95%) of crops in the United States are now produced with chemical fertilizers and pesticides (U.S. Department of Agriculture, National Agricultural Statistical Service, Agriculture, 1998; National Agricultural Statistical Service, 2000), and producing crops using these chemicals has come to be known as conventional agriculture.

There is evidence, however, that this major change in agricultural methods may not have been entirely benign from a nutritional point of view. Coincident with the change to agricultural practices, there have been recently identified changes in the nutrient composition of fresh fruits and vegetables. Four different analyses of U.S. and British nutrient content data have shown a decline in the vitamin and mineral content of fresh fruits and vegetables over the last 60 years (Klein and Perry, 1982; Benzerger, 1997; 1997; Jack, 1998). Average declines in nutrient content are shown in Table 1.

### RESULTS

A single comparison consisted of a single nutrient in a single organic fruit, vegetable or cereal grain grown in one growing season compared to the same nutrient in the same conventionally grown crop grown in the same season, e.g., 0.30 mg of zinc in 100 g of organic cabbage compared to 0.25 mg in an equal amount of conventional cabbage, both grown in the summer of 1986. Some studies reported pooled comparisons that averaged the results for more than 1 year or more than one crop. These comparisons were included in the analysis when single comparisons were not available. All comparisons were used as reported.

A total of 1,297 comparisons were considered for analysis. Of this total, 57 comparisons came from 4 studies that did not report the numerical nutrient content measurements but instead made statements such as "the products of the conventional and organic plots did not differ in content" or otherwise presented the information in a nonnumeric way (Nilsson, 1979; Harwood, 1984; Reiknen, 1984; Termine et al., 1984). Because the majority of these 57 comparisons indicated no difference in nutrient content, these comparisons were excluded from determinations of statistical significance and other computations. The remaining 1,240 comparisons were entered into a database for calculation, encompassing 35 vitamins and minerals as well as protein quality and quantity.

For each comparison, a percent difference was calculated by study for these nutrients, statistically significant. In order to produce a coherent visual display, average percent difference was calculated based on these results and these plots were plotted for each of these frequently studied nutrients.

Data were analyzed using SAS (SAS Institute Inc., Cary, NC) and plots were produced using NCSS (NCSS Inc., Kaysville, UT).

### RESULTS

This analysis was designed to answer several questions for each nutrient considered:

1. **Is there a difference in the nutrient content of organic crops and those grown with agricultural chemicals?**
2. **How much of the time does the difference occur?**
3. **How big is the difference?**

These questions are representative of larger questions such as whether a consumer encounters a difference often enough to be affected? And is the difference large enough to be biologically significant?

Of the 12 nutrients that were analyzed statistically, 4 nutrients and 1 toxic substance were significantly different.
Table 2. Differences in Nutritional Content Between Organic and Conventional Vegetables: Mean Percent Difference for Four Nutrients in Five Frequently Studied Vegetables

<table>
<thead>
<tr>
<th>Nutrient*</th>
<th>Ingredient</th>
<th>Vitamin C</th>
<th>Iron</th>
<th>Magnesium</th>
<th>Phosphorus</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lettuce</td>
<td>+17</td>
<td>+17</td>
<td>+29</td>
<td>+14</td>
<td></td>
</tr>
<tr>
<td>Spinach</td>
<td>+52</td>
<td>+25</td>
<td>-13</td>
<td>+14</td>
<td></td>
</tr>
<tr>
<td>Carrot</td>
<td>-6</td>
<td>+12</td>
<td>-69</td>
<td>+13</td>
<td></td>
</tr>
<tr>
<td>Potato</td>
<td>+22</td>
<td>+21</td>
<td>+5</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Cabbage</td>
<td>+43</td>
<td>+41</td>
<td>+40</td>
<td>+22</td>
<td></td>
</tr>
</tbody>
</table>

* Plus and minus signs refer to conventional crops as the baseline for comparison. For example, vitamin C is 17% more abundant in organic lettuce (conventional 100%, organic 117%)

Next, an attempt was made to quantify how differences in nutrient content could influence the results for vitamin C are similar to those of the German review, which found a lower nitrate content in organic vegetables and make them more available to plant roots (Stevenson and Ardakani, 1972). For iron, in particular, this is especially important because many soils contain adequate iron but in an unavailable form (Allaway, 1975). The presence of these microorganisms at least partially explains the trend showing a higher mineral content of organic food crops.

Finally, there are several nonsignificant trends in the data that are worth of further investigation. First, there are to be higher amounts of nutritionally significant minerals in organic compared to conventional crops. The organic crop had a higher mean mineral content for all 21 minerals considered in this analysis. Figure 1 shows the mean percent additional mineral content in organic crops by mineral for some of these minerals. In addition, there may be less of the toxic heavy metals in organic crops than in conventional crops. For all four heavy metals considered, the organic crop contained lower amounts of the heavy metals more often than comparable conventional crops. The number of comparisons where the organic crop had less and where the conventional crop had less were 7 and 5 for lead, 6 and 5 for cadmium, 3 and 2 for mercury, and 4 and 1 for aluminum.

A further trend indicates that the quantity of protein may be less but the quality may be better in organic crops than in conventional crops. In all but one of the few measurements that were included in this analysis, the quantity of crude protein was lower in organic compared to conventional crops but the quality was better as measured by essential amino acid content. There is considerable support elsewhere for this difference in protein quantity and quality, some of which will be reviewed in the next section.

Table 3. Nutrient Content of an Organic and Conventional Diet: Milligrams of Vitamin C, Iron, Magnesium, and Phosphorus in One Day’s Vegetable Intake

<table>
<thead>
<tr>
<th>Diet</th>
<th>Vitamin C</th>
<th>Iron</th>
<th>Magnesium</th>
<th>Phosphorus</th>
</tr>
</thead>
<tbody>
<tr>
<td>Organic</td>
<td>89.2</td>
<td>3.7</td>
<td>80.0</td>
<td>124.0</td>
</tr>
<tr>
<td>Conventional</td>
<td>67.9</td>
<td>3.0</td>
<td>68.6</td>
<td>111.8</td>
</tr>
</tbody>
</table>

Further supporting evidence for the results of this analysis comes from the known effects of fertilizers and pesticides on soil ecology and plant metabolism. Before reviewing these effects, it is helpful to know something about the differences in organic and conventional fertilizers and fertility management. In organic farming, a number of methods are used to maintain soil fertility. These include:

1. Crop rotation, which ensures that one crop does not deplete the soil of the nutrients that it uses most;
2. Cover crops to protect against soil erosion;
3. The planting of special crops known as “green manures” that are plowed back into the soil to enrich it; and
4. The addition of aged animal manures and plant wastes, also known as compost, to the soil.

The distinguishing feature of these fertility management practices is the addition of organic matter to the soil, in the form of plant and animal wastes, to preserve the soil structure and provide food for soil microorganisms. With these methods, soil nutrients are released slowly over time.

In contrast, chemical fertilizers contain a few mineral substances, principally nitrogen, potassium, and phosphorus. Sometimes trace minerals are also added. These fertilizers dissolve easily in the water that is present in soil. As a result, plants fertilized with chemical fertilizers are presented with large quantities of nutrients all at once and the nutrients will not last as long as those of their needs. Farmers who use chemical fertilizers control erosion of topsoil through methods such as no-till planting, where weed-killing pesticides are used in place of plowing to prepare a field for planting. With chemical fertilizers, there is no attempt to influence soil structure or to encourage soil microorganisms (Cacek and Lagnert, 1986).

These differences in the management of soil fertility affect soil dynamics and plant metabolism, which result in different quality, quantity, and nutritional quality. Soil that has been managed organically has more microorganisms (Hader, 1986; Hens, 1986). These microorganisms produce many compounds that improve the quality of foods, including substances such as citrate and lactate that combine with soil minerals and make them more available to plants. As for iron, in particular, this is especially important because many soils contain adequate iron but in an unavailable form (Allaway, 1975). The presence of these microorganisms at least partially explains the trend showing a higher mineral content of organic food crops.

Nitrogen from any kind of fertilizer affects the amounts of vitamin C and nitrates as well as the quantity and quality of protein produced by plants. When a plant is presented with an excess of nitrogen, it increases protein production and reduces carbohydrate production. Because vitamin C is made from carbohydrates, the synthesis of vitamin C is reduced also. Protein is presented to plants, including substances such as lysine and consequently has a lower quality in terms of human and animal nutrition. If there is more nitrogen than the plant can handle through increased protein production, the excess is accumulated as nitrates and stored predominately in the green leafy part of the plant (Salunkhe and Desai, 1988; Mozafar, 1993). Because organically managed soils generally present plants with lower amounts of nitrates as well as nitrogen, it would be expected that organic crops would have more vitamin C, less nitrates and less protein but of a higher quality than comparable conventional crops.

Potassium fertilizer can reduce the magnesium content and increase the phosphorus content of at least some plants. When potassium is added to soil, the amount of magnesium absorbed by plants decreases. Because phosphorus absorption depends on magnesium, the less phosphorus is absorbed as well. Potassium is presented to plants differently by organic and conventional systems. Conventional potassium fertilizers dissolve readily in soil water presenting plants with large quantities of potassium while organically managed soils hold moderate quantities of both potassium and magnesium in the root zone of the plant (Bear et al., 1949; Hamawany et al., 1980). Given the plant responses just described, it would be expected that the organic

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Table 2.

<table>
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<tr>
<th>Vegetable</th>
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<th>Iron</th>
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crops would contain larger amounts of magnesium and phosphorus than comparable conventional crops.

Several kinds of fertilizers contain toxic heavy metals that enter the soil and are absorbed by plants. Phosphate fertilizers produced from industrial waste can contain a number of heavy metals (Batelle Memorial Institute, 1999). These heavy metals build up in the soil when these fertilizers are used year after year. As the soil becomes more contaminated, the crops grown on these soils also become more contaminated. When chemical nitrogen fertilizers are added to these soils, plants may absorb even more toxic heavy metals (Reuss et al., 1976; Harbut, 1986). Organic farmers only rarely use trace mineral fertilizers and virtually never use fertilizers produced from industrial waste, which are the most contaminated (Organic Crop Improvement Association, 1996; Batelle Memorial Institute, 1999). As a consequence, it might be expected that organic crops would contain lower amounts of toxic heavy metals, but more investigation is required to confirm this expectation.

Furthermore, it is reasonable to ask how the observed differences in nutrient content might affect a person’s nutrient intake and health. Estimates of the nutrient content of organic and conventional daily vegetable intake were made, and the organic vegetables had higher amounts of all nutrients shown. For vitamin C, in particular, five servings of the organic vegetables met the recommended daily intake for women and the organic vegetables had higher amounts of potassium. Aspelin AL. Pesticide Industry Sales and Usage Information Bulletin No. 378. Washington, D.C.: US EPA, 1999:1–8. For sodium, an essential nutrient, the organic vegetables had higher amounts of sodium compared to conventional crops. In: Vogtmann H, Boehncke E, Fricke I, eds. The Importance of Biological Agriculture in a World of Diminishing Resources. Witzenhausen: Veriagsgruppe Weiland, 1984: 236–248. For iodine, magnesium, and selenium, the organic vegetables had higher amounts of these nutrients compared to conventional crops. In: Vogtmann H, Boehncke E, Fricke I, eds. The Importance of Biological Agriculture in a World of Diminishing Resources. Witzenhausen: Veriagsgruppe Weiland, 1984: 236–248.


In summary, this analysis found more iron, magnesium, phosphorus, and vitamins C and less nitrates in organic crops as compared to conventional crops. In addition, there were several trends showing less protein but of a better quality, more nutritionally significant minerals, and lower amounts of some heavy metals in organic crops compared to conventional ones. More research is needed both to verify these findings and to discover relevant mechanisms in both plants and soil. As with all real-world data, there is considerable variability in agricultural measurements, making it necessary to collect and consider a lot of data in order to identify underlying patterns. Consequently, for most nutrients, there is a need for additional data collection before any further analysis is warranted. Finally, because the data collected to date suggest that there are real differences in nutrient content between organic and conventional crops, more research into the relative health effects is certainly in order.

REFERENCES


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Proof that Grazing is Better

“Confinement herds had 1.8 times more clinical mastitis than pastured and eight times the rate of culling for mastitis.”

by Kathie Arnold

Organic management of both dairy and beef cattle require that they have access to the out-of-doors and pasture. To the extent that most other cattle raised in this country are fed concentrates for higher milk production (dairy), or are finished off in feed lots (beef), the benefits of pasturing and grass-feeding cattle are relevant to the question: “Is Organic Better?” Here is an annotated list of studies Kathie Arnold of Twin Oaks Dairy in Truxton, NY has put together enumerating the benefits of grazing cattle.

Benefits to Animal Health


4. Cornell University 2004 Dairy Farm Business Summary. www.ce.cornell.edu. Cull rates for conventional farms were 29% whereas for organic herds of similar size, it was 22%.


6. Goldberg, J.J., E.E. Wildman, J.W. Pankey, J.R. Kunkel, D.B. Howard, and B.M. Murphy. 1992. “The influence of intensively managed rotational grazing, traditional continuous grazing and confinement housing on bulk tank milk quality and udder health.” J Dairy Sci. 75:S96-T04. Grazed herds had lower total bulk milk bacteria counts (TBC) that confined herds did in the summer but there was no difference in the winter when all cows were confined. Trends towards fewer udder health problems in grazing herds were also observed.


9. Regula G., J. Danuser, B. Spyucher and B. Wechsler. 2004. “Health and welfare of dairy cows in different husbandry systems in Switzerland.” Prev Vet Med. 15:247-64. Risks for lameness and teat injuries increased with increased confinement. Skin lesions on hocks and carpal joints were decreased in cattle allowed to go out at all times rather than cows that were allowed to go out only in good weather.


12. Somers, J.G., Frankena, K., E.N. Nordholm-Stassen and J.H. Metz-2003. “Prevalence of claw disorders in Dutch dairy cows exposed to several floor systems.” J Dairy Sci 86:2082-93. Cows that were not grazed were at high risk for most claw disorders when compared to cows with pasture access. All herds on concrete flooring were affected by digital dermatitis.


15. Washburn, S.L., W. J. Green, and J.A. Benson. 2002. “Reproduction, mastitis and body condition of seasonally calved Holstein and Jersey cows in confinement or pasture systems.” J Dairy Sci. 85:105-111. There was no difference in reproductive performance between pasture and confinement herds. Pastured herds had lower body condition scores than confinement. However, confinement herds had 1.8 times more clinical mastitis than pastured and eight times the rate of culling for mastitis.


Benefits to Food Safety and Milk Quality

1. Bailey, G.D., B.A. Vanselow, M.A. Hornitzky, S.I. Hum, G.J. Eamens, P.A. Gill, K.E. Walker and J.P. Cronin. 2003. “A study of the foodborne pathogens: Campylobacter, Listeria and Yersinia in faeces from slaughter age cattle and sheep in Australia.” Comm Di Dis Intell. 27:249-57. Prevalence of Campylobacter shedding among different management groups was: dairy cattle (6%), feedlot cattle (58%), pastured beef cattle (2%), mutton sheep (0%), prime lamb (8%). All dairy cattle were on pasture.

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4. Husu, J.R. 1990. Epidemiological studies on the occurrence of Listeria monocytogenes in the feces of dairy cattle. Zentralb Veterinar B. 37:276-82. Seasonal variation in shedding of Listeria spp. in dairy cattle was examined by collecting 3,878 fecal samples over two years. Prevalence of Listeria spp. and Listeria monocytogenes was higher during the indoor season than in samples collected from animal pasture.


6. Nielsen, J., T. Lund-Nielsen, and L. Skibstead. 2004. Danish Research Center for Organic Farming. Found that organic milk was 50% higher in Vitamin E, 75% higher in beta carotene and in omega 3 essential fatty acids than conventional milk. This study tied these qualities to organic cows having room to graze and a diet high in fresh grass and clover, and forage and less maize.

7. Sonon Jr., R.D. Beitz and A. Trenkle. 2004. Improving Health Benefits of Beef & Milk: A Field Study. A.S. Leaflet R1864, Iowa State University. Intensively pastured cows produced milk with CLA concentrations that were about 3- to 4-fold greater than initial concentrations. Ribeye steaks from cattle finished on a combination of pasture and concentrate were higher in CLA content than steaks from cattle finished on conserved forages plus concentrates.

8. Ward, A.T., K.M. Wittemberg, H.M. Froebe, K. Przybylski, and L. Malcolmson. 2004. Fresh forage and silage supplementation on conjugated linoleic acid levels in plasma and milk. J Dairy Sci. 86:1742-50. Fresh forage, compared to conserved hay, increased milk fat vaccenic acid and CLA proportions by 15% and 22% respectively. Addition of solin seed increased these levels further to 41% and 25%.

9. Kay, J.K., J.R. Roche, E.S. Kolver, N.A. Thomson, and L.H. Baumgard. 2005. A comparison between feeding systems (pasture and TMR) and the effect of vitamin E supplementation on plasma and milk fatty acid profiles in dairy cows. J Dairy Res. 72:322-32. Milk from cows on pasture or cows fed a TMR supplemented with Vitamin E were compared. Milk from cows grazing pasture had higher CLA, vaccenic acid, and lower trans-10 fatty acids than cows on TMR with supplemental vitamin E. Unknown pasture constituents are likely responsible for the difference.


Elevating Antioxidant Levels in Food Through Organic Farming and Food Processing

“It is clear that consuming organic fruits, vegetables, and whole grains promotes good health, and that the antioxidants in these foods play complex and important roles in enhancing human health and well-being.”

by Charles Benbrook, Ph.D.

Antioxidants are chemicals that help prevent or reduce tissue damage in cells caused by free radicals. Free radicals are oxygen and nitrogen-based molecules with unpaired electrons that are generated by a number of metabolic processes within the body. Antioxidants inhibit damaging reactions within human cells by providing the positively charged atoms needed to neutralize free radicals, which are also called “reactive oxygen species” (ROS), or “reactive nitrogen species.” (For more on the key terms see the Glossary at the end of this summary.)

The total supply of antioxidants circulating in the body is the sum of antioxidant enzymes and acids manufactured by the body, plus antioxidants consumed in foods. The human body manufactures a wide range of antioxidants including enzymes, alpha-lipoic acid, coenzyme Q10, ferritin, uric acid, lactoferrin, and many others.

Plants produce more than 50,000 “secondary plant metabolites” (SPMs) as part of their normal growth processes and in response to stresses in the environment. Stress might arise from insects, plant diseases, chemical imbalances in the soil, or weather extremes. Some SPMs are polyphenol flavonoids and many of these are antioxidants. Plants are the source of essentially all antioxidants in the diet, including the carotenoids and beta-carotene, ascorbic acid, tocopherols, and lycopene. Plant-based animal feed is the source of antioxidants in milk, meat and poultry products.

By lessening free radical damage in human tissues, antioxidants reduce inflammation and can lessen joint muscle pain. Through this mechanism, antioxidants can play a role in promoting cardiovascular health, lessening the risk and severity of neurodegenerative diseases like Alzheimer’s and Parkinson’s disease, and in general, help slow the aging process.

A wide range of studies has shown that plant antioxidants are also anti-proliferative (i.e., they slow the proliferation of cells). In this way, antioxidants can prevent or slow the growth of some cancerous tumors. And recent research suggests that some polyphenols in plants can increase the sensitivity of the body to insulin, thereby delaying the onset of Type 2 diabetes or slowing the progression of this increasingly common disease.

Because of the many potential health benefits associated with antioxidant consumption, increasing average daily antioxidant intake through the diet has emerged as an important public health goal and is a major factor behind the U.S. government’s broad-based effort to increase fruit and vegetable consumption.

The weight of the evidence reviewed here suggests that a shift toward organic farming methods can play a role in promoting overall health. By reducing the exposure to other chemicals, bacteria and viruses. The linkages between antioxidant intake and health promotion and disease prevention are complex and dynamic and are difficult to definitively prove.

The degree of biological response and health benefits following consumption of antioxidants in a given food is a complex function of each person’s health status and total diet and age, as well as exposures to other chemicals, bacteria and viruses. The linkages between antioxidant intake and health will not guarantee good health. Antioxidant intake is just one piece in the complex puzzle linking dietary choices to health outcomes.

Epidemiological evidence has confirmed that diets rich in fruits and vegetables are associated with reduced frequency and severity of several health problems. Scientists have been searching intensely for decades to identify the specific ingredients in fruits and vegetables that account for their many health-promoting benefits. Increasingly, that search points to combinations of essential vitamins, minerals, fiber and antioxidants.

Because antioxidants cannot substitute for each other and some do not last long once ingested, they slow the proliferation of cells. In this way, antioxidants are also anti-proliferative (i.e., they slow the proliferation of cells). Moreover, consuming more fruits and vegetables is often associated with lessened consumption of other, often fatty and low-fiber foods. For this reason, some of the health benefits stemming from extra servings of fruits and vegetables may arise to some degree from a “substitution effect” in a person’s overall diet.

So why not simply add antioxidant supplements to the diet? Dietary supplements do not appear to deliver the full range of health-promoting benefits that stem from consumption of whole foods that are rich in antioxidants. In addition, plant antioxidants help trigger and modulate a number of biosynthetic processes in the human body. To optimally promote health though, they must be present in the right proportions relative to a variety of other vitamins, minerals, fats and proteins. Excesses of certain nutrients and bioactive chemicals, including antioxidants, can be as damaging as inadequate levels. Some antioxidants become prooxidants at high doses and levels, and then increase the risk of cellular damage from reactive oxygen species, especially if the levels of other antioxidants in the body are depressed.

Increasing the amounts of antioxidants consumed in food will not guarantee good health. Antioxidant intake is just one piece in the complex puzzle linking dietary choices to health outcomes.

Increasing the amounts of antioxidants consumed in food will not guarantee good health. Antioxidant intake is just one piece in the complex puzzle linking dietary choices to health outcomes. Epidemiological evidence has confirmed that diets rich in fruits and vegetables are associated with reduced frequency and severity of several health problems. Scientists have been searching intensely for decades to identify the specific ingredients in fruits and vegetables that account for their many health-promoting benefits. Increasingly, that search points to combinations of essential vitamins, minerals, fiber and antioxidants.

Because antioxidants cannot substitute for each other and some do not last long once ingested, conventional and organic foods, levels in organic food averaged about one-third higher.

Complex Linkages Between Antioxidants and Health

The degree of biological response and health benefits following consumption of antioxidants in a given food is a complex function of each person’s health status and total diet and age, as well as exposures to other chemicals, bacteria and viruses. The linkages between antioxidant intake and health promotion and disease prevention are complex and dynamic and are difficult to definitively prove.}

<table>
<thead>
<tr>
<th>Antioxidant Category and Fresh Food</th>
<th>Serving Size (grams)</th>
<th>Typical Serving</th>
<th>H-ORAC Units per gram</th>
<th>H-ORAC Units per Serving</th>
<th>Calories per Serving</th>
<th>H-ORAC Units per Calorie</th>
<th>Ranking of Foods by H-ORAC Units per Calorie</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Very High</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Blueberries, wild</td>
<td>1 cup</td>
<td>1 cup</td>
<td>92.0</td>
<td>13,311</td>
<td>44</td>
<td>247</td>
<td>1</td>
</tr>
<tr>
<td>Antidote, cooked</td>
<td>8 cup</td>
<td>1 cup</td>
<td>57.2</td>
<td>879</td>
<td>4.3</td>
<td>196</td>
<td>2</td>
</tr>
<tr>
<td>Blackberry, raw</td>
<td>1 cup</td>
<td>12.0</td>
<td>17.0</td>
<td>255</td>
<td>4.1</td>
<td>107</td>
<td>3</td>
</tr>
<tr>
<td>Blackberry, raw</td>
<td>5 l, b.</td>
<td>2.8</td>
<td>28.10</td>
<td>395</td>
<td>38</td>
<td>128</td>
<td>5</td>
</tr>
<tr>
<td>Blackcurr, 1 cup</td>
<td>1 cup</td>
<td>52.45</td>
<td>13,330</td>
<td>62</td>
<td>122</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>Strawberries</td>
<td>1 cup</td>
<td>35.41</td>
<td>5,820</td>
<td>73</td>
<td>111</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td>Blueberries, cultivated</td>
<td>5 l, b.</td>
<td>61.84</td>
<td>5,806</td>
<td>83</td>
<td>129</td>
<td>8</td>
<td></td>
</tr>
<tr>
<td>Cabbage, red, cooked</td>
<td>1 cup</td>
<td>31.46</td>
<td>2,820</td>
<td>32</td>
<td>107</td>
<td>9</td>
<td></td>
</tr>
<tr>
<td>Raspberries</td>
<td>1 cup</td>
<td>47.84</td>
<td>5,940</td>
<td>56</td>
<td>127</td>
<td>13</td>
<td></td>
</tr>
<tr>
<td>Apple (Red Delicious)</td>
<td>1 cup</td>
<td>42.34</td>
<td>5,840</td>
<td>22</td>
<td>82</td>
<td>14</td>
<td></td>
</tr>
<tr>
<td>Apple (Granny Smith)</td>
<td>1 cup</td>
<td>39.63</td>
<td>5,322</td>
<td>72</td>
<td>74</td>
<td>13</td>
<td></td>
</tr>
<tr>
<td>Starchy Carrots</td>
<td>1 cup</td>
<td>33.64</td>
<td>4,649</td>
<td>41</td>
<td>33</td>
<td>19</td>
<td></td>
</tr>
<tr>
<td>Beans, red, kidney</td>
<td>1 cup</td>
<td>146.04</td>
<td>1,022</td>
<td>310</td>
<td>83</td>
<td>23</td>
<td></td>
</tr>
<tr>
<td>Salad Greens</td>
<td>1 cup</td>
<td>11.83</td>
<td>2,499</td>
<td>89</td>
<td>36</td>
<td>24</td>
<td></td>
</tr>
<tr>
<td>Beans, pinto</td>
<td>1 cup</td>
<td>11.03</td>
<td>7,193</td>
<td>2,500</td>
<td>13</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td>Peas, red, kidney</td>
<td>1 cup</td>
<td>7,193</td>
<td>8,160</td>
<td>2,500</td>
<td>13</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td>Green, red</td>
<td>1 cup</td>
<td>10.40</td>
<td>2,624</td>
<td>155</td>
<td>18</td>
<td>30</td>
<td></td>
</tr>
<tr>
<td>Tomato, blended, cooked</td>
<td>1 cup</td>
<td>15.21</td>
<td>3,500</td>
<td>106</td>
<td>18</td>
<td>43</td>
<td></td>
</tr>
<tr>
<td>Tomato, red, cooked</td>
<td>1 cup</td>
<td>20.12</td>
<td>4,262</td>
<td>153</td>
<td>21</td>
<td>40</td>
<td></td>
</tr>
<tr>
<td>Average</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>45.8</td>
</tr>
</tbody>
</table>

Notes: Serving size and H-ORAC units per gram from [Paris et al., 2000]. Calories per serving from the USDA database on the nutrient composition of foods.
people need to consume antioxidants in plant-based foods with most meals in order to sustain optimal levels in the body. A variety of strategies should be pursued to increase average antioxidant intakes including selecting additional servings of a diverse selection of fruits and vegetables. Buying locally grown and fresh produce that has been harvested relatively ripe is another proven strategy to increase antioxidant intake.

**Antioxidant Levels Vary Widely Across Foods**

The ten foods richest in antioxidants include blueberries, plums, broccoli, strawberries, and red cabbage. These antioxidant-dense foods provide, on average, three times more antioxidant capacity per calorie than the ten foods that rank lowest on the scale of antioxidant capacity per calorie. Low-antioxidant foods include cucumbers, granola, cereal, canned corn, and lima beans.

The USDA has classified foods into four groups as a function of antioxidant content per typical serving and per gram or per calorie: very high, high, moderate, and low. Just a five-to-ten percent increase in the antioxidant capacity in a food already high in the ranking of antioxidant capacity per calorie would deliver a bigger boost to daily antioxidant intake than a full serving of most low-antioxidant foods. A thirty percent average increase in the antioxidant capacity of a single-serving food or a food in the USDA’s “very high” antioxidant category would increase total antioxidant intake by over 1,800 H-ORAC units (a common measure of a food’s total antioxidant capacity). It would take an additional 5.6 servings of a typical food in USDA’s “low” antioxidant category in order to increase total antioxidant intake by a comparable amount. These enormous differences support a common recommendation made by nutritionists to consumers — select a variety of brightly colored fruits and vegetables in the course of increasing overall fruit and vegetable intake.

Minimal cooking and food preparation tends to preserve most of the antioxidants in food when harvested. As a rule of thumb, the more processed and heavily cooked food is, the greater the average loss of antioxidants.

Another promising option is to identify combinations of plant varieties and farming systems that routinely increase the levels of antioxidants in food. Even relatively modest increases in antioxidant levels, like those that appear attainable through organic farming methods, could have a substantial impact on public health, especially if coupled with progress toward more healthy diets and lifestyles.

**Existing Studies Show That Organic Farming Methods Increase Antioxidant Levels Compared to Conventional Production Systems**

A wide range of factors can influence the mix and levels of antioxidants that a plant manufactures. In general, factors that impose stress on plants tend to trigger stress-defense and wound-healing mechanisms, and these mechanisms are driven by and/or entail the synthesis of various polyphenols, many of which are antioxidants. These well-known facts led many scientists to hypothesize that plants on organic farms produce higher levels of polyphenols and antioxidants because the plants on organic farms are grown without added protection provided by synthetic pesticides. Several studies have directly tested this hypothesis and supported its basic premise. None have rejected it.

Studies provide evidence that several core practices on organic farms — use of compost, cover crops, and decrease forms of nitrogen — can increase antioxidant and polyphenol content compared to conventional practices that depend on commercial fertilizers and pesticides. Scientific interest in exploring the links among farming practices, plant genetics, and food quality is growing, especially in Europe.

Seven studies make direct comparisons of levels of antioxidants in organic versus conventional produce. Each study sought to isolate the impact of organic farming methods on antioxidant levels by selecting matched pairs of organic and conventional crops that were similar in every respect, except for use of organic versus conventional production practices. In general, the crops were grown from the same plant varieties, on similar soils, and under the same weather conditions. The major differences in farming practices arose from the use of commercial fertilizers and pesticides, or conventional vs. organic forms of compost and cover crops, in contrast to biologically-based soil fertility and pest control practices on the organic fields.

These studies report fifteen cases where there were statistically significant differences in antioxidant levels in organic food compared to conventional food grown nearby using similar genetics and production practices. Organically grown produce had higher antioxidant levels in thirteen out of fifteen cases, and in two cases, the levels were higher in conventional produce. On average where there were differences, the organic crops contained about one-third higher antioxidant and/or phenolic content than the comparable conventional produce.

Several studies have found levels of specific vitamins, flavonoids or antioxidants in organic foods to be two or three times those found in matched samples of conventional foods.

Given the many factors affecting antioxidant levels, more research must be done to sort out the relative importance of each individual factor. More sophisticated experimental designs are needed and will help control for confounding variables. Improved and more consistent antioxidant testing methods are needed in order to produce data in multiple studies that can be compared across regions, crops, and over time. The characterization of conventional and organic farming systems also needs to be sharpened.

Despite limits in existing studies and the need for more research, the available evidence is encouraging and provides hope that widespread adoption of some of the limits of organic farming methods will increase average antioxidant levels in many foods. Harvesting fruits and vegetables at optimal ripeness and consuming them in less-processed forms, without removing skins, will preserve a greater portion of the antioxidants in these foods as they leave the farm. This is because the outer layers of fruits and vegetables typically contain the highest concentrations of antioxidants.

Like antioxidant levels, pesticide residues are also most common on the skin of fresh produce. Some consumers peel produce as a precautionary step to reduce pesticide uptake. Organic produce can therefore deliver a dual benefit to consumers by maximizing antioxidant intake and minimizing pesticide dietary exposure.

**Organic Processing May Also Increase Antioxidant Levels**

There are some significant differences between organic and conventional food processing technologies, especially those involving the extraction of oils from plant-based foods. Some of these differences are known to have an impact on antioxidant levels. For example, the synthetic chemical hexane is often used in extraction of oils from crops in conventional oil processing plants, but is prohibited in organic oil processing. Hexane is known to promote removal of lipid-soluble antioxidants such as the tocopherols. Polyphenol levels are typically reduced in alcohol or aqueous extraction methods. High-temperature and high-pressure processing technologies also tend to cause degradation of antioxidant and polyphenol content in foods, especially those that are water-soluble. Organic food processing plants often use lower pressure, cold-pressing methods to extract oils and juices. They use these methods to produce oils and juices that are richer in flavor and retain more nutrients, including antioxidants. Increasing retention of antioxidants in foods as they are processed and prepared may offer some of the most cost-effective strategies to increase average antioxidant intakes, especially in the near term.

**Conclusions**

It is clear that consuming organic fruits, vegetables and whole grains promotes good health, and that the antioxidants in these foods play complex and important roles in enhancing human health and well being. Current evidence suggests that organic farming methods increase average concentrations of

<table>
<thead>
<tr>
<th>Polyphenoloxidase (PPO) Activity and Total Polyphenol Content of Conventional and Organic Peaches and Pears</th>
<th>Peaches</th>
<th>Pears</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Conventional</strong></td>
<td><strong>Organic</strong></td>
<td><strong>Conventional</strong></td>
</tr>
<tr>
<td><strong>PPO Activity (IU/100 g pear)</strong></td>
<td>2.093</td>
<td>2.655</td>
</tr>
<tr>
<td><strong>Total Polyphenols</strong></td>
<td>21.2</td>
<td>29</td>
</tr>
</tbody>
</table>

Note: PPO activity measured as 1-hydroxybenzene-3-carboxylic acid activity (JHE). One unit of activity is the amount of enzyme that caused an absorbance increase of 0.001 unit per minute in the conditions of the assay. Total polyphenol concentrations measured as mg tannic acid per 100 g fresh weight.
phenolic antioxidants in selected fruits, vegetables, and grains. Increased consumption of organically grown, polyphenol-rich fruits, vegetables, and grains will have a positive impact on antioxidant status and human health, especially if produce is harvested relatively ripe and consumed in a relatively unprocessed form.

Glossary
Antioxidant - An enzyme or other organic molecule that can counteract the damaging effects of oxygen in tissues.
Carotenoids - Yellow, orange and red pigments in plants, often masked by chlorophyll and thought to function as antioxidants.
Enzyme - A protein that catalyzes a chemical reaction. A substance that increases the speed of a chemical reaction without being changed in the process.
Free Radical - An atom or a molecule with an unpaired electron, highly reactive with nearby molecules. Free radical damage may be countered with antioxidants.
Oxidation - A chemical reaction that removes electrons from an atom or molecule.
Oxidative Stress - A state in which the effects of free radicals exceed the ability of antioxidant systems to neutralize them.
Phytochemical - Substance derived from a plant. The term is generally reserved for molecules with biological activity.
Prooxidant - An atom or molecule that promotes oxidation of another atom or molecule by accepting electrons, free radicals, reactive oxygen species (ROS) and reactive nitrogen species (RNS).
Reactive nitrogen species (RNS) - Highly reactive chemicals, containing nitrogen, that react easily with other molecules resulting in potentially damaging modifications.
Reactive oxygen species (ROS) - Highly reactive chemicals, containing oxygen, that react easily with other molecules resulting in potentially damaging modifications.

Chuck Benbrook is Chief Scientist, The Organic Center for Education and Promotion. The Organic Center’s full “State of Science Review” on antioxidants can be found at: /stateofscience.htm.

<table>
<thead>
<tr>
<th>Ascorbic Acid and Total Phenolic (mg/100g fresh weight) in Frozen Conventional and Organic Marionberries and Corn</th>
<th>Marionberries</th>
<th>Corn</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Conventional</strong></td>
<td><strong>Organic</strong></td>
<td><strong>Organic as a Percent of Conventional</strong></td>
</tr>
<tr>
<td>Ascorbic Acid</td>
<td>ND</td>
<td>2.1</td>
</tr>
<tr>
<td>Total Phenolics</td>
<td>412</td>
<td>620</td>
</tr>
</tbody>
</table>

Note: Total phenolics is corrected for ascorbic acid content. Similar differences were observed for frozen-dried and air-dried marionberries and corn.

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HOSTED BY HAWTHORNE VALLEY FARM
Building sustainable communities means building a lasting, supportive network of personal, conscious, and collaborative relationships. Agriculture can provide the fundamental basis for these relationships in the way we:

- observe, nurture, and care for the natural world entrusted to us on our farms;
- transform and process food while preserving and honoring its life forces;
- relate to those who transport our food from farm to table;
- foster mutual concern and understanding amongst farmers, distributors, and consumers.

Plan now to join us this summer for four days of workshops and speakers as we examine our theme from the viewpoint of the Producer, Distributor, and Consumer. Keynote speakers include STEFFEN SCHNEIDER, farmer and General Manager at Hawthorne Valley Farm; JEAN PAUL COURTENS, farmer at Rosbury Farm, a local, 500-member biodynamic CSA; VERLYN KLINKENBERG, member of the New York Times editorial board, book author, and essayist; GARY LAME, Director of the Center for Social and Environmental Responsibility at Hawthorne Valley Association; and HILARY BAUM, director of Baum Forum and author of Farming as the Foundation for Social Change.

Our presenters will offer sessions on a wide variety of topics, including:

- Livestock management • plant and animal breeding • biodynamic seed production • vegetable growing for CSA and green markets • making farmstead cheese • Steinert’s Agricultural Course in the life of a working farm • the plant as a teacher of transformative thinking • the farm individuality • working with children on a biodynamic farm • land ownership for new farmers • cultivating the soil and the social life on our farms • drawing living plants and animals • biodynamics, nutrition and consumer awareness • apprenticeship training • and much more

We’ll combine all of this with delicious biodynamic and organic food from Hawthorne Valley and other local farms, farm tours, lively conversation and music to create an experience you won’t want to miss. For a complete schedule and registration information, contact:

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Chuck Benbrook is Chief Scientist, The Organic Center for Education and Promotion. The Organic Center’s full “State of Science Review” on antioxidants can be found at: /stateofscience.htm.
Organic Farming Reduces Nitrogen Pollution of Groundwater as Well as Greenhouse Gas Pollution

by Environment News Service

Organic farming has been promoted as an environmentally friendly alternative to conventional agriculture, and new research provides evidence to support that claim. Writing in the March 6 online edition of the Proceedings of the National Academy of Sciences (PNAS), Stanford University graduate student Sasha Kramer and her colleagues found that fertilizing apple trees with synthetic chemicals produced more adverse environmental effects than feeding them with organic manure or alfalfa.

“The intensification of agricultural production over the past 60 years and the subsequent increase in global nitrogen inputs have resulted in substantial nitrogen pollution and ecological damage,” Kramer and her colleagues write. “The primary source of nitrogen pollution comes from nitrogen-based agricultural fertilizers, whose use is forecasted to double or almost triple by 2050.”

Nitrogen compounds from fertilizer can enter the atmosphere and contribute to global warming, adds Harold Mooney, the Paul S. Achilles Professor of Environmental Biology at Stanford and co-author of the study.

“Nitrogen compounds also enter our watersheds and have effects quite distant from the fields in which they are applied, as for example in contaminating water tables and causing biological dead zones at the mouths of major rivers,” Mooney says. “This study shows that the use of organic versus chemical fertilizers can play a role in reducing these adverse effects.”

The PNAS study was conducted in an established apple orchard on a four acre site in the Yakima Valley of central Washington, one of the premiere apple growing regions in the United States.

Some trees used in the experiment were raised with conventional synthetic fertilizers. Others were grown organically without pesticides, herbicides or artificial fertilization. A third group was raised by a method called integrated farming, which combines organic and conventional agricultural techniques.

During the yearlong experiment, organically grown trees were fed either composted chicken manure or alfalfa meal, while conventionally raised plants were given calcium nitrate, a synthetic fertilizer widely used by commercial apple growers. Trees raised using the integrated system were given a blend of equal parts chicken manure and calcium nitrate.

To measure nitrate levels during the experiment, water was collected in resin bags buried about 40 inches below the trees and then analyzed in the laboratory.

“We measured nitrate leaching over an entire year and found that it was 4.4 to 5.6 times higher in the conventional treatment than in the two organic treatments, with the integrated treatment in between,” says John Reganold, Regents Professor of Soil Science at Washington State University and co-author of the study.

“This study is an important contribution to the debate surrounding the sustainability of organic agriculture, one of the most contentious topics in agricultural science worldwide,” Reganold says.

“Our findings not only score another beneficial point for organic agriculture but give credibility to the middle-ground approach of integrated farming, which uses both organic and conventional nitrogen fertilizers and other practices. It is this middle-ground approach that we may see more farmers adopting than even the rapidly growing organic approach.”

Washington State produces more than half of the nation’s apples. In 2004, the state crop was worth about $963 million, with organically grown apples representing between five and 10 percent of the total value.

published March 8, 2006 on www.ens-newswire.com
More Omega 3 in Organic Milk

“Organic milk is a better source of Omega 3 essential fatty acids than conventional milk.”

by the Organic Milk Suppliers Cooperative, UK

Research published by the Institute of Grassland and Environmental Research (IGER) at Aberystwyth, Wales, has found that organic milk contains two-thirds more Omega 3 essential fatty acids than conventional milk. Omega 3 fatty acids are essential for good health, playing an important role in maintaining heart health, combating the effects of arthritis and developing healthy brains in unborn children.

OMSCO, the UK Organic Milk Suppliers Cooperative, is now calling on the Food Standards Agency to recognize the health benefits of organic milk. Sally Bagenal, Chief Executive of OMSCO, said, “Sir John Krebs has said in the past that there is no proof of the health benefits for organic food and drink, now it unequivocally exists. We are inviting the FSA to start recommending organic milk as part of a healthy diet.”

The research, led by Dr Richard Dewhurst found that samples of milk from organic cows contained at least 64% more Omega 3 than conventional milk. Dr Dewhurst said; “Our previous research has shown that samples of milk from organic cows contained at least 64% more Omega 3 than conventional milk. Dr Dewhurst said; “Our previous research has shown that milk from cows fed clover can contain up to 249% more Omega 3 fatty acids than milk from cows fed grass and concentrates. 1 Organic dairy farmers feed much higher levels of clover because they use it as an alternative to using synthetic chemical fertilisers to ensure lush pastures.”

Omega 3 fatty acids have to be obtained from food as they cannot be made in the body. Nutritionist and State Registered Dietitian, Sian Porter said; “Most people in the UK do not have an adequate intake of Omega 3 fatty acids and need to increase the amount of Omega 3 rich foods in the diet. The best source is oily fish, but research has shown that only a third of the population eats oily fish regularly. Drinking just half a pint a day of organic milk as part of a healthy balanced diet gives a useful additional source of this Omega 3 fatty acid, as it provides approximately 10% of the recommended daily intake (RDI) of essential n-3 fatty acid, alpha-linolenic acid. Eating a matchbox sized piece of organic cheese will give you up to 88% of your RDI of this Omega 3 fatty acid.”

Sally Bagenal added, “Evidence is accumulating that organic milk is more nutritious and safer than conventional. We know that organic food is less likely to contain pesticide and antibiotic residues. In 2000, research found organic milk contains higher levels of conjugated linoleic acid (CLA)2 which helps boost your immune system, and now this research by IGER shows that organic milk is a better source of Omega 3 essential fatty acids than conventional milk.”


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Organic farming approaches for these crops not only use an average of 30 percent less fossil energy but also conserve more water in the soil, induce less erosion, maintain soil quality and conserve more biological resources than conventional farming does,” Pimentel said, pointing out that soil carbon in the organic systems increased by 15 to 28 percent, the equivalent of taking about 3,500 pounds of carbon dioxide per hectare out of the air.

Among the study’s other findings:

• In the drought years, 1988 to 1998, corn yields in the legume-based system were 22 percent higher than yields in the conventional system.
• The soil nitrogen levels in the organic farming systems increased 8 to 15 percent. Nitrate leaching was about equivalent in the organic and conventional farming systems.
• Organic farming reduced local and regional groundwater pollution by not applying agricultural chemicals.

Pimentel noted that although cash crops cannot be grown as frequently over time on organic farms because of the dependence on cultural practices to supply nutrients and control pests and because labor costs average about 15 percent higher in organic farming systems, the higher prices that organic foods command in the marketplace still make the net economic return per acre either equal to or higher than that of conventionally produced crops.

Organic farming can compete effectively in growing corn, soybeans, wheat, barley and other grains, Pimentel said, but it might not be as favorable for growing such crops as grapes, apples, cherries and potatoes, which have greater pest problems.

The study was funded by the Rodale Institute and included a review of current literature on organic and conventional agriculture comparisons. According to Pimentel, dozens of scientific papers reporting on research from the Rodale Institute Farming Systems Trial have been published in prestigious refereed journals over the past 20 years.

Published July 13, 2005 on the Cornell News Service
New Studies Back Benefits of Organic Diet

“There was a dramatic and immediate protective effect against the pesticides while consuming organically grown foods,” by Stephen Leahy

Organic foods protect children from the toxins in pesticides, while foods grown using modern, intensive agricultural techniques contain fewer nutrients and minerals than they did 60 years ago, according to two new scientific studies.

A U.S. research team from Emory University in Atlanta analyzed urine samples from children ages three to 11 who ate only organic foods and found that they contained virtually no metabolites of two common pesticides, malathion and chlorpyrifos.

However, once the children returned to eating conventionally grown foods, concentrations of these pesticide metabolites quickly climbed as high as 263 parts per billion, says the study published Feb. 21, 2006.

There was a “dramatic and immediate protective effect” against the pesticides while consuming organically grown foods, said Chensheng Lu, an assistant professor at the Rollins School of Public Health at Emory University.

These findings, in addition to the results of another study published in Britain earlier this month, have fueled the debate about the benefits of organically grown food as compared to conventional, mass-produced foods, involving academics, food and agro-industry executives and activists in the global arena.

According to the new British analysis of government nutrition data on meat and dairy products from the 1930s and from 2002, the mineral content of milk, cheese and beef declined as much as 70 percent in that period.

“These declines are alarming,” Ian Tokelove, spokesman for The Food Commission that published the results of the study, told Tierramérica. The Commission is a British non-governmental organization advocating for healthier, safer food.

The research found that parmesan cheese had 70 percent less magnesium and calcium, beef steaks contained 55 percent less iron, chicken had 31 percent less calcium and 69 percent less iron, while milk also showed a large drop in iron along with a 21 percent decline in magnesium.

Copper, an important trace mineral (an essential nutrient that is consumed in tiny quantities), also declined 60 percent in meats and 90 percent in dairy products.

“It seems likely that intensive farming methods are responsible for this,” Tokelove said from his office in London.

Although controversial, a number of other studies have also found differences between conventionally produced foods and foods grown organically or under more natural conditions.

Organic foods and vegetable had significantly higher levels of cancer-fighting antioxidants, according to a 2003 study in Journal of Agricultural and Food Chemistry.

The organic plants produced these chemicals to help fight off insects and competing plants, researchers said.

A 2001 report by Britain’s Soil Association looked at 400 nutritional research studies and came to similar conclusions: foods grown organically had more minerals and vitamins.

“Modern plant breeding for quick growth and more minerals and vitamins. Modern plant breeding for quick growth and more minerals and vitamins,” says Katherine Tucker, director of the nutritional epidemiology program at Tufts University.

Lower levels of minerals in food we eat is cause for concern, she says, stressing that “magnesium, calcium and other minerals are very important for proper nutrition.”

Good nutrition and exercise are the major factors that can make a difference in the incidence of many diseases, including cancer, according to Tucker.

She recommends eating unprocessed foods, meat from free-range animals, and grains, fruits and vegetables grown organically or at least using more natural farming methods.

Farmers in other parts of the world should not adopt the intensive farming practices of North America or Europe, says Ken Warren, a spokesman for The Land Institute, based in Kansas.

“It’s an unsustainable system that relies heavily on chemical fertilizers... to keep yields high and produces ‘hollow food’,” Warren told Tierramérica.

“Hollow food” contains insufficient nutrition and is suspected in playing a role in the rapid rise in obesity, as people may be eating more in order to get the nutrition they need, he said.

Crops take minerals, trace elements and other things from the soil every year. All that modern agriculture puts back into the land are some chemical fertilizers which do not replace all that has been lost, Warren said.

Moreover, herbicides and insecticides kill microorganisms in the soil that play an important role in maintaining soil fertility and helping plants grow.

Pesticide residues in modern agriculture are another cause for concern. A 2003 University of Washington study found that children eating organic fruits and vegetables had concentrations of pesticide six times lower than children eating conventional produce.

The Land Institute advocates what it calls “natural systems agriculture.” This involves the use of perennial crops in polycultures, that is, planting several different crops together as has been practiced in traditional gardens and farm plots in many parts of the world.

“Farmers in other parts of the world should learn from American agriculture’s mistakes. Looking to nature is a better model for farming,” Warren said.

Stephen Leahy is a Tierramérica contributor. Tierramérica is a specialized news service produced by Inter Press Service with the backing of the United Nations Development Program and the United Nations Environment Program. This article was originally published Mar. 4, 2006 at www.ipnews.net.

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Brockton, MA
As we have substituted chemical fertilizers, pesticides and monoculture farming for the natural cycling of nutrients and on-farm biodiversity, we have lessened the nutritional value of our produce. Integrated well-established organic farming systems can counter the decline.

The fruits and vegetables that our parents ate when they were growing up were more nutritious than the ones we’ll serve our children tonight. On average, the produce we grow in the United States has lower levels of several vitamins and minerals today than it did 50 to 60 years ago. By growing or buying and eating organic produce, however, we can make up much of the difference. Organically grown fruits and vegetables are proving to have higher levels of antioxidants, vitamins and minerals than their conventionally grown counterparts.

Donald R. Davis, a research associate with the Biochemical Institute at the University of Texas, Austin, recently analyzed data gathered by the USDA in 1950 and 1999 on the nutrient content of 43 fruit and vegetable crops. He found that six out of 13 nutrients had declined in these crops over the 50-year period (the seven other nutrients showed no significant, reliable changes). Three minerals, phosphorous, iron and calcium, declined between 9 percent and 16 percent. Protein declined 6 percent. Riboflavin declined 38 percent and ascorbic acid (a precursor of vitamin C) declined 15 percent.

A study of the mineral content of fruits and vegetables grown in Britain between 1930 and 1980 shows similar decreases in nutrient density. The British study found significantly lower levels of calcium, magnesium, copper and sodium in vegetables, and of magnesium, iron, copper and potassium in fruit. The report concludes that the declines indicate “that a nutritional problem is accumulating rapidly. It isn’t uncommon for researchers to find that Good science comparing the nutritional value of organic and conventional foods is accumulating rapidly. It isn’t uncommon for researchers to find that the higher nutrient levels in organic produce completely offset the declines.

The decline in our produce’s nutritional value corresponds to the period of increasing industrialization of our farming systems. As we have substituted chemical fertilizers, pesticides and monoculture farming for the natural cycling of nutrients and on-farm biodiversity, we have lessened the nutritional value of our produce. Integrated well-established organic farming systems can counter the decline.

Good science comparing the nutritional value of organic and conventional foods is accumulating rapidly. It isn’t uncommon for researchers to find that the higher nutrient levels in organic produce completely offset the decline. Davis found in conventional produce. “What all our data shows,” says Charles Benbrook, chief scientist at the Organic Center and a former executive director of the Board on Agriculture of the National Academy of Sciences, “is that whenever there’s been a valid comparison between conventional and organic, organic is virtually never lower than conventional and, in a significant number of cases, it’s higher. Sometimes it’s significantly higher in several important nutrients.”

For example, Virginia Worthington, a clinical nutritionist who earned her doctorate in nutrition at Johns Hopkins, published a review in 2001 of 41 studies comparing the nutritional value of organic and conventional produce. After tallying the data across all the studies, Worthington concluded that organic produce had on average 27 percent more vitamin C, 21.1 percent more iron, 29.3 percent more magnesium and 13.6 percent more phosphorous than conventional produce.

Benbrook released a review in 2005 of the research comparing antioxidant levels in conventional and organic foods. In humans, antioxidants reduce damage to cells and DNA from free radicals (molecules generated by metabolic processes within the body), and thereby promote cardiovascular health, inhibit the reproduction of cancerous cells, slow the aging process in the brain and nervous systems, and lessen the risk and/or severity of Alzheimer’s, Parkinson’s and Huntington’s diseases. Benbrook found that in 85 percent of the comparable data points, produce from organic farms had higher levels of antioxidants than did produce from conventional farms. On average, antioxidant levels in organic produce were 30 percent higher.

Earlier this year, a Swedish team of scientists demonstrated that extracts from organically grown strawberries slowed the proliferation of colon and breast cancer cells to a significantly greater degree than extracts from conventional strawberries did. The levels of all the antioxidants analyzed by the team were higher in the organic strawberries than in the conventional.

“As someone that has been involved with science and science policy for my whole life,” says Benbrook, “I think the scientific case has been made for organic produce. The case has been made firmly enough so that it is appropriate and, indeed, irresponsible at this point not to tell consumers straight up that choosing organic fruits and vegetables probably delivers nutritional benefits because of the higher levels of antioxidants and vitamins and minerals.”

The decline in nutrients

Our push for higher yields per acre and cheaper food is largely to blame for the decline in nutrient levels in conventional produce. With irrigation and fertilization we can get more pounds per acre, but often not without sacrificing nutrients per pound produced. This “dilution effect” on nutrient density was widely observed by agricultural scientists even 20 to 30 years ago. The use of hybrids selected for high yields has probably compounded the trade-off between yield and nutrients. Davis writes, “Modern crops that grow larger and faster are not necessarily able to acquire nutrients at the same, faster rate, whether by synthesis or by acquisition from the soil.”

In addition to pushing a plant to grow big fast, heavy fertilization can interfere with a plant’s ability to synthesize vitamin C. A plant will increase protein synthesis or by acquisition from the soil.”

In addition to pushing a plant to grow big fast, heavy fertilization can interfere with a plant’s ability to synthesize vitamin C. A plant will increase protein synthesis or by acquisition from the soil.”

Use of potassium fertilizers (potassium is the “K” in N-P-K fertilizers) can reduce the phosphorous content of some plants. For the plant to absorb...
phosphorous, it must have adequate amounts of magnesium. But when potassium is added to soil, plants absorb less magnesium, and, indirectly, less phosphorous as well.

Organic farmers do not use synthetic formulations of fertilizers, and this restriction is part of the reason organic produce has relatively higher nutrient values. Organic farmers feed their crops only indirectly. Instead of plowing plants with nitrogen, phosphorous and potassium in readily dissolved and absorbed powders and solutions, they fertilize their crops by adding organic matter to the soil in the form of composts, cover crops and manures. The organic matter feeds microorganisms in the soil that, in the process of eating and living and dying, recycle the nutrients embedded in the organic matter. The microbes slowly release not only nitrogen, phosphorous and potassium but also a host of other nutrients in ratios difficult to replicate with synthetic fertilizers.

The large populations of microorganisms that typically inhabit organically managed fields also produce substances that combine with minerals in the soil and make them more available to plants, a function that can be especially important for iron absorption. Iron is usually present in soil, but it is often in an unavailable form.

The relatively larger root-balls of organic plants are another reason organically grown plants can absorb a wider variety of nutrients than chemically fertilized plants can. Because organic plants don’t have macronutrients spoon-fed to them, they grow larger root systems out of necessity. Roots on organic plants have to range farther to access nutrients they sense how big a root system they need to grow and reach maturity and reproduce,” says Benbrook. “On a conventional farm where there are high levels of fertilizer nutrients in the soil, along with lots of water, there is little incentive for roots to penetrate far.”

Making healthful choices

The role that antioxidants play in plant health probably also contributes to the higher antioxidant levels found in organic produce. Many antioxidants help a plant resist diseases, deter pests and recover from insect damage. Because organically grown plants do not “benefit” from the protection of pesticides, they must be able to muster their own defenses and therefore produce high levels of antioxidants.

By providing plants with more balanced nutrition and by triggering production of higher levels of antioxidants, organic farming systems yield fruits and vegetables that are, on average, more nutrient dense than conventional produce. We can maximize the nutritional benefits of eating fruits and vegetables by choosing organic.

“For the average consumer that’s looking for a way to tilt their odds in favor of healthy development and graceful aging for themselves and for their families, the single most important thing they can do is eat more fruits and vegetables and less added fat, sugar and highly processed foods,” says Benbrook.

“The second most important thing for them to do is to seek out organic fruits and vegetables known to be high in vitamins and antioxidants.”

Foods rated “very high” and “high” in antioxidants

**VERY HIGH**
- Wild blueberry; artichoke, cooked; black plums; broccoli raab; blackberry; strawberry; cultivated blueberry; red cabbage; raspberry; apple (‘Red Delicious’); apple (‘Granny Smith’); sweet cherry; red kidney bean; navel orange; prune; pinto bean; pear (‘Red Anjou’); red grape; russet potato; raisin

**HIGH**
- Raw asparagus; red leaf lettuce; cooked asparagus; beet; red grapefruit; peach; yellow pepper; tangerine; cooked yellow onion; apricot; green grape; pineapple; white potato; black-eyed pea; almond

Source: The Organic Center

Resources


The Swedish study, conducted by Marie E. Olsson, C. Staffan Andersson, Sina Oredsson, Rakel H. Berglund and Karl-Erik Gustavsson, is “Antioxidant Levels and Inhibition of Cancer Cell Proliferation in Vitro by Extracts From Organically and Conventionally Cultivated Strawberries.” Journal of Agricultural and Food Chemistry, American Chemical Society, published on the Web, Jan. 21, 2006.


This article reprinted from the San Francisco Chronicle, Saturday, March 25, 2006

Deborah K. Rich is a freelance writer and olive rancher in Monterey.

E-mail her at home@sfchronicle.com

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Honoring the Orchard Ecosystem

by Michael Phillips

A deep-felt appreciation for the astounding diversity of life in the orchard – and just what that means for true system health – is where every holistic orchardist gets a proper handle on management choices. That which we focus on as paramount can and does drive the philosophy from which we steward our land and trees. Maximizing yields with chemical input produces one kind of apple; recognizing the fascinating interrelationship of natural cycles produces an entirely other kind of apple. The full reality of insect pests, disease pressures, and the nutritional merit of the apple itself follows from this simple launching point of understanding.

Seeing the Big Picture

Intuiting the “whole of orchard ecology” means we must perceive the complexity involved with even seemingly benign tasks. One can go out and mow six or more times, for instance, because that’s what Americans do with grass. Or we can understand how apple roots interact with mycorrhizal fungi beneath a haphazard mulching plan that encourages flowering meadow species in the aisle ways which provide nectar for adult parasitic wasps that lay their eggs in coding moth eggs. There’s a full day’s course in that statement, of course, but the point is we affect everything in the orchard when we do anything.

The revised and expanded edition of Apple Grower goes to great lengths to stress the importance of “wood’s edge ecology” and just what that means for the apple tree. Those teachings about haphazard mulching, the making of orchard compost, herbaceous root interaction, and abetting fungal dominance in the soil are essential concepts to grasp. Supporting diversity in a living soil provides answers we too often fail to recognize as growers. The symbiotic organisms which feed and protect our trees are the best of allies. The untapped minerals in almost any soil — once accessed by this healthy humus complex — are more than sufficient to revitalize every sensible orchard, year after year after year. What follows are additional insights about understory management that I consider especially profound.

The Fungal Curve

The growth cycle of feeder roots reveals the best timing for a number of orchard tasks. In a nutshell, the apple tree experiences two flushes of root growth that follows on the heels of observable green tissue. The “spring flush” corresponds perfectly with this red curve. Beneficial fungi and bacteria also arise and establish on the foliar surface during this outreach time of the “fungal being”. The successful employ of compost tea, induced systemic resistance, and minimal sulfur (on susceptible varieties) in holistic disease management all tie in directly to recognizing our allies.

Bioactivity of numerous decomposers on the orchard floor is represented by the hazy areas on the orchard floor in early spring and all through the fall months. Many of our practices aimed at reducing fungal disease inoculum in the understory are really about supporting the decomposers, which includes numerous species of beneficial fungi.

The intricate interactions of the soil food web are what make animated life above the ground possible. The below-ground portion of the fungal curve amounts to celebrating and abetting the role of mycorrhizal fungi in the orchard ecosystem. The fall flush of feeder roots is trumped a hundred times over by the mychora ree of these symbiotic fungi. Nutrient balance for the apple tree very much depends on the health of this life-support system.

Priming the Pump

The ability to get the juices flowing in such soil communities just when we most need bioactivity for decomposition and nutrient uptake comes to us in the form of “pulsing agents”. This is a tool that biological farmers need to understand!

A number of companies offer pulsing agent products to optimize metabolic function of the microorganisms and thus the soil food web as a whole. I’m listing the homegrown ways that I know of in preference to spending high dollar on products. But whatever you do, please keep in touch so I can share promising results on the Research Pages of www.HerbsAndApples.com.

Michael’s apple book has been a modest success, selling 15,000 copies since its publication by Chelsea Green in 1998. The exciting news is that this classic orcharding book has just been written anew! This time around Apple Grower comes in full color with many practical charts and seventy additional pages.

“Thus is a book I’d love to have written - the best source available of all the best information on growing healthy apples.”

Eliot Coleman, author of The New Organic Grower
A Golden Opportunity
Denitrification of domestic wastewater can start at the source: human urine

by Carol Steinfeld

Seth Wilkinson and Alison Flynn enjoy explaining their unusual toilet visitors. With its treated tank and unique two-button flush knob (one is pushed and one is pulled), it could pass for one of the new dual-flush toilets. But lift the lid and the key difference is apparent: inside, a small drained basin is cast like a shelf in the front of the toilet bowl, so that urine is caught and flushed with a tablespoon of water to a tank. Solids are flushed away via a standard 1.2-gallon flush to a conventional septic system.

This urine-diverting toilet, the Ekologen DS by West-Man of Sweden, is only one of a handful in North America, but they are far more common in Scandinavia, Mexico, China, and Germany. In some installations, such as in multi-unit buildings, the urine drains to tanks in ground or under the building that are periodically pumped. Others drain directly to onsite evapotranspiration trenches, sometimes lined. In some instances, the pumped urine is applied to animal fodder crops.

Wilkinson and Flynn live in Orleans, Massachusetts, on Cape Cod, a region grappling with nitrogen pollution affecting lakes, seashore, and groundwater. With the blessing of their local health agent, they chose the urine-diverting toilet to reduce their environmental impact. Urine drains to a 250-gallon in-ground tank. A float switch turns on a light when it’s full, about once a year. Flynn hoses the urine-water mixture on piles of composting leaves and walkways. The garden has no major odor, she reports.

Growing away pollution

Human urine accounts for about 90 percent of nitrogen in human excreta. What points to opportunities is that urine is usually pathogen free in a healthy population (feces are the main source of potential pathogens). In essence, we flush away free pathogen-free urea fertilizer in the form of urine. (How much nutrient value is determined by how much protein one eats.)

As federal regulations increasingly require tertiary treatment and regulators work to mandate existing advanced denitification systems—most with powered aeration to convert nitrogen to ammonia gas that is vented away—some are asking if there might be a better way to manage nitrogen. After all, they reason, it’s a valuable fertilizer when applied to crops and better way to manage nitrogen. After all, they reason, it's a valuable fertilizer when applied to crops and using it in place of farm chemicals. By not mixing urine with these sources of potential pathogens, the Swedes isolated the constituent—nitrogen—and put it to use.

Urine can be slightly acidic and salty. It should not be a common sense practice in the future.

The author picks cherry tomatoes and pole beans fertilized with the urine of employees of Ecovaters and Environmental Engineering Group in Concord, Mass. Urine was applied directly to the garden, which was heavily mulched with compost and topped with wood chips. Without the woodchips layer, full strength urine applications might be far too strong for the plants.

Porcelain urine-diverting toilets were developed in Sweden in the past decade in response to nutrient pollution and eutrophication evident in that country’s many lakes and along the Baltic and Atlantic coastlines. Large “dead zones” of eutrophication are now well documented, particularly in Sweden, where several research institutions and Stockholm’s water authority studied the sociology, bacteriology, and viability of collecting urine and using it to fertilize grain crops.

One of the most likely candidates for diverting urine may be on the very far horizon for the regulated mainstream in the U.S., we can thank the Swedes for pointing the way. Denitrification with urine diversion can be an easy way to complement existing septic systems without installing expensive biofilters. To treat urine for plant use, it must be oxidized to a nitrate form which plants can use. Or it can be diluted and mixed into well-aerated soils where the urine-diverting microorganisms complete the oxidation (nitrification) process.

Methods for managing diverting urine:
1. Drain urine to planted graywater system beds. For planted systems, urine’s nitrogen is a good addition to graywater, which is a lot of water and a little carbon (BOD) but nearly no nutrients. Direct this combination to a planted evapotranspiration bed. This can be very far horizon for the regulated mainstream in the U.S., but we can thank the Swedes for pointing the way.
2. Constructed wetlands created to treat only graywater often suffer for lack of nitrogen. Because the wetland environment is less aerobic than an aerobic, nitrogen in a wetland is largely lost to the atmosphere, providing cheap denitrification.
3. Drain urine to a tank that is periodically pumped like a septic system. The collected urine can be contained, tested for pathogens, and applied to high well-draining forests, tree farms or pastures lands. Or it can be discharged to a tertiary treatment plant.
4. Municipal composting facilities that handle woody landscape waste and shredded paper often have a nitrogen deficit. Urine provides a low-risk nitrogen match.

Urine can be slightly acidic and salty. It should not be distributed with drip-irrigation tubing unless it is diluted, otherwise emitters might clog.

The world needs all the nutrients we are flushing away each day in our urine. Given the high cost of chemical nitrogen fertilizers and the huge costs of using manufactured fertilizers, utilizing this valuable and usually pathogen-free resource deserves more consideration.

Diverting and using urine may seem on the “lunatic fringe” now, but the benefits are so great that it will be a common sense practice in the future.

Parts of this article are excerpted from Liquid Gold: The Lore & Logic of Using Urine to Grow Plants by Carol Steinfeld (Ecowaters Books).
Farming with Urine in Sweden
by Carol Steinfeld

A tank truck pulls up to a housing development outside Stockholm, extends a hose into an underground tank. Later, the truck heads to a farm where its contents are discharged into storage tanks. In the late 1990s, the Stockholm Water Company and other agencies tested and proved the viability of using urine as an agricultural fertilizer. Urine-diverting toilets that flush with a small volume of water were installed in four housing projects, from an ecovillage with 44 apartments to a public housing development with 51 apartments. Urine was drained to in-ground fiberglass tanks. Then it was transported to a facility outside Stockholm for testing. A farmer used the tested urine to fertilize grain crops.

In Sweden, urine-diverting toilets have long been manufactured, primarily for vacation and mobile homes; about 3,000 porcelain urine-diverting toilets were sold there in the 1990s alone. However, they were less common in year-round homes, with the exception of ecologically oriented housing often called ecovillages.

The urine was collected from an ecological community that uses urine-diverting toilets. The urine was contained in tanks for six months to assure deactivation of any pathogens present before it was collected by the farmer.

The Swedish study found urine is almost equal in strength and effectiveness to liquid mineral fertilizers that farmers buy and use. Compared to animal manure, human urine lacks only the microorganisms. The Swedish study also revealed that urine and flush water is free of pathogens if stored above freezing for three to six months. Naturally rising pH (from 7 to 9), high temperature, and time kills any pathogens present (from fecal contamination in the toilet).

The urine could also be used in gardens and landscapes at the housing developments.

The study is important for showing the significant advantages of collecting and using urine to enrich soils. Some conventional wastewater plants produce sewage sludge as a byproduct that is applied to forests and fields; however, sludge usually contains little nutrient content. Nitrogen and phosphorus are often reduced in the conventional wastewater systems and discharged to where they can pollute. Urine diversion makes it possible to use them to fertilize farmland, turning a wastewater challenge into an asset.

Results of the Swedish urine study, “Source-Separated Human Urine—A Future Source of Fertilizer for Agriculture in the Stockholm Region,” is detailed in the report, “Urine Separation—Closing the Nutrient Cycle.” It describes specifics of toilet installation, user acceptability, and farming techniques. The project was conducted by Stockholm Water Company, AB Stockholmshem, HSU National Federation, Swedish Institute for Infectious Disease Control, Swedish Land University, the Swedish Institute of Agricultural and Environmental Engineering, VERNIA Ecology, Linköping University, Chalmers University of Technology, and Swedish Environmental Protection Agency.

Stonyfield and Organic Valley See Potential in Massachusetts Dairies for Organic Milk
by Kate Rossiter

By way of $4,000 and $2,000 respectively, Stonyfield Farm and CROPP Cooperative/Organic Valley have offered their support to the NOFA/Mass Organic Dairy Program, whose goal is to help farmers in Massachusetts transition to organic milk production. As more and more consumers are reaching for organic milk (milk from cows raised on organic pasture and feed and not given growth hormones or treated with antibiotics) both companies are hoping to find dairies in the Bay State to help them meet the demand.

As dairy farmers continue to face low prices for conventional milk, many farmers in the Commonwealth and throughout the Northeast are making the switch to organic production. With a higher price per hundredweight than conventional milk, producing organic milk is seen as a way for farmers to keep their dairy viable. Despite the increasing number of organic dairies in the region, more organic milk is needed.

For information about the NOFA/Mass Organic Dairy Program, upcoming workshops and pasture walks, contact Kate Rossiter, NOFA/Mass Organic Dairy Coordinator, at krossiter@nofamass.org, or at (413) 625-0118. A list of resources is also available at the NOFA/Mass website, www.nofamass.org.

For information about CROPP/Cooperative, contact John Cleary, CROPP Northeast Dairy Pool Coordinator, at (802) 658-9291.

Quick Facts About Using Urine for Farm Fertilizer

- Human urine is a quick-acting fertilizer that can replace mineral fertilizer in cereal crop production. In trials, cereal crops fertilized with urine yielded 80 to 90 percent as much as those fertilized with mineral fertilizer.
- Nitrogen in urine is volatile; it can be lost to the air. So it must be stored in a covered container and worked into the soil to minimize nitrogen losses.
- Plants fertilized with urine suffered no toxic effects in trials. However, it’s best not to fertilize seeded grassland, as urine may be too strong for sprouting seeds.
- An estimated 1.5 to 2.6 quarts (1.5 to 2.5 liters) of urine solution (yellow water) per person is produced daily.
- Urine can be transported up to 137 miles (220 km) before the energy used surpasses that of conventional treatment.
- Nitrogen losses in the form of ammonia were less than 10% of the nitrogen applied and usually much lower.
- The risk of nitrogen leaching into water is no greater than when mineral fertilizer is used.
Summer Conference continued from page 1

If eating’s not the main reason you came to the conference, perhaps it is for the endless social and networking opportunities. Meet your neighbors and make new friends while Contra dancing inside the Robert Crown Center, dance the night away in the Red Barn Friday night, swap stories and drum beneath the stars during the Saturday night campfire, discuss the documentary films you’ve enjoyed or share your heartfelt ideas during the Saturday night debate.

NOFA Pre-Conference 2006 “Sprouting the Seeds of the Next Generation: Food and Farming Education”

From 1 to 5 p.m. on Thursday, August 10th and 8 a.m. to Noon on Friday, August 11th, the NOFA Pre-Conference will help farmers from throughout New England and beyond to share their knowledge and expertise about on-farm education programs, connecting agriculture to the classroom and adult farming education.

Pre-Conference presenters include: Mikey Azzara - NOFA-NJ; Pennington, NJ; Sara Cohn, Bryn Mawr, PA; UVM Extension: Brattleboro, VT; Leslie Cox and Nancy Hanson - Hampshire College: Amherst, MA; Bill Duesing - CT NOFA: Stevenson, CT; Kelly Erwin - MA Farm to School Project: Amherst, MA; Deb Habib - Seeds of Solidarity Farm and Education Center: Orange, MA; Dan Kaplan - Brookfield Farm: Amherst, MA; Ian Marvy - Added Value and Herban Solutions, Inc.: Brooklyn, NY; Abbie Nelson - NOFA-VT: Richmond, VT; and Amy Watmough and Keely Deutch - Shelburne Farms: Shelburne, VT.

The Pre-Conference will offer hands-on workshops, panel discussions, plenary talks and networking sessions. Presenters are encouraged to bring photographs, posters, handouts and flyers about their programs to display during the pre-conference networking sessions.

For the full schedule of the Pre-Conference, visit www.nofamass.org and click on the “Summer Conference” link, then click on the “Pre-Conference” link.

Sister Miriam MacGillis continued from page 1

perspective, so that farmers can see that what’s been happening is not a failure on their part. It is a failure in our culture’s world view that continues to believe that humans are disconnected from Earth.

“One of the major flaws of the western world view is that we think we’re separate from everything that is happening to the planet, that everything in the universe except us is made of physical matter, that we’re the only ones who have soul, spirit, psyche, whatever. That’s a crisis of major proportions now. The industrialized, mechanistic world view that’s causing this difficulty has to change and hopefully we can change it before we’ve done more terrible damage,” she said.

MacGillis was born in the small industrial city of Bayonne, NJ. At age 7, her family began to clear a heavily wooded area along the Musconetcong River, in what was then a sparsely populated area. As a child, she would often hike the Musconetcong, and in what was then a sparsely settled region of northwest New Jersey. Her childhood was deeply influenced by summers spent in the forests and fields of that watershed, and she developed a deep love of the earth. She entered the Dominican order in 1957 because she “wanted to do something good for the world and for God.”

“That’s how I would have seen it those days. I’m 66 years old now,” she laughed. “Like in a marriage, you’re going to have upsets all the time. I certainly have moved through lots and lots of changes in theology and in my understanding of the church, the scriptures, and my religious traditions (MacGillis was raised Roman Catholic). Now this whole work towards the fostering of life itself seems to be core to my belief in God. The issues we’re dealing with today really challenge the belief systems of all religions, to evolve to a deeper grasp of the world, in order to remain faithful to life.”

MacGillis received her master’s degree in art from the University of Notre Dame and has taught art at the high school and college levels. Following her peace and justice work in the 1970’s, a large tract of farmland in Blairstown, NJ was willed to her congregation of Dominican sisters. With three others, MacGillis submitted a proposal to found a reflection center focused around ecology, spirituality and agriculture.

In 1980, Genesis Farm was born, as a place for learning to live and farm sustainably, as well as to be “a learning center where people were welcomed to grapple with the big questions of life, what was happening to the planet and how our lifestyles could make a difference.”

It was viewing the film by Indian Line Farm entitled, “It’s Not Just About Vegetables” that prompted MacGillis and Heinz Thomer, a young, Swiss biodynamic farmer to found the Community Supported Agriculture (CSA) venture at Genesis Farm in 1987.

The first community meeting exploring the possibility of starting a CSA garnered 70 eager members who purchased the first shares; today Genesis Farm’s CSA supports 300 families with seasonal as well as winter shares, said MacGillis.

Today, on 226 acres, Genesis farm also offers a variety of residential and non-residential programs, including accredited graduate and undergraduate courses in Earth Literacy.

“...from the scientific understanding of an evolving universe. We have this thread that goes back to the beginning of time 13.7 billion years ago, on a planet nearly five billion years old. What we’ve done in the last 50 years of farming is not only an aberration, but it’s made possible by NOFA, Summer Conference link) or send scholarship donations, make sure you come!

Visit the Website!

Check out www.nofamass.org and click on the Summer Conference link to learn all about this year’s event. We’ve been hard at working up the site, making it user-friendly and getting up all of the Summer Conference information you need to know. View photos from last year’s event, read the post-event article from The Natural Farmer, get the scoop on this year’s happenings and read former keynote addresses by Satish Kumar (2005) and Vandana Shiva (2004). Send us your website feedback: email Kathy Litchfield, publicity coordinator, at: kathylich29@yahoo.com.

Exhibits Still Available

Want to exhibit at the NOFA Summer Conference? Space is still available. The exhibit form is available on the website, or contact Katie Campbell-Nelson at (413) 624-3242 or email campkba2@earlham.edu.

Scholarship Donations

Your generous donations make it possible for low-income individuals to attend the conference. General adult scholarships or targeted scholarships to adults or teens of color are much appreciated.

Donate online at the website (www.nofamass.org, Summer Conference link) or send scholarship donations, make sure you come!

Join the Summer Conference Committee!

It’s a fun way to get involved with a great group of people working towards putting on the Summer Conference each August. Learn more by visiting our website – each section of the conference run by a different coordinator. Call Julie Rawson at (978) 355-2853 for more information or to get involved!
"Oh what some power the giffie gie us
tae see ourselves as others see us:
Robert Burns, "To a Louse" (spotted on a lady's bonnet in church), 1786

Summertime in the USA

Book Reviews

"Organic, Inc. – Natural Foods and How They Grew" by Samuel Fromartz
published in 2006 by Harcourt, Inc.
reviewed by Steve Gilman

Fromartz’s food quality quest began in earnest once he was no longer single or relying on takeout food. When his inner chef led him into the carefully controlled Whole Foods Market experience, his business analyst proclivities caused him to buy stock in the company and marvel at its meteoric burst during the time of the overall stock market dot-com bust. In 2004-05 he took time off to do his homework and travel the country interviewing organic farmers, advocates, and businesses to write this book – judiciously selling his still-ascending Whole Foods stock to avoid a conflict of interest in his reporting.

This isn’t your standard business analysis tract. Fromartz has an eye (and respect) for the “strong-minded and often eccentric idealists” who led the foundations of ORGANIC to begin with and wants to meet “the people who were feeding me.” While he doesn’t wear his politics on his sleeve, he wants to meet “the people who were feeding me.”

Organic is consumer driven in more ways than one, he says at one point. “In a direct way, consumers are also providing the investment in research and development that the government has largely avoided making in organic farming until very recently. Agribusiness has not pushed deeply into this area, either, since, unlike research into genetically modified crops, the results cannot be patented, owned and licensed. The only funds available are from CSAs, borrowing money from customers ($250,000 one year from over 40 customers, who were issuing the funds like startup notes), organic certification, immigrant labor, small farm economic sustainability and the “disappearing middle” of mid-sized farms.

This is contrasted with Earthbound Farm, the huge west coast bagged-salad greens grower (accounting for over 26,000 acres in CA and AZ as well as Mexico, Canada, Norway, and New Zealand), who were influenced by Helen and Scott Nearing, to their success as founders of the Tuscarora Organic Growers cooperative, a million dollar, plus, operation. The idea was to provide an opportunity for asides on CSAs, borrowing money from customers ($250,000 one year from over 40 customers, who were issuing the funds like startup notes), organic certification, immigrant labor, small farm economic sustainability and the “disappearing middle” of mid-sized farms.

Fromartz underscores the wide diversity of adherents that constitute today’s organic community – including agrarians, larger farmers, consumers and consumer activists, chefs, entrepreneurs, retailers and wholesalers:

“These interests did not see eye-to-eye, because they had different agendas, but that was the point. In its diversity, the organic coalition enlarged itself and avoided a stagnant monoculture. But this diversity proved to be the movement’s greatest weakness. It couldn’t easily evolve into conflict... After three decades of growth, the coalition showed signs of hemorrhaging after the organic regulations took effect in 2002 and then moved dramatically into a way that threatened the entire industry. By then, the bedrock vision of the common enemy – conventional agribusiness, or the industrial complex” depicted by Michael Pollen “intersection of idealism and business” in the organic world and what happens when the founding ideals of the movement are altered by producers, consumers and an infusion of new money.

The organic movement’s collision course with USDA (and consumer groups), nutritionists, chefs, politicians and big food including the evolution of the Organic Standards Board (NOSB) and the industry influence is the major theme of this book.

Fromartz’s two-volume work is a comprehensive look at the history of organic farming and how the industry that is to take up where the original organic movement left off by 2005, severe chemical dependency and ozone layer destroyer. Originally targeted by international agreement to be completely phased out by 2005, severe chemical dependency and Bush Administration “critical use” exemptions are keeping it in wide use. The US is using twice as much methyl bromide as all other nations combined.

Fromartz’s text is divided into seven sections, each containing a series of chapters, with each chapter focusing on a particular aspect of the organic movement. The first section, “The Birth of Organic,” covers the early years of the movement and the challenges it faced. The second section, “The Rise of Organic,” examines the growth of the movement and the challenges it faced as it expanded. The third section, “The Rise of Big Food,” looks at the challenges faced by the organic movement as it faced competition from larger food companies.

The book concludes with a section on the future of the organic movement and the challenges it faces as it continues to grow. Fromartz’s text is well-researched and provides a comprehensive look at the history of the organic movement. It is a must-read for anyone interested in the history of organic farming and the challenges faced by the movement as it continues to grow.

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Chapters Three and Four present the design process itself via conceptual frameworks and step-by-step assistance. Chapter Five covers site challenges that require either adaptive design or special pre-planting preparation. Chapter Six goes into the details of planting – variety selection, placement, the art of digging and filling in holes, and mulching. Finally, Chapter Seven talks about the practicalities of managing and maintaining the garden, and evolving with it to a higher potential.

Permaculture is the art of designing a living environment in such a way that it minimizes the amount of human energy required while maximizing the useful output. This is done primarily by working with nature to design sustainable ecosystems that provide most needed inputs – fertility, water, weed and pest control – without human intervention. A model for permaculture enthusiasts is the forest itself – fertility from falling leaves and leguminous plants, water from rain plus groundwater reserves with losses only through natural plant transpiration, weed and pest control through biological diversity of both plants and animals and soil microorganisms. The energy comes, naturally enough, from the sun. The outputs – fruits, nuts, tubers, mushrooms, firewood, medicinal – can support not just humans but a host of livestock and wild creatures who sustain the complexity of the system.

In the sense that a forest (in a moist, temperate climate such as we have in most of the US) is the ultimate stage in natural succession, this makes a lot of sense. For most of us farmers and gardeners, however, it goes against the grain. We try to maximize sunlight and open space, accepting the concomitant burden of erosion and need for fertilization, tillage, irrigation, and pest control as part of the price of bounteous harvests.

There is a wealth of resources in Edible Forest Gardens to help you think through this alternative growing paradigm. I have included a number of illustrations from the book to give you an idea of how permaculturists approach thinking about designing an environment.

**Figure 1.3** illustrates a classic permaculture goal – the integration of various homestead functions with a minimum of human effort (things like arbors and fences and other one-time improvements are greatly preferred to ongoing intervention.)

My one criticism of this work is that reading Jacke is a little like reading Hegel. One learns all the attributes of a thing before ever getting a concrete example of it. But if you can suspend your impatience until he finishes his classifications, you will be well rewarded by the passion and thoroughness with which he writes.

**TABLE 2.3. Permaculture zones of use: how various design factors change from zone 1 to zone 4 as distance from the core of a homestead or farm increases. Zone 5 is wild and unmanaged.**  
Adapted from Molin, 1990.

**TABLE 2.4. Forest-garden zones of use: suggested changes in forest garden design characteristics as distance from the core of a homestead increases. Many smaller sites will not have enough room for zones 3 and 4. Zone 5 is wild, unmanaged landscape.**

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by distance from the dwelling, partly by natural features of the land, and partly by one's own preferences. Tables 2.3 and 2.4 suggest the uses and design factors one might consider in establishing zones. Figures 2.6 and 2.7 sketch how these uses and factors might apply in one specific case.

Understanding the daily and seasonal movement of the sun at one's latitude, for instance, is a core permaculture design idea. Sun and shade patterns are thus fundamental design tools when you look at a piece of land. (Figures 2.17 and 2.18)

Zones are another core idea. Relative to one's dwelling (zone 0), one can establish zones for various activities – intensive gardening, livestock, orchards, cropping, recreation, etc. governed partly from the dwelling, partly by natural features of the land, and partly by one’s own preferences. Tables 2.3 and 2.4 suggest the uses and design factors one might consider in establishing zones. Figures 2.6 and 2.7 sketch how these uses and factors might apply in one specific case.

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Organic Growers Announce Fifth Annual Taste! Organic Connecticut

Celebrate the harvest this year at the third annual Taste! Organic Connecticut, to be held Sunday, September 10, 2006 from 10 a.m. - 4 p.m. at Topmost Herb Farm in Coventry, CT. The event sponsored by CT NOFA (the Connecticut chapter of the Northeast Organic Farming Association) will feature a Fall Festival with something for everyone.

There will be the state’s largest organic farmers’ market with educational workshops, children’s entertainment, sustainable craft vendors, great live music, and of course the freshest, tastiest organic food to be found.

Workshops include Growing Garlic, Purchasing Produce for the Winter, Organic Land Care, Making and Using Compost, Raising Chickens, Organic Land Care for the Fall, Saving Seeds, Raising Mushrooms, Growing Gourds and four popular Weed Walks.

As always at Taste! Organic Connecticut, freshness is measured in hours. The menu at the Willimantic Food Coop Tent, prepared by Chef Mariah Bechtold, features the finest organic vegetables prepared in delicious ways. Dessert features fresh fruit cobblers from Sweet Sage Bakery.

Check the website, www.ctnofa.org for the menu, list and schedule of musicians, times of workshops and directions.

Mark your calendars today for September 10th, and join in the fun at Topmost Herb Farm, 244 North School Road, Coventry, CT. Admission is $5 per person for everyone between 12 and 80 years old, and includes parking, workshops and music. For more information, contact 203-888-5146 or visit www.ctnofa.org. No pets, please.

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www.mhof.net, farm@mhof.net

The organic farmers market, great music, delicious food, children’s activities and educational workshops at Taste! Organic Connecticut draw over 1,000 people to Topmost Herb Farm in Coventry, CT on the Sunday after Labor Day.
One-day course designed for landscapers and municipal employees by Kathy Litchfield

The NOFA Organic Land Care Program is growing! With 215 NOFA Accredited Organic Land Care Programs working hard in their communities in nine different states, the word is spreading quickly that Organic Land Care is widely respected and increasingly popular. The Wall Street Journal recently featured organic lawn care in its weekend edition.

Consumers are demanding less- and non-toxic playgrounds, town parks and backyards. Universities nationwide are publishing books and fact sheets with resources for pesticide-free lawns and gardens. States including Connecticut, and many towns throughout New England are passing laws banning the use of toxic chemicals on public properties.

Furthering its mission of education and outreach in organic land care, the NOFA Organic Land Care Program will offer the NOFA Organic Lawn & Turf Course for the first time in two states – on August 15, 2006 at the Wilbur Cross High School in New Haven, CT and on August 17 at the South Shore Vocational Technical High School in Hanover, MA. This one-day course was held in Manchester, CT last year to an audience topping 150.

The course is designed for professional landscapers and municipal employees, as well as being suitable for garden and environmental center staff, landscape designers, community activists, homeowners, and anyone interested in learning specific organic methods of caring for lawns and turf.

It will take place from 8:30 a.m. to 5 p.m. in both locations and will include separate lawn and turf tracks in the afternoons, giving participants a choice of what they’d like to focus on in-depth. The morning sessions will include Why Organic?, Site Analysis, Soil Fertility, Soil Amendments, Compost and Compost Tea, Cultural Practices and Pests, Weeds, Diseases and Insects.

Participants will learn how to grow organic lawn and turf that looks good and survives stress; why the demand for organic lawn and turf care is increasing; how to transition from conventional to organic management; how to use this knowledge to make a profit in a rapidly expanding market; as well as ways to educate and communicate with clients about organic land management methods.

Course speakers, who are scientists, experts and professionals in the field of organic land care include:

- **Thomas Akin**, an agronomist with the USDA’s Natural Resources Conservation Service in Amherst, MA
- **Donald Bishop**, owner of Gardens Are . . . . in Marlborough, MA
- **Todd Harrington**, owner of Harrington’s Organics and Sustainable Growth™ in Bloomfield, CT
- **Michael Murray**, owner of Organic Soil Solutions in Woburn, MA
- **Michael Nadeau**, owner of Plantscapes, Inc. in Fairfield, CT
- **Chip Osborne**, co-founder of the Living Lawn Project in Marblehead, MA
- **Kimberly Stoner**. Ph.D., an entomologist with the CT Agricultural Experiment Station in New Haven, CT

The course will offer four re-accreditation credits for NOFA Accredited Organic Land Care Professionals (AOLCPs), as well as pesticide applicator credit hours in both Connecticut (6.5) and Massachusetts (TBA). The course costs $145 for the first person from a firm or town and $120 for each additional person. It includes coffee, the handbook, course speaker handouts and a local, organic lunch. Register by visiting www.organiclandcare.net or call Bill Duesing, CT NOFA Executive Coordinator, at (203) 88-5146 (email: bduesing@cs.com) or Kathy Litchfield, NOFA/Mass Organic Land Care Coordinator, at (978) 724-0108 (email: kathylitch29@yahoo.com).

The NOFA Organic Land Care committee will publish a comprehensive handbook on managing Organic Lawns & Turf, funded by the Community Foundation for Greater New Haven’s Quinnipiac River Fund. The handbook will become the course manual.

Founded in 2000, the NOFA Organic Land Care Program extends the vision and principles of organic agriculture to the care of the landscapes where most people carry out their daily lives. Organic land care uses appropriate methods and materials to promote plant health and uses no synthetic pesticides or soil amendments. A healthy soil contains billions of organisms, from earthworms to microscopic bacteria. Such a balanced ecosystem is necessary for a healthy landscape. Healthy soils yield plants that are disease-resistant, negating the need for chemical pesticides. Organic land care prohibits the use of soluble, synthetic fertilizers and toxic pesticides. Experience has shown that organic land care methods work well and can be less expensive in the long run.

For more info, visit www.organiclandcare.net!
Connecticut

CT NOFA Office: PO Box 164, Stevenson, CT 06491, phone (203) 888-5146, FAX (203) 888-9289, Email: cntnoa@ctnofa.org, website: www.ctnofa.org
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* indicates voting representative

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**Calendar**

**Saturday, June 10**: A Sustainability Living Tour at two homesteads/farms in Ashfield, MA for more info: seedpotato@yahoo.com or 781-894-4358

**Saturday, June 17**: Grazing School, Fairfield VT. For more info: 802-933-6965 or sarah@globalnetisp.net

**Saturday, June 24**: Workshop on Growing Organic Strawberries with Mike Raymond at Land’s Lake, Weston, MA. For more info: seedpotato@yahoo.com or 781-894-4358

**Sunday, June 25**: CT NOFA Organic 3-Farm Tour, Voluntown and Stonington, CT. For more info: Bill Duesing (203) 888-5146 or bduesing@cs.com

**Saturday, July 4**: Foraging for Wild Edibles with Russ Cohen at Hampton College, Amherst, MA. For more info: seedpotato@yahoo.com or 781-894-4358

**Saturday, July 15**: Workshop on Using Draft Horses with Dale Perkins at Overlook Farm, Rutland, MA. For more info: seedpotato@yahoo.com or 781-894-4358

**Sunday, July 16**: Tour of Codman Community Farm focusing on Haying and Compost-making with Ray and Harriette Adamson at Codman Community Farm, Lincoln, MA. For more info: seedpotato@yahoo.com or 781-894-4358

**Wednesday, July 19** – **Saturday, July 22**: Foundations of Herbal Healing course with Nancy & Michael Phillips, Groveton, NH, for more info: www.HerbsAndApples.com

**Saturday, July 22**: Workshop on Organic Free Range Chickens for Eggs and Meat with Jack and Dan Kittredge and Julie Rawson at Many Hands Organic Farm, Barre, MA. For more info: seedpotato@yahoo.com or 781-894-4358

**Saturday & Sunday, July 29, 30**: Workshop on Straw Bale Construction with Deva Ruscnen in Greenfield, MA. For more info: seedpotato@yahoo.com or 781-894-4358

**Thursday, August 10 – Friday, August 11**: NOFA Pre-Conference on Food and Farming Education, NOAP Meeting, Hampshire College, Amherst, MA.

For more info: seedpotato@yahoo.com or www.nofamass.org/conferences/2006/2006conference.php

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**NOFA Membership**

You may join NOFA by joining one of the seven chapters. Contact the person listed below for your state. Due to 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 $150, Student/Senior $25

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

**Massachusetts**: Individual $30, Family $40, Supporting $100, Low-Income $20

Contact: Membership, 41 Sheldon Road, Barre, MA 01005 (978) 355-2853, or email info@nofamass.org

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

Contact: Elizabeth Obedelms, 4 Park St., Suite 208, Charlestown, MA 02813 (401) 755-7757, fritzvoeh@verizon.net

**New Jersey**: Individual $35, Family/Organizational $50, Business/Organization $100, Low Income: $15*

Contact: PO Box 866, Pennington, NJ 08634-0886, (609) 737-6848 or join at www.nofanj.org

**New York**: Student/Senior/Limited Income $15, Individual $30, Family/Farm/Nonprofit Organization $45, Business $100, Add $10 to above membership rates to include subscription to The Natural Farmer.

Contact: Mayra Richter, NOFA-NY, P.O. Box 880, Cobleskill, NY 12043, info@nofany.org or www.organiclandcare.net

**Rhode Island**: Student/Senior: $20, Individual: $25, Family $55, Business $25

Contact: Membership, NOFA RI, 51 Edwards Lane, Charlestown, RI 02813 (401) 755-7757, fritzvoeh@verizon.net

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

Contact: NOFA-VT, PO Box 697, Richmond, VT 05477, (802) 434-4122, info@nofavt.org

* does not include a subscription to The Natural Farmer
Studies document the importance of organic food, particularly in children's diets. This issue contains news, features, and articles about organic growing in the Northeast, plus a special Supplement on Is Organic Better?